

MODELLING PROJECT COMPLEXITY FOR LEADERSHIP DECISION-MAKING AND SUCCESS IN THE BUILDING CONSTRUCTION INDUSTRY IN LAGOS, NIGERIA

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Dedicated to Grace Udeme Essien, my incredible mother..

Declaration of Original Authorship

I hereby declare that this doctoral thesis is entirely my own work and that it has not been submitted in any other college or university.

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ABSTRACT

Construction projects improve the built environment and human civilisation. However, the challenges arising from project complexity in the strategic era of Project Management (PM) have resulted in majority of projects around the world failing to deliver to stakeholders' satisfaction. Particularly, building construction projects are inherently complex and this affects leadership decision-making and project success at project, organisation and institutional levels. This study argues that existing models of project complexity (MPC) are limited in their conceptualisation as they do not account for all the factors that influence project success, resulting in poor decision-making and project failure. This study examines failure relating to building collapse in Lagos, Nigeria. Therefore, a literature review revealed the main paradigms, concepts and constructs that influence project success in the PM, Business Management and Leadership Studies literature. The gaps in existing models informed the development of the novel Leadership Systems Response (LSR) framework which characterises project systems within organisation, environment and leadership constructs. The LSR framework was used as a conceptual lens for the research design, data collection and analysis using the epistemology of pragmatism, applying retroductive strategies and adopting the exploratory sequential mixed method approach and analysis techniques. The data collection tools were mainly interview and questionnaire while the data was analysed using content analysis, as well as descriptive and inferential statistics. The findings are based on the 2010 Building Industry Reforms (BIR) in Lagos and were used to validate and revise the LSR framework. The results suggest that projects are embedded in complex systems, which have endogenous and exogenous dimensions. These exist as complex adaptive organisation, environment and leadership, systems of which are in constant interaction with one another through people, in linear and non-linear social dynamics. Decision making must account for these dynamics to improve project outcomes. Additionally, leadership systems are essential to improve project success and maintain the adaptability of projects within complex systems. Therefore, this study's main contribution to knowledge is the LSR framework as a new decision-making tool that can improve the way complex projects are conceptualised, particularly by researchers and practitioners.

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ABBREVIATIONS

Building Collapse Prevention Guild	BCPG
Building Industry Reforms	BIR
Complex Adaptive Systems	CAS
Critical Success Factors	CSF
Exploratory Sequential Mixed Method	ESMM
Key Performance Indicators	KPI
Lagos State Building Control Agency	LASBCA
Lagos State Materials Testing Laboratory	LSMTL
Macro Leadership	MAL
Micro Leadership	MIL
Mixed Method Analysis	MMA
Model(s) of Project Complexity	MPC
Nigeria Institute of Architects	NIA
Project Management	PM
Project Based Organisations	PBO
Rethinking Project Management	RPM
Standard Organisation of Nigeria	SON

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CHAPTER 1

INTRODUCTION

1.1 THE FOCUS ON CONSTRUCTION PROJECTS

Construction projects foster long-term socio-economic development in economies around the world, enhancing human civilization and the quality of life. This may explain why the successful delivery of construction projects has continued to generate considerable interest of governments, industry practitioners, the academia and the public the world over. This is predicated on the direct impact of construction processes and outputs on national economies, the environment and humans (Ofori, 2012), especially in the area of housing and physical infrastructure (Ijigah et al., 2013; Camponovo, Merz and Vorlet, 2006).

Furthermore, the industrial revolution that occurred in the early 19th century resulted in rapid urbanization and greater complexity in construction processes due to changes in technology and clients' expectation. Due to these changes, the construction industry witnessed the transformation in construction-related disciplines later in the 20th century. Project Management (PM) as a discipline emerged in the 1960s due to the inability of the traditional practitioners to cope with increasing complexity of the project-driven industries, such as construction.

PM offers a pragmatic approach to addressing some of the challenges of the construction industry, but its success as a discipline continues to attract robust debate, both in research and practice. Despite the advent of PM in construction, majority of projects around the world continue to fail to achieve project objectives of budget, schedule and quality as set out at inception (Ramanathan et al., 2012; Cserhati and Szabo 2014). Over 80% of projects in the UK fail to fulfil their set objectives (APM, 2015) and these figures are even higher in developing countries (Toor and Ofori, 2008a; Rwelamila, 2012). This is particularly evident in construction projects due to their complexity (Ma and Fu, 2020).

There is a consensus in PM literature that projects are generally complex which is significant because complexity makes achieving project success more challenging (Rolstadas and Schiefloe, 2017). Similarly, the lack of understanding of the complexity of project systems may explain why majority of projects around the world continue to fail to meet the expectations of stakeholders. However, Rolstadas and Schiefloe (2017) argued that the nature of project complexity remains contentious which has led to a proliferation of models without a commensurate improvement in project success or a narrowing of the gap between research and practice. This is the premise upon which this study evolves.

1.2 RESEARCH PROBLEM

For many decades the research community on PM have sought to provide knowledge to improve success in the delivery of projects and enable practitioners make better project-related decisions. Some of these research endeavours focused on improving the understanding of project complexity. Numerous tools and methods are available for PM as defined in *A Guide to the Project Management Body of Knowledge 6th Edition* (PMI, 2017) and *APM Body of Knowledge 7th Edition* (APM, 2019).

Nonetheless, Rolstadas and Schiefloe (2017) argued that the use of these tools and methods become more challenging as projects become complex. Likewise, Brady and Davies (2014) suggested that many projects fail due to practitioners' inability to manage increasing project complexity. These practitioners provide leadership at project, organisation and institutional levels by making decisions that inform project outcomes. Since the mental conceptualisation influences leadership decision making and project success, literature reveals that inadequate models of project complexity has resulted in poor decision making and subsequent project failure (Vidal, Marle and Bocquet, 2011; Daniel and Daniel, 2018).

Therefore, leadership decision making and project complexity significantly influence project success (Ma and Fu, 2020; Luo et al, 2021). These constructs are not mutually exclusive and a departure from the traditional PM approach, as well as the exploration of new models of project complexity (MPC), are necessary for better

leadership decision making and improved project outcomes, particularly in an era of rapidly changing project dynamics. This is particularly relevant in rapidly developing cities such as Lagos, Nigeria where cases of cost and time overrun, project abandonment and building collapse are ubiquitous in the construction industry (see discourse in Chapter 7).

Numerous studies in PM have attempted to develop MPC. Particularly, the Rethinking Project Management (RPM) movement provided guidelines for future research direction in this regard. The scope of the RPM guidelines includes the development of a new model that reflects the complexity of projects (Winter et al., 2006). These guidelines align with further calls for the contextualization of new models of complexity to encompass both exogenous and endogenous elements (Svejvig and Andersen, 2015; Rezende et al., 2018) and; to improve our understanding of the relationship between project, organisation and environment (Geraldini and Soderlund, 2018). This study focuses on models of project complexity with relevance to construction projects as distinct from other project typologies.

Since 1999, calls for new paradigms of project complexity that can improve on classical methods have been palpable (Williams, 1999). Project complexity influences its performance and overall success, particularly where underestimation of nature of complexity results in poor decision-making (Vidal et al. 2008; Luo et al. 2020). Since success is the ultimate goal pursued by stakeholders in PM (Luo et al. 2020), new MPC and their analysis can improve success in production planning (Gidado, 1996), leadership decision-making (Vidal et al., 2011; Qureshi and Kang, 2015) and project risk management (Vidal and Marle, 2008; Qazi et al., 2016).

Following the analysis of 50 years of project complexity research, Rezende et al. (2018) suggested that MPC is the most significant topic in this research area. In their words, the central discourse in this knowledge domain includes,

‘Efforts to characterize and classify complex projects to focus on the developing models and frameworks that, considering aspects of uncertainty and dynamic, supported managers in adapting and managing their projects’.

Evidently, MPC are essential to support project managers, particularly in the area of decision-making and project delivery to match stakeholders' expectations. Therefore, this study seeks to develop a MPC and validate it by exploring the effects of leadership decision-making on project success. Project success and leadership decision making are discussed extensively in Sections 2.3 and 3.4.3. Factors that influence project success exist as systems and their study is important because most of the time, the systems, not the individual factors cause projects to fail (Jitpaiboon et al., 2019). The foregoing heightens the need for MPC.

A model is a simplified representation of the existing structure of a phenomenon found in the world, which can be a useful resource for sharpening our focus to analyse and tackle complex problems (Rooke et al., 2008, p 53 – 54). Therefore, such a model will be very useful for sharpening research objectives in academia, as well as tackling project-related problems in practice. To corroborate this gap in knowledge, Denicol et al (2020) suggested that PM literature lacks an overarching framework that sufficiently depicts the disparate factors that contribute to project success. These factors are examined in this study through an interdisciplinary approach and the specific aim and objectives are as follows.

1.3 RESEARCH AIM AND OBJECTIVES

The aim of the research is to investigate the effects of leadership decision-making on project success in Lagos, Nigeria from the PM context. The research will seek to,

1. Examine the key factors and concepts influencing project success.
2. Draw on these factors and concepts to develop a conceptual framework
3. Apply the conceptual framework to investigate the factors that affect building construction success in Lagos, from a leadership perspective.
4. Explore, analyse and validate leadership responses to project failure.
5. Draw wider conclusions on the interplay between organisation, environment and leadership with implications for PM research and practice.

The focus on leadership decision making is informed by its impact on project success. This is particularly significant in the construction industry where leadership, decision making and problem-solving are identified as essential skills for the construction process to deliver projects successfully (Khamaksorn, 2016). Furthermore, majority of construction project management literature lay emphasis on the impact of leadership and decision making on various aspects of projects such as goals and objectives, organisation structure, operations and outcomes at key decision points (Fewing, 2005; Walker, 2007). These are addressed in greater detail in Chapter Three.

In order to validate the hypothetical model of project complexity, the study examines the effects of leadership decision-making on project success in response to the issues of building collapse in Lagos. Particularly, the reflections and wider conclusions focus on the 2010 Building Industry Reforms (BIR) in Lagos. The focus on building collapse was informed by the fact that this form of project failure encapsulates the full essence of project success, involving project management success and product success (see Section 2.3). Additionally, success in this study is rated using stakeholder satisfaction rather than time, cost and quality metrics (see Section 2.4.1) and at the time of completing this thesis there was widespread concern and stakeholder satisfaction with the issue of building collapse which triggered the reforms. Furthermore, one of the causes of poor project performance is leadership decision-making behaviour (Denicol et al, 2020), which underscores the significance of this study.

Similarly, the global paradigm shift in PM ideology that began the 21st century continues to challenge PM thinking and raise questions about the efficacy of current models, theories and practices. Should practitioners be more focused on conformance to construction specification rather than performance to stakeholders' expectation? Can construction organisations and their project strategies remain static in a constantly evolving environment? How can we assess the impact of leadership behaviour or influence on subsequent outcomes in projects, organisations and industry? These and many more questions have shaped recent discourse of PM development and the answers provided in this study will seek to contribute knowledge towards the conceptualisation of project complexity, thereby improving project conceptualisation and decision-making to open new vistas of future research.

1.3.1 Research Questions

This study iteratively evolved based on the outcome of the critical review of literature and pilot study with the following main research questions.

1. Why are buildings projects in Lagos failing to meet the expectations of stakeholders in Lagos, particularly in the light of building collapse? How has Lagos State Building Control Agency (LASBCA) performed in reversing building collapse in Lagos? Please give reasons for your response and views.
2. How can the building construction industry be improved?

These research questions directly address the study's aim and objectives and this is discussed in Section 9.5. Although these questions appear to be quite distinct from the research objectives, they are based on the peculiar events in the building industry in Lagos; building collapse and the consequent BIR by the government of Lagos State (Section 7.4). The nature of the questions permitted the participants to describe the factors that affect building construction success in their own words following which the researchers inductively examined the prevalent themes relating to project complexity. This approach became necessary after the pilot study revealed that the questions generated directly from literature were full of specialist jargon, which made understanding difficult for the participants, resulting in low response rate (see Section 7.7.1). Therefore, the ideas and structure of the questions for all the phases of the study were tailored with the context in mind and contained less of specialist language. Project complexity is a very broad subject; therefore, it is necessary to define the scope of this study. This is outlined next.

1.3.2 Unit and Level of Analysis

According to Fernandez-Solis (2008), there are four standard units of analysis in social science research. These are individuals (e.g. entrepreneurs), groups (e.g. cultural groups), organisations (e.g. construction companies) and environments (e.g. natural environments). These all possess elements in multi-levels of interaction that affect the subject of interest and produce various levels of complexity (Fernandez-Solis,

2008). In this study, the subject of interest is building construction projects (see Section 2.2.3.1) and the unit of analysis is limited to individuals with a focus on decision-making. Again, this is significant because complexity affects decision-making and emergent behaviour (Rooke et al. 2008).

Similarly, in construction-related research the level of analysis can be macro i.e. industry and micro i.e. project and firm (Fernandez-Solis 2008, p 37 – 38; Morris and Geraldi, 2011). This study focuses on the macro-level, which Soderlund and Sydow (2019) described as the institutional level. At the institutional level, project-driven endeavours focus on success at wider environmental context of projects and organisations (Morris and Geraldi, 2011; Soderlund and Sydow, 2019). The unit and level of analysis significantly influenced the choice of participants for this study (Section 6.7.2.4), as well as other methodological consideration. Notably, participants are selected from both the micro and macro levels of the building industry to provide a robust discourse on MPC.

1.3.3 Study Area

Majority of published studies on project success focus on the developed regions, while empirical studies relating to the developing countries remains weak (He et al., 2019). The choice of Lagos as the study area responds to this gap in empirical PM studies, particularly its status as a megacity. According to Taubenbock et al. (2012), a megacity is the largest category of urban agglomeration with over 10 million inhabitants, which breeds attendant economic, socio-cultural and environmental complexities. Between 1975 and 2012, the number of mega cities in the world increased from three to twenty-seven, including Lagos (Taubenbock et al., 2012). This population portends great challenges for the building construction practitioners, researchers, government and development partners.

As Nigeria's most populous city with a population that was put at 17,552,942 million people in 2006 (Lagos Bureau of Statistics, 2012), Lagos is estimated to have exceeded 20 million inhabitants in 2015 (United Nations Human Settlements Programme, 2006 p. 71) and ranked the most populous city in Africa. It was Nigeria's

capital city from 1960 until 1991 and remains the country's most important commercial hub having evolved from a trade harbour in the 19th century. The city continues to experience rapid urbanisation with attendant ripples beyond its boundaries. It has the largest seaport in Nigeria, handling 80% of the nation's import trade, as well as providing the most important connecting point for travel within and outside the country with Nigeria's busiest international airport.

The direct consequence of this scenario is massive migration to Lagos resulting in higher demands for housing and improved infrastructure. Geographically, it is the smallest state in Nigeria with a land area of 3345 square kilometres with about 17 percent of this total area consisting of lagoons and creeks, which further exacerbates the severe land constraints, as well as housing and infrastructural challenges. The aforementioned commercial and demographic narrative are just a few of the reasons why Lagos continues to attract world attention. The city's rapid but seemingly unregulated growth, coupled with the challenges of its fragmented geographical features have resulted in large expanse of urban slums and spontaneous settlements such as the Makoko coastal community.

Consequently, the concerted efforts to drive improved development of projects had accelerated since 2007, to mitigate the negative effects of rapid urbanization and improve the quality of the urban space (Pinto, 2016). As the Federal and State governments continue to grapple with the myriad of developmental problems, the project delivery and success has not matched demand, which has stretched existing housing and infrastructure in Lagos (Ede et al., 2014). Particularly, many cases of building collapse have been reported in Nigeria and project complexity is attributed amongst the causal factors (Adebisi, Ojo and Alao, 2018). The focus on building collapse in this study is significant because these types of project failure are very extreme, occur during and beyond the project lifecycle phases and have necessitated wide-spread industry reforms in Lagos (see Section 2.4.1 and Chapter 7). These challenges are examined in detail in Section 7.3 and 7.4, in the light of 2010 BIR and the establishment of Lagos State Building Control Agency (LASBCA).

1.4 SIGNIFICANCE AND MOTIVATION OF THE STUDY

For any research endeavour, it is essential to understand its motivation and influences with a view to establishing the credibility of the outcomes (Ahmed and Opoku 2016, p. 3). This research is primarily motivated by the researchers' previous professional work experience in Nigeria as an architect and project manager that created the awareness of challenges of construction project delivery. Furthermore, during his Master's programme in PM, the works of Anthony Walker on PM in Construction became a profound influence, particularly research on Organisational Structure and Systems Theory. These became the building blocks for his seminal work and future research interest.

Therefore, the assumptions about how organisational and environmental factors influence the decision-making of project practitioners became a pivotal interest. Arguably, investigating the relationship between the constructs of organisation, environment and leadership in projects presents a credible challenge, particularly to improve understanding of the complex nature of projects. Therefore, this study builds on the publication by Walker and Kalinowski (1994) which succinctly discusses the anatomy of a construction project in Hong Kong, arguing that all projects are comprised primarily of organisation, environment and leadership systems.

This insightful publication contributes immensely to contemporary discourse, however, what seems rather surprising is its very low citation in literature; 18 citations in scholar.google.com (January 2021). It is compelling to argue that studying phenomena as amorphous as organisation, environment and leadership within projects comes with obvious methodological and ethical challenges. Additionally, the causal relationship between the organisation, environment and leadership of projects and their impact on decision-making and success are rather difficult to generalise due to their complex characteristics. These difficulties may explain why this subject has remained largely under-scrutinised in PM literature.

Nonetheless, the research by Walker and Kalinowski (1994) appears to have been many years ahead of its time because debates about the impact of organisation, environment and leadership on project success have morphed into mainstream PM

discourse (FoPM, 2017; Daniel and Daniel, 2019; Mamedio and Meyer, 2020). Although constructs of project-based organisations have been researched extensively in PM literature, studies on leadership and the environment of projects are less ubiquitous. Therefore, an interdisciplinary approach is adopted in this study to examining literature in Leadership Studies, as well as Business Management domains to bridge this gap in knowledge in the PM research.

Invariably, as this research seeks to extend the study by Walker and Kalinowski (1994) one of its main contributions to knowledge is the development of the Leadership Systems Response (LSR) framework (see Chapter Five). This model not only allows these salient concepts of organisation, environment and leadership to be visualised and understood as they exist in reality, but it also provides a tool to facilitate the empirical aspects of this study, improve decision-making in practice and create an opportunity for other researchers to build upon the outcomes thereafter. Notably, Walker and Kalinowski did not provide a model in their study.

1.5 RESEARCH STRATEGY

Given the breadth of the research problem, the study began with a critical review of literature that resulted in the deep understanding of the constructs and paradigms, as well as debates and issues from previous studies regarding project success and MPC. This led to the development of the LSR framework to fulfil Objectives 1 and 2. The subsequent research stages developed retroductively (Section 6.7.1) based on pragmatism epistemology (Section 6.3.2). To study this complex phenomenon, the Exploratory Sequential Mixed Method (ESMM) approach using both quantitative and qualitative methods (Section 6.7.2), was adopted to achieve the objectives of this research. According to Bryman (2008 p 607), the complementarity of mixed methods permits different aspects of an investigation can be dovetailed. This strategy allowed for the practical investigation of real-world problems in building projects without the constraints of epistemological allegiance.

Exploratory interviews were conducted at the pilot study in Lagos between December 2013 - January 2014 to contextualize the issues emanating from literature and to test

the suitability of the various tools used in previous studies. This process improved the research design and led to clarity on the study population, understanding of the sample size, validation of the data gathering tools, and deepened understanding of the phenomena. The leadership at micro- (project and organisation) and macro- (industry or institutional) levels of the building construction industry in Lagos were identified and secondary data were acquired, which included the register of the various professionals in the building industry. These outcomes validated the LSR framework as a lens to drive the data collection and analyses in the main study. Thereafter, the research focused on exploring the BIR in Lagos through interviews and a questionnaire survey.

Twenty-two semi-structured interviews were conducted over the telephone from the UK followed by face-to-face interviews conducted with twelve participants. These were necessary to draw on the experience of practitioners in the study area. Respondents for the telephone interview phase of the study were selected from the Register of Chartered Architects only because they are recognised as the lead consultants in the building construction industry. During the face-to-face interviews, the twelve participants were selected from amongst leaders involved in the 2010 BIR in Lagos, being representatives of the seven built environment professional bodies, as well as other relevant building construction related stakeholder groups.

In this study, the group of twenty-two respondents that mainly function at the project and organisation level of the industry are referred to as either Micro-Leaders (MIL), while the Macro-Leaders (MAL) are those twelve leaders selected from the institutional level based on their involvement in the BIR in Lagos. In the final data collection phase, a questionnaire survey was conducted to validate the LSR framework using inferential statistics and to complement the qualitative data relating to decision-making. All participants gave their written consent before the data collection could proceed and these methods and empirically processes are fully described and justified in Section 6.7.2.

The objectives of the research were fully addressed (Section 10.5) and it is important to note that this study does not seek to measure complexity, rather, it builds and validates a model of project complexity. The study bridges the gap between theory

and practice, whereby the LSR framework can be used for future research, as well as improving decision-making and project success in practice. From a theoretical perspective, complexity theory helps us understand the phenomenon of project complexity and broadens our understanding of how project systems interact to produce complex outcomes.

Since its emergence from the natural sciences in the 19th century, the relevance of complexity theory has grown significantly and found application in research domains such as the Built Environment (Boussabaine, 2008) and PM (Whitty and Maylor, 2009). Boussabaine (2008) argued that CT offers,

‘A unique interdisciplinary framework for linking the often separate worlds of natural, social and artistic studies beyond their rigid boundaries.’

This interdisciplinary approach has improved research in the PM domain (Winters et al., 2006; Mamedio and Meyer, 2020) and is suitable for this study to broaden the conceptualisation of complexity within projects to encompass exogenous as well as the more traditional endogenous factors, thereby drawing inferences about the nature of projects as complex adaptive systems (CAS). In summary, the research strategy and design are outlined in Table 1.1 and the structure depicted in Figure 1.1.

1.6 ORGANISATION/STRUCTURE OF THE THESIS

The whole study is organised into ten chapters and the remaining sections of this thesis are structured as follows;

Chapter Two consists of a critical review of traditional PM literature weighing in on current debates, predominant constructs and theoretical obsolescence. The focus on the building construction typology is highlighted and the challenges of organising and delivering building projects are examined in the project success literature. The two main success paradigms, Key Performance Indicators (KPI) and Critical Success Factors (CSF), are evaluated within integrated success models. The interplay between organisation, environment and leadership begins to evolve in the various models found in extant literature and existing gaps are highlighted.

Table 1. 1 Summary of LSR research design and justification

(Adapted from Ahmed et al., 2016)

Research Process	Selected research tools and procedures	Reasons for the choice
The philosophy of the research	Pragmatic philosophical stance adopting both positivist and interpretivist paradigms	Leadership decision making and the modelling of project complexity are best understood through diverse theoretical positions, research methods and the examination of the knowledge and experience of construction leaders at different strata and segments of the building industry
Research strategy	Retroductive reasoning is the logic of this research which takes the middle ground between deductive and inductive approaches	Leadership decision making and the model of project complexity have many dimensions, therefore a mix of deductive and inductive research approaches was found to be suitable to answer the research questions
Research approach	Exploratory Sequential Mixed Method Approach was used in this study starting with interviews then a questionnaire survey based on the Reductive methodology	No single approach could adequately answer the research questions relating to project complexity and the dynamic interplay between organisation, environment and leadership. Hence, the use of multiple approaches improved the understanding of the challenges of decision making and the nature of project complexity.
Data collection and analysis approach	Mixed Method Analysis was used by combining both quantitative and qualitative methods to match specific research questions	The qualitative analysis provides deep textual data to draw out the knowledge and experience of the participants. The quantitative approach improved the breadth of the study by reaching more respondents at the project and organisation level, as well as examine the internal reliability of the data and validate the LSR framework using data factor reduction techniques.
Method(s) used for data collection	Due to the broad scope and the context of this study, interviews were used to collect the qualitative data and the outcome of its analysis was used to develop the questionnaire for the survey to achieve the research aim and objectives	The interviews provide indepth understanding of the state of the building industry in Lagos, problems and probable solutions, while the questionnaire survey validated the qualitative outcomes and provided the wider views of leaders and followers at the project and organisation levels of the building industry
Unit and Level of Analysis of the Study	The unit of analysis in this study is <i>leadership decision making</i> and level of analysis in the <i>macro or institutional level</i> of the building industry in Lagos, Nigeria	Research assumptions suggest that project complexity influences leadership decision making and building construction success which are then tested in the light of the Lagos Building Industry Reforms 2010. Notably, project systems are assumed to have 3 dimensions: organisation, environment and leadership systems which coexist as complex adaptive systems
Data analysis technique	The data from the interviews are analysed with Nvivo data management software while the questionnaires are analysed using Statistical Package for Social Sciences (SPSS)	Nvivo was used to manage the large data sets, improve coding and development of themes from the interview transcripts while the SPSS was used to conduct descriptive and inferential statistics, particularly factor analysis, as well as draw on larger number of participants at the micro level of the building industry in Lagos, Nigeria

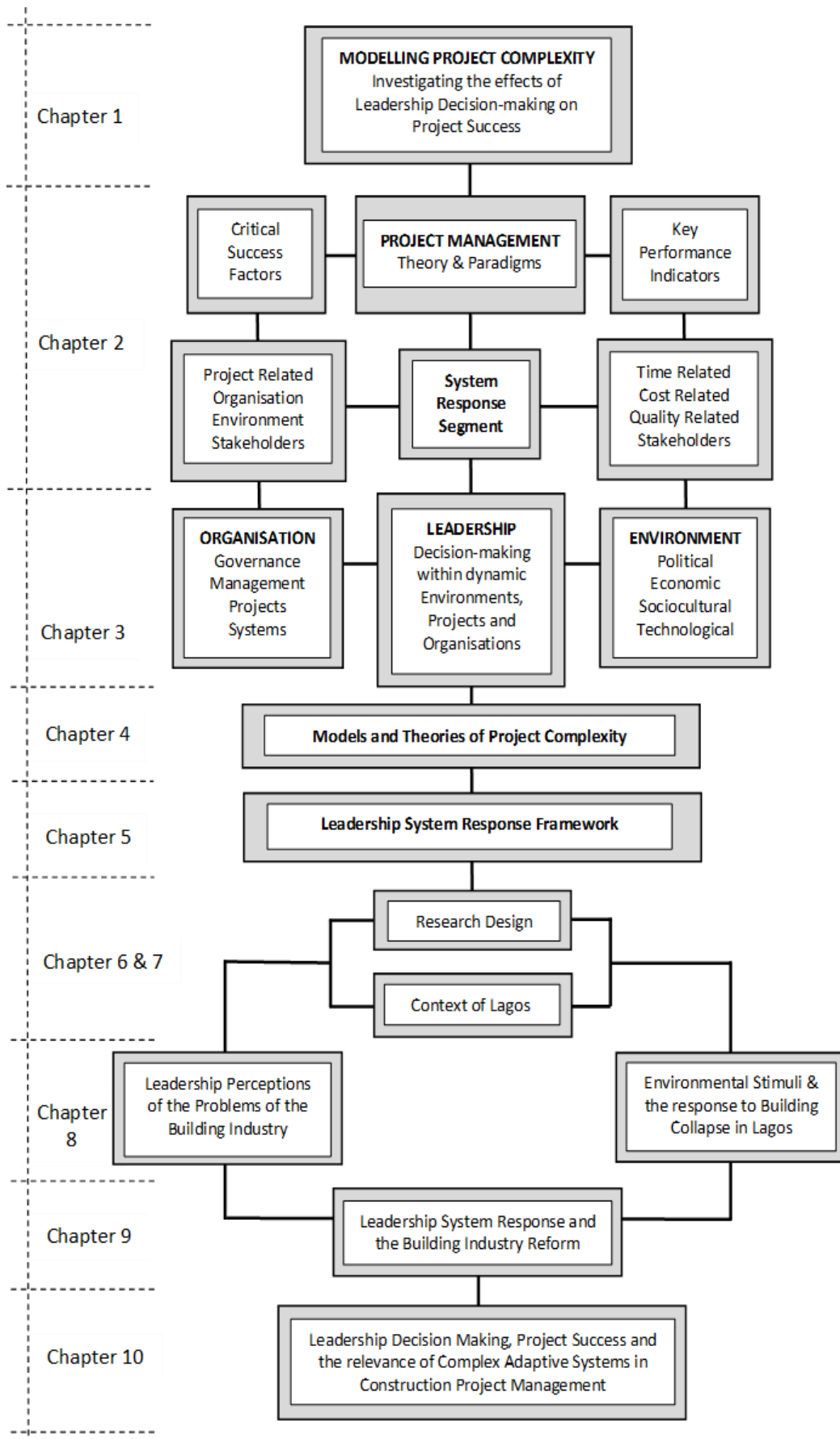


Figure 1.1 The overall thesis organisation

Chapter Three focuses on the strategic PM era by drawing on years of research in the Business Management and Leadership Studies domains to bring an interdisciplinary perspective to the understanding of the phenomena of project complexity. Furthermore, the interaction between the business organisation and environment is reviewed from a strategy development perspective. This chapter highlights the need for organisations to develop environmental-awareness and responsiveness through leadership-driven strategies. The concept of leadership decision-making and dynamism is espoused to highlight its importance within integrated models of organisation and environment. These models are compared with others in the previous chapter and the gaps in knowledge are identified and used to improve the development of the LSR framework.

Chapter Four discusses the relevant theoretical underpinning, background of CT and CAS, reviewed with particular reference to organisation, environment and leadership in building construction. Specifically, this chapter combines themes from CAS theory with the outcomes of the previous chapters to critique existing MPC in PM literature. Themes such as adaptability and nonlinearity begin to emerge as inherent characteristics of project systems. At this stage, some of the reasons why projects fail become more apparent, particularly the poor conceptualisation of project complexity which affects decision-making and project success.

Chapter Five discusses the process of development of the LSR framework as a conceptual depiction of project complexity by bringing all the key constructs that influence project success and interrelated project systems into visualisation. The methods of validating this new framework are espoused, as well as ways in which the framework may be used in research and practice.

Chapter Six gives a detailed analysis of the research methodology by describing philosophical choices within the ontological, epistemological and axiological options. Existing methodologies and justification for adopted approaches are discussed. Furthermore, the choice of research strategy is discussed as a structured template to guide the empirical phase of the study and improve the replicability of the research findings. The research methods used are discussed in line with the research

objectives. All aspects of the research design are discussed to provide a basis for empirical validity of this study. Techniques for analysing the data are also reviewed.

Chapter Seven gives account of the pilot and exploratory phases of the study to provide the general contextual discussion of the building construction industry in Lagos, Nigeria as well as uncover the problems of construction delivery in Lagos, Nigeria. Events and trends within the building industry are analysed to espouse the significance of the research problem. Furthermore, with the aid of purposively selected peer-reviewed publications on the challenges of the building industry in the study area, clarity was provided on how the LSR framework can be used to deconstruct project systems into aggregate subsystems. These secondary data were analysed to further understand the factors that influence project success, as well as validate the LSR framework. The sample population and sampling strategy were also verified. These outcomes led to a revision of the research design.

Chapter Eight examines factors influencing project success using primary data from interviews about the underlying causes of recurrent building collapse. Using the LSR framework as a lens, the existence and complexity of hypothetical variables of organisation, environment and leadership are explained. The data from twenty-two (telephone) and twelve (face-to-face) interviews are analysed thereby capturing the experiences of leaders in the building industry in Lagos. Furthermore, the success of LASBCA in reversing the trend of building collapse was evaluated. Therefore, a robust thematic analysis of the critical success factors is presented in the light of stakeholders' satisfaction and using Mixed Method Analysis (MMA) guidelines. The results are compared with the discourse from the previous phase of the study.

Chapter Nine presents leadership decision-making and recommendations for improving the building construction industry. The data is discussed using the LSR framework as a lens and conclusions are drawn about the underlying structure of complex projects. Here, the results of the interviews and questionnaire survey are triangulated with extant literature to provide robust evidence of the interplay between organisations, environment and leadership. This is aimed at providing some clarity on how project systems intricately influence decision-making and project

success. Inferential statistics is used to test the reliability of the data and the validity the LSR framework to confirm the existence of its entities.

Chapter Ten discusses the results of the exploratory sequential mixed method (ESMM) study and provides answers to the research questions, as well as explaining how the research objectives have been achieved. The LSR framework is revised based on the research findings to include all elements that may have been omitted in other MPC in previous studies. Conclusions are drawn about the implications of project complexity for PM research and practice, particularly the relevance of Complexity Theory. This ties up the main research findings with the aim and objectives of the study. Contribution to knowledge are discussed and limitations of the research are enumerated. Finally, recommendations for future research are outlined.

1.7 CONCLUSION

Without doubt, the project organisation, environment and leadership pose strong influences on decision-making and project success. It is expected that this study heightens the awareness of the nature and extent of these influences, as well as provide insights into how project outcomes may be improved. Inferences drawn at the end of this study improves understanding of the relational nature of these interdisciplinary constructs to give credence for future research on project complexity. Particularly, this study bridges the gap between research and practice by providing new knowledge that can help leadership in research and practice make better decisions and deliver construction projects successfully.

Therefore, it may be concluded that the outcomes of this research will ultimately provide knowledge that will enhance decision-making and project success which is imperative if the quality of the built environment is to be improved, investments are to yield commensurate value and the vibrancy of national economies are to be sustained through projects. Some of the conceptual gaps relating to the study of project complexity in PM have been addressed and it is expected that the study of organisation, environment and leadership of projects using Complex Adaptive Systems theoretical frameworks will continue to improve the understanding of project systems and inform future research in PM.

CHAPTER 2

TRADITIONAL ERA OF PROJECT MANAGEMENT

2.1 INTRODUCTION

This chapter traces the development of Project Management (PM) in literature as well as definitions and the understanding of the concept of success within the discipline. Although the profession appears to lack a unitary theoretical foundation, ideological movements and paradigms do exist that exemplify efforts at improving the development of the discipline, particularly to understand why projects continue to fail to meet stakeholders' expectations after six decades of PM growth. Ultimately, the discourse focuses on the traditional era of PM development and seeks to espouse the concept of success in PM and reveal the factors that influence project success.

Issues in the practice of PM are also examined to bridge the gap between theory and practice. Specifically, building construction typology of projects is selected for empirical focus on factors which influence project success, which will subsequently inform the choice of methodology and methods. Some success frameworks are examined to provide a basis for developing the LSR framework in Chapter Five. Insight on some of the concepts and paradigms that influence project success are also espoused and the chapter ends with a look at the significance of organisational and environmental factors on project success.

2.2 THE DEVELOPMENT OF PROJECT MANAGEMENT

The development of PM knowledge domain has evolved through many years of research and practice. A project is a distinct human endeavour because its systems' characteristics are unique, temporary, cross functional, executed to engender change and operates in an environment of uncertainty (APM, 2019). Similarly, PM is defined as, *"the application of processes, methods, knowledge, skills and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters"* (APM, 2019). According to PRINCE2 (2009) PM is,

‘The process of planning, delegating, monitoring and controlling of all aspects of the project, and motivation of those involved, to achieve the project objectives within the expected performance targets for time, cost, quality, scope, benefits and risks.’

Here the emphasis on monitoring and control of all aspects of the project raises questions about the realities of PM practice. Can the complexity of projects be sufficiently monitored and controlled? These ideas are examined, particularly in Section 2.5.3. The novelty and multidisciplinary nature of project work have made the theoretical development of PM a bit challenging and the following sections will briefly examine the growth of this profession, practically and theoretically.

2.2.1 Theories in Project Management

PM methods have been used for decades as tools to handle activities which are not only novel, but also exhibit various levels of complexity with the sole objective of successfully delivering projects (Munns and Bjeirmi, 1996; Shenhar and Wideman, 2002). The basic approach to addressing project management tasks involves the combination of hard skills involving the use of project management techniques such as work breakdown structure, as well as soft skills which refer to administrative and social skills of project managers for customers’ satisfaction (Ogwueleka, 2011).

Nonetheless, PM literature lacks an explicit theory (Musawir et al. 2020), and this deficiency is particularly noteworthy because theory distinguishes professions from crafts (Koskela and Howell, 2002). Due to its multidisciplinary nature, PM draws practitioners from numerous well-established professional domains such as the built environment, natural and social sciences. Inevitably, these professionals draw theoretical approaches from their distinct backgrounds then seek to find applicability in PM and overlaps may or may not exist (Winter et al, 2006).

These resulted in PM researchers and experts seeking to substitute the existing approaches with more powerful theoretical foundation, which resulted in the

proliferation of theories. For example, the proposition by Koskela and Ballard (2006) for building alternative theories of PM from economics-based and production-based theories does not appear to have been widely accepted despite evidence that these theoretical approaches overlap in their assumptions. Likewise, Floricel et al. (2014) suggested that the theoretical bases of PM could be renewed using social theories such as Activity Theory, Actor-Network Theory and Structuration Theory. Similarly, Agency, Stewardship, Transaction Cost Economics, Stakeholder, Institutional, Contingency and Network theories have found application in project literature (Musawir et al. 2020 p 6 - 7).

Notably, organisational and institutional theories have been drawn upon by many scholars to advance this cause (Biesenthal et al., 2018; Dille and Söderlund, 2011) while complexity theory is being increasingly perceived as a credible lens in Project Studies (Mamedio and Meyer, 2020). Therefore, the need to improve the PM led to movements such as the *'Rethinking Project Management'* (Winter et al, 2006), *'Making Projects Critical'* (Sage et al., 2014) and *'New Project Management'* (Piccioto, 2019). These approaches all address the theoretical and practical challenges of PM. This has resulted in proliferation rather than convergence of ideas. In the light of the foregoing, Winter et al (2006) argued that due to this widespread criticism of the profession, the *'Rethinking Project Management'* (RPM) intellectual movement defined a future research agenda for PM, which is the focus of the next section.

2.2.2 Rethinking Project Management Movement

The RPM movement outlines the need to develop new models and theories that reflect the complexity of projects (Winter et al., 2006). This is one out of five strands of RPM future research directions. Within this strand, there is a greater emphasis on the broader view of projects especially managing exogenous factors as well as the more traditional endogenous ones. This study responds and contributes to this strand of research by developing a new model that reflects the complexity of projects. This RPM approach focuses on expanding and contextualising the concept of projects to encompass elements of the environment and organisation (Svejvig and Andersen,

2015), otherwise referred to as endogenous and exogenous factors which influence project success. Although the RPM research directions originated from 2004 - 2006, its agenda has continued to influence PM research for decades (Walker and Lloyd-Walker, 2016; Geraldi and Soderlund, 2016). Furthermore, subsequent studies and practice in PM have extended their level of analysis from individual projects to these micro- and macro-levels (Geraldi and Soderlund, 2018).

Table 2. 1: Levels and types of research in project studies
(Geraldi and Soderlund, 2018)

	Type 1	Type 2	Type 3
Level 3: Society/ Organisation	● Predict and improve multi-project firms/project-based organisations ● Contribution to project studies ● Examples: work on maturity models	● Understand the context and its relationship with projects, such as the tensions and relationships between temporary and standing organisations firms/ project-based organisations ● Contribution to project studies and organisational studies, and partly to strategy and innovation ● Examples: Midler (1995)	● Challenge and impact our understanding of projects in organisations and society ● Contribution to project studies, management and organisational studies ● Examples: Scott (2012), Manning and Sydow (2011), Lundin et al (2015)
Level 2: project	● Predict and improve project management processes ● Contribution to project studies ● Examples: conventional research on project management, project planning techniques, breakdown structure	● Understand temporary modes of organising and behaviour of projects ● Contribution to general management and organisation studies, e.g. process studies, organising ● Examples: Scandinavian School of Project Management, work on temporary organising	● Challenge and impact our understanding of projects and temporary organisations ● Contribution to project studies and beyond e.g. our understanding of organisations and organising practices more generally ● Examples: Bechky (2006), Hodgson (2004)
Level 1: individual/ team	● Predict and improve individual and social behaviour ● Contribution to project studies ● Examples: Muller et al (2012)	● Understand individual and social behaviour ● Contribution to leadership, human resource, organisational behaviour ● Examples: Partington et al (2005)	● Challenges and impact our understanding of individual and social behaviour ● Contribution to project studies and beyond e.g. organisational behaviour and leadership ● Examples: Hodgson et al (2011), Lindgren and Packendorff (2006)

These micro- and macro-levels represent organisational and environmental features of projects respectively. From Table 2.1, levels of analysis and types of research are integrated to produce nine different avenues for future research on projects and project practice. They argue that *Type 3 Research* reconciles the need for theoretical development and engagement with practice, which addresses limitations of *Type 1* and *Type 2 research*. Therefore, this thesis aligns with *Level 3* research and contributes knowledge to our understanding of the relationship between individuals, project and organisation/society within the MPC. It draws on previous studies and frameworks to develop a new model that depicts and conceptually evaluates the systems of projects and their complexity. It also aligns with the contextualization of projects to contribute knowledge to future research on the relationship between project success and organisational strategy (Geraldi and Soderlund, 2018), thereby proffering best guesses on why projects may fail or succeed. The next section examines issues in PM practice to align the study with practical realities.

2.2.3 Issues in Project Management Practice

Beyond theory, PM in practice has been focused on the organisation and successful completion of projects. In fact, Shenhar and Wideman (1996) stated that the primary goal of PM is to deliver projects successfully; therefore, stakeholders need to clarify the meaning of success and agree on its measurement criteria as it relates to distinct project typology, to ensure that those responsible for formulating projects have a greater chance at success. Shenhar and Wideman (2002) corroborated this view and concluded that failure to match PM style and resources to a specific project typology and external influences can result in negative project outcomes.

Therefore, the importance of typology and context cannot be overemphasised, as researchers remain preoccupied with the concepts of success and effective project delivery. More recently, this ideology was reiterated in the collaborative research between Arup, UCL and the APM tagged; Future of Project Management (arup.com/FoPM) launched in April 2017. This study sought to improve understanding of the next phase of projects knowledge and suggested that academic

thoughts will need to be strategic to explore the big-ticket items that we should expect on the PM horizon. These big tickets issues were captured in the words of Andrew Edkins (arup.com/FoPM p. 5),

“The answer is to be found of two areas: the types of projects that project management is tasked to deliver; and the context in which project managers will find themselves”.

Understanding project typology and context is particularly necessary if the constantly evolving requirements of stakeholders are to be met and projects delivered successfully. The foregoing suggests that PM is not a ‘one size fits all’ discipline. Therefore, the concepts of project ‘typology’, ‘context’ and ‘success’ need to be clearly understood if the research design and outcomes are to be tailored with empirical rationality to ensure that research objectives are attainable and justifiable, thereby giving the overall study its significance in PM literature.

2.2.3.1 THE TYPOLOGY OF PROJECTS

Project are ubiquitous in industries such as manufacturing, telecommunications, IT, education and engineering and construction (Hyvari, 2006), and typology of projects should be prime consideration in research and practice because different types of projects will have different requirements (Musawir et al., 2020). Of particular interest in this study is the phrase ‘construction’, which Chitkara (2009, pp 9-10) classified into four categories of buildings, infrastructure, industrial works and special-purpose projects. Unlike other forms of construction, everyone can largely undertake building projects. Nwachukwu and Emoh (2011, p. 56) corroborated this notion by stating,

‘All business activities for both public and private sector are housed in a structure called building; production activities, medical and health care, agro based activities, educational activities, political activities, sports, transport sector to mention a few cannot operate proficiently without having direct or indirect need for housing facility.’

Construction can be quite distinct from other types of projects due to its peculiar procurement methods, professional services and contractual requirements (Hendrickson, 2008). These have necessitated the tailoring project strategies to suit the various types of construction due to its peculiarities, uniqueness and transformative impact on the physical environment. The importance of construction projects to human civilization cannot be overemphasised. Statistically, the UK construction outputs were estimated at more than £110 billion per annum (Cabinet Office - Government Construction Strategy Report, May 2011).

The construction industry accounted for 6% of gross domestic product (GDP) and this drop reflects the volatility of the industry which responds to fluctuations in consumer, business and particularly, economic variables such as interest rates, inflation, exchange rates, employment legislation and GDP itself (Office of National Statistics – ONS, 2017). Furthermore, ONS reported that the industry accounted for approximately three million jobs and 10% of total UK employment (Construction Industry Strategy 2025, July 2013). Building construction forms an important segment of the construction industry, both in terms of volume and financial investment.

In the UK, commercial and social buildings accounted for 45% of the industry while residential and infrastructure contributed 40% and 15% respectively (Construction Industry Strategy 2025, July 2013). These statistics underscore the importance of the building construction sector and may explain why the successful delivery of construction projects has continued to generate considerable global interest of governments, industry practitioners, the academia and the public. Similarly, the processes and outputs of projects are governed by stringent technical and environmental regulations, which makes understanding the complexity of projects and enhancing their success of the utmost importance (Chan and Chan, 2004).

The choice of building construction typology informs research design and methodology in Chapter 6, particularly the choice of sample population and research respondents. Professional disciplines, such as Architecture and Engineering, developed over the centuries to ensure that building construction works are

undertaken and executed successfully and in a pragmatic manner. However, as clients and users' needs continued to increase in complexity following the industrial revolution in the 19th century, the need for a specialized discipline, which will be solely responsible for overseeing the cohesion and integration of outputs of these various professional contributors, became imminent.

This led to the emergence of PM in response to the growing challenges of project delivery based on the inability of the traditional practitioners to cope with project complexity. However, the poor performance of projects has persisted and examining these issues within the building construction domain is worthwhile. Projects in the built-environment should be understood as complex social-ecological systems requiring a convergence of interdisciplinary and theoretical ideas (Cloete, 2017). Therefore, the interdisciplinary approach is a valid proposition for PM studies, and their context must be clearly examined.

2.2.3.2 THE CONTEXT OF PROJECTS

Majority of the studies within the PM domain have focused largely on factors relating to organisational systems, which are within practitioners' control. Factors outside of the control of the project participants, such as relating to the environment, have received scanty attention in literature (Davis, 2014). Several studies have argued that environmental influences pose considerable influences on project outputs and outcomes (Jugdev and Muller, 2005; Dille and Söderlund, 2011; Soderland and Sydow, 2019). Besides the obvious difficulties of fully understanding a phenomenon as broad-based and amorphous as environmental influences (Fewing, 2005; Walker, 2007), this limited literature on the external environment may be explained by the ethical challenges associated with research into political and institutional variables of projects (Soderland and Sydow, 2019).

Similarly, studies such as Rolstadas and Schiefloe (2017) stressed that complexity factors within projects are embedded in systems of its context, yet the broader conceptualisation of the project context which includes its institutional, political, social and ethical dimensions, are often neglected in PM research (Hodgson and

Cicmil, 2008; Biesenthal et al., 2018). Since adopting a '*one-size-fits-all*' approach may have negative outcomes in research and practice, the specific context selected for this study is Lagos, Nigeria. The empirical outcomes of this study reflect the peculiarities of this context beginning in Chapter 7 and the foregoing underscores the importance of environmental factors. However, literature clearly reveals the inadequacy of research on these factors (Davies, 2014). With these in mind, further discourse on the significance of environmental factors is enumerated in Section 2.5.1.

Moreover, the new model developed in this study brings the context and other key project success variables into perspective to align with the primary essence of PM, delivering successful projects. In the next section, success constructs are examined in PM literature to draw out paradigms, which were taken, into account in the conceptualisation of the MPC.

2.2.3.3 THE SUCCESS OF PROJECTS

Several studies suggest that in spite of the rapid development and increasing interest in PM, projects continue to fail to meet set objectives at an unacceptable rate (Thomas and Mengel, 2008; Cooke-Davies, 2002; Chidambaram et al, 2012; CIOB 2014). APMs' (2015) *Conditions for Project Success* revealed that nearly 80% of projects fail to meet their planned objectives. This report suggests that around 1 in 8 projects failed to meet their budget, and around 1 in 6 failed to deliver on time. Nevertheless, projects are far more likely to succeed than fail (APM, 2015).

PM professionals and researchers remain in the vanguard to address problems associated with delivering projects to clients' expectations. Historically, studies on industrialised nations (Arditi, Koksai and Kale, 2000) and developing countries (Jannadi, 1997) have attempted to examine reasons for ubiquitous project failures in construction. These studies are necessary to understand the success phenomenon and accomplish the major objectives of projects (Shenhari and Wideman, 2002; Toor and Ogunlana, 2009). These are relevant to construction (CIOB, 2014). Since achieving success is the main objective of project endeavours (Ma and Fu, 2020), the explicit keys and constructs in success literature are examined in the following sections.

2.3 DEVELOPMENT OF SUCCESS LITERATURE

Project success is the most discussed and controversial topics in the field of PM (Ika, 2009; Al-Hajj and Zraunig, 2018; Li Ma and Hongwei Fu, 2020). The definition, prediction and interpretation of success and failure of projects is a complex problem and consensus amongst researchers and practitioners is often challenging (Ika, 2009; Sebestyen, 2017). Nonetheless, dimensions of success in literature consists of two distinct concepts namely; ‘project management’ success and ‘project’ success (Radujkovic and Sjekavica, 2017; Ma and Fu, 2020). Project management success denotes that the construction projects achieve the predetermined goals, particularly based on the traditional time, cost and quality factors, while project success is assessed by taking into consideration the overall goal and purpose of the project or organisation (Sebestyen, 2017; Ma and Fu, 2020).

Similarly, it is generally accepted that ‘project management’ success is also referred to as ‘project performance’, which relates to project efficiency and delivering efficient outputs, while ‘project’ success relates to ‘product success’ to deliver beneficial outcomes for the client or business (Baccarini, 1999; Daniel and Daniel, 2018). It is rational to assume that PM success leads to project success. (Sebestyen, 2017), however, due to their mutual relationship it is hard to make a strong differentiation between them (Radujkovic and Sjekavica, 2017). For instance, completing a project within constraints of time and cost does not guarantee that overall success and business value will accrue at the end of the project lifecycle (Kerzner, 2013). In this view, projects may attain time, cost and quality goals but fail to meet customer expectations, resulting in overall failure (Radujkovic and Sjekavica, 2017).

Optimum success is achieved when project and PM success dimensions are attained simultaneously (Shenhar and Wideman, 2002; Daniel and Daniel, 2018). Therefore, overall project success depends on project management success and the success of the end-product (product success), particularly in construction projects (Ma and Fu, 2020; Al-Hajj and Zraunig, 2018). This implies that project management and project success are inseparable, whereby these views merely represent the micro and macro

perspective of success (Al-Hajj and Zraunig, 2018). At the same time, many studies on the causes of success concentrate on these two directions exclusively but an integrated approach could lead to sustainable success (Sebestyen, 2017). Therefore, this thesis does not focus on distinguishing between these levels of successes, rather it examines the challenges in the building construction industry which have both micro and macro dimensions, such as building collapse.

Perspectives on success have changed over the course of project management development and a retrospective look at how the literature has evolved may provide an insight into how it is likely to change further in the future. With over 60 years of PM success research, capturing how much views have changed over the years will enrich our understanding of this organisational phenomenon (Davis, 2014). For this purpose, Jugdev and Muller (2005 p 23 - 29) and Davies (2014 p 192 - 194) clearly identified four developmental periods which are presented as follows;

2.3.1 Period One: Project Implementation Phases (1960s – 1980s)

This period witnessed the advent of the triple constraints of time, cost and quality (also referred to as specifications) which are popularly described as the iron triangle, and were used to measure the progress of projects. These constraints, now referred to as Key Performance Indicators (KPIs), were predominantly acknowledged in early literature as the foundation of PM. Judgev and Muller (2005) added that these metrics were generally easy to use by project organisations and practitioners, and were quickly embraced in research and practice.

Therefore, Davies (2014) asserted that success was assessed at the implementation stage and dependent on the capabilities of the individuals involved, particularly project managers and team members. This dominant trend reflected an emphasis on efficiency of technical systems instead of the behavioural systems. In practice, project managers were focused on getting projects realised in the execution phase of projects by delivering objectives on time, within budget and to agreed specification. There was little evidence of emphasis on clients' or users' satisfaction.

Although, this iron triangle predominated success literature in PM in this era, projects were still perceived as successful despite failing to meet time, cost and quality project management objectives. In the area of research, Belassi and Tukel (1996) stated that literature was more theoretical and paucity of extensive empirical work persisted. The focus on the implementation or execution stage prevailed while the concept of client satisfaction was perceived to be too complex to grasp and was often measured using surrogates. This led to the second era of success paradigms.

2.3.2 Period Two: Critical Success Factors' lists (1980s – 1990s)

This era was characterized by the inclusion of client and stakeholder satisfaction as a prime indicator of the performance of projects, with more focus on the expectation of stakeholders. Studies in this era further led to the development of lists of few elements required to create conducive environments for managing projects effectively and consistently, referred to as Critical Success Factors (CSFs), which underscores the main contribution of this period.

Prior to CSFs, project managers addressed challenges through experience and intuition, without any empirical rationale for their choices. Research became less mechanistic and the importance of stakeholders was reinforced. Stakeholder groups were identified in literature including owner, consumers, users, project sponsor, senior supplier, project manager project team and the public. Pinto and Slevin are the most recognised CSF authors and their highly cited CSF list is presented in Table 2.3. Subsequently, research witnessed the production of large numbers of CSFs lists, which were largely based on the study by Pinto and Slevin (1987).

Critiques such as Judgev and Muller (2005) argued that due to the lack of a strategic management perspective, literature lacked a coherent categorization of these concepts, thereby making generalisations difficult. Furthermore, the relational nature of these concepts was incomprehensible and led to disparities in perception by researchers and practitioners. Other criticisms weighed in on the transience of CSF

lists and by the end of this period, these criticisms were particularly rife because some of these success approaches lacked clear applicability in practice.

2.3.3 Period Three: CSF Frameworks (1990s – 2000)

The need for coherent frameworks to capture the interrelationship amongst the CSFs led to the emergence of integrated frameworks of project success in this period. The pioneering framework by Morris and Hough in 1987 grouped success factors into Project functionality; PM; Contractors' commercial performance and; Project termination (Jugdev and Muller, 2005). Others such as Kerzner (1987) provided a broader framework that designated CSFs into projects, PM, the project organisation, senior management and the environment addressed the limitations of this.

This broadened the scope of CSFs by highlighting the interfaces between the internal and external environment of projects, its main difference from the previous framework. The inclusion of organisational adaptability and PM leadership style also led to a deeper understanding of how projects actually evolve. The wide acceptance of Kerzners' framework was due to its robustness, as well as the detailed description of the dynamic interface between the internal and external environments of organisations where project success outcomes dramatically change. Nonetheless, Judgev and Muller (2005) argued that it lacked the required integrated depth.

Other attempts to improve this framework during this period were proposed by notable scholars such as Pinto and Slevin (1988), Pinto and Prescott (1990), Munns and Bjeirmi (1996). Nevertheless, the framework produced by Belassi and Tukel (1996) provided the most comprehensive approach to the understanding of success concepts. It classifies success factors into four individual groups: the Project-related factors (e.g. size and complexity); factors related to the Project Manager and Team (e.g. skills and motivation); Organisation-related factors (e.g. top management), and; factors related to the External Environment (e.g. social and economic). This is reviewed further in Section 2.5.3. (see Figure 2.4)

2.3.4 Period Four: Strategic Project Management (21st Century)

Many empirical papers emerged in the previous era which enabled researchers develop, discuss and operationalize success concepts and their measurement methods. KPI and CSF emerged as clear success paradigms within strategic PM, and the need became rife for stakeholders to clearly articulate project objectives by understanding the distinction between project and PM success then link these to overall organisational objectives. Therefore, project success became viewed from both operational and strategic perspectives. Therefore, the 21st century heralded a period of strategic thinking in PM literature and the emergence of integrated frameworks, which have culminated in acceptable global best practice.

This period is more stakeholder focused with increasing emphasis on the need to recognise PM success as a core strategic asset at the organisational level, moving the discipline from its narrow tactical outlook to being more strategic (Judgev and Muller, 2005; Davies, 2014). Strategic project management requires the project team to learn how to deal with the business aspects of their projects by aligning project objectives with their company's business strategy and sustainable (Patanakul and Shenhar, 2011). Project-based organisations are increasingly under pressure to deliver projects quicker, within budget and to specifications that exceed the expectations of the growing retinue of stakeholders. Strategy-related studies are the focus of Chapter 3.

From the strategic perspective, PM and project success are mutually interlinked due to the increasingly demanding organisational goals (Judgev and Muller, 2005; Todorovic et al. (2015)). The emergence of CSFs and KPIs heralded rapid progress in the area of project success research. However, the advancements witnessed in the improvement of PM paradigms, processes and tools has not significantly improved overall project success in practice (Mir and Pinnington, 2014). Nonetheless, if organisations and stakeholders are to accomplish the major objectives of projects, and through a PM system, a deep understanding of PM paradigms is essential (Toor and Ogunlana, 2009). Therefore, the following sections evaluate these paradigms and their importance in research and practice.

2.4 SUCCESS PARADIGMS

This section discusses the main success paradigms in PM literature to further clarify and justify how this study sought to determine project success or failure in Lagos, Nigeria. Notably, it had been stated in the foregoing sections that the focus is on building collapse and not time, cost and quality of project objectives.

2.4.1 Key Performance Indicators

Key Performance Indicators (KPI) can be defined as the measure of project success or failure and their purpose is for assessment of project and organisational performance through the measurement of the outcome of project deliverables (Chan and Chan, 2004). Cooke-Davies (2002) described KPIs as measures by which success or failure of a project or business will be judged. KPIs are very significant metrics which contribute towards the success of any project and can drastically increase performance or accomplishment of the project's objectives (Kerzner, 2013; Mir and Pinnington, 2014; Alkilani et al., 2015). Additionally, good metrics provide valuable information to keep stakeholders informed of the status of the project, thereby facilitating and improving decision making especially in complex projects (Beatham et al, 2004; Kerzner, 2013).

KPI were developed in the UK construction industry following the Egan Report to aid the assessment of performance in financial and non-financial terms (Murray and Langford, 2003). The Movement for Innovation, Housing Forum, National Contractors Federation, Design and Build Foundation and over 20 other organisations have all developed their own KPIs within the construction industry (Beatham et al, 2004). Specific and important KPIs include construction cost predictability and time predictability, defects, clients' product and service satisfaction, safety, profitability, productivity, environment, scheduling, sustainability, quality and team satisfaction (Alsulamy, Wamuziri and Taylor, 2012; Moradi, Ansari and Taherkhani, 2021). Table provides a summary of KPIs found in previous studies.

Table 2.2 Summary of key performance indicators (KPIs) in previous studies

Source: Yun, Choi, de Oliveira and Mulva (2016)

	KPI	Number of studies
1	Cost performance	9
2	Schedule performance	9
3	Quality performance	9
4	Safety performance	6
5	Customer performance	6
6	Change (scope) management	3
7	Productivity	2
8	Profitability	2
9	Sustainability	2
10	Effective communication	2
11	Innovation and improvement	2
12	Unit cost	1
13	Top management commitment	1
14	Trust and respect	1
15	Project team	1
16	Material management	1
17	Predictability of cost and schedule	1
18	Public satisfaction	1
19	User's satisfaction	1
20	Functionality	1
21	Planning effectiveness	1

With regards to the dimensions of PM success, the most important KPIs for the project management dimension of construction projects include the iron triangle of time, cost and quality (Ogwueleka, 2011; Chan and Chan, 2004; Alsulamy, Wamuziri and Taylor, 2012), as well as safety and client satisfaction (Demirkesen and Ozorhon, 2017). These metrics can change during each life cycle phase (see Table 2.3), as well as from project to project and project manager and leadership must understand what critical metrics need to be identified and managed at each phase for the project to be viewed as a success by all stakeholders (Kerzner, 2013).

Table 2.3 Project lifecycle (CIOB 2014 p 5)

	Code of Practice for Project Management		Royal Institute of British Architects (RIBA) Plan of Work 2013		BIM Digital Plan of Work 2013
1	Inception	0	Strategic definition	1	Strategy
2	Feasibility	1	Preparation and brief	2	Brief
3	Strategy	2	Concept design	3	Concept
				4	Definition
4	Pre-construction	3	Developed design	5	Design
		4	Technical design		
5	Construction	5	Construction	6	Build & commission
6	Testing and commissioning				
7	Completion, handover and operation	6	Handover & close out	7	Handover & close out
8	Post-completion review and in use	7	In use	8	Operation & end of life

It is notable that the focus on building collapse is justified by the fact that these events in Lagos occur at different project lifecycle phases (see Section 7.4.1). Similarly, the focus on the stakeholder satisfaction in this thesis is informed by need to align research outputs with strategic era of project management which is more stakeholder focused. Moreover, it is important to note that the reference to stakeholders in this study is drawn from Davis' (2017 p 605) categorisation of three main stakeholder groups of senior management, project core team and project recipients. Additionally, there is the possibility that failure of projects can result from the different interpretations of the criteria used for success by multiple stakeholder groups and this is reflected in the main study (see Section 8.14).

Another means of classification of KPIs are the lagging, diagnostic and leading indicators. Lagging KPIs measure past performance, diagnostic KPIs measure current performance while leading KPIs drives future performance by measuring how the work being done now would affect the future (Kerzner, 2013). Construction sites represent complex environments with peculiar characteristics and high levels of risk which has informed the criticism of the use of lagging indicators as appropriate for construction (Forteza, Carretero-Gomez and Sese, 2016). Lagging indicators use

lessons learned for project events and trends to draw conclusions and make explanations regarding success or failure rates. Current trends have taken proactive approaches and made use of analyses based on precursors or leading indicators. Leading indicators aim to avoid, prevent and circumvent project challenges which could lead to project failure, such as accidents, by measuring or studying different elements that contribute to risk, limiting the probability of their occurrence and mitigating negative outcomes (Forteza, Carretero-Gomez and Sese (2016)

Examples of performance indicators of organisations include financial, customer, business process, and innovation which are leading indicators; while financial measures are lagging indicators (Kaplan and Norton, 1992 cited in Alsulamy, Wamuziri and Taylor, 2012). Most project KPIs are lagging indicators designed for post evaluation of processes and practices after project completion (Yun, Choi, de Oliveira and Mulva, 2016), which has been described as the key weakness of KPI application in the field of construction (Alsulamy, Wamuziri and Taylor, 2012). This is because these lagging indicators are not able to fully recognise performance variation within each phase of project delivery and offer little or no opportunity for process improvement (Beatham et al. 2004; Alsulamy, Wamuziri and Taylor, 2012). Therefore, KPIs could be tailored to phase-based benchmarking and utilised as both leading and lagging indicators (Yun, Choi, de Oliveira and Mulva, 2016), as is the case with building collapse.

Table 2. 4: The seven characteristics of KPIs (Parmenter, 2020)

1. Nonfinancial	Nonfinancial measures (e.g., not expressed in dollars, pounds, euros, etc.)
2. Timely	Measured frequently (e.g., 24/7, daily, or weekly)
3. CEO focus	Acted upon by the CEO and senior management team
4. Simple	All staff understand the measure and what corrective action is required
5. Team based	A team can be phoned, and they will accept responsibility, and can take action to improve measure
6. Significant impact	Major impact on the organisation's critical success factors
7. Limited dark side	Have been tested to ensure that they have a positive impact on performance, with any unintended consequence being of minor significance

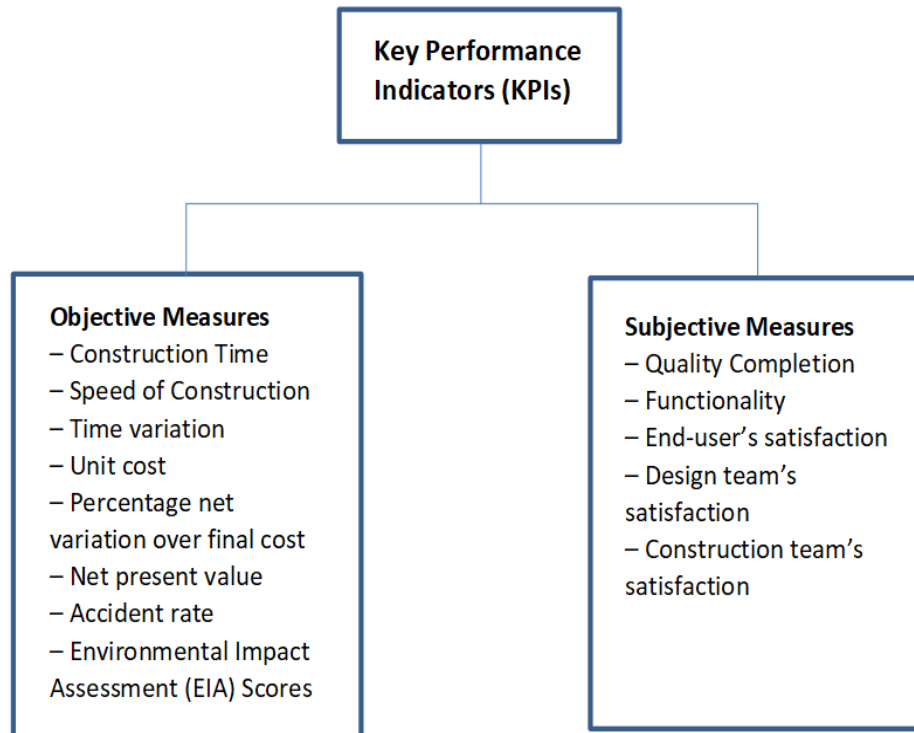


Figure 2.1: KPIs for project success (Chan and Chan, 2004)

KPIs can also be categorised KPIs into objective and subjective measure (Chan and Chan, 2004). Figures 2.1 outlines examples of these project success measures. Similarly, Parmenter (2020) named seven characteristics of KPIs (Table 2.4) and argued that countless performance measures exist in practice. However, there is limited evidence of information sharing within industry groups due to the fragmentation and competitiveness of the construction industry (Beatham et al, 2004). Therefore, all project-based organisations should have a system in place that ensures that KPIs are developed, capturing short-term benefits of the ongoing project such as the cost, time and quality, as well as long-term benefits of the organisation like learning, profitability and continuous improvement (Mir and Pinnington, 2014).

Rodriguez-Labajos et al. (2016) suggested that in the International Healthcare Providers' arena, KPIs currently in use include physical conditions, utilisation, functionality, operation cost, backlog maintenance and maintenance cost. They noted that most KPIs are driven by organisations goals, government priorities and policies making these measures context specific. Therefore, there are some

differences in the set of core attributes and KPIs established by authors in the literature and it is difficult to establish a common framework representing the best set of performance measures. KPIs can also be developed and used at different levels of the construction industry, whereby the sector-level KPIs include health and safety, environmental sustainability, socio-economic contribution and customer satisfaction (Alkilani et al, 2015).

Although, clear patterns for the selection of KPIs seem to be lacking across the various fields of application (Albert et. al., 2017), the quadruple constraints of Time, Cost, Quality and Stakeholder satisfaction are the most prevalent KPIs in PM literature (Pinto, 2016; Albert et. al, 2017). This thesis adopts stakeholder satisfaction to assess the issues of building collapse and industry reforms in Lagos. This subjective measure informed the use of the qualitative-dominant mixed-methods approach in this study to assess the views of construction leaders in Lagos (see Figure 6.3, Section 6.5.3).

Furthermore, the biggest mistake in developing project performance measures would be to fail link KPIs to organisations' strategy and current CSFs (Marr, 2011; Parmenter, 2020). In this view, KPIs are most useful when they are aligned to or determined by wider organisational strategy and inform leadership decision making, and failure to make this link will result in waste of valuable organisation resources, particularly time and money. Therefore, it is necessary to examine CSFs next.

2.4.2 Critical Success Factors

The study of Critical Success Factors (CSF) is considered as the most popular targeted research area in project success literature within the context of construction and management (He et al., 2019). CSF are simply described as certain elements or actions which significantly contribute to, and are vital for, the success of a project (Toor and Ogunlana, 2008). Cooke-Davies (2001) opined that CSF are, *"those inputs to the management system that lead directly or indirectly to the success of the project or business"*. CSF is distinct but interrelated to KPIs in that the latter are deployed as the measure for assessing the efficacy and outcomes of the former (Kerzner, 2013).

Table 2. 5: Examples of success factors from literature

Authors	Context	Typology	Success Factors
Chan and Tam (2000)	Hong Kong	Quality delivery in construction projects	Better project management actions; increased effectiveness of the construction team leader; increased clients' emphasis on quality and; increased clients' emphasis on time affect quality performance with actions by the project team being the most critical predictor.
Park (2009)	South Korea	Construction	Clarity of contracts; fixed construction period; precise project budget estimate; material and quality; mutual and trusting relationships; leadership and team management and; work safety on site
Iyer and Tha (2006)	India	Construction	Participant's commitment and; owners' competence (importance of stakeholders).
Nguyen et al. (2004)	Vietnam	Large construction projects	Competent project manager; adequate funding until project completion; multidisciplinary/ competent project team; commitment to project; and; availability of resources
Toor and Ogunlana (2009)	Thailand	large-scale construction projects	Project planning and control; project personnel inputs and; involvement of the client.
Babatunde et al, 2012	Nigeria	PPP procurement methods for infrastructure projects	Competitive procurement process; thorough and realistic assessment of the costs and benefits; favourable framework; appropriate risk allocation and risk sharing; government involvement by providing a guarantee; political support; stable macroeconomic condition; sound economic policy and; availability of suitable financial market
Bing Li et al. (2005)	UK	PPP/PFI projects in construction	Strong private consortium; appropriate risk allocation; available financial market; effective procurement; project implementability; government guarantee; favourable economic conditions.
Yu and Kwon (2011)	Korea	urban regeneration projects	Minimisation of stakeholders' conflict, good communication, information sharing, cooperativeness of stakeholders are high priorities in phases two and three of these type of project respectively.
Ika et al. (2012)	Global	World Bank projects	Monitoring, Coordination, Design, Training and Institutional Environment
Banihashemi et al. (2017)	Developing countries	Sustainability in construction	For the preparation of projects phase: project managers' tenure, knowledge, experience and competence were most critical

To plan and achieve project success, it is vital for professionals to identify and examine the CSFs that contribute to project success under different context (Toor and Ogunlana, 2008). CSF must be viewed as a strategic management concept, whereby project efforts and limited resources will be channelled in line with strategic long-term goals of the clients' organisation (Shenhar and Wideman, 2002). Ogwueleka (2011) reinforced this view and stated further that the identification of CSF of any project will help firms direct their capabilities towards adopting ideal strategies to improve project performance.

Table 2.6: Components of project influences within CSF frameworks from PM literature

Factor Groups	Description	Authors
Stakeholder-related	Project Manager (leadership, tenure, knowledge and competence), Project Teams (commitment and experience), Personnel training, Team management and effectiveness, End Users and Operators, Trusting relationships, cooperativeness and minimisation of stakeholders conflict, information sharing, capable sponsor and private consortium	Belassi and Tukel (1996), Pinto and Slevin (1987), APM (2015), Chan and Tam (2000), Park (2009), Iyer and Tha (2006), Nguyen et al. (2004), Bing Li et al. (2005), Yu and Kwon (2011), Ika et al. (2012), Banihashemi et al. (2017)
Project-related	Project mission (size, value, complexity and urgency), Planning (precise schedule, budget and control), Technical specifications, Good communication, Troubleshooting, Proven methods and tools, Better PM actions, Clarity of Contracts, Appropriate risk allocation and Effective procurement, Life cycle issues.	Belassi and Tukel (1996), Pinto and Slevin (1987), APM (2015), Chan and Tam (2000), Park (2009), Toor and Ogunlana (2009), Babatunde et al (2012), Bing Li et al. (2005), Yu and Kwon (2011), Ika et al. (2012), Banihashemi et al. (2017)
Organisation-related	Top management support, Project organizational structure, Client Acceptance, Monitoring and Feedback, Effective Governance, Strategic Goals and Objectives, Secure Funding, Owners' Competence and Availability of Resources	Belassi and Tukel (1996), Pinto and Slevin (1987), APM (2015), Iyer and Tha (2006), Nguyen et al. (2004), Toor and Ogunlana (2009)
External Environment-related	Environmental Factors (institutional, political, economic, sociological and technological), Aligned Supply Chain, Appropriate Standards, Government Guarantee, Political Support, Sound and stable Macroeconomic Policy and Suitable Financial Market and Business Competitors	Belassi and Tukel (1996), APM (2015), Bing Li et al. (2005), Ika et al. (2012), Babatunde et al. (2012)

CSF studies have been conducted in sectors such as information technology and construction, as well as in different context around the world. Some published studies relating to construction projects are presented in Table 2.5. These studies often produce long lists of CSFs; however, this linear approach underscores this approach's criticisms and limitations as discussed in Section 2.3.2. On the contrary, CSF frameworks provide a deeper understanding of individual CSF grouping, as well as the interrelationship between composite influences for ease of examination.

These frameworks are still relevant in contemporary studies as corroborated by Davies (2014), and exemplified in Table 2.6 based on the consolidation of the CSF literature. Four main categories of CSF are therefore established in PM literature; external environment-related, organisation-related, project-related and factors related to the project stakeholders. While Belassi and Tukel (1996) referred to the project stakeholders' segment as being comprised of the Project Manager and Project Team Members, Davies (2014) collectively referred to them as merely stakeholders. Notably, stakeholder categorisation in this study refers to people that are directly or indirectly responsible for project outputs and outcomes which includes the project manager, client, owner, user and project team (Davies, 2017)

Therefore, CSF has to be analysed in tandem with KPI in an integrated framework, which aligns with organisational strategy if project success is to be guaranteed (Todoric et al., 2015). Researchers and practitioners continue to question the value and effectiveness of PM processes, tools and systems due to evidence in literature and practice that project success has not significantly improved in spite of these advancements in PM. Therefore, the clamour for integrated frameworks at the end of Period 3 is stretched in the following sections to further examine robust models, which integrate both CSFs and KPIs.

2.5 TOWARDS AN INTEGRATED SUCCESS APPROACH

To guide the construction and improve the validity of the new MPC, previous models from PM literature must be critically examined to explore gaps that need to be

addressed. Over time, integrated models have been proposed to exemplify the intrinsic relationship between KPI and CSF that all provide different perspectives to these paradigms. The following sections present other models that corroborate the efficacy of integrated models of project success.

2.5.1 Integrated Frameworks

Todorovic et al. (2015) provide a framework that examines knowledge acquisition and transfer in the project environment, see Figure 2.2. Their integrated framework exemplifies project success analysis and can improve knowledge management in project environment. This framework is comprised of CSFs and KPIs, which both have a very positive influence on project outcomes. This reiterates the need to integrate KPIs and CSFs for project success and argues for an examination of the project environment, where knowledge can be acquired and distributed.

This framework in Figure 2.2 reveals linear and sequential feedback loops which validate the views of Marr (2011) and Parmenter (2020) on the efficacy of linking performance measures to success factors within a robust organisational strategic roadmap. However, this integrated framework is clearly process-focused and does not include the characteristic and segments of the environment of projects.

Conversely, the framework by Lasa et al (2015) underscores the importance of the external environment of PM systems (see Figure 2.3). CSF and KPIs segments are clearly delineated with an apparent distinction between the internal factors and external environment influences. This framework provides examples of segments of the external environment such as political and economic; however, this is an oversimplification of the nature and inherent complexity of the project environment. Therefore, these limitations were considered in the development of the conceptual framework for this thesis (Figure 5.1 and 10.1).

Similarly, the framework by Belassi and Tukul (1996) allows for clarity in evaluating the individual and collective impact of CSFs. As depicted in Figure 2.4, the aforementioned endogenous and exogenous factor groups are very distinct and

constantly interact through processes that yield outcomes, success or failure. The ability of the project system to adapt to the changes in the organisational or environmental segments is retained at the core of the framework referred to as the system response segment.

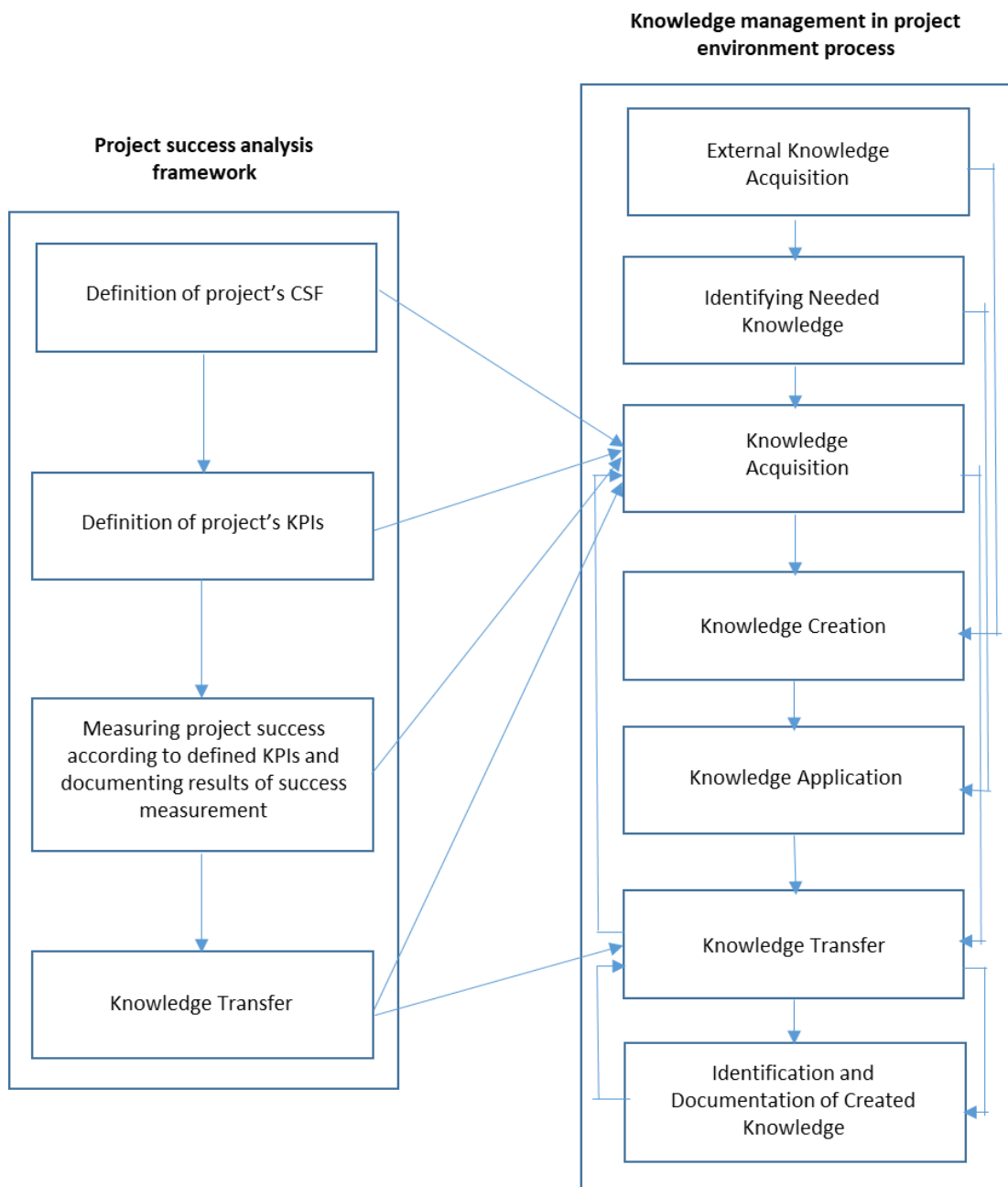


Figure 2.2: Project success analysis framework for knowledge management in project environment (Todorovic et al., 2015)

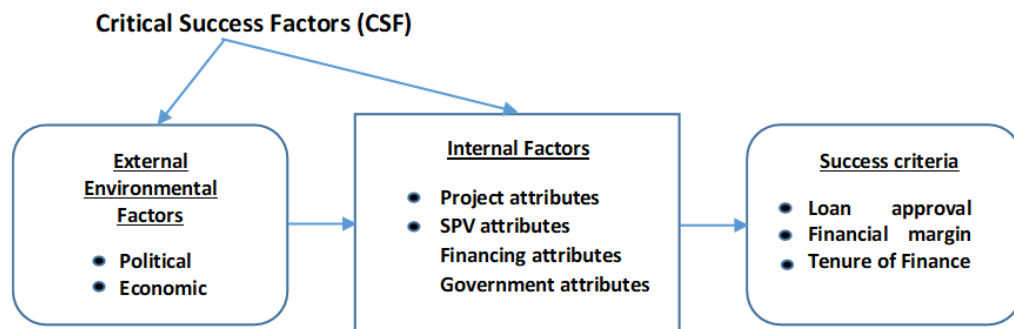


Figure 2.3: Proposed PFI project financing theoretical framework (Md Lasa et al., 2015)

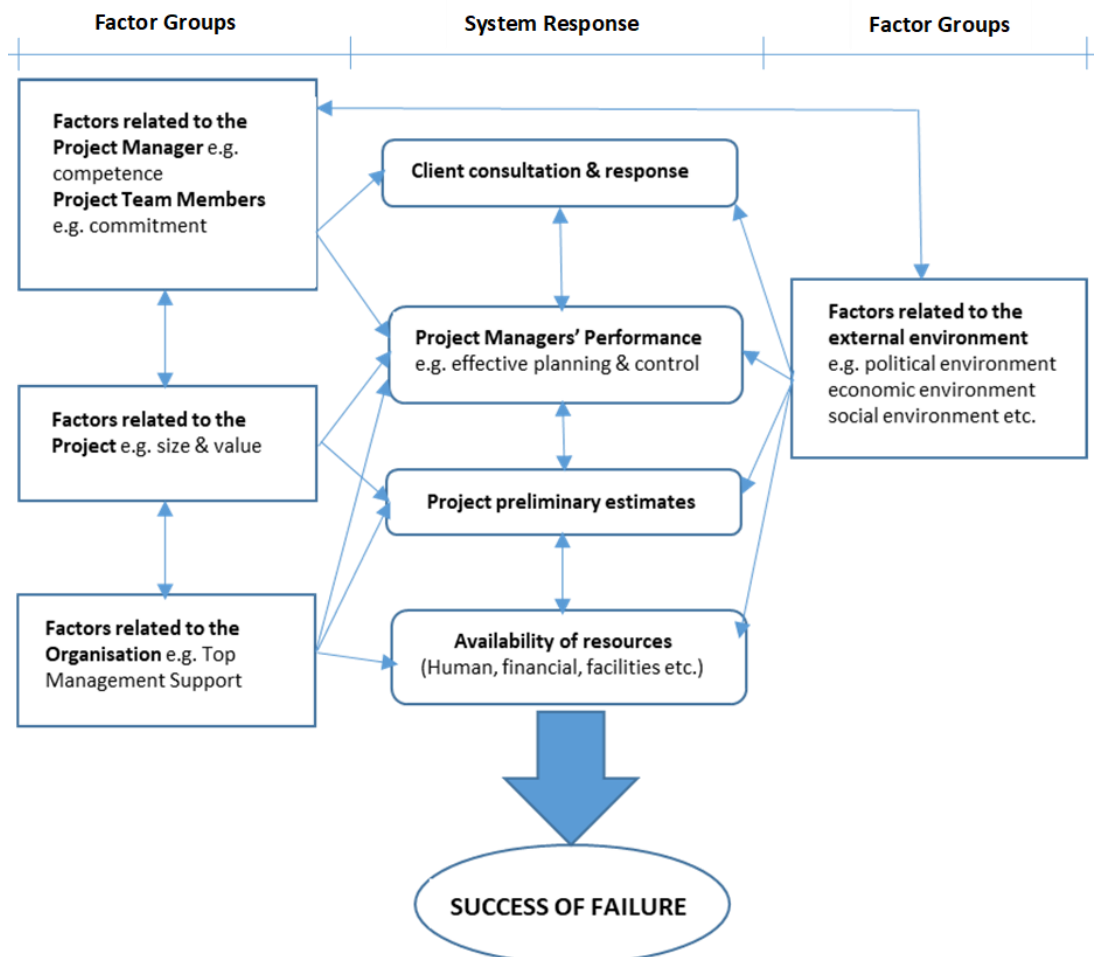


Figure 2.4: Critical Success/Failure Factors framework (Belassi and Tukel, 1996)

In this framework, the endogenous system is reflected as having significantly more factor groups and subsystems than the exogenous system. This assumption aligns with the study by Davies (2014 pg. 198) which concluded that the external factors are the least studied in PM literature and many studies focused mainly on the endogenous factors influencing project success. This assumption is examined further using the data in Table 2.8.

The factors in each group influence project outcomes and implementation through formal and informal arrangements. The linear and non-linear feedback loops depict these arrangements, which are particularly interesting because the reality of the interaction and interconnectedness between the internal and external systems cannot be constrained within a formal system response mechanism. This is discussed in further detail in Chapter , where existing models of project complexity in literature are examined and system interactions are explored.

From the framework it is clear that the role of the project manager is pivotal for the attainment of success within project and this is facilitated through regular client consultation, effective planning and control, as well as management of project resources within agreed KPI (see also Table 2.9). The foregoing is exemplified in the systems response segment which appears to coalesce all other subsystems of the framework. Therefore, the systems response segment is significant because it clearly connects to all four CSF subsystems.

By analysing the causal relationship amongst these factors, project managers are able to identify, eliminate or mitigate the impact of factors that have a negative effect on project performance. Therefore, the outcome of a project is dependent on the project managers' actions and decisions within an effective systems response group. To achieve successful project outcomes these system response group must not be overlooked in models of project complexity. Similarly, research on the complexity of environmental influences are lacking in PM literature, therefore, this study improves on these shortcomings by reviewing business management literature and developing a conceptual framework which combines organisational, environmental and leadership factors into a unitary whole (see Figure 5.1 and 10.1).

2.5.2 The Significance of Success Factor Groups

The study by Davis (2014) examines literature for success factors that are critical for the project delivery and the results are presented in Table 2.7. Two things become evident for the table; the project manager is the most significant success factor and; the external environmental influences rank lowest and arguably pose the least influence on project success, which may explain why current literature reflects a huge scarcity of related studies. These assumptions may seem cogent at a glance but further interrogation of previous PM literature, reveals a different prognosis.

Beginning with factors which are outside of the control of the project participants, also called exogenous factors, their low rankings are debatable because the author failed to integrate similar variables such as Environment (Kerzner, 1987), External influences (Morris and Hough, 1987) and External Environment (Belassi and Tukel, 1996; Jugdev and Muller, 2005). Nevertheless, only four publications account for these three variables which still underscores the paucity of studies relating to the external environment. Similarly, the scantiness of literature is at variance with several studies that argue that the environment and external influences pose considerable influences on project outputs and outcomes, especially construction projects (Fewings, 2005; Walker, 2007; CIOB 2014).

Traditionally, PM research has focused on organisational forces that influence the outcome of projects and its complexity (Qureshi and Kang, 2015). At the same time, much of the blame for project failure has been attributed to environmental factors, which are outside of the control of construction organisations and project practitioners (De Wit, 1988; Pinto and Mantel, 1990; Walker, 2007). For instance, Pinto and Mantel (1990 pg. 274-275) provided one of the earliest empirical studies into PM success factors, and highlighted a clear limitation in their definition of causes of project failure. Their study revealed that organisation factors accounted for only about 40% of the variance in causes of project failure and argued that there were very important causes of failure, such as environmental forces, that were omitted. They reinforced the assumption that previous research had been focused only on factors that were within the control of the project participants and stakeholders.

Table 2. 7: Frequency stakeholder mentioned in the literature as having an interest in project success (Davis, 2014)

Stakeholder	Number of references	Literature
Project manager	31	Andersen et al. (1987), Atkinson (1999), Barclay and Osei-Bryson (2009), Belassi and Tukul (1996), Belout and Gauvreau (2004), Cooke-Davies (1990), Smith-Doerr et al. (2004), Freeman and Beale (1992), Jugdev and Müller (2005), Kendra and Taplin (2004), Kerzner (1987), Lim and Mohamed (1999), Müller (2003), Müller and Turner (2007a, 2007b), Munns and Bjeirmi (1996), Pinto and Slevin (1987, 1988a, 1988b, 1989), Shenhar et al. (1997), Tishler et al. (1996), Toor and Ogunlana (2010), Tukul and Rom (2001), Turner (2004), Turner et al. (2009), Turner and Müller (2005, 2006), Wang and Huang (2006), Wateridge (1998), and Wenell (2000)
Project team	24	Barclay and Osei-Bryson (2009), Belassi and Tukul (1996), Bounds (1998), Cooke-Davies (1990, 2002), Smith-Doerr et al. (2004), Jugdev and Müller (2005), Kerzner (1987), Munns and Bjeirmi (1996), Pinto and Prescott (1990), Pinto and Slevin (1987, 1988a, 1988b, 1989), Shenhar and Dvir (2007), Slevin and Pinto (1986), Toor and Ogunlana (2010), Turner (1999, 2004), Turner (2009), Turner et al. (2009), Turner and Müller (2006), Wang and Huang (2006), and Wateridge (1995, 1998)
Client	18	Atkinson (1999), Barclay and Osei-Bryson (2009), Belassi and Tukul (1996), Bryde and Robinson (2005), Jugdev and Müller (2005), Kerzner (1987), Müller and Turner (2007a), Munns and Bjeirmi (1996), Pinto and Prescott (1990), Pinto and Slevin (1987, 1988b, 1989), Shenhar et al. (1997), Slevin and Pinto (1986), Toor and Ogunlana (2010), Turner et al. (2009), Turner and Müller (2006), and Wateridge (1998)
Contractor User/consumer	15	Contractor—Barclay and Osei-Bryson (2009), Bryde and Robinson (2005), Users/end Jugdev and Müller (2005), Kerzner (1987), Lim and Mohamed (1999), Morris and Hough (1987), Müller and Turner (2007a), Pinto et al. (2009), Tishler et al. (1996), Toor and Ogunlana (2010), Turner (2004), Turner et al. (2009), Turner and Müller (2006), Wang and Huang (2006), and Wateridge (1998) Users/end user/consumer—Atkinson (1999), Jugdev and Müller (2005), Kerzner (1987), Lim and Mohamed (1999), Müller and Turner (2007a), Munns and Bjeirmi (1996), Pinto and Prescott (1990), The Standish Group (1995), Tishler et al. (1996), Toor and Ogunlana (2010), Turner (1999, 2009), Turner et al. (2009), Turner and Müller (2006), and Wateridge (1998)
Customer Project sponsor	14	Customer—Atkinson (1999), Barclay and Osei-Bryson (2009), Cooke-Davies (1990, 2002), Freeman and Beale (1992), Jugdev and Müller (2005), Kerzner (1987), Lim and Mohamed (1999), Shenhar et al. (1997), Shenhar and Dvir (2007), Tishler et al. (1996), Tukul and Rom (2001), Turner et al. (2009), and Wateridge (1998) Project sponsor—Barclay and Osei-Bryson (2009), Cooke-Davies (1990, 2002), Freeman and Beale (1992), Jugdev and Müller (2005), Kerzner (1987), Morris and Hough (1987), Müller (2003), Müller and Turner (2007a, 2007b), Turner (1999, 2004), Turner et al. (2009), and Wateridge (1998)
Top management	9	Top management—Atkinson (1999), Belassi and Tukul (1996), Cooke-Davies (1990), Jugdev and Müller (2005), Kerzner (1987), Pinto and Prescott (1990), Pinto and Slevin (1987, 1989), and Slevin and Pinto (1986)
Organisation Owner	8	Organisation—Belassi and Tukul (1996), Bounds (1998), Cleland and Ireland (2002), Jugdev and Müller (2005), Morris and Hough (1987), Pinto and Slevin (1988b), Shenhar et al. (1997), and Wang and Huang (2006) Owner—Jugdev and Müller (2005), Lim and Mohamed (1999), Pinto and Slevin (1988b), Pinto et al. (2009), Turner (2004), Turner et al. (2009), Wang and Huang (2006), and Wateridge (1998)
Line manager	7	Cooke-Davies (1990), Jugdev and Müller (2005), Kerzner (1987), Müller and Turner (2007b), Toor and Ogunlana (2010), Turner and Müller (2005), and Wenell (2000)
Project leader Project personnel	4	Project leader—Pinto and Slevin (1988b), Slevin and Pinto (1986), Smith-Doerr et al. (2004), and Wateridge (1998)

Team members		Project personnel—Kerzner (1987), Müller and Turner (2007a), Slevin and Pinto (1986), and Tishler et al. (1996) Team members—Atkinson (1999), Belassi and Tukel (1996), Tishler et al. (1996), and Turner and Müller (2005)
Executive	3	Executive—Jugdev and Müller (2005), Kerzner (1987), and Toor and Ogunlana (2010)
Executive management		Executive management—Barclay and Osei-Bryson (2009), Kerzner (1987), and The Standish Group (1995)
Internal and external		Internal and external—Lester (1998), Morris (1997), and Pinto and Slevin (1988b)
Management		Management—Bounds (1998), Freeman and Beale (1992), and Morris and Hough (1987)
Public		Public—Lim and Mohamed (1999), Munns and Bjeirmi (1996), and Turner et al. (2009)
Senior management		Senior management—Jugdev and Müller (2005), Kerzner (1987), and Wateridge (1998)
Support		Supporters—Toor and Ogunlana (2010), Turner (1999), and Wateridge (1998)
Director	2	Director—Cooke-Davies (1990) and Smith-Doerr et al. (2004)
Engineer		Engineer—Smith-Doerr et al. (2004) and Wang and Huang (2006)
External environment		External environment—Belassi and Tukel (1996) and Jugdev and Müller (2005)
Investor		Investor—Barclay and Osei-Bryson (2009) and Turner et al. (2009)
Management		Management—Cooke-Davies (1990) and Toor and Ogunlana (2010)
Other interested parties		Other interested parties—Turner et al. (2009) and Turner and Müller (2006)
Project team leader		Project team leader—Pinto and Slevin (1988a, 1989)
Supplier		Supplier—Müller and Turner (2007a, 2007b)
Environment	1	Environment—Kerzner (1987)
External influences		External influences—Morris and Hough (1987)
Other suppliers/Project executive/Senior supplier		Other suppliers/Project executive/Senior supplier—Turner et al. (2009)

Therefore, it is clear from the foregoing that future studies need to examine other extraneous factors as proposed by the RPM movement (see Section 2.2.2). Despite this obvious gap in knowledge, Davies (2014) asserted that many authors merely replicated these success factors presented by *Pinto and Slevin*. Furthermore, De Wit (1988) reviewed the factors affecting project success and identified a set of micro and macro factors, concluding that the project environment is contextual and poses a significant influence on project success. Most PM studies on the environment appear to have focused on micro-level, rather than other macro-level factors that are outside the control of the project practitioners (De Wit, 1988).

Moreover, more recent studies have shown that much of the blame for the PM industry's poor performance is often allocated to environmental factors, which include political, economic, socio-cultural and technological factors that organisations and professionals find difficult to control or predict (FoPM, 2017). In the construction industry these forces are interrelated and influence project success by continually interacting with one another in a systemic fashion to produce outputs

and outcomes, which may sometimes be unexpected (Walker, 2007). The environment is a significant contingency factor within project organisations (Donk and Molloy, 2008; Cavalho et al., 2015), therefore social and political contextualisation of projects is necessary for success to be achieved (Sage, 2014). Understanding the context is necessary because it triggers complexity that is beyond the project managers' control (Whitty and Maylor, 2009).

Table 2. 8: Frequency of exogenous and endogenous factors from PM success literature

S/No	ENDOGENOUS FACTORS	Freq	EXOGENOUS FACTORS	Freq
1	Project Manager	31	Contractor	15
2	Project Team	24	User/consumer	15
3	Client	18	Consumer	14
4	Project Sponsor	14	Public	3
5	Top Management	9	Supporters	3
6	Organisation	8	External environment	2
7	Owner	8	Other Interested Parties	2
8	Line Manager	7	Suppliers	2
9	Project Leader	4	Engineer	2
10	Project Personnel	4	External Influence	1
11	Team Member	4	Environment	1
12	Executive	3	Other Senior Suppliers	1
13	Executive Management	3		
14	Internal & External	3		
15	Management	3		
16	Senior Management	3		
17	Project Team Leader	2		
18	Directors	2		
19	Investors	2		
20	Management	2		
TOTAL		154		61

Table 2. 9: The role of project managers at various project stages

Adapted from Graham and Portny (2015 pp. 13 – 17)

Project Stage	Project Managers' Tasks
Initiation (starting the project)	Sketch out initial project ideas for the projects, with the justification, outline costs and timelines
Organising and Preparing	Plan the project, including mapping out the controls that will be put in place, defining what quality the project needs and how it will be achieved, analysing risk and planning control actions
	Liaise with external supplies
	Liaise with Project Managers of interfacing projects
	Liaise with programme management staff if the project is one of a group of projects being coordinated as a programme
Execution of project works	Decide on changes, getting approval from others where you don't have personal authority to make a decision (for example, when changes involve very high cost)
	Motivate and support teams and team members
	Ensure that the project deliverables are developed to the right quality
	Control the flow of work to teams (or perhaps just team members in a smaller project)
	Plan successive delivery stages in more details
	Keep track of risks and make sure that control actions are taken
	Keep track of progress and adjust to correct any minor drifts off the plan
	Keep track of spending
	Deal with any problems, involving other people as necessary
	Report progress to the Project Steering Group and perhaps to others too
	Go to others, such as the Project Steering Group, if things go more significantly off track (for example, the whole project is threatened)
Closing the project	Close the project down in an orderly way when everything is done

This gap in knowledge is further substantiated through the aggregation of exogenous and endogenous factor groups in Table 2.8, based on the data provided in Davies (2014), see Table 2.7. This content analysis reveals that only 28% of these studies examine environmental factors. This limitation corroborates the need for a more robust conceptualisation of projects. The importance of environmental factors and their influence on construction projects cannot be overstated (Jugdev and Muller, 2005 p. 27), therefore, project studies need to extend beyond the focus on micro-levels to macro-level concerns (Geraldi and Soderlund, 2018).

At the same time, the project manager is the highest ranked CSF in PM literature. Project managers are within the endogenous factor groups and are primarily responsible for decision-making and project success (Rolstadas et al. 2015). This role is significant because one of the main causes of project failure is management mistakes in refusing to make decision in a timely manner, particularly when these decisions involve external influences (Kerzner, 2013). Kerzner (2013) concluded;

‘Failure in assessing the environmental input factors correctly such as the timing for getting approvals, authorization from third parties, and a poor understanding of the culture and politics in the project context usually result in project failure’

Decision making and other specific tasks undertaken by project managers at the different project stages are presented in Table 2.9 and it is important to note that KPIs are used by stakeholders as the basis for assessing and accepting project outcomes at the various decision milestones. The interactions between the project manager and client’s organisations, as well as endogenous and exogenous factors, occur in the systems response segment of the framework in Figure 2.4, which is driven by project managers. The nature and outcome of these interactions can be complex which contributes significantly to the success or failure projects.

Therefore, addressing the limitations outlined in this chapter can be challenging. As Walker (2007 pg. 73) explained, the apparent complexity of the project environment, the difficulty in assessing this complexity in empirical terms, challenges in defining them explicitly and the fuzziness in identifying the boundary between an organisational system and its environment are just a few of the difficulties confronting researchers. Likewise, Geraldi and Soderlund (2018) surmised that one of the reasons why there appears to be a scarcity of PM studies on the environment is that existing literature tends to avoid political and ethical discourses, thereby presenting a false abstraction of PM realities.

This limited conceptualisation of PM has continued to expand the gap between research and practice. Bearing these in mind, this study seeks to provide understanding of the broader view of projects by examining not just the endogenous factors that influence projects, but exogenous influences that have been largely overlooked in PM literature. The new model proposed in this study (see Figure 5.1 and 10.1) addresses these gaps through an interdisciplinary approach. Particularly, the new model questions one of the underlying principles of PM practice and research, the primacy of control. From the definitions of PM in Section 2.2, managers employ processes to control resources, participants and project outcomes.

However, in reality even the best-trained and experienced project managers still find it extremely difficult to deliver construction projects owing to the factors examined in this chapter. How much control do project managers exert over the economy, politicians, weather, legislation or even stakeholder's behaviour? Rather than control outcomes, project managers are increasingly being required to develop capabilities to manage complex projects at team, organisation and environmental level (Rezende et al, 2018). This paradox is examined in literature and the main study to espouse contradictions which have for too long moulded our perception of projects.

Sage (2014) argued that the general assumption that better management can overcome failure of projects is wrong because it is false to assume that project failures are largely associated with the failure of PM. This is a paradox because the very essence of PM profession revolves around the illusion of control, which may explain the current crisis of performance and widespread criticism of the profession. This philosophical anchor is challenged in latter chapters to provide evidence that control of complex systems is a fallacy. Moreover, project complexity research has resulted in a paradigm shift in the focus of PM, from planning and control to learning and adaptation (Rezende et al, 2018; Daniel and Daniel, 2018). As projects become more complex and rigorous, traditional management control mechanisms become inadequate. Therefore, contemporary thinking in the strategic era of PM are examined in the next chapter to improve project conceptualisation.

2.6 CONCLUSION

In this chapter, the lack of a unitary or explicit theory of PM is espoused and the focus on building construction projects clarified. This study adopts the RPM movement ideology and seeks to develop a model of project complexity that broadens the contextualisation of projects to encompass endogenous and exogenous factors. Success of construction projects will be evaluated based on stakeholder's satisfaction, capturing both project management success and project success constructs. The traditional approach to PM and integrated project success models reveals knowledge gaps that the conceptual framework of this study addresses.

Particularly, the limited conceptualisation of exogenous factors has promoted the illusion of control in research and practice. In PM literature there is a greater emphasis on endogenous factors and limited studies on the exogenous influences that are largely outside of the control of project practitioners. These endogenous and exogenous systems are in constant interaction with one another resulting in significant complexity of projects. This gap in knowledge informed the need for an interdisciplinary approach to this study. Similarly, success paradigms are examined within integrated frameworks to provide a basis for developing the MPC.

The emergence of a systems response segment within traditional PM frameworks was particularly interesting due to its role in facilitating decision-making to produce project outcomes and outputs. This segment integrates the endogenous and exogenous factor groups, and the influence of these three factor groups on project success is significant. Ultimately, this research seeks to draw inferences about why projects continue to fail and it is apparent that the poor conceptualisation of project complexity may result in project failure due to poor decision-making by project managers. The next chapter examines these constructs further and presents arguments from the strategic management perspective.

CHAPTER 3

STRATEGIC ERA OF PROJECT MANAGEMENT

3.1 INTRODUCTION

The previous chapter examined success paradigms and the gaps in integrated frameworks of project success. These gaps represent limitations in the conceptualisation of project complexity. This chapter extends this discourse with a focus on the strategic era of PM. Organisation, environment and leadership peculiarities are examined within the Business Management and Leadership Studies research domain, where extensive literature on these constructs appear to exist. Therefore, the conceptualisation of project complexity is stretched to further understand the systems response mechanisms of projects and organisations to environmental stimuli. Bearing this in mind, this chapter draws inferences on the phenomenon of project complexity, particularly from a leadership dynamism perspective.

3.2. STRATEGIC PROJECT MANAGEMENT

The strategic era witnessed a divergence from traditional PM and heralded the introduction of concepts and tools from other well-established fields such as Business Management. Particularly, Marr (2011) and Parmenter (2020) argued that the biggest mistake in handling success paradigms would be to fail to link them to organisational strategy. In this view, KPIs and CSFs are most useful when they align with or are determined by wider organisational strategy. There is value in exploring the strategic era of PM because project failure originates at the front-end of projects, particularly within organisations during strategy formulation (Anderson and Merna, 2003)

3.2.1 The Concept of Strategy

As traditional PM become less adequate for achieving organisational goals, Patanakul et al. (2012) surmised that strategic aspects of PM help organisations improve

business results. Strategy is the unifying concept that improves project and business success (Young et al, 2012). According to Henry (2018), *“Strategy is, very simply, an outline of how a business intends to achieve its goals”*. Ultimately, strategy seeks to explore ways by which an organisation can satisfy its customers’ needs better than its rivals giving it competitive advantage (Mintzberg et al, 1999).

Therefore, the strategic approach improves the traditional PM mindset and project outcomes by enabling stakeholders to align project execution with wider organisations’ business results (Patanakul et al., 2012). Strategy provides means of aligning organisational resources and capabilities with verifiable environmental changes to improve outcomes (Henry, 2018). Consequently, business strategy and project strategy mutually influence each other to improve business competitiveness (Srivannaboon and Milosevic, 2006). The next section briefly discusses project strategy as a primer for subsequent organisation level focus.

3.2.2 Project Strategy

Project strategy is defined, *“as the project perspective, position and guidelines for what to do and how to do it, to achieve the highest competitive advantage and the best value from the project”* (Patanakul and Shenhar, 2011). To adapt PM for better business results, Patanakul et al. (2012) argued that project managers need strategy as a mechanism to improve project and business outcomes simultaneously through the three components described in Table 3.1.

Integrating strategic management and PM through project strategy increases the efficiency of processes and success (Hauc and Kovac, 2000), therefore, success is a broader organisational concept (Muller and Jugdev, 2012). This implies that project strategy is an indicator of success and the pursuit of success is the central goal in both the traditional and strategic eras of PM. According to Artto et al. (2008) projects exist in three ways; as subordinate to a parent organisation; autonomous but connected to a larger organisation or; exist completely independent.

Table 3. 1: Components of project strategy

(Patanakul et al. (2012) and Patanakul and Shenhar (2011))

Project strategy Components	Description
Perspective	
Business Background	The business motivation for implementing this project or producing project products
Business Objective	The ultimate business goals of the project
Strategic Concept	The general strategic idea behind the project's business strategy
Position	
Product Definition	The description of project products, including their specifications
Competitive Advantage/Value	The reasons why the project products are better than other products and the value the products create
Success & Failure Criteria	The perspective and expectations that the organisation has for the product/project
Plan (Guidelines)	
Project Definition	The project boundaries, scope of work, project deliverables, and project type
Strategic Focus	The mindset and guidelines for behaviour to achieve the product's competitive advantage and value

The discourse in this chapter focuses on projects as subordinate to parent organisations, particularly project-based organisations (PBO). Based on organisational philosophy, PBO is strictly project-specific and their primary unit of production is projects (Muller, Drouin and Sankaran, 2019). Therefore, PBO is the most significant of all organisation types in PM literature (Aubry et al., 2012; Muller, Drouin and Sankaran, 2019 p 502). This is critical because organisation strategy and models vary according to typology (Muller, Drouin and Sankaran, 2019).

3.3 ORGANISATION STRATEGY

The purpose of strategy is to improve business competitiveness and success through organisational and environmental analysis. As outlined in Figure 3.1, successful organisations begin by clearly defining their objectives, then they develop strategies to outline how they intend to achieve their objectives and remain competitive.

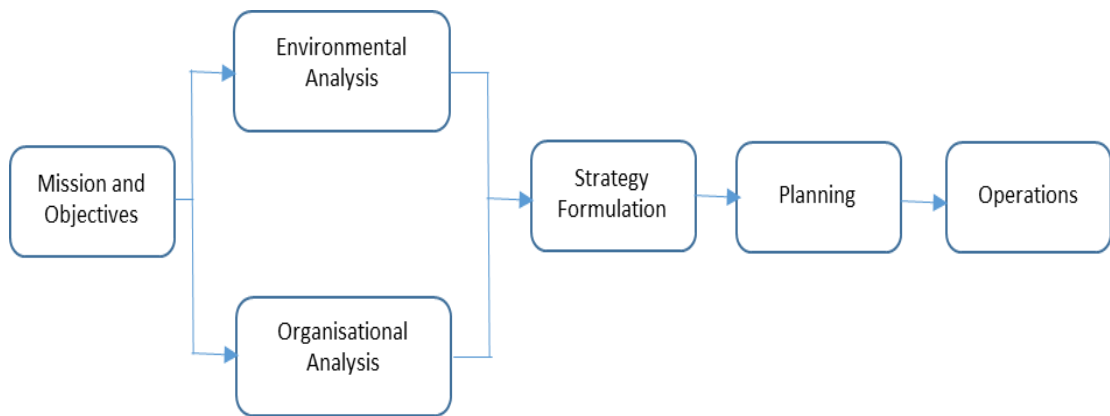


Figure 3.1: The strategic planning process (Harrison, 2014)

Therefore, strategy must be developed in line with organisation's capabilities and the dynamics of the external environment (Harrison, 2014). External influences affect the internal functions of organisations, since these organisations do not exist within a vacuum (Kelly and Ashwin, 2013; Harrison, 2014). Moreover, Walker and Kalinowski (1994) suggested that the nature of interchange between the project organisations and its environment determines their systems' viability and stability. Furthermore, these influences are reciprocal and the analysis of organisational systems in relation to environmental stimuli usually triggers strategic responses (Walker, 2007). The next section examines these constructs, to align strategic response with the systems response analogy in Figure 2.4.

3.3.1 Organisation Analysis

Organisations are comprised of '*systems, processes, individuals, teams, leadership and decision-making units*' (Kelly and Ashwin, 2013). To develop an effective business strategy these features need to be analysed in relation to the dynamics of the external environment (Lichtenthaler, 2009). An organisational system is defined by its permeable boundary beyond which is its external environment (Walker and Kalinowski, 1994).

In systems terms, it is difficult to understand an organisation without examining its external influences (Walker, 2007) and a firm's ability to survive partly depends on its ability to anticipate external change (Lichtenthaler, 2009), through its management and governance systems (see Too and Weaver, 2014).

3.3.2 Management and Governance Systems

PBO evolve in response to the dynamism of their environment and to succeed there must be a link between project outputs and the organisations' business strategy (Aubry et al., 2012). This implies that organisations need to put systems in place for aligning the project deliverables with their organisational goals and these can be achieved through effective management and governance structures (Too and Weaver, 2014). Governance and management systems are hierarchical, with authority and responsibility flowing from top to bottom of the hierarchy.

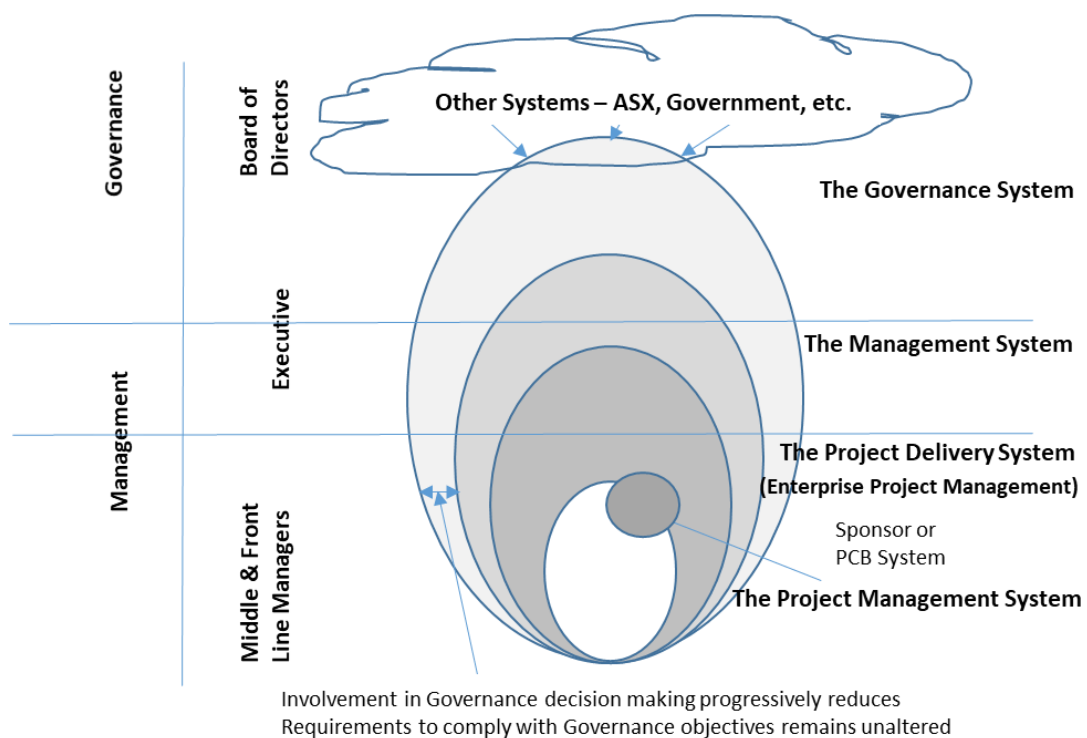


Figure 3.2: Nested governance and management systems (Too and Weaver, 2014)

Governance Systems are responsible for setting strategy and ensuring scarce organisation resources are used effectively while the management systems implement these strategies (Too and Weaver, 2014). Therefore, these systems exist to align projects and organisations within their dynamic context and appropriate conceptualisation of complexity will improve success. This conceptualisation affects the structure of organisations and decisions making.

Too and Weaver (2014) stated that decision-making can be improved through a framework with well-defined roles and responsibilities. Management and governance systems are both essential for successful project delivery, benefits realisation and organisational success (Musawir et al., 2020). Governance and management systems work together to improve project outcomes (Too and Weaver, 2014; Musawir et al., 2020), and the framework in Figure 3.2 provides guidance to organisations on the development of effective governance to optimize the management of projects to yield optimal business value.

The governance system is responsible for decision-making within organisations beginning with decisions about which projects the organisation should approve, fund and support. Similarly, the role of the management system is similar to those of governance in the sense that it makes decisions within the framework set by the governance body. Therefore, the governance systems cannot operate without the effective support of management systems. This is particularly relevant to this thesis because the unit of analysis is leadership decision-making, whereby governance and management are hierarchal systems with the governance system at a higher level of decision-making (Too and Weaver, 2014).

Furthermore, the actors at the top of the system delegate authority and responsibility for clearly defined activities to actors in the lower levels of the hierarchy systems. Therefore, decision-making authority generally reduces down the hierarchy, highest in the governance system and lowest at the management system, although each lower system is integrated into and part of the higher systems. This is of significance because the research design for this thesis is informed by hierarchical structure of

decision-making and data was collected from decision makers at two different levels of the building construction industry (see Section 6.7.2.2).

Therefore, at the heart of the governance and management system is decision-making, particularly those resulting in strategy, which must be properly communicated and aligned at all hierarchical levels (Too and Weaver, 2014). Therefore, the nature of this framework suggests that when projects consistently fail, the root cause could be a dysfunctional system. Therefore, a pluralistic and systemic approach is required for this study to weigh in the levels of complexity within construction projects, organisations and their environment.

This gives credence to the choice of the institutional level of analysis for this study bearing in mind the high rate of project failure globally. Institutional levels are the highest levels of governance that influence project success (Soderlund and Sydow, 2019). Although contextual issues play a role in determining success, the Project Governance framework fails to discuss the link between organisational and environmental system (indicated in Figure 3.2 as Other Systems – ASX, Government). The latter is discussed next.

3.3.3 Environment Analysis

According to Kelly and Ashwin (2013), the business environment refers to every internal and external factor that may influence the attainment of organisational goals. The external environment comprises all those factors and events outside the organisation that influences its activities (Palmer and Hartley, 2011). Despite the importance of the environment to strategy formulation, there is limited evidence of empirical research on business environments in the construction PM domain (Walker, 2007) which underscores the limitations of the traditional PM approach.

Therefore, firms should trade conventional PM practices for new approaches, due to the limitations of the former, since this will improve strategy and decision-making in turbulent business environments (Piccioto, 2019). Lesca and Caron-Fasan (2008) suggested that this could include the implementation of a strategic scanning systems

for collecting and storing information, then analysing it for distribution to serve the organisations' strategic goals (Lesca and Caron-Fasan, 2008). Environmental scanning is at the heart of all strategic systems and enables organisations learn about and respond to environmental dynamics. It is defined by Aguilar (1967 p. 1) as, *'The acquisition and use of information about events, trends and relationships in an organisation's external environment, the knowledge of which would assist management in planning the organisation's future course of actions'*.

The words *'events, trends and relationships'* in this definition provide a guiding principle for the new MPC (see Figure 5.1). In this study, events and trends in the study area were examined during the pilot study (Section 7.4 and 7.5), while leadership dynamics (Section 3.6) reflects the relationships between the different project stakeholders. Therefore, decision-makers in PBO must constantly scan the external environment for signals of change that may affect project success. This can be achieved by decentralising leadership to promote nonlinear interactions that would permit a more robust mechanism for responding to environmental change (Rohrbeck and Bade, 2012; Toivonen and Viitanen, 2016; Derakhshan et al., 2019), which may occur at the micro- and macro- dimensions of the environment.

3.3.4 Micro- and Macro- Environment Systems

The environment of organisations is comprised of external (macro-) and internal (micro-) environment. Micro-environment is comprised of anything which is internal to an organisation and within its sphere of control including customers, suppliers, the labour market, local communities and pressure groups (Worthington and Britton, 2009; Kelly and Ashwin, 2013). Whereas, the macro-environment includes factors that are outside of the control of organisations that indirectly affect an organisation's relationship to its markets (Palmer and Hartley, 2011).

Others, like Henry (2018), prefer to describe the macro- and micro-environment as the general and competitive environment respectively. Irrespectively of the nomenclature, it is evident that the environment has two key segments that can be

examined through their forces. Some of the earliest construction PM studies on environmental forces recognised the distinction of the microenvironment and its existence because of the macro-environmental (see Walker, 1989; Hughes, 1989). Project managers need to be sensitive to factors of the micro- and macro-environment (see Table 3.2), because the interaction of environmental forces creates risks and opportunities for organisations (Pheng and Chuan, 2006)

Several frameworks, such as the PEST framework (Figure 3.3), have evolved for understanding the environment (Henry, 2018). This examines political, economic, social and technological subsystem and represents the most widely accepted environmental analysis framework (Palmer and Hartley, 2011). The popularity of PEST analysis is due to its' proven flexibility and ease of use in the context of strategic planning. Nevertheless, the limitation of the PEST framework to construction organisations is in the omission of physical, institutional and legal influences.

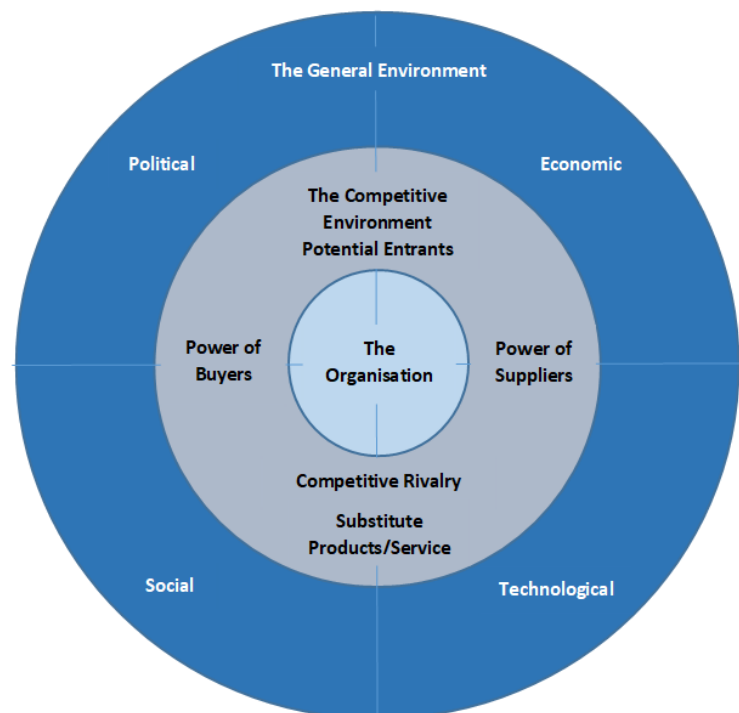


Figure 3.3: The organisation and its external environment (Henry, 2018)

Table 3. 2: Components of the Macro- and Micro-Environment

Category	Definition	Authors
MACRO ENVIRONMENT		
Political	Deals with actions and effects of government policies which influences individuals, projects and businesses at international, national, subnational levels. Political forces and decisions affect availability of finance and the labour market the project. It also covers the large influence of powerful individuals. Examples include political stability, taxation policies and resource allocation.	Campbell and Craig (2005), Henry (2011), Walker (2012), Harrison (2014) Needle (2015), Palmer and Hartley (2012), Kelly and Ashwin (2013), Sammut-Bonnici and Galea (2014), Boddy (2017)
Economic	Economic policies and decisions of governments affecting households, consumers and businesses. Examples include the level of general economic activity, competition, economic resources, rate of inflation, disposable income, public expenditure, taxation, consumer expenditure, interest rates, gross domestic product (GDP), effects of monopolistic phenomena and exchange rates.	Henry (2011), Walker (2012), Harrison (2014) Needle (2015), Worthington and Britton (2009), Palmer and Hartley (2012), Kelly and Ashwin (2013), Sammut-Bonnici and Galea (2014)
Social, Cultural, Sociological, Socio-cultural Sociological, or Demographic	Refers to the people, their influences and features of population, beliefs and cultural norms, tolerance of prevalent practices and activities reflecting aspects of the local community. Examples include birthrates, ageing workforce, social structure, skills shortages, values, human expectations, religion, education, fashion and trends in work and leisure.	Campbell and Craig (2005), Henry (2011), Walker (2012), Harrison (2014) Needle (2015), Worthington and Britton (2009), Kelly and Ashwin (2013), Sammut-Bonnici and Galea (2014), Boddy (2017)
Technological	Development and application of technology and its effects on work, processes, peoples' productivity, communication, information management and decision making. Technology has become a major driver of project complexity. Examples include lack of technology, development of new materials, the advent of the internet and software development and computer availability and speed.	Walker (2012), Harrison (2014) Needle (2015), Worthington and Britton (2009), Henry (2018), Palmer and Hartley (2012), Kelly and Ashwin (2013), Sammut-Bonnici and Galea (2014)
Institutional or Regulatory	This refers to the activities and influence of government regulatory institutions, professional bodies, trade and employment associations and pressure groups over the conduct of its members. Examples are regulatory standards, conditions of engagement, fee scales, codes of conduct, training, education and continuous professional development for project stakeholders.	Walker (2012), Sammut-Bonnici and Galea (2014), Dille and Söderlund (2011)
Physical, Ethical, Environmental or Ecological	Environmental concerns of individuals and businesses, including sustainability, environmental management and protection requirements, corporate social responsibility goals, the ecosystem, ethical standards, ecological degradation, global warming, pollution, waste disposal, environmental regulations, emissions trading scheme, pollution taxes, energy consumption and site soil structure.	Hughes (1989), Worthington and Britton (2009), Henry (2018), Harrison (2014), Palmer and Hartley (2012), Kelly and Ashwin (2013), Sammut-Bonnici and Galea (2014), Boddy (2017) Cloete (2017)
Legal	System responsible for regulating laws, restrictions and rules governing human and organisation behaviour. It includes legislation on employment, health and safety, trading standards, planning law, control of land and building regulation. Enactment of statutory legislation is a result of activity within the political and institutional sectors. Examples include common, statute, criminal and civil laws.	Campbell and Craig (2005) Harrison (2014) Needle (2015), Worthington and Britton (2009), Palmer and Hartley (2012), Kelly and Ashwin (2013), Sammut-Bonnici and Galea (2014), Boddy (2017)
MICRO ENVIRONMENT		
Micro or Competitive	In organisations these include the value and supply chain, resource base, market rivalry and competition (e.g. substitute goods and services), buyers, sellers. Others include organisational core competencies, distinctive capacity, structures, technology, systems, culture, human resources, financial strength, marketing and intellectual assets, rates of pay, employment of child labour etc.	Henry (2011), Worthington and Britton (2015)

It is salient to note that the nature of the construction environment is largely physical, comprising structure and materials, features that distinguishes it from other industries (Hughes, 1989; Cloete, 2017). Similarly, the institutional environment which includes professional and regulatory bodies is a significant influence of project activities, however, this is scarcely examined in the Business Management domain (Dille and Söderlund, 2011; Walker, 2007). Therefore, these were considered in the development of the conceptual framework for this study in line with Table 3.2.

There are several variations of the PEST framework in literature including PESTEL which includes environment or ecological and legal; STEEPLE which includes the ethical dimension and; STEER which incorporates regulatory factors (see Table 3.2). These frameworks are prompt brainstorming tools that assist decision-makers understand the discrete categorisations of the external environment and the variation in framework depends on the industry, organisational context and their relevance to operational performance.

In the construction industry, all aforementioned environmental influences have strong influences on success in spite of them being outside of the control of the project manager, teams and the clients' organisation (Walker, 2007). Furthermore, these variables are interrelated, interacting continually to exert their influence on project processes and increase complexity (Walker, 2007). Therefore, the purpose of acquiring environmental information is to improve decision-making and strategy formulation (Zhang et al., 2010 p 719), which are examined next.

3.4 STRATEGY FORMULATION

Based on Figure 3.1, organisational and environmental analysis results in strategy formulation which requires decisions to be made regarding plans, perspectives and positions that promote the attainment of the organisations mission and objectives. Therefore, the next section examines decision-making systems in PM literature.

3.4.1 Decision Making Systems

In the PM domain, Fortune and White (2006) developed a robust systems model for understanding benefits delivery and decision-making (Figure 3.4). At the heart of this model is the decision-making subsystem that is responsible for driving how systems objectives are achieved and how scarce internal resources are distributed. This model also integrates performance monitoring and task executing subsystems, which clearly suggests that the outputs of decision-making systems are a consequence of the influence of the wider system and environment.

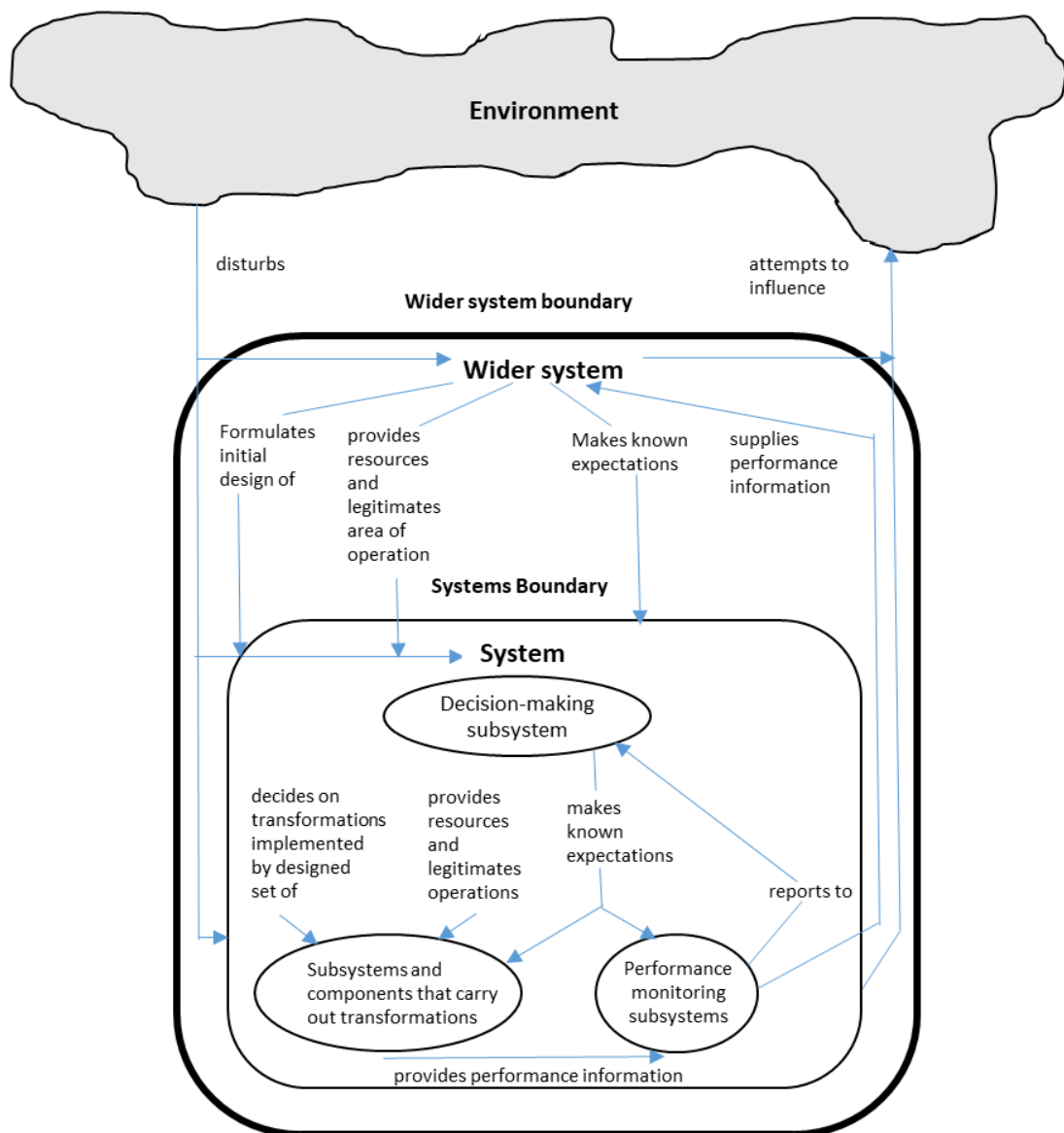


Figure 3.4: The Formal System Model (Fortune and White, 2006)

This model is similar to Too and Weavers' (Figure 3.2) in that both reflect the systemic nature PBOs. Their hierarchical segments are distinct, yet properly integrated within management, governance and contextual systems. At the heart of both frameworks is a decision-making subsystem, which links the strategic and management segments of the organisation. The decision-making subsystem allows for organisational adaptation, choice and purposeful responses to environmental influences (Fortune and White, 2006 p 56). In other words, these frameworks reflect the importance of decision-making as a catalyst for organisational transformation and success.

Decision making in construction project management is an iterative process which begins with identification of the user requirements, project constraints, resource needs, and establishment of realistic objectives to meet the strategic goals. (Erdogan, Saparauskas and Turskis, 2017). Erdogan, Saparauskas and Turskis (2017) argued that following these frontend activities, other decisions such as selecting the contractor can be complicated since criteria such as technical experience, performance record, financial stability, qualifications, capacity, safety record and operations and equipment must be considered using appropriate decision-making models.

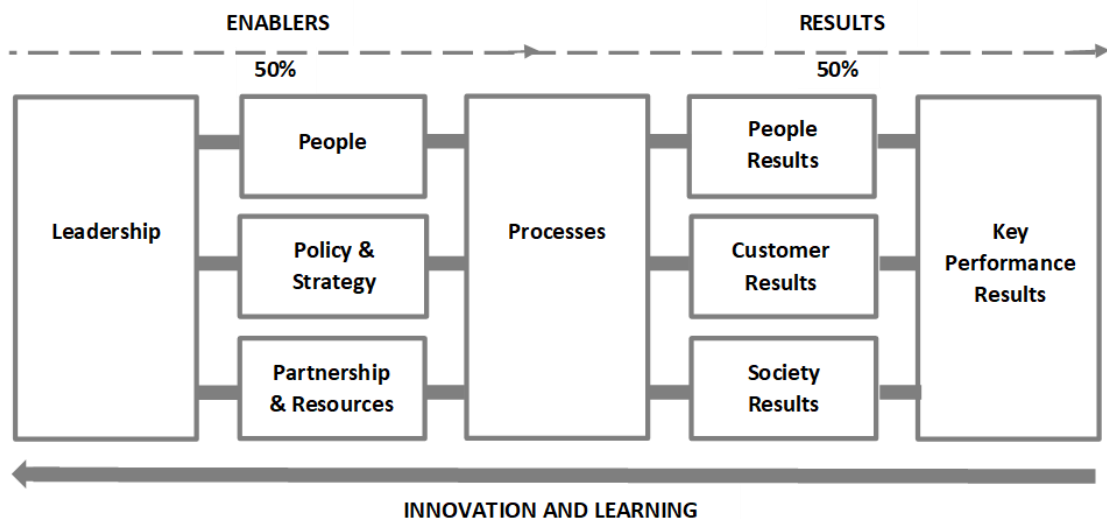


Figure 3.5: The EFQM Excellence Model (EFQM registered trademark)

Similarly, the EFQM excellence model (Figure 3.5) suggests that leadership is the main catalyst for organisational success. Here, leadership makes decisions, develops strategies and processes that deliver positive results to people, customers and society. Innovation and learning are key attributes of leadership in this excellence model, whereby strategy contextualises organisational dynamics within environmental peculiarities. This underscores the importance of leadership within projects and organisations, which aligns with the systems response segments in Figure 2.4., and the functions of leaders (Table 3.3) and project managers (Table 2.9).

Table 3. 3: Functions of Strategic Leadership (Samimi et al., 2020)

Functions	Definitions
1. Making strategic decisions	Making decisions on strategic changes and the overall directions of the firm
2. Engaging with external stakeholders	Representing the firm and managing relationships between the firm and public and private entities
3. Performing human resource management activities	Making decisions regarding personnel selection and dismissal, setting compensation, and personnel evaluation and development
4. Monitoring and influencing	Motivating organisational members, establishing follower trust and a unified workforce, serving as a role model, shaping the firm's culture, and communicating a vision
5. Managing information	Processing strategic information and distributing it to the different areas and hierarchical levels of the organisation
6. Overseeing operations and administration	Managing the development and implementation of structure and procedure, monitoring different areas, and delegating
7. Managing social and ethical issues	Steering the firm's moral behaviour and controlling illegal behaviours of the firm
8. Managing conflicting demands	Attending to conflicting needs of different internal and external stakeholders and resolving conflicting strategic issues

Although there are numerous overlaps in terms of the roles of leadership and management, particularly in the area of decision-making, the construction domain clearly distinguishes these roles, theoretically and practically (Nixon et al., 2012; Nienaber and Svensson, 2013; Liphadzi, Aigbavboa and Thwala, 2017). Overall, greater complexity of the business environment will also cause decision-making to be more complex (Gemunden et al. 2018) and organisations have found it expedient to put in place decision-making tools and models (Abbasianjahroni et. al, 2014). This is particularly crucial for project success because MPC are primarily decision-making tools in PM practice (Rolstadas et al. 2015). Decision-making tools must sufficiently conceptualise the complexity of factors that influence success within organisation, environment and leadership constructs (Nixon et al. 2012; Henry, 2018).

Therefore, decision problems exist in almost all typologies and hierarchies of projects and organisations. Numerous methods and theories for analysing decisions can be found in literature including behavioural reasoning theory (Westaby et al. 2010), stakeholder theory (Beringer et al. 2013) and historiometric methods (Zeni et al., 2016). However, an in-depth analysis of decision-making systems or theories is beyond the scope of this thesis. Rather, the study focuses on investigating and conceptualising project complexity to highlight how this affects decision-making and success. As organisation and environment variables interact within governance and management systems, complex leadership dynamics emerge which influence project complexity, decision making and success (Snowden and Boone, 2007; DeChurch et al. 2010). Therefore, the next section examines leadership decision making.

3.4.2 Leadership Decision Making

Leadership is essential in organisations in this millennium owing to the rapidly changing business environment (Hickman, 2010). Furthermore, leadership development has attracted more interest of researchers because this dynamic external environment is one of the major driving forces, which determines the survival of new era organisations (Hickman, 2010). For organisations to thrive they must understand and continuously evolve with the environment, through adaptation and change processes enhanced by leadership (Snowden and Boone, 2007).

Leaders must have a deep understanding of the organisation and environment to adapt their behaviour, organisational strategy and decisions to match that context (Morris and Gerald, 2011). This adaptation process is depicted conceptually in Figure 3.6 and this framework captures the internal decision-making participants within an organisation. It highlights the need to align organisational mission with environmental influences in the society. In this framework, leaders and organisational participants such as managers collaboratively make decisions, which adapt their organisations to external changes (Hickman, 2010).

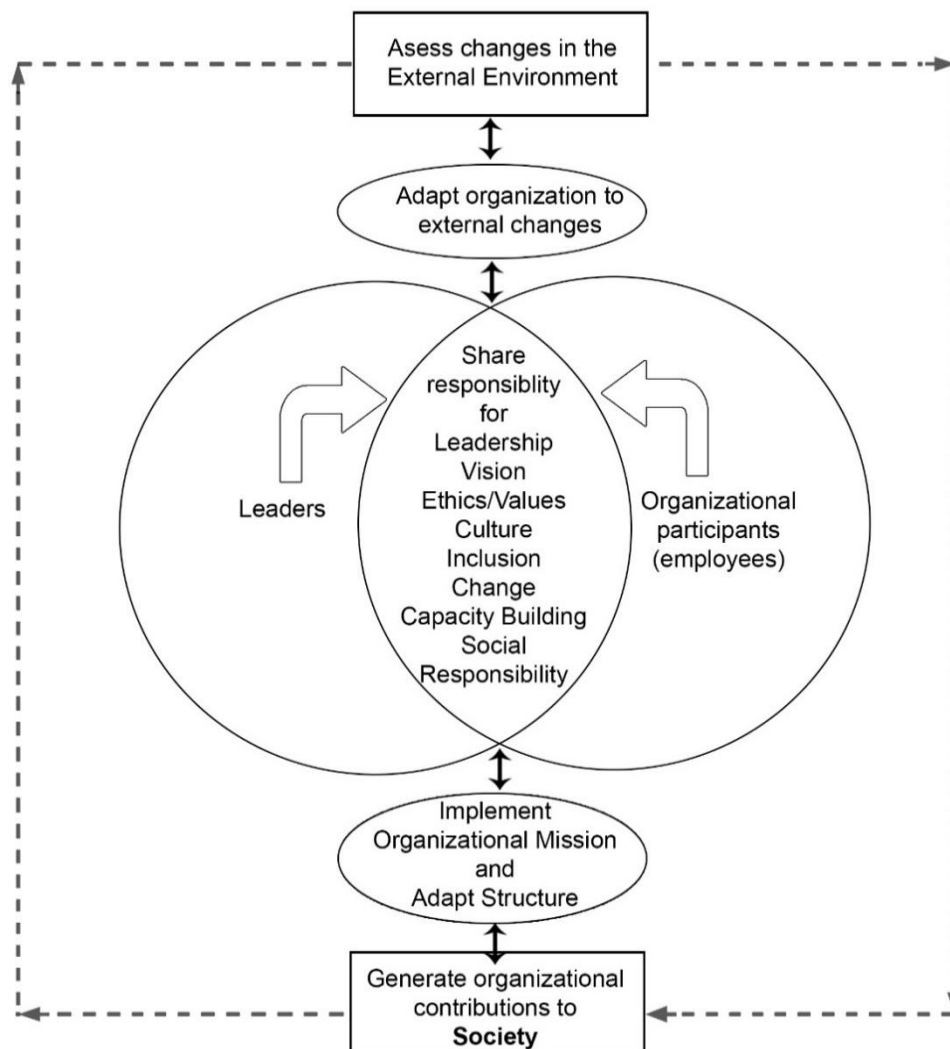


Figure 3.6: Leading Organisations Framework (Hickman, 2010)

Since the turn of the millennium, the responsibility for decision-making has become increasingly distributed amongst leadership, management and other staff (Nienaber and Svensson, 2013), as depicted in Figure 3.7. In the modern era, organisational and environmental dynamics have become too complex for decision-making to remain within the purview of an elite group of individuals (Alvarenga et al., 2020). While leadership decisions are future-based, management and other staff focus past-based and present-based decisions respectively.

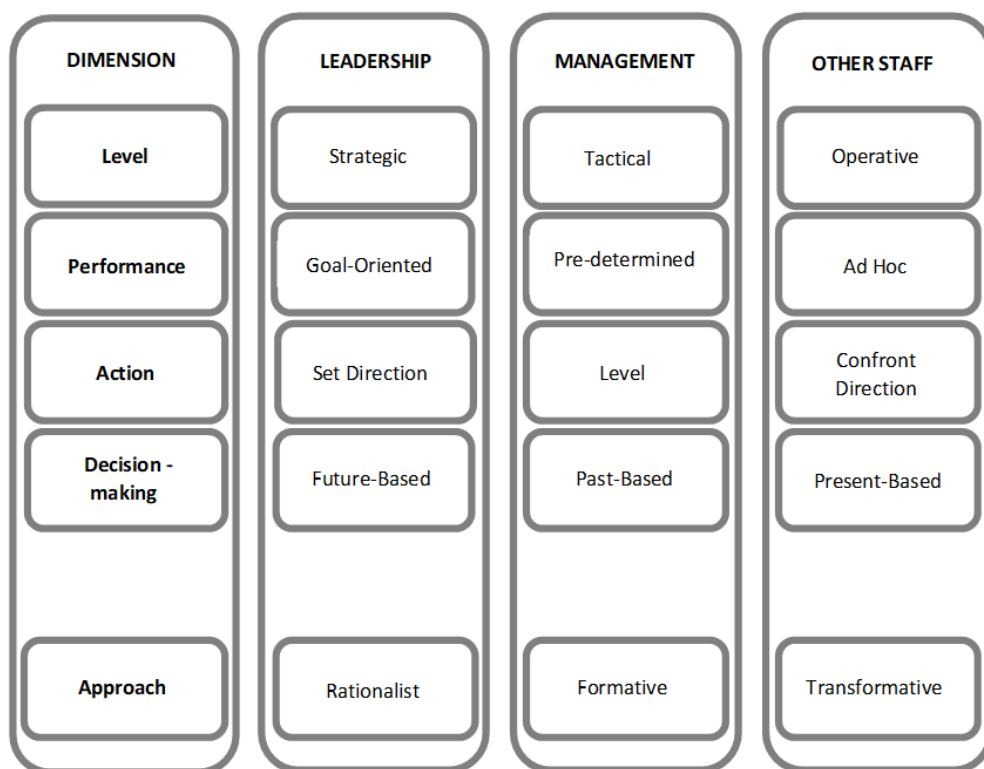


Figure 3.7: Managerial/Leadership Framework (Nienaber and Svensson, 2013)

The plethora of factors that influence project complexity and success are embedded in exogenous and endogenous factors, as well as the leadership systems. The framework in Figure 3.6 clearly provides some insight on the need for shared responsibility of leadership amongst stakeholders, to improve organisational thinking at all levels in response to environmental stimuli. These ideas spawned a divergence from centralised patterns of leadership (see DeRue, 2011 p 133).

Therefore, the term 'leadership' in this study refers to leaders, managers and other staff, all embedded within the systems response factor group. This is significant because the traditional forms of leadership may be inadequate in complex scenarios and calls for new leadership conceptualisations are rife (Uhl-Bien and Arena, 2018). Since PM literature is in the strategic era, it will be of particular interest to review how leadership research has evolved to espouse trends and contradictions. Therefore, the next section traces the prevalent leadership concepts and theories in Leadership Studies literature.

3.5 LEADERSHIP CONCEPTS AND THEORIES

Leadership interest dates back to the beginning of written knowledge in ancient Rome, Greece and Troy (Avery, 2012). In contemporary literature, leadership issues continue to evoke rigorous interest in many fields of human endeavour including military studies, business, politics and construction (Ofori and Toor, 2012; Vroom and Jago, 2007). Albeit, many aspects of leadership are yet to be adequately explained despite years of intellectual efforts (Avolio, 2007). The critical review of Leadership Studies literature will improve leadership conceptualisation with a view to examining how it influences project complexity.

3.5.1 Leadership Definitions

The search for a consensus on the definition of leadership remains elusive (Ofori and Toor, 2012, Northouse, 2016). With more than 200 definitions for leadership in literature (Rost, 1991 cited in Northouse 2016 p.2) and as many as 65 different classification systems (Northouse 2016 p.5), critiques like Stogdill (1974) suggested that leadership concepts and definitions are as numerous as there are experts on the subject. For example, early research suggested that, "*leadership behaviour means particular acts in which a leader engages in the course of directing and coordinating the work of his group members*" (Fiedler, 1967 cited in Ofori and Toor, 2012).

Others like Yukl (1989) opined that "*leadership involves influencing task objectives and strategies, influencing commitment and compliance in task behaviour to achieve these objectives, influencing group maintenance and identification and influencing the culture of an organisation*". Similarly, Vroom and Jago (2007) affirmed that leadership is a process of '*motivating people to work together collaboratively to accomplish great things*'; while Northouse (2016 p 6) proposed that it is, "*a process whereby an individual influences a group of individuals to achieve a common goal*". Some of these definitions imply that the phenomenon is not a trait or characteristic that resides in the leader, but rather a transactional event based on social influence that occurs between the leader and the followers.

Leadership is not a linear, one-way event but rather an interactive event, which occurs in a group context, therefore, without influence leadership does not exist (Northouse, 2016). The reference to common goals implies that leaders and followers must have a common purpose for which they are willing to collaborate to achieve success. More recent definitions reflect the understanding of leadership as a "social process" between leader and followers (Toor et al., 2012; Pietraszewski, 2020). From the breadth of leadership studies literature therefore, leadership can be conceptualised as a trait, process or relational construct.

As researchers continue to study leadership, various approaches have emerged in Leadership Studies literature and the next section discusses them. The various theoretical leadership approaches in literature are outlined according to their eras of dominance but chronological overlaps exist (Ofori and Toor, 2012). An in-depth chronological review of the Leadership Studies literature revealed that successive concepts and theories are not inherently superior to previous constructs and do not necessarily replace the former, rather they occur concurrently. This has resulted in the proliferation of leadership constructs which are too numerous to define and explain within this thesis.

3.5.2 Various Approaches in Leadership Theory

The background understanding of some primary leadership theories and their lead proponents are summarised in Table 3.4. This provides evidence of the multiplicity of leadership approaches and the lack of consensus in its conceptualisation, which has made theorizing extremely contentious. In spite of these, the development of leadership research can be broadly divided four eras, based on the works of Avery (2004) and Toor (2009 in Ofori and Toor, 2012) which are presented as follows;

3.5.2.1 Classical Approach (Up to 1950s)

This approach is known as the trait or great man theory. The underlying assumption of this approach is that leaders are naturally endowed with certain traits from birth, which sets them apart (Avery, 2004). These leadership attributes include physical features, personality aspects, charisma, intelligence, capabilities and inherited money (Ofori and Toor, 2012). Similarly, Zaccaro (2007) argued that natural traits are necessary for leadership to be effective while DeChurch et al. (2010) suggested that the trait approach has a long history in organisational science.

Nonetheless, the key limitation of this classical theory in the modern era is its reliance on the idea of a 'great man', implying that only a select few are good enough to exercise leadership initiative, leaving the leader exclusively accountable for group outcomes (Avery, 2004). However, subsequent studies have made it clear that leadership capabilities can be developed through training. Other drawbacks include the inability of one leader to control every action in complex organisations and that could be particularly catastrophic in complex projects and organisations.

3.5.2.2 Transactional Approaches (1950s and 60s)

According to Avery (2004), transactional approach includes behavioural and contingency theories, developed during the 1950s and 1960s. In general, this leadership approach is prevalent in many organisation and depends heavily on interpersonal and negotiation skills, as well as the cooperation from followers (Avery,

2004). Some theories in this era include the behavioural and Leader-Member Exchange approach (DeChurch et al., 2010). This approach stresses that people can learn to become leaders through teaching and observation. Therefore, leadership behaviours can be acquired, measured and changed to suit the exigencies of the environment.

This approach overcomes some of the limitations of the classical era by considering and involving its followers, however, Avery (2004) argued that, *“in times of rapid change and uncertainty, transactional leadership becomes limited, particularly when greater commitment is needed from followers”*. Furthermore, the behavioural leader focuses on short-term payoffs when making decisions, which does not prepare the organization for future change.

3.5.2.3 Visionary Approach (1970s and 80s)

Resulting from the inadequacies of the previous paradigms, social constructs such as ‘charismatic’, ‘inspirational’ and ‘transformational’ leadership emerged (Ofori and Toor 2012). Through moral suasion, leaders compel followers to perform tasks and follow willingly by convincing them of the leader’s vision and ideology. The effect is that the followers embrace the leaders’ vision and goals as theirs. Trust and belief by the followers begin with an emotional attraction towards the leader and grows based on the leaders’ attributes such as the self-confidence and clear vision.

When the followers’ convictions are swayed by the leaders’ mission and accomplishments, leadership influence grows thereby unquestioning commitment to the leader is developed (Ofori and Toor, 2012). Again, critiques described this era as lacking in conceptual clarity because it covers a wide range of activities and characteristics, making definition of its exact parameters difficult (Northouse, 2013). Others argue that researchers are yet to establish that transformational leaders are actually able to transform individuals and organisations (Northouse, 2013 p. 203).

Table 3. 4: Key Leadership Concepts (adapted from Storey (2011) and Northouse (2016))

	Leadership Concepts	Definitions	Key proponents
1	Trait or 'great man' Theory	Focused on individual leadership attributes of such as intelligence, self-confidence, integrity, determination and sociability	Carlyle (1841); Bernard (1926); Stogdill (1948); Mann (1974); Zaccaro, Kemp, and Bader (2004)
2	Behavioural and Style Theories	These are relationship and task-related, focused exclusively on what leaders do and how they act including actions of leaders towards followers in various contexts.	Ohio State University Studies, University of Michigan (Katz and Kahn, 1951), Likert (1961), Blake and Moulton (1964)
3	Situational, Expectancy and Contingency Theory	Based on the premise that different situations demand different kinds of leadership, requiring a person to adapt his or her style to the demands of the situations.	Fiedler (1967), Vroom and Yetton (1973), Yukl (2009), Hersey and Blanchard (1969), Thompson and Vecchio (2009)
4	Exchange and Path Goal models	Emphasises that leadership style is contingent on the characteristic of the followers and organisational setting. Leaders must adapt to the development level of followers.	Graen and Uhl-Bien (1995), House (1977), House (1996), Evans (1970); House and Dessler (1974); House and Mitchell (1974)
5	'New Leadership'; Charismatic, Visionary and Transformational leadership	Gives attention to the affective elements of leadership such as emotions, values, ethics and standards. Focuses on the process that transforms people.	Burns (1978), Bryman (1992), Conger and Kanungo (1988), Bass (1985a), Tichy and Devanna (1986), Kouzes and Posner (1997)
6	Team, Shared or Distributed Leadership	Occurs when members of the team take on leadership behaviour to influence the team and to maximize team effectiveness, particularly in increasingly complex scenarios.	Bergman, Rentsch, Small, Davenport and Bergman (2012); Day, Gronn and Salas (2004), Morgeson, DeRue and Karam (2010)
7	Leader-Member Exchange (LMX)	Conceptualises leadership as a process that is centred on the interactions and dyadic relationship between leaders and followers.	Graen and Uhl-Bien (1995); Dansereau, Graen and Haga (1975); Harris, Wheeler, and Kacmar (2009)
8	Servant Leadership	Emphasises the need for leaders to be attentive to the concerns of followers, empathizing with them.	Greenleaf (1970, 1972, 1977)
9	Leadership within Learning organisations	Studies how leaders within organisations sustain competitive edge by gaining capacity to learn faster than its competitors	Senge (1990, 2006)
10	Post Charismatic, Post Transformational, Spiritual and Authentic Leadership theory	Focuses on whether leadership is genuine and real by addressing the authenticity of leaders and their leadership styles	Khunna (2002a, 2002b), Maccoby (2000), Fullan (2001a, 2001b), Boyatzis and Meke (2005)
11	Skills Approach	Takes a leader-centred perspective but shifts from personality traits to skill-based model which includes technical and social skills	Katz (1955); Mumford, Zaccaro, Harding, Jacobs, & Fleishman (2000); Yammarino (2000)
12	Adaptive leadership	Involves changing behaviour in appropriate ways as the situation in the external environment of organisations changes to create opportunities and threats.	Heifetz (1994); Heifetz and Sander (1988); Heifetz, Grashow and Linsky (2009); Heifetz and Laurie (1997) Yukl and Mahsud (2010)

3.5.2.4 Organic Approach (1990 and beyond)

Developments within the most recent decades reflects researcher's realisation that leadership is not merely about style, charisma, motivation, inspiration, or strategy (Ofori and Toor, 2012). Future issues being addressed focuses on the follower as a prime element in the leadership dynamic and these include the evolution of authentic servant, adaptive, strategic and shared leadership constructs (Limsila and Ogunlana, 2008; Northouse, 2016). Other constructs in this era include, 'cognitive leadership', 'ethical leadership', 'shared leadership', 'complexity' and 'authentic' leadership (Walumbwa and Weber, 2009).

In summary, the leadership style exhibited by individuals is usually the result of a combination of the persons' understanding of the conditions of the operating environment, personality traits, the underlying motive and the leader's self-related cognition (Toor and Ofori, 2008). Therefore, this era witnessed a general tendency towards complexity constructs (Ofori and Toor, 2012), which is of particular interest to this study (see Section 4.3). Although the significance of leadership in theory and practice is apparent and relevant to PM, the foregoing discourse has significant limitations which may provide some insight on why success in projects and organisation has remained challenging.

3.5.3 Limitations of Leadership Conceptualisation

Leadership studies is not without its limitations. For instance, Collinson (2014) criticised mainstream leadership research for overreliance on conceptual dichotomisation of leadership, stating that the fixation with approaching leadership as either a trait or process neglects the possibility of combining both. Collinson also cited examples from early studies (such as Burns, 1978; 2007) which described leadership as constructs that lack overlapping conceptualisations.

These approaches eschew the complexity of leadership and as Collinson (2014) concluded, dichotomisation can have a significantly negative effect on leadership studies because it *'over-simplifies the complex, inter-connected, and shifting*

relationships that characterise leadership dynamics'. (Collinson 2014 p. 39). Therefore, important issues such as inherent complexities, dilemmas, ambiguities, paradoxes and contradictions relating to leadership tend to be ignored.

Another example is the polarisation between leadership and management positions within organisations that breeds excessive competition and conflict (Collinson, 2014 p 48). Although arguments can be made for the value of polarised thinking in leadership studies, this approach is unsuitable for advancing project endeavours in dynamic and complex business environments. Similarly, a limited range of studies have emerged called Critical Leadership studies which sought to digress from the two dominant leadership research approaches: functionalist and interpretive studies. Alvesson and Spicer (2012) surmised that their approach is largely a negative critique of leadership, which seeks to understand and examine leadership patterns of power and domination, sometimes referred to as the "darker side" of leadership.

These critiques discuss constructs such as inequality, discipline, resistance and control as negative leadership conceptualisation, which must be addressed in empirical discourse. Other critiques like DeRue (2011 p 127 - 131), suggested that there are four fundamental assumptions of leadership theories that have limited its conceptualisation which include; the hierarchical conceptualisation of leadership; portraying leadership as one directional influence; depicting leadership as an individualistic and personal attribute, and; treating the environment as exogenous to the leadership process. Although this publication appears dated, its assumptions completely align with Rosenhead et al (2019), which provides the central theoretical underpinning for this study (see Section 5.2.5).

Firstly, leadership should not be depicted as a personal trait, skill or attribute possessed by an individual because this individualistic perspective erroneously venerates these persons as the primary source of leadership. This approach does not account for the social processes by which patterns of leading and following evolve. Leadership is not a static feature of a person but involves a process whereby people engage in acts that influence others following which the leadership or followership

roles are socially constructed. This ideology shifts the individualistic paradigm to embrace a more relational construct of leadership which allows for investigation of actions and engagements of people in social processes.

Secondly, most leadership theories and research are grounded in the hierarchical perspective of leadership entrenched in supervisor-subordinate relationships and assumes that leadership only originates from people who are hierarchically superior. Arguably, there are instances where supervisors are not viewed as leaders in organisations; rather their colleagues may perceive subordinates who may not hold leadership-styled positions as leaders. Therefore, this hierarchical assumption limits our ability to explain and conceptualise the development and effectiveness of non-supervisory leaders and the dynamic of collaborative leadership.

Thirdly, another disconnect between early research and current realities is the presentation of leadership as a one-directional influence process, suggesting that one individual exerts influence over another individual or group. In reality, leadership should be viewed as a series of interlocking and interdependent acts of leading and following. In other words, influence is mutual and reciprocal, which has led to constructs such as shared and distributed leadership. Therefore, the leadership process should be understood as a more dynamic and reciprocal social process.

Lastly, the leadership process is similar to the strategic change process between the organisation and the environment. In this sense, leaders adapt their style and processes to their environment, but over time changes in these leadership processes are expected to influence the environment. Therefore, treating the environment as exogenous to the leadership process does not fully account for the reciprocal ties that bind leadership to its environment. Therefore, leadership as a relational construct is integral to teams, organisation and environment. This idea is particularly relevant in the construction industry due to its large number of stakeholders.

3.5.4 Leadership in the Construction Industry

Leading effectively remains one of the primary answers to the problems of PM, and the construction industry as a whole (Ofori and Toor, 2012) and the lack of effective leadership and inappropriate choice of leadership styles in the construction industry have been attributed to project failure (Buba and Tanko, 2017). This is because features of construction projects are quite complex which render effective leadership even more essential and one of the primary answers to the problem of project failure in the construction industry (Ofori and Toor, 2012).

Ofori and Toor (2012) argued that construction projects are complex, expensive, technically demanding, involve large and diverse project teams, evolve through long processes, involves a large number of discrete and interrelated tasks. Similarly, constructed products influence long-term socioeconomic development in countries, poor performance on projects can have severe implications for the nation and its citizens (Ofori and Toor, 2012). Therefore, project and construction managers need to improve upon their leadership skills to increase successful project outcomes and create a high-level performance. (Farler and Haan, 2021).

Although, certain leadership traits are naturally endowed there is consensus that most individuals can develop leadership attributes and capabilities through appropriate structured training and interventions (CIOB, 2008; Ofori and Toor, 2012). Understanding ways to improve leadership is vital for successful project and organisation outcomes to be achieved in the construction industry (Farler and Haan, 2021). For example, leadership improvement in construction projects and industry will have a positive impact on workplace safety (Wu, Li and Fang, 2017), construction innovation (Liu and Chan, 2017) and sustainable performance of construction firms (Pham and Kim, 2019).

Effective leadership can also help to increase profits, cut down costs, improve culture and increase employee motivation within projects and organisations. (Farler and Haan, 2021). From the strategic perspective, effective leadership in construction

contributes to improving the strategic direction organisations, level of two-way communication amongst managers, as well as business planning process (CITB 2018). Other ways in which leadership affects the success of complex construction projects include impacting organisation behaviour, stakeholder's satisfaction, project effectiveness and performance, relationship atmosphere, team building and institutional support (Luo, et al., 2021). Therefore, there is a need for construction industries to develop practical ways to heighten leadership capabilities in projects and across organisations through provision of training and development opportunities for managers and a great number of staff (CITB, 2018).

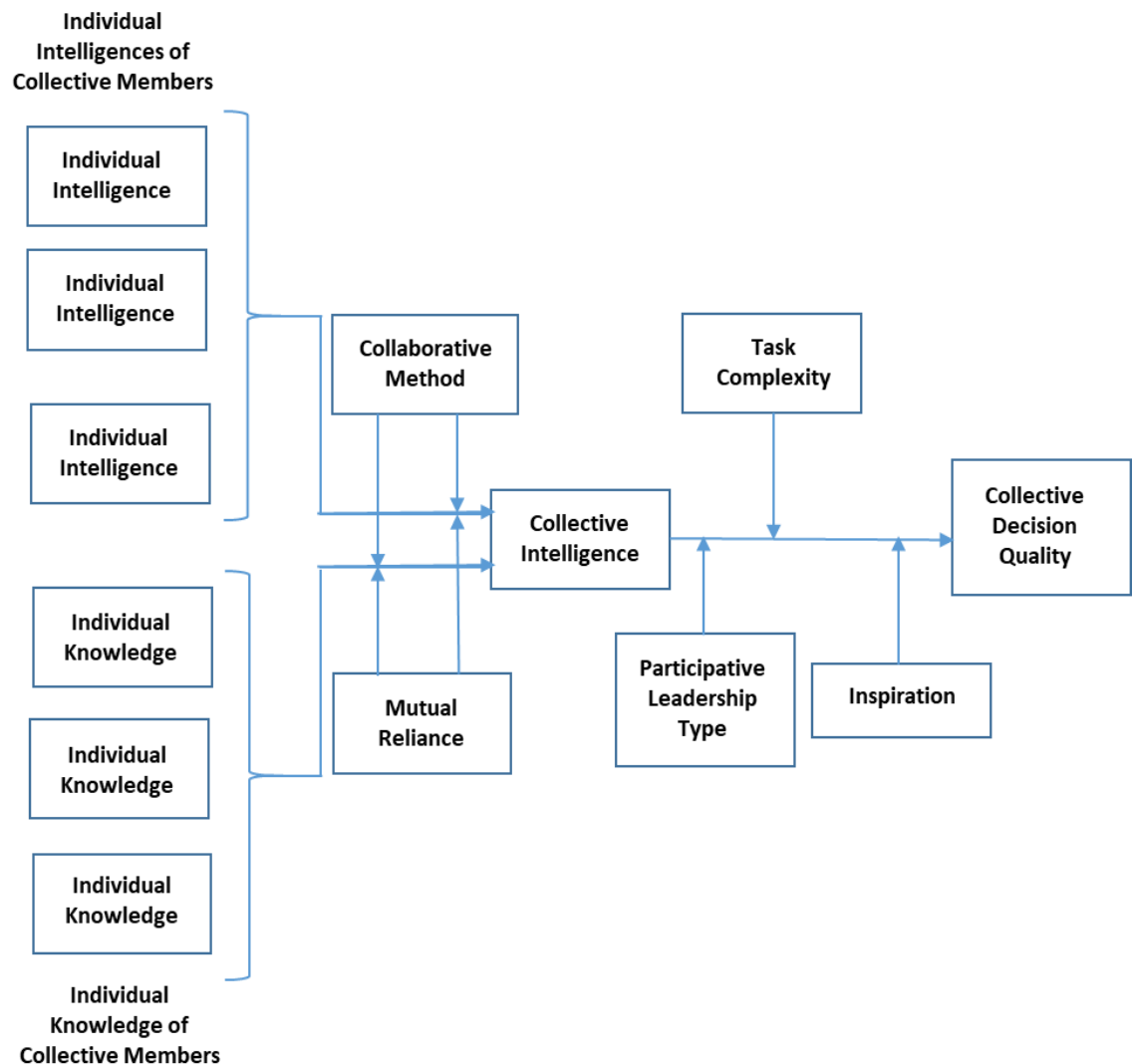


Figure 3.8: Model for Collective Decision Making (McHugh et al., 2016)

Particularly, CITBs' 2018 research report advocated for an increase in the shared and distributed decision-making responsibility across leadership roles in the construction industry. This can be enhanced through an in-depth understanding of leadership dynamics (Luo, et al., 2021) and collective decision-making (McHugh et al., 2016), which have a positive impact on project success, particularly in complex construction projects (CITB, 2018). While leadership dynamics enhances learning in complex systems (Luo, et al., 2021), collective decision-making is a form of collective or shared leadership intelligence that extends the leadership and decision-making constructs to the collective level of analysis. (McHugh et al., 2016), different from the leadership of a single, formal leader (see Figure 3.8). Therefore, the next section examines the dynamics of leadership and its effects on decision-making within project systems.

3.6 LEADERSHIP DYNAMICS IN COMPLEX SYSTEMS

Leadership constructs have evolved from unilateral social influences of leaders to the more recent emphasis on mutual influence of leaders and followers (Zhu et al., 2019). This is particularly important in dynamic and complex operating environments because person-focused leadership constructs limit the ability to achieve project success. Since the contextualization of new models of complexity should improve our understanding of the relationship between project, organisation and environment (Svejvig and Andersen, 2015; Rezende et al., 2018; Geraldi and Soderlund, 2018) it is necessary to examine the systems hierarchy from the leadership perspective.

Traditionally, leaders and other stakeholders exist and interact within hierarchical systems of all project-based organisations as exemplified in the framework by Howsawi et al. (2011). This framework presents four levels, which explain the relationship between the context, business, deliverables and project processes, as well as guidelines for decision making (see Figure 3.9). It also gives credence to the need to evaluate environmental systems in relation to the organisational systems given the interconnected nature of the different sequential levels.

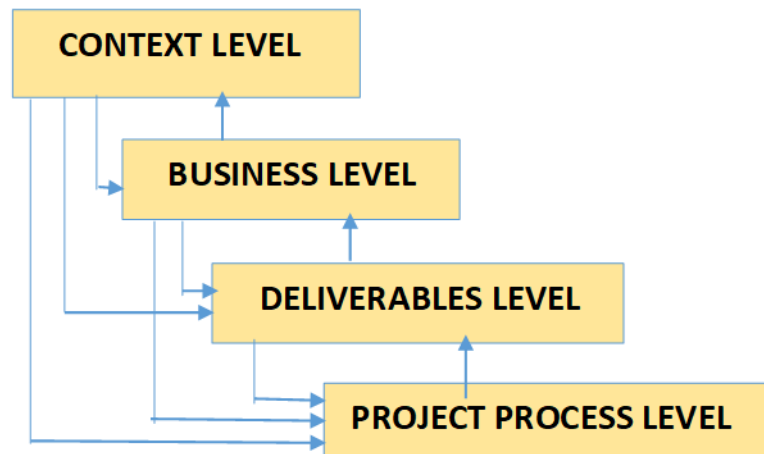


Figure 3.9: The Four Levels Framework (Howsawi et al., 2011)

According to Howsawi et al (2011), the four levels within this framework are all hierarchically linked. The project process level involves actions and variables focused on delivering project outputs and outcomes on schedule, within budget and to specified performance requirements. Next is the deliverable level where all project outputs are tested for alignment with organisational strategy through the Project Steering Committee that deals with criteria for technical requirements such as technical validity and setting performance objectives.

At the business Level, criteria for benefits realisation are implemented which is particularly focused on how the project improves the organisations' strategic mission in response to the needs of society. Decisions made at this level are driven by the need for project success, business growth and market competitiveness. Finally, the context level contains criteria that deal with external variables, such as the political and economic conditions, that have an effect upon the project, the project team or organisation for which they have no control. The Four Levels framework aligns with the Nested governance and management systems (Figure 3.2) and The Formal System Model (Figure 3.4).

Using this framework, projects outcomes and complexity can be assessed wholly or at individual levels. Consequently, decision making at lower levels are more focused on these individual levels of the project while those higher up in hierarchy have a more holistic or overall strategic outlook. Similarly, Howsawi et al. (2011) argue that the higher the level in hierarchy, the higher its influence in success or failure of the project, which implies that the context level factors, for example institutional factors, generally have more significant influences than those at project level. Likewise, each lower hierarchical level can have success criteria that might be at variance with those at the higher levels but where contradictions exist, higher priority is assumed by the higher levels of the framework.

Nonetheless, overall project success relies on strong links and effective strategy that permeates all levels of the framework because all the levels are hierarchical and integrated. This implies that the change and disruptions at a higher level alters the conditions at the lower levels, and vice versa. The magnitude of disruptions and complexity within the system will depend upon the significance of the change and these usually emanate from the interactions within the leadership dynamics. Therefore, for success to be achieved in complex construction projects, individuals in decision-making roles must be conscious of leadership dynamics divided into personal ability, relationship atmosphere and organisational strategy (Luo, et al., 2021), as well as the value of collective intelligence (McHugh et al., 2016).

Particularly, DeChurch et al (2010) opined that leadership processes at various levels interact and together to form a complex arrangement, both internally and externally. As the stakeholders interact, the structure and systems of organisations begin to emerge and these should be tailored to ensure effective information sharing and leadership decision-making. The effectiveness of decision making largely depends on the outcome of stakeholder interaction within formal and informal arrangements (see feedback loops in Figure 3.9), as well as leadership dynamics between internal and external stakeholders as depicted in Figure 3.10 (see also Davis, 2017).

As leadership systems begin to emerge through these interactions, their main function is to make decisions relating to how the organisation interacts with the external environment to guarantee corporate and individual success (Derakhshan et al. 2019). This success can be achieved using an approach that solves the problem of meta-coordination by creating a social marketplace where the information-processing roles of leaders and followers can evolve (Pietraszewski, 2020). This lends itself to the departure from the individualistic decision-making construct of leadership discussed earlier and presents a new way to study leadership, as collective intelligent entities that make collective decisions to promote not just success but positive relationships between individuals (McHugh et al., 2016).

In PBOs the tripartite arrangement of projects, organisations and institutions (environment) triggers mutual influence which are intrinsically leadership-driven (Soderlund and Sydow, 2019). Therefore, the outcome of the interaction between these project, organisation and environment actors helps leaders clarify opportunities and threats, thereafter developing appropriate strategies, which will determine organisational success by adding value to the environment. These actors are described as agents in Chapter 4, who contribute significantly to decision-making through their complex and adaptive processes.

Derakhshan et al. (2019) argued that strategic decisions made at the organisational level are then operationalised at portfolio level to influence the approach at the project level, as represented in Figure 3.10. This framework illustrates the relationship between projects and organisations with the environment, from the stakeholders' perspective thereby contextualises projects to encompass elements of the environment and organisation as recommended in Section 2.2 (see Svejvig and Andersen, 2015; Geraldi and Soderlund 2018). Therefore, the feedback loops in the two frameworks in this section suggest that it would be erroneous to assume that the interaction between actors and stakeholders only occurs through linear and formal systems as depicted in Figure 3.2.

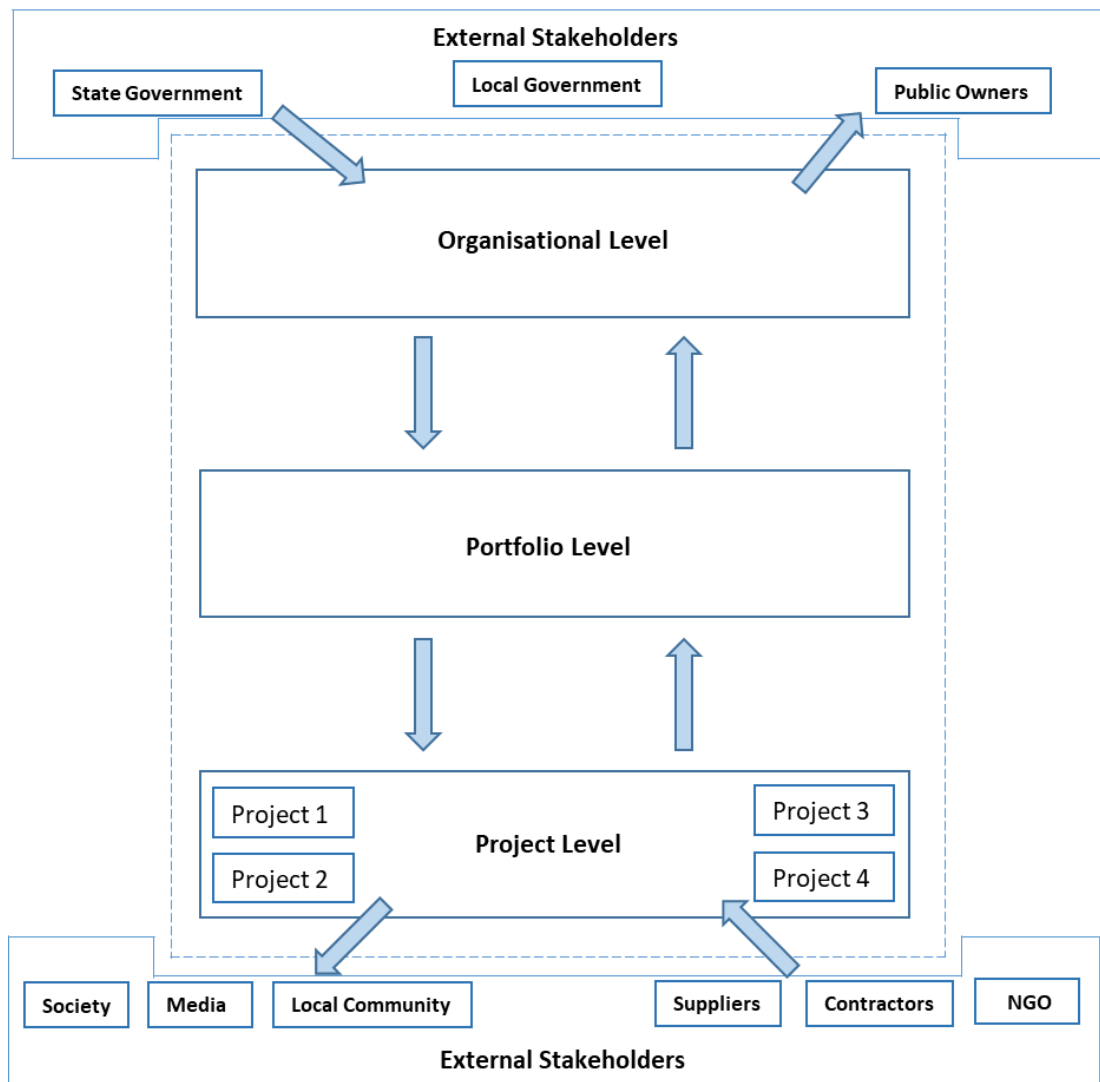


Figure 3.10: The interrelation between external stakeholders and the three levels of the organisation (Derakhshan et al., 2019)

Rather, literature on complexity theory in Chapter 4 reveals that the interactions amongst agents in complex systems occur both through linear and non-linear arrangement, as depicted in feedback loops in Figure 3.9, which creates significant uncertainty and complexity for decision makers at all levels. From these frameworks, it is clear that leadership influences context-driven decision making at multiple levels. Therefore, understanding the leadership dynamics and decision-making bridges the ideological loop for this study. Organisations that are faced with emerging threats require leadership strategies that are flexible, adaptive and collaborative (Yukl and Mahsud, 2010; McHugh et al., 2016).

Although strategy is the primary responsibility of top executives, innovative responses to problems can emerge if they collaborate with middle or lower-level managers and other employees who are often best placed to observe emerging threats (Yukl and Mahsud, 2010; Useem, 2010; McHugh et al., 2016). Therefore, a paradigm shift is necessary for leadership decision-making from the leadership of a single, formal leader into the realm of collective decision-making and collective intelligence, particularly in complex scenarios, (McHugh et al., 2016). Therefore, the leadership and followership dynamic is touted as a credible solution to the problems of coordination and success within enterprises (Pietraszewski, 2020), and this relational construct is adopted for this study. Now that the project level (see Chapter 2) and organisation level discourse have been covered, the next chapter presents the theoretical underpinnings of this study.

3.7 CONCLUSION

Organisation and environment are important influences of project success. One of the ways in which organisations respond to the challenges of the environment is through strategy formulation. Good strategy improves the quality of decision-making at project and organisation and institutional levels. Strategy development is leadership-led which involves an analysis of the organisation and its business environment. Leadership also facilitates strategy implementation, organisational adaptability and success through processes that require people, policies, partnership, and resources. However, the complex and dynamic nature of organisations and the environment makes leadership decision-making more difficult and riskier in all management hierarchies of project-based organisations.

Organisational analysis involves management and governance dimensions that are distinct but complementary. Environmental analysis involves exploring and monitoring factors external to the organisation for events, trends and relationships that could pose opportunities or threats to success. In response to the peculiar needs of construction projects, existing frameworks for analysing micro- and macro-environment systems are modified to include institutional and physical subsystems.

Furthermore, leadership is the catalyst for creating environmentally aware organisations, capable of rousing success within projects, through collective decision making. Truly adept leaders must have a deep understanding of the environment, knowing how to analyse it and adapt their behaviour, organisational strategy and decisions to match the context and improve competitiveness.

Leadership constructs have evolved from a person-centred to a social-dynamic and relational construct whereby leaders inextricably collaborate with other organisation participants to achieve success. This social-dynamic exists in interconnected and interdependent hierarchical systems. Therefore, this study focuses on the effects of leadership decision-making on project success at the highest leadership hierarchy of building projects, the institutional level. Specific environmental stimuli that trigger organisational response and strategies are examined from the purview of leadership. This allowed inferences to be drawn about the complexity of projects, particularly the causal relationship between the organisation, environment and leadership as they exist in reality. In summary, this thesis effectively contributes to the debate on the models and theories of complexity relevant to PM,

CHAPTER 4

MODELS OF PROJECT COMPLEXITY

4.1 INTRODUCTION

In the previous two chapters, literature relating to organisation, environment and leadership were examined with a view to providing knowledge on the current realities of project complexity. These concepts have been discussed with a view to clarifying their interrelationship and effects on project success. The main thrust of this chapter is to review existing literature on theories and models of complexity to develop a clearer understanding of existing paradigm and models, and find gaps in knowledge and the inadequacies of existing models. This chapter further examines construction project management issues at the conceptual level and its relevance within metaphors and models of complexity.

4.2 THE ESSENCE OF MODELS AND FRAMEWORKS

In Section 2.2.2, it was mentioned that the RPM movement advocates for a broader contextualisation of projects and the development of new models and theories that reflect the complexity of projects. This will help researchers and practitioners understand factors that influence success. Similarly, the traditional PM planning and control approach is obsolete and inadequate in complex systems, which requires an innovative approach particularly in the strategic era of PM (see Section 2.5.2) whereby complexity can be conceptualised using models (Rooke et al., 2008). A conceptual model can be used to represent a complex phenomenon by deliberately simplifying its systems so that the important features can be examined and managed in practice and research (Rooke et al., 2008 p 50). Conceptualisation is important because it helps researchers select which research features are important or meaningful, what data to collect, analyse and how to derive meaning from the study (Ravitch and Riggan, 2017).

Theoretical and conceptual frameworks can be combined to provide clarity on the research focus by highlighting the research goals and methods for achieving them (Leshem and Trafford, 2007 p. 97). In essence, an understanding of conceptual and theoretical frameworks in research can lead to greater cohesion throughout the study. By definition, a conceptual framework can be described as, *‘the main things to be studied - the key factors, variables, constructs and the presumed relationship among them’* (Miles et al. 2014 p. 20). According to Ravitch and Riggan (2017),

“a conceptual framework is a mechanism, process or product, which presents an argument about why the topic one wishes to study matters, and why the means proposed to study it are appropriate and rigorous”.

Similarly, Marshall and Rossman (2011 p. 58) argued that one key element of conceptual frameworks is that it,

“Identifies gaps in what is known by critiquing previous research, by extending existing theory, or by pointing to practices and policies that are not working.

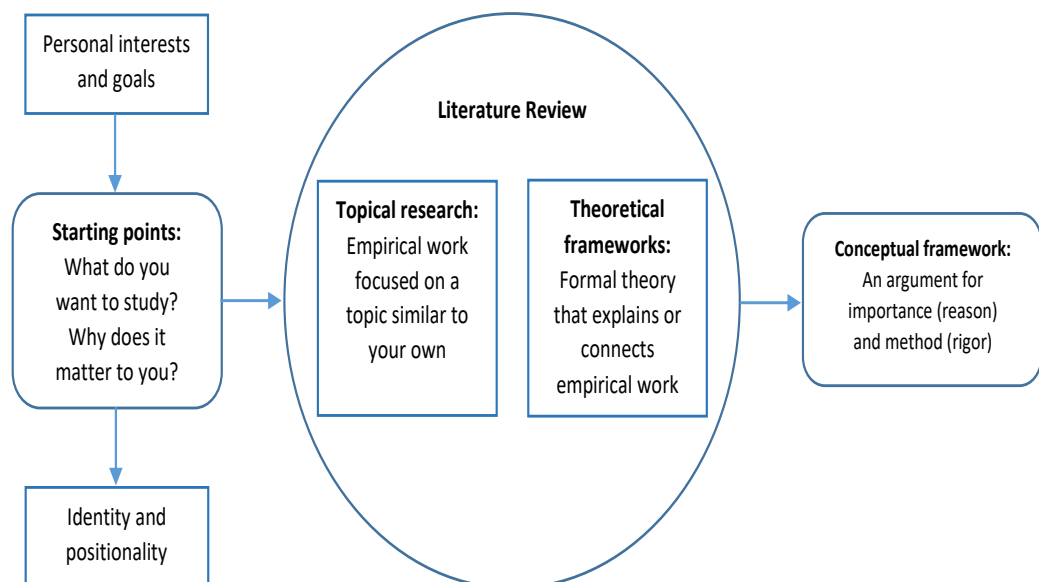


Figure 4.1: Elements of a conceptual framework (Ravitch and Riggan, 2017)

Therefore, conceptual frameworks are systems of concepts, assumptions, beliefs, and theories that support and inform research and its design (Maxwell, 2013 p. 39). Moreover, it begins with researchers identifying lines of inquiry that are important to them, and then they develop a conceptual framework to iteratively guide their choice of research strategies and empirical processes (Ravitch and Riggan, 2017). The following sections provide a basis for building and explaining the model of complexity for this study, based on extant literature, and the steps for developing a conceptual framework are depicted in Figure 4.1. The nature of complex systems can only be modelled and described to a very limited degree (Allen, 2008 p 5). Therefore, development of new models should be approached as a means of exploring possibilities, particularly latent constructs, rather than tools for the prediction of project outcomes (Rooke et al., 2008 p 50).

Conceptual frameworks are not merely causal or analytical discourse, rather they provide an interpretive approach to social reality by collecting concepts which follow underlying presumptions of relationship among them (Jabareen, 2009). Therefore, new MPC must transcend the dominant lifecycle model of projects towards highlighting complexity at organisation and institutional levels (Walker and Lloyd-Walker, 2016). Although the conceptual framework for any research incorporates ideas that are usually derived from literature, its structure and overall coherence is something that must be built purposefully (Maxwell, 2013 p. 41). Therefore, since the lines of enquiry for this study have been clarified in previous chapters, the task of building the conceptual framework is much easier and will follow the guide in Figure 4.1, starting with identifying relevant theory.

4.3 UNDERSTANDING THEORETICAL FRAMEWORK

Formal theories are the parts used to explain the ideas that form the conceptual framework. Theoretical frameworks are usually identified in scholarly literature and their role is to highlight and explain significant aspect of ones' conceptual framework (Ravitch and Riggan, 2017). Particularly, it helps us understand the interrelationships

among the concepts that make up our conceptual framework (Miles et al, 2014). Based on the guidance in Figure 4.1, literature was examined for empirical works with similar focus to this thesis with the hope of finding a formal theory that is congruent with the complex nature of the concepts under review. To conceptually build upon what has been learned in the PM, Business Management and Leadership literature, this thesis turns to complexity theory for theoretical coherence that explains the nature of the interactions amongst concepts under review.

4.3.1 Background of Complexity Theory

Despite the advancement of the knowledge of complexity, the use of this term is more prevalent in everyday conversation than in its theoretical context (Thomas and Mengel, 2008). In systems terms, complexity can be defined as a measure of the inherent difficulty in understanding a system (Thomas and Mengel, 2008), while a complex system may be described as, *'A system formed out of many components whose behaviour is emergent and cannot be simply inferred from the behaviour of its components'* (Whitty and Maylor, 2009).

Complexity theory emerged in the last half of the twentieth century and examples of complex systems include the worlds' ecosystem and human society (McMillan, 2008). Although complexity theory is generally associated with the natural science disciplines like physics and mathematics (Mitleton-Kelly, 2003; Thomas and Mengel, 2008; Whitty and Maylor, 2009), it has found wide acceptance and application in social sciences and general management (Nienaber and Svensson, 2013).

Although complexity theory has continued to grow in popularity, literature reveals that there is no unified theory of complexity but several strands of theories which have emerged from various knowledge domains (Remington, 2011; and Bosch-Rekveldek et al., 2011; Rosenhead et al., 2019). Mitleton-Kelly (2003 pp 24-26) argued that there are five main areas of research in this domain namely; (a) dissipative structures; (b) chaos theory; (c) increasing returns and path dependency; (d) autopoiesis and; (e) complex adaptive systems.

Autopoiesis whose origin stems from the biological sciences is comprised of three essential elements: (i) processes of self-reproduction or self-constructing (ii) organisations with temporal and spatial relations and (iii) organisations focused only on processes of self-reproduction. There is evidence that the concept of autopoiesis has been extended from its biological origin to other disciplines, however, its main criticism with relevance to social systems is the difficulty in identifying clearly constructed boundaries by the system and how these are maintained (Cadenas and Arnold, 2015).

Table 4.1: Developments in complexity science (McMillan, 2008: 58)

Time period	Theory / concept	Key researcher	Discipline	Country of birth / experience
1960s - 1970s	Dissipative structures (self - organisation)	Ilya Prigogine	Chemistry	Russia and Belgium
	Self-organisation / self-organising systems	Herman Haken	Physics	Germany
	Self-organisation, evolution, complexity, edge of chaos	Stuart Kauffman, Brian Goodwin	Biology Biology	USA Canada and UK
	Patterns and patterning	Ian Stewart	Mathematics	UK
1980s	Self-organisation / autopoiesis	Humberto Maturana Francisco Varela		Chile Chile
1990s	Complex adaptive systems	John Holland Murray Gell-Mann	Mathematics Physics	USA USA
	Emergence	Chris Langton	Anthropology and computing	USA

Similarly, Path Dependence has been used to abstractly describe and connect the past and the future in organizational research (Vergne and Durand, 2010). Beyond organisation literature, the relevance of path dependence has remained unclear in domains such as technology and institutional research (Vergne and Durand, 2010). Furthermore, Vergne and Durand (2010) concluded that path dependence does not causally relate identified variables systematically; rather, existing literature tends to address path dependence as a process and as an outcome.

In organisational theory, Thomas and Mengel (2008) suggested researchers have embraced only 3 approaches in complexity theory. Firstly, chaos theory which focuses on the behaviour of randomly evolving, dynamic and unstable systems. Secondly, dissipative structures which focuses on examining the consequences of the dynamics between stability and instability within deterministic linear structures. Lastly, complex adaptive systems (CAS) describe systems which are comprised of large number of independent and constantly evolving agents, each capable of behaving both independently and collectively.

These developments and their main proponents are presented in Table 4.1. Although CAS is only one of three avenues of complexity theory studies, it is the most recent of these approaches. Extensive research on complexity in different knowledge areas has led to strategic thinking and the creation of new organisational forms (Mitleton-Kelly 2003 pp 24-26) as well as the understanding CAS in dynamic project environments (Aritua et al., 2009). Therefore, CAS theory is used in this study to describe the MPC and the research outcomes.

4.3.2 Complex Adaptive Systems

CAS have been defined as, *“a set of interdependent agents that form an integrated whole where an agent may be a person, group or organisation”* (Palmberg, 2009). Others like Lewin and Regine (2003) described CAS as, *“a system comprised of a diversity of agents that interact with each other, mutually affect each other, and in so doing generate novel behaviour for the system as a whole”*. Obolensky (2014) argued,

“CAS means a dynamic involving an organisation or organism of many interconnecting parts which improves to meet changing circumstance, and which has complicated underlying dynamics to produce visible simple results”

These descriptions resonate the discourse on leadership dynamic (see Section 3.6), which underscores the appropriateness of complexity theory in this study. Therefore, CAS possesses three vital attributes (Sisney, 2012; Obolensky, 2014). ‘Complex’, because they have many interconnected and interdependent elements and subsystems, which affect each other in an iterative, process which cannot be controlled or fully predicted. ‘Adaptive’, they can make themselves more suitable to a changing context by using feedback to change, shape and respond to changes in the surrounding environment. ‘System’, they respond as a collective unit not just as a collection of parts.

Furthermore, the whole system must be studied to understand how CAS really works, rather than merely breaking it down into its components (Sisney, 2012). Learning and adaptation are key properties of CAS and this distinguishes it from complicated systems (McMillan, 2004). Examples of CAS include human cells, insect colonies and socio-political systems. CAS systems have many levels of organisation, with large number of agents (individuals or groups) on different levels, both high and low, mutually influencing one another through processes of constant reorganization as they learn and gain experience (Mittleton-Kelly, 2003).

In Sections 3.4.2 and 3.6, stakeholders interact as agents within social ecosystems and their interactions result in project and organisational complexity which gives credence to the relevance of CAS for the study of MPC. Notably, CAS actively exploit and benefit from the circumstances around them, rather than mere survival (McMillan, 2004), which is certainly the case in human systems. In the case of leaders, managers and other staff (Figure 3.7), they aspire to benefit from the organisation and environment in linear and nonlinear fashions, which also creates complexity.

Table 4.2: Description of CAS Properties

CAS Feature	Description	Authors
Self-Organisation	This is the tendency to self-structure collective patterns of behaviours, not resulting from deliberate strategy or a genetic necessity, rather simply the result of the level of coherence that takes place between the individual actors in pursuing their local goals. Self-organising takes place when interdependent agents in a bounded state of instability act together to create something new by self-organising.	Andriani (2003), McMillan (2008), Palmberg (2009), Aritua et al. (2009), Mitleton-Kelly (2003)
Emergence	Emergence comes out of the interactions of many participants, referred to agents, through a process whereby the properties of the whole emerges from the properties of the parts. Emergent properties, qualities, patterns or structures arise from the interaction of individual elements which are far greater than the sum of the parts and may be difficult to predict by studying the individual elements.	Palmberg (2009), Richardson 2008, Mitleton-Kelly 2003; McMillan 2008; Aritua et al. 2009
Connectivity	Connectivity applies not only to elements within a system but to related systems within an ecosystem. . This will not have equal or uniform impact, and will vary with the state of each related individual and system at the time. High degree of inter-connectivity may not always be beneficial throughout an ecosystem as this will lead to wider turbulence or disturbance as a result of actions of related entities.	Mitleton-Kelly (2003)
Interdependence	Interdependence generates co-evolution, a principle which results from inter-relationship of parts as well as complex behaviour. These all arise from the interaction and inter-connectivity of elements within a system, and between a system and its environment. In a complex system, individual components affect each other and influence actions creating turbulence or disturbance in the system	Mitleton-Kelly (2003), Andriani (2003), Aritua et al. (2009)
Feedback	Feedback is the action of reporting the results of an action to the people performing that action and this is a key factor affecting learning. The main distinction between a complex and complicated system is that feedback in the former exists in linear as well as non-linear feedback loops allowing for adaptability, learning and many other key concepts that have become synonymous with complexity thinking.	Kelly and Allison (1999 cited in Palmberg 2009), Mitleton-Kelly (2003), Eurat (2006 cited in Palmberg 2009) Richardson (2008) Andriani (2003)
Co-evolution	This refers to actions that place within an ecosystem and cannot happen in isolation, having the potential to trigger a series of cascading effects on the agents and their interconnected nodes resulting in the virtual impossibility of isolated change of individual parts of the system. Coevolution makes environmental and organisational predictability more difficulty.	Mitleton-Kelly 2003), Andriani (2003)
Non-linearity	Non-linearity is a property of CAS which makes interactions and outcomes less predictable in systems. CAS consists of large numbers of agents interacting in a non-linear way. It is by contemplating the whole, as well as the relationships and interactions between agents that one can understand a system, not by the absolute knowledge about the agents.	Aritua et al. (2009), McMillan (2008), Richardson (2008) Klara Palmberg (2009)
Adaptability	Adaptability means that systems have the ability to learn from their own experience and adapt to new unexpected conditions. Agents in complex systems constantly revise and change their structure as they learn about the world. CAS can be analysed but not predicted in clear detail due to constant adaptation.	McMillan (2008), Palmberg (2009), Aritua et al. (2009), Richardson (2008)

Through learning, evolution and adaptation CAS anticipate the future, a feature which makes them distinct from non-living complex systems (McMillan, 2008). At the same time, the agents exist in constant competition and collaboration within the different hierarchies of the system, which leads to the emergence of new forms of group organisation and individual behaviour (McMillan 2008 p 60). Again, with particular reference to the discourse and frameworks in Section 3.6, internal and external agents work in collaboration, as well as competition, which makes emergent outcomes difficult to predict.

Generally, the nature of connections and strength of linkages define the power of the agents under review (Andriani, 2003). This is relevant in the creation of organisational hierarchies in Figure 3.9; the strength of connections between all four levels of the project system has an impact on their ability to deliver projects successful, particularly between the context and business levels. Furthermore, the pattern of behaviour we see in these systems is constantly evolving because a change in the system's environment will result in a change in the behaviour of its agents and the system as a whole (Lewin and Regine, 2003).

Complex systems possess the inherent capacity to respond to environmental stimuli in numerous and unpredictable ways (Allen, 2001 cited in Walker 2007), particularly exercising the prerogative of choice in their responses (McMillan, 2008). The complexity approach seeks to build a rich inter-connected model of the elements of a complex system thereby providing a deeper and more cohesive understanding of its attributes (Mitleton-Kelly 2003).

Complexity approach suggests that everything is influenced by everything else that exists around it (McMillan, 2008), which is particularly relevant for understanding success paradigms (Section 2.5) and leadership decision making (Section 3.4.2). Models of complexity require metaphors to evaluate and describe the nature of interaction amongst variables in the structure of any phenomenon (Rooke et al., 2008, p 53 – 54). Therefore, the characteristics and themes of CAS provide these metaphors as described in Table 4.2 and this further improves its relevance to PM.

4.3.3 Relevance of Complexity Theory in Project Management

Complexity theory has been applied to PM before the millennium (Whitty and Maylor, 2009 p. 307) and it is useful in determining appropriate PM strategies (Baccarini, 1999), training of project managers (Thomas and Mengel, 2008) and improving project risk mitigation (Cicmil et al, 2009). Complexity might exist in various aspects of a project such as its organisation, technology, environment, information management, decision-making and systems (Baccarini, 1999; 1996), which is particularly critical in construction projects that are dynamic and operate ever-changing environments (Cloete, 2017). In management research, Burnes (2005) argued that, *'the attraction to complexity science stems mainly from the fact that managing and changing organizations appears to be getting more difficult'*.

As open social systems that utilise processes operated by people, organisations are influenced by peoples' decisions that are informed by personal goals that may not necessarily be consistent with those of their organisations (Nienaber and Svensson, 2013 p. 839). These affirm some of the reasons for the growing popularity of complexity theory. Complexity theory helps with understanding project systems and management responsiveness to their internal and external environment, which is essential for organisational performance and the pursuit of its future goals (Nienaber and Svensson, 2013). Walker (2007) corroborated this by suggesting that complexity theory feeds into the general ideas of systems theory, hence the phrase 'complex systems'. Therefore, there is consensus that projects are complex and systemic models provide a conceptualisation of complex behaviour (Cicmil et al., 2006).

With this in mind, the ideas and constructs of complex systems are foundational to construction project management. Relevant textbooks in this knowledge area clearly discuss the efficacy of organisation, environment and leadership as indelible systems within construction projects (Fewings, 2005; Walker, 2007; CIOB, 2014). Furthermore, the ideology of construction projects as systems and the influence of the environment and organisation on the decision-making of individuals in leadership roles of projects are not new concepts (Bennett, 1985; Woodward, 1997).

What is new about this study is the conceptualisation of construction projects as complex systems which have emergent and adaptive characteristics. Particularly, this approach involves a paradigm shift from the classical approach of management which involves the planning and control fixation to the more contemporary complexity approach which is grounded in the learning and adaptation paradigm (Daniel and Daniel, 2018). In this view, Daniel and Daniel (2018) suggests that mental models of decision makers will need to evolve for the deterministic constructs of regulation to the non-deterministic constructs of complexity, uncertainty and emergence. The new LSR framework (see Figure 5.1) is pivotal to addressing this paradigm shift.

Table 4.3: Organisation form and design principles – a comparison (McMillan, 2008: 212)

Classical science principles	Complexity science principles
Linear	Non-linear
Hierarchical	Non-hierarchical
Reductionist	Holistic
Controlling	Self-organising
Inflexible	Flexible
Uniform	Diverse
Centralised	Networked
Closed	Open

Based on the foregoing, there are marked differences between complexity and classical science, as presented in Table 4.3. The natural sciences evolved using the reductionist approach to research which entails breaking down a phenomenon into its smallest constituent parts to allow for closer and detailed examination, in order to build up an accurate picture of how the whole works (McMillan 2008). This approach is prevalent in traditional PM paradigm.

However, Mcmillan (2008) observed that it gives less emphasis on interactions, emergent behaviour and flows of activity, which has limited its use in studying complex dynamical systems, particularly human systems such as the ones described in Section 3.6. Nonetheless, critiques of the application of complexity theory like Burnes (2005 pp. 73–90), argued that although complexity theory has changed the way we view the natural world, its' impact on the way we evaluate the purpose and operations of organisations lacked empirical evidence, calling for a link between theory, model development and practical realities.

This view aligns with the RPM ideology and validates the rationale for this study, to build a model that depicts complexity in theory and practice. Therefore, the use of complexity theory in management domains such as PM should be more than a mere metaphorical device since complexity models have the potential to reduce project risks, inform decision making and improve project success (Luo et al., 2020; Zaman et al., 2020; Qureshi and Kang, 2015). The foregoing questions the place of objective reality and clearly reinforces the need for complexity to be studied using its two analogies, metaphors and models (Boussabaine, 2008).

Although, the research domains of PM, Business Management and Leadership Studies have exhibited a lack of unitary theories, complexity theory is particularly relevant to and appropriate for the interdisciplinary approach adopted for this study. Complexity theory is relevant in contemporary academic discourse in PM (Daniel and Daniel, 2019), organisation and strategy (Sisney, 2012), and leadership studies (Rosenhead et al, 2019). Therefore, this theory was adopted for this study to provide a metaphor for explaining the new model of project complexity.

4.4 TOPICAL RESEARCH: MODELS OF PROJECT COMPLEXITY

Several studies present an extensive review of literature on MPC and concluded that there is no consensus on what project complexity is and how it can be defined (Vidal and Marle, 2008; Geraldi et al, 2011; Qazi et al, 2016; Rolstadas and Schiefloe, 2017).

Kiridena and Sense (2016) also suggested that there is no convergent perspective or framework on how to depict and manage the effects of project complexity. These authors suggest that the limited conceptualisation of project complexity in research and practice has resulted in further theoretical weakness of PM academic pursuits and project failure in industry.

Some have viewed complexity from either the perspective of drivers such as ambiguity, uncertainty, unpredictability and pace; and factors such as socio-political, economic, technological and surroundings) (Rolstadas and Schiefloe, 2017). At the same time, other schools of thoughts are fixated with either distinguishing complexity from uncertainty (Vidal and Marle, 2008) or merging the two constructs (Bosch-Rekvelde et al., 2011). The proliferation of complexity ideologies includes its categorisation by project size, variety, interdependence and context (Vidal and Marle, 2008), or using contrasting complexity matrix including its structural, dynamic, independent and interacting variables (Whitty and Maylor, 2009). Faith, Fact and Interaction are other constructs for assessment of complexity (Muller et al., 2012).

The foregoing sums up the challenges of conceptualising complexity in PM and there are about seventeen project complexity approaches in PM literature, based on categories and attributes (Kiridena and Sense, 2016). Nevertheless, researchers generally agree that the underlying factors of project complexity must include Technical (e.g. project size, number of interdependent parts and novelty of technology), Organisational (e.g. governance framework, expertise of project team, leadership style and organisational culture) and Environmental (e.g. institutional frameworks, social interfaces, geographical conditions, political realms, market competitiveness) (Qazi et al, 2016; Kiridena and Sense, 2016). Therefore, to improve understanding of MPC it was necessary to validate this consensus and its relevance through the critical review of four project complexity models (see Table 4.4).

Table 4.4: Examples of Models of Complexity

Author & Project Description			Complexity Factors		
	Technical	People	Context and Environment	Organisation	Surrounding and nature
Mamedio and Meyer Jr. (2020): New Hospital Project	Cutting edge technology, technical training, maintenance of equipment, technical committee, feedback processes, integration challenges, dynamic interactions, systems for quick decision making	Formal and informal human relations, talents, abilities, human energy, behaviour, non-linear feedback, interactions among the social actors, divergent interests, low cooperation, lack of experience, interdisciplinary team	Political dimensions, conflicts and attrition, culture, stakeholder management, participants behaviour, learning through trial and error, power and authority		
Rolstadas and Schiefloe (2017): Oil and Gas Project	Technological aspects including the systems produced and production technology		Primary (owners, suppliers, mother organisation); Secondary (customers, unions, local interest groups, regional and national political stakeholders); and Tertiary (media and competitors)	Project Organisation including its structure, culture, interactions, technologies, social relations and network dimensions.	Physical (onshore or offshore), Political, Economic and Geological considerations
Qazi, Quigley, Dickson and Kirytopoulos (2016): Project Complexity in Construction Projects	Goals (number, alignment, clarity) and associated technical risks		Environmental (market conditions, pressure) and associated contextual risks	Structure (project duration, resources) and associated organisational risks	
Bosch-Rekvelde et al. (2011): Large Engineering Project	Goals (number, alignment and clarity), scope (uncertainty and quality,), tasks (dependencies and standards), experience (with technology) and technical risks		Stakeholders (variety, influence, and dependencies), location (weather conditions and remoteness), market conditions (internal strategic pressure) and risks from the environment	Structure and size (project duration, site area), resources (compatibility, experience, skills, availability), project team (number, nationalities), trust (project team and contractor) and organisational risks	

Mamedio and Meyer (2020 p 729) provide a framework with technical (professional practices and technology), human (formal and informal relations) and political (negotiations and interest groups) dimensions of project complexity. Their framework clearly differs from the norm, as it does not explicitly mention environmental or organisation complexity. Unlike other models, their differentiation is arguably due to the departure from the linear approach to PM. In contrast, these authors model complexity based on the CAS approach to managing projects. Moreover, a careful evaluation of the discourse on political dimensions of complexity reveals that most of the statements could relate to either environmental or organisation. For instance;

‘The constant uncertainty in the face of diverse adaptations in the project led to a high degree of internal stress in the organisation and had a negative effect on interpersonal relationships. This context led to informal agreements, intense negotiations and collective learning’. (Mamedio and Meyer, 2020 p 735)

This statement provides connotations of political conflict between individuals within the organisation, as well as the project environment. Nevertheless, in compiling Table 4.4 this study did not consider the political segment a distinct, stand-alone dimension of complexity, rather it is categorised under context and environment in line with the discourse in Section 3.3.4 and framework in Table 3.2. Similarly, this study of a ‘New Hospital Project’ proposes a distinct human categorisation of project complexity which a departure from extant literature.

Human influences are very significant in projects, particularly when managing project as CAS. Although it may be argued that human dimensions exist in all other project subsystems, a deep dive into the discourse in this paper (pp 736- 737) reveals that this aspect focuses on professional expertise, individual talents and abilities, teamwork and leadership, work experience and decision-making of the project members. These are essential and complex aspects of projects; therefore, this dimension is considered a valid and distinct complexity categorisation.

Although Mamedio and Meyers' framework omits the organisation segment, technical dimensions as described could also be categorised as either a distinct technical factor group or project-related CSF (see Figure 2.4 and Section 2.5.1). The review of literature suggests that projects (Technical dimension) are embedded within the organisation systems of PBO (see Figure 3.2). However, in other types of organisations such as infrastructure-driven typologies, the technical complexity of projects could be more profound and distinguished as a factor group (see Muller, Drouin and Sankaran, 2019 p. 504). This is certainly the case for large and complex engineering projects. Nevertheless, building projects such as the one described by Mamedio and Meyer are predominantly managed within PBO, so the technical dimension is assumed synonymous with the project dimension.

Clearly, the highly cited TOE framework by Bosch-Rekvelde et al (2011) captures the consensus on the predominant factors of project complexity. Developed with a focus on large engineering projects, it is characterised by technical, organisational, and environmental dimensions of project complexity. This model is brilliant for adapting the front-end development phase of projects to these three dimensions of complexity. To corroborate the popularity of this model, Qazi et al (2016) extended the TOE subsystems by integrating risk management segments that are applicable for the construction industry. In contrast to the framework by Mamedio and Meyer, this popular model clearly lacks a distinct human segment, which are predominantly leadership systems, rather depicts the deterministic approach to PM.

Similarly, the MPC by Rolstadas and Schiefloes' (2017 p. 305) presents four complexity factors. Particularly, these authors present the project context as having primary, secondary and tertiary environmental segments, which contrasts the discourse in extant Business Management literature (see Figure 3.3 and Section 3.3.4) where the environment is assumed to have only two levels.. Similarly, Rolstadas and Schiefloe suggest that surrounding and nature are distinct from the project context. Although, surrounding and nature are very important complexity factors in the construction industry and should be conceptualised appropriately within oil and gas projects, arguably these factors are macro environment constructs and can be categorised as physical environment (see Table 3.2).

All the reviewed models of complexity, with the exception of Mamedio and Meyers', appear to approach projects from a more deterministic and mechanistic viewpoint without consideration of the CAS attributes of projects. The need to manage projects as CAS with human dimensions cannot be overstated and this means recognising that the project environment is constantly changing and being open to surprises, whilst planning for success (Mamedio and Meyer, 2020). Arguably, this static approach and the conceptualisation that projects are largely technical, organisational and environmental entities explains why leadership decision-making remains challenging and projects continue to fail to meet expected goals. As Mamedio and Meyer (2020 p 730) argued, *"Managing projects like CAS means taking on emerging behaviour through constant innovation and creativity to respond to complexity"*.

4.5 CONCLUSION

The fundamentals of complexity theory provide the principles and metaphors required to understand the causal relationship existing between organisation, environment and leadership. Particularly, the knowledge of CAS provides deeper insight into new ways of managing projects and the essence of conceptual frameworks for research and practice have been examined. MPC from literature were critically reviewed and the main gap in knowledge found is the lack of a leadership segment in existing models, to reflect the critical role of humans in project.

This is relevant to construction project management where it is apparent that project systems need to account for leadership dynamics within complex and adaptive models if decision making processes are to improve project outcomes in the future. Novel mental models and decision-making processes require a shift from deterministic to non-deterministic paradigms of complexity. Overall, this gap in knowledge is addressed in the next chapter where the Leadership Systems Response (LSR) framework is presented, as a new model of project complexity.

CHAPTER 5

LEADERSHIP SYSTEM RESPONSE (LSR) FRAMEWORK

5.1 INTRODUCTION

The focus of this chapter is to develop a conceptual framework that draws on the inherent characteristics of project systems to provide a guide for understanding project complexity and a lens for the empirical phase of this research. The Leadership Systems Response (LSR) framework is constructed with a focus on Project Based Organisations (PBO) and based on Complex Adaptive Systems theory metaphors to explain the causal relationships that exist amongst its components.

The insight provided by Walker and Kalinowski (1994) on the interdependence of organisation, environment and leadership is compared with other models of complexity reviewed in Section 4.4 in order to extend some aspects of these studies. Particularly, this thesis extends the work of Walker and Kalinowski (1994) by providing the LSR framework that clarifies how these concepts interact to influence decision making and project success.

5.2 PROCESS OF DEVELOPMENT OF THE FRAMEWORK

As leadership within projects seek to create an ‘illusion of control’, mental modelling of complex systems takes place before assumptions can be made about organisations and the environment (Remington 2011). However, practical tools for managing complex systems are scarce (Whitty and Maylor, 2009), and existing ones are limited in their conceptualisation (Section 4.4). These add impetus to the need for a comprehensive MPC. This can be achieved using simple rules from practical experience and understanding from research literature (Whitty and Maylor, 2009; Obolensky, 2014). Therefore, the LSR framework in Figure 5.1 is conceptualised to bridge the gaps identified in literature, both theoretical and practical.

In its entirety, the LSR framework reflects project complexity and provides a tool for project conceptualisation, mental modelling and decision-making in research and practice. It provides a basis for understanding factors of complexity and their subsystems informed by knowledge acquired in the critical review of literature. It can also be used as a tool for evaluating risks and improving project outcomes. The process of developing this new framework is discussed next, however, this was approached with caution because as Denicol et al (2020) argued, no single framework could adequately account for the multiple levels and causes of project failure.

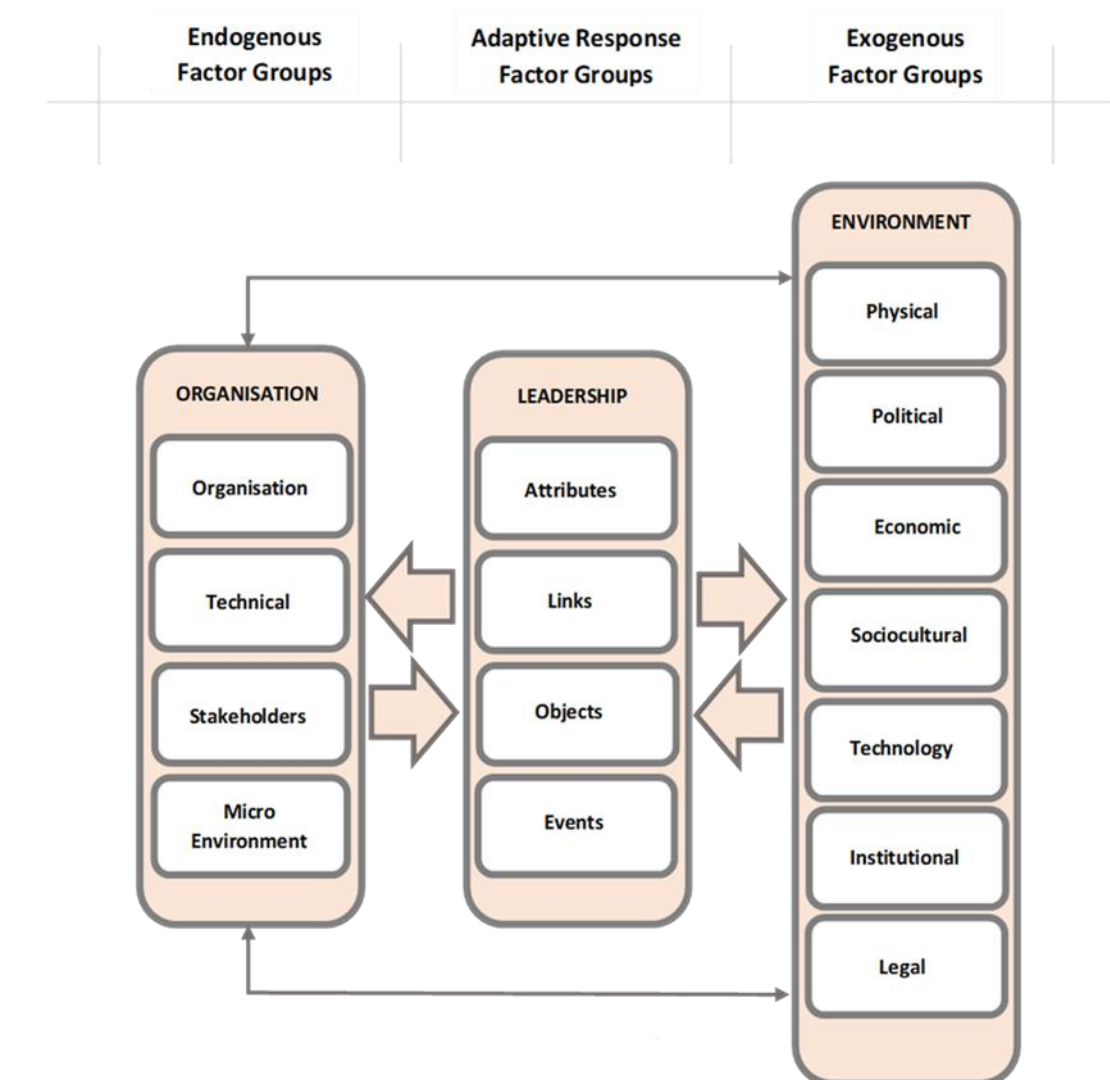


Figure 5.1: The Leadership System Response (LSR) Framework

(Author, 2021)

5.2.1 Building the LSR Framework

The segments of the LSR framework and their relevance are informed by previous studies. Beginning in Section 2.5.1 and 3.3.4, this new LSR framework draws from the examples of integrated frameworks where its factor groups were derived. Firstly, the endogenous factor group is identified as comprising of microenvironment, organisation, technical (project-related) and stakeholders' systems; secondly, the exogenous factor group comprising environment systems such as political and economic influences are highlighted; thirdly, the adaptive response segment represents the leadership dynamic segment (see Figure 2.4).

The leadership segment is at the core of the project system and its subsystems draw on the ALOE Framework (see Table 6.2 in Section 6.4) which permits the description of any characteristic of project complexity and informed leadership decision-making (Vidal and Marle, 2008). Similar to Figure 2.4, the leadership segment or adaptive response factor group in the LSR framework coalesces the organisation and environmental factor groups. Therefore, attributes, links, objects and events within the system all contribute to the success of projects and leadership decisions must take these into account. In this study, the focus is on leadership events only with decision-making as the unit of analysis (see Section 1.3.2).

The value of leadership decision-making and its centrality within MPC is consistent with extant literature (see Figures 3.4 and 3.6). From Figures 3.7, 3.8 and 3.10, it is clear that the concept of leadership has evolved from the individualistic construct to a more dynamic and relational phenomenon comprising leaders, managers, organisation participants and external stakeholders. Therefore, the leadership factor groups represent all individuals responsible for adapting the project and organisations to their environment, and vice versa. From the CAS perspective, this leadership segment drives innovation, learning and success through people, partnerships, resources, policy and strategy (Figure 3.5).

Similarly, KPIs are embedded in the leadership factor group whereby the effects project attributes, links, objects and events can be measured using both objective and subjective performance measures. This is significant in this study because the aim is to investigate the effects of leadership decision making on project success measured based on stakeholder's satisfaction (see Section 2.4.1). Additionally, the project-related factor group in Figure 2.4 is renamed technical factors based on the discourse in Table 4.4 and Section 4.4, and this is embedded in the endogenous segment. Therefore, this new model replicates many of the features in Belassi and Tukel (1996), particularly the systems response segment, and the basis for this segment has been justified in discourse on leadership in Chapter 3.

Leadership is responsible for facilitating integration, adaptation and decision-making to produce success in projects, organisations and society. It operates as an enterprise enabler with functions such as ensuring an appropriate contracting and procurement environment, developing a culture driven towards improving project performance, and helping organisations to adapt to changes in the wider context. Therefore, the role of leadership dynamics is essential in understanding the conceptualisation of projects as complex adaptive systems and the empirical phase of this research will validate its efficacy within the LSR framework.

5.2.2 Understanding the LSR Framework

The conceptual framework for this thesis provides a more robust viewpoint for evaluating how organisational, environmental and leadership systems interact. Therefore, the following sections specifically discuss these project dimensions from the perspective of CAS.

5.2.3 Complex Adaptive Organisations

Boal and Schultz (2007) argued that organisations survive and maintain competitiveness through their CAS properties within management, leadership and context dimensions. Organisations are CAS and must constantly adapt to deal with

disruptive changes in the fast-changing business environment (Lewin and Regine, 2003; Janssen and van der Voort, 2016). Similarly, organisations are somewhat unpredictable due to their dynamic and non-linear systems, which may explain why most change efforts fail based on poor understanding (Burnes, 2005).

Complexity paradigms require organisations to be seen as complex evolving systems, which coevolve within a social ecosystem and this will lead to a change in how we think about strategy and management (Mitleton-Kelly 2003). In organisations, agents at one level, team or department interact with and act as building blocks for agents on the next, which create diverse levels of complexity (see Figure 3.9). The transition starts with individuals forming small groups, which then form part of larger groups, further making up an organisation (Mcmillan 2008).

Therefore, the complex nature of organisations emanates the diverse interactions among these collective groups and networked nature of the people across groups within the system (Richardson 2008; Karp and Helgo 2009; Nienaber and Svensson 2013). Again, this is clear from Figure 3.2 and 3.9. In other words, the way we organise ourselves and society has enormous implications for managers of organisations as well as the people at work in these organisations (Mcmillan 2008), and the challenge for management of contemporary organisations is how to manage complexity instead of attempting to reduce it (Palmberg, 2009). With increasing connectivity of organised society through technology, management within organisation has become more challenging owing to inherent and induced complexity generated by the interactions of the organisation with its environment.

5.2.4 Complex Adaptive Environments

The dynamic and complex nature of society in which organisations have to operate was captured by Buckley (1998 p 77-123), who described society as complex, sociocultural adaptive systems. His arguments are summarised as follows; (1) Advances in science have shifted focus towards relationship between components; (2) CAS are open systems in intimate interchange with an environment characterised

by its constrained structure of causal relationships; (3) Change in the structure of adaptive systems is an essential condition for maintaining its viability.

Furthermore, Buckley (1998) argued that the situation in CAS is complicated by the fact that we are dealing directly with two levels of adaptive systems, environment and organisations, thus two levels of structure. Therefore, the '*complementarity of expectations*' is a continuum in these two levels of adaptive systems which informs the association pattern and structural arrangement that may occur with each system actively seeking to use these changes for their advantage and survival. This arrangement inevitably results in disruptions to existing structures, as is the case in building construction projects.

Similarly, Cloete (2017) opined that the built environment and its ecosystem should be understood as a complex social-ecological system with complex, dynamic and self-producing characteristics. Others like Harrison (2014 p. 4) described the business environment as CAS that adapt their structure and individual elements, independently and collectively. Moreover, the general environment is characteristically complex with traits of self-organisation (Boulton et al., 2015). Just like organisations, examples such as the natural food chain reveal traits of CAS in the wider environment with agents at one level interacting and acting as building blocks for agents on the next. These create higher levels of diversity and complexity.

In the human world, climatic changes, frequent fires and ethnic rivalries are a few examples of conditions that create complexity to which society and organisations have to adapt; with the recent COVID 19 pandemic as a clear example. Therefore, organisations and environment have a self-organising relationship because they are not designed by an external agent, the outcome of their relationships cannot be predicted, and they do not in general align with any overarching principle (Boulton et al., 2015). Therefore, this calls for new leadership approaches beyond the direct and control metaphor of management (Thomas and Mengel, 2008).

5.2.5 Complex Adaptive Leadership

One of the reasons that organisations fall short of planned results is due to the limited ability of leadership to know and accurately predict the future, thereby making poor decisions that negatively influences the long-term growth of organisations. Therefore, Nienaber and Svensson (2013) suggested that the long-term survival of organisations may be achieved through a logical decision-making process that is based on activities that consider the interactions between the organisation, its environment and interconnected agents. In this complex era, leadership cannot control organisations mechanistically as systems become more organic.

Therefore, leaders should aspire to influence how their projects and organisations evolve rather than seeking to control its growth (Lewin and Regine, 2003) and it is pertinent to approach leadership with a CAS disposition (Boal and Schultz, 2007b). Complexity leadership theory has primarily contributed to the development of a theoretical framework for explaining the interactive dynamics in social systems (Lichtenstein et al., 2006). As the need to broaden the traditional approach to leadership and decision-making becomes more imminent, complexity theory offers a potentially valuable metaphor for leadership practice and research (Snowden and Boone, 2007; Rosenhead et al, 2019). Moreover, Lichtenstein et al (2006) argued,

“Complexity leadership is the product of dynamic interactions of people, exchange of ideas and agreement on rules governing change and explains how those interactions can produce emergent outcomes”.

Good leadership frameworks are not a one-size-fits-all ideology in uncertain business environments where complex decisions and novel strategies are essential. The prevalence of complex, non-linear interactions of stakeholders lead to adaptive outcomes, therefore, this paradigm shifts focus to enabling the learning, innovation, and adaptive capacity of leadership within a context of knowledge-producing organisations (Uhl-Bien et al., 2007). Clearly, leaders play a central role in the organisations' capacity to learn from its past and adapt for its future (Boal and Schultz 2007), therefore, there is an emerging shift in leadership theory.

Particularly, the leading-following process needs to be at the core of any assumptions on leadership in organisations and dynamic environments. Complexity theory influences Leadership Studies with the principles of learning and adaptation being essential qualities of leadership in CAS, which is necessary for revising their organisational structure and behaviours in response to changes in their environment (McMillan 2008). Leadership as CAS is a special case of complex systems, one that exhibits the capacity to learn from experience and achieve change through its interaction with follower and stakeholders (Rosenhead et al, 2019).

Furthermore, some strategies for improving the adaptive capacity of leadership include decentralising decision-making power using a bottom-up approach within organisations to improve the decision-making speed and the ability to deal with uncertainty (see Section 4.3.3). These and many more strategies are provided in the comprehensive review of Complexity Leadership literature by Rosenhead et al (2019), summing up five distinguishing characteristics that sets this paradigm apart from traditional constructs of leading and following.

5.2.5.1 Learning and adaptation:

Effective learning and adaptation is essential, particularly, if an organisation must remain competitive and survive. Leadership should contextualise learning processes within complex systems because the future is uncertain and change is constant (Section 3.5.3). Leaders need to reflect on the appropriateness and effectiveness of their behaviour in response to feedback. In a changing environment, assumptions that inform their actions, strategies and targets must be constantly reviewed and this requires agility of thought.

5.2.5.2 Rejection of individual agency:

To corroborate the discourse on individualism (Section 3.5.3), Rosenhead et al. (2019) argue that as organisations focus their resources on strategies that enable their systems adapt to situational developments, complexity leaders must focus on

promoting social dynamism and managing conflicts in the adaptive space. This would require a more distributed view of leadership, which aligns with calls for collective decision making as a form of collective leadership and intelligence (McHugh et al., 2016). This corroborates the discourse on leadership dynamics (Section 3.6).

5.2.5.3 Dissonant dialogue

Similar to multi-directional influence (Section 3.5.3), this refers to the avoidance of a single homogenous organisational culture because studies in complexity leadership value incongruity within organisations as a reflection of dissonance in the complex external environment. Therefore, leadership cannot deterministically control the response of others within the projects and organisation. The role of leadership in complex scenarios is largely to facilitate processes of dialogue that can lead to innovation, rather than command and control.

5.2.5.4 Bottom-up innovation:

Similar to the discourse on dispersed leadership (Section 3.5.3), Rosenhead et al. (2019) argue that strategy should not be formulated at the top of the pyramidal organisation, then implemented at its base. In their view, strategy formulation should be iteratively linked with implementation, whereby the organisation's strategy evolves serendipitously. For complexity leadership theorist, openness to disorder, accidents and coincidences are important for emergent organisational growth, rather than stable equilibrium.

5.2.5.5 Limited role of established tools and techniques:

Generally, complexity leadership theorists reject the use of tools and techniques to facilitate prediction for control or as a means of taming complexity. The main premise behind this reasoning is that leaders cannot determine the future of their organisations, which sharply contradicts traditional management and leadership

ideologies, particularly in the Business Management and PM domain. Not surprisingly, this is the only complexity leadership approach that does not align with the treatise by DeRue (2011) (see also 3.5.3). The limited role of established tools and techniques remains contentious in literature, and it is likely to remain so due to the fundamental premise of management studies, to create the illusion of control within projects and PBOs with tools and techniques.

In the light of the foregoing, the first four outlined assumptions of complexity leadership formed the basis for analysing complex adaptive leadership and decision-making approach in the discussion chapter (see Section 10.3). Therefore, this study considered the foregoing assumptions in the development of the LSR framework and the analysis of project complexity in Chapter 10 since conceptualisation informs leadership decision-making and consequent project outcomes. The next section reviews extant PM literature for evidence of complex adaptive systems to improve the understanding of the relationship that exist amongst its organisation, environment and leadership variables.

5.3 COMPLEX ADAPTIVE SYSTEMS IN PROJECT MANAGEMENT

Conceiving and managing projects as CAS may improve project success with an increase on studies that focus on the human conceptualisation of project complexity (Mamedio and Meyer, 2020; Kiridena and Sense, 2016 p 65). Similarly, CAS thinking has permeated the discourse on projects, whereby McEnvoy et al. (2016 p. 531) provides a framework which suggests that capacity development for delivering complex projects is necessary at personal, organisational and environmental levels. Project complexity is linked to project success because underestimation of complexity causes low performance (Vidal, Marle and Bocquet, 2007; Luo, Zhang and He, 2020). Therefore, this thesis aligns with contemporary PM discourse and the research outcomes will contribute knowledge on why projects continue to fail.

The causal relationship between leadership, project complexity and success is not entirely novel. Muller et al. (2012) suggested that leadership attributes and

competencies such as intellectual, emotional and managerial quotients significantly influence complexity and project outcomes. Likewise, Daniel and Daniel (2019) grouped project structure into environment, organisation and individual intentions, thereby observed that the segment of individuals' intentions is the most significant segment. CAS properties are inherent in megaprojects, particularly in their self-organised networks of individuals, groups or coalition of groups (Daniel and Daniel, 2019). Therefore, leadership and human systems are prevalent in complex projects.

As CAS, projects need people to drive organisational adaptation to external and internal influences of the environment. Leadership emerges through human systems and fully aligns with the CAS conceptualisation of projects. With the establishment of the link between organisations, environment and leadership in this background chapters of this study, one of the most significant studies found on this subject date back over 25 years. The study by Walker and Kalinowski (1994) is unique because it captures the interplay between organisation, environment and leadership. Although their study fails to present a conceptual framework, it succinctly provides an understanding of how these constructs influence one another.

Following the inadequacies of prevalent MPC in literature (see Section 4.4), it is clear that a more robust conceptualisation of complexity is required in research and practice of PM. This gap in knowledge as highlighted by the RPM movement (see Section 2.2.2) aligns with Walker and Kalinowski. Like Mamedio and Meyer (2020), the study by Walker and Kalinowski (1994) exemplifies the need for this human-driven system at the heart of the discourse on the connection, interrelationship and interdependence of organisation and environment. Walker and Kalinowski further suggest that macro-environmental forces (such as the polity) are particularly strong influences all stages of the project lifecycle.

The main study of this thesis seeks to extend key aspects of the research by Walker and Kalinowski, nonetheless, there are marked divergence in approach which are informed by contemporary realities (see Table 5.1). Primarily, unlike Walker and Kalinowski's heavy reliance on Contingency and Systems Theory, this thesis uses aspects of complexity theory, particularly the themes from CAS for the description of

the complexity model in the data analysis and discussion chapters. Furthermore, as this thesis draws inferences about the complexity of organisation, environment and leadership if focuses on leadership decision-making as the unit of analysis, to evaluate how this affects project outcomes and outputs. The analysis draws on the leadership experiences of practitioners and stakeholders at the macro- and micro-levels of the building construction industry of the study area.

Table 5.1: Comparison with Walker and Kalinowski (1994)

<i>The Anatomy of a Hong Kong Project</i> (Walker and Kalinowski, 1994)	<i>Leadership Systems Response Study</i> (Ifonima Essien, 2021)
Case study research approach focusing on analysis of a single construction project	Mixed method approach focusing on institutional level building industry reforms
Relies heavily on Contingency and Systems theory	Relies heavily on Complex Adaptive Systems
Methodology and technique of the analysis not fully described but reference made to Walker and Hughes (1984, 1986 and 1987)	Mixed method approach is fully described starting with semi-structured interviews which is followed by a questionnaire survey
Analyse by identifying the operating and management systems of a single project and the relationship which exists between them	Analyse by identifying leadership, organisation and environmental factors, and their effects on decision making and project success
Focused on decision-making at project level (conception, inception and realization stages) as well as operational level	Focused on leadership responses at industry level by evaluating decision making events and their outcomes at institutional level
Features of leadership styles are discussed as adapted at a high level on the project	Features of leadership decision making are discussed with reference to CAS theory
No Conceptual Framework developed to exhibit the interrelationship between core themes of Organisation, Leadership and Environment	Leadership Systems Response Framework used to evaluate concepts, drive research design, data collection and empirical analysis.
Distinction is made between the macro- and micro-environments of the project	Distinction is made between the macro- and micro-environments of organisations
The complexity of the interplay between project organisation, environment and leadership is not evaluated theoretically	The complexity of project organisation, environment and leadership is analysed as it affects decision making and project success

Although Walker and Kalinowski (1994) appear to omit the technical segment which is very important for the evaluating project complexity, a critical review of their study reveals that it focuses on a building project typology where technical complexities are usually embedded within PBO and the systems of their sponsoring organisations. Furthermore, as external influences create high levels of uncertainty and in turn affect organisational structure, they argue that leadership style and effectiveness must be adaptive and collaborative.

In their view, poorly structured systems and ineffective project leadership will inevitably result in project failure under negative environmental conditions. Walker and Kalinowskis' emphasis on the strong macro-environmental forces contradicts the evidence from PM literature, which suggests that endogenous forces are more influential than exogenous influences (see Table 2.8). The empirical stages of this study will examine the influence of endogenous and exogenous factors and compare the outcomes with literature.

5.4 HOW TO USE THE FRAMEWORK

The LSR framework can be used as a decision-making tool for PM researchers and practitioners. Models of Project Complexity are basically decision-making tools (Vidal et al., 2011; Abbasianjahroni et al., 2014; Qureshi and Kang, 2015) that can be used by leadership in project management practice to develop strategy to improve project and organisation success in areas such as production planning (Gidado, 1996), project risk management (Vidal and Marle, 2008; Qazi et al., 2016) and strategy development (Harrison, 2014). The use of decision-making tools is particularly crucial for project success, because they improve the conceptualisation and knowledge of decision makers (Rolstadas et al. 2015), particularly regarding contending organisation, environment and leadership factors that influence project success. (Rezende et al., 2018; Geraldi and Soderlund, 2018), at all lifecycle stages of projects.

In research, decisions about the focus, unit of analysis and research problems can be improved with the LSR framework (see Rooke et al., 2008). Based on the discourse in Section 4.2, this framework can be used by researchers to highlight the research goals and methods for achieving them (Leshem and Trafford, 2007), clarify the key factors, variables and constructs being studied, as well as the presumed relationship among them (Miles et al. 2014). Ultimately, this framework can be used to present an argument about why the topic one wishes to study matters, and why the means proposed to study it are appropriate and rigorous (Ravitch and Riggan, 2017).

For this PhD study, it is clear that project, organisation and leadership activities are institutionally bound. However, stakeholders in research and practice pay little attention to the institutional environment, particularly its strong macro cycles, critical decision points, conflicts, recurring activities, regular events and the role of actors (Dille and Söderlund, 2011; Soderlund and Sydow, 2019). The role of stakeholders as decision makers at the micro- (project and organisation) and macro- (institutional) levels are similar but distinct (Derakhshan et. al., 2019). Therefore, this study will use the LSR framework as a lens to examine stakeholder satisfaction regarding the challenges of building collapse and construction industry reform in Lagos, Nigeria with a focus on the institutional level of building projects. Recommendations are made for further research at project and organisation levels (see Section 10.8).

Particularly, this PhD research uses the framework in the pilot study to examine literature relating to project success in Lagos, Nigeria (Section 7.6), see Tables 6.4, 6.5 and 6.6. Following this exploratory phase, the efficacy of the framework was established. Therefore, the empirical stages in Chapter 8 and 9 used the framework to discuss themes emerging from the interviews and this process validated the endogenous and exogenous subsystems of the framework. Finally, inferential statistics was used to validate the existence of the distinct factor groups within the framework and the results are presented in Section 9.15. The outcome of the data analysis was used to revise the framework in Section 10.4. Overall, this process and the achievement of the research objectives validated the LSR framework.

5.5 CONCLUSION

The LSR framework draws on knowledge from extant literature and addresses the gaps observed in existing frameworks and models of project complexity. It incorporates components of the macro- and micro-environment, integrates KPI and CSF constructs as the prevalent project success paradigms, as well as the new leadership factor group that aligns with the systems response segment. Therefore, it provides a basis for the research design and data analysis in the empirical phase of this study. It draws on all aforementioned PM, business and leadership paradigms, as well as CAS theory. This framework suggests that leadership decision-making approach is a systems response mechanism, as the name indicates.

Consequently, in the latter stages of this study the researcher expediently used the LSR framework as a lens to examine project complexity and success. The ever-present human factor in the dynamics of interconnected systems is the central driver of complexity and efforts should be made to understand this phenomenon better, both conceptually and theoretically, with leadership at the heart of the discourse. This is necessary to guide empirical choices in order to arrive at the research contribution, thereby, keeping this research focused and concise. Therefore, the next chapter focuses on Research Design with consideration of issues such as methods and methodology adopted for this study.

CHAPTER 6

RESEARCH DESIGN

6.1 INTRODUCTION

The previous chapters have helped with understanding and adopting the key concepts of organisation, environment and leadership as components of project systems. These form the basis for the empirical stage of this study. Furthermore, the critical review of literature led to the development of the LSR framework, which has improved the understanding of the interrelationship and dependencies amongst these key concepts in the PM context. This framework was used to direct the philosophical choices, research design, fieldwork and data analysis. These outcomes have enriched the knowledge of factors that influence project success, which is one of the objectives of this study. Therefore, this chapter presents the research design, which is tailored for investigating the building industry.

6.2 GENERAL RESEARCH FOUNDATION

It is pertinent to begin by restating the aims and objectives of this study, before going into the details of research foundations and specific aspects of the research design.

6.2.1 Aim of the Study

The aim of the research is to investigate the effects of leadership decision-making on project success in Lagos, Nigeria from the PM context. The research will seek to,

1. Examine the key factors and concepts influencing project success.
2. Draw on these factors and concepts to develop a conceptual framework
3. Apply the conceptual framework to investigate the factors that affect building construction success in Lagos, from a leadership perspective.
4. Explore, analyse and validate leadership responses to project failure.
5. Draw wider conclusions on the interplay between organisation, environment and leadership with implications for PM research and practice.

The unit of analysis is leadership decision-making and this study explores why building projects continue to fail to deliver to stakeholders expectations. In this chapter, the research foundations and selected approach are evaluated and justified as a function of the knowledge domain and peculiarities of this study. The advantages and disadvantages of the various approaches are considered in order to avoid choosing the wrong strategy. Therefore, the next section addresses philosophical approaches of research, especially those relating to social science and PM.

6.2.2 Research Frameworks

Generic terminologies and tools of research are widespread in literature some of which are directly applicable in the social science and PM domain. An understanding of these terminologies will provide clarity on how to achieve research objectives by examining the core concepts that influence research procedures and the interrelationship amongst them, both directional and logical. Therefore, Grix (2002) suggested that *'before students actually get down to research they need to be exposed to the 'building blocks' of generic social research'*, and provided a framework of these building blocks (Figure 6.1).

This framework is a necessary guide because academics in diverse disciplines ascribe different meanings and interpretations to research terminologies. For instance, in Hospitality and Tourism research, Slevitch (2011 p 79) corroborates the framework by Grix (2002) but there is no mention of 'Sources', which may be a subset of or intricately linked to 'Methods' therefore, indistinct from the other terminologies within this framework. Similarly, a study in Accounting Research by Wahyuni (2012 p 70) includes Axiology as an important building block of research whilst excluding Methods and Sources, creating even more uncertainty on which are the valid concepts for social research.

Particularly, 'Methods' should not be confused with 'Methodology' (Barry White, 2011; Slevitch, 2011 p 74). Wahyuni (2012, p 72) explained that, *"a method is a practical application of doing research whereas a methodology is the theoretical and*

ideological foundation of a method". Furthermore, Yilmaz's (2013 p 316) study in Education Research argued for the inclusion of Ontological, Epistemological, Axiological, Rhetorical and Methodological paradigms, but failed to include 'Methods' and 'Sources'. Although 'Rhetorical' relates to the language of research, social science authors do not commonly discuss it. Similarly, the omission of 'Methods, reinforces the caution by Grix (2002) that methodology should not be confused with research methods.

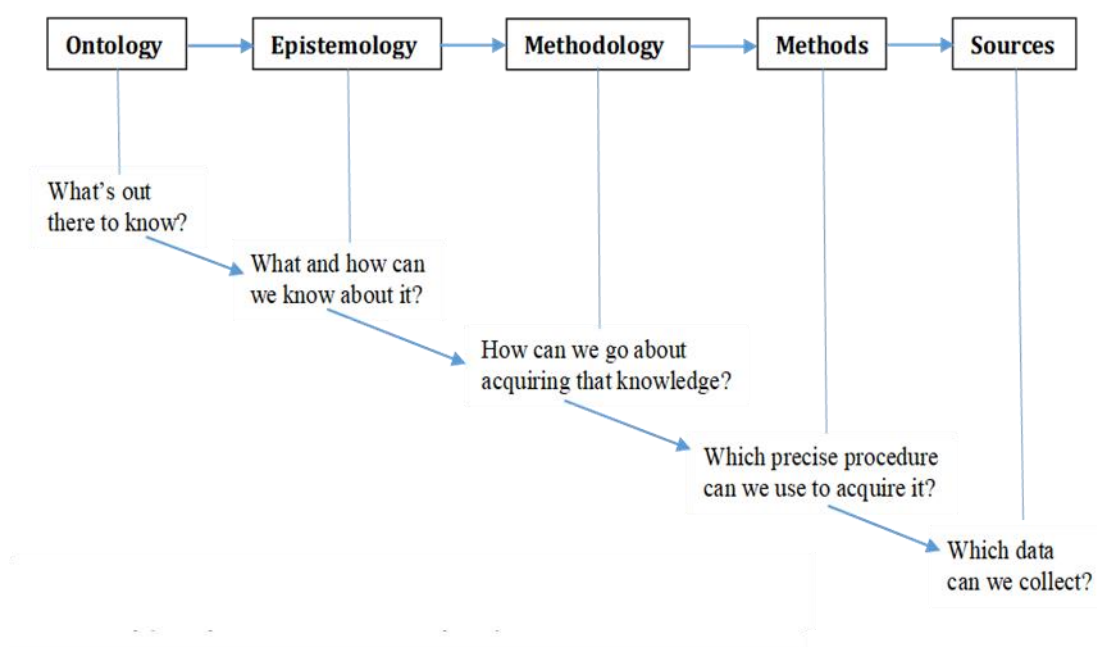


Figure 6.1: The interrelationship between the building blocks of research

Source: Hay (2002 p 64, cited in Grix, 2002 p 180)

Furthermore, studies by Carter and Little (2007, p 1322) in the Health Research domain argue that 'Epistemology' is synonymous with 'Axiology' because the former has ethical weight and contain values which cannot be distinguished from the latter, an argument that is inconsistent with other philosophical standpoints (see White, 2011). One thing becomes clear from the foregoing, research foundations and approach may differ in the various disciplines depending on the philosophical

disposition of the researchers, the nature of the study and traditions in the knowledge domain. The only constructs that appear to be consistent from the foregoing are ontology, epistemology, axiology, methodology and methods, while sources and rhetoric are less prevalent.

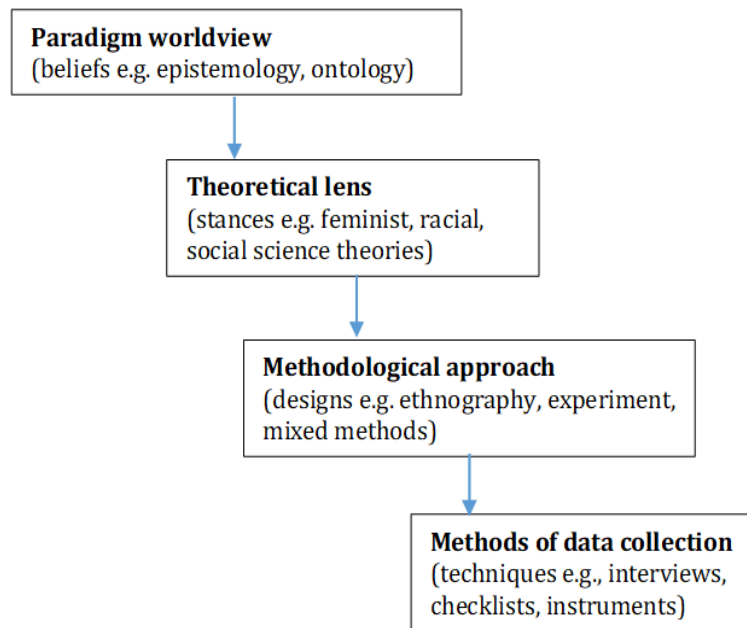


Figure 6.2: Creswell and Plano Clark (2018 p 35)

Furthermore, the framework in Figure 6.2 extends this discourse by including 'Theoretical Lens' as an indispensable element in the process of research design and articulation, a feature omitted by Grix. Therefore, the following sections present the research design by using Figure 6.1 and 6.2 as guides. Philosophical and methodological choices are also presented. According to Creswell and Plano-Clark (2017 p 34), *"All research has a philosophical foundation, and inquirers should be aware of assumptions they make about gaining knowledge during their study"*. In their view, assumptions that shape the processes of research and should be properly identified and articulated. This is the basis for the empirical stages of this study.

6.3 PARADIGM WORLDVIEW

This refers to the philosophical choices of Ontology, Epistemology and Axiology. The purpose of this section is to discuss these concepts by critically considering individual characteristics before making rational choices.

6.3.1 Ontology

The term Ontology refers to the philosophy of reality or what reality is (Krauss, 2005; Creswell, 2013). As one of the main philosophical approaches, it describes assumptions made about the world in which researchers operate in their search for new knowledge (Denzin and Lincoln 2011). Ontology can also be understood as the search for the nature of reality and knowledge about how the world operates, how knowledge is perceived and obtained to help researchers develop and validate their research designs (Krauss, 2005). Ontological considerations are important because they guide and inform the research design and choice of tools (Krauss, 2005). Therefore, the two distinct ontological approaches are Objectivism and Subjectivism (Denzin and Lincoln, 2011).

For this study, the ontological stance is primarily Subjectivism because social actors continually construct the phenomenon of complex systems, decision-making and their meanings. Although project performance can be measured objectively, using success paradigms described in Section 2.4, this is not the focus of the study. Furthermore, it is clear from the discourse in Section 5.3 that organisations, environment and leadership are constantly changing which will require a socially constructed and non-linear approach to strategy development. Notably, leadership is not passive; rather it co-creates social realities through processes of adaptation in a multi-layered ecosystem (see Section 3.6).

With the focus on decision-making, the social phenomena under review and their meanings are not mutually exclusive from the social actors. Therefore, the phenomena of complexity is created from the perceptions and consequent actions of those social actors, which in this instance refers to decision-makers within PBOs. To examine decision-making, perception plays a major role because decisions are a

function of individuality and the attributes of the decision makers. Therefore, the effects of decision-making are examined which is very subjective because they are based on peoples' point of view, interests and values.

6.3.2 Epistemology

Epistemology is the philosophy of knowledge. It describes how we come to know what we know, underscores the relationship between the researcher and the knowledge acquired, as well as how we determine what counts as knowledge (Krauss, 2005; Creswell, 2013). Epistemological standpoints have remained contentious for decades because existing paradigms are understood purely as a philosophical exercise (Krauss, 2005). Therefore, while Ontology questions what is real and what is not, Epistemology seeks to address how we come to know the reality of the world (Creswell, 2013). These are clearly depicted in Table 6.1.

The foregoing highlights the fact that epistemology determines the type of relationship the researchers have with the participants of their research and informs the choice of methods of data collection and analysis. Ultimately, epistemology provides the basis for assessing the validity of research outcomes (Creswell, 2013). Tuli (2010 p 104) argued that the main epistemological paradigms are Positivism and Interpretivism; the former is a resource efficient approach giving the researcher the possibility of reaching a larger number of respondents, while the latter aids the understanding of a complex phenomenon by evaluating participants' experiences.

These main approaches are particularly relevant to this study because complex phenomena require the evaluation of different perspectives before a detailed analogy crystallises. Therefore, the epistemological choice for this study is Pragmatism because a combination of deductive and inductive evidence is required to understand project complexity. Pragmatism combines Interpretivism and Positivism standpoints and the data presentation relies on quotes from the participants, as well as statistical data (Creswell, 2013). This improves understanding of the meaning of the data, as well as allowing access to a larger number of participants, which broadens the array of actor's perspective.

Table 6.1: Research Paradigms and Implications in Practice (adapted from Blaikie (2000 p. 184; Slevitch 2011 p. 79; Wahyuni 2012 p. 70; Creswell and Plano Clark, 2018 p. 38)

Fundamental Beliefs and definitions	RESEARCH PARADIGMS			
	Positivism (Naïve Realism)	Postpositivism (Critical Realism)	Interpretivism (Constructivism)	Pragmatism (Mixed Method)
Ontology: the position on the nature of reality of the world	External, single, objective reality exists and independent of social actors. It can be known or decribed as it really is.	Objective. Exists independently of human thoughts and beliefs or knowledge of their existence, but is interpreted through social conditioning (critical realist)	Socially constructed reality, subjective, may change, various peoples' point of view, multiple social realities that are mind dependent, cannot be described free from peoples' particular interests and values.	External, multiple, view chosen to best achieve an answer to the research question
Epistemology: the view on what constitutes acceptable knowledge	Objectivist; only observable phenomena can provide credible data, facts. Focus on causality and law-like generalisations, reducing phenomena to simplest elements. Knowledge is summarised in the form of time and context-free generalisations	Only observable phenomena can provide credible data, facts. Focus on explaining within a context or contexts	Subjectivist; social phenomena; focus upon the details of situation, the reality behind these details, subjective meanings and motivating actions. Reality is only knowable through the human mind and socially constructed meanings	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data
Axiology: the role of value in research and the researcher's stance	Value-free and etic. Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Value-laden and etic. Research is value laden; the researcher is biased by world views, cultural experiences and upbringing	Value-bond and emic. Research is value bond, the researcher is part of what is being researched, cannot be separated and so will be subjective	Value-bond and etic-emic. Values play a large role in interpreting the results, the researcher adopting both objective and subjective points of view
Research Methodology: the model behind the research process	Quantitative: Aiming at objectivity and generalization through finding causal effects that allow prediction. Sample size is critical for generalization purposes.	Quantitative or qualitative	Qualitative: Aiming at understanding phenomena from the point of view of those being studied. Sample size is irrelevant; transferability of findings depends on data richness and interpretation	Quantitative and qualitative (mixed or multi-method design)
Research Method: technique and tools used in the process of developing new knowledge	Empirical examination and measurement, hypothesis testing, randomization, blinding, structured protocols, questionnaires, etc.	A combination of quantitative and qualitative methods	Ethnographies, case studies, narrative research, interviews, focus groups, observations, field notes, recordings, filming, etc.	A combination of quantitative and qualitative methods with a more flexibility compatibility / incompatibility ideology
Sources of Data: types of data used by social researchers including primary, secondary and tertiary forms	Data is in the form of numbers generated by the researcher, obtained from artificial settings, uses strict random, single stage and probabilistic sampling techniques	Data is in the form of numbers and textual, obtained from semi-natural settings, uses both probalistic and non-probabilistic sampling techniques in multi-stages	Data is textual, images and in the form of words, obtained from natural social settings and from social artefacts, uses non-probability sampling techniques in multi-stages	Data can be in the form of numbers, textual, images and any othe form, obtained from both natural and artificial settings, using both probalistic and non-probabilistic sampling techniques in multi-stages, can contain primary, secondary and tertiary data

6.3.3 Axiology

Axiology questions what role researchers' values play in the research process (Creswell, 2013). White (2011) distinguished this philosophical approach from others by stating, '*Axiology is the study of what can be regarded as of value*'. This suggests that axiology focuses on the researcher by capturing their values, beliefs and/or biases in conducting research. Although, authors like Carter and Little (2007, p 1322) argued that Axiology is enmeshed in Epistemology, White (2011) argued that it is important to identify the role of the researchers' assumptions, particularly in the Interpretivism approach, which is characterised by values and bias.

Values reflect both the researchers' and the participants' views (Creswell, 2013), therefore, White (2011) suggested that there is a need to limit the role of assumption by identifying, defining and categorising the universal (etic) features of a phenomenon in order to better understand the local (emic) or context-driven features. This implies that interpretivist researchers need to discuss values that shape the narrative, particularly their own interpretation in advance of or in conjunction with the interpretations of participants (Wahyuni, 2012). Whilst values improve understanding of phenomenon, it limits the generalisability of knowledge, which informed the choice of the Pragmatic approach.

6.4 THEORETICAL LENS

The relevance of CAS theory has been discussed in the previous chapters as a prominent stream of inquiry. In this view, CAS can be examined from the decision makers' perspectives as is the case of the events structure of the Hinkley point C (Daniel and Daniel, 2019). Similarly, this approach is effective for identifying and modelling complexity within the field of PM (Vidal and Marle, 2008). The ALOE framework in Table 6.2 provides a mechanism for studying complexity within the project system, in research and practice. Particularly, events could include internal and external decisions that could induce complexity (Vidal et al. 2011).

Table 6.2: The ALOE Framework (Vidal and Marle, 2008 p 1107)

ATTRIBUTES	LINKS	OBJECTS	EVENTS
Quality	Hierarchical link	Objectives	Occurred event
Cost	Contribution link	Deliverable	Potential event
Duration (start date)	Sequential link	Activity	
Advancement	Influence link	Resource	
Allocated resources	Exchange link	Other project within the firm	
Added value			

Conventionally, leader actions and their impact on followers, groups and organisational outcomes tends to be investigated at the aggregate person level but assessment of their influence could be improved by linking leader behaviour and decision-making to subsequent outcomes at the level of events (Hoffman and Lord, 2013). This is important in this study because decision-making events reflect the outcome of leadership, organisational and environmental interaction and complexity. Therefore, the focus on leadership decision-making events is a credible research approach in both PM and Leadership Studies.

6.5 METHODOLOGICAL APPROACH

Methodology identifies the particular practices used to attain knowledge (Krauss, 2005; Creswell, 2013). It is an approach to research inquiry involving quantitative and/or qualitative approaches to data collection and analysis (Lincoln et al, 2011; Creswell, 2013), as well as the principles of how enquiry should proceed (Lincoln et al, 2011). Ahmed and Opoku (2016) noted that appropriate research methodology allows researchers position their research problem within an appropriate philosophy, which in turn enhances the development of a suitable research strategy, methods for data collection and focused unit of analysis.

Table 6.3: Comparison of strengths and weaknesses (Amaratunga et al. 2002)

Theme	Strengths	Weaknesses
Positivist (quantitative paradigm)	They can provide wide coverage of the range of situations	The methods used tend to be rather inflexible and artificial
	They can be fast and economical	They are not very effective in understanding processes or the significance that people attach to actions
	Where statistics are aggregated from large samples, they may be of considerable relevance to policy decisions	They are not very helpful in generating theories
		They focus on what is or what has been recently making it hard for policy makers to infer what changes and actions should take place in the future
Phenomenological (qualitative paradigm)	Data-gathering methods seen more as natural than artificial	Data collection can be tedious and require more resources
	Ability to look at change processes over time	Analysis and interpretation of data may be more difficult
	Ability to understand people's meaning	Harder to control the pace, progress and end-points of research process
	Ability to adjust to new issues and ideas as they emerge	Policy makers may give low credibility to results from qualitative approach
	Contribute to theory generation	

The two main methodological research approaches, quantitative and qualitative, were established based on the two main epistemological paradigms, the positivist and interpretivist respectively (Holt et al 2014). The most obvious difference is that positivists assume that it is possible for an observer to remain detached from the reality or phenomena studied, while the interpretivists believe that reality is co-created by the observer during the enquiry (Krauss, 2005 p. 761). Table 6.3 compares these approaches based on their strengths and weaknesses.

6.5.1 Quantitative Paradigm

The quantitative approach largely operates by the laws of cause and effect, focusing on the idea that observation and measurement are at the core of the scientific endeavour. According to Amaratunga et al. (2002) features of this approach include: inquiry that refers to the need for independence of the observer from the subject being observed; formulation of one or more hypotheses for subsequent verifications; and converting data into numerical form for statistical calculations. Krauss (2005) also argued that for objectivity to be satisfactory, researchers must take great care to avoid their own presence, behaviour or attitude affecting the validity of the results.

These imply that for the quantitative results to be valid, all external factors which might affect the results must be controlled, however, CAS cannot be predicted and controlled in a mechanistic manner. Similarly, it is impossible to understand a complex system from outside the system and the researcher cannot be completely detached from the object of study. Therefore, quantitative methods can be inflexible for understanding the meaning people attach to problems and actions. Nonetheless, the value of the quantitative approach to this study lies in its ability to survey large samples of respondents using fast and economical tools (Table 6.3). Overall, a mix of approaches is desirable for this study to ameliorate these limitations.

6.5.2 Qualitative Paradigm

In general, the qualitative paradigm uses naturalistic approaches to understand human experience (Amaratunga et al, 2002). Researchers establish knowledge and attach meaning to phenomenon through interaction with the subjects of study (Krauss, 2005). In this way, it is inevitable that the enquiry changes both the researcher and subject of study. Furthermore, Krauss (2005) argued that since meaning lies in individual cognition, the knowledge so derived is subjective, time-based and context dependent. This paradigm particularly suits the LSR study because this study is not fixated on pre-determined hypotheses, rather, the study evolved iteratively and in sequential phases.

This approach is suitable for studying the complex world of projects, which are socially constructed and subjective (Cloete, 2017). In this approach, researchers give participants some degree of freedom to express themselves as they please and the collected data is usually in textual form. The preceding themes appear to be best fit for this LSR research, however, the smaller number of respondents typically involved in qualitative research and poor generalisability of research outcomes are the main points of criticism of this approach. Likewise, data collection can be extremely tedious and requires enormous resources to fulfil (see Table 6.3). Therefore, this study adopted the mixed method approach because it permits a higher level of methodological adaptation.

6.5.3 Mixed Method Paradigm

The polarization of research paradigms following years of fervent debate promoted quantitative and qualitative purists, which Onwuegbuzie and Leech (2005) argued is the biggest threat to the advancement of the social sciences. Arguments in favour of a compatibility approach suggests that there are neither right nor wrong choices. Therefore, studies could mix methods to draw on strengths and minimise weaknesses of other well-established paradigms (Mangan et al, 2004; Holt and Goulding, 2014). Therefore, the unitary approaches can be replaced by a pragmatic approach, which sought to combine their strengths and mitigate inherent shortcomings.

Therefore, while the qualitative method improves microanalysis and provides explanations to phenomena by exploring depth of local knowledge in the field, the quantitative approaches can describe its heterogeneity on a macro-level (Kelle, 2006). Similarly, Fielding (2010) argued that using more than one method is beneficial to assess the extent to which the outputs from these methods confirm or contradict each other. Therefore, mixed method research is very suitable for this study, drawing on the depth of qualitative research and breadth of quantitative techniques within the same framework. Mixed method is widely accepted as a valid approach to research (Creswell and Piano-Clark, 2017).

Table 6.4 Purposes of Mixing Methods (adapted from Zachariadis et al., 2013 p 11)

Purpose of Combination	Description
Complementarity	MMs are used in order to gain complementary views about the same phenomena or events
Completeness	MM research design is used to ensure a complete picture (as detailed as possible) of the phenomenon under study
Developmental	Inferences of one type of research are being used as questions for another type of research
Expansion	MMs are being implemented in order to provide explanations or expand the understanding obtained in previous research
Corroboration	MMs are used in order to confirm the findings from another study
Compensation	The weakness of one method can be compensated by the use of another method
Diversity	MMs are used in order to obtain divergent views on the same phenomena or events

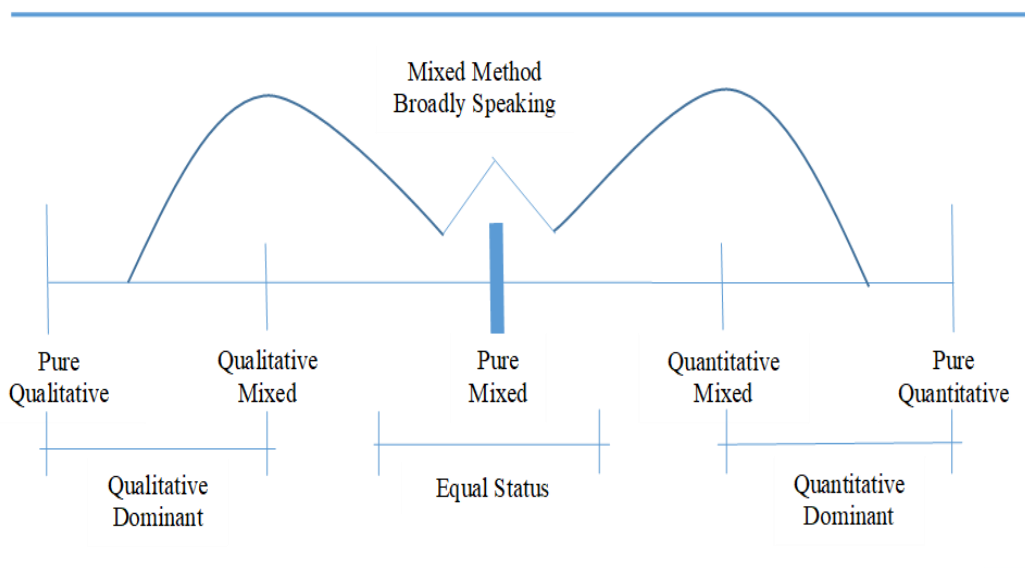


Figure 6.3 Graphic of the Three Major Research Paradigms including Subtypes of Mixed Methods Research (Johnson et al., 2007 p 124)

The different purposes of mixing methods are presented in Table 6.4 and this study focuses on establishing complementarity by using the qualitative and quantitative methods to draw on complementary perspective of leaders at micro- and macro-levels of the building industry. This study aligns with the views of Onwuegbuzie and Combs (2011) on complementarity whereby the results from the quantitative analysis are interpreted to expand or clarify findings derived from the qualitative strand, thereby improving data reliability, credibility of the analysis and interpretation of the results. This provides a more complete picture of the challenges of project complexity, success and decision-making. Figure 6.3 presents a qual-quant continuum with different mixed methods possibilities.

This study adopts the qualitative dominant approach. Qualitative dominant mixed methods research relies primarily on the constructivist research approach, while recognizing the value of combining quantitative data (Creswell and Plano Clark, 2018). This approach is justified because it aligns with the performance measures adopted for this study (see 2.4.1). Stakeholder satisfaction is a subjective measure of performance the qualitative dominant approach is most suitable due to its epistemological peculiarities. Similarly, Barker et al. (2002) who suggested that the exploratory nature of qualitative inquiry as best applicable when existing research is contradictory or the topic is highly complex. In this instance the topic is evidently complex and the quantitative aspects of this study are essential to validate the LSR framework. Surprisingly, combining methods is uncommon in the PM domain.

6.6 FOCUS ON PROJECT MANAGEMENT RESEARCH

Padalkar and Gopinath (2016) traced the evolution PM literature covering six decades and found research to be dominated (66 to 90%) by quantitative studies. Conversely, qualitative methods have been more prevalent amongst The International Research Network of Organising by Projects (IRNOP) publications (Biedenbach and Muller, 2011). Methodological convergence towards a more pragmatic approach is necessary if PM research is to overcome its lacks of robust research methodologies and advance towards theory building (Padalkar and Gopinath, 2016).

The field of PM is broad and multidisciplinary with a large collection of rich specialist literature and strict adherence to prescribed tenets of either positivism or constructivism is palpable (Padalkar and Gopinath, 2016). Therefore, researchers choose paradigms based on ideological leanings and institutional affiliation rather than the purpose of the study, the nature of the research questions or the breadth of available data sources. Smyth and Morris (2007 p 433) argued, '*research methodologies are being selected and applied in ways that are often inappropriate, both to context and to issues concerning general-particular explanations*'.

Mixed method is unpopular in PM research; therefore, to break free from a level of methodological inertia the robust mixing of methods is necessary, particularly for the study of complex phenomena (Cameron et al., 2015). This pluralist approach is also suitable for research in construction (Cloete, 2017). The foregoing arguments make it extremely crucial for researchers to gain an understanding of the philosophical and methodological paradigms debates before selecting methods of data collection (Holt and Goulding, 2014; Padalkar and Gopinath, 2016). Therefore, this study combines methods based on the complexity of the research problem.

6.7 RESEARCH METHOD

Methods refers to both the strategy and techniques adopted for answering research questions and can be defined as the link between theory and research outcomes (Blaikie, 2000; White, 2011). There is a distinction between research strategy and methods; strategies are plans for implementing the chosen research approach that are then implemented using specific methods, such as questionnaires and interviews (White 2011). The research approach should be designed with the sole intention of collecting data considered representative of the larger population (Ahmed et al., 2016) and this process begins with the adoption of appropriate strategies.

6.7.1 Research Strategy

For empirical studies in social research, the four main approaches found in literature are the Inductive, Deductive, Retroductive and Abductive approaches (Blaikie, 2000). The nature of the research, its theoretical foundations and philosophical underpinnings ultimately determine the choice of a distinct strategy. Blaikie (2000) succinctly discusses the features of the four main strategies in social research, as summarised in Table 6.5. The retroductive approach is the most suitable for this study. It begins with an observed regularity (building collapse) then followed by the construction of a hypothetical model of the causal structure and phenomena (LSR framework). The existence of this structure and phenomenon are then tested through methods such as observation and experimentation.

Table 6.5: The Logic of Four Research Strategies (adapted from Blaikie, 2000 pp 101, 124)

	Inductive	Deductive	Retroductive	Abductive
Aim	To establish universal generalizations to be used as patterns explanations	To test theories to eliminate false ones and corroborate the survivor	To discover underlying mechanisms to explain observed regularities	To describe and understand social life in terms of social actors' motives/accounts
Startpoint	Accumulate observations or data	Borrow or construct a theory express it as an argument	Document and model a regularity	Discover everyday concepts, meanings and motives
Outcome	Produce generalisations	Deduce hypotheses	Construct a hypothetical model of a mechanism	Produce a technical account from lay accounts
Endpoint	Use 'laws' as patterns to explain observations	Test the hypotheses by matching them with data	Find the real mechanism by observation or experiment	Develop a theory and test it iteratively
Major Activity	Exploration, Description	Explanation, Prediction	Explanations	Exploration, Description, Understanding
Moderate Activity	Prediction,, Evaluation, Assess Impacts	Evaluation, Assess Impacts	Change, Evaluation, Assess Impacts	Change, Evaluation, Assess Impacts
Minor Activity	Explanation	Change		
Types of Questions	What and Why	What, Why and How	What, Why and How	What, Why and How

Blaikie (2000) argued that the main research outcome of the retroductive strategy is the validation of the hypothetical model, which is then explained using established theory. Therefore, the LSR framework in Figure 5.1 was tested in the empirical phase of this study by investigating the effects of leadership decision-making on project success. Distinctively, retroduction does not seek to establish universal generalizations nor test theories. Rather the study seeks to discover and validate underlying mechanisms that produce the regularities of events by describing the nature of the interactions within the structure. This aligns with the objectives of this study as it attempts to explain why project failure persists. Therefore, the steps of the retroduction research strategy followed in this study are as follows;

- 1) In order to explain observable phenomena and the regularities that obtain between, researchers must attempt to discover appropriate structures and mechanisms.*
- 2) Since these structures and mechanisms will typically be unavailable to observation, it is necessary to first construct a model of them, often drawing upon already familiar sources.*
- 3) A model is such that where it correctly represents these structures and mechanisms, the phenomenon would be causally explained.*
- 4) The model is then tested as a hypothetical description of actually existing entities and their relations. To do so, it is necessary to work out further applicability of the model, which are additional to the phenomena, which can be stated in a manner open to empirical testing.*
- 5) If these tests are successful, this gives good reason to believe in the existence of these structures and mechanisms.*
- 6) It may be possible to obtain more direct confirmation of these existential claims, by the development and use of suitable instruments.*
- 7) The whole process of model-building may then be repeated, in order to explain the structures and mechanisms already discovered.*

The first three steps above have been completed from literature while steps 4, 5 and 6 will form the focus of the empirical phase of this study. Step 7 is beyond the scope of this study and is recommended for future research. Although, there is a dearth of research that explicitly use retroduction logic in social science (Blaikie 2000), it is possible to reconstruct classic studies in the social sciences within the retroductive strategy (Zachariadis et al., 2014). This methodological robustness may help to address some of the methodological issues noted in PM research. The next section discusses the specific techniques for achieving the research objectives and answering the research questions.

6.7.2 Exploratory Sequential Mixed-Method Approach

There are almost forty mixed-methods research designs to choose from (Tashakkori and Teddie, 2003 cited in Ivankova et al., 2006), however, the most frequently used designs include the concurrent and sequential designs (Creswell and Piano-Clark, 2017). The exploratory mixed methods approach is one of three sequential designs and it involves the use of two consecutive methodological phases within one study (Onwuegbuzie, Bustamante and Nelson, 2010; Creswell and Piano-Clark, 2017).

The Exploratory Sequential Mixed-Methods (ESMM) approach is particularly ideal for exploring complex phenomena (Fetters et al., 2013). ESMM integration in this study is particularly evident in the presentation and interpretation of results in Chapter 9 where the weaving narrative approach is used to describe the qualitative and quantitative findings together (see Fetters et al., 2013). The presentation of findings and discussion will be organised on a theme-by-theme basis, guided by the ESMM template developed by Creswell and Plano Clark (2017), see Figure 6.4.

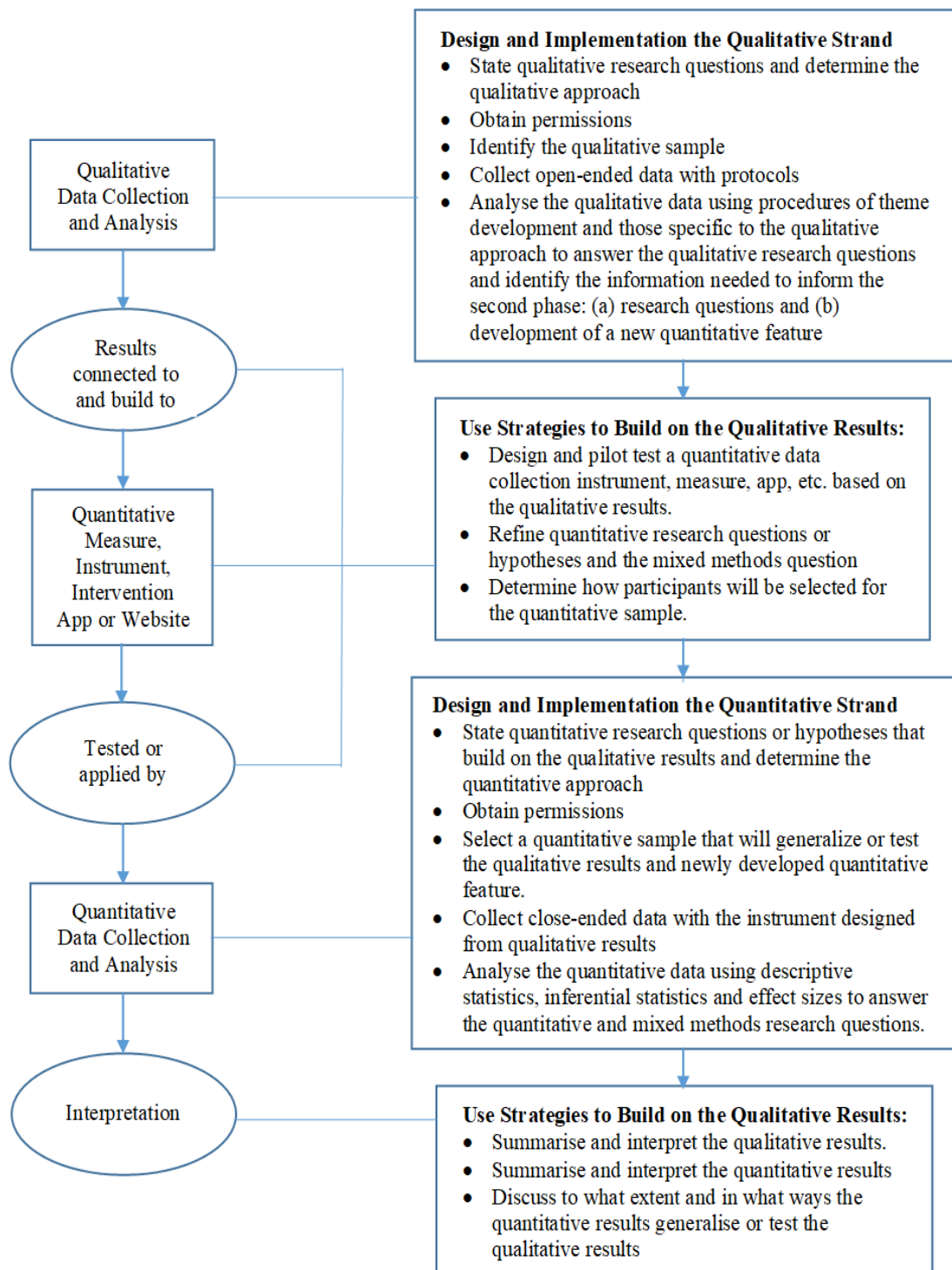


Figure 6.4: Flowchart of the Basic Procedure in Implementing an Exploratory Sequential Mixed Method Design

Source: Creswell and Plano Clark (2018)

6.7.2.1 Qualitative Research Questions

This study used the qualitative and quantitative approaches flexibly to answer the research questions and examine the forces that influence project success, as well as possible solutions. According to Fetters et al. (2013), researchers should apply qualitative methodologies to answer research questions that explore why and how a phenomenon occurs; while quantitative methodologies are used to address research questions about causality and generalisability. The nature of the research questions informed the choice of methods for the qualitative phase as follows;

1. Why are buildings projects in Lagos failing to meet the expectations of stakeholders in Lagos, particularly in the light of building collapse? How has Lagos State Building Control Agency (LASBCA) performed in reversing building collapse in Lagos? Please give reasons for your response and views.
2. How can the building construction industry be improved?

To clarify the relevance of these questions and reduce ambiguity of purpose, the questions directly address the objectives of this study as explained in Section 10.2. The quantitative methodology was used to improve the reliability of the data and validate the structure of the model. These questions were pilot tested for their relevance to the context and research problem. The pilot study and peculiarities of the study area are described in Section 7.7. This process validated the research design and tools, while the sources of data are discussed next.

6.7.2.2 Sources of Data

In the main study, leadership perception of problems of the industry and likely solutions were examined through interviews in two stages. The respondents were drawn from the membership of the seven built environment related professional bodies, including the Nigerian Institute of Architects and Nigerian Society of Engineers. For further detail on the selection criteria see also 6.7.2.4 and 6.7.2.5. Two

groups of professionals were selected for this study; those involved in the 2010 Building Industry Reforms named Macro-Leadership (MAL); and decision-makers within projects and organisations, subsequently named Micro-Leadership (MIL).

The professional institutes enabled the researcher draw names of potential participants from their registers. Similarly, the relevant government bodies gave consent to enable the researcher contact representatives of the leading construction companies and other stakeholders based on the list of the major construction projects during the period 2007 – 2014. These gatekeepers also provided the names of participants in the 2010 Building Industry Reforms. Therefore, the data is credible and steps undertaken in the qualitative phase are discussed in the next section.

6.7.2.3 Qualitative Instrumentation (Interview Procedures)

In qualitative studies, the researcher is the key instrument (Creswell, 2013). Therefore, in the first phase of the main study semi-structured interviews were used to collect data and produce textual transcripts of the perceptions of construction professionals. Interviews are very prominent data collection techniques in situations where the research seeks to create a deeper understanding about a particular phenomenon (Denzin and Lincoln, 2008 cited Ahmed et al., 2016). The pilot study helped this researcher to practice and improve the interview protocol. Notably, the researcher conducted the interviews for the main study in two phases; telephone interviews from the UK and face-to-face interview in Lagos.

6.7.2.4 Sampling Strategy (Telephone Interviews)

Recruiting participants with first-hand experience of the industry was crucial. Sampling is very important in research because it enables researchers to gather sufficient data, conduct meaningful analysis and arrive at the best analytical conclusions (May, 2011 cited Ahmed et al., 2016). Therefore, the selection of an appropriate sampling technique is essential for estimating and selecting respondents

from a large population set which will ultimately determine the validity, credibility and generalizability of the research outcomes.

The use of a sampling technique allows the assembling of such information from a segment of the population following which the researcher can then make inferences from their study about the larger groups (Saunders et al., 2009). Sampling Techniques include Random, Stratified Random, Snowball, Purposive and Convenience Sampling techniques (Ahmed et al., 2016). Random samples are not applicable in this case because this study seeks to include respondents with specialist knowledge and specific characteristics. Rather, the purposive sampling technique was used for this phase of study (see Table 6.6 and Figure 6.5).

Table 6.6: The Research Sampling Criteria

Selection Criteria	Telephone Interviews	Face-2-Face Interviews	Questionnaire Survey
Minimum years of experience	5 years - professional experience	10 years - professional experience	Not applicable
Professional Affiliations	Must be Full Member of the Nigeria Institute of Architects	Full Member and Leader in a Built Environment Professional body	Members or affiliates of the Nigeria Institute of Architects
Population size	300 Professionals	Members of the Building Industry Reform Committee - 2008	300 Professionals
Sample size	24 Participants	12 Participants	300 Participants
Sampling technique	Purposive Sampling	Purposive Sampling	Stratified Random Sampling
Justification	Based on literature and thematic saturation	Based on literature and thematic saturation	Based on statistical criteria in literature
Data Collection Method	Semi structured interviews	In-depth and semi - structured interviews	Questionnaire survey

Therefore, with the aid of the professional register of the Nigeria Institute of Architects (NIA), the researcher recruited professionals listed under the chartered

categories, Full Members and Fellows of the institute. Subsequently, a list of 100 potential respondents was extracted from the register. The decision to select members of the Nigerian Institute of Architects only for this phase was informed by the Nigerian Construction Industry Codes on Conditions of Engagement (1996), which recognises Architects as the lead consultants in the building industry.

The means by which these participants were recruited involved the use of their contact details as contained in register of professionals. The researcher contacted all possible participants by email and circulated the research information sheet of this study (see Appendix B). However, after the first round of emails only ten of these contacts replied to indicate their interest to participate in the study. Following this low response rate, many of these professionals were then contacted by telephone to solicit their participation in this study which significantly improved the response rate.

In line with recommendations by Creswell (2013), this exercise continued until twenty-four suitable respondents confirmed their interest in this study. Qualitative samples must be comprised of heterogeneous groups of between 5 to 25 participants in phenomenology and 20 to 60 participants in grounded theory (Creswell 2013, p 81-89). Others like Guest et al. (2006) argue that 12 interviews would be adequate, while Elliot and Timulak (2005) also argued *'qualitative research typically tries to sample broadly enough and to interview deeply enough that all the important aspects and variations of the studied phenomenon are captured in the sample – whether the sample be 8 or 100'*.

Thereafter, follow-up emails were with a consent form (Appendix A) for participants to endorse. The participants were assured of their anonymity as all interview transcripts are de-identified and pseudonyms used as identifiers. Subsequently, interview schedules were agreed and in June 2014 the main study commenced with the telephone interviews from the UK which lasted for three months. Again, the selection criteria and sample details are presented in Table 6.6. During this phase, data was collected, transcribed and analysed simultaneously until thematic saturation point was attained after the 22nd telephone interview (see Figure 8.1). This process ensured that all relevant themes were captured until no new information or themes are observed in the data (see Guest et al, 2006).

Although qualitative outcomes are not generalisable in a traditional sense, thematic saturation is a commonly accepted practice for validating the data and sampling techniques (Elliot and Timulak, 2005) and this fully discussed in Section 8.2. Bearing in mind the focus on leadership decision-making, it must be emphasised that post qualification accreditation and membership of professional bodies is a mandatory requirement for professional practice and leadership of projects, organisations and institutions in the building industry of the study area (see 9.3).

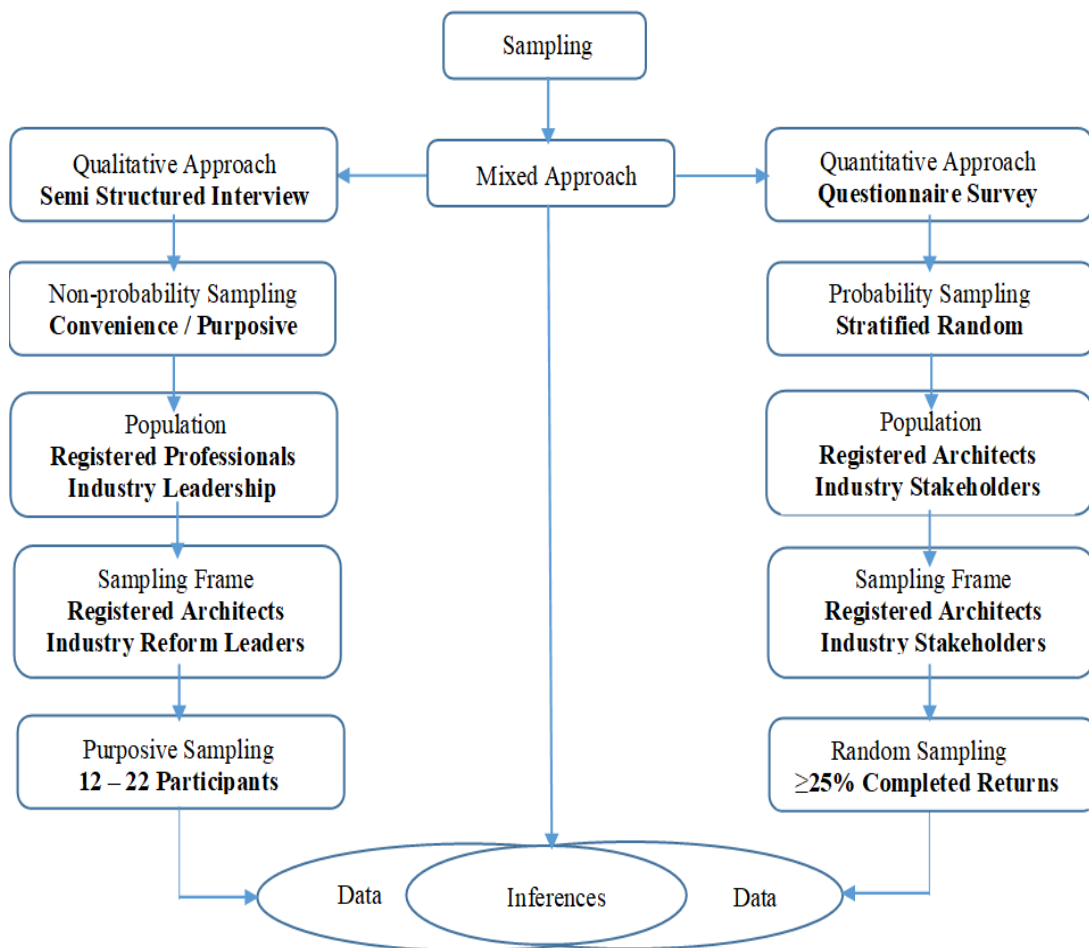


Figure 6.5: The Sampling Approach (adapted from Saunders et al. 2009)

Professional bodies through ascertained professional development, written examinations and peer interviews assess the respondents' leadership and professional capabilities. This establishment of data saturation was also useful for determining the number of participants required for the face-to-face segment of interviews. As this process was highly resource dependent, lessons learned about timings of the interviews, appropriateness of questions, cultural challenges and availability of participants were used to iteratively improve the data collection in subsequent interviews.

6.7.2.5 Sampling Strategy (Face-to-Face Interviews)

The most common sampling strategy used in qualitative research is the purposive sampling (Creswell, 2013, Elliot and Timulak, 2005), and this strategy was also adopted for the face-to-face interviews. This time the approach was used to identify and recruit participants at the macro (institutional) level of the building industry, particularly those involved in the 2010 BIR in Lagos. These participants had been identified during the pilot study and sampling commenced in November 2014, about three months after completion of the telephone interviews.

This phase of data collection lasted for two months and was concluded in January 2015. The selection criteria are outlined in Table 6.6 and Figure 6.5. This second phase of interviews sought to recruit participant at a higher level of industry. All participants in this phase of study were directly involved in the 2010 BIR in Lagos. Again, during the pilot stage the researcher had obtained the list of these potential participants from the government establishments, as well as consent to contact these leaders.

This second phase of interviews was essential to provide evidence that is representative of the leadership of the building industry and not just architects. The researcher was careful to improve the reliability and credibility of the data, which depends on the number of people involved in the study, how they were selected, the setting conditions and it is important that the people involved in the study are a representative sample of the wider population or group.

The letters of introduction from Oxford Brookes University made access to these participants easier. During this phase, telephone contact was used to confirm verbal consent and agree dates for the interviews. The location was based on the choice and at the convenience of the participants. The information sheets were sent in advance by email, which included interview questions. Therefore, the researcher interviewed 12 participants following their completion of the consent forms.

6.7.2.6 Data Collection and Analysis (Qualitative)

Qualitative studies should be conducted in natural setting (Creswell, 2013), therefore the participants of the face-to-face interviews were requested to select a venue of their choice for the interviews and most opted for their offices. The participants were encouraged to speak freely and elaborate on their accounts thereby deliberately giving power to the respondents to express themselves. All interviews were audio-recorded and transcribed verbatim with the permission of the participants.

To answer the research questions, transcripts were analysed for significant statements, meaning units, and structural description. This is important because complex problems or issues are better understood by talking directly with people and allowing them to tell their stories (Creswell, 2013). The outcome of the data analyses is presented in Chapter 8 and 9. To analyse the data the four-stage mixed method analysis (MMA) approach was followed (Tashakkori & Teddlie, 1998; Onwuegbuzie & Teddlie, 2003; and Onwuegbuzie et al, 2007).

Firstly, a thematic (qualitative) analysis was conducted through exploratory, generative, and constructive processes (see Section 8.2.1). Ghauri and Gronhaug (2010) suggested that qualitative data could be organised and categorised effectively with the aid of thematic analysis. Thematic analysis was particularly useful in the qualitative phase to allow for the identification of the central themes for presentation. Davies and Hughes (2014) stated that the development of thematic analysis enables researchers to summarise collated data by exercising content analysis and data coding to produce index data.

Thematic analysis of the transcripts was conducted separately for the two phases and the outcomes were subsequently compared and weaved together (Tables 8.2 and 9.2), followed by content analysis and descriptive statistics which were used to quantify and analyse the hierarchical structure of emergent themes (see Section 8.2 and 9.2). Based on the guidelines by Bazeley and Jackson (2013), NVivo 12 qualitative software was used for data storage, coding and theme development. The findings are presented as detailed descriptions that summarises how the individuals perceive the problems of the industry, and solutions thereof (Tables 8.3 and 9.3).

The LSR framework was used to code their description by exploring the core organisation, environment and leadership influences. These validated the subsystems within the LSR framework. The data coding in NVivo helped to inductively identify and name the emergent themes and relate them to the LSR framework. In Chapter 9, the qualitative and quantitative data were combined with literature to provide a triangulated perspective. The emerging themes were documented in memos and through rigorous data editing, repetitions were eliminated and incoherent language were interpreted for deeper understanding. This was done iteratively with the assistance of the two professors assigned as research advisors.

All alterations to the original transcripts were tracked and properly archived. Next, the meaning units from the data were extracted to understand how the different sets of meaning units describe different aspects of the phenomenon. The LSR framework was used to visually understand the project complexity and its emerging themes. Through a process of reading, reflecting, coding, annotating, linking and visualising the themes, the structure of the LSR framework was validated. The next phase of MMA is the quantitative analysis, which is described in the next section.

6.7.2.7 Quantitative Instrumentation and Pilot Testing

Surveys are associated with a deductive approach that use tools such as questionnaires (Saunders et al, 2009). A structured questionnaire survey is a resource-efficient standardised approach, which allows for ease of administration

(Holt, et al., 2014; Saunders et al, 2009). Questionnaires remain the best-known data collection instrument in quantitative techniques used by researchers in social research (de Vaus, 2014). The key components of the questionnaire for this study were developed from the outcome of the qualitative phase.

At the start of this study, the survey questions were derived from literature and following the pilot testing, they were found to be unsuitable to address the research objectives because they contained specialist jargon which made comprehension difficult for the respondents (see Section 7.7.2). Subsequently, the interview transcripts and qualitative analysis produced 43 core survey variables that were then presented on two sides of A4 paper in a five-point Likert scale format. The survey instrument was carefully developed to ensure that the questionnaires can be self-administered and the language was tailored to suit the participants. The pilot testing of the new instrument was repeated with eight participants; two academics at Oxford Brookes University, three professionals in Lagos, as well as three academics from the University of Lagos.

Revision to the questionnaire was based on feedback and knowledge gained from the first pilot study. The researcher started the quantitative phase by sending the questionnaire and information sheet online but the response rate was very low. Several email reminders were sent to potential participants; however, this did not improve the response rate. Following these failed attempts, the researcher was advised to distribute the survey at the monthly meetings of the NIA, where industry stakeholders meet to discuss the progress of the building industry. In line with this advice therefore, the low response rate was minimised by improving the content, questions and method of administration.

The questionnaire length was short, intrusive questions were avoided, and repetitive or irrelevant questions were omitted which resulted in a carefully worded instrument. The survey was distributed at the two monthly meetings of the NIA and the usable questionnaire were collated. Reliability and validity of the variables and

the survey scales items were established based on two pilot studies involving academics and professionals, as well as the triangulation of the data with the interview transcripts and literature. Based on recommendations by Duffy et al (2005), face-to-face administration of questionnaire was avoided because this technique may introduce bias due to the presence of the researcher. Therefore, the researcher distributed the survey to industry stakeholders as they arrived for the NIA meeting and received the completed ones at the end of the meeting.

6.7.2.8 Questionnaire Survey Sampling Strategy

Stratified random sampling was the preferred method (see Table 6.6 and Figure 6.5). Respondents were drawn randomly by working collaboratively with the NIA, Lagos Branch and other professional institutions in Lagos whose members meet monthly as key construction stakeholders to discuss the progress of the industry. An email containing a formal introduction, a brief research description of this phase of the study and its objectives was sent to secretariat of the NIA for approval and dissemination to potential participants. Following the approval of the Chapter Chairman, meeting dates were communicated to enable the researcher plan the distribution and collection of the questionnaires.

Sample size was considered during the research design to ensure that sample is large enough to provide answers to the research questions. Sampling is one of the ways to determine the reliability and suitability of the data for statistical assessment (see Section 8.15.1). Bearing in mind the lack of consensus amongst researchers on the ideal sample size, Tabachnick and Fidell (2013) recommended a rule of thumb, *“The larger samples are better and more reliable due to the correlation coefficient among the variables which tends to vary from sample to sample”*.

For factor analysis studies, 150 – 300 cases are adequate provided the solutions have high loading marker variables (Tabachnick and Fidell, 2013). Others suggested that the ratio of participants to surveyed items should be between 5 : 1 Tabachnick and Fidell (2013). Some examples of factor analysis studies such as Heimann et al. (2020)

and Perkins et al. (2019) collected significantly high useable samples of 450 and 437 respectively. However, the acceptable sample size for researchers appears to have reduced over the years as research tools become more sophisticated and knowledge advances (Steven, 1996; Pallant, 2016).

Particularly, examples in PM literature include Muller et al. (2012) who received 136 survey responses from a sample frame of 400 project managers, however, only 119 of these were used for the factor analysis. This study with a response rate of 29.75% exemplifies the low response issues that characterises project studies. Nonetheless, this study still satisfied the statistically requirement for publications in this knowledge area. In PM studies the minimum threshold for factor analysis of 150 cases appears to be difficult to achieve. For instance, Jitpaiboon et al (2019) had a sample frame of 121 students and received 94 completed survey for their Factor Analysis.

Other PM studies like Qureshi et al. (2015) and Zaman et al (2020) reported response rates of 56.18% and 49% respectively. Therefore, based on the sample frame as determined from the register of Architects in Lagos (n = 300), 300 questionnaires were distributed randomly at two monthly Stakeholders' Meetings hosted by the Nigeria Institute of Architects, Lagos. 151 completed and usable questionnaires were returned with a response rate of 50.33%. Therefore, this study fulfils the minimum criteria for data reduction techniques in PM based on similar published works.

6.7.2.9 Data Collection and Descriptive Statistics

To ensure that the respondents possess sufficient knowledge of the context, some questions about their professional work experience were included in the survey. The outcomes were combined with the qualitative data in Chapter 9 in response to Objective 4 of this study. The support of NIA ensured that the survey phase was completed at two successive meetings in April and May 2017. The anonymity of the respondents was enhanced by making the inclusion of names optional, completely de-identifying respondents, and analysing the data by aggregates (see Table 9.3).

The quantitative analysis in MMA has two components; descriptive statistics was used to quantify and analyse the hierarchical structure of the emergent themes while factor analysis was conducted to validate the underlying LSR structure. De Vaus (2014) opined that descriptive statistics is a core part of univariate analysis, which can be used to describe the distribution of variables. Therefore, the descriptive analysis tested the frequency of the emergent themes, as well as attributes of the respondents. Descriptive statistics is helpful for checking variables for any wrong assumptions in response to the research questions (Pallant, 2016). The next section outlines the process of inferential statistics in this study.

6.7.2.10 Principal Component Analysis (PCA)

A principal component analysis (PCA) was conducted to validate the underlying latent structure of the LSR framework (see Sections 9.15). Similar to Factor Analysis (FA), PCA can be used to estimate and validate hypothetical models. FA measures latent variables, particularly those that cannot be accessed directly, by measuring observable characteristics and then determining whether these observations reflect single or multiple variables (Field, 2018). This technique explains variance or covariance between a set of observed variables in a population by a set of fewer unobserved variables (Pallant, 2016; Tabachnick and Fidell, 2007).

In summary, it is a data reduction technique used to reduce large number of variables (or data) into fewer and manageable number of variables called factors or components thereby simplifying a hypothetical structure (Field, 2018). Therefore, covariance of the factors that influence project success in Lagos were examined to find out their underlying factor groups. Fewer underlying factors are extracted in SPSS by identifying clusters of variables that fit together from the observed variables to form a structural model (Pallant, 2016; Tabachnick and Fidell, 2007).

Collectively, PCA and FA are empirical methods used to search for the latent structure underlying a set of variables (Tabachnick and Fidell, 2007). They are both linear models; however, FA is particularly useful for developing and assessing theory, while PCA focuses on the maximum amount of total variance in a correlation matrix by

transforming the original variables into linear components (Field, 2018). This means that PCA seeks to analyse all variance, including unique, shared and error variance while FA only analyses shared variance. The foregoing is the main advantage of PCA over FA (Field, 2018).

In spite of these differences, Tabachnick and Fidell (2013) concluded that in practice the two approaches often result in very similar solutions, particularly when the pattern of correlations among the items is clear and the sample size is significant. Therefore, PCA is the choice for the study since the goal is to reduce the large number of variables in Table 9.2 into fewer factor groups, rather than developing theory. Section 9.15 outlines the processes undertaken to arrive at these outputs and the last phase of the MMA process involves the discussion on alignment and contradictions of the data (Sections 8.15 and 9.16) which permits conclusions to be drawn.

6.7.2.11 Discussion of the Research Outcomes

In Chapter 10, the mixed method approach concludes with the triangulation, interpretation and discussion of all data collection outputs. The research outputs are compared with extant literature to end the MMA and the nature of project complexity and leadership decision making is discussed based on the structure of the LSR framework and metaphors of CAS theory. This final stage of the SMME study aligns with Objective 5 of the study, which is achieved through a triangulation of data from literature, interviews and questionnaires research output.

The complementarity of qualitative and quantitative techniques provides a robust understanding of the phenomenon of project complexity and the coherence of the LSR framework as a meaningful and coherent whole (see Onwuegbuzie & Combs, 2010, p. 398). Similarly, Chapter 10 discusses the extent to which the research questions have been answered and the revision of the LSR framework is undertaken based on the findings of this study. Recommendations are made to improve understanding of the role of leadership in CAS.

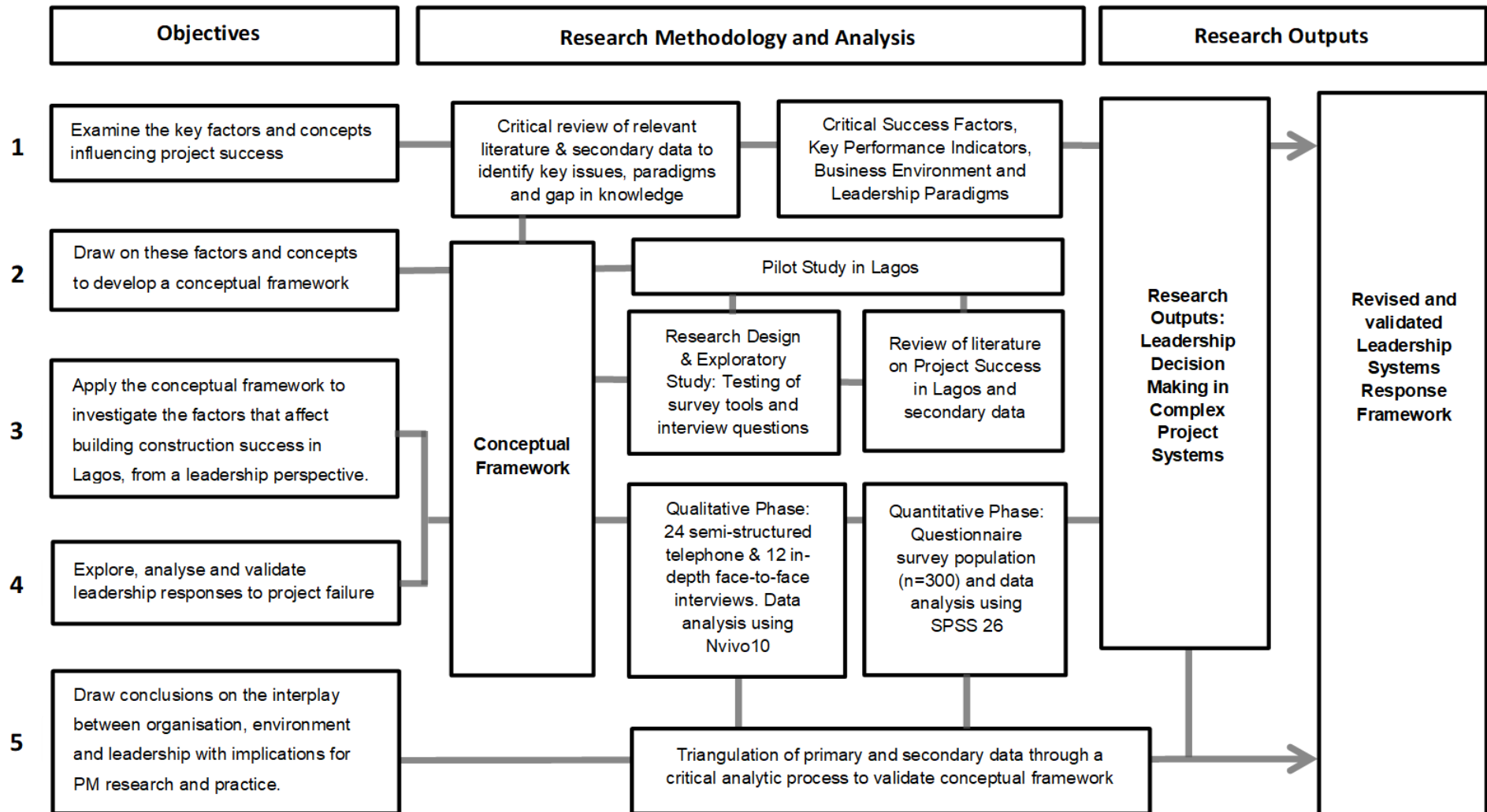


Figure 6.6 Summary of the LSR Research Design

To guarantee the reliability of this study, the entire research process is transparently described with detailed descriptions of the research design and explicit theoretical grounding. Similarly, the careful design of this study's instruments, epistemological choices, proper sampling, appropriate research design and pilot study improved the validity of the research outcomes (see Ahmed and Opoku, 2016 p. 8 cited Ahmed et al., 2016; Holt, Goulding and Akintoye, 2014; Creswell, 2013). Overall, the research design is summarised in Figure 6.6.

6.8 CONCLUSION

The research design has been linked directly to the nature of the research problem, stated questions and what this research intends to achieve. As a lens, the LSR framework makes project complexity and the interplay between organisation, environment and leadership apparent. As Paul Cilliers' *Critical Complexity* (2016) sheds light on why we cannot know complex things completely, the intention of this study is not to establish causation between leadership decision-making and project success.

This is empirically difficult to achieve in the context of building construction projects since causation can only be established in an environment where the parameters affecting the phenomenon under study can be controlled. The choice of the mixed method approach is informed by its pragmatism and to conclude this chapter, it is instructive to reflect on the words of Gomm (2008 p 5);

'In complex phenomena everything prior influences everything subsequent, but not consistently, and how things turn out depends on how things started – which means they usually turn out differently every time. If this is so then it further undermines claims that experiments conducted under highly controlled conditions can tell us what will happen on another occasion even when what appear to be the same actions are taken'.

As the study moves into its empirical phase the preceding statement underscores the challenges of what can be achieved. There was a strong case for combining methods; the qualitative methods being used to intricately examine textual evidence of leadership decision making and how it affects project success based on knowledge and experiences of leaders in the building construction industry.

At the same time, the quantitative technique complements the qualitative outcomes, enabled larger samples of respondents participate in the study and improved the statistical validation of the LSR framework. Finally, this study is focused on the context of developing countries where arguably higher levels of complexity are manifest and the next chapter examines at the building industry in Lagos, Nigeria to critically review the state of the building industry and validate the research design.

CHAPTER 7

EXPLORING THE CONTEXT OF LAGOS, NIGERIA

7.1 INTRODUCTION

This chapter focuses on the pilot study and the context of Lagos to improve understanding of the state of its building industry in response to research Question 1. Issues that may impede the main study and some of the factors influencing project success are clarified. The significance of the context is also examined, as well as its representativeness as a microcosm of Nigeria. Primary, secondary and tertiary data are examined to enhance this phase of the study, using the LSR framework as a lens. Unique events and trends in Lagos are also examined to improve the depth of the discourse.

Furthermore, the data was collected to test and validate the research design, data collection tools and LSR framework. This guaranteed that the strategy for this study was fit for purpose and could adequately answer the research questions. Overall, the analysis of trends relating to the building construction industry in Lagos sought to draw inferences on its semblance with those peculiar to the context of developing countries as outlined by Rwelamila (2012), see Section 7.4. This phase of the study improves the reliability of the LSR framework as a lens to guide the empirical phase of this study.

7.2 PILOT STUDY IN LAGOS, NIGERIA

In his study, Pinto (2016) suggested that Lagos is still in desperate need of developing and maintaining infrastructure to support its growing population and complement its status as the largest and fastest growing city in sub-Saharan Africa. Nevertheless, he concluded that in 2010 the government launched an ambitious urban development programme to address these needs with numerous initiatives such as the Metro Blue Rail Line, Eko Atlantic, Bus Transit System and power plants across the state (Pinto, 2016 p. 22). However, Table 7.1 suggests that the outcome of projects in this context have been largely unsatisfactory and project strategies continue to challenge government, as well as built environment stakeholders at all levels.

To address the research objectives and gap in knowledge, it is pertinent to seek an understanding of the state of the building industry and examine factors influencing project success by drawing on tertiary, secondary and primary data. Therefore, the pilot study began by drawing government publications and newspaper reports, followed by journals and other web-based data sources. Subsequently, a questionnaire survey and interviews were conducted to test the research questions and improve the research design, ensuring that scarce research resources are utilised efficiently. This phase of the study commenced in December 2013 and lasted for 6 weeks.

The questionnaire survey was distributed first, followed by semi-structured interviews and the entire process involved 12 participants; six questionnaires were distributed to three professionals and three academics while six face-to-face semi-structured interviews were conducted. This allowed the researcher practise interviewing and survey administration in preparation for the main study. The sampling method for this phase was convenience sampling by selecting readily available but suitably qualified academics and professionals. The academic respondents for the questionnaire phase were recruited from the University of Lagos while the respondents for the interviews were recruited from amongst contractors, professionals and government regulators practicing in the building industry in Lagos.

The main purpose of this exploratory phase was to develop a deeper understanding of the research context, specifically examine evidence regarding the building industry events and trends in Lagos. It also sought to test the efficacy of the research methods and appropriateness of the data gathering tools as proposed. This process improved the research design and deepened understanding of the research problem. Furthermore, the novelty and nature of research study area made it imperative to examine the context for methodological constraints, which further informed revision of the research approach. These provided some insight on the efforts to ameliorate building collapse in Lagos and the mixing of methods will improve depth and breadth of the analysis of leader's responses.

7.3 STATE OF THE CONSTRUCTION INDUSTRY

The following sections are comprised of a critical review of literature on the state of the construction industry in Lagos, and Nigeria, to assess the success of construction projects and examine other related challenges. Notably, the terms 'housing' and 'buildings' though clearly distinct phraseologies are used interchangeably to describe building construction projects, which include buildings for dwellings, commercial and institutional use. Giving the background of rapid urbanisation, secondary data is reviewed to understand the state of the construction industry since 2010. This timeline is based on the study by Pinto (2016), as well as government and newspapers reports on the reforms in the built environment in Lagos between 2008 -2010.

Starting with the national outlook, the World Bank (2016 p 5) suggested that Nigeria has a housing deficit of 17 million housing units as at 2013 and the Nigerian government was similarly quoted; *"Successive efforts to meet this target have failed... Consequently, at least N60 trillion is required to provide 17 million housing units at N3.5 million per unit"* (World Bank, 2016 p. 6). Likewise, ThisDay Newspaper (April 15, 2012) reported in its Home News section that the housing deficit in the country was showing no sign of improvement with 85 percent of the housing stock being provided by the private and informal sectors. Whilst this thesis is not about housing deficit or Nigeria as a whole, a brief review of the wider issues of housing demand and supply dynamics provides a deeper understanding of underlying challenges that have resulted in poor construction practices.

In Lagos, the housing deficit translates to about 10 percent of the national figure and it is anticipated that this figure will continue to rise (Aluko, 2011a). Notably, some of the discourse in this section will be about Nigeria while inferences will be drawn about Lagos based on its' economic and demographic significance, which have been discussed previously (Section 1.3.3). Government housing programmes at all levels have been largely unsuccessful due to poor policy formulation and implementation while recent efforts to address the deficit have been mostly private-sector led (Ebehikhalu and Dawam, 2015). Arguably, the building industry is chaotic and the overall failure rate of building and infrastructure projects is rising (Ede et al., 2014).

The public domain is rife with reports of widespread economic losses. This results from poor construction outputs, project delays, abandonment and outright building collapse, see Table 7.1. This trend has persisted despite public outrage and stakeholder interventions. Again, to examine these peculiarities it was necessary to understand the characteristic trends in the larger context of Nigeria, then draw inferences on how the construction industry has evolved in Lagos. Ede (2011) argued further that as Nigeria continues to experience population growth and increased economic activities, the social demand for developmental facilities become even more pressing. Evidence of these problems from thirty-six purposively selected studies are summarised in Table 7.1.

To underscore the significance of the external environmental factors, Fagbadebo (2007) argued that governance issues are the bane of national development and political instability in Nigeria, stressing that some of the key issues faced include corruption, profligacy, high unemployment rates as well as widespread abysmal physical and infrastructural underdevelopment. He concluded that in order to break this cycle, accountability and transparency have to be guaranteed in all sectors of the economy and the people have to be involved in issues that affect their lives and immediate environment. This narrative on the political state of the nation is relevant given that the government is the biggest client in the industry and the key driver of construction-related transformations.

Economically, in September 2013 the African Development Bank Group published a report on Nigeria following a statistical economic rebasing exercise that propelled the country to the largest economy by GDP in Africa. It was further ranked 26th largest economy in the World based on the same criteria and 121st by per capital income (Oxford Business Group, 2014). It would later be surpassed by Egypt as the largest economy in Africa (PwC Nigeria, 2019) and some critiques, such as The Economist of April 12, 2014 suggested that this economic elevation does not necessarily translate to improved quality of life for the populace. Nonetheless, these numbers underscore Nigeria's growth potential.

Technological inadequacies have continued to limit the efficiency and effectiveness of project delivery in Nigeria. Equere and Tang (2010) evaluated the consequences of the dearth of automation and low technological development in the Nigerian construction industry and concluded that this has resulted in increased project cost, tedious work processes and low

efficiencies. Other problems include scarce housing finance and lack of consistency in policy formulation (Ibem et al, 2011). Particularly, poor housing policy formulation and implementation have resulted in 75 percent of the urban dwellers in Nigeria living in slums with degraded conditions (Olotuah and Bobadoye, 2009).

These are a few examples of conditions with far-reaching implications for the construction industry. These studies provide a snapshot of the underlying problems within the external environment, which have an impact on project success. The investigation of these challenges in the context of Lagos provided a basis for the pilot study, revision of the research strategy and subsequent fieldwork in line with assertions by Ramanathan et al. (2012) that majority of projects around the world fail to meet the set objectives. Due to its peculiar status, Lagos has become the centre where many of these Nigerian challenges have manifested.

The key recommendations from these studies are summarised in Table 7.2 and a careful examination reveals elements of both organisation- and environment-related factors are included in this data. Notably, these cited literature were deliberately selected to provide insight of the state of the construction industry within five years of the 2010 Building Industry Reforms in Lagos. Nevertheless, the problems and recommendations enumerated in Table 7.1 and 7.2 remained prevalent several years after the industry reforms. Challenges such as the prompt delivery of construction projects in Lagos Mega City (Ogunde et. al, 2017), project cost overrun (Akinradewo, Aigbavboa and Akindewo, 2019), project abandonment (Alao and Jagboro, 2017; Adebisi, Ojo and Alao 2018), mechanisation and technology issues (Babatunde et al., 2019; Oviawe and Uwameiye, 2020) appear to be rife in this context.

Furthermore, economic issues (Abubakar, Abdullahi and Bala, 2018), procurement issues (Nwokenkwo, Yunusa and Faruk, 2019), policy issues (Akinshipe, Oluleye and Aigbavboa, 2019), corruption (Adindu et al, 2020), contractor-related issues (Omopariola, Ilori and Windapo, 2019) and effects of project management skills (Inuwa, Joseph and Musa, 2018) continue to pose constraints to project success in the building construction industry. Unfortunately, these challenges are further exacerbated by the incidences of building collapse in Nigeria (Okagbue et al, 2018), with Lagos experiencing the highest number of occurrences which results in environmental disaster, as well as loss of human lives, properties, incomes, investments, trust and dignity of individuals in society (Ede, 2013; Isreal and Kukoyi, 2021; Okunola, 2021). Building collapse and other industry related events are discussed next.

Table 7.1: Examples of the problems of the building construction industry in Lagos and Nigeria

PROJECT ISSUES	REFERENCES	SUMMARY OF FINDINGS
Construction Delays and Costs Overrun	Akinsiku and Akinsilire (2012)	Financial, design, project planning, environmental, communication, contractor and logistics related issues
	Ibironke et al (2013)	Insufficient equipment, inaccurate time and cost estimates, payment difficulties and change orders
	Udofia et al (2015)	Reasons for road project premature termination include site conditions, budgetary problems, incompetent contractors, design problems and so on
	Adegbehingbe (2012)	Inadequate cashflow is the most prominent problem, delay of approval of drawings was identified as a major problem
	Fatoye (2012)	Inadequate resources, delayed payment, poor site management and supervision result in project delays.
Construction Abandonment	Ayodele and Alabi (2011)	Inadequate planning and finance, inflation, contractors' bankruptcy and variation of project scope
	Olalusi and Otunola (2012)	Poor infrastructural facilities, government policies, cash-flow, procurement, project resources, incompetent consultants and contractors, defective design
Building Collapse	Amadi et al (2012)	Poor design and construction, building materials, contractors, maintenance culture, absence of site investigation and incompetent personnel
	Ayodeji (2011)	Poor quality building materials and workmanship, excessive structural loading, natural phenomenon, design error and poor maintenance culture
Construction Technology	Dahiru and Shehu (2012)	Poor concrete production methods on site and non involvement of construction experts,
	Ede et al (2014)	Inferior steel reinforcement used in construction
Construction Economics	Nubi and Njoku (2011)	High costs of completing land documentation and registration in Lagos impedes housing delivery
	Taiwo et al (2014)	High interest rates on mortgages and private-sector housing financing
	Akanni et al (2014)	High currency exchange rates and cost power of power supply, changes in government policy and legislation
Construction Procurement	Awodele et al (2012)	PPP procurement framework is necessary for housing and infrastructure development in Lagos
	Ajayi et al (2012)	Risk assessment methodology not utilised in Design and Build projects
	Famakin et al (2012)	Bid evaluation methods are inadequate to ensure effective construction delivery in Lagos
	Idoro (2012)	Lapses have been identified in project documentation
	Babatunde et al (2014)	Technological-, environmental-, social- and variations-related factors limit the implementation of PPP infrastructure mega-projects
Policy and Legislation	Dahiru (2012)	Government does not have adequate finances and capacity to bridge the critical infrastructure gap and improve PPP investment
	Aluko (2011a)	1978 Land Use Act, housing provision issues such as high costs of land titles, high interest rates on mortgages and high importation of building materials
	Aluko (2011b)	Incapable planning authorities and enforcement of planning ordinances
	Olarenwaju (2013)	Insufficiency of infrastructure facilities and habitable housing among the urban poor in Lagos
	Ebehikhalu and Dawam (2015)	Nigeria's housing policies have been wasteful due to corruption, inequality, inconsistencies and under-funding
Governance and Corruption	Awe et al (2009)	Shortage of skilled workforce is the most pressing issue in the industry
	Okafor (2013)	Evidence of profligacy of the state, nepotism, accumulation of wealth by public servants and ethnicity in recruitment and promotion of public officers
	Fagbadebo (2007)	Evidence of leadership crisis, political intrigues and corruption
	Ekanem and Ekefre (2013)	Corruption, failure of institutions, low salary, poor economy, social disorder, ambiguity of laws, poor social values and ethics and weak regulations
	Opoko and Oluwatayo (2014)	Lagos State Government lacks the capacity to cope with the problems arising from urbanisation
Contractors	Ijaola (2012)	Lack of knowledge on Risk Management
	Akinola et al (2012)	Lack of Total Quality Management principles among indigenous construction firms in Nigeria
	Adamu et al (2012)	Lack of training and limited human skills amongst the construction workers in Nigeria
Project Management	Diugwu et al (2015)	Failure due to poor adherence to project management principles in conceptualisation, design and construction
	Ogwueleka (2011)	The operating environment has a vital role in determining the critical success factors influencing project performance
	Anyanwu (2013)	Improper planning and scheduling issues without input from a certified project manager resulting in project failure
	Zuofa and Ochieng (2014)	Corruption and lack of professionalism are among the main causes of project failure in Nigeria

Table 7.2: Recommendations for the building construction Industry in Lagos and Nigeria

PROJECT ISSUES	REFERENCES	RECOMMENDATIONS
Construction Delays and Costs Overrun	Akinsiku and Akinsilire (2012)	Proper planning and budgeting at inception, good project management monitoring and control at execution phase
	Ibironke et al (2013)	Project financing, competent project manager and experienced contractors
	Udofia et al (2015)	Proper risk management template required, proper budgeting, competent contractor and project clients' participation
	Adegbehingbe (2012)	Address the causes of delay of approval of drawings
	Fatoye (2012)	Adequate funding and training programmes for organisations' personnel
Construction Abandonment	Ayodele and Alabi (2011)	Adequate project planning and funding, competent professionals, prompt payment of contractors and reduction of scope variation
	Olalusi and Otunola (2012)	Curb corruption, establish National Construction Bank, improve project funding, culture reforms - transparency, fairness, accountability and honesty
Building Collapse	Amadi et al (2012)	Pre-construction soil survey, qualified professionals, enforce National building code and SON to improve quality of building materials
	Ayodeji (2011)	Engage qualified professionals, SON to improve quality of building materials, proper training of workforce and incentivise workmen
Construction Technology	Dahiru and Shehu (2012)	Employ professionals to supervise all construction works and strict adherence to specifications
	Ede et al (2014)	SON to ensure superior steel in the construction market
Construction Economics	Nubi and Njoku (2011)	Set up National Lands Bureau to improve land ownership registration and issuance of titles which will enhance mortgage financing
	Taiwo et al (2014)	Low interest loans and comprehensive PPP approach for housing finance
	Akanni et al (2014)	New government policies, reduce importation of building materials, improve power supply and reduce cost of fuel
Construction Procurement	Awodele et al (2012)	Government to develop a framework to attract investment partners and training of public officers in PPP concepts
	Ajayi et al (2012)	Proper risk assessment methods essential to deliver DandB projects particularly Cost, Quality and Schedule risks
	Famakin et al (2012)	New improved techniques of bid evaluation should be incorporated in construction systems in Lagos State
	Idoro (2012)	Proper project documentation required at all levels of the project lifecycle
	Babatunde et al (2014)	Critical success factors include enabling legislation, strong commitment of stakeholders and adequate project financing
Policy and Legislation	Dahiru (2012)	Implement PPP governance system in Nigeria, reduce political uncertainty, improve incentives, guarantee return on investment by the private sector
	Olarenwaju (2013)	Improve policy formulation, effective policy, adequate project funding schemes and public enlightenment
	Aluko (2011a)	Review Land Use Act, improve policy formulation and housing development
	Aluko (2011b)	Collaboration with other stakeholders such as professional bodies has become essential; capacity building of personnel is also required
	Ebehikhalu and Dawam (2015)	New development strategies for mass housing required
Governance and Corruption	Awe et al (2009)	Develop a workable "best practice framework" for the vocational education and training of tradesmen in the construction industry.
	Fagbadebo (2007)	Citizenry should get involved in issues affecting the state especially in choosing their leaders
	Okafor (2013)	Fight against corruption should be concerted between the state, citizenry and other stakeholders
	Ekanem and Ekefre (2013)	Statutes against corruption required, stronger values, reorientation of the populace, education, collaboration of stakeholders and so on.
	Opoko and Oluwatayo (2014)	Proactive planning, regulatory framework, improve housing finance, use indigenous building materials, engage qualified professionals in projects
Contractors	Ijaola (2012)	Provide risk management training to contractors' personnel
	Akinola et al (2012)	SON to improve enforcement and demand higher quality from contractors
	Adamu et al (2012)	Construction companies to adequately train workforce to be multi-skilled.
Project Management	Ogwueleka (2011)	Objective management, management of design, technical factors, top management support and risk management to improve project performance
	Diugwu et al (2015)	Integrate PM principles on infrastructural projects, ensure robust monitoring
	Anyanwu (2013)	Use project management tools, train construction professionals in PMBoK, especially for proper planning and monitoring of project activities
	Zuofa and Ochieng (2014)	Introduce a proper governance mechanism, establish PMOs, introduce PM communication strategies and train personnel in project management

7.4 THE EVENT LEVEL ANALYSIS

The evaluation of any system to unravel its complexity and problems arguably begins with the assessment of visible and symptomatic events (Monat and Gannon, 2015). This section examines two events; the occurrence of building collapse and; how the government and other relevant stakeholders in Lagos have addressed this problem. Building collapse is an extreme case of project failure which has had very debilitating effects on the people and society in Lagos, particularly in terms of security and socio economic challenges (Isreal and Kukoyi, 2021). This warranted the intervention of government and professional institutions through Building Industry Reforms an examination of which will provide some insight into project complexity and its impact on leadership decision-making and project success.

The purpose of this section is not to provide a systematic review of building collapse in Lagos, Nigeria (see Okagbue et al, 2018). Rather, the evaluation of these challenges at the event level seeks to focus on how leadership in the building industry responds to project challenges, as well as the effects and outcomes of leadership intervention which aligns with the aim and objectives of this study. At the time of completing this phase of the study, building collapse was the most significant project-related issues in the building industry in Lagos and purposefully selected newspaper reports on this issue are presented in Table 7.3. This was examined to give latter stages of the study a clear focus and form the basis for preliminary data analysis at the pilot study, alongside other challenges presented in Tables 7.1 and 7.2.

7.4.1 Building Collapse in Lagos

Edes' 2013 study revealed that buildings that collapse in Lagos are predominantly multi-floor structures in suburban areas ranging from new-builds, those still under construction and older existing buildings. In the absence of a centralised database for building collapse, purposefully selected newspaper reports compiled in Table 7.3 provide evidence of occurrences of building collapse in urban areas such as Ikeja and Lagos Island, as well as suburban areas such as Ikotun and Agege. Therefore, this problem is not limited to specific sections of the state and there were 33 occurrences in 2012 alone (Israel and Kukoyi, 2021 p. 11), which underscores the significance of the problem. Table 7.3 reveals records of collapsed residential institutional and commercial buildings, both public and privately owned.

ThisDay (July 27, 2016) reported that Lagos had emerged as the State with the highest case of building collapse in Nigeria based on statistics of incidences between 2007 and 2016 accounting for 51.5% of the 64 recorded incidences across Nigeria. Therefore, similar to the previous intervention by government in 2008, on May 20, 2015 the State Government set up a Tribunal of Enquiry on Building Collapse. This tribunal reported that building collapse has persisted in Lagos for reasons including building projects being handled by unqualified and uncertified persons referred to as quacks; poor enforcement of the building control law; corruption by all stakeholders; and ineffective law enforcement (The Guardian Nigeria Newspaper, 29 January 2018).

These reports and literature conclude that these problems are primarily man-made and result from institutional failure (Israel and Kukoyi, 2021; Okunola, 2021), while ThisDay Newspaper of November 8, 2016 observed that the inauguration of commissions of inquiry to investigate these events is a regular occurrence in Lagos. These commissions are usually comprised of leaders within the building industry drawn from the seven built environment professional bodies. These include chairpersons of the Nigerian Institute of Architects (NIA); Nigerian Institute of Building (NIOB); Nigerian Institute of Quantity Surveyors (NIQS); Nigerian Institution of Estate Surveyors & Valuers (NIESV); Nigerian Institution of Surveyors (NIS); Nigerian Society of Engineers (NSE); and Nigerian Institute of Town Planners (NITP); all of the Lagos State Chapters of these professional bodies.

Back in July 2008 the Lagos State governor, Mr. Babatunde Raji Fashola, set up a similar technical committee that would eventually make recommendations for the reform of laws relating to physical planning, building control and urban regeneration. Brig-General Tunde Reis (rtd) led this Technical Committee and their comprehensive work included wide-ranging consultations with members of the various built environment professional bodies and other representatives of non-governmental organisations. Therefore, the members of this 2008 Technical Committee and leaders of the professional bodies formed the target population for the industry level segment of the main study as outlined in Section 6.7.2.5.

Table 7.3: Samples of newspaper reports of incidences of building collapse in Lagos (2006 – 2019)

Incidences of Building Collapse in Lagos, Nigeria						
S/No	Publication	Date	Event	Death toll	Causes of Collapse	Outcome
1	Punch Newspaper	March 00, 2006	Collapse of the top 9 floors of the 21 storey Bank of Industry (BOI) building, Broad Street, Lagos Island	2	Fire gutted two floors in the building, weakened structure, heavy rain/winds	No legal consequence
2	Punch Newspaper	July 18, 2006	4 storey 'Titanic' residential building, Ebute Metta with 36 flats with capacity to house 180 people	28	Faulty construction attributed	No legal consequence
3	Punch Newspaper	July 00, 2013	3 storey residential building at Oloto Street, Ebute Metta previously marked for demolition	7	Distressed structure and marked for demolition in 2012 but occupants continued to inhabit the building	No legal consequence
4	Punch Newspaper	September 12, 2014	Collapse of 6 storey Synagogue Church Guesthouse, Ikotun	116	Completed and crowded building collapsed with reports from the church owners of sabotage	Legal case ongoing
5	Punch Newspaper	March 08, 2016	Collapse of 5 storey residential building at Lekki whilst under construction with several workers living on site	34	Government described it as an act of defiance and impunity by the building owners because the building had been previously sealed due to wrong construction methods/contraventions	No legal consequence
6	Reuters	December 25, 2016	Collapse of 2 storey building in a Police Training College in Ikeja District, Lagos	2	Structural defects	No legal consequence
7	Premium News / Observer	May 29, 2017	Collapse of 3 storey building at Daddy-Alaja Street, Oke-Arin Lagos Island undergoing renovation	2	Structural defects	No legal consequence
8	VOA Africa / Tribune	July 26, 2017	Collapse of 4 storey residential building at 3 Massey Street in Lagos Island, Lagos	8	Structural defects	No legal consequence
9	Punch / Sahara	August 29, 2017	Collapse of 3 storey residential building at 21 Saka Okoro Street, Ilufe Road, Ojo Alaba, Lagos with 8 flats	0	Had been marked for demolition by Lagos State Government due to structural defects and occupants had been evacuated at the time of collapse	No legal consequence
10	Vanguard	March 31, 2018	Collapse of single storey building at 9 Abeje Street, Morikaz Road Agege	2	Had been marked for demolition by Lagos State Government due to structural defects and residents remained in defiance of the law	No legal consequence
11	Reuters	March 15, 2019	Collapse of 4 storey primary school building at Ita-Faji, Lagos Island	20	Structural defects	No legal consequence
12	The Nation	March 25, 2019	Collapse of 3 storey building at Kakawa Street, Lagos Island	0	Structural defects; the building had been marked for demolition	No legal consequence

These leadership samples are essential due to their pivotal role in shaping the building construction industry in Lagos. Participants were clearly identified at the pilot study to inform the sampling strategy. The process of consultation and reporting by the 2008 committee lasted approximately two years and culminated in the 2010 law establishing the Lagos State Building Control Agency (LASBCA) by the Lagos State Government and its' House of Assembly. This is the institutional and legal framework for the 2010 Building Industry Reforms in Lagos, which Pinto (2016) alluded to. Therefore, an examination of the effects of this leadership decision in response to building collapse will provide some insight into how project success can be improved within the context of complex systems. The next section will briefly trace the development of this new regulatory agency based on information published on the Lagos State Government website.

7.4.2 Establishment of the Lagos State Building Control Agency

In his study of Planning Laws in Cosmopolitan Lagos, Aluko (2011) concluded that planning for housing and setting standards for the regulation of building construction is a task that seems to overwhelm the relevant government authorities in Lagos. He concluded that the enactment of the Lagos State Urban and Regional Planning and Development Law 2010, following comprehensive engagement between the public and private sector leadership, has been touted as the panacea to the problems of the industry in Lagos (Aluko, 2011).

In the wake of consistent building collapse, this new law resulted in major restructuring of the ministry responsible for the physical development of Lagos State. The Lagos State Government website suggested that since the creation of Lagos State, the Ministry of Physical Planning and Urban Development had been the hub of Town Planning activities in the State, however, following the advent of democratic rule in 1999, the ministry went through the following historical evolutions;

February 2001: Creation of the Office of Physical Planning under the aegis of the Ministry of the Environment and Physical Planning

January 2003: Splitting of the Ministry of Environment and Physical Planning into two Ministries

July 2003: Scope of operations of the Physical Planning was expanded to include Urban Development

July 2010: Physical Planning, Urban Development and Building Law of Lagos State was enacted and the Ministry of Physical Planning and Urban Development assumes the supervisory role in the affairs of three parastatals created as a result of this new planning law. These parastatals are Lagos State Urban Renewal Authority (LASURA), Lagos State Physical Planning Permit Authority (LASPPPA) and Lagos State Building Control Agency (LASBCA) all having clearly defined and differentiated mandates.

July 2011: Lagos State Government announces the immediate take-off of the Lagos State Building Control Agency (LASBCA) following frequent occurrence of building collapse in Lagos. Their mandate and functions include;

- The inspection of building works and the certification of various stages of building construction and keeping of such records;
- Removal of illegal and non-conforming developments;
- Identification and removal of distressed buildings to prevent collapse;
- The provision of building services such as material evaluation and testing, fire and public health control;
- Conducting research in building construction and control;
- Cooperating with the Development Permit Authority to achieve zero tolerance of illegal developments and;
- The issuance of Certificate of Completion and Fitness for Habitation.

These government interventions not only resulted in the establishment of a new institution but also led to the restructuring of existing ones to make them more efficient. However, despite these interventions buildings continue to collapse in Lagos as Table 7.3 reveals. Therefore, based on the studies on project complexity in Chapter 4 and the data from this pilot phase, this study argues that the linear approach to problem solving is rife in Lagos and this approach does not take into account the complex nature of project systems. This argument was pivotal in the assessment of leadership decision-making in the main study.

LASBCAs' impact and the problems of the building industry are further evaluated in the main study (see Chapter 8). To improve understanding of the factors affecting project success, the next section will examine the trends in Lagos. Published literature from Table 7.1 are examined against the building industry criteria set by Rwelamila (2012) for developing countries. It is anticipated that these will provide some inferences on why these problems have persisted, thereby reinforcing the significance of the context of Lagos. These will provide a primer for evaluating the complexity of the industry using the LSR framework.

7.5 THE TREND ANALYSIS

Rwelamila (2012) suggested that the challenges of the construction industries in majority of developing countries are more complex and shrouded with uncertainty, requiring a greater level of management innovation. Therefore, the common characteristics of the construction industry in developing countries include low income of majority of the workforce, poverty, poor access to capital, low economic prospects, insufficient infrastructure, poor maintenance culture, rapid urbanisation, inequitable wealth distribution and low industrialisation (Rwelamila, 2012). These challenges make project execution in these climes more difficult, resulting in the loss of investments and low public confidence in the construction industry and its practitioners. Regarding project delivery, he opined that sufficient numbers of experts to support the planning, design, and implementation of construction projects was lacking.

Although this is not a case-study research and the generalisation of the outcome of this study is not intended, drawing similarities between the features found in Lagos, Nigeria and those of other developing countries improves the significance of the study area. The analysis of the data presented in Table 7.1 and 7.2 provides some understanding of factors that influence building construction success. These were used to validate the segments of the LSR framework (see Table 7.4 and 7.5). Ultimately, inferences were drawn on leadership decision-making to understand the larger phenomenon of complex systems.

Table 7.1 provides some evidence of problems in the building construction industry and the data reveals an array of organisation factors including construction delays, cost overrun and construction abandonment, as well as environmental factors such as low construction technology and legislation challenges. Although many of these features relate to Nigeria, it

had been noted that as the country's most populous and economically boisterous city, Lagos manifests a majority of these problems particularly the highest incidence of building collapse. Therefore, Okagbue et al (2018 p 1395 - 1396) provide a list of 28 causes of building collapse in Nigeria, many of which align with pattern prescribed by Rwelamila (2012).

Some of these issues include the poor state of planning for the maintenance of completed built assets, lack of sound PM approach, corruption stemming from insufficient transparency in the selection of projects and subsequent implementation of projects, as well as the lack of an umbrella organisation to cater for the interest of the stakeholders of the construction projects and coordinate the activities of the construction industry which breeds fragmentation amongst stakeholders. Therefore, many of the features found in developing countries as described by Rwelamila (2012) are manifest in Lagos. Particularly, the following were discovered about the context based the desk research (see Okagbue, 2018; Okunola, 2021; Israel and Kukoyi, 2021) and the primary data from the pilot study;

- a. Massive rural to urban migration persists leading to rapid urbanisation, inequitable distribution of wealth and uncontrolled physical development in Lagos State.
- b. From some of the incidences of collapsed buildings cited, including the Bank of Industry building in Lagos Marina, there is evidence of poor maintenance culture within the built assets.
- c. Infrastructure is evidently insufficient from the data examined.
- d. Poor access to capital for building and infrastructure projects is highlighted and the establishment of a National Construction Bank to provide low-interest funds is proposed. Although the economy in Lagos appears to be boisterous, prospective developers are still plagued with uneven wealth distribution and the lack of robust financial institutions and corrupt practices within government establishments, which have made prospecting difficult.
- e. Although Nigeria is an oil-rich nation, there is evidence of high importation of foreign technology and low automation in the building industry in Lagos due to limited mechanisation and industrialisation.
- f. Weak regulation and insufficient number of experts to support planning, design and implementation of building construction projects, even in the new regulatory agency.

- g. Corruption appears to pervade the construction industry and this has festered due to the lack of transparency and accountability by government, as well as the weak judicial system. Notably, at the time of completed this study no one had been found culpable for the numerous building collapse incidences in Lagos.
- h. Low income of the workforce is a common feature, both in the public and private sectors, which is assessed based on global per capital income indices of the country.
- i. Project management as a profession is still at its infantile stage and this knowledge gap may be responsible for some of the problems in the building industry.
- j. Several attempts to develop an umbrella organisation to cater for the interest of stakeholders in the building construction industry have failed resulting in fragmentation of disciplines and adversarial relationships amongst the various stakeholders in Lagos.

Although causation is difficult to validate, occurrences of building collapse in Lagos cannot be completely dissociated from these observed organisational, environmental and leadership issues. As these patterns persist, Rwelamila suggested that the building industry would require a strong tradition of greater cooperation and collaboration between the public and private sector stakeholders. This was examined further in the main study in the light of the fragmentation amongst disciplines and agencies, to provide some insight on why these problems have persisted. Therefore, Lagos appears to provide an ideal context for this study and the next section examines project complexity with the aid of the LSR Framework.

7.6 TESTING THE LEADERSHIP SYSTEMS RESPONSE FRAMEWORK

Understanding the systems structure is at the heart of this study. Particularly, in human-designed systems repeated events or trends derive from systemic structures. Events and patterns that we can observe are often caused by systemic structures that are hidden (Monat and Gannon, 2015). This section sets the stage for the main study by providing some understanding of why projects continue to fail and leadership decision-making remains difficult in Lagos. This was achieved by evaluating the subsystems of the building construction industry using data from the 36 publications outlined in Tables 7.1 and 7.2 with the LSR

Table 7.4: Categorisation of the problems of the building industry in Lagos and Nigeria

LSR SUBSYSTEMS	SUMMARY OF FINDINGS
Physical (5)	natural phenomenon, absence of site investigation, environment-related factors, insufficiency of infrastructure facilities, poor site conditions
Political (12)	low PPP procurement framework, changes in government policy, profligacy of the state, nepotism, high costs of land titles, high importation of building materials, inadequate habitable housing among the urban poor, poor and inconsistent housing policies, corruption in government, leadership crisis, political intrigues, government lacks of capacity to cope urbanisation
Economic (9)	financial issues, inflation, high interest rates on mortgages, expensive private-sector housing financing, high currency exchange rates, cost of power, low power supply, high interest rates on mortgages, poor economic conditions
Sociocultural (8)	poor maintenance culture, social-related factors, corruption, accumulation of wealth by public servants, inequality, social disorder, poor reward system, poor social values and ethics
Technological (6)	insufficient equipment, substandard building materials, poor quality building materials, inferior steel reinforcement used in construction, poor concrete production methods on site, technological-related factors
Institutional (6)	high costs of completing land documentation and registration, ethnicity in recruitment and promotion of public officers, ineffective planning authorities, low pay received by public servants, weak regulations, poor oversight
Legal (3)	1978 Land Use Act, changes in legislation, ambiguity of laws
Microenvironment (2)	challenging operating environment, non-professional personnel
Organisation (7)	logistics related issues, variation of project scope, payment difficulties, budgetary problems, inadequate finance, project under-funding, non-involvement of construction experts
Stakeholders (8)	lack of professionalism, contractor issues, incompetent contractors, contractors' bankruptcy, contractors' greed, lack of Total Quality Management principles among indigenous construction firms, poor quality workmanship, lack of trained project manager
Technical (14)	poor design and construction, design error, excessive structural loading, inadequate project planning, communication, inaccurate time and cost estimates, change orders, lapses in project documentation, inadequate bid evaluation methods, poor risk assessment methodology, lack of knowledge on Risk Management, poor adherence to project management principles, inadequate project planning and scheduling of the project activities

Table 7.5: Categorisation of the recommendations for the building industry in Lagos and Nigeria

LSR SUBSYSTEMS	SUMMARY OF RECOMMENDATIONS
Physical (1)	pre-construction soil survey
Political (14)	set up a National Lands Bureau is necessary to improve land ownership registration, improve issuance of titles, comprehensive PPP approach, new government policies, reduce importation of building materials, government to develop a framework to attract investment partners, training of public officers in PPP, improve policy formulation, develop low-income housing, improve policy formulation, effective policy implementation, strategies for mass housing, fight against corruption should be concerted, proactive planning and regulatory framework
Economic (6)	proper project financing, enhance mortgage financing, low interest loans required, improve power supply, reduce cost of fuel, improve housing finance
Sociocultural (5)	public enlightenment, citizenry involvement in issues affecting the state, fight against corruption should be concerted, stronger values, reorientation and education of the populace
Technological (1)	use of indigenous building materials
Institutional (8)	Standard Organisation of Nigeria to improve quality of building materials, Standards Organisation of Nigeria to ensure superior steel in the construction market, capacity building of personnel, Standard Organisation of Nigeria should improve its enforcement role, collaboration amongst stakeholders such as professional bodies, proper training of workforce, government and academia, train construction professionals in project management tool
Legal (4)	enabling legislation, enforcement of the National Building Code, review the Land Use Act, firm statutes against corruption required
Microenvironment (2)	strong commitment of stakeholders and collaboration of stakeholders
Organisation (10)	workmen incentive and motivation, introduce proper project governance mechanism, establish project management offices, appoint competent project manager, appoint experienced and competent contractors, project clients' participation, engagement of qualified professionals, customers must demand higher levels of quality from contractors, reduction of scope variation during construction, top management support
Stakeholders (3)	competent construction professionals, risk management training to contractors' personnel, train personnel in project management
Technical (17)	Proper planning, proper budgeting at inception, good project management monitoring and control at execution phase, proper risk management, prompt payment of contractors, supervise all construction works, strict adherence to specifications, proper risk assessment methods, new improved techniques of bid evaluation, proper project documentation required at all levels, adequate project financing, good project management principles, objective management, management of design, technical factors, project management communication strategies

Table 7.6: Content Analysis from literature on the construction issues in Lagos

LSR SUBSYSTEMS	FINDINGS	RECOMMENDATIONS	COMBINED
ENVIRONMENT			
Physical	5	1	6
Political	12	14	26
Economic	9	6	15
Sociocultural	8	5	13
Technological	6	1	7
Institutional	6	8	14
Legal	3	4	7
TOTAL	49	39	
ORGANISATION			
Microenvironment	2	2	4
Organisation	7	10	17
Stakeholders	8	3	11
Technical	14	17	31
TOTAL	31	32	

Framework as a conceptual lens. This data was used to validate the efficacy of LSR framework using a content analysis approach by inductively distributing the outputs of these studies into the aggregated subsystems as displayed in Table 7.4 and 7.5. The frequency of the factors in each subsystem reveals that a significant number of the problems encountered in project delivery are exogenous (see Table 7.6), largely political and economic issues. These contradict the evidence in Table 2.6 that suggested that 71.6% of the factors that influence PM success

are internal factors while only 28.4% are exogenous factors. Nevertheless, the significance of external factors corroborates the need for more empirical studies focused on the contextualisation of projects in line with RPM literature (see Section 2.2.2). Therefore, there is a valid need to expand the conceptualisation of projects to encompass elements of both the environmental and organisational subsystems, particularly for complex project scenarios.

Upon closer examination of Table 7.6, the dominance of project-related factors becomes evident and arguably, this bias is no surprise because many of the publications are drawn from the PM domain. Overall, this content analysis not only improves understanding of and validates the use of the LSR Framework but highlights the need for a paradigm shift from the planning and control fixation by project management practitioners and academic. Evidently, both the environmental and organisational factors have a profound impact on project outcomes. This corroborates the current emphasis on improving the skills of project managers in line with the strategic era of PM. The foregoing clearly provides an example of how the LSR framework can be used in research and the next section discusses the process of testing the research design, data collection and analysis during the pilot study.

7.7 TESTING THE RESEARCH DESIGN

The main purpose of this section is to validate the data collection tools that were designed primarily from existing literature. Shortly after purchasing this register of professionals, the process of testing and validating the questionnaire protocol began as discussed next. The site for the study is Lagos, Nigeria and permission to commence the fieldwork was granted by Oxford Brookes University Research Ethics Committee in December 2013. All research questions and questionnaire developed from literature were tested during this pilot study. The state of building industry was also explored to understand the Building Industry Reforms (BIR). This process validated the research design and tools. Similarly, participants for the main empirical stages of the study were identified. Moreover, secondary data comprising government reports and registers of professionals in the building industry were acquired from the government offices, libraries and professional secretariats. The following sections outline the processes and outcome of this phase in more detail.

7.7.1 Survey Protocol - Questionnaire Data Collection

A questionnaire was developed based on the work of Hughes (1989). This cited literature was the only study found in the PM body of knowledge at the beginning of this study that provided a systematic technique for identifying the environments of building construction projects. Hughes' research dealt specifically with the evaluation of the subsystems of the environment of projects and argued that the building projects can be seen as a response to environmental factors whereby the interactions of projects with their environments are reciprocal.

This provided a common basis for describing and understanding the complexity of the project environment in Lagos. The questionnaire described the types of environmental influences on construction projects including political, legal, institutional, cultural, technological, economic and competitive influences. Although this framework examined only the environmental features of the LSR framework, it was suitable for the early stages of this study because it included definition of the environment with dimensions such as stability and complexity.

The method of distribution was face-to-face but many of the respondents requested for more time to study and complete the survey at their convenience, which meant that collection had to be rescheduled. The main inclusion criteria of these respondents were their construction-related academic qualifications as well as up to ten years of post-qualification experience in Lagos. Only two out of the six surveyed respondents returned completed questionnaires within the six weeks allowed for this phase. Three other respondents clearly stated that they could not understand the survey while one respondent somehow lost the questionnaire.

Although many of the respondents were accessible to the researcher, the low response rate was attributed to the lack of understanding of the questionnaire. The follow-up interviews to evaluate reasons for this poor response rate revealed that the questionnaire was a bit ambiguous and ineffective in providing answers to the research questions because the ideas, structure and vocabulary of the questionnaires were drawn primarily from literature. The respondents suggested that to test their understanding of the challenges of building construction in line with the research objectives, the ideas and structure of the questionnaire must evolve from the study area and contain less of specialist language.

This was considered in the development of a suitable research strategy for the subsequent phases of the study. Therefore, it was discovered that it would be beneficial to begin the study with a qualitative survey, which will provide a deeper understanding of construction-related problems in this context before the questionnaires can be tailored for the understanding of the target population. This validates the SMME approach described in 5.7.2. It was also suggested that the target population should have relevant professional experience in this study area. Respondents also advised that questions should be short and straightforward with a maximum length of two A4 pages because professionals are very busy and would not be keen to participate in lengthy surveys.

Generally, the tool was found to be ineffective in answering the research questions. It was also confirmed that face-to-face administration of the survey would be more effective and stratified random sampling method was suitable for the main survey. Subsequent approval from the Nigerian Institute of Architect made it possible for fully accredited members of the building profession to be contacted directly for the main study. The next section discusses the pilot stage interviews.

7.7.2 Interview Protocol

To develop a clearer understanding of the state of building construction, extensive thought had to be given to the interview protocol due to the novelty of this study and outcome of the questionnaire survey. The interviews had to be open-ended and exploratory at this stage and all questions were revised inductively to understand the nature of the phenomenon under study. This is in line with Agrees' (2009) conclusion that research questions must iteratively articulate what the researcher wants to know about the perspectives of those involved in social interactions, focusing in a reflective manner, which will lead to specific data that can add knowledge to a larger field of study.

The formal interviews involved six respondents; two contractors, two professionals and two government regulators. The first point of contact was the government agency and respondents were recruited through the Ministry of Physical Planning and Urban Development. Furthermore, respondents representing registered contractor were recruited

with the help of government officials in the Ministry of Works and Infrastructure who made available a list of all the registered government contractors including their contact details and schedule of ongoing projects in Lagos State. These gate-keepers made the recruitment process fairly stress-free.

For the professionals, they were recruited based on the referral of the Nigeria Institute of Architects, Lagos Branch, each meeting the criteria of full accreditation as chartered professionals with up to ten years post-qualification experience. Convenience sampling was used to recruit all respondents in this phase and the interviews were held at venues preferred by the respondents. All interviews were audio recorded following the signing of the consent form by the participants. This process improved the researchers' interview techniques and also provided insight on how the questions should be framed for the next phase.

Several informal interviews were conducted to further evaluate the events, trends and state of the building industry in Lagos as discussed earlier. Many respondents corroborated the challenges of project delivery and overall, their contributions added great value to the study. The outcome of the interviews were analysed and themes began to emerge including construction delays, costs overrun, project abandonment, building collapse, low construction technology, economic challenges, procurement issues, policy inconsistencies, poor governance, corruption and other project management issues. These outcomes are similar to those in Table 6.1.

Similarly, on why project delivery continues to fail to meet the expectations of stakeholders, particularly in the light of frequent building collapse, the interview transcripts revealed a consistency of themes with literature, particularly factors such as corruption and inadequate regulation. To understand efforts at reducing building collapse, the researcher asked questions regarding the role and performance of Lagos State Building Control Agency (LASBCA) since its inception. Respondents discussed the formation of LASBCA and many suggested that since its formation the incidences of building collapse had become less prevalent. They noted also that buildings may continue to collapse because many old developments have been found to be structurally defective by LASBCA but the government does not have the resources to effect controlled demolition and resettle the residents.

Nonetheless, majority of the respondents praised the government for this initiative and affirmed that this new agency had reduced the incidences of building collapse, particularly in the urban centres and Lagos Island. The foregoing suggests that appreciable progress has been made since the formation of LASBCA. This was summed up in the words of PS-001;

“Lagos State Government is ahead of the Federal Government in terms of Physical Planning evolution with the implementation of the Lagos State Physical Planning and Development Law and the enactment of the Building Control Agency Law in 2010. LASBCA is the engine room for full implementation of the material testing labs at Ojota, Lagos”.

This interview brought to light the establishment of the Lagos State Material Testing Laboratory (LSMTL) by the government to complement the work of LASBCA with the sole mandate of ensuring that building materials and construction methods applied on all building projects met the laid-down regulatory standards. In the light of the geographical features of the state, these new agencies of government were also required to ensure that all land acquired for building purposes were geologically tested to verify the soil bearing capacity, particular multi-storey buildings.

Clearly, this confirms efforts by government in restructuring existing parastatals and establishing new ones to improve project delivery in Lagos. Nonetheless, it was suggested that one of the reasons why the mandates of these new agencies remain challenging is the difficult and expensive process of acquiring land for building purposes, which makes the additional cost of compliance to the requirements of LASBCA and LSMTL prohibitive for prospective developers. This assertion was confirmed as follows;

“Land acquisition is a problem in Lagos because of the 1978 Land Use Act. There is a lack of a proper and effective mortgage system to encourage developers to finance affordable housing. So at the moment government does not provide free land to developers and the cost is exorbitant which is making housing expensive. If this problem is to be addressed, government has to buy these houses from the developers through a Public Private Partnership (PPP)”.

PS-001

Moreover, despite the good intentions of government, the lack of financial institutions to provide affordable sources of funding remains a problem. Therefore, people are forced to utilise personal funds for housing development and focus on price points rather than quality. Many of these suggestions align with the evidence in Table 6.1 but more importantly, there is no evidence of a synergy between the government and private developers to make housing available and affordable, which gives credence to the failure of public policies and underfunding of public housing schemes.

This has resulted in a haphazard development of the city despite the existence of enabling laws. This urban sprawl is particularly difficult to control when law enforcement is weak as suggested by this next respondent;

“Collapsed buildings led to legislation to improve building standards as well as the formation of Lagos State Building Control Agency (LASBCA). It is important to examine the impact of this new government agency on the building industry but law enforcement appears to be weak”. PS-002

Therefore, this assertion has made it more imperative to examine the performance of LASBCA in the next phase of the study. Similarly, one of the practitioners corroborated this last comment on the weak enforcement of the laws as follows;

“Law enforcement is a problem due to corruption; it is a major problem because after ‘settlement’ contractors can barely breakeven. There are no penalties or negative consequences to deter corrupt government officials. Building construction projects never get properly supervised by regulatory agencies and some provisions of the law are not very clear”. PS-003

These comments clearly indict the government, giving an indication of institutional lapses, corruption and a lack of accountability by government institutions. PS-003 followed through by suggesting that a lot of public awareness is necessary and government should prosecute corrupt government officials who collude with developers. Furthermore, another practitioner corroborated this view, suggesting that some State laws are at variance with Federal laws, and the latter will need to be adopted by the states to make enforcement more effective.

The foregoing argument is particularly significant giving the former status of Lagos as the Federal Capital of Nigeria, which still host a large number of Federal Government facilities, making law enforcement within this jurisdiction very complicated. Therefore, these statements provide evidence that there is a need to improve governance in the building industry, particularly through an accelerated harmonisation of State and Federal laws relating to physical development. A contractor and professional corroborated this view as follows;

“Implementation and enforcement is the problem in Lagos and not the law. For instance, the National Building Code has not been domesticated by Lagos State government”

PS-005.

“Government has set up building control units (BCUs) or enforcement units through the Lagos State Building Control Agency but the National Building Code has been approved but adoption by government is lacking” PS-004.

Similarly, there are areas of dispute between the government of Lagos State and the professional bodies particularly in the area of remuneration. As the next except suggests, the statutory fees payable to consultants in the building industry continues to generate discord;

“Consultants sign-off on construction works is necessary from stage to stage of the project lifecycle and there are three regulatory bodies involved; approval bodies, supervisory bodies and enforcement agencies which are distinct, unique and autonomous organs of government. Some of the problems we find include the unit building rates and consultancy fees proposed by the professional bodies which are at variance with proposed and acceptable fees by the government” PS-004.

These conflicts have led to a fragmentation of the building industry in Lagos, nonetheless, one respondent seemed to suggest that the laws and the government institutions are working properly and being implemented effectively. This participant referred to a controversial provision of the 2010 law, which stipulates that the State Government have the right to confiscate any property on which a building collapses without reference to the indemnity of other professional participants such as the consultants and contractors. In their view,

“The laws are working such that with collapsed buildings the owners will have to forfeit rights to their plots of land. Facilities for materials testing has been provided by the state

government and the Governor's office has a monitoring team to regulate physical development. Also abandoned contracts can be recovered in court due to Advance Payment Bonds and Performance Bonds from banks" PS-006

Unfortunately, this legal provision of property forfeiture has remained controversial in the building construction industry and there is still no record of its implementation at the time of completing this study, see Table 6.3. There are also issues of too many unregistered practitioners in the construction industry and weak financial capabilities of many contractors, which have made project delivery difficult. Similarly, high interest rates have made borrowing from financial institutions for building projects less profitable. Most clients, both public and private, are compelled to support building works by providing at least 20% of the contract sum to the contractors as advance payment prior to mobilization to site. This assertion was corroborated in the following except;

"Contingency sums take care of fluctuation and variations in contract price. Normally about 20% Advance Payment is given to the contractors at project award but the financial capacity of the contractors to deliver must be ascertained through bank statements." PS-006

Unfortunately, as corruption issues continue to fester many of these projects get abandoned by some contractors after receipt of cash advance, particularly public projects which are awarded based on political affiliations. This scenario has also resulted in the low morale of professionals responsible for managing these projects. Therefore, to improve the building construction industry the respondents suggested that stakeholder enlightenment by government is essential.

Others opined that the buck-passing approach to solving the problems by government and the professional bodies need to change and greater collaboration is needed. Clearly, many of the issues discussed during the interviews corroborate the evidence from the secondary and tertiary data. With more clarity on the state of the building construction industry in Lagos and the constraints for the main study, the next section presents the implications for the research design.

7.8 IMPLICATIONS FOR THE MAIN STUDY

Throughout all the phases of this research, efforts were made to involve only research participants who have experienced the phenomenon under review. To help clarify which participants should be recruited, one interviewee from the NIA offered the following advice;

“There are different categories of professionals. First at the top you have those that are registered and practicing professionals; then we have the registered non-practicing professionals, people who have been out of the main stream and might be a bit rusty; and lastly you have those that are not registered professional at all. The last group form the preponderance of those practicing in the construction industry that are always found in particular areas and undertake particular types of structures which form the majority or about 99% of projects that collapse in Lagos.”

Therefore, the sampling strategy was improved with participants for the main study recruited strictly in line with the sampling criteria in Table 5.5. Other gains of this pilot study include the cooperation of the various professional bodies, testing of the data gathering tools, verifying some of the problems in the industry in the study area and revision of the research design. By the end of this phase, the causal relationship amongst the key concepts of organisation, environment and leadership began to emerge. This reality improved the use of the LSR framework thereby providing a sound guide for the main study. The interview questions outlined in Sections 1.3.1 and 5.7.2.1 were found to be suitable for this study and the questionnaire will be developed based on the outcome of the qualitative phase.

The process of revising the Research Design, Methodology and Conceptual Framework was concluded by May 2014. The realities regarding building construction success and the role of stakeholders including Government Regulators, Professionals, Contractors and the Tradesmen, were also verified in the light of the challenges in the building construction industry in Lagos. Clearly, the depth of knowledge of the respondents depends on the quality of their professional experience and not all stakeholders have adequate understanding of the Building Industry Reforms. Therefore, the professional bodies, as well as government agencies and contractors, were approached for guidance on how to improve this study.

The professional bodies advised that the best research approach for data collection would be to focus on accredited professionals using the register of licenced professionals. Consequently, the researcher purchased the register of accredited professionals in the seven building-related professional bodies and consent to contact listed professionals was granted by these institutions. This strategy provided more clarity on the target population sets and only sources with proven professional competence and first-hand project experience in Lagos were selected.

Therefore, this process further led to a clear identification of leaders in the construction industry in Lagos to improve sampling in the main study. To capture the different perspectives and ensure representativeness, the main study drew samples from professionals working for government, contractors, property developers and consultants in industry to ensure a minimum level of professional knowledge and expertise possessed by all participants.

The research design was revised in the light of the outcome of the quantitative survey. Rather than embarking on the survey before interviews, it became obvious that the interviews should be conducted first to draw out the core issues relating to project success, which will then inform the focus, structure and vocabulary of the questionnaire. This improved comprehensibility of the questionnaire.

Postal and online surveys were ruled out following the advice of the professional bodies because this will result in lower response rates. Therefore, face-to-face administration was recommended and approval was given for the survey to be conducted during the monthly meeting of these professional bodies. In summary, the research design for the main study will be comprised of three stages; firstly semi-structured telephone interviews with micro-level leaders; then in-depth face-to-face interviews with macro-level leaders and; finally the questionnaire survey is based on the qualitative outcomes.

7.9 CONCLUSION

This phase of study examined the state of the building construction industry and the factors influencing construction success in Lagos and Nigeria. It provides evidence of both organisation- and environment-related issues. Significant events such as building collapse and the establishment of LASBCA were examined alongside extant literature to provide a basis for evaluating the problems of the building industry. Reasons for building collapse in Lagos are numerous and include factors that are within and outside the control of practitioners. Environmental factors appear to be more significant than organisational factors which contradicts the conclusions from Chapter 2. The industry challenges appear to be multifarious requiring the adoption of a more holistic approach to problem solving to improve project delivery.

The building industry is fragmented and collaboration is lacking amongst stakeholders. Therefore, Lagos as the context for this study exhibits many of the attributes peculiar to developing economies. Some participants in the main study were drawn from members of Commissions of Inquiry established in the past to investigate these mishaps. Many of the issues raised during the interviews corroborate the evidence from literature and the deeper understanding of the context and research problem informed the revision of the research design. Consequently, the interview questions were revised iteratively by considering highlighted methodological constraints. The efficacy of the LSR framework was ascertained and the outcome of the data analysis clearly reinforced the need for better conceptualisation of the challenges of PM. Therefore, the next chapter presents the results of the data analysis.

CHAPTER 8

CHALLENGES OF BUILDING PROJECTS IN LAGOS

8.1 INTRODUCTION

This chapter seeks to address the research Objective 3 using data from two sets of interviews with leaders in the building industry in Lagos, as well as extant literature. Two significant events were identified during the pilot study; the recurrent collapse of buildings and the establishment of the LASBCA by the state government. These events are examined by asking participants to respond to research questions; “Why is project delivery failing to meet the expectations of stakeholders, particularly in the light of frequent building collapse?”, and; “How well has the Lagos State Building Control Agency (LASBCA) performed in reversing the negative trends in the building construction industry in Lagos”.

Using the LSR Framework, this chapter investigates why projects continue to fail in Lagos, with a focus on building collapse. LASBCA evolved to deal with building collapse and the success of this institution is evaluated in Section 8.14. The LSR framework is used as a model of complexity to examine the systemic structures of projects and allow for the investigation of aspects of building industry that are typically unavailable to observation. This phase of the study is grounded in the retrodution guidelines in Section 6.7.1 and proceeds in Step 4, *“The model is then tested as a hypothetical description of actually existing entities and their relations... which can be stated in a manner open to empirical testing”*. Themes from CAS theory are used to explain the existence and complexity of emergent hypothetical entities.

8.2 THEMATIC SATURATION

The research method follows the Exploratory Sequential Mixed Method (ESMM), see 6.7.2, and the results of 22 telephone interviews and 12 face-to-face indepth interviews are presented. The data from the experience of building industry leaders is combined with the data from literature to produce a robust thematic analysis of the factors that influence building construction success. The analysis in this chapter carefully follows the Mixed Method Analysis (MMA, see 6.7.2.7) guidelines, particularly steps one and two: to produce a qualitative thematic analysis and, content and hierarchical analysis of the themes. However, it is necessary to begin by validating the data using thematic saturation analytics.

8.2.1 Thematic Saturation

Further to the discourse in 6.7.2.6, the first task is to establish thematic saturation during data collection (see Guest et al, 2006) to ensure that the data and sampling techniques are validated (Elliot and Timulak, 2005). Therefore, in line with Elliot and Timulaks' (2005) proposition all the transcripts of the respondent's words and phrases were developed and read repeatedly during this data collection phase. The researcher did this for two reasons: firstly, to obtain a feeling for the data and grasp a preliminary understanding of their meaning; secondly, to follow the criterion of saturation and ensure that no new interviews are conducted at the point when no new information or theme emerges.

Since the preliminary analysis of the data was conducted as the transcripts were being developed, a memo was maintained and field-notes were produced as new concepts and themes emerged from the data. This exercise allowed for a description of the collective experiences of respondents, which meant that similar themes could be collated and examined. The analytical methodology proposed by Onwuegbuzie et al (2007 p 126) was very useful in this phase to convert the leadership responses into codes, extract a list of non-repetitive significant statements, establish clusters of thematic meanings of these unique statements, formulate representative meanings and organise the unique aggregate codes based on the predetermined segments of the LSR framework.

Therefore, Figure 8.1 captures the systematic procedure of data saturation for the transcripts of interviews with Project Leaders selected from the register of Architects. The numbers assigned alongside the themes in Figure 8.1 represent the serial number of each participant during the telephone interviews. Therefore, 45 unique themes emerged during this phase of data collection. Similarly, the horizontal bands reflect clusters of new themes as they emerged during successive interviews. For example, the first eight themes emerged during the Interview No.1, seven new themes emerged during Interview No.2, five new themes in Interview No.3, and so on.

22 TELEPHONE INTERVIEWS											
Non Engagement of Qualified Professional	1	2	3	5	7	9	18	19	20	21	22
Low Capacity of Government	1	5	9	15	19	20					
Difficult Building Approval Processes	1	2	3	10	11	13	14	21			
Contractors Related Issues	1	3	4	9	11	13	14	15	16	18	19
Consultants Related Issues	1	3	4	7	8	10	11	12	13	14	15
Client Related Issues	1	4	5	6	7	8	9	10	12	13	14
High Cost of Building Materials	1	7	11	15	16	22					
Substandard Building Materials	1	3	5	7	8	9	11	13	16	17	18
Unrealistic Design Briefs	2	17									
Severe Inflation	2	7	19								
Issues Relating to Government Policies	2	10	13	16	19						
Challenging Land Tenure System	2	22									
Building Material Market Issues	2	9	22								
Ineffective Development Control	2	4	5	8	9	10	11	12	13	14	15
Corruption	2	3	5	6	7	8	9	10	11	12	13
Procurement Related Issues	3	17	19	20							
Unskilled Artisans	3	4	8	16	17	19	20				
Lack of Technical Schools	3	16	19								
Understaffed Regulators/Poor Monitoring & Control	3	7	13	15	16	19	20	21	22		
Challenges with Estate Developers	3	7	16								
Quacks in Construction	4	5	7	8	11	12	13	14	15	17	18
Unethical Professional Practices	5	6	7	8	10	12	15	18	22		
Low Project Funding	5	6	7	11	12	19	20				
Weak Professional Institutions	5	7	8	9	14						
Weak Government Institutions	5	8	11	14	15	19					
Poor Welfare of Government Employees	5										
Inadequate Project Information	7	8	20								
High Importation of Building Materials	7	10	11	16							
Weak Financial Institutions	7	13	16								
Non Payments of Professional Fees	8	9	12	17	18						
Political Interference on Projects	8	9	15								
Professional Rivalry	8	13	18	20	21						
Urbanisation and Economy Issues	8	10	16	18	19	22					
Poor Building Design	8	19									
Poverty and Lawlessness	8										
Haphazard Price Fluctuation	9	11	18	19	22						
Poor Weather and Soil Conditions	9	12	13	18							
Inadequate Infrastructure	10										
Low Public Enlightenment	13	15	16	18							
Lack of Culture of Planning and Excellence	16										
Issues Relating to Building & Employment Laws	16										
Low Indigenous Technology and Tools	16	19									
Lack of Building Innovation	16	19									
Moral Decadence	16	19									
Unpredictable Project Environment/Local Gangs	17										

Figure 8.1: Thematic Saturation Analysis of the Telephone Interviews

12 FACE-TO-FACE INTERVIEWS											
Clients' Related Issues	1	2	3	4	7	8	9	11	12		
Corruption	1	2	3	4	5	6	8	10	11	12	
Substandard Building Materials	1	2	3	4	5	6	7	8	9	11	12
Consultants Related Issues	1	2	3	6	9	10	11	12			
Ineffective Development Control	1	2	3	4	5	6	7	8	9	10	11
Contractor Related Issues	1	2	3	6	7	9	11	12			
Quacks in Construction	1	2	3	4	6	8	9	10	11	12	
Non Engagement of Qualified Professional	1	2	3	6	7	8	10	11	12		
Unethical Professional Practices	1	2	3	5	6	9	11	12			
Understaffed Regulators/Poor Monitoring and Control	1	2	3	6	7	11	12				
Difficult Building Approval Processes	1	2	4	5	6	8	10	11			
Unskilled Artisans	1	2	3	5	7	8	10	11			
Weak Government Institutions	1	2	3	4	6	7	8	10	11	12	
Low Capacity of Government	1	6	10	11							
Professional Rivalry	1	2	4	6	11						
Procurement related issues	1	10	11								
Inadequate Project Information	1	3									
Poor Building Design	1	9	10	11							
Lack of Building Innovation	1	11									
Low Indigenous Technology and Tools	1										
Unpredictable Project Environment /Local Gangs	1	6									
Weak Professional Institutions	2	4	9	12							
Non Payments of Professional Fees	2	7	11								
Poor Weather and Soil Conditions	2	3	7								
Challenges with Estate Developers	2	3	6	8	10						
Political Interference on Projects	2	12									
Lack of Technical Schools	2	3									
Moral Decadence	2	7									
Poverty and Lawlessness	2	6	7	8	10	11	12				
Issues relating to Government Policies	3	4									
Low Project Funding	3	6	7	8	10	11	12				
Urbanisation and Economic Issues	4	5	10	12							
Weak Financial Institutions	4	11	12								
Challenging Land Tenure System	4	12									
High Cost of Building Materials	5	10	11								
Low Public Enlightenment	5	8	11								
Lack of Culture of Planning and Excellence	6										
Inadequate Infrastructure	7	10	11								
Building Materials Market Issues	11										

Figure 8.2: Thematic Saturation Analysis of the Face-to-Face Interviews

At the same time, some interviews did not produce any new themes, rather they merely repeated the emergent themes from the previous interviews including serial numbers 6, 11, 12, 14, 15, 18, 19, 20, 21 and 22. Therefore, based on the principle of diminishing returns (Elliot and Timulak, 2005) it was found that no new theme emerged after the 17th interview. However, to validate thematic saturation five additional interviews were conducted yet, no new information emerged. Therefore, after the 22nd interview no new cases were added and the telephone interviews were concluded. Thereafter, a total number of 12 bands were established which represents the minimum number of participants that could contribute significant themes to the study.

This analytical process is significant because it provided a guide for the purposive sampling protocol, interviewing techniques, transcription methods and qualitative data analysis competencies of the researcher. Further to the purposive sampling technique in the telephone interview phase, the careful choice of 12 participants for the face-to-face interviews ensured that participants had the knowledge, experience and competencies to address the research questions. Moreover, based on the lessons learned the choice of 12 respondents for the in-depth interviews followed very strict purposive protocol with inclusion criteria such as their leadership role within the building-related professional bodies and participation in the Building Industry Reforms (2008 – 2010) in Lagos State.

Subsequently, a confirmatory thematic saturation analysis was undertaken in the second phase of interviews and the result is presented in Table 8.2. In this phase, the saturation point was attained at the 11th interview and no new data emerged during the 12th and final interview. This is not surprising because of the improved sampling strategy. Again, counting the horizontal bands it was confirmed that a minimum of 8 participants (serial numbers 1, 2, 3, 4, 5, 6, 7 and 11) contributed most of the themes. Therefore, from this study it is apparent that using appropriate purposive sampling technique between 8 and 17 participants are assumed to be sufficient for interviews which will adequately validate the research outcomes.

These processes of data validation through the sampling technique align with studies by Elliot and Timulak (2005), Guest et al (2006) and Creswell (2013), with suggest that the careful choice of participants and thematic saturation would give the data reliability. This also guarantees that the collected data is satisfactory to ensure that the qualitative outcomes are significantly and reflect the true nature of the phenomenon.

Table 8.1: MIL Analyses of Issues Influencing Project Success (Thematic Frequency)

S/No	Project Performance Influences	Micro Leadership (MIL) Respondents	Micro Leadership Frequency	Micro Leadership Ranking
1	Client-related Issues	1 4 5 6 7 8 9 10 12 13 14 15 16 17 18 19 20 21 22	19	1
2	Corruption	2 3 5 6 7 8 9 10 11 12 13 14 15 16 18 19 22	17	2
3	Substandard Building Materials	1 3 5 7 8 9 11 13 16 17 18 19 20 22	14	3
4	Consultant-related Issues	1 3 4 7 8 10 11 12 13 14 15 16 17 22	14	3
5	Ineffective Development Control	2 4 5 8 9 10 11 12 13 14 15 18 19 21	14	3
6	Contractor-related Issues	1 3 4 9 11 13 14 15 16 18 19 20 22	13	4
7	Quacks in Construction	4 5 7 8 11 12 13 14 15 17 18	11	5
8	Non Engagement of Qualified Professional	1 2 3 5 7 9 18 19 20 21 22	11	5
9	Unethical Professional Practices	5 6 7 8 10 12 15 18 22	9	6
10	Understaffed Regulators/Poor Monitoring & Control	3 7 13 15 16 19 20 21 22	9	6
11	Difficult Building Approval Processes	1 2 3 10 11 13 14 21	8	7
12	Unskilled Artisans	3 4 8 16 17 19 20	7	8
13	Low Project Funding	5 6 7 11 12 19 20	7	8
14	Weak Government Institutions	5 8 11 14 15 19	6	9
15	Urbanisation and Economic Issues	8 10 16 18 19 22	6	9
16	Low Capacity of Government	1 5 9 15 19 20	6	9
17	High Cost of Building Materials	1 7 11 15 16 22	6	9
18	Weak Professional Institutions	5 7 8 9 14	5	10
19	Professional Rivalry	8 13 18 20 21	5	10
20	Non Payments of Professional Fees	8 9 12 17 18	5	10
21	Issues relating to Government Policies	2 10 13 16 19	5	10
22	Haphazard Price Fluctuation	9 11 18 19 22	5	10
23	Poor Weather and Soil Conditions	9 12 13 18	4	11
24	Procurement Related Issues	3 17 19 20	4	11
25	Low Public Enlightenment	13 15 16 18	4	11
26	High Importation of Building Materials	7 10 11 16	4	11
27	Weak Financial Institutions	7 13 16	3	12
28	Severe Inflation	2 7 19	3	12
29	Challenges with Estate Developers	3 7 16	3	12
30	Political Interference on Projects	8 9 15	3	12
31	Building Material Market Issues	2 9 22	3	12
32	Lack of Technical Schools	3 16 19	3	12
33	Inadequate Project Information	7 8 20	3	12
34	Unrealistic Design Briefs	2 17	2	13
35	Poor Building Design	8 19	2	13
36	Lack of Building Innovation	16 19	2	13
37	Moral Decadence	16 19	2	13
38	Low Indigenous Technology and Tools	16 19	2	13
39	Challenging Land Tenure System	2 22	2	13
40	Unpredictable Project Environment/Local Gangs	17	1	14
41	Poverty and Lawlessness	8	1	14
42	Poor Welfare of Government Employees	5	1	14
43	Inadequate Infrastructure	10	1	14
44	Lack of Culture of Planning and Excellence	16	1	14
45	Issues relating to Building & Employment Laws	16	1	14

Table 8.2: Combined Analyses of Issues Influencing Project Success (Thematic Frequency)

S/No	Project Performance Influences	Micro Leadership Frequency	Macro Leadership Frequency	Total Frequency	Ranking
1	Client-related Issues	19	9	28	1
2	Corruption	17	10	27	2
3	Ineffective Development Control	14	12	26	3
4	Substandard Building Materials	14	11	25	4
5	Consultant-related Issues	14	8	22	5
6	Contractor-related Issues	13	8	21	6
7	Quacks in Construction	11	10	21	6
8	Non Engagement of Qualified Professional	11	9	20	7
9	Unethical Professional Practices	9	8	17	8
10	Understaffed Regulators/Poor Monitoring and Control	9	7	16	9
11	Difficult Building Approval Processes	8	8	16	9
12	Weak Government Institutions	6	10	16	9
13	Unskilled Artisans	7	8	15	10
14	Low Project Funding	7	7	14	11
15	Urbanisation and Economic Issues	6	4	10	12
16	Low Capacity of Government	6	4	10	12
17	Professional Rivalry	5	5	10	12
18	High Cost of Building Materials	6	3	9	13
19	Weak Professional Institutions	5	4	9	13
20	Non Payments of Professional Fees	5	3	8	14
21	Poverty and Lawlessness	1	7	8	14
22	Challenges with Estate Developers	3	5	8	14
23	Issues relating to Government Policies	5	2	7	15
24	Poor Weather and Soil Conditions	4	3	7	15
25	Procurement Related Issues	4	3	7	15
26	Low Public Enlightenment	4	3	7	15
27	Weak Financial Institutions	3	3	6	16
28	Poor Building Design	2	4	6	16
29	Lack of Technical Schools	3	2	5	17
30	Inadequate Project Information	3	2	5	17
31	Political Interference on Projects	3	2	5	17
32	Haphazard Price Fluctuation	5		5	17
33	Building Material Market Issues	3	1	4	18
34	Inadequate Infrastructure	1	3	4	18
35	Lack of Building Innovation	2	2	4	18
36	Moral Decadence	2	2	4	18
37	Challenging Land Tenure System	2	2	4	18
38	High Importation of Building Materials	4		4	18
39	Low Indigenous Technology and Tools	2	1	3	19
40	Unpredictable Project Environment/Local Gangs	1	2	3	19
41	Severe Inflation	3		3	19
42	Lack of Culture of Planning and Excellence	1	1	2	20
43	Unrealistic Design Briefs	2		2	20
44	Poor Welfare of Government Employees	1		1	21
45	Issues relating to Building & Employment Laws	1		1	21

The following sections present the results of the data analysis and emergent themes from both phases of qualitative data collection. The key issues influencing building construction performance in Lagos are examined and the frequency of the unitised themes are tabulated in rank order to aid further analyses using the LSR framework as a lens.

8.2.2 Presentation of the findings

Following the first and second analytical phase of the MMA approach (see Section 6.7.2.6), the researcher quantified and analysed the data to develop the hierarchical structure of the emergent themes. For clarity, it is important to note that the theme ‘quacks’ in construction (Item 7 in Table 8.2) refers to academically and professionally uncertified persons that undertake building projects in Nigeria. Therefore, the hierarchical outputs are summarised and presented in Tables 8.1 and 8.2, then discussed in the following sections.

8.2.3 Hierarchical Analytic Overview

Hierarchical analysis of the themes was conducted using NVivo 12 after completion of the telephone interviews and the results are presented in Table 8.1. The emergent themes are placed in rank order and clearly client-related issues such as their refusal to adhere to professional advice appears as the most prevalent problem discussed by the respondents. Conversely, other themes such as inadequate infrastructure and issues relating to employment laws were the least mentioned. From the systems perspective, all emergent themes are considered relevant because everything is influenced by everything else within a system. Therefore, no theme was discarded at this stage.

The hierarchical analysis and weightings permitted deeper analysis of the prevalence of organisational, environmental and leadership factors, as well as their connectivity to other seemingly less dominant themes. By the end of the face-to-face interview, the data from the two phases were compared and the results are presented in Table 8.2. Many of the themes from Table 8.1 similarly emerged in the second phase of interviews with industry leaders, with a few exceptions. Notably, the themes not mentioned by the industry leaders include haphazard price fluctuation, high importation of building materials, severe inflation,

unrealistic design briefs, poor welfare of government employees and issues relating to building laws. The frequency analysis of collective qualitative data revealed that the client-related issues still ranked highest amongst the problems of building construction.

Subsequently, the data was further examined using the LSR framework as a lens and the outputs were categorised according to their relevance within its pre-defined subsystems (see Table 8.3). This clearly reveals that the exogenous factors are very significant influences of project success, particularly the institutional factors, which corroborates the arguments on the impact of the business environment outlined in previous chapters (Section 2.5.3, 3.3.3 and 3.3.4). Furthermore, the significance of stakeholders within the organisation segment begins to emerge. These are all discussed in more detail in subsequent sections of this chapter using a qualitative thematic analysis to retroductively examine respondents' views on why projects are failing in Lagos.

8.2.4 The Structure of Project Systems

At the end of the thematic data analysis, forty-one variables were found that influence or affect building construction success in Lagos. The discourse is structured based on the references in Table 8.3 and the validation of these variables resulted from three rounds of qualitative analysis and presentation of the findings to two professors responsible for supervising this study. Therefore, repetitive themes were identified and consolidated. From Table 8.2, Non-engagement of qualified professionals (Item 8) was merged with Client-related Issues (Item 1), Non-payment of Professional Fees (Item 20) was merged with Unethical Professional Practices (Item 9), while Poor Building Design (Item 28) and Unrealistic Briefs (Item 43) were merged with Inadequate Project Information (Item 30).

Furthermore, to understand the underlying project structure and mechanism, the strategy setout in Section 6.7.1 was followed. The LSR framework has been constructed as a hypothetical model of project complexity and this chapter explains the validity of these constructs, structures and mechanisms within this model. Therefore, the following sections present results of the qualitative tests and data analysis.

Table 8.3: Categorisation of Issues Influencing Project Success using the LSR Framework

	PHYSICAL	Reference	Frequency	% Frequency
1	Poor Weather and Soil Conditions	8.3.1	7	20.58%
2	Inadequate Infrastructure	8.3.2	4	11.76%
	TOTAL		11	
	POLITICAL			
3	Low Capacity of Government	8.4.1	10	29.41%
4	Issues relating to Government Policies	8.4.2	7	20.58%
5	Political Interference on Projects	8.4.3	5	14.70%
6	Challenging Land Tenure System	8.4.4	4	11.76%
	TOTAL		26	
	ECONOMIC			
7	Low Project Funding	8.5.1	14	41.17%
8	Urbanisation and Economic Issues	8.5.2	10	29.41%
9	High Cost of Building Materials	8.5.3	9	26.47%
10	Weak Financial Institutions	8.5.4	6	17.64%
11	Haphazard Price Fluctuation	8.5.5	5	14.70%
12	Building Material Market Issues	8.5.6	4	11.76%
13	High Importation of Building Materials	8.5.7	4	11.76%
14	Severe Inflation	8.5.8	3	8.82%
	TOTAL		55	
	SOCIOCULTURAL			
15	Corruption	8.6.1	27	79.41%
16	Poverty, Lawlessness and Religion	8.6.2	8	23.52%
17	Low Public Enlightenment	8.6.3	7	20.58%
18	Moral Decadence and Culture	8.6.4	4	11.76%
19	Lack of Culture of Planning and Excellence	8.6.5	2	5.88%
	TOTAL		48	
	TECHNOLOGICAL			
20	Substandard Building Materials	8.7.1	25	73.52%
21	Lack of Building Innovation	8.7.2	4	11.76%
22	Low Indigenous Technology and Tools	8.7.3	3	8.82%
	TOTAL		32	
	INSTITUTIONAL			
23	Ineffective Development Control	8.8.1	26	76.47%
24	Unethical Professional Practice	8.8.2	25	73.52%
25	Understaffed Regulators - Poor Monitoring and Control	8.8.3	16	47.05%
26	Difficult Building Approval Processes	8.8.4	16	47.05%
27	Weak Government Institutions	8.8.5	16	47.05%
28	Professional Rivalry and Industry Conflict	8.8.6	10	29.41%
29	Weak Professional Institutions	8.8.7	9	26.47%
30	Lack of Technical Schools	8.8.8	5	14.70%
31	Poor Welfare of Government Employees	8.8.9	1	2.94%
	TOTAL		124	
	LEGAL			
32	Quacks in Construction and Poor Law Enforcement	8.9.1	21	61.76%
33	Issues relating to Building & Employment Laws	8.9.2	1	2.94%
	TOTAL		22	
	MICRO-ENVIRONMENT			
34	Unpredictable Project Environment & Local Gangs	8.10.2	3	8.82%
	TOTAL		3	
	ORGANISATION-RELATED			
35	Client-related Issues	8.11.1	32	94.11%
36	Challenges with Estate Developers	8.11.2	8	23.52%
	TOTAL		40	
	TECHNICAL-RELATED			
37	Inadequate Project Information	8.12.1	13	38.23%
38	Procurement Related Issues	8.12.2	7	20.58%
	TOTAL		20	
	STAKEHOLDER-RELATED			
39	Consultant-related Issues	8.13.1	22	64.70%
40	Contractor-related Issues	8.13.2	21	61.76%
41	Unskilled Artisans	8.13.3	15	44.11%
	TOTAL		58	

In line with the retroductive principle (Blaikie, 2000) if these tests are successful, this gives good reason to believe in the existence of these structures and mechanisms. The data is triangulated with studies in literature (see Table 7.1) to ensure that the evidence about Lagos is valid and credible.

8. 3 PHYSICAL SUBSYSTEM

8.3.1 Geographical factors

In Section 7.1 it was explained that 17% of the total land area of Lagos consists of lagoons, creeks, and waterways which has posed constraints to rapid development of the state. The challenges of its fragmented geographical features were discussed by 20.5% of the respondents with some suggesting that poor soil conditions adversely influence the delivery of building projects in Lagos. This view is consistent with literature whereby it had been stated that such natural phenomenon contributes to building collapse (Ayodeji, 2011).

Nevertheless, others argued that failure does not result from the poor bearing capacity of the soil or other geographical factors rather from the poor design and construction techniques used by the various professionals as corroborated by MAL04;

‘Failure occurs due to lack of comprehensive subsoil investigation despite the susceptible terrain and poor soil formation to determine the type of foundation and load that subsoil will carry without failure’.

It was also discovered that the laws governing physical development in Lagos clearly stipulates that proper soil testing must be carried out to ensure that an appropriate foundation is designed for building projects. However, it appears that soil testing is usually omitted during project development and some respondents attributed this to the clients’ unwillingness to pay for this additional service, consequently the problems have persisted.

From a systems perspective, this problem links with the low capacity of government to implement its laws and statute (see 8.4.1), poor project funding by the client (see 8.5.1), lack of culture of planning and excellence (see 8.6.5), lack of building innovation (see 8.7.2),

ineffective development control (see 8.8.1), issues relating to building laws (see 8.9.1), quacks in construction (see 8.10.1) and client-related issues (8.11.1), to mention a few.

8.3.2 Inadequate Infrastructure

Infrastructure is critical for physical development of the built environment and 11.7% of the respondents suggested that poor infrastructure, particularly the lack of access roads, is one of the reasons why development control is failing in Lagos. In the words of MAL10,

‘Some places in the so called metropolitan areas of Lagos are not accessible. Now if somebody is going to develop a 2 bedroom bungalow or a storey building in an area that is not accessible, development control personnel cannot go there’.

This view is consistent with Olalusi and Otunola (2012), Awodele et al. (2012) and Aluko, O., (2012) who argue that inadequate distribution of infrastructure such as water, road and electricity results in not just poor development control but also project abandonment. Other respondents posited that these remote areas of Lagos with poor accessibility appear to be the areas where a lot of the poorly developed projects are being executed by non-professionals and without government scrutiny.

Similarly, poor physical infrastructure had also been discussed in Section 7.5 as a recurring feature of developing countries. This becomes more challenging when weighed against the study by Udofia et al. (2015) which concluded that efforts by government to develop infrastructure usually fail due to poor site conditions, budgetary problems and design related issues which results in either poor delivery or outright termination of the road construction.

In instances where government lacks the capacity or resources to provide infrastructure, Public Private Partnership (PPP) has also failed to yield positive results because of technological, environmental, variations-related and social barriers (Babatunde et al., 2014). Many of these are consistent with the arguments in subsequent sections relating to issues of government policies (see 8.4.2), unpredictable project environment (see 8.10.2), technological challenges (see 8.7.3) and corruption (see 8.6.1). Therefore, these problems persist and continue to worsen the problem of poor building construction outcomes as stated;

‘It is a challenge where government itself does not provide infrastructure, it does not provide road (and) it does not provide accessibility to sites. As soon as you move into the inter-land where accessibility is not there you dare not go and talk to the people about developmental control because they will ask you, ‘have you controlled the road as a government?’ (MAL10).

This results in a scenario whereby these regions develop haphazardly, become densely populated and result in other environmental problems such as flooding of access roads and residences due to poor drainage systems. Therefore, infrastructure is essential for physical development to be properly planned and controlled. This is largely the responsibility of government but as Dahiru (2012) argued, government does not have adequate finances and capacity to bridge the critical infrastructure gap and improve PPP investment. The next section discusses some of these government constraints.

8.4 POLITICAL SUBSYSTEM

8.4.1 Government Capacity

Many of the problems in the building industry have been attributed to poor governance and Fagbadebo (2007) summed it up as follows, *“it is obvious that governance issues are the bane of national development and political instability in Nigeria”*. 29.4% of the respondents agree with this assertion and suggested that the government of Lagos lacked the financial resources, human capacity and administrative structures to tackle some of the challenges in the building industry, particularly development control and building collapse. This is consistent with literature and further captured in the words of MAL04 as follows;

‘We used to joke that the total budget of Lagos which is the biggest in the country today is not up to the budget of Fire Service in New York. Even when the houses are collapsing who will rescue the occupants, it is even difficult because we don’t even have equipment that can respond to emergency, not because we don’t want to have. Those houses that have been identified as distressed are still there because government is financially handicapped’

This suggests that there is a clear correlation between the economic capacity of a state and its ability to control physical development (see Section 8.5.1). There were also suggestions that although the government has the political will, it is incapacitated by inadequate human resources, also discussed in Section 8.8.3. Other respondents suggested that Lagos State cannot employ more manpower than they can sustainably maintain due the high salary bill. This is corroborated by MAL06 as follows;

‘The major challenge is not even the political will but it is the capacity in terms of personnel, personnel capacity! The government of Lagos State is trying and it is only that the population is too much compared to those doing the monitoring and they are overwhelmed’.

Others suggested that the problem of building collapse in Lagos State is due to lack of an effective administrative structure for the proper monitoring of all development, which includes the lack of data on the population growth and demographic trends. This narrative about rural/urban migration is consistent with the discourse in Section 7.5 and discussed in further detail in Section 8.5.2. Nevertheless, MAL07 reiterated that the problems in Lagos are quite daunting as follows; *‘Lagos State government is trying to address these problems but their agencies are overwhelmed due to the magnitude of the problem including poor accessibility, the vast landmass, high population of the state and the agency’s low manpower’.*

Overall, MAL06 argued that the challenges of administrative structure are not just political but includes the legal system which is discussed in Section 8.9. This viewpoint about the governance challenges is exacerbated by the centralisation of the offices of government responsible for the building industry, particularly LASBCA, which are largely located in Ikeja District. Respondents suggested that following the Building Industry Reforms 2008 - 2010, recommendations were made for the distribution of LASBCA sub-offices in the 20 official Local Government Areas (LGAs) and 37 Local Council Development Areas (LCDAs) of the state but this has not been implemented. Therefore, reforms should not just be driven by public policy creation but effective implementation of same, which is the focus of the next section.

8.4.2 Government Policies

20.5% of the respondents argued that government policies regarding physical development have been inconsistent and implementation have been largely ineffective. Particularly, some of the data suggests that public policies such as those relating to land acquisition and physical development in Lagos have been challenging due to the existing Land Tenure System.

This is consistent with Olalusi and Otunola (2012) who linked non-functional government policies with project abandonment and Aluko, (2012) who argued that, *'land is the main component of solving the housing problem in urban areas and the various policies and regulations formulated by government have not provided the required solution to housing deficiency in the country'*.

Although there appears to be a huge need for urban renewal in some areas in Lagos, some respondents argued that, *'The fees for approval of building plans, approval of this, approval of that are quite high. So government itself is not interested in tackling the problems in the environment but more interested in how much money it is going to make'* (MAL10).

This perceived drive for government revenue through tariffs has resulted in the higher cost of construction (see 8.5.2). Nevertheless, opposing views such as MAL11s' suggested that there are really no problems in terms of the quality of the policies by government or the fees, rather it is the failure of implementation that is the major issue and this has been the bane of growth in the building industry.

The foregoing argument is compelling and a critical assessment of the data revealed that many of the government policies are ineffective not because of their quality but due to other factors such as governments' lack of capacity to implement them (see 8.4.1) weak public institutions (see 8.8.5) and corruption (see 8.6.1). Unfortunately, these systemic problems are manifesting as poor project performance and incidences of building collapse.

8.4.3 Political Interference

The world over, persons and organisations with political influence are able to influence public policy to gain competitive advantage and the case of Lagos is no different. Even in the cases of building collapse, 14.7% of the respondents suggested that many sponsors of such projects lobby the government to avoid prosecution and ensure that their properties are not confiscated, as stipulated by law. Therefore, there is widespread political interference in the management of affairs relating to the building construction industry.

For example, a six-storey church building belonging to the Synagogue Church, Nigeria collapsed in Lagos on September 12, 2014 reportedly killing 115 persons, many of whom were foreign nationals (BBC - 22 September, 2014 <https://www.bbc.co.uk/news/world-africa-29224936>). At the time of completing this thesis, no one had been found culpable by a court of competent jurisdiction and neither has government confiscated the property.

The foregoing occur in flagrant defiance of the provisions of the 2010 LASBCA legislation and several respondents argued that these powerful organisations and churches are owned by very influential individuals in Lagos who appear to be above the law. In such a scenario, law enforcement will continue to fail in Lagos because of the collective apathy of the stakeholders. At the same time, the land tenure system in Lagos can be challenging as revealed next.

8.4.4 Challenging Land Tenure System

Nubi and Ajoku (2011) argued that land documentation and registration for housing delivery is ineffective and inefficient, while 11.7% of the respondents agreed with this view describing the Land Administration and Building Approval guidelines as very difficult to fulfil. Specifically, MAL12 suggested that documenting land titles in Lagos State is expensive and this is further encumbered by the dual status of Lagos as a State and former Federal Capital of Nigeria.

This duality in many instances has resulted in double taxation of projects because approvals from the Federal Government are not tenable with the Lagos State government. Therefore, land administration is particularly critical in Lagos Island and jurisdiction must be determined at early project stages. MAL07 also suggested that many projects in remote areas of Lagos do

not meet regulatory requirements and tend to avoid the planning permit processes altogether.

These problems are linked to social issues of poverty and lawlessness (see 8.6.2), low project funding (see 8.5.1), difficult building approval processes (see 8.8.4), unethical professional practices (see 8.8.2) and other stakeholder related challenges. Therefore, it will be difficult to improve the current land tenure problems without addressing the other systemic issues simultaneously, particularly the numerous economic challenges that plague the industry, as discussed in the next section.

8.5 ECONOMIC SUBSYSTEM

8.5.1 Project Funding

Funding of projects by clients was described as inconsistent by 41.1% of the respondents. Some argued that many clients are low income earners, particularly the public servants, therefore project funding challenges will persist due to the poor lending culture of the financial institutions in Nigeria. These institutions are not favourably disposed to lending to low income earners and interest rates are very high, mostly double digit, which exacerbates this problem.

These views are consistent with those of Adegbehingbe (2012), as well as Akinsiku and Akinsulire (2012) who stressed that inadequate funding and poor budgeting significantly contribute to project failure. Many poorly funded projects may eventually be abandoned by the clients (Olalusi and Otunola, 2012) or the owners resort to building through self-supervision to save cost which may also have negative implications for project outcomes.

The trend of funding showed that only 26.8% of housing loans are sourced from commercial banks while 61.9% come from government, 10.1% from personal savings and 0.6% from cooperative organisations (Taiwo et al, 2014). Therefore, due to the weak lending culture and weak purchasing power of the clients, property acquisition has become a daunting venture. Ultimately, this has led to unscrupulous practices. This becomes even more critical due to the effects of rapid urbanisation.

8.5.2 Urbanisation and Economic Issues

In the previous chapter, the status of Lagos as a megacity and the commercial hub of Nigeria had been discussed extensively. 29.4% of the respondents agree that economic growth in Lagos has been followed by rapid urbanisation which continues to pose a challenge to successive governments. MAL04 suggested that the rate of urbanisation is as high as 8% and the government is overwhelmed and unable to meet the demand for housing and infrastructure.

This corroborates the arguments by Opoko and Oluwatayo (2014) who stated that urbanization in Lagos has resulted in poverty, unemployment and difficulties in accessing housing delivery inputs. Coupled with the lack of adequate capacity on the part of government, this has resulted in severe housing and infrastructure deficit. Therefore, in response to the growing social demands many private sector investors are delving in housing development.

Unfortunately, these private initiatives have not matched demand and as supply continues to diminish, developers appear to be involved in many sharp practices to maximise profits. This has resulted in haphazard development and reports of flagrant disregard of building laws in the state, mainly due to weak institutions. Therefore, as the forces of demand and supply continue to stretch the resources of the state finding new ways of solving these problems has become essential.

These economic problems are also linked to the inadequate infrastructure (see 8.3.2), low capacity of government (see 8.4.1), poverty and lawlessness (see 8.6.2) amongst many others. There are indications that government institutions will need to be strengthened economically, its human capability improved to deal with the challenges of urbanisation, and these efforts must be tailored to suit the sociocultural peculiarities of the country. Notably, the biggest concern for many of the respondents is the spiralling cost of building materials which is addressed next.

8.5.3 High Cost of Building Materials

Akanni et al. (2014) stated that factors responsible for high cost of building materials includes the exchange rate of the Naira, cost of fuel and power supply, changes in government policies and legislation. 26.4% of the respondents also mentioned this factor as contributory to the problems of building failure. In one view, *'When the cost of building construction materials are high there is the tendency for builders, clients or owners to want to cut corners'* (MAL05).

The presumption here is that cutting corners in local parlance refers to corruption, lowering standards and disregarding compliance requirements. Other respondents suggested that these problems are compounded by the volatile currency exchange rate and high importation of building materials, components and finishes used in Lagos from Europe and Asia which is consistent with the discourse in Sections 8.4.2, 8.6.2, 8.7.3 and 8.13. Again, several respondents suggested that the role of financial institutions need to be examined and improved to meet the needs of the industry.

8.5.4 Weak Financial Institutions

The state of the financial sector in Lagos was summed up by MAL11 as follows;

"Proper real estate requires good access to funds at a cheap rate. Once you cannot guarantee long term mortgage, it means that every real estate has to be short term and profit has to be short term; and for profit to be short term, it means that a lot of things would have to give".

This assertion was reiterated by 17.6% of the respondents arguing that the financial institutions prefer to lend to short-term business for a quick cash turnover which is difficult in construction. Furthermore, Aluko (2012) confirmed that high interest rates from mortgage banks and short amortization period of loans from financial institutions makes improving the building industry difficult and this particularly affects low-income earners.

8.5.5 Haphazard Price Fluctuation

Many of the economic factors discussed so far, including haphazard price fluctuations of materials and labour, have far-reaching implications for the building industry. Particularly, prices in the construction market will continue to fluctuate due to factors such as high interest rates and these views were shared by 14.7% of the respondents. As MAL11 explained,

“If the interest rate is very high, obviously price will be very high and if the real estate becomes affordable to only certain levels of people that means the market will be very small, competition becomes very high and so all these problems lead to the market being unstable and immature”.

Although no specific evidence of this was found in the 36 publications, inferences can be drawn from the impact of price fluctuation as it relates to other economic factors like importation of building materials (see 8.5.7). Therefore, this factor continues to plague the industry and needs to be addressed alongside other market issues in the light of the burgeoning population in Lagos.

8.5.6 Building Material Market Issues

Aluko (2012) and 11.7% of the respondents suggested that as building materials such as cement, electrical fittings and sanitary wares are being imported it has resulted in an unsustainable market. This means that prices and availability of building materials are unpredictable for a large segment of the populace. One respondent suggested that the building quality is low because, *“The developers try to cut costs in order to use price as an advantage. So, this is the state of the Lagos real estate market so beyond the production costs nobody wants to spend anything extra so there is really no guarantee of quality”.*

Additionally, some segments of manufacturing in Nigeria, such as the cement industry, appear to be oligopolistic whereby a few large firms control the price and quality of the building materials in the industry. This lack of market competitiveness and widespread importation of building inputs from foreign countries have led to a situation where price hikes have continued unabated.

8.5.7 High Importation of Building Materials

11.7% of the respondents agreed that as large proportion of the building materials used in the industry are imported and import tariffs charged by government remain high, these contribute to the spiralling cost of building materials. These wholesome importation of building materials in the Nigerian market is attributed to failing government policies (see also 8.4.2) and low indigenous technology (see 8.7.3).

Although this factor is not expressly mentioned in the examined literature, there is clear evidence that innovativeness of the indigenous industries would have to be improved to match the needs of the growing population before importation can be reduced. Furthermore, infrastructure will also need to improve to support cottage industries, financial institutions need to improve their lending culture and governments' capacity to enforce public policy must be enhanced.

8.5.8 Severe Inflation

Respondents suggested that severe inflation and the high property rental prices have made Lagos one of the most expensive places to live in Nigeria. Furthermore, this high cost does not appear to translate to good quality considering the prevalence of substandard building materials (see 8.7.1). The correlation between price and quality will continue to draw debates from industry stakeholders.

Akanni et al (2014) stated that the inflationary rate between 2003 and 2012 ranged between 5% and 21% which occurred around the period of the building industry reforms in Lagos. Recent figures show an inflationary rate of 11.4% (World Bank, 2019) and 12.82% (Central Bank of Nigeria, July 2020). These assertions were corroborated by 8.8% of the respondents arguing that this has reduced the value of money and the standard of living of the citizens. As MAL04 suggested, *'An average civil servant cannot afford a 3 bedroom flat of good quality, even the senior ones'*.

Similarly, MAL11 argued that there is poverty at the different levels of society which is exacerbated by other economic issues such as high unemployment rate which reduces the

borrowing capability of the citizens. All these are linked to many political-, sociocultural-, institutional-, organisational- and stakeholder-related issues. In the next section, the social and cultural influences are examined.

8.6 SOCIOCULTURAL SUBSYSTEM

8.6.1 Corruption

Majority (79.4%) of the respondents stated that corruption is the biggest issue plaguing the building industry in Lagos. Some suggested that this is prevalent in the construction industry the world over citing the cases of Halliburton in America and Odebrecht in Brazil. In the case of Lagos different idiosyncrasies were used to refer to corruption such as the 'Nigerian factor', 'greasing of palms', 'settlement' and 'showing of appreciation' which respondents claim largely involves government officials and which continues to affect many segments of the industry.

For example, Ebehikhalu and Dawam (2015) suggested that housing development policies have been wasteful because the policies have been implemented with high level of corruption. Similarly, Okafor (2013) stated that corruption is endemic and the bane of Nigeria's socio-economic development while Ekanem and Ekefre (2013) posited that corruption in Nigeria is very pervasive and plays a dominant role in the development deficit in the country. Particularly, Zoufa and Ochieng (2014) argued that corruption is among the main causes of project failure in Nigeria. This phenomenon has crept into every facets of society as one respondent lamented;

"There is no integrity of delivery from everybody; from the artisans to the manager, supervisor, the builder, the government and even the owner, you know. There is no integrity of performance so that keeps everybody jumpy and tricky (MAL11)".

Others suggested that a lack of political will has made the various anti-corruption strategies to fail while some attributed the endemic nature of corruption to the poor economy (see Section 8.5) and the resultant poverty syndrome. Similarly, some respondents attributed corruption to the weak public institutions (see 8.8.5). However, further evidence reveals that

the seeming correlation between corruption and poverty is less the case of poverty and more the case of greed and eroded values. This aligns with the evidence in 8.6.4 as discussed further in the next section.

8.6.2 Poverty, Lawlessness and Religion

23.5% of the respondents suggested that culture, particularly religion, remains a very strong influence on society. The case of Lagos is no exception and religion has a strong influence on the building industry often manifesting in lawlessness. To buttress this point, several respondents cited the aforementioned Synagogue Church collapse and described its premises as a fortress, which is difficult to access by even government agencies. Therefore, while construction work was ongoing development control personnel were unaware of the unethical practices on this site.

This scenario results from the influence of religion on society which MAL02 described as follows; *“In Nigeria and Africa generally, we put so much emphasis on religion and its leadership. It was Karl Marx who wrote, ‘religion is the opium of the people’ and this would seem to be the shared reality in Nigeria. Things are done that are not right and ignored simply because of religion”*

Other respondents argued that the inquest into the Synagogue incident has been stalled due to religious sentiments and the weak law enforcement system (see 8.9). Furthermore, the case for poverty has already been made and this has also become an excuse for individuals found to be breaking the law. Therefore, whether at individual or organisational level, these factors influence behaviour and are aggravated by others such as political interference (see 8.4.3), weak government institutions (see 8.8.5) and low public awareness.

8.6.3 Low Public Awareness

There are suggestions that the public are fairly unaware of the root causes of building failure and collapse in Lagos. In fact, 20.5% of the respondents agree that extensive public awareness

programmes are required to improve the state of the building industry. This view was corroborated by MAL04 stating,

“People are still not fully informed about the prerequisites of construction. Many times people don’t know the role of the architect, the engineer or what happens on construction projects”.

Other problems include the general apathy and orientation of the youth towards skills training and learning through construction-related apprenticeships. All these are linked to the political and economic factors discussed earlier, as well as weak government and professional institutions, lack of technical school, issues relating to employment and incentives, and microenvironment issues.

8.6.4 Moral Decadence & Culture

Okafor (2013) argued that due to corruption, poverty and other cultural issues, the moral fabric of the society is being destroyed and stunting the country’s technological and industrial development. Therefore, many individuals seek to live in wealth and affluence without developing the necessary work culture which has resulted in low cultural values.

11.7% of the respondents held this view with many drawing a strong alignment between poverty, crime and lawlessness. Morals and values seem to be totally lost with too much focus on material things resulting in lack of patriotism, as well as many of the social issues which are also evident in the fragmented state of the building construction industry

8.6.5 Lack of Culture of Planning and Excellence

A few (5.8%) of the respondents attributed some of the problems of building collapse to the lack of planning and poor maintenance culture even amongst professionals. This is consistent with Ayodeji (2011) who argued that planning for maintenance must begin early in the project lifecycle. Essentially, the design of building projects must include a maintenance strategy especially when many of the building components are imported from foreign countries.

In the case of Lagos, many clients have acquired very high taste for foreign building materials and technology which remains unsustainable (see 8.7.3). In his view, MAL11 posited that *‘their desire to do something special or different will then require bringing the expertise from abroad at very high cost’*. He concluded that following the completion of these sophisticated projects, maintenance becomes a problem due to poor maintenance culture and lack of skilled manpower locally.

Similarly, MAL06 argued *‘we have low maintenance culture so you find out most of these buildings have problems, not just the new ones coming up but the existing ones are actually collapsing’*. Therefore, these cultural challenges align with the political, economic and technological narrative and contribute to the issues of buildings’ poor performance and collapse, most of which result from poor planning and limited expertise.

8.7 TECHNOLOGICAL SUBSYSTEM

8.7.1 Substandard Building Materials

In the discourse of the problem of building collapse, respondents ranked substandard building materials very highly (73.5%), as well as client-related issues (see 8.13.1) and corruption (see 8.6.1). Many of the respondents suggested that there is a high preponderance of poor quality and shoddy building materials in the market including sandcrete blocks, cement and steel. These thoughts align with those of Amadi et al (2012) and Ayodeji (2011).

The ubiquitous nature of inferior building materials has been blamed on both local manufacturers and unscrupulous importers which the government is finding difficult to tackle. Although material testing for projects has become mandatory, most building developers seem to fail to comply with this regulation. When quizzed about these, MAL06 argued that,

“It is the client representatives’ responsibility, particularly the contractors or their agents, to take materials to the designated testing centres for certification but the reality today is that these stakeholders prefer to buy cheaper and inferior building materials to maximise profit”.

Most buildings collapse because the reinforced concrete elements of the structure are not properly designed and constructed. Therefore, the material testing regulations in Lagos are very stringent on the quality of steel reinforcement and strength of concrete used for these works. This emphasis is consistent with the conclusions of Dahiru and Shehu (2012) on substandard strength of concrete and Ede et al (2014) on substandard steel reinforcing bars.

Overall this poor-quality control regime reflects the interdependence of the various environmental subsystems such as weak regulatory institutions, corruption, low capacity of government, building materials market issues and weak law enforcement to mention a few. Arguably, until a systems approach is employed many of these problems will persist. To reduce these occurrences, sustainable building innovation is necessary. This is examined next.

8.7.2 Lack of Building Innovation

There are suggestions by 11.7% of the respondents that the building industry in Lagos has low indigenous technology, inadequate standard of tools and lacks innovation. Some of these industry leaders also suggested that the country is laden with very obsolete technology which are insufficient to drive building systems in the modern age. To corroborate this view one respondent said,

‘The gap is not just with the obsolete technology handed down from developed countries but also obsolete statistics, applications, ideas and concepts’ (MAL05).

For instance, the manual mixing of concrete on project sites, amongst so many other issues, has led to many of the problems witnessed in the building industry over the years (MAL04). Innovation cannot be dissociated from government policies (see 8.4.2) economic issues (see 8.5), culture of excellence (see 8.6.5) amongst other environmental influences. It is predicted that the growth of innovation will lead to the development of indigenous technology.

8.7.3 Low Indigenous Technology and Tools

Awodele et al (2012) stated that the technologies and tools used in the construction industry in Lagos State appear to be inadequate which results in poor project delivery. 8.8% of the respondents corroborated this view stating that this problem features in every stage of building construction; from the wet-works, the building services and finishes. Nevertheless, one respondent suggested that lack of technology is not a problem, therefore, should not be generalised in Nigeria particularly since majority of the building projects are low-rise. Conversely, ground-breaking projects such as high-rise buildings at the Eko Atlantic City have redefined the urban landscape in Lagos with high levels of sophisticated technology.

Unfortunately, some respondents suggested that even the low-rise buildings could incorporate these sophisticated technologies but given the discourse on economic challenges in Lagos, it is clear that this approach will significantly increase building costs since the building technology is largely imported. From the foregoing, these issues are similar to the discourse on building innovation that are interdependent and interconnected with other environment subsystems mentioned previously, particularly the role of government institutions.

8.8 INSTITUTIONAL SUBSYSTEM

8.8.1 Ineffective Development Control

Twenty-six respondents (76.4%) opined that development control by the government regulators was ineffective. The views of this significant majority were summed up in the words of MAL01;

“When you study these failed projects and see where they are located, who handled them, you will find that majority of them do not have building approval or if they do they have dodgy ones, they didn’t go through the approval process because such buildings would never have gotten approval”

This marked failure of regulatory oversight was corroborated by Aluko (2012) who concluded that development control is difficult due to poor implementation of planning laws and building regulations which has led to many of the problems found in the building industry. Notably, collapsed buildings are not limited to private projects in remote locations as a number of government projects have also collapsed. This underscores the challenges of development control in Lagos.

This was certainly the case with the Synagogue Church collapse described previously where contravention notices by the government agencies were ignored and the law appears to be difficult to enforce. Nevertheless, there are regions of Lagos where law enforcement appears to be effective. As MAL02 noted, *'monitoring happens mostly in the urban, low- and medium-density areas while the high-density suburbs are largely neglected'*.

Similarly, MAL06 opined that cases of illegal 'Change of Use' of properties has created a lot of problems in Lagos, especially when residential buildings are converted to commercial without recourse to the structural implication of these changes. Unfortunately, these problems have persisted due to issues such as rapid urbanisation (8.5.2), corruption (8.6.2), weak government institutions (8.8.4) and unethical professional practice (8.8.2).

8.8.2 Unethical Professional Practice

There are different categories of professionals in Lagos. Based on the discourse in Section 7.7.1, firstly, we have the fully licenced and practicing professionals; then the registered but non-practicing professionals; and finally, those who are not licenced to practice in the building industry. Many of the respondents confirmed that there is a preponderance of those non-registered professionals carrying out projects in Lagos and they are always in particular areas where the majority of projects tend to collapse. These group of unqualified non-professionals are generally referred to as 'quacks' (see Section 8.9.1), who wield significant influence due to their low pricing thus regularly receive patronage by both public and private clients.

Nonetheless, this section focuses on the lapses amongst the fully certified profession since respondents like MAL01 concluded that even amongst the licenced practitioners there appears to be a significant knowledge deficit. Therefore, 73.52% of respondents argued that

due to factors such as corruption, weak institutions and non-payment of professional fees by clients there has been an increase in unethical professional practices. This assertion aligns with those of Zoufa and Ochieng (2014) who argued that lack of professionalism is among the main causes of project failure.

The respondents agreed that this notion of low professional capacity has drawn extensive debate within the industry, especially with the incursion of foreign firms into the building industry in Nigeria. As unethical practice and low professional standards continue to plague the industry, some have suggested that understaffing of the government institutions has made monitoring and control challenging, discussed next.

8.8.3 Understaffed Regulators - Poor Monitoring and Control

47% of the respondents suggested that poor development control in Lagos is due to the low staff strength of the regulators. The number of specialised building professionals working in these government agencies are too few to match the needs of the industry. Specifically, MAL09 suggested that poor supervision is one of the many reasons why we are having collapse of buildings and this assertion was confirmed by MAL01 stating that,

“A lot of building collapse occur where additional floors are put onto an existing building because those who are supposed to control the standard of building are negligent”.

These views are consistent with Aluko (2011) who observed that planners in government agencies often dabble into filling the gap of other professionals, such as architects and engineers, making their workload burdensome and performing these tasks haphazardly. Furthermore, project sites require periodic inspection by staff of the physical planning department but manpower shortages have made this difficult (MAL08). Similarly, MAL01 put it this way,

‘There are very few architects in the planning industry or the planning ministry, including the Ministry of Physical Planning where building approvals are done, and the quality of the few architects in government employment remains unsatisfactory due to their lack of experience’.

As respondents continue to insist that non-professionals manage many of the failed projects, government appears to be overwhelmed due to work force shortage that has led to lax development control. As one respondent concluded, *'All their staff cannot monitor Lagos State, they cannot even monitor the Lekki axis alone not to talk of the whole Lagos State. The construction work going on in the State is tremendous'* (MAL12).

As a city located to the east of Lagos State, Lekki is set to become one of the economic hubs of the West African sub-region. In 2006, the Master Plan of Lekki Free Trade Zone was developed following which the blueprint of developing the entire Lekki Peninsula into a 'Blue-Green Environment City' was proposed by the State Government in July 2008.

This modern city that has attracted significant infrastructural investment covering a total area of about 155 square kilometres is acclaimed by the Lagos State government as a special multi-functional economic zone with planned housing for a population of 120,000 residents. The period of development of this new city period coincided with the 2008 Building Industry Reforms and many respondents insisted that this dream has been slow to realise partly due to work force issues.

8.8.4 Difficult Building Plan Approval Processes

To obtain a building approval in Lagos State, a Certificate of Occupancy or a registered land title is required which can be obtained at a significant cost and duration. Officially, these title documents should be processed within 30 days following the payment of all statutory fees, however most respondents suggested that this may take between two and three months. Therefore, the bureaucratic processes cause a lot of delay to projects mainly because the system is not automated.

Furthermore, after receiving the land titles many of the respondents complained about difficulty in accessing the building regulations and guidelines to enable professionals to produce drawings and documents which are compliant with the regulatory standards. Specifically, some respondents noted that these regulations are not published on-line or in print which puts designers and clients' representative at the mercy of the government officials. As MAL01 explained,

‘They sometimes tell you there is a gazette somewhere with this information and you now have to go and look for it hidden in some printing office somewhere’.

Others complained that the existing stage-by-stage method of getting approval is cumbersome because, *‘you can’t fast track anything and then innovation becomes a problem’* (MAL01). The foregoing is consistent with Adegbehingbe (2012) who opined that these problems include the turnaround time for building approval which may take up to three months. This limits innovation and the guidelines for development control need to be placed in the public domain otherwise the problems in the industry may persist.

Furthermore, the cost of obtaining land titles and planning approval has been described as prohibitive. In fact, Aluko (2012) suggested that fees payable for obtaining certificate of occupancy and the governors’ consent cost between 15 to 45% of the cost of the land. These high costs and delays have been linked to the apathy of citizens towards paying taxes and development levies in the building industry. In his view MAL07 opined,

“That is why people are cutting corners and not going through the right channels”.

Therefore, these were the views of 47% of the respondents and they linked these problems with corrupt practices, which is now resulting in a high level of defiance by stakeholders. These problems are clearly interconnected with the economic realities in the country (see 8.5) amongst other political, social, technological and stakeholder-related issues. The next section examines government institutions and how they are perceived by industry leaders.

8.8.5 Weak Government Institutions

Aluko (2011) argued that planning authorities alone cannot enforce all the planning ordinances and his views align with suggestions from 47% of the respondents. Many cited the case of the recently constituted Building Control Agency and pointed out its challenges. Bearing in mind the population size of Lagos State and the attendant problems of urbanisation, LASBCA appears to lack the capacity to prevent the problems of the building industry, particularly building collapse, although some also argued that fewer buildings have collapsed since LASBCAs’ creation (see 8.14)

Regarding substandard building materials, MAL11 suggested that once the market is flooded with low quality products it is difficult for untrained buyers to distinguish the different standards. Therefore, this questions the role and capability of the government agencies responsible for checking and certifying the standard of imports into the country such as The Nigeria Customs Service and Standard Organisation of Nigeria (SON).

Lack of continuous training of professionals within government agencies was also criticised by the respondents. Many argued that inexperience and lack of professionalism by government personnel is the bane of the existing institutions. This trend has led to frequent conflict and low innovation in the design and construction of buildings. For progress to be made, the chasm between practitioners and regulators of the industry must be addressed.

Furthermore, respondents opined that the knowledge gap between the older and younger professionals in the various segments of the building industry has also resulted in its fragmentation and widespread project failures. Therefore, institutions of government may be strengthened through a systemic approach by simultaneously improving issues relating to all other subsystems mentioned in this chapter. The rivalry amongst allied professions has made it even more difficult to address these problems and industry conflicts are examined next.

8.8.6 Professional Rivalry and Industry Conflicts

29.4% of the respondents agreed that the various professionals in the building industry have existed for years in an environment of continuous rivalry. Distrust is rife and the egoistic disposition of building professionals is blamed for many of the problems. This conflict became more pronounced during the process of enacting the National Building Code (NBC) where stakeholders found it difficult to agree on many of the issues concerning the industry (see 8.9.1)

The NBC review process went on for almost 20 years and even after the codes were developed the conflict has continued resulting in limited use of these codes by the professionals and the state government. Some have suggested that despite its enactment, building construction professionals are yet to fully agree on the content and processes which led to the NBC. For example, some are irked by the involvement of the parliament in the development of the

building codes arguing that, *'National Assembly has nothing and I can repeat nothing to do with Building Code. It is the code that professionals in the construction industry agree upon and we are supposed to take it to the local authority or state government if they want to domesticate it'* (MAL04).

Conflict amongst State and Federal government agencies, in this case Lagos State Materials Testing Laboratory (LSMTL) and Standard Organisation of Nigeria (SON) respectively, was also observed. Furthermore, the rivalry amongst the professional disciplines has persisted due to overlapping roles and the seeming lack of specialisation within the industry. Conversely, others suggested that the rivalry is waning following the rise in building collapse as captured below;

'I don't see this (rivalry) as a problem because when the problem (building collapse) arises all actors have a common enemy and must become friends. The common enemy of all professionals as at today is the issue of building collapse and everybody is working together to ensure that it is eradicated. The wrangling about overlapping roles is so insignificant when it comes to this matter. The primary thing that is on the front burner is the fight against building collapse (MAL05).'

Therefore, many respondents agreed that the building professionals should collaborate more effectively to improve the building permit and approval process undertaken by government. Collaboration will only be possible if the professional bodies drive the process of stakeholder awareness and make specialisation an essential part of practice. This role cannot be overstated and it appears the professional bodies are incapable of facilitating this change.

8.8.7 Weak Professional Bodies

26.4% of the respondents suggested that the professional institutes lack the resources to improve the industry and ensure that only properly certified persons engage in building related works. Moreover, it was suggested that the total number of registered professionals in the country was too low to match the challenges of urbanisation and physical development. Therefore, these institutes have been unable to wield their influence and meet the needs of the country.

For instance, MAL04 suggested that, *'Dead and alive, retired and the youngest one, we are not up to 5000 registered planning professionals in the country. If you deploy 5000 registered Town Planners to Lagos they cannot cope even with the metropolis but we are talking of 36 States plus Abuja. The same thing goes for all other professionals'*.

This above scenario has left a vacuum which is now being filled by the 'quacks' and the professional bodies seem powerless to reverse this trend. Similarly, MAL10 argued that the professional bodies have the same limitations the government agencies experience (see 8.4.1) and cannot enforce the laws independent of government and its institutions.

Whilst the building construction industry in Lagos continues to receive criticisms for its inability to deliver projects successfully, respondents persisted in the argument that qualified professionals do not handle many of the failed projects, which is a clear indictment of both public and private institutions. Therefore, until these statutory bodies begin to enforce professional statutes, the standards of professionalism and quality of project delivery may continue to diminish.

8.8.8 Lack of Technical Schools

Lack of good Technical Schools and Vocational Training centres is another problem plaguing the building industry in Lagos. The old training institutions established in the South-West region of Nigeria appear to be dysfunctional and the certification of bricklayers, electricians, carpenters and other skilled artisans are no longer strictly regulated resulting in diminishing standards of project. These were the views of 14.7% of the respondents and consistent with Adamu et al (2012).

To corroborate this, some respondents suggested that due to poor funding by government these training centres appear to have been abandoned, resulting in a massive shortage of skilled artisans in the building industry. Consequently, a large number of the skilled workforce in Lagos are now being imported from neighbouring countries in the sub-region such as Benin and Togo.

Unfortunately, some respondents suggested that the policy makers and government have not created the proper frameworks for these technicians and artisans to improve on their knowledge and skills. This is interrelated with the foregoing discourse on the systems approach to analysing and solving the problems in the building industry. Overall, government needs to focus on developing human capacity and this includes proper welfare of its personnel.

8.8.9 Poor Welfare of Employees

The welfare package of government employees, particularly those responsible for development control, was considered inadequate which may explain why corruption has continued to spread within the civil service. Some respondents suggested that government salaries are low and employment benefits are unsatisfactory, with examples of civil servants retiring from service without owning a home of their own. Although only one respondent (2.9%) made this assertion, linkages between staff motivation and corrupt practices cannot be completely dismissed, rather, these inferences may be drawn by examining other sections, such as 8.5.8.

8.9 LEGISLATIVE SUBSYSTEM

8.9.1 Quacks in Construction and Poor Law Enforcement

A significant number of respondents (61.76%) suggested that many of those undertaking construction works in Lagos are 'quacks'. This phrase was previously described (see 8.2.2) as persons lacking the academic and/or professional qualifications necessary to undertake building projects in Nigeria. This problem has etched deeply into every facet of society, particularly affecting the building construction industry. Opoko and Oluwatayo (2014) confirmed this stating that the quality issues experienced in housing can be attributed to the use of draughtsmen or quacks. This problem also contributes significantly to the growth of slums (Opoko and Oluwatayo, 2014) and collapse of buildings (Amadi et al, 2012) in Lagos. MAL12 summed it up as follows,

‘The infiltration of quacks into the construction industry, especially contractors, is a problem and the government cannot monitor and accredit the individuals undertaking these construction activities’.

Therefore, to address this problem all construction participants need to be properly trained, certified and monitored. In most civil societies, the laws and statutes affect everything and everyone. This is particularly significant in the building industry where prevalent laws dictate how processes for procurement and conditions of engagement of practitioners should be conducted. Unfortunately, enforcement of such laws is weak because government institutions are weak which has resulted in the proliferation of unprofessional conduct. Law enforcement is the primary responsibility of government and based on the discussion under political subsystem, it is evident that the legal systems will remain ineffective without a viable political system.

Another example of these lapses is a clause in the statutes establishing LASBCA which stipulates that government can confiscate any land on which buildings collapse which will result in immediate forfeiture by the land owners. Many respondents have questioned the rationale behind this legal provision stating that government cannot enforce these without any investigations or due legal proceedings.

Arguably, it is difficult to enforce such a law because causation would need to be established in a court of competent jurisdiction. Notably, there are myriad of problems in the industry which may result in building collapse (see Table 7.3). Similarly, others argued that there is no moral basis for confiscating these properties concluding that the bulk of the responsibility rests with policy and law makers. Therefore, these legal issues continue to plague the industry as quacks continue to hold sway and the problem is exacerbated by the apathy with which law enforcement is undertaken in Lagos. This is discussed further in the next section.

8.9.2 Issues relating to Building and Employment Law

Another problem is lack of public access to the laws and documents relating to building development in Lagos. One respondent suggested that there are very few areas with laws to guide the development of master plans, party wall and so on, which makes building projects

extremely difficult and risk laden. Therefore, to make these laws readily available online the political and institutional subsystems will have to be greatly involved. Similarly, conflict exists over the merging of the building regulations with planning laws. One of the respondents suggested that this is creating some confusion as follows;

‘We are supposed to have Construction or Building Law which will involve building regulations or construction regulations, we don’t have that. We don’t have building law or building act, we don’t have construction law or construction act. We just evolved a building code but where does it derive its main law. Many people are confused including we professionals’ (MAL04).

Other laws such as those relating to employment of construction personnel are inadequate resulting in an employment culture that perpetuates poor job security in the building industry. MAL11 summarised it this way,

‘Hiring construction personnel on a short-term contract basis does not allow for adequate training of the workforce. They are just hired whenever projects arise because of the instability of the economy and uncertainty of whether or not projects will come’.

In this regard, the National Building Code was supposed to unify all the laws relating to building standards and compliance requirements; however, this document is yet to be domesticated by many states including Lagos. Without adopting and implementing these laws at state level, the document becomes inadequate for addressing the geographical, climatic and cultural peculiarities of the region. As MAL04 put it;

‘The National building code review which started in 1986 had its report published in 2006 but has not been adopted by most states till date. This is because the professionals have refused to adopt it because it lacks clarity on issues such as the roles of the various professional disciplines resulting in rivalry amongst the various professionals and the decline of the industry’.

Therefore, it appears the industry is being regulated without any unifying statute resulting in poor law enforcement. Since law enforcement is the primary responsibility of government and based on the discussion under political subsystem, it is evident that the legal systems will remain ineffective without a viable political system to drive it.

8.10 MICRO-ENVIRONMENT SUBSYSTEM

8.10.1 Unpredictable Project Environments and Local Gangs

Ogwueleka (2011) argued that the operating environment, which she described as unpredictable, plays a vital role in determining the performance of a project in Nigeria. This is consistent with the discourse on Lagos as reiterated by 8.8% of the respondents. Many communities in Lagos have gangs, popularly referred to as ‘area boys’ and ‘omo-oniles’, that are notorious for disrupting building construction on sites in areas controlled by them. MAL03 stated that;

“These local gangs called ‘area boys’ regularly disrupt concrete works during construction to extort money from the contractors”

These disruptions during concrete works have been identified as one of the causes of defective building structure which may eventually lead to building collapse. These gangs appear to have a clear mechanism for monitoring projects within their domain of influence as described below;

“You see this ‘omo-onile’ of a thing, they have a way of monitoring if there is any construction work going on within their environment. Any time they see a vehicle going with a load of building materials they will pursue that tipper and as soon as they locate the site the information will spread to the gangs and you will see them, they will just come in unannounced (MAL08)”

This is just one of many issues peculiar to the microenvironment and the law enforcement agencies appear to be incapable of preventing this menace. Therefore, this trend of extortion and violence has continued unabated in many parts of Lagos. Other causal issues mentioned include poor access roads (see 8.3.2) and poor government capacity (see 8.4.1). Therefore, the problem of building collapse may persist if these environmental issues are not addressed.

8.11 ORGANISATION SUBSYSTEM

8.11.1 Client Related Issues

Majority (82.3%) of the respondents blamed the client for the failure of projects. This relates to issues such as project funding, decision-making and non-adherence to professional advice. These are consistent with the narrative in literature such as Akinsiku and Akinsulire (2012), Amadi et al. (2012) and Fatoye (2012) who all stressed that clients' problems are the main causes of project delay and failure, especially delayed payment of contractors.

Several respondents expressed their frustration with the situation where professionals are only consulted for the design stage of buildings projects and excluded from monitoring the buildings' construction. This has led to many of the problems in Lagos, including building collapse. This aligns with Olalusi and Otunola (2012) who stressed that the lack of adequate control in monitoring project resources contributes significantly to project abandonment.

In many instances, respondents suggested that the clients do not engage the professional services of consultants and contractors because they are not willing to pay for these services preferring to recruit cheaper and uncertified personnel (see also Olalusi and Otunola, 2012), and this contributes significantly to project abandonment and other project issues. Similarly, Ayodele and Alabi (2011) argued that this leads to variation of project scope and poor funding strategies.

Some respondents attribute the clients' unwillingness to pay for professional services to their low awareness on the benefits of professionalism. The public perceive professional fees as being too expensive and does not match the value received. This perception needs to be addressed by all stakeholders if the industry is to be improved. Even when professionals are commissioned, clients may not adhere to professional advice which could also lead to project failure.

Clients have consistently questioned the value of consultancy services in the industry resulting in apathy towards professionalism. Many argue that the inconsistent standards in the industry have resulted from clients either seeking cheaper alternatives such as the

draftsmen, or contracting foreign expertise at a significantly higher cost. Therefore, the patronage of indigenous professionals appears to be on the decline and the wavering industry standards was captured as follows; *“We really don’t demand much so anybody can put up some ugly set of drawings and he will get approvals for it whereas there should be a minimum (industry) standard. I don’t think I have ever seen any document that details the standards requirement for building in Lagos in terms of quality of materials, processes and so on (MAL01)”*.

Most respondents agreed that the transformation of the industry is necessary and must begin with the engagement of only suitably qualified professionals on all projects. Even where professionals are commissioned for projects, their competency must be scrutinised and professional fees guaranteed. Unfortunately, professional and regulatory institutions appear to lack the capacity to enforce the professional scale of fees and respondents argue that this has resulted in a situation where many clients, including government, are adamant about paying the fees prescribed by law. One respondent opined that,

‘Even when there are claims that the clients choose not to employ qualified professionals or pay proper fees to the qualified ones, it still takes us back to the regulation of the industry by the professional bodies and the capacity of its practitioners’ (MAL02).

Therefore, practitioners’ motivation and professional standards continues to diminish because of these issues. The perpetuity of this problem is in sharp contrasts to growth of the real estate and property investment business, which many perceive to be very lucrative, and has become an all-comers affair. This is examined next.

8.11.2 Challenges with Real Estate Developers

Due to the housing deficit in Lagos and the governments’ inability to match the demand, many private organisations known as Real Estate Developers are vigorously building housing estates. However, 23.5% of the respondents suggested that many of these developers are merely business men with limited knowledge of the building industry and are driven solely by profit and not professionalism. Therefore, the respondents concluded that some of these houses may have been built with substandard and cheap building materials and may eventually lead to building collapse.

Aluko (2012) corroborated this assertion by arguing that many of these private estate developers are compelled to create expensive residential estates as a result of the bureaucratic regulatory processes, high cost of construction and the lack of incentives or support from government. As one respondent put it, *'The developer whose motivation is to maximise profit, does not conduct an integrity test of the structure and makes a judgement based on the physical appearance and aesthetics'* (MAL02).

Others suggested that due to high market demand for housing and weak regulation of the sector, property development has become the domain for accountants, lawyers, doctors, politicians and anyone with significant financial resources. Again, many of these developers do not commission the services of competent construction professionals to manage the design and construction processes, primarily to save cost. Respondents concluded that this trend will continue due to poor regulation of the industry and lack of government capacity. Therefore, project-related challenges are examined in the next section to improve understanding of why building projects are failing.

8.12 TECHNICAL SUBSYSTEM

8.12.1 Inadequate Project Information

38.23% of the respondents argued that inadequate information during the planning phase of projects. This results in poor design which has also been identified as a common cause of building collapse. For instance, embarking on change of use of properties without due process, particularly very old buildings, is a common example. This was corroborated in Diugwu et al. (2015) with poor project conception, definition and poor budgeting being major issues raised. Even when sufficient documentation is prepared for projects, Idoro (2012) argued that the level of use of the documents prepared in the four project stages was between 59% and 78%.

Other issues include stakeholder management and insufficient control of the design, tendering and construction process by licenced practitioners. This is a common phenomenon resulting in collapse of buildings in Lagos. In many instances, mandatory procedures such as

conducting proper soil test to determine the soils' bearing capacity are ignored which may result in deficient structural designs. Such designs are largely based on assumptions which may be inaccurate. Again, respondents suggested that only competent practitioners must be involved in these PM processes.

Another controversial project management practice in Lagos is how contingency sums are used for building projects. Due to the risky nature of the business environment and inadequate project information at planning stage, one respondent argued that, *'actually contingency sums should not be more than 5 - 10% of your total cost but I have handled a project for someone recently where I was the project manager and we provided about 25% as contingency'* (MAL12). In his defence, this respondent argued that this strategy is justified because of high inflation, regular price fluctuation, as well as other unanticipated government fees and levies.

This view was corroborated by other respondents who suggested that some clients issue unrealistic and inadequate design briefs which usually makes it difficult for professionals to plan projects effectively. This is consistent with the suggestion by Ayodele and Alabi (2011) that inadequate project planning causes project abandonment. Similarly, Fatoye (2012) suggested that inadequate resources rank amongst the most prominent causes of project delay. Overall, to deliver projects in such a complex business environment the financial plan would need to be sufficiently robust in anticipation of any future alterations that may become necessary during the procurement stage.

8.12.2 Procurement Related Issues

Procurement methods in use in Lagos can also influence project outcomes and 20.5% of the respondents suggested that traditional procurement methods are not very effective in the delivery of complex projects in dynamic business environments. This view aligns with those of Famakin et al. (2012) and Olalusi and Otunola (2012) who stressed that design and build methods are more suitable for complex projects where project risks are shared with the contractors.

These views also corroborate the study by Ajayi et al. (2012) and, Zoufa and Ochieng (2014) who suggested that these risks will affect cost, time and quality expectations. Whichever method is selected, the bureaucratic processes, government policies, funding challenges, corruption and other systemic problems continue to cause project failure in Lagos.

Therefore, project related issues are largely reflective of the economic and sociocultural issues discussed in Section 8.5 and 8.6 respectively. Housing is a basic human need and government policies relating to project financing and procurement in Lagos will need to be addressed if this trend is to be reversed. Due to the low capacity of government, private sector and other stakeholders' involvement is essential which is discussed in the next section.

8.13 STAKEHOLDERS SUBSYSTEM

Majority of the respondents blamed the various stakeholders for many of the problems in the building industry. Although stakeholders include the clients, consultants, contractors, government and non-professionals, this segment refers to individuals or organisations that are commissioned by the clients to directly undertake the project design and delivery. The impact of the consultants, contractors and artisans are examined in the following sections.

8.13.1 Consultant Related Issues

64.7% of the respondents argued that unprofessional conduct is a problem amongst some segment of professionals despite the fact that no professional has been found liable in the various incidences of building collapse in Lagos. For example, they suggested that building material testing is the responsibility of professionals to ensure these meet the required standard but often overlooked. Therefore, MAL02 concluded that if some of the incidences of collapsed buildings are thoroughly investigated, professionals may also be found liable of negligence.

Professional liability is also discussed in literature such as Akinsiku and Akinsulire (2012), Ayodeji (2011) and Olalusi and Otunola (2012) who all mentioned design error by consultants as a major cause of project failure and abandonment. Similarly, from the project management

perspective Ayodele and Alabi (2011) and Zoufa and Ochieng (2014) blamed failure of projects, wrong estimates and inadequate cost control on incompetent project managers. Others such as Amadi et al. (2012) and Fatoye (2012) pointed out that inadequate project supervision on site and absence of geo-technical investigation by consultants are significant causes of project failure.

Therefore, professionals clearly have a critical role to play in the success of projects and there is a clear alignment of the data from interviews and literature. Professional negligence and knowledge deficit have to be addressed. As MAL06 suggested, *‘As professionals the knowledge base is thinning out in the older and even the younger generation. The knowledge base is not being transferred’*. Knowledge deficit appears to be an issue in the building industry in Lagos requiring revamping of professional training and development.

8.13.2 Contractor Related Issues

61.7% of the respondents argued that construction professionals are not the only ones experiencing diminishing knowledge and competency as a majority of the contractors in Lagos have also been found to lack the expertise to deliver projects satisfactorily. This view was corroborated by MAL06 as follows,

“What we find is that substandard work has become the norm mainly because the industry has become vastly under-regulated and the competence of numerous contractors and developers in the construction industry is substandard because many of them do not have the professional qualifications or experience to properly execute building projects”

This clearly aligns with evidence from literature. Akinsiku and Akinsulire (2012) and Ibironke (2013) suggested that contractors appear to lack the ability to honour project deadlines, while Ayodele and Alabi (2011) surmised that bankruptcy of the contractor is a problem in Nigeria. Moreover, Ijaola (2012) and Akinola et al (2012) stated that the lack of knowledge on risk management and total quality management principles respectively among indigenous contractors is also a major problem. These problems continue to plague the industry and sometimes result in failed projects.

Although competent contractors do exist within the industry, some respondents argue that the ratio of incompetent to the competent contractors is about twenty to one, which they claim is unacceptable. Others like MAL08 described some of these incompetent contractors as being faceless and without proper company registration, certifications or insurance which makes accountable difficult. Therefore, Amadi et al. (2012) and Olalusi and Otunola (2012) concluded that collapse of buildings and poor-quality construction have persisted due to these incompetent contractors.

8.13.3 Unskilled Artisans

44.1% of the respondents described the artisans in the industry in Lagos as predominantly unskilled surmising that many of the contractors and developers do not train their workforce appropriately, which has resulted in many problems within the value chain. This corroborates the exacerbated by the lack of technical schools (see 8.8.8), which portray gaps in both private and public sector-led technical education. Unfortunately, rather than provide training for the workforce many of the skilled artisans are now being recruited from countries in the West African sub-region such as Togo and Benin Republic. Specifically, MAL06 argued *‘The entire value chain has to be re-engineered through training and education enlightenment’*.

Ayodeji (2011) and Awe et al. (2009) criticised both the quantity and quality of the construction workforce in Nigeria, corroborating this view. In their opinion, this is the most pressing issue in the nation’s construction industry and has serious implications for both businesses and the economy. Therefore, the training and certification of artisans and tradesmen in Lagos, and Nigeria in general, is of the utmost importance. Despite Nigeria’s large population of teeming youths, proper training and certification to update their skillset is not been promoted because of the lack of vocational training institutions (see 8.8.7). Alternatives measures were suggested including the following excerpt;

“You would expect that the big construction companies like Cappa and D’Alberto and Julius Berger should have a training school for providing the skilled manpower for the industry, where the older workers can train and mentor the younger one to replace them on retirement but that vision is not there in Nigeria” (MAL02).

Therefore, all respondents agreed that the shortage of skilled trades has to be addressed to improve the building industry and this was one of the mandates of LASBCA. Overall, the preceding sections have focused on the factors that influence building construction success in response to the first research question. The next section responds to the second research question by presenting the findings from the interviews regarding the success of LASBCA in improving the building industry in Lagos, particularly in reducing building collapse.

8.14 THE IMPACT OF LASBCA

The vision for LASBCA included the reduction of building collapse and promotion of industry standards. The need to examine the performance and impact of LASBCA in attaining its vision was informed by the outcomes of the pilot study (see 7.7.2). Their success in this regard was examined in response to the research question, *“How would you assess the performance of the Lagos State Building Control Agency (LASBCA) in reversing poor building construction in Lagos?”* The 22 telephone respondents were encouraged to provide explanations to perceived successes or failures of this agency of government. The results of the interviews are presented in the Table 8.4 with excerpts from the transcripts and colour codes to summarise the perception of the respondents along a triple range spectrum.

Although, the macro-level leaders were asked to comment on the progress of LASBCA their views are excluded from Table 8.4 to avoid bias since these group of respondents were directly responsible for initiating the Building Industry Reforms. Rather, their views on the rationale for setting up this new organisation are examined separately in this section which provides a basis for an axiological comparison with their decision-making outcomes. Therefore, excerpts of their transcripts are weaved together with the data in Table 8.4 to fully understand what went right, or wrong. Some progress appears to have been made in the industry since the creation of LASBCA with ten favourable comments, eight negative feedbacks and three indifferent responses. Notably, one respondent refused to comment on the progress of the agency and given the mixed reviews received on the performance of LASBCA, the researcher probed the macro-level leaders involved in the industry reforms.

Table 8.4: Perceptions on the Impact of LASBCA on Building Construction in Lagos

RESPONDENTS	INTERVIEW EXCERPTS	FEEDBACK		
		POSITIVE	NEUTRAL	NEGATIVE
MIL-02	I think they need to do more. I can't say that this mandate is being achieved in all cases because they focus on large scale projects. It shouldn't be limited to large scale projects because building collapse is not limited to large scale building alone.			
MIL-03	Lagos State Building Control Agency are doing the best that they can. LASBCA are not performing because they do not have the required manpower and they are understaffed.			
MIL-04	Then as par the Lagos State Building Control Agency, have they really been functioning? I will say no to that. They have not being functioning and they are not performing.			
MIL-05	No, the competence level is a problem because you find generally that most of the staff in those agencies do not have the requisite qualification to supervise projects. Secondly, I don't want to use the word poor supervision but they have very low level of supervision			
MIL-06	I want to score them average in terms of performance. In the last 2 years there has not been any collapse so I can say that they are working although there are still bad eggs collecting kickback from people so for now I will still score them average			
MIL-07	Even though they have good intention they don't have enough manpower. Are their impact really felt? The answer, I would say is "No" because they are not carrying along the professionals in the building industry			
MIL-08	For me LASBCA is a growing baby and they are performing, I can't say they are under performing. A baby must learn to crawl before walking. In a decaying environment when they start a new program, you don't feel the impact immediately because for the policy to stand they must weather through a lot of storms, criticisms here and there			
MIL-09	I think reasonably they have tried because it is almost impossible for you to build something somewhere at least in the city without getting them to come to site, they will just get to site anyhow and usually they are very prompt but it's more of them making an effort for them to be able to make some money for themselves			
MIL-10	I can say there is some improvement in the industry since the establishment of LASBCA and we feel their presence one way or the other. If you don't call them they will still come anyway at a later date and if they tell you to breakdown any aspect of the building you will have to bring it down.			
MIL-11	Yes, I would say they are actually performing well and trying all their best but you see the system has really been bastardized for a long time and so it's going to take some time for the system to be completely sanitised. Since 2010, or 2011 after LASBCA was set up the incidence of building collapse has reduced and it's not as rampant			
MIL-12	From what I can see so far from my extent of experience is that they are not performing to expectations at all. I say so because if the construction site is at a remote area the building works will be completed without them getting to know about it and yes, there is a level of corruption.			
MIL-13	To some extent LASBCA is performing well and I will rate them 60%, remove the fact that I am part and parcel of the system I will rate them 60% because they are not doing it alone and there is still another agency that handles the issue of materials and mix in Lagos and they work together with LASBCA			
MIL-14	The answers to the question of the non-performance of LASBCA is not far-fetched and you should know the answer because it is in the public domain it's not that they are not performing to expectations but, you see, everybody has a price and I say no more. Put it this way, they can do a lot better and not that they are not performing to expectations. They can do a lot better			
MIL-15	On projects that I have been involved in and we have had reasons to have an encounter with them, we haven't really had issues par se if you are able to defend what you are supervising and what you are overseeing. There are probably hidden structures in hidden areas whereby they probably won't come to their notice until after the disaster might have occurred			
MIL-16	Due to the vast land area of the state, transportation challenges and the remoteness of some of these building sites it becomes difficult for these bodies to perform effectively. These bodies are understaffed and their very low manpower further makes deployment of personnel to building sites quite difficult.			
MIL-17	I think if you survey major projects in Lagos state you might want to say that the government has done well but you hardly will even find them coming to site to do the necessary checks to determine if there is an architect or engineer on site			
MIL-18	Well they are actually doing a good job but they should ensure that materials that are being produced in the country are of the right standard and suitable for building construction. They are focusing on the products they see on site not focusing on the raw materials and whether we like it or not the raw materials play a large role			
MIL-19	LASBCA has not performed up to expectation for some reasons; one, like I said you know those Building Control Agency are still part of the civil service system of Nigeria and the way the civil service system is structured is such that it is difficult to achieve performance, it is not structured for performance			
MIL-20	Though it is a very good idea the biggest challenge is that there are not enough professionals on ground to handle most of the things that need to be done but they are on ground and they are working towards that.			
MIL-21	I think Lagos State Building Control Agency have performed well at least they are bringing in some measures of control such that the part of the requirement where you must do material test in centres			
MIL-22	I want to say that there is still a lot to be done and well, although this is not really government, there is a Building Collapse Prevention Guild (BCPG) which is a body formed by all the professionals including Architects, Engineers, QS and all that trying to say ok, we are going to create awareness about building collapse to the public			

The main reasons why LASBCA appears to be under-performing include understaffing, low competency in monitoring and control, corruption, organisational issues such as bureaucracy and underfunding. These factors are consistent with those discussed in Section 8.8, so why has this pattern persisted? In the views of macro-level leaders, until the Building Control Agency becomes independent of the civil service and engenders mechanisms for preventing corrupt practices progress will remain slow. This view was captured as follows;

‘When the law approved it, the professionals believed that this Building Control Agency must be independent of the Civil Service, it should not be government-run but should be privately-run’.

They reiterated the fact that a partnership between government and the professional bodies was proposed at the inception of LASBCA to ensure that the certified professionals are involved in the process of development control, however, it has been difficult to establish an acceptable framework to make this a reality. The industry leaders suggested that,

“The agency may need to have private professionals involved in monitoring. The problem of the building collapse is about monitoring and control... We don’t have a proper structure to monitor building construction in Lagos State”.

This is particularly challenging due to the remoteness of large sections of the state. To address this problem, they had offered further advice as follows;

“This agency might need to have accredited consultants in different Local Governments zones. They are supposed to have about 50 Local Areas with accredited professionals so we proposed that the building consultants and professionals can go through the accreditation for specific zones”.

For instance, professional bodies were asked to nominate their accredited members to function as consultants to work with LASBCA within the different Local Governments zones. However, the contentious issue has been the process of remunerating these consultants as government does not have the resources to be pay. Many professionals protested governments’ inability to pay accredited professionals arguing that;

“We said government does not need to be paying all these people; based on the approval permit these charges would be included so that every construction site or company that needs to start can be attached to the consultants so that they can get their funds through the government”.

In other words, these costs should be charged directly to the client and construction companies during the statutory approval permit and remitted through the government, a proposition which the government rejected since this will make development costs more exorbitant. Clearly, government did not adhere to some of the recommendations of these leaders and LASBCA is currently run like every other government agency, manifesting the same level of bureaucracy and staffing inadequacy. These have stifled growth and efficiency since its establishment in 2010. Coupled with the scenario where many organisations and individuals with political clout in Lagos persist in preventing the enforcement of existing laws, the cause of LASBCA remains daunting. Nonetheless, all the industry leaders agreed that the principal challenge with LASBCA is their lack of sufficient manpower and some of provisions of the law establishing LASBCA. As one respondent put it;

“If you go to the agency today and ask for their regulations they don’t have one. They are just trying to bring one up and they have been operating for years; so now on what basis are you harassing people on building sites?”

Overall, all respondents agreed that this is a very good policy but the perennial disconnect between policy enactment and implementation which has plagued many previous government reforms has crept into LASBCA. They argued that the only way to prevent a complete failure of this initiative is to revert to the original proposal of collaboration between the public and private sector stakeholders because government does not have enough personnel to monitor and control development in Lagos.

In the light of the need for collaboration, it was discovered that the establishment of LASBCA by government was preceded by two years of interaction between industry leaders in the wake of rampant building collapse in Lagos. These industry leaders later formed the Building Collapse Prevention Guild (BCPG) in 2011 to complement the strategies of LASBCA in line with

the 2010 Building Industry Reform (BIR). Furthermore, the qualitative data revealed that these two organisations were formed almost in parallel during the 2010 BIR. BCPG was established as a non-governmental organisation and has become an umbrella body for all stakeholders in the building industry. The collaborative efforts and success of these industry leaders through BCPG forms the basis for the discussion in Section 10.3.

Overall, some positive initiatives have been undertaken but the respondents cautioned that the issue of building collapse cannot disappear instantaneously, rather it will be a gradual process, which they likened to the control of an epidemic. They insisted that a lot of enlightenment is necessary to ensure that everyone is aware of the reasons why buildings collapse. This awareness campaign has to be developed through the concerted efforts of both the public and private sectors. Therefore, this chapter corroborates the evidence in the background chapters which suggest that the control of complex project systems is a fallacy.

8.15 CONCLUSION

It can be concluded that the phenomenon of complexity is evident in building industry in Lagos. Complex Adaptive Systems properties can be used to explain project challenges and the structure of the model of project complexity based on the data presented in this chapter. The set of subsystems converge to form an integrated whole of groups and organisations. The diversity of individual and collective agents mutually affect each other, which has resulted in the events and trends found in the building industry in Lagos.

As this industry continues to evolve, it is clear that its systems will remain dynamic as its numerous interconnecting parts continue to learn and adapt their attributes to meet changing circumstance. Particularly, the synergic properties of this complex system are manifest in the formation of LASBCA in 2010, following two years of interaction, learning and mutual influence of industry leaders. This is indicative of leadership dynamics and consequent emergent outcomes. As the phenomenon of complexity began to emerge, three vital CAS attributes can be used to describe project complexity in this industry.

Firstly, the word 'complex' refers to the numerous interconnected and interdependent elements, subsystems or parts, which affect each other in an open interactive and iterative process that cannot be controlled or fully predicted. From the forty-one variables within eleven subsystems, it is clear that the building industry is far from simple. The limited ability to control and predict project outcomes in Lagos continues to frustrate practitioners. For instance, government policies, severe inflation and corruption are just a few of the challenges that are out of the control of professionals, making project systems complex and their outcomes difficult to predict.

Therefore, there is no hard boundary between the organisation and environment; rather the systems are closely linked with all other related subsystems within an ecosystem. This gives credence to the concepts of connectivity and interdependence of variables. For instance, inadequate infrastructure is the result of poor government capacity and policies, which is influenced by urbanisation issues, corruption, low indigenous technology, weak professional bodies and other stakeholder-related issues. Clearly, LASBCA appears to be overwhelmed by the challenges of the building industry and problem solving must be approached with a collaborative disposition. In human systems, connectivity and relationships are very important because the decision or action of any actor, may affect other related individuals and actors within the system.

Adaptive attributes of CAS are exemplified in the collaborative efforts between LASBCA and BCPG. In the wake of recommendations for collaboration amongst industry decision-makers, LASBCA will need to adapt from its erstwhile bureaucratic civil service approach to problem solving and become more favourably disposed to cooperation with other government and non-governmental organisations. This is discussed in more detail in Section 10.3. The linear and non-linear interactions of these organisations make it more difficult to validate the conceptual distinction between the organisations' system and its operating environment. For instance, corruption, substandard building materials and professional rivalry are examples of problems that make the industry complex and these exist as a result of interaction between people in projects, organisations and their operating environment. LASBCAs' strategies will need to take these into account.

The third vital CAS attribute is the ability of ‘systems’ to respond as a whole group, not just as a collection of parts. This is evident in the way the government and industry leadership groups have responded in the wake of sporadic building collapse in Lagos since 2010. The emergence of BCPG and its organic self-organisation (see Section 10.3) is manifest in the way it has broken down professional barriers and galvanised the support of all stakeholders. LASBCA and BCPG have coevolved since 2010, each operating as a unitary system with emergent social ecosystem of individuals, teams and organisations. In organisational context, the spontaneous coming together of professionals to form BCPG is unprecedented and it is anticipated that this group will perform a significant role in partnering with LASBCA to achieve the goal of building collapse prevention in the future.

CHAPTER 9

RECOMMENDATIONS FOR INDUSTRY IMPROVEMENT

9.1 INTRODUCTION

This chapter seeks to understand how leadership responds to the problems of the building construction industry discussed in the Chapter 8. The data from both the qualitative and quantitative studies are presented and triangulated with data from literature. Following on from the discourse in Section 8.2.2 and the strategy set out in Section 6.7.1, the last two steps in the seven-step recommendation by Blaikie (2000) are now discussed. To test for the existence of the LSR structures and mechanisms, the study now proceeds to:

- Obtain more direct confirmation of these claims, by the development of further themes and use of suitable instruments.
- Repeat the whole process of model-building using leadership recommendations to the problems in Lagos in order to explain the structures and mechanisms already discovered.

Specifically, this chapter responds to the Research Question: *How can the building construction industry be improved?* It also seeks to address the research Objective Four: *Define, analyse and validate Leadership Systems Responses for improved project performance.* This is aimed at providing some clarity on how organisation, environment and leadership intricately influence project success. Therefore, the hypothetical description of the LSR framework is further tested to validate the existence of its entities and their relevance to leadership decision-making.

9.2 PRESENTATION OF THE FINDINGS

Three sets of data are weaved together, analysed and presented in this chapter. Firstly, the two sets of interviews are thematically analysed following which the contents and implications of these themes are compared with data from the questionnaire survey, as well as literature, to confirm these claims and validate the qualitative outcomes. This stage of

analysis brings together the data from decision makers in the building industry in Lagos at two levels; micro-level comprising project and organisation, and macro or industry level, with a view to unpacking the complexity of project systems and leadership decision making. The knowledge and experiences of micro- and macro-level leaders are described using excerpts from verbatim interview transcripts, while their decisions and attributes are also examined using quantitative techniques to further validate the systems structure and its intricate mechanisms based on the LSR framework.

Again, the mixed method analysis (MMA) approach is used (see Section 6.7.2.) and all four stages are presented beginning with the thematic qualitative analysis, then descriptive analysis, followed by the factor analysis; and, lastly the alignment of the data. The complementarity of qualitative and quantitative techniques provides a robust understanding of project complexity in a meaningful way that yields strong meta-inferences and sound reasoning. Ultimately, it is argued that the organisations and environments of the building industry as CAS have influenced the process of leadership decision-making. Therefore, decision-making determines the degree of success in the building construction ecosystem.

9.2.1 Hierarchical Analytic Overview

Hierarchical analysis of the themes was conducted using NVivo 12 after completion of the telephone interview and the results are presented in Table 8.1. The emergent themes are placed in rank order and clearly, collaboration between government and professionals appears to be the most prevalent recommendation by the respondents after the telephone interviews. Conversely, other themes such as outsourcing material testing functions and improving national infrastructure were ranked the least. Thereafter, a deeper analysis of prevalent organisational and environmental factors was conducted.

As mentioned in the previous chapter, the data from the telephone and face-to-face interviews were subsequently dovetailed and compared, the results of which are presented in Table 9.2. Many of the themes from Table 9.1 similarly emerged in the second phase of industry leaders' interviews with a few exceptions including the review of government policy on importing building materials, and the downward review of professional fees. The frequency analysis of both sets of qualitative data revealed that collaboration between government and professionals still ranked highest.

Table 9.1: MIL analyses of recommendations for project success (thematic frequency)

S/No	Recommendations for Project Success	Micro Leadership (MIL) Respondents	Micro Leadership Frequency	Micro Leadership Ranking
1	Government/Professionals Collaboration	3 4 5 7 9 13 16 19 20 21 22	11	1
2	Stakeholder Engagement and Enlightenment	1 7 8 10 11 13 15 17 19 22	10	2
3	Enforce Professional Ethics and Penalties	5 8 11 15 16 20 21 22	8	3
4	Strengthen Government Institutions	2 9 12 13 14 16 21 22	8	3
5	Professional Specialization/Reduce Stakeholder Rivalry	11 13 15 16 18 20 22	7	4
6	Government/Professionals Knowledge Sharing	3 7 16 18 19 20 22	7	4
7	Improve Development Control	2 5 14 16 17 18 22	7	4
8	Continuous Professional Development	3 7 8 10 13 18 22	7	4
9	Engage only Qualified Professionals	2 4 9 11 12 19 22	7	4
10	Cultural Reorientation for Excellence and Patriotism	6 7 15 16 19 20	6	5
11	Staff Regulators with Professional	2 4 7 12 13 16	6	5
12	Reduce Corruption	1 7 16 18 19	5	6
13	Proper Project Planning and Documentation	1 8 15 18	4	7
14	Train Construction Workforce	1 10 16 20	4	7
15	Automation of Land and Building Approval Process	1 2 16 22	4	7
16	Enforce Payment of Professional Fees	2 9 16	3	8
17	Improve Quality Control Regime (SON)	5 16 18	3	8
18	Implement Appropriate Legislation	5 8 9	3	8
19	Proper Choice of Contractors	1 2 18	3	8
20	Restructure Professional Bodies	8 14 16	3	8
21	Revive Technical Schools	3 14 20	3	8
22	Project Financiers/Banks Involvement	1 16 22	3	8
23	Improve National Economy	8 18 22	3	8
24	Proper Project Funding	6 16 18	3	9
25	Advance Payment Buffers	1 18	2	9
26	Arrest and Prosecution of Quacks	4 15	2	9
27	Better Legal Framework for Construction Projects	7 16	2	9
28	Develop Indigenous Building Technology	8 10	2	9
29	Establish Independent Regulatory Agency	4 9	2	9
30	More Material Testing Laboratories	3 12	2	9
31	Sustainable Innovation	10 17	2	9
32	Borrow/Adopt Foreign Technology	8	1	10
33	Host Community Involvement	7	1	10
34	Implement National Building Code	4	1	10
35	Improve Welfare and Salaries of Government Staff	6	1	10
36	Industry/Academia Partnership	10	1	10
37	Regulatory Transparency	1	1	10
38	Review Policy on Importation	17	1	10
39	Review Professional Fees Downwards	8	1	10
40	Use Risk Management Framework	5	1	10
41	Sincerity of All Stakeholders	6	1	10
42	Outsource Material Testing	5	1	10
43	Improve National Infrastructure	17	1	10

Table 9.2: Combined analyses of recommendations for project success (thematic frequency)

S/No	Recommendations for Project Success	Micro Leadership Frequency	Macro Leadership Frequency	Total Frequency	Ranking
1	Government/Professionals Collaboration	11	10	21	1
2	Stakeholder Engagement and Enlightenment	10	10	20	2
3	Enforce Professional Ethics and Penalties	8	10	18	3
4	Government/Professionals Knowledge Sharing	7	10	17	4
5	Professional Specialization/Reduce Stakeholder Rivalry	7	9	16	5
6	Continuous Professional Development	7	8	15	6
7	Engage only Qualified Professionals	7	8	15	6
8	Cultural Reorientation for Excellence and Patriotism	6	9	15	6
9	Strengthen Government Institutions	8	5	13	7
10	Improve Development Control	7	6	13	7
11	Train Construction Workforce	4	9	13	7
12	Staff Regulators with Professional	6	3	9	8
13	Reduce Corruption	5	3	8	9
14	Proper Project Planning and Documentation	4	4	8	9
15	Revive Technical Schools	3	4	7	10
16	Improve Quality Control Regime (SON)	3	3	6	11
17	Restructure Professional Bodies	3	3	6	11
18	Better Legal Framework for Construction Projects	2	4	6	11
19	Automation of Land and Building Approval Process	3	2	5	12
20	Proper Project Funding	3	2	5	12
21	Sincerity of All Stakeholders	1	4	5	12
22	Host Community Involvement	1	3	4	13
23	Enforce Payment of Professional Fees	3	1	4	13
24	Implement Appropriate Legislation	3	1	4	13
25	Proper Choice of Contractors	3	1	4	13
26	Project Financiers/Banks Involvement	3	1	4	13
27	Improve National Economy	3	1	4	13
28	Arrest and Prosecution of Quacks	2	1	3	14
29	Develop Indigenous Building Technology	2	1	3	14
30	Establish Independent Regulatory Agency	2	1	3	14
31	Sustainable Innovation	2	1	3	14
32	Improve Welfare and Salaries of Government Staff	1	2	3	14
33	Implement National Building Code	1	1	2	15
34	Industry/Academia Partnership	1	1	2	15
35	Regulatory Transparency	1	1	2	15
36	Sufficient Advance Payment Buffers	2		2	15
37	Establish More Material Testing Laboratories	2		2	15
38	Review Policy on Importation	1		1	16
39	Review Professional Fees Downwards	1		1	16
40	Use Risk Management Framework	1		1	16
41	Borrow/Adopt Foreign Technology	1		1	16
42	Outsource Material Testing	1		1	16
43	Improve National Infrastructure	1		1	16

Table 9.3: Categorisation of recommendations for project success using the LSR framework

	PHYSICAL	Reference	Frequency	% Frequency
1	Government should improve road infrastructure	9.4.1	1	2.94%
	TOTAL		1	
	POLITICAL			
2	Strengthen Government Institutions	9.5.1	13	38.23%
3	Reduce Corruption	9.5.2	8	23.52%
4	Improve Welfare and Salaries of Government Staff	9.5.3	3	8.82%
5	Government needs to review policy on importation of building materials which lack local substitutes	9.5.4	1	2.94%
	TOTAL		25	
	ECONOMIC			
6	Proper Project Funding	9.6.1	5	14.70%
7	Project Financiers/Banks Involvement	9.6.2	4	11.76%
8	Improve National Economy	9.6.3	4	11.76%
	TOTAL		13	
	SOCIOCULTURAL			
9	Cultural Reorientation for Excellence and Patriotism	9.7.1	15	44.11%
	TOTAL		15	
	TECHNOLOGICAL			
10	Automation of Land and Building Approval Process	9.8.1	5	14.70%
11	Sustainable Innovation	9.8.2	3	8.82%
12	Develop Indigenous Building Technology	9.8.3	3	8.82%
13	Borrow and/or adopt foreign technology	9.8.4	1	2.94%
	TOTAL		12	
	INSTITUTIONAL			
14	Government/Professionals Collaboration,	9.9.1	21	61.76%
15	Enforce Professional Ethics and Penalties	9.9.2	18	52.94%
16	Government/Professionals Knowledge Sharing	9.9.3	17	50%
17	Continuous Professional Development	9.9.4	15	44.11%
18	Improve Development Control	9.9.5	13	38.23%
19	Train Construction Workforce	9.9.6	13	38.23%
20	Staff Regulators with Professional	9.9.7	9	26.47%
21	Revive Technical Schools	9.9.8	7	20.58%
22	Improve Quality Control Regime (SON)	9.9.9	6	17.64%
23	Restructure Professional Bodies	9.9.10	6	17.64%
24	Enforce Payment of Professional Fees	9.9.11	4	11.76%
25	Establish Independent Regulatory Agency	9.9.12	3	8.82%
26	Regulatory Transparency	9.9.13	2	5.88%
27	Establish more material testing laboratories	9.9.14	2	5.88%
28	Industry/Academia Partnership	9.9.15	2	5.88%
29	Review professional fees downwards	9.9.16	1	2.94%
30	Regulators should outsource material testing functions	9.9.17	1	2.94%
	TOTAL		140	
	LEGAL			
31	Better Legal Framework for Construction Projects and Industry	9.10.1	6	17.64%
32	Implementation of New and Appropriate Legislation	9.10.2	4	11.76%
33	Arrest and Prosecute Quacks	9.10.3	3	8.82%
34	Implement National Building Code	9.10.4	2	5.88%
	TOTAL		15	
	MICRO-ENVIRONMENT			
35	Host Community Involvement	9.11.1	4	11.76%
	TOTAL		4	
	ORGANISATION-RELATED			
36	Engage only Qualified Professionals	9.12.1	15	44.11%
37	Proper Choice of Contractors	9.12.2	4	11.76%
38	Sufficient advance payment to contractors	9.12.3	2	5.88%
	TOTAL		21	
	TECHNICAL-RELATED			
39	Proper Project Planning and Documentation	9.13.1	8	23.52%
40	Risk management framework for project planning	9.13.2	1	2.94%
	TOTAL		9	
	STAKEHOLDER-RELATED			
41	Stakeholder Engagement and Enlightenment	9.14.1	20	58.82%
42	Professional Specialization/Reduce Stakeholder Rivalry	9.14.2	16	47.05%
43	Sincerity of All Stakeholders	9.14.3	5	14.70%
	TOTAL		41	

9.2.2 The Structure of Project Systems

The data was further examined using the LSR framework as a lens and the outputs were categorised according to their relevance within pre-defined subsystems (see Table 9.3). The significance of environmental factors becomes more apparent. Particularly, institutional factors are very significant influences of building project performance, which corroborates the arguments by Soderlund and Sydow (2019) and the need to tailor the environmental analysis for the construction industry (see Section 3.3.4). Similarly, the significance of the organisational factors cannot be overemphasised given the high number of recommendations in the stakeholder's subsystem. Furthermore, the distinction of the microenvironment is manifest based on the recommendation seeking to address constraints in this subsystem.

These provide further validation of the efficacy of the LSR framework as a hypothetical model of project complexity with clearer structure and mechanism. Therefore, the existence of these entities was confirmed qualitatively but further test of the model using quantitative techniques are presented herein. A description of the relations of the subsystems is provided using metaphors relating to Complex Adaptive Systems theory. The discourse is structured based on the references in Table 9.3, starting with Improvement of Road Infrastructure and concluding with Sincerity of all Stakeholders. Furthermore, the data is triangulated with studies in literature which were itemised in Table 7.2 to ensure that these leadership recommendations are valid and credible.

9.2.3 Questionnaire Survey and Response Rate

The questionnaire has two main sections; first to examine respondents' attributes and; secondly, to test the views of project leaders on the outcomes of the qualitative study using the 43 emergent themes. The emergent themes were presented on two sides of A4 paper on a 5-point Likert scale and respondents were requested to tick their responses accordingly. The range of options included 'Strongly Agree' to 'Strongly Disagree' (see Appendix D).

Since the constructs and language emerged directly from the interviews, the thematic designations and questions were easy to understand and corresponded with the study's aim and objectives. Therefore, the survey was distributed to a population of professionals ($n = 300$) and successfully self-administered as described in Section 6.7.2.8. 151 completed and useful questionnaires were returned which yielded a response rate of 50.33%. This response rate is satisfactory for studies in PM.

9.3 ATTRIBUTES OF QUESTIONNAIRE SURVEY RESPONDENTS

This section discusses the characteristics of the respondents in the quantitative survey. These include the distribution of respondents by their gender, age group, professional disciplines, and membership of professional institutions amongst others. However, most of the data on respondents' attributes will be used for future research while those which directly align with this phase of the study are presented as follows.

9.3.1 Distribution of respondents by professional discipline

In this section the researcher sought to establish the professional discipline of the respondents and their responses are shown Table 9.4. Notably, the components labelled 'Strictly Two' and 'More than Two' in Table 9.4 refers to respondents having more than one professional affiliation. For example, there are a number of respondents with a background in Architecture, as well as other built environment specialisms such as Town Planning, Building, Engineering or Quantity surveying.

The data reveals that majority (90.7%) of the respondents are professionally affiliated to Architecture while the representation of other professions such as Quantity Surveyors, Builders and Contractors are less significant. Similarly, there is evidence of respondents having more than one specialisation. The preponderance of Architects in this sample is of little surprise because the sampling strategy focused on purposively extracting the knowledge and experience of the lead practitioners in building construction projects. In Section 6.7.2.5, the selection of members of the Nigerian Institute of Architects, as well as other attendees of the monthly Building Industry Stakeholders Meeting in Lagos, had been fully justified based on

the Nigerian Construction Industry Codes on Conditions of Engagement (1996), which recognises Architects as the lead consultants in the building industry. Again, the views of all other building industry professions were assessed in the in-depth interviews.

Table 9.4: Professional Affiliations of Respondents

		Profession			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Architect	137	90.7	90.7	90.7
	Real Estate Journalist	1	.7	.7	91.4
	Strictly Two	8	5.3	5.3	96.7
	More than Two	1	.7	.7	97.4
	Quantity Surveyor	1	.7	.7	98.0
	Builder	1	.7	.7	98.7
	Estate Surveyor and Valuer	1	.7	.7	99.3
	Contractor	1	.7	.7	100.0
	Total	151	100.0	100.0	

Nonetheless, potential bias was mitigated by comparing the survey outcomes with the interviews, which drew on the experience of leaders of all the professional bodies and stakeholder groups. Similarly, during the pilot study it was ascertained that attempts to draw samples from the entire industry would be futile. Therefore, with a focus on leadership it was expedient to focus on gathering data at events, particularly the ones organised by architects, which are likely to feature many of the industry stakeholders.

The likelihood of bias was also reduced by triangulating this data with extant literature from Chapter 6. Respondents include NIA members, building industry professionals and their associates. Therefore, the views of leaders and followers were captured in the phase of study, in line with leadership dynamics discourse in Section 3.6. Followers here refers to any professional that is yet to sit for or pass their professional examinations, such as Graduate and Associate Members, as well as other building industry stakeholders.

9.3.2 Distribution of respondents by membership of built environment-related professional bodies

In this section, the researcher sought to establish the membership status of the respondents in professional bodies and their responses are shown in Table 9.5 below;

Table 9.5: Membership Status within Professional Institutions

		Membership			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Fellow	3	2.0	2.0	2.0
	Full Member	72	47.7	48.0	50.0
	Associate Member	55	36.4	36.7	86.7
	Graduate Member	12	7.9	8.0	94.7
	Student Member	2	1.3	1.3	96.0
	Non Member	6	4.0	4.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

The data reveals the professional membership status of respondents as follows; 2% - Fellow, 48% - Full Member, 36.7% - Associate Member, 8% - Graduate Member, 1.3% Student Member, 4% - Non-Member. With 50% being Full members and Fellows, this validates competency of majority of the respondents and reliability of the data.

9.3.3 Distribution of respondents by years of work experience in Lagos

In this section the researcher sought to establish the number of years of work experience of the respondents in Lagos and their responses are shown Table 9.6. Years of experience was essential to determine the suitability of the respondents. This data is particularly important when compared with Table 9.5 because professionals require between 2 – 5 years of work experience to be eligible to take the professional competency examination and attain the chartered status. This status is necessary to be eligible to design and manage projects.

Table 9.6: Years of Work Experience in Lagos

Years_Experience_Lagos					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strictly Under 5	35	23.2	23.5	23.5
	5-10	56	37.1	37.6	61.1
	Strictly Over 10	58	38.4	38.9	100.0
	Total	149	98.7	100.0	
Missing	0	2	1.3		
Total		151	100.0		

Similarly, it takes a minimum of 10 years of post-accreditation experience to become a fellow of professional bodies like the NIA, as well as to become a Chairperson or executive of a professional body. With 76.5% of the respondents having over 5 years work experience in Lagos it was deemed that they possess the knowledge and experience to provide answers to the research questions relating to the 2010 BIR in Lagos. These criteria are important because the results of the pilot study revealed that a significant number of professionals are not actively involved in building construction practice in Lagos. Therefore, the data received from these respondents is reliable and valid for this study.

9.4 PHYSICAL SUBSYSTEMS

9.4.1 Improve physical infrastructure

In response to the problem of inadequate infrastructure (see Section 8.3.2), 2.94% of the interview respondents suggested that to improve the building industry there must be a simultaneous improvement of the physical infrastructure in the state. This is consistent with Opoko and Oluwatayo (2014) who argued that new towns should be provided with adequate infrastructure in order to tackle the growth of informal settlements in Lagos.

From the survey, 59.3% of the respondents also strongly agreed that improved infrastructure is necessary. However, this simplistic approach will not improve the problems in the building industry in Lagos because the government clearly lacks the resources to provide this

infrastructure and private sector participation remains a difficult prospect due to issues such as poor collaboration and weak Public Private Partnership (PPP) legislation. Similarly, Udofia et al. (2015) suggested that budgeting, design and the process of choosing contractors will need to improve if the infrastructural deficit is to be improved.

Others like Babatunde et al. (2014) argued that for infrastructure to be improved, enabling legislation would need to be in place, strong commitment of public and private sectors has to be guaranteed, project financing has to be strong and the high risk in the business environment would have to be mitigated. Considering all these, a systemic approach is essential to improve and manage the growth of the building industry in Lagos. What we need to bear in mind is that, everything is influenced by everything else within the ecosystem.

Table 9.7 Survey results on improving infrastructure

Physical-Government should improve road infrastructure to make remote areas of Lagos accessible for development control					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	5	3.3	3.3	4.0
	Agree	55	36.4	36.7	40.7
	Strongly Agree	89	58.9	59.3	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

From Table 9.7, less than 1% of the survey respondents disagreed with these views and this suggests that this variable is a valid Leadership Response and should be considered alongside other variables within the LSR framework such as political, economic, sociocultural and technological. Particularly, interview respondents suggested that areas of Lagos such as Makoko require urgent urban renewal and the planning should be participatory. Planning and policy making are the primary responsibility of government, within the political subsystem, which is discussed next.

9.5 POLITICAL SUBSYSTEMS

9.5.1 Strengthen government institutions

Several political challenges were discussed in Section 8.4 which informs the need for government reforms to improve the delivery of building projects through improved service delivery and governance in Lagos. Particularly, in response to low capacity of government and weak institutions (see Sections 8.4.1 and 8.8.5) 38.23% of interview respondents and majority (63.5%) of survey respondents strongly agreed that government institutions need to be strengthened through proper funding and provisions of equipment.

From the table below, less than 3% of the survey respondents had contrary views and this suggests that this variable is also a valid Leadership Response and should be considered through a systemic approach. For instance, corruption within public institutions will need to be tackled (see 9.5.2) and automation of land and building approval processes (see 9.8.1) will help to make this aspiration a reality. Similarly, host community participation and government/professional's collaboration are essential if success is to be sustained.

Table 9.8 Survey results on strengthening government institutions

Political-Government Institutions need to be strengthened, well-equipped and empowered to fulfil their mandates					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.4	1.4
	Neither Agree or Disagree	2	1.3	1.4	2.7
	Agree	50	33.1	33.8	36.5
	Strongly Agree	94	62.3	63.5	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

9.5.2 Reduce corruption

Corruption remains a huge problem in developing countries and Lagos is no exception as suggested by majority of the respondents (see Section 8.6.1). Therefore, 23.52% of interview respondents suggested that government should take responsibility for this issue and one of the ways to do this within public service is to improve staff welfare, which will consequently improve staff motivation and possibly reduce corruption.

From the Table below, 98% of the survey respondents strongly agreed that without reducing corruption the reforms within the building industry will not succeed. These align with Ebehikhalu and Dawam (2015) who argued that government should pursue a new development strategy devoid of corruption and inequality, while Fagbadebo (2007) suggested that a genuine monitoring of government policies and programmes could lead to the detection of corrupt practices.

Table 9.9 Survey results on reducing corruption within government institutions

Political-Government should make its processes transparent and reduce corruption in its ministries and parastatals					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	2	1.3	1.3	2.0
	Agree	27	17.9	18.1	20.1
	Strongly Agree	119	78.8	79.9	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

Others such as Okafor (2013), Ekanem and Ekefre (2013) and, Olalusi and Otunola (2012) all agreed that the total overhaul of the anti-corruption agencies within the executive, legislative and judicial arms of government was essential to combat corruption. In their view, only persons of integrity should lead these agencies and a more holistic approach involving the

education of stakeholders at schools, religious institutions and public service is necessary. Less than 1% of the survey respondents disagreed with these views. Therefore, improving the welfare of government employees is necessary if corruption is to be reduced.

9.5.3 Improve welfare of government employees

Following on from Section 8.6.2 and 8.8.5, 8.82% of interview respondents and 83.9% of survey respondents concurred to the need for government to improve the welfare of its staff. These include staff remuneration, pensions and provisions of cars for site visits. In his view, MAL04 suggested that, *'Government needs to adequately fund the aspect of planning and building control so that enforcement can be done effectively using modern tools and vehicles'*.

Table 9.10 Survey results on improving the welfare of government employees

Political-Welfare and salaries of government employees should be improved to boost staff motivation and diligence		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	2	1.3	1.3	2.0
	Neither Agree or Disagree	21	13.9	14.1	16.1
	Agree	59	39.1	39.6	55.7
	Strongly Agree	66	43.7	44.3	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

Others such as Ayodeji (2011) argued that the industry will improve when stakeholders' motivation improves and this can be made possible through increased workmen incentives, higher salaries and regular training. Some of these factors are discussed under the institutional subsystems. Clearly, from the table above, only 2% of the survey respondents disagreed with improving staff welfare which ought to make this Leadership Response valid. However, the 14.1% of respondents that neither agree nor disagree raised a few questions.

Following further scrutiny of the interviews transcripts, it became obvious that majority of the respondents were of the opinion that improving staff welfare will not automatically translate to better industry outputs. In their view, the problems of corruption and poor attitude to service will persist regardless because these issues are mostly sociocultural which improved welfare alone cannot fix. Arguably, the LSR framework approach will be more effective for simultaneously addressing the problems in all the interlinked subsystems including using advanced technology to improve accountability, improved enforcement of laws and restructuring professional organisations. Nonetheless, this approach will only become reality if government policies sufficiently support such an initiative.

9.5.4 Review importation policy

Public policy is essential to drive any kind of reform within the building industry as discussed in Section 8.4.2. This study revealed that one of the problems which policy can address is the high importation of building materials and components into Nigeria. Although the government had banned the importation of some of these items to address the high cost of building materials (8.5.3) and severe inflation (8.5.8), however, the conditions do not appear to have improved.

Table 9.11 Survey results on the review of government policies

Political-Government needs to review its policy on the importation of building materials and finishes which lack local substitutes					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	5	3.3	3.4	4.1
	Neither Agree or Disagree	30	19.9	20.4	24.5
	Agree	56	37.1	38.1	62.6
	Strongly Agree	55	36.4	37.4	100.0
	Total	147	97.4	100.0	
Missing	00	4	2.6		
Total		151	100.0		

According to 2.94% of interview respondents, some of the banned products do not have local substitutes of acceptable quality and they argued that some of these import restrictions should be repudiated. Further data revealed that 75.5% of the survey respondents accepted this assertion while 20.4% neither agreed nor disagreed. Again, this higher percentage of passive respondents, led to further scrutiny of the transcripts and it was discovered that lack of stakeholders' commitment to research and development has limited the growth of indigenous building technology (see 8.7.3) which could promote innovation and growth of cottage industries.

The findings support the assertion of Akanni et al. (2014) who argued that government should formulate policies that will reduce the nations' dependence on the use of imported building materials by encouraging research in the production of local building materials. These could be through tax breaks and reduced tariffs on items linked to production costs, as well as cheaper power supply. Similarly, Olarenwaju and Adesanya (2013) suggested that government policies should be focused on the needs of the people such as affordable housing, which is only possible through sustainable innovation.

Therefore, this recommendation appears credible but must be carefully tailored to ensure that indigenous manufacturers of building materials are supported and the quality of their products improved and standardised. Similarly, indigenous research initiatives can be improved if there is political will as well as economic, sociocultural and stakeholder support. This aligns with the systems approach using the LSR framework. Economic considerations must be contextualised and critically reviewed, which is examined in the next section.

9.6 ECONOMIC SUBSYSTEM

9.6.1 Proper project funding by the client is paramount

Low funding of projects by the clients (Sections 8.11.1 and 8.5.1) remains one of the biggest issues in the building industry in Lagos and 14.7% of the interview respondents suggested that proper funding strategies would improve project and industry performance. Similarly, 52.7% of the respondents agreed to improved project financing while less than 2% disagreed.

These views are consistent with Akinsiku and Akinsulire (2012), Fatoye (2012) and, Olarenwaju and Adesanya (2013) who argued for improved funding to improve project delivery particularly in public projects, such as slum redevelopment, which have high environmental and social impact. Collaborative models of project financing, such as the Build-Operate-Transfer (BOT) model, should be explored by government (Akinsiku and Akinsulire, 2012), in the light of its low capacity (see 8.4.1).

The BOT model is a form of integrated partnership between public and private entities to combine the design, construction, operations and maintenance responsibilities of project acquisition strategy. This BOT model could be particularly advantageous for government because it allows the private companies to get involved in building technically complicated and expensive assets, such as power stations, using highly skilled teams in the ‘build’ phase. Then the private firms put these assets into preliminary performance and viability testing during the ‘operate’ phase, which is followed by the ‘transfer’ phase, when full control of the company’s processes, tools, and methodologies are handed over to government. Therefore, this is one of many asset acquisition models where projects and technology can be acquired with the advantage of testing before buying. This improves governments’ team training and its investment viability.

Table 9.12 Survey results on improving project funding by the client

Economic-Proper project funding by the client is paramount					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.3
	Neither Agree or Disagree	6	4.0	4.0	5.3
	Agree	63	41.7	42.0	47.3
	Strongly Agree	79	52.3	52.7	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Therefore, this recommendation is acceptable due to the consistency of the data and funding must be addressed alongside improved legal framework, political considerations and stakeholder issues, amongst many others. Similarly, the role of the financial institutions is pivotal to the growth of the building industry due to the significant capital outlay of projects and this will be examined next.

9.6.2 Financiers/banks involvement/proper project funding

Financial institutions have been described as weak (Section 8.5.4) which has resulted in poor project funding (Section 8.5.1). 11.76% interview respondents argued that the banks and other financial organisations should be more involved in project development while 30% and 45.3% the survey respondents strongly agreed and agreed respectively.

From literature, Taiwo et al. (2014) explained that better terms and conditions for bank loans, such as lower interest rates, will improve project funding. At the moment, majority of households relied on their savings to access housing due to the weaknesses of the Nigeria housing market and financial institutions (Opoko and Oluwatayo, 2014). Therefore, Ebehikhalu and Dawam (2015) suggested that government should assist the populace by providing guarantees for housing finance to make them more accessible particularly to low-income households.

Similarly, Olalusi and Otunola (2012) concluded that a National Construction Bank should be established to improve project funding and complement the existing commercial banks, savings and loan institutions and primary mortgage institutions. These authors recommended that the Federal Mortgage Bank of Nigeria should also be reorganised. Although these views appear consistent with the qualitative and quantitative data, the fact that 21.3% of the respondents gave a passive response prompted further data exploration. This revealed that there are concerns and uncertainties over the role of financial institutions within a traditional project organogram.

Table 9.13 Survey results on the involvement of financial institutions on projects

Economic-Project financiers and banks should be actively involved at building project implementation stage

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.3	1.3
	Disagree	3	2.0	2.0	3.3
	Neither Agree or Disagree	32	21.2	21.3	24.7
	Agree	68	45.0	45.3	70.0
	Strongly Agree	45	29.8	30.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Therefore, to address the concerns it was recommended that new organisational models that accommodate the role of project financiers would need to evolve with the consent of primary stakeholders before this recommendation can be implemented. The need for accessible project finance cannot be overemphasised, as this is critical to the success of the industry and economic growth. In the words of MAL11,

“There is a simple solution to all these building failures and everything in the industry and that is finance. Once finance is friendly, cheap and available, you will find that real estate will flourish at a good level and once real estate can operate at that good level, that standard level everything else will be working, everything will be working.”

Nonetheless, the availability of finance is an indicator of the state of the economy and recommendations for this is examined in the next section.

9.6.3 Improve national economy

In response to the economic issues raised in Section 7.5, 11.76% of the interview respondents suggested that as long as the national economy does not experience growth the economic woes in the industry will persist. Subsequently, almost 90% of the survey respondents jointly agreed with this assertion while 8.2% neither agreed nor disagreed. Scrutiny of the data revealed that this number of indecisive respondents could have resulted from the apathy of respondents towards the prospects of growth in the national economy because government policies (see example 8.4.2) have consistently failed to improve the state of the economy.

Table 9.14 Survey results on improving the nations' economy

Economic-Improvement of the national economy will lead to an improvement of the building industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	2	1.3	1.4	2.1
	Neither Agree or Disagree	12	7.9	8.2	10.3
	Agree	64	42.4	43.8	54.1
	Strongly Agree	67	44.4	45.9	100.0
	Total	146	96.7	100.0	
Missing	00	5	3.3		
Total		151	100.0		

Ayodele and Alabi (2011) corroborated this view and suggested that government should make strong efforts to reduce inflation to stem the spiralling cost of construction in Nigeria. One of the ways the economy can be improved and poverty eradicated is through wealth redistribute to bridge the gap between the rich and poor (Ekanem and Ekefre, 2013). Arguably, this may also reduce some of the sociocultural problems in the industry and nation at large but remains a tall order due to the pervasive limitations within government.

9.7 SOCIOCULTURAL SUBSYSTEM

9.7.1 Cultural reorientation for excellence and patriotism

In response to many of the issues discussed in Section 8.6, a relatively high number of interviewees (44.11%) argued for a deliberate programme to help improve cultural orientation and engender national patriotism amongst stakeholders within the building industry. About 77% of the survey respondents also jointly agreed with this view with less than 3% in disagreement. Nonetheless, 19.6% neither agreed nor disagreed which may be attributed to the fact that the questionnaire appears to be ambiguous on the specific processes for this cultural reorientation. Generally, respondents appear to share the common desire to have a society where excellence in attitudes and social values prevails but may disagree on the methodology for achieving this.

Table 9.15 Survey results on cultural reorientation of all stakeholders

Sociocultural-Cultural reorientation of all stakeholders is necessary to improve patriotism, attitudes and social values					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	3	2.0	2.0	2.7
	Neither Agree or Disagree	29	19.2	19.6	22.3
	Agree	67	44.4	45.3	67.6
	Strongly Agree	48	31.8	32.4	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

This is common because literature also sparsely provides sufficient detail of how to solve these cultural issues. For example, Olarenwaju and Adesanya (2013) suggested that government should embark on public awareness campaigns on a regular basis. However, with

the politicisation of the mass media in Nigeria many respondents seemed to disagree on how this will be achieved. Similarly, Amadi et al. (2012) argued that attitudinal change from social issues such as getting-rich-quick, maintaining standards and poor maintenance culture is required but they provide very limited explanations on how attitudinal change will be engendered sustainably. These make a strong case for a systems approach which the LSR framework seeks to facilitate.

This LSR study revealed that people need to be educated and given information relating to the cultural ethics, morals and the laws of the land. Furthermore, it was suggested that the issue of building collapse can only be controlled gradually like an epidemic through extensive public enlightenment. Many of the respondents insisted that successive governments must take the lead in this campaign, stressing that any solution must be continuous. Some views expressed are as follows;

*‘This can be remedied through massive enlightenment, education and advocacy’
(MAL05)*

‘Encourage other stakeholders, not just the professionals in the industry, even an ordinary person along the road to be aware that this is a problem and all of us are in it together’ (MAL04)

‘Knowledge to be disseminated includes the need to use only qualified personnel for projects, professionals, the laws relating building development and collapse in Lagos, which should be continuous using the necessary mass media channels i.e. popular TV and radio stations’ (MAL06)

Clearly, these programmes must have a targeted stakeholder’s approach and the use of information technology to promote attitudinal change was not mentioned in any of the interviews or literature which shows a clear gap in knowledge. The internet and social media have become ubiquitous in the world over, becoming the most effective way to run media campaigns. Other ways in which technology can improve the building industry are addressed in the next section.

9.8 TECHNOLOGICAL SUBSYSTEMS

9.8.1 Automation of land and building approval process

Further to the challenges of land tenure system (Section 8.4.4) and difficult building approval process (Section 8.8.4), 14.7% of interview respondents suggested that technological solutions should be deployed to improve land acquisition and planning approval in Lagos. Similarly, over 90% of the survey respondents corroborated this view with less than 1% in disagreement. Again, 6.8% neither agreed nor disagreed, which may be attributed to uncertainty on the nature of the technology or the specific area of improvement which are unclear from the questionnaire.

Table 9.16 Survey results on automation of land and building approval processes

Technological-Improve land acquisition and building approval processes by deploying appropriate technology and automation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	10	6.6	6.8	7.4
	Agree	65	43.0	43.9	51.4
	Strongly Agree	72	47.7	48.6	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

The need for ICT infrastructure was also mentioned by Nubi and Ajoku (2011) who argued that the payments of land charges, documentation and processing could all be improved digitally since the land registry will be decentralize. Similarly, respondents suggested that the government will need to provide the enabling policy, legislative and institutional framework for the digital growth of the industry. This is consistent with Aluko (2012) who concluded that improved policy formulation is essential if housing and land acquisition is to be improved.

9.8.2 Sustainable innovation - research and development

Over 96% of the survey respondents agreed that building research and development in Lagos needs to be promoted to address the problems of building innovation (Section 8.7.2) and low indigenous technology (Section 8.7.3) This aligns with the suggestion by 8.82% of interview respondents and underscores the importance of sustainable innovation in the building industry. Opoko and Oluwatayo (2014) further explained that through government support, the use of local building materials will drive the growth of cottage industries and skill acquisition centres, thereby creating jobs and reducing construction cost in housing.

Table 9.17 Survey results on research and development in the building industry

Technological-Research and development should be promoted to ensure sustainable innovation in the industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	4	2.6	2.7	3.3
	Agree	54	35.8	36.0	39.3
	Strongly Agree	91	60.3	60.7	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Others suggested that innovative processes such as the use of satellite technology for surveillance of construction activities within the state is being undertaken in conjunction with the Building Control Agency. There are many advantages for deploying innovative technology in the management of the construction industry but many respondents raised concerns over the lack of adequate funding of research programmes in Nigeria. Particularly, the satellite technology is being imported at prohibitive maintenance costs and the respondents suggested that the government should seek indigenous solutions to these problems.

9.8.3 Develop indigenous building technology

Evidently, the assertion by 8.82% of interview respondents that indigenous building technology is crucial aligns with the views of majority of the survey respondents (92%), as well as other studies such as Opoko and Oluwatayo (2014). The latter argued that to address the issue of availability and affordability of building materials, concerted efforts should be made at encouraging the use of local building materials which will also support the technological base of the country. These responses seek to address many of the problems raised in Section 8.7. Indigenous products will need to be standardised and this process has already begun in Lagos with the manufacturers of steel reinforcements who have been mandated to inscribe their brand name on their products to ensure that substandard products can be traced. Compliance has improved significantly through collaboration with the Standard Organisation of Nigeria and professional bodies in Lagos.

Table 9.18 Survey results on the development of indigenous building technology

Technological-Indigenous building technology should be developed					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.3	1.3
	Disagree	1	.7	.7	2.0
	Neither Agree or Disagree	9	6.0	6.0	8.0
	Agree	54	35.8	36.0	44.0
	Strongly Agree	84	55.6	56.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Locally manufactured grades of cement are also now being differentiated and standardised for use in different aspects of construction. Similarly, readily available building materials such as bamboo, sandcrete blocks, brick blocks, cellotex boards and regenerated timber products like plywood are being explored and improved for their structural and aesthetic use. As

research and development improves, respondents opined that this will lead to cheaper and safer buildings. Furthermore, building research will require extensive funding by government and other stakeholders but the biggest threat to the growth of this sector is the popularity of imported products. Many products continue to be smuggled into the country in spite of government policies and find ready markets when they are cheaper than local alternatives or of a much higher quality. The next section examines this trend.

9.8.4 Borrow and/or adopt foreign technology

In response to several of the issues discussed in Section 8.7, 2.94% of the interview respondents opined that borrowing foreign technology and importing building materials from abroad is inevitable because indigenous industries do not have the capacity to match local demand. 56% of the survey respondents concurred while 12% disagreed with this approach to solving the technology problems in the industry. Remarkably, 31.3% neither agreed nor disagreed with this notion.

Table 9.19 Survey results on the option to borrow and adopt foreign technology

Technological-Stakeholders should borrow and/or adopt foreign technology					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	7	4.6	4.7	4.7
	Disagree	11	7.3	7.3	12.0
	Neither Agree or Disagree	47	31.1	31.3	43.3
	Agree	57	37.7	38.0	81.3
	Strongly Agree	28	18.5	18.7	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

With only a little over half of the survey respondents in agreement, this shows that the issue of borrowing or adopting foreign technology is very contentious. To begin with, due to poor policy formulation, weak government institutions, inadequate infrastructure, as well as the high cost of energy and finance, local industries find it difficult to produce building materials and develop technology that are not just affordable but also meet the quality standards desired by the end users in Lagos. This systemic problem will require a systemic solution.

Similarly, due to weak regulatory institutions such as the Standard Organisation of Nigeria, low quality and cheap building materials find their way into the markets in Lagos because compliance and quality checks are ineffective which led to the establishment of the Materials Testing Laboratories. The evidence from the preceding sections show that other environmental subsystems like physical, political and economic will also need to be improved simultaneously if the prospect of reducing the country's dependence on imported technology is to materialise.

9.9 INSTITUTIONAL SUBSYSTEM

9.9.1 Collaboration between government and professionals

Collaboration as a theme has repeatedly emerged in the various sections of this chapter therefore it came as no surprise that 61.76% of interviewees and 96% of survey respondents suggested that to improve the building industry there is a need for synergy between professional organisations and Lagos State government. Arguably, collaboration may ameliorate the deficiencies of the weak professional institutions (see 8.8.7), weak regulatory institutions (see 8.8.5) and low government capacity (see 8.4.1), thereby improving their capacity to solve the problems of the industry.

For instance, in response to ineffective development control (see 8.8.1) Aluko (2011) suggested that planning authorities need to seek collaboration with other professional bodies in order to enhance capacity building. Similarly, to fix the problems of standards and prices of building materials (see 8.7.1), Ayodeji (2011) argued that SON could collaborate with the building professional institutes such as Nigeria Institute of Building (NIOB) and Nigeria

Institute of Structural Engineers (NISTructE) to improve the building materials market. Likewise, Anyanwu (2013) suggested that prices can be reduced through the strategic partnership of professional bodies and government.

Table 9.20 Survey results on government and building professionals' collaboration

Institutional-Collaboration between government and building professionals is essential for the building industry to be improved

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	3	2.0	2.0	2.0
	Neither Agree or Disagree	3	2.0	2.0	4.0
	Agree	35	23.2	23.3	27.3
	Strongly Agree	109	72.2	72.7	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

To fix these problems, some respondents suggested that the bulk of the responsibilities rest with the policy makers within government. Yet others opined that it would be beneficial to examine case studies from other developing countries for solutions. Conversely, the data suggests that development models from other countries such as Malaysia and Singapore may not be suitable due to the systemic peculiarities in Nigeria. Therefore, solutions will need to be tailored to match the context of Lagos. Unfortunately, recent efforts to forge these partnerships have fallen through primarily because of disagreement over operational modalities, particularly in the area of monitoring and control of projects. Nonetheless, there is a glimmer of hope with the formation of the Building Collapse Prevention Guild, which has unified all the building-related professionals in their bid to work with government to reduce building collapse in Lagos. One interviewee insisted that,

"I can assure you that with what government is doing and with all the professionals coming together under the Building Collapse Prevention Guild to assist, a lot will be achieved and I am sure the issue of building collapse will definitely reduce (MAL07)".

Therefore, it is compelling to conclude that professionals and government have to work together more than ever before to solve the problems of the industry and emulate what is happening in the developed parts of the world. For this to become a reality, the entire value chain from design to delivery of building projects will need to be examined and overhauled. All subsystems will need to be addressed simultaneously and stakeholders must be enlightened on the benefits of collaboration.

9.9.2 Enforce professional standards and ethics

A significantly high number of interview (52.94%) and survey (94.7%) respondents recommended that the enforcement of professional ethics and standards through sanctions would improve the building industry in Lagos. This aligns with the views of Zoufa and Ochieng (2014) who advocated for the execution of punitive measures enshrined in the statutes of professional institutions as a deterrent to erring project stakeholders who engage in unethical behaviour and practices.

Table 9.21 Survey results on enforcement of professional ethics

Institutional-Professional ethics should be enforced by the various institutes and penalties issued against defaulters					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.3	1.3
	Neither Agree or Disagree	6	4.0	4.0	5.3
	Agree	40	26.5	26.7	32.0
	Strongly Agree	102	67.5	68.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

This recommendation responds to consultant related issues (see 8.13.1) and one respondent reiterated that, *'We need to continue to reinforce the ethos of professional code of conduct and ethics especially when admitting professionals into the chartered cadre of the various institutes. This cannot be overemphasised because I am convinced this is key to transforming the industry'* (MAL02).

The capacity of the professional bodies to enforce the ethics has largely diminished overtime (see 8.8.2) and this has resulted in lower standards. Developing standards for the industry should be a continuous process and should include regular training as mentioned below;

'We simply have to try and get things right starting with training, then documenting these things. If we were asked by someone now, what are the minimum standards for submissions, we will need to determine that. Minimum standard for maybe approval drawings, we need to determine minimum quality, minimum required information. We need to draw up that document' (MAL01).

As mentioned in the previous chapter (see under 8.14), BCPG have made efforts to provide a platform for the various tradesmen to come together and form their own specialist bodies like the bricklayers association, plumbers and all others. Further training for these trades is underway in conjunction with government. Therefore, these problems can be ameliorated through increased cooperation and knowledge sharing amongst the allied professionals.

9.9.3 Government/Professionals knowledge sharing

'Knowledge is the essential and we need to continue to improve the capacity of all professionals and other stakeholders in the industry' (MAL01). This preceding statement encapsulates the views of 50% of interviewees and 96% of the survey respondents in response to the problems discussed in Sections 8.13 and 8.6.3.

Table 9.22 Survey results on government and building professionals' knowledge sharing

Institutional-Government and Professionals must embark on knowledge sharing to bridge the knowledge gap between them

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	5	3.3	3.4	4.0
	Agree	57	37.7	38.3	42.3
	Strongly Agree	86	57.0	57.7	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

The questionnaire refers specifically to government and professionals in this section because of the existing conflict between professionals and regulators over issues such as building standards. Therefore, it is anticipated that the synergy between government and professional bodies will also lead to knowledge exchange and improved standards. Respondents concluded that the prevailing standards are below international benchmarks and local standards can be improved through knowledge sharing. In this regard, practitioners in mainstream practice should re-evaluate their position in the industry and share their industry insights at seminars and conferences to improve practice and industry. Such events should continue to be used for Continuous Professional Development to validate professional qualifications of stakeholders.

9.9.4 Continuous Professional Development

With 44.11% of interviewees and almost 97% of survey respondents advocating for continuous professional development, implementing this recommendation is definitely essential. Exposure to current best practise through international seminars, exhibitions and conferences would greatly reduce the knowledge deficit in the industry. Professional and inter-governmental visits to other developed countries of the world for knowledge exchange was also recommended.

Anyanwu (2013) suggested that professional bodies in the building industry should regularly provide workshops and seminars to educate all construction stakeholders about the need to adopt network processes in building project delivery. These will go a long way to improve development control (see 8.8.1), unethical professional practice (8.8.2) and stakeholder related issues (8.13).

Table 9.23 Survey results on the need for regular Continuous Professional Development

**Institutional-Regular Continuous Professional Development programmes
are essential for all technical stakeholders**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	4	2.6	2.7	3.3
	Agree	61	40.4	40.7	44.0
	Strongly Agree	84	55.6	56.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Respondents stressed that practitioners need to be more professional and this can be enhanced through continuous training throughout their professional careers. This will result in improved professional service within the industry and accrue economic benefits. Notably, developing CPD programmes is the primary responsibility of professional bodies and through a synergy with government institutions this could lead to improved development control.

9.9.5 Improve development control

Under Section 8.8 the most prominent institutional problem is ineffective development control and 38.23% of the interview respondents proposed that this needs to improve both at planning and construction stages. Almost 96% of the survey respondents validated this suggestion, making it very significant for improving the building industry particularly since this completely aligns with literature.

Table 9.24 Survey results on the need to improve development control

Institutional-Government needs to improve development control both at the plan approval and construction stages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.4
	Neither Agree or Disagree	4	2.6	2.7	4.1
	Agree	43	28.5	29.5	33.6
	Strongly Agree	97	64.2	66.4	100.0
	Total	146	96.7	100.0	
Missing	00	5	3.3		
Total		151	100.0		

In the light of the rapid urbanisation in Lagos, areas which require urgent improvement include demographic data management (Opoko and Oluwatayo, 2014), the turn-around time for processing planning applications (Adegbehingbe, 2012) and capacity building of government personnel to improve their functionality (Aluko, 2011). Collaboration with professional institutes was highly recommended by these authors to make these realities.

The foregoing resonates with extracts of the interviews with many cautioning that poor funding has limited governments' ability to provide a credible institutional framework for improved development control. Other areas of improvement include information dissemination to the public and implementation of the National Building Code. Regarding planning approval, a 2-part process was recommended as follows;

"First the mini plan approval comprising not too detailed preliminary drawings, schematics based on basic planning requirements such as parking, setback, number of floors, structural building materials with which you can move to site while the final detailed design can come later (MAL01)"

During the construction phase, it was recommended that regulators need to work with professional bodies to ensure that only certified professionals manage project sites. Similarly, samples of building materials used on site, particularly concrete, must be tested for strength. Other suggestions include enforcing professional ethics and values within the industry. Bureaucracy and statutory fees charged can be improved as suggested in the following extract;

“You see government needs to bring some of these things down because the fees should not be too high and to be fair, it is too exorbitant for the people. Building in Lagos has become a very expensive process and I strongly believe that if the processes are simplified and the cost highly subsidized people will willingly submit to the rule of law rather than seek ways to subvert the system (MAL08)”.

If government addresses these impediments as suggested it may improve compliance to the rule of law and reverse some of the problems in the building industry. To improve quality control at the construction stage, the artisans and site personnel need to be properly trained and certified which is the focus of the next section.

9.9.6 Train and certify construction workforce

In response to the problem of unskilled artisans (see 8.13.3) and lack of technical schools (see 8.8.8), 38.23% of the interview respondents emphasised the need for regular training and certification of construction workers in order to guarantee industry growth. Similarly, over 95% of the survey respondents corroborated this view to underscore the importance of human development. This significant suggestion was found to be consistent with literature. In their view, Ayodeji (2011) and Adamu et al. (2012) all argued that construction companies should trained site personnel on a regular basis through construction-related education schemes. This resonates with the except from the interview transcripts below;

“The big construction companies have a huge role to play in this regard by establishing training schools, providing the expertise to develop the manpower for the industry and enact a framework for knowledge transfer by recruiting youths to replace the aging workforce in the industry (MAL02)”.

Table 9.25 Survey results on the need to train and certify construction workforce

Institutional-Training and certification of the construction workforce is essential, especially for the artisans and technicians

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	6	4.0	4.0	4.6
	Agree	60	39.7	39.7	44.4
	Strongly Agree	84	55.6	55.6	100.0
	Total	151	100.0	100.0	

This private sector involvement will ameliorate the lack of technical schools and provide trainees with access to real-time project learning. Likewise, Fatoye (2012) stressed that training programmes or short courses should also be extended to senior technical and managerial personnel. This should also apply within government, beginning with the recruitment of the appropriate professionals.

9.9.7 All building professional specialisations must be represented in the government regulatory agencies

One of the ways to strengthen the government institutions is through its staff, which makes the problem of understaffed regulators, and poor monitoring and control quite troubling (see 8.8.3). This is of particular concern owing to the rivalry amongst the allied professions in the built environment such as Architects and Town Planners (see 8.8.6). Therefore, 26.47% of the interview respondents opined that this problem could be addressed by improving the representation of these professionals within the planning authorities and regulatory agencies.

This view was reiterated by Aluko (2011) as well as over 95% of the survey respondents. Beyond the quality of the staff, numerical challenges still pose a problem in these agencies with some arguing that, *‘the government agencies need to employ more personnel to work for them to guarantee specialisation within these agencies and improve monitoring and control’* (MAL06).

This is also relevant for agencies like LASBCA, as expressed by MAL01 below; *“When it came to the building control agency they said we should recommend our members who are registered to work with the building control agency because there are so many sites in Lagos”*.

Table 9.26 Survey results on the need for regulators to involve all professional specialisations

Institutional-All building professional specialisations must be represented in the government regulatory agencies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.3
	Neither Agree or Disagree	5	3.3	3.4	4.7
	Agree	53	35.1	35.6	40.3
	Strongly Agree	89	58.9	59.7	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

Therefore, in the areas of planning, monitoring and control in the built environment, the issue of work force is very critical which the authorities should improve upon with the help of other building-related professional institutions. Similarly, others stressed that proper technical education would reduce the need for extensive monitoring and control by government as is the case in developed countries. This is examined in further detail next.

9.9.8 Improvement of technical education and reestablishment of schools is necessary to sustain a skilled workforce

20.58% of the interview respondents suggested that government has the primary responsibility of improving technical education through the establishment and sustenance of Technical Colleges. This was corroborated by majority (94.7%) of the survey respondents, as well as Awe et al. (2009) who argued that the development of a “best practice framework” for vocational education and training of trades in construction in Nigeria was essential.

Conflicting arguments pointed out that government is not very efficient at running technical schools so collaboration is required between government, professional organisations and large construction companies. This has become particularly critical to develop the middle and lower level cadres of artisans through certification schemes. Clearly, the lack of continuous training over the years has resulted in poorly skilled artisans and substandard project delivery.

Table 9.27 Survey results on the need to improve technical education

Institutional-Improvement of technical education and reestablishment of schools is necessary to sustain a skilled workforce					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	7	4.6	4.6	5.3
	Agree	69	45.7	45.7	51.0
	Strongly Agree	74	49.0	49.0	100.0
	Total	151	100.0	100.0	

Technical Colleges have existed in Nigeria since the 1970s but due to poor management, they no longer function and may require revamping. In the meantime, professional organisations such as Nigeria Institute of Building (NIOB) continue to organise training workshops and internships for the construction trades. Ultimately, collaboration amongst key stakeholders is the key improving the quality control regime and raising the capacity of the lower skilled tradesmen and artisans.

9.9.9 Improve the Quality Control Regime

Amadi et al. (2012) stressed that the problems of substandard building materials and collapse of buildings has its roots in the poor-quality regime in the country whereby relevant agencies such as Standard Organisation of Nigeria have failed to ensure that all construction materials

are tested and standardised. In response, 17.64% of the interview respondents suggested that these controls are critical and agencies like LASBCA need to improve their control strategies. Similarly, over 90% of the survey respondents endorsed this recommendation. To promote the use of indigenous building materials, appropriate standards should be formulated (Opoko and Oluwatayo, 2014) and clients must demand high quality from suppliers of building materials (Akinola et al., 2012). Therefore, competency is key to ensuring that quality expectations are met in the processes of building construction. Therefore, public and private institutions have a pivotal role to play in vetting not just the quality of building materials but the personnel on projects.

Table 9.28 Survey results on the need to improve the Quality Control regime

**Institutional-Improve the Quality Control Regime through agencies such as
Standard Organisation of Nigeria**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	9	6.0	6.0	6.7
	Agree	53	35.1	35.3	42.0
	Strongly Agree	87	57.6	58.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

9.9.10 Restructure professional bodies

In response to many of problems discussed in Sections 8.8.6, 8.11, 8.12 and 8.13, 17.64% of interviewees argued that professional bodies need to be restructured to make them more effective in delivering their mandate. Similarly, 89.3% of the survey respondents strongly agreed while 9.3% neither agreed nor disagreed. The questionnaire results and transcripts lack clarity on the methodology for this recommendation and this may explain the high rate of neutral responses.

Nevertheless, the need for restructuring is very clear and consistent in literature. According to Amadi et al. (2012) professional regulatory bodies should ensure that only registered and qualified professionals are involved in the construction of buildings while Zoufa and Ochieng (2014) hinted that introducing a governance mechanism through this process could allow for the improvement of processes and creation of standard guidelines that support projects.

Table 9.29 Survey results on the need to restructure professional bodies

Institutional-Professional bodies need to be restructured to make then more effectively in promoting ethics and professionalism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.3
	Neither Agree or Disagree	14	9.3	9.3	10.7
	Agree	60	39.7	40.0	50.7
	Strongly Agree	74	49.0	49.3	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

9.9.11 Enforce payment of professional fees

Other ways in which restructuring professional bodies could improve the industry is in the enforcement of payment of professional fees by clients. Clearly, with 11.76% of the interviewees and 95.4% of the survey respondents in agreement, this is a good recommendation in order to solve some of the integrity problems in the industry. Arguably, when services are paid for appropriately, ethics will improve and many of the problems relating to expertise will reduce. In other words,

‘The professionals can always do well when their fees are guaranteed. So if there is a way that professional fees can be guaranteed, maybe in terms of legislation and enforcement, things will improve. All over the world, Architects do work on speculative basis at reduced fees but it is not as bad as it is here. So if there are ways we can get paid for the different stages of a project and you know that whatever happens you will get paid, things will work (MAL11).

Table 9.30 Survey results on enforcement of professional fees

Institutional-Payment of professional fees by clients should be enforced by the professional bodies and government					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	3	2.0	2.0	2.6
	Neither Agree or Disagree	3	2.0	2.0	4.6
	Agree	41	27.2	27.2	31.8
	Strongly Agree	103	68.2	68.2	100.0
	Total	151	100.0	100.0	

Economic challenges may sometimes dictate the purchasing power of clients and this was taken into consideration by a few interviewees. They noted that professional fees have been reviewed upwards a number of times over the last decade and suggested that this has led to the perception that building professional services are too expensive. This has also led to widespread defiance to the conditions of engagement of professionals by clients.

9.9.12 Establish independent regulatory agency

Institutional constraints had been discussed extensively in Section 8.8 and in response to many of these challenges, 8.82% of the interview respondents recommended that it would be beneficial to have a regulatory agency, which is bereft of government control and bureaucracy. With almost 70% of the survey respondents in agreement and less than 10%

dissenting, this recommendation seemed quite popular, save for the rather high 23.8% of respondents who neither agreed nor disagreed. Arguments from the interviews reveal that this clamour for an independent regulatory agency preceded the formation of LASBCA, which was conceived to solve many of the problems of the traditional government departments. However, since its creation LASBCA has been run like other government agencies because at the time of completing this study it did not have an independent source of funding therefore cannot be independent.

Table 9.31 Survey results on the need for an independent regulatory agency

Institutional-Establish a regulatory agency which is totally independent of government					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	10	6.6	6.8	7.5
	Neither Agree or Disagree	35	23.2	23.8	31.3
	Agree	51	33.8	34.7	66.0
	Strongly Agree	50	33.1	34.0	100.0
	Total	147	97.4	100.0	
Missing	00	4	2.6		
Total		151	100.0		

Unfortunately, the private sector and donor agencies have been incapable of financially supporting such an initiative. Hence, other legal complications would need to be addressed to promote such an agency's independence. Therefore, due to systemic challenges which includes both political and economic issues, the hope of establishing a regulatory agency which will be independent of government remains a fallacy. Realistically, the processes within the existing agencies can be improved for better service delivery and this could begin with professionalism and transparency.

9.9.13 Regulatory transparency

From the survey, 93.9% consented to reforms within the regulatory body in line with recommendations by 5.88% of the interview respondents. As one of the respondents put it,

“When I say reform the regulatory body I am not saying that they are not working, but the regulatory body here is a small body right now with a small mandate. (MAL11)”

Table 9.32 Survey results on transparency of the building law and regulatory processes

Institutional-Transparency and openness is essential in the building laws and regulatory processes to foster stakeholder confidence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	8	5.3	5.4	6.1
	Agree	64	42.4	43.2	49.3
	Strongly Agree	75	49.7	50.7	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

Therefore, these reforms should include the ease of access to planning and building regulations, either online or in publications and this will allow for transparency. Similarly, many respondents suggested that reducing the bureaucracy in the existing agencies will improve productivity. As mentioned in Section 8.8, technology can enhance service delivery in numerous ways, including testing the quality of building components and construction materials.

9.9.14 Establish more material testing laboratories

The case for establishing more material testing laboratories was also examined following some of the challenges mentioned Sections 8.7.1. 5.88% of the interview respondents thought this was a good idea, while 42.3% and 45.6% of the survey respondents strongly

agreed and agreed respectively. Conversely, 10.1% neither agreed nor disagreed and this high percentage of indecisive respondents triggered further interrogation of the data. Clearly, the decision to provide more testing labs is more popular with the project stakeholders than organisation and industry leaders.

Majority of the interview respondents noted that establishing more material testing laboratories is unnecessary because there is no evidence that the existing government facility is currently underutilised. They also observed that another testing facility exists at the University of Lagos, which fully complements the government establishment. In other words, there is very limited justification for providing more labs and policy makers may discard this recommendation.

Table 9.33 Survey results on the need for more material testing laboratories

Institutional-Government should establish more material testing laboratories across the state					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	2	1.3	1.3	2.0
	Neither Agree or Disagree	15	9.9	10.1	12.1
	Agree	68	45.0	45.6	57.7
	Strongly Agree	63	41.7	42.3	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

However, the only constraint derived from the data appears to be the location of these existing facilities, both located on Lagos mainland, which could pose a constraint to developers on Lagos Island due to inadequate infrastructure (see 8.3.2). This is consistent with the constraint mentioned in 8.4.1 about the centralisation of the offices of government responsible for the building industry, particularly the LASBCA, all largely located in Ikeja District of the state.

9.9.15 Strategic partnership of industry and academic experts

Further partnership is required in the area of research and this can be improved through a synergy between industry and academic experts. Therefore, 5.88% of the interview respondents recommended that industry experts need to collaborate with research institutions and academics to provide solutions to industry challenges through innovative research. Over 95% of the survey returns corroborated this leadership response.

Table 9.34 Survey results on partnership between industry and academic experts

Institutional-Experts in Industry and Academia should form strategic partnership to aid training, research and innovation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.4
	Neither Agree or Disagree	5	3.3	3.4	4.7
	Agree	61	40.4	41.2	45.9
	Strongly Agree	80	53.0	54.1	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

The following transcript excerpt reiterates the importance of research to industry development;

“We need people that will do a lot of research on these problems so that we can have good papers and also bridge these knowledge gaps either by exposing ourselves to more international seminars, exhibitions and conferences (MAL05)”.

9.9.16 Review professional fees downwards

Notably, 2.94% of the interview respondents suggested that professional fees were too exorbitant, recommending a downward review. Conversely, majority (57%) of the survey respondents disagreed with this notion and a further 21.5% neither agreed nor disagreed.

This is the recommendation with the least acceptance by the survey respondents, which underscores the significance of payment of appropriate fees to building professionals since this influences ethical behaviour.

Clearly, this recommendation was largely rejected by respondents and the transcripts suggest that the upward review of professional fees was consistent with the inflationary trends in the country (see Section 8.5.8). Others argue that poor payment for professional services is not an economic issue rather a sociocultural problem (see Section 8.6) because even the government does not always pay appropriate fees. Fees and project costing are critical elements of planning and must be examined *ab initio*. These arguments notwithstanding, a review of the exogenous factors clearly reveals a more complex and systemic problem that defies linear thinking.

Table 9.35 Survey results on downward review of professional fees

Institutional-Professional fees should be reviewed downwards in view of the economic conditions of the country					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	38	25.2	25.5	25.5
	Disagree	47	31.1	31.5	57.0
	Neither Agree or Disagree	32	21.2	21.5	78.5
	Agree	21	13.9	14.1	92.6
	Strongly Agree	11	7.3	7.4	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

These problems of the industry are complex and this study reveals the significant bias of the respondents, who are predominantly architects and built-environment professionals. It also espouses their linear-approach to problem solving since the economic and institutional influences discussed earlier largely suggest that majority of the clients are unable to afford the prevailing professional fees, including government. Arguably, if the sampling had included

some project clients the findings might have been different. Suffice to say, the industry conflict discussed in Section 8.8.6 is likely to persist due to these systemic problems and the refusal of these group of leaders to adapt to exogenous realities.

9.9.17 Regulators should outsource material testing functions

2.94% of the interviewees recommended that some of the material testing functions of the regulators should be outsourced to private companies. The arguments in section 9.9.14 is relevant here because there does not appear to be sufficient demand for this service to inform private sector participation. Notably, 37.6% of the survey respondents neither agree nor disagree to this.

Table 9.36 Survey results on the need to outsource material testing role of regulators

Institutional-Government regulators should outsource material testing functions to private firms					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	6	4.0	4.0	4.0
	Disagree	15	9.9	10.1	14.1
	Neither Agree or Disagree	56	37.1	37.6	51.7
	Agree	40	26.5	26.8	78.5
	Strongly Agree	32	21.2	21.5	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

With less than 50% of the survey respondents approving this recommendation it is evident that this option is also widely unacceptable, particularly where there is no evidence from literature to validate it. Many respondents also argued that the private sector options would be rather expensive and exacerbate the economic challenges currently being experienced by prospective homeowners. With this in mind, the legal recommendations are examined next.

9.10 LEGAL SUBSYSTEM

9.10.1 Better legal framework for construction projects

In response to the issues relating to building and employment laws (Section 8.9.2), 17.64% of the interview respondents recommended that a better legal framework needs to be developed for the building industry. In their view, this should include developing a strong culture of contracts for all projects as this is inexistent at the moment. Therefore, stakeholders must draw up contracts which will be administered by an independent institution and subject to the laws of arbitration. This is linked to recommendations in Section 9.9.12 for an independent regulatory agency.

Table 9.37 Survey results on improving the legal framework for the construction industry

Legal-Improve the legal framework for the construction industry and building projects		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.4
	Neither Agree or Disagree	14	9.3	9.7	11.0
	Agree	68	45.0	46.9	57.9
	Strongly Agree	61	40.4	42.1	100.0
	Total	145	96.0	100.0	
Missing	00	6	4.0		
Total		151	100.0		

89% of the survey respondents agreed to the need for improved legal frameworks while 9.7% neither agreed nor disagreed. In response to procurement issues (see 8.12.2), literature reveals that an improved bid evaluation system could be incorporated for construction projects in Lagos State (Famakin et al., 2012), as well as better PPP frameworks for private participation in infrastructure development (Awodele et al., 2012). In the words of MAL11,

“So once we create our own niche of equity and justice, through arbitration not courts, then people will be forced to do good work for whatever they are being paid for. It will also ensure that issues of people not being paid will be history. These are the things that cause problems and with integrity, we have to find ways of guaranteeing justice for everything within our own industry”.

Notably, Dahiru A. (2012) also argued that for PPP governance system in Nigeria to be successful, political uncertainty must be reduced, economic incentives must be right, returns on private investments must be guaranteed through stringent contract administration. This discourse underscores the systemic approach required to solve the problems of this industry. Nevertheless, some have argued that the enabling laws are lacking and this is examined next.

9.10.2 New and appropriate legislation

In line with the arguments in the preceding section, 11.76% of the interview respondents retorted that new legislation is required for the building industry. Although 77.1% of the survey respondents agreed, the significant 18.2% that neither agreed nor disagreed made it imperative to scrutinise the data further. Given the 2010 LASBCA legislation that paved way for extensive reforms in the building industry, many respondents such as MAL07 were surprised that stakeholders would call for new laws. In his view,

“All the laws are on ground so let us effectively and faithfully practise them, faithfully. If we do it the way things should be done then definitely these problems will reduce (MAL07)”.

Nonetheless, some complained about some controversial clauses in the LASBCA act such as the right of government to confiscate properties or sites where buildings collapse. They advocated that some of these clauses should be reviewed and repealed because clients should not be punished for the negligence of their agents, whether certified professionals or quacks, as well as the prevalence of substandard building materials in Lagos. Therefore, there were suggestions that the 2010 building reforms legislation needs to be reviewed and tailored to meet the yearning of stakeholders.

Table 9.38 Survey results on the need for new legislation for the building industry

Legal-New and appropriate government legislation is necessary					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	3	2.0	2.0	2.0
	Disagree	4	2.6	2.7	4.7
	Neither Agree or Disagree	27	17.9	18.2	23.0
	Agree	55	36.4	37.2	60.1
	Strongly Agree	59	39.1	39.9	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

Furthermore, others have argued for the retention of all existing clauses as a deterrent by pointing out that it is the clients' apathy towards commissioning competent personnel to design, supervise and construct their projects that usually results in building collapse in Lagos. In their view, the laws establishing LASBCA were carefully thought through and publicised in response to the prevalent sociocultural problems. Unfortunately, the menace of quacks has made law enforcement more challenging and this is reviewed in the next section.

9.10.3 Quacks in the industry

8.82% of the interview respondents and 78.5% of the survey respondents recommended that quacks in the building industry should be arrested and prosecuted. Of these survey respondents, less than 10% disagreed while 14.8% neither agreed nor disagreed. Although Aluko (2012) and Amadi et al. (2012) reiterated the need for government to prosecute and penalise unqualified individuals who carry out building construction project without complying with the laws and codes, the interview transcripts revealed a slightly different narrative.

Macro-level leaders strongly cautioned against arresting erstwhile quacks. In their view, due to the enormous sociocultural and economic problems in the country these categories of stakeholders provide an essential service to the teeming population because the numbers of qualified professionals cannot adequately cope with the housing and infrastructural deficit in Lagos. Therefore, they suggested that rather than penalise them they should be properly registered, trained for their category of service, such as draughtsmanship, and be held strictly accountable. This approach would engender inclusiveness and accountability of all stakeholders in the building construction process thereby reducing the fragmentation of the industry.

Table 9.39 Survey results on the need to arrest and prosecute quacks

Legal-Quacks in the industry should be arrested and prosecuted					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	5	3.3	3.4	3.4
	Disagree	5	3.3	3.4	6.7
	Neither Agree or Disagree	22	14.6	14.8	21.5
	Agree	47	31.1	31.5	53.0
	Strongly Agree	70	46.4	47.0	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

In some instances, the qualified professionals may not have the capacity to supervise all their projects because of the rapid urbanisation of Lagos, which makes it imperative to upskill these quacks, and bring them into the value chain. The macro-level leaders particularly hoped that this approach would assuage the existing conflicts amongst stakeholders in the industry (see also Section 9.14.1). These respondents concluded that government should channel their limited resources to setting acceptable building standards and improving the adoption of the National Building Code.

9.10.4 Implement National Building Code

Literature espouses the need for government to facilitate the adoption and enforcement of the National Building Code (Dahiru and Shehu, 2012; Amadi et al., 2012) which is consistent with the responses from 5.88% of interviews. Furthermore, over 95% of the survey respondents concurred which clearly validates broad-based acceptance of this recommendation.

Table 9.40 Survey results on the need to implement the National Building Code

Legal-Professional bodies and the State government should adopt and implement the National Building Code					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.4	1.4
	Disagree	1	.7	.7	2.0
	Neither Agree or Disagree	4	2.6	2.7	4.7
	Agree	50	33.1	33.8	38.5
	Strongly Agree	91	60.3	61.5	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

The adoption of this code will resolve some of the problems discussed in Chapter 7 such as poor building design (8.12.1), unethical professional practise (8.8.2) and issues relating to standards and building laws (8.9.2). Nonetheless, this national code will need to be tailored to suit the peculiarities of the microenvironment in the various states. Markedly, the challenges in Lagos are unique and some of the influences of its microenvironment are examined next.

9.11 MICROENVIRONMENT SUBSYSTEM

9.11.1 Host Community Involvement

Many of the issues that make Lagos unique have been discussed extensively in Chapter 6. The project environment has been described as unpredictable and one of the biggest challenges is the existence of local gangs in the suburban areas. These gangs have flourished due to poverty (see 8.6.2), moral decadence (8.6.4) and other political inadequacies (see 8.4)

Therefore, Ebehikhalu and Dawam (2015) recommended that people residing in host communities need to be involved in the formulation and implementation of public policies and programmes. Similarly, Fagbadebo (2007) advocated for the active participation of the civil society in oversight functions within their communities to ensure accountability and improve development control.

These views were corroborated by 11.76% of the interview respondents and 71.5% of the survey respondents. Although less than 10% disagreed, of greater concern was the significant (19.2%) number of respondents who neither agreed nor disagreed. Obviously, participatory planning and community development can be very challenging, particularly in developing countries, which might explain the high number of neutral responses.

Table 9.41 Survey results on involving host communities in development control

MicroEnvironment-Involvement of host community in monitoring physical development will improve development control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	5	3.3	3.3	3.3
	Disagree	9	6.0	6.0	9.3
	Neither Agree or Disagree	29	19.2	19.2	28.5
	Agree	60	39.7	39.7	68.2
	Strongly Agree	48	31.8	31.8	100.0
	Total	151	100.0	100.0	

Nonetheless, the advantages of this recommendation are numerous; collaboration could improve monitoring and control of building works in Lagos by raising awareness of people to what happens in their neighbourhood, thereby improving public enlightenment by word of mouth. However, the transcripts also suggest that these host community participants will have to be incentivised by government if this participatory approach is to be successful, an approach that could be counterproductive. One of the industry leaders opined,

“I would propose the creation of a volunteer group called Building Control Marshals identified within certain communities to help monitor the development of construction works in their locality and report incidences to the appropriate authorities”.

The problem with this solution is that volunteering appears to be unlikely to receive stakeholder buy-in and government does not have the financial resources to support such a proposition. Reflecting on the low capacity of government (Section 8.4.1), it is highly unlikely that the government has the resources to fund the training of this community groups that are likely to lack the technical knowledge to undertake collaborative development monitoring and control.

Similarly, other respondents suggested that the government could make use of the elderly people living in these communities in Lagos State for advocacy because they will require less financial gratification to promote cultural change and improved development control. Due to the presence of gangs in some of these neighbourhoods, respondents also expressed concern about asking the elderly to act as informants to the government, which could have unpleasant repercussions.

Whichever solution the government chooses to adopt it is clear that this would have to be backed by strong legislation and capacity building of the participants. The latter could be facilitated through collaboration with professional and business organisations that have a stake in these communities and packaged as Corporate Social Responsibility projects. Therefore, some ways in which organisations can positively influence the building industry are discussed next.

9.12 ORGANISATION SUBSYSTEM

9.12.1 Engage only qualified professionals

Ayodele and Alabi (2011) and Amadi et al. (2012) suggested that industry standards will improve when clients are compelled to engage the services of only competent construction professionals, from design to completion stages. This will require extensive client enlightenment and aligns with 44.11% of interview and 81.8% of survey returns. Conversely, over 10% disagreed.

The relatively higher number of respondents that disagreed or remained neutral (8.1%) may have resulted from the bias of the high number (see Figure 9.5) of unchartered professionals (those not attaining Full membership or Fellow cadre) that participated in this survey. These include the Associates (36.7%), Graduates (8%), Students (1.3%) and Non-members (4%). Similarly, the issue of quacks (see 8.10.3) remains contentious as there are more professionally unqualified professionals than certified ones. Therefore; *“All the professional bodies, NIA that is Institute of Architects, NSE that is Society of Engineers, NIQS that is Institute of Quantity Surveyors, all these bodies also need to really work together, harmonise things together and definitely it will be very difficult for people to undercut them (MAL07)”*.

Table 9.42 Survey results on the need to commission only certified building professionals

Organisation-Only qualified and certified professionals should be involved in building design and construction projects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	14	9.3	9.5	10.1
	Neither Agree or Disagree	12	7.9	8.1	18.2
	Agree	47	31.1	31.8	50.0
	Strongly Agree	74	49.0	50.0	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

This response provides some insight into the sociocultural issues discussed Section 8.6 and the cooperation and sincerity of all stakeholders is necessary for systemic problems like building collapse to be eradicated holistically.

9.12.2 Proper choice of contractors and suppliers

A critical stage of planning involves the choice of contractors and suppliers for the project. The project manager must do this professionally and the building team to avert the problems raised in Sections 8.13.2 and 8.12.2. 11.76% of interviewees and 87.3% of the survey respondents agreed that proper pre-qualification processes are necessary to ensure that the most competent contractor with the most competitive price is appointed to the project.

Table 9.43 Survey results on the need for proper choice of contractors

Organisation-Proper choice of contractors through pre-qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.3	1.3
	Disagree	1	.7	.7	2.0
	Neither Agree or Disagree	16	10.6	10.7	12.7
	Agree	60	39.7	40.0	52.7
	Strongly Agree	71	47.0	47.3	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Although 10.7% neither agreed nor disagreed, this recommendation is credible because the evidence in Section 9.3 and Table 9.4 shows that this data may contain some bias since the respondents are predominantly Architects, while others have more than one professional affiliation. Similarly, others like Ibironke et al. (2013) and Ayodele and Alabi (2011) recommended that clients appoint contractors with strong financial capabilities. This is examined in more detail in the next section.

9.12.3 Sufficient advance payment sums to contractors

The effect of low project funding was discussed in Sections 8.5.1. To ameliorate some of these problems, 5.88% of the interview respondents recommended that the client at the start of the construction phase should make sufficient payments to the contractor. This is the common practice in the building industry in Nigeria due to the weak financial institutions.

Table 9.44 Survey results on the need for sufficient advance payment to contractors

Organisation-Sufficient advance payment sums should be given to contractors to help reduce the effects of inflation and fluctuation on projects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	3	2.0	2.0	2.0
	Disagree	5	3.3	3.4	5.4
	Neither Agree or Disagree	27	17.9	18.4	23.8
	Agree	72	47.7	49.0	72.8
	Strongly Agree	40	26.5	27.2	100.0
	Total	147	97.4	100.0	
Missing	00	4	2.6		
Total		151	100.0		

Interestingly, 18.4% neither agreed nor disagreed to this recommendation in spite of the relatively high ratio (76.2%) that gave their consent. This could be explained using the discourse on sociocultural issues, particularly corruption (see section 8.6.1). After receipt of the advance payment from the clients, some contractors divert project funds to private use which may result in project abandonment, failure or litigation.

Therefore, many of the interviewees argued that the projects are more likely to be successfully if the contractors use their personal funds to begin the construction works following which payments from the clients are made based on completed and measured works. Ayodele and Alabi (2011) also insist that the clients must ensure prompt payment to contractors at all ascertained milestones. Projects are laden with risks which should be shared between the client and the contractors by using appropriate project planning methodologies.

9.13 PROJECT SUBSYSTEM

9.13.1 Proper Project Planning

Effective planning is critical for achieving success in projects and this assertive is ubiquitous in literature. Akinsiku and Akinsulire (2012) and Amadi et al. (2012) suggested that processes like geotechnical soil survey and detailed documentation of plans should be carried out at the early stages of a project. This is consistent with the returns from 98% of survey respondents and 23.52% of interviewees to confirm the importance of proper project planning.

Similarly, Diugwu et al. (2015) and Anyanwu (2013) recommended that the appointment of a competent project manager would improve project outcomes through the application of good project management principles at all phases. This will also ensure that a robust monitoring and evaluation procedure is implemented for building projects.

Table 9.45 Survey results on the need for proper project planning and documentation

Projects-Proper project planning and detailed documentation should be provided by the building professionals					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	2	1.3	1.3	2.0
	Agree	53	35.1	35.1	37.1
	Strongly Agree	95	62.9	62.9	100.0
	Total	151	100.0	100.0	

The foregoing resonates with several transcript excerpts but some respondents cautioned that project managers will suffer a similar fate because clients do not readily pay full professional fees. Therefore, MAL11 stated that *“Professionals are people who can plan a project better despite whatever problems will ensue, environmental, economic and all that, it is their work to do so. That will happen if they are briefed, paid for their service and enough time allowed for the works”*.

Besides project managers, other stakeholders can influence the outcome of projects and Idoro (2012) stated that clients should strive to provide all required documentation at each project stage to avoid delays. Similarly, Ayodele and Alabi (2011) reiterated the need for clients to undertake adequate financial planning before embarking on building projects. This can best be achieved with the aid of architects, quantity surveyors and other relevant building professionals.

9.13.2 Risk management framework for project planning

Risk management is another important aspect of project management and authors like Ajayi et al. (2012) recommended that a robust risk management framework is necessary for large construction projects, particularly for design and build procurement methods. In Lagos, some of the risk to successful project delivery include environmental (see 8.10.1 and 8.4.3), procurement-related (see 8.12.2) and human-related risks, to mention a few.

Table 9.46 Survey results on the need to integrate a risk management framework

Project-Risk management framework should be an integral part of the project planning process to prevent project failure					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Disagree	1	.7	.7	1.3
	Neither Agree or Disagree	20	13.2	13.4	14.8
	Agree	68	45.0	45.6	60.4
	Strongly Agree	59	39.1	39.6	100.0
	Total	149	98.7	100.0	
Missing	00	2	1.3		
Total		151	100.0		

Therefore, 2.94% of interview respondents recommended that a risk management framework should be integrated within project packages and this was corroborated by 85.2% of the survey respondents. 13.4% of the questionnaire returns neither agreed nor disagreed which may be due to the limited knowledge of the respondents regarding the risk management. As one respondent explained, risk management is only taught to architects at the professional level, not in the universities, therefore many unregistered professionals may be ignorant of the value of risk management.

Section 9.2.2 and Table 9.5 clearly reveals that only 50% of the survey respondents have attained their full professional qualifications, which could be used to explain this neutral response. Therefore, Ijaola (2012) concluded that providing regular training in the area of risk management practice to stakeholders, especially contractors and consultants, would increase project success and improve resource management. Therefore, the next section examines leadership decisions that relate to the stakeholder's subsystem.

9.14 STAKEHOLDERS SUBSYSTEM

9.14.1 Stakeholder engagement and enlightenment

In response to some of the issues in Section 8.13, 58.82% of interviewees and 97.3% of the survey respondents agreed that stakeholders responsible for project delivery, such as consultants and contractors, must be enlightened about best practice and the need to get involved in the reforms of the industry. Many argued that this is necessary because knowledge and technology are constantly evolving and these stakeholders need to be kept abreast of the trends through continuous training.

Other stakeholders in the industry such as building materials manufacturers, suppliers, community leaders should all be included in the fight against building collapse otherwise they can work against the progress of the campaign. Educating these stakeholders would entail mass education using electronic and print medium. Lagos State government is doing this already through regular flyer distribution, as well as radio programmes, organised to educate and enlighten the public on the essence of engaging professionals and building permits

Table 9.47 Survey results on the need for stakeholder engagement and enlightenment

Micro-Environment-All stakeholders must be enlightened about best practice and involved in the reforms of the building industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	3	2.0	2.0	2.0
	Neither Agree or Disagree	1	.7	.7	2.7
	Agree	35	23.2	23.3	26.0
	Strongly Agree	111	73.5	74.0	100.0
	Total	150	99.3	100.0	
Missing	00	1	.7		
Total		151	100.0		

Respondents concluded that the building industry links all stakeholders like a chain and industry players must be made aware wherever there is a missing or defective link that will affect the entire industry. This is consistent with systems thinking as illustrated in the LSR framework and new codes of conduct for stakeholder are required if the aspirations of improving the industry are to become reality. These codes should include the need for stakeholders to share knowledge and reduce the competency gaps in the industry.

9.14.2 Professional specialization to reduce stakeholder rivalry

Reducing professional rivalry is essential for the growth of the building industry and one of the ways to catalyse this is to promote specialisation amongst experts. These were the views of 47.05% of interviewees and 73.6% of the survey respondents. Similarly, Amadi et al. (2012) suggested that professional harmony is essential for the building industry to grow. Curiously, 21.6% of the survey respondent neither agreed nor disagreed and a careful examination of the data provides some explanation for this high percentage.

Table 9.48 Survey results on promoting and maintaining professional specialisation

Stakeholder-Professional specialisation should be maintained and overlapping roles should be avoided to reduce rivalry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	2	1.3	1.4	1.4
	Disagree	5	3.3	3.4	4.7
	Neither Agree or Disagree	32	21.2	21.6	26.4
	Agree	57	37.7	38.5	64.9
	Strongly Agree	52	34.4	35.1	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

In Section 9.3.1, the distribution of respondents by membership of professional bodies reveals that some of the respondents have more than one specialisation and possibly, work in more than one sector of the building industry. From the transcripts, it became obvious that this is a rampant trend in the industry because most clients are unwilling to commission certified consultants or pay professional fees (8.11.1) which compels professionals to delve into multiple specialisations. These have resulted in professional conflict and rivalry.

However, the real problem lies in professional competency and the lack of the accreditation by some practitioners (see 9.3.2), rather than professional affiliations. Training and accreditation are essential to reducing the conflict in the industry and interviewees argued that exposing building professionals to advance training in other areas of specialisation such as Building Information Modelling, Building Law and Contracts and Fire Prevention Experts, would create other revenue streams and reduce this antagonistic trend.

Others stressed that it is necessary to make room for sub-professions to emerge, such as the discipline of Building Inspectors, distinct from other building professions. Many of the erstwhile quacks may find it easier to pursue these sub-professions and improve the value chain in the building industry. MAL04 explained it thus,

‘You don’t need to be an Architect or professional to become a Building Inspectors, you simply apply or they recruit you then you go for proper training’.

These interviewees stressed that these sub-professions should not be treated as subordinates, rather as active participants and stakeholders in the process of building construction development. Extensive engagement amongst the various stakeholders is necessary not based on superiority but as equals and partners in progress. Irrespective of the area of specialisation, regular training is required to keep abreast with changes in knowledge and technology.

9.14.3 Sincerity of all stakeholders

Over 96% of the survey respondents and 14.7% of interviewees concluded that industry stakeholders need to be sincere about improving the construction industry for current campaigns to succeed. This comment underscores the problems resulting from the fragmentation of the industry following many years of conflict amongst stakeholders (see 8.8.6), as well as other sociocultural challenges (see 8.6).

Table 9.49 Survey results on the essence of stakeholder sincerity

Micro-Environment-Sincerity of all stakeholders is essential					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly DisAgree	1	.7	.7	.7
	Neither Agree or Disagree	4	2.6	2.7	3.4
	Agree	51	33.8	34.5	37.8
	Strongly Agree	92	60.9	62.2	100.0
	Total	148	98.0	100.0	
Missing	00	3	2.0		
Total		151	100.0		

In literature, Aluko (2011) stated that staff of the planning agencies should exhibit more patriotism to their duties to the nation by avoiding corruption while Fagbadebo (2007) argued that for a virile civil society to emerge, stakeholders must make deliberate and conscious efforts towards building a great nation, borne out of patriotism and a sense of collective duty. Cultural traits such as transparency, fairness, accountability, honesty and integrity are also necessary to improve society (Olalusi and Otunola, 2012). Therefore, the data suggests that government and non-government officials should desist from sharp practises; the regulatory processes should be reformed for efficiency and professional ethics should be sacrosanct. New ways of solving the industry problems may also evolve if the government embarks on collaborative strategies.

9.15 INFERENCE STATISTICS

This section explains the validation of the LSR framework using inferential statistics to reduce the variables discussed so far into meaningful constructs. These large data sets were reduced into smaller yet meaningful underlying constructs to provide some explanation of the characteristics of the data, particularly how it groups together. These underlying constructs are either referred to as factors for Factor Analysis (FA) and components for Principal Component Analysis (PCA), however, authors generally use the term factor to refer to the outputs of both FA and PCA (Pallant, 2016). Therefore, the following sections conform to this convention by extracting and interpreting factors that explain the LSR framework using PCA as the preferred data reduction techniques (see Section 6.7.2.10).

9.15.1 Assessing the suitability of the data

There are three ways to assess the suitability of data for PCA. Firstly, through ensuring that the sample size is appropriate as discussed in Section 6.7.2.9. Although 151 completed cases are suitable for conducting PCA, a Cronbach Alpha reliability test was also conducted to examine the internal consistency and improve the strength of the relationship among the variables (Tabachnick and Fidell, 2013). The test results for reliability checks are presented in Tables 8.50 to 8.54.

The initial case processing summary (Table 8.50) reveals that out of 151 variables, SPSS excluded 29 variables which resulted in a validity measure of 80.8%. Thereafter, the researcher examined these 29 excluded and completed questionnaire and realised that the respondents did not answer all questions in the survey, resulting in the SPSS listwise deletion. Therefore, only 122 cases were assumed valid for PCA. Therefore, this validated cases account for 40% response rate. Although this is lower than the threshold recommended by Tabachnick and Fidell, (2013) and Field (2018), literature confirms that this figure was suitable.

For instance, in Section 6.7.2.9 it was argued that researchers appear to have reduced the minimum case for PCA over the years (Pallant, 2016). Particularly, Saunders et al. (2009) argued that a response rate greater than or equal to 25% is statistically adequate. With particular reference studies to PM literature, studies like Muller et al. (2012) with 29.75% response rate and Jitpaiboon et al (2019) with just 94 survey responses were considered suitable for publication in a PM journal. Therefore, the 122 cases validated in this study were assumed sufficient for the factorisation to proceed.

Furthermore, the reliability coefficient of .950 (Table 8.51) was used to assess the variables in the Total Statistics output, following which three items with a Cronbach's Alpha coefficient higher than .950 were deleted (Table 8.52) since these deviates from the internal consistency of the data. Thereafter, the reliability test was repeated and the scale is reliable with a higher reliability coefficient .956 (Table 8.53) with only forty variables retained for further analysis.

Table 9.50 Initial Case Processing Summary

Case Processing Summary			
		N	%
Cases	Valid	122	80.8
	Excluded ^a	29	19.2
	Total	151	100.0

a. Listwise deletion based on all variables in the procedure.

Table 9.51 Reliability Statistics for all measured variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.950	43

Table 9.52 Deleted items based on Cronbach Alpha test reliability test

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Technological-d-Stakeholders should borrow and/or adopt foreign technology	180.99	356.190	.320	.951
Organisation-f-Professional fees should be reviewed downwards in view of the economic conditions of the country	182.12	362.968	.119	.953
Institutional-i-Government regulators should outsource material testing functions to private firms	181.11	358.691	.259	.951

Table 9.53 Reliability Statistics for only correlated variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.956	40

Table 9.54 Reliability Statistics for only correlated variables

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.913
Bartlett's Test of Sphericity	Approx. Chi-Square	2901.530
	df	780
	Sig.	.000

Similarly, the KMO and Bartlett's test was repeated to confirm the internal consistency and reliability of the data (see Table 9.54), where the Kaiser-Meyer-Olkin (KMO) coefficient exceeds .8 and Bartlett's test of sphericity is significant at less than .001 (Tabachnick and Fidell, 2013). Therefore, the data is reliable because the sample adequacy is satisfactory and very suitable for PCA.

9.15.2 Principal Component Analysis

An exploratory approach was used to determine the number of components that best describe the underlying relationship among the variables. To explain and validate the structure of the LSR framework, IBM SPSS factor reduction technique was used to remove redundant variables and reduce the number of variables into a definite number of underlying factors (Pallant, 2016). Although the eigenvalue rule (Kaiser criterion) is one of the most commonly used techniques, it has been criticised for its propensity for retaining too many factors (Field, 2018). This is evident in Appendix E where eight factors with eigenvalue greater than 1.0 were extracted for further analysis.

To mitigate the criticisms of the Kaiser criterion, a Scree test (Catel, 1966) was conducted to improve the analysis. This approach plots each of the eigenvalues of the factors and by inspecting the plot the researcher found the point of inflexion, where the curve changes dramatically and becomes almost horizontal (Field, 2018). Two factors plotted above the elbow, or break in the plot, were retained as these contribute the most to the explanation of the variance in the data set (Catel, 1966 in Field, 2018). The Scree plot is presented in

Appendix F; specifically, Figure 9.1 depicts the point of inflexion using orange lines that were superimposed by the researcher.

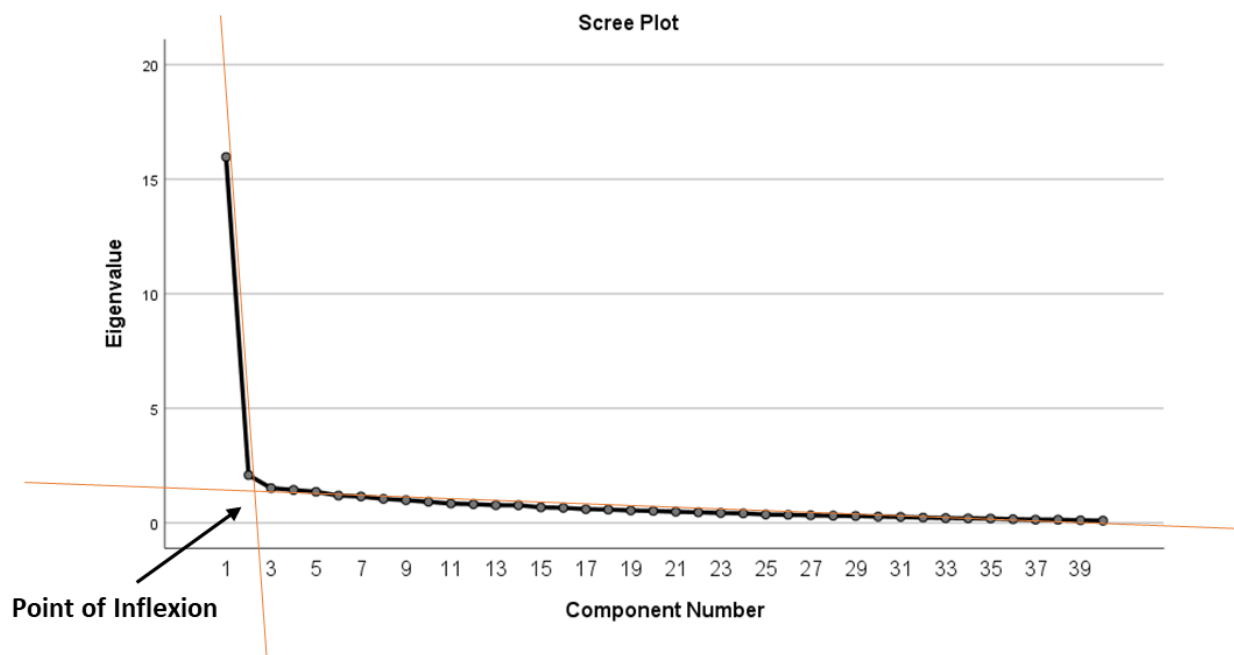


Figure 9.1 Scree plot of eigenvalues and components

Although the Scree plot solution is in sharp contrast to the outcome of the Kaiser criterion table its two-factor solution seemed more rational. Since the process of deciding how many factors to retain must balance between the need to find as few factors as possible and providing satisfactory explanations for much of the variance in the original data (Pallant, 2016), further assessment was necessary. From Table 9.55, the first eight extracted factors explain 64.439% of the variance in the data, while the first two factors explain only 45.115%. At this stage, interpretation was extremely difficult due to these disparities in the factors extracted and variance explained. Therefore, conducting a factor rotation was necessary to improve interpretability of the underlying solution (Field, 2018; Pallant, 2016).

9.15.3 Factor Rotation (Pallant, 2016 pp 188 – 202)

In the first instance, the researcher used the Direct Oblimin (Oblique) rotation technique and the rotation failed. Thereafter, the Varimax (Orthogonal) rotation was used to improve the loadings on each of factor. This resulted in more interpretable clusters of factors (see Table 9.56). This process resulted in a simpler factor structure; as previous, the Screeplot remained the same and eight factors were extracted based on the Kaiser criterion. In the Rotated Sums of Squared Loadings, a better distribution of the variance amongst the factors was evident, nevertheless, the cumulative variance explained of 64.439% remained unchanged for all eight extracted factors. The outputs of Rotated Component Matrix and Total Variance Explained (not included due to space constraints) were compared and again, only two components stood out with the highest clusters of variables.

This pattern is consistent with the unrotated solution in Appendix E. These suggest that the two-factor solution is a valid solution at 45.155% of the variance explained (see Table 9.57), particularly since the Screeplot remained unchanged. Therefore, it was necessary to repeat the factor rotation to specify the number of factors one would like to retain (Field, 2018). The output of the two-factor solution is presented in Appendix G and Table 9.58. Furthermore, the two-component solution explained 45.155% of the variance and revealed the presence of a simpler structure with each of the forty variables loading higher on only one component (Table 9.59 and 9.60).

Table 9.55 Combined Rotated Component Matrix and Total Variance Explained

Extracted	No of Variables	% Variance Explained	Cumulative %
Component 1	18	19.557	19.557
Component 2	4	9.586	29.144
Component 3	6	8.389	37.533
Component 4	4	7.422	44.954
Component 5	3	5.789	50.743
Component 6	2	5.302	56.045
Component 7	2	5.102	61.185
Component 8	1	3.274	64.439

Table 9.56 Component Transformation Matrix using Varimax Rotated Method

Component Transformation Matrix								
Component	1	2	3	4	5	6	7	8
1	.663	.380	.361	.327	.264	.225	.232	.065
2	-.128	-.734	.471	.273	.137	.048	.299	-.194
3	-.427	.200	-.132	.544	-.353	.544	.172	.120
4	-.039	.080	-.011	-.494	.134	.613	.111	-.585
5	-.560	.346	.463	-.032	.524	-.039	-.235	.139
6	-.157	.135	-.498	.204	.477	-.305	.536	-.243
7	-.139	.339	.407	-.203	-.504	-.369	.481	-.191
8	-.038	-.135	-.043	-.441	.110	.212	.490	.698

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 9.57 Two-factor solution - Extract from Appendix G

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.973	39.932	39.932	15.973	39.932	39.932	9.241	23.102	23.102
2	2.089	5.223	45.155	2.089	5.223	45.155	8.821	22.053	45.155

Table 9.58 Rotated Two-Factor Solution of Component Transformation Matrix using Varimax

Component Transformation Matrix

Component	1	2
1	.718	.696
2	-.696	.718

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 9.59 Organisation (Endogenous) Rotated Factors

S/No	Variables	Component	
		1	2
1	Stakeholders-b-All stakeholders must be enlightened about best practice and involved in the reforms of the building industry	0.856	
2	Organisation-a-Professional ethics should be enforced by the various institutes and penalties issued against defaulters	0.765	
3	Stakeholder-a-Collaboration between government and building professionals is essential for the building industry to be improved	0.735	
4	Institutional-e-Improvement of technical education and reestablishment of schools is necessary to sustain a skilled workforce	0.685	0.316
5	Projects-a-Proper project planning and detailed documentation should be provided by the building professionals	0.681	0.393
6	Organisation-c-Regular Continuous Professional Development programmes are essential for all technical stakeholders	0.646	0.313
7	Stakeholders-c-Government and Professionals must embark on knowledge sharing to bridge the knowledge gap between them	0.611	0.474
8	Legal-a-Improve the legal framework for the construction industry and building projects	0.61	0.406
9	Institutional-b-Transparency and openness is essential in the building laws and regulatory processes to foster stakeholder confidence	0.608	0.45
10	Project-b-Proper choice of contractors through pre-qualification	0.603	0.332
11	Political-b-Government should make its processes transparent and reduce corruption in its ministries and parastatals	0.592	0.431
12	Technological-a-Improve land acquisition and building approval processes by deploying appropriate technology and automation	0.58	0.314
13	Institutional-a-Government needs to improve development control both at the plan approval and construction stages	0.563	0.34
14	Technological-b-Research and development should be promoted to ensure sustainable innovation in the industry	0.557	0.49
15	Institutional-d-Training and certification of the construction workforce is essential, especially for the artisans and technicians	0.554	0.369
16	Institutional-c-Improve the Quality Control Regime through agencies such as Standard Organisation of Nigeria	0.506	0.449
17	Political-a-Government Institutions need to be strengthened, well-equipped and empowered to fulfil their mandates	0.494	0.463
18	Technological-c-Indigenous building technology should be developed	0.449	0.379
19	Sociocultural-a-Cultural reorientation of all stakeholders is necessary to improve patriotism, attitudes and social values	0.423	0.417
20	Stakeholders-e-Only qualified and certified professionals should be involved in building design and construction projects	0.362	

Table 9.60 Two-Factor Solution – Environment (Exogenous) Rotated Factor

S/No	Variables	Component	
		1	2
21	Project-c-Sufficient advance payment sums should be given to contractors to help reduce the effects of inflation and fluctuation on projects		0.648
22	Project-d-Risk management framework should be an integral part of the project planning process to prevent project failure	0.364	0.638
23	Economic-c-Improvement of the national economy will lead to an improvement of the building industry	0.326	0.635
24	Economic-a-Project financiers and banks should be actively involved at building project implementation stage		0.63
25	Institutional-h-Government should establish more material testing laboratories across the state		0.604
26	Legal-b-Professional bodies and the State government should adopt and implement the National Building Code	0.357	0.599
27	Political-c-Welfare and salaries of government employees should be improved to boost staff motivation and diligence		0.593
28	Stakeholders-d-Experts in Industry and Academia should form strategic partnership to aid training, research and innovation	0.498	0.586
29	Stakeholders-f-Sincerity of all stakeholders is essential	0.434	0.578
30	Economic-b-Proper project funding by the client is paramount	0.362	0.577
31	Organisation-d-Professional bodies need to be restructured to make them more effectively in promoting ethics and professionalism	0.407	0.571
32	MicroEnvironment-a-Involvement of host community in monitoring physical development will improve development control		0.565
33	Physical-a-Government should improve road infrastructure to make remote areas of Lagos accessible for development control	0.436	0.548
34	Organisation-e-Payment of professional fees by clients should be enforced by the professional bodies and government		0.521
35	Political-d-Government needs to review its policy on the importation of building materials and finishes which lack local substitutes		0.505
36	Legal-c-New and appropriate government legislation is necessary		0.496
37	Institutional-f-All building professional specialisations must be represented in the government regulatory agencies	0.396	0.47
38	Legal-d-Quacks in the industry should be arrested and prosecuted		0.467
39	Institutional-g-Establish a regulatory agency which is totally independent of government		0.454
40	Organisation-b-Professional specialisation should be maintained and overlapping roles should be avoided to reduce rivalry		0.331

To confirm that this solution is sound the factor rotation was repeated for each of the cluster of variables in Table 9.59 and 9.60, their Screeplots are presented in Appendix H. This confirms that these variables strongly cohere into one factor each. Therefore, the two-factor solution was retained and named accordingly based on the knowledge acquired in literature and theory. This solution was interpreted and explained in the next section.

9.15.4 Interpretation of the data

In spite of existing cross loading the variables are split evenly between the two factors, which significantly improved interpretability (Table 9.59 and Table 9.60). Additionally, examining the Component Correlation Matrices (not included due to size and limited space in thesis), the latter shows the high strength of the relationship between the factors and the simplicity of its structure. In contrast, the eight-factor solution reveals very low correlation amongst the variables, thus this option was discarded.

Although the Two-Factor Solution is valid, IBM SPSS does not label or interpret the factors and the labels and possible interpretations of the underlying components were drawn from previously discussed constructs in literature (see Section 2.2.2) and through the LSR framework in Figure 5.1. Each factor is comprised of twenty variables and surprisingly, both organisation and environment variables are clustered in these factors. This may explain the interconnected, interdependent and coevolving nature of these constructs.

Each factor contains a mix of eight organisation and twelve environment factors. This made labelling these components more difficult and to resolve this problem, the variables and their coefficients of correlation were examined further. As both factors have eight organisation-related variables each, the cross-loadings were considered and the factor in Table 9.59 reveals only four variables which do not have cross-loadings. Upon closer scrutiny, it was discovered that these four variables all belong to the same underlying construct, the endogenous factors.

Table 9.61: Consolidation of all qualitative and quantitative data

S/No	Concepts		Variables	Qualitative		Quantitative		
				MAL + MIL	% Total	% Agree	% Neutral	%Disagree
1	Physical	a	Improve road infrastructure	1	2.94	96	3.3	0.7
2	Political	a	Stengthen government institutions	13	38.23	97.3	1.4	1.4
		b	Reduce corruption in government	8	23.52	98	1.3	0.7
		c	Improve staff welfare and salaries	3	8.82	83.9	14.1	2
		d	Review importation policy	1	2.94	75.5	20.4	4.1
3	Economic	a	Proper funding by client	5	14.7	94.7	4	1.4
		b	Involve financial institutions	4	11.76	75.3	21.3	3.3
		c	Improve national economy	4	11.76	89.7	8.2	2.1
4	Sociocultural	a	Cultural and social reorientation	15	44.11	77.7	19.6	2.7
5	Technological	a	Automate regulatory processes	5	14.7	92.5	6.8	0.7
		b	Research and sustainable development	3	8.82	96.7	2.7	0.7
		c	Develop indigenous technology	3	8.82	92	6	2
6	Institutional	a	Government & professionals collaboration	21	61.76	96	2	2
		b	Enforce professional ethics	18	52.94	94.7	4	1.3
		c	Stakeholders knowledge sharing	17	50	96	3.4	0.7
		d	Continuous Professional Development	15	44.11	96.7	2.7	0.7
		e	Improve development control	13	38.23	95.9	2.7	1.4
		f	Training and certification regime	13	38.23	95.3	4	0.7
		g	Professionals in regulatory agencies	9	26.47	95.3	3.4	1.4
		h	Revive technical schools	7	20.58	94.7	4.6	0.7
		i	Improve quality control regime	6	17.64	93.3	6	0.7
		j	Restructure professional bodies	6	17.64	89.3	9.3	1.4
		k	Enforce professional fees	4	11.76	95.4	2	2.7
		l	Independent regulatory agency	3	8.82	68.7	23.8	7.5
		m	Make regulations transparent	2	5.88	93.9	5.4	0.7
		n	More material testing laboratories	2	5.88	87.9	10.1	2
		o	Industry and academia partnership	2	5.88	95.3	3.4	1.4
7	Legal	a	Legal framework for construction	6	17.64	89	9.7	1.4
		b	New and appropriate legislation	4	11.76	77.1	18.2	4.7
		c	Arrest construction quacks	3	8.82	78.5	14.8	6.8
		d	National Building Code	2	5.88	95.3	2.7	2.1
8	Micro Environment	a	Host community involvement	4	11.76	71.5	19.2	9.3
9	Organisation	a	Use qualified professionals	15	44.11	81.8	8.1	10.2
		b	Proper choice of contractors	4	11.76	87.3	10.7	2
		c	Advance payment to contractors	2	5.88	76.2	18.4	5.4
10	Technical	a	Proper project planning	8	23.52	98	1.3	0.7
		b	Risk management framework	1	2.94	85.2	13.4	1.4
11	Stakeholder	a	Stakeholder engagement & enlightenment	20	58.82	97.3	0.7	2
		b	Maintain professional specialisation	16	47.05	73.6	21.6	4.8
		c	Sincerity of stakeholders	5	14.7	96.7	2.7	0.7

The numerical significance of the environment-related variables in both factors reinforces the need for more studies in PM on the complexity of the project (business) environment, particularly from an interdisciplinary approach. These endogenous and exogenous components explain only 45% of the variance in this data and the remaining 55% unexplained variance could belong to other latent factors, particularly those belonging to the systems response factor group. Complex systems are difficult to explain or predict and the outcome of this study confirms that majority of the variables that significantly influence project success are complex and cannot be controlled.

9.16 CONCLUSION OF THE FINDINGS

From the foregoing, Organisation and Environment systems are the main factors that influence project outcomes. The data confirms that these factors influence one another, as well as decision making of leaders (being the research participants in this instance). Table 9.61 presents the consolidation of the primary data from this study with forty retained variables. A careful evaluation of this data reveals that institutional forces are the strongest influences of decision making. Conversely, physical factors appear to be the least significant. Nevertheless, from the systems perspective all subsystems are significant and must be given adequate consideration during the process of decision making because everything is affected by everything else within the ecosystem.

This outcome also reveals that projects have the human dimension. Projects are complex because people are complex and adaptive, operating in unpredictable but highly organised systemic networks. The close examination of the 41 challenges discussed in Chapter 7 reveals that people are at the heart of the problems of project delivery, not nature technology or machines. From soil testing, to inadequate infrastructure, low manpower, policy implementation, political influences, urbanisation, inflation, corruption, high importation of goods, substandard building materials, unethical professional practice, rivalry amongst stakeholders, implementation of laws, prevalence of quack and gangs, inadequate project information and procurement issues, people are responsible for the decisions and actions that influence these project outcomes.

Evidently, the built-environment and construction industry in Lagos did not develop independent of human contribution. Therefore, people are significantly responsible for the successes, problems and chaos of projects and this should be considered in developing models of complexity. Similarly, this study suggests that people will be required to reform and improve the building industry. In Table 8.59 and 8.60, the cross loading amongst the forty recommendations and the 2-factor solution reveal that organisation and environmental factors are interconnected in non-linear patterns, arguably through people.

Strategies like collaboration and knowledge sharing between government and building professionals can help improve stakeholders' enlightenment, enforce professional ethics, plan projects better, improve technical education, improve legal frameworks in the building industry, engender institutional transparency, reduce corruption and promote technological research and development; are all people-related. Therefore, the interactions between organisations and the environment are driven by people which has an effect on the success of projects. It is important to note that there is no dichotomy or hard boundary between elements in complex systems, rather systems are closely linked with all other related systems within an ecosystem (see Section 4.3). Since these linkages are human-driven, decisions and choices are constantly being made which results in the organisations influencing the state of the environment, and vice versa.

Although Organisation and Environment are the dominant underlying factors of project complexity, it is obvious from the discourse in this chapter that these systems rely on people for adaptation and change to occur. The evidence in Chapter 8 suggests that many of the problems in the building construction industry in Lagos are caused by people, therefore, people within endogenous and exogenous systems would be required to fix the myriad of challenges. Therefore, leadership systems must be deliberately incorporated into project ecosystems to avert the state of chaos where people function without restraint, rules and regulations. Ultimately, the interactions within leadership dynamics determine the stability of the project system as exemplified in the Building Industry Reform in Lagos. In conclusion, leadership is a subset of endogenous and exogenous factors and the structure of the LSR framework was revised to reflect this conceptual reality in Figure 10.1.

CHAPTER 10

DISCUSSION AND CONCLUSION

10.1 INTRODUCTION

This chapter discusses the implications of the results and key findings from Chapters 8 and 9. These key findings are compared with existing knowledge and discussed in relation to the aim and objectives of the study. The discussion is structured into six main sections. The first part discusses the key findings from the empirical phase of this study and compares these outcomes with existing knowledge in extant literature. In the second section, the effects of leadership decision-making on project success are discussed. Next, Section 10.4 presents the revised LSR framework and explains the changes made based on the research findings. The fourth section discusses how the aim and objectives were achieved, following which the contributions to knowledge are discussed. Finally, the last section explains the limitations of this study and makes recommendations for further research.

10.2 DISCUSSION OF KEY FINDINGS

Majority of projects around the world fail to wholly meet their objectives (see APM 2015 in Section 2.2.3.3) and this study reveals that Lagos is not an exception. Therefore, it is pertinent to begin the discussion of the findings of this study by espousing best guesses on why projects continue to fail. The findings suggest that building construction projects in Lagos are failing because projects are complex, adaptive and systemic, however, the strategies of stakeholders do not appear to take account of this complexity, which results in poor decision-making and project failure. This corroborates the evidence in literature which argue that the complex nature of projects makes achieving project success more challenging (Cicmil et al., 2006; Rolstadas and Schiefloe, 2017).

Additionally, the results from Chapter 8 (Section 8.15) suggest that projects are complex adaptive systems which also validates existing knowledge (McMillan, 2004; Palmberg, 2009; Sisney, 2012; Obolensky, 2014). Particularly, the results in Chapter 8 and 9 clearly exhibit the multiplicity of factors that influence building construction success. From literature it is clear

that these factors exist as systems and most of the time, the systems, not the individual factors cause projects to fail (Jitpaiboon et al., 2019). Particularly, forty-one variables were validated as influences of building construction success (Table 8.3). Moreover, forty recommendations were verified as being valid for improving the building construction industry (Table 9.59 and 9.60). Comparing Table 8.3 and Table 9.3 reveals that the recommendations respond directly to the endogenous and exogenous problems. This interrelationship aligns with the complexity paradigm which suggests that everything is influenced by everything else that exists around it (Mcmillan, 2008), and projects fail due to practitioners' inability to manage increasing project complexity (Brady and Davies, 2014).

Furthermore, the results of the inferential statistics validate the existence of the endogenous and exogenous factor groups (Section 9.15.4), as well as their influence on project success. The discovery of two, rather than three, latent factors aligns with the discourse on endogenous and exogenous factors in the RPM philosophy (see Winters et al, 2006 in Section 2.2.2). These factors exist as organisational and environmental systems, exerting significant influence on project outcomes. The results from the content analysis of organisational and environmental factors in PM literature (see Section 2.5.2 and Table 2.8), suggest that endogenous factors (154) are more significant than the exogenous ones (61), which is in sharp contrast to the findings of this study.

For example, in Table 7.6 the exogenous factors appear to surpass the endogenous ones in frequency and this pattern is repeated in Section 8.3 and 9.3. Furthermore, the data from this study reveals that institutional variables outweigh all other factors. Arguably, the high impact of the institutional variables is indicative of the level and focus of analysis of this study, which is the macro- or institutional-level of projects. Therefore, it is anticipated that the findings would be markedly different if the level of analysis switched to project or organisation levels, and this is recommended for further research.

Furthermore, Pinto and Mantel (1990) argued that organisational factors accounted for only about 40% by variance of the causes of project failure and suggested that there were very important causes of failure, such as environmental forces that were not accounted for in this study (Section 2.5.2). However, this LSR study addressed the gap in Pinto and Mantels' work

by analysing both environmental and organisational factors. Yet these factors account for only 45% by variance of the causes of project failure. This implies that the majority of the factors that influence success are not accounted for in both studies and this is subject for further research, particular in the human-related and leadership factor groups of projects.

Research in the human-related factor groups is a valid proposition because the results of this study suggest that humans, through interaction, conflict, cooperation and collaboration have an impact on outcomes in complex systems (Section 9.16). Therefore, studying and managing projects as CAS may improve project success if human conceptualisation of project complexity is improved (Mamedio and Meyer, 2020; Daniel and Daniel, 2019; Kiridena and Sense, 2016). The LSR framework provides opportunities for this aspiration to evolve in research and practice, particularly given the invaluable role of social dynamic in aligning the needs of projects and organisations with the challenges of the environment through leadership systems (see Section 3.6).

Furthermore, the cross loading amongst the organisational (Table 9.59) and environmental factors (Table 9.60) provides evidence of the non-linearity within the LSR framework, which could be an evidence of project complexity driven by people working within leadership dynamics. All humans in modern society exist and thrive within leadership systems. As CAS, these factor groups are difficult to control or predict. This is because CAS actively exploit and benefit from the circumstances around them, rather than thrive for mere survival (McMillan, 2004; Mamedio and Meyer, 2020). This is certainly the case in human systems such as projects where leadership dynamics are central to strategy development, decision making and project success. In the case project stakeholders (see Figure 3.7), they aspire to benefit from the organisation and environment in linear and nonlinear fashions, which also creates complexity. Therefore, an underestimation of nature of this complexity results in poor decision-making (Vidal et al. 2008; Luo et al. 2020), and project failure.

These systems not only influence one another, but also influence the decision-making of the participants through formal and informal mechanisms. This assumption can be inferred from the LSR framework which was used to map the decision making capabilities of project leaders

in Lagos. Many of the respondents exhibited features of the linear-reductionist approach to problem solving and decision making which has proven to be inadequate in complex systems. The results in Table 9.59 and 9.60 reveal that project complexity exists within organisations and the environment, with leadership systems is assumed to exist as a derivative of both systems. Therefore, the model in Section 5.2 (see Figure 5.1) was revised in Section 10.4 based on the results of this study (see Figure 10.1).

Leadership drives change and it is clear that complex organisation and environment systems cannot adapt of their own accord. Furthermore, the reports of all the Commissions of Inquiry in Lagos that investigated incidences of building collapse reveal that many of the problems are human induced (Chapter 7). At the same the time, the 2010 BIR in Lagos was essentially a leadership endeavour. It calls to reason that unless the approach to problem solving and conceptualisation in PM accounts for the attributes of complexity, projects failure is likely to persist. From the results it is clear that endogenous and exogenous factors influence project success, with leadership existing as a systems response factor group at the heart of the models of complexity for contingent decision-making and strategy.

Therefore, literature confirms that leadership attributes and decision-making behaviour are amongst the main influences of project success (Denicol et al., 2020; Flyvbjerg et al., 2018; and Lavagnon, 2018). This was certainly the case with the 2010 BIR in Lagos, where the establishment and operations of LASBCA Does not appear to account for these dimensions of complexity (see Section 10.3). The events in Lagos, particularly the BIR, provides evidence of the need for the adoption of the complexity paradigm in decision making at the institutional level. This aligns with Brady and Davies (2014), who argued that the main reasons why many projects fail to meet the targets can be attributed to the limitations of the traditional approach to PM and the inability of practitioners to manage project complexity. Therefore, the traditional approach to decision-making will lead to failure in complex systems such as the one in Lagos, Nigeria.

Decision-making is influenced by a multiplicity of variables embedded within organisation, environment and leadership system (see Table 8.3). The systems viewpoint suggests that all variables within the ecosystem are important and no factor should be overlooked in the

decision-making process. This is important because even the least significant variables from this study, like roads and risk management framework, have the capability to trigger chaos and turbulence within the ecosystem. In other words, everything is influenced by everything else in CAS and decision-makers in leadership role must properly conceptualise this phenomenon to improve project outcomes. Notably, leadership in this study refers to the relational construct, being a collective term for decision-makers responsible for project and organisational success, rather than the individualistic perspective (see Section 3.5.3).

Leaders and organisational participants interact and exist in constant competition and collaboration within the different hierarchies of systems, which leads to the emergence of new forms of group organisation and individual behaviour. For example, leadership exists in organisations' governance and management systems (Figure 3.2), as well as micro and macro environmental systems (Figure 3.3), interacting in linear and non-linear patterns (Figures 3.8 and 3.9) with decision-making functions at their core (Figure 3.4). This applies to projects, organisations and institutions like LASBCA. Leadership has been widely accepted as one of the most essential roles in the survival of any organisation, whereby it appears to coalesce and influence all other success factors to deliver on corporate goals (Figure 2.4 and 5.1).

From this study it is apparent that decision-making is indeed challenging in Lagos due to the complex, adaptive and systemic nature of these organisation, environment and leadership constructs. The next section examines the effects of leadership decision-making on project success in Lagos to fulfil the aim of this study. The reflections and discussion are based on the interviews relating to the successes and failures of LASBCA and BCPG, as they played out in the 2010 BIR in Lagos. This is important because effective leadership remains one of the primary answers to the problems of project failure in the construction industry (Ofori and Toor, 2012; Buba and Tanko, 2017). This provides a narrative of the complex, adaptive and dynamic nature of the leadership factor groups. It also provides evidence of the effects of appropriate conceptualisation of project complexity on project success from a leadership decision-making perspective. The constructs of Complex Adaptive Leadership (Section 5.2.5) and properties of CAS (Table 4.2) were used as metaphors to describe the reforms in the building industry in Lagos.

10.3 EFFECTS OF LEADERSHIP DECISION-MAKING ON PROJECT SUCCESS

Leadership is a special case of complex systems, one that exhibits the capacity to learn from experience and achieve change through its interaction with follower and stakeholders (Rosenhead et al, 2019). Furthermore, leadership decision making and project complexity significantly influence project success (Ma and Fu, 2020; Luo et al, 2021). Particularly, the outcome of this study suggests that people-related challenges underlie majority of the problems of the building industry in Lagos (Section 9.16). Therefore, these problems require effective leadership because the relational construct of leadership and followership dynamic is touted as a credible solution to the problems of coordination and success within enterprises (Pietraszewski, 2020). Although the leadership factor group is embedded within the endogenous and exogenous segment, the conclusions from the analysis of the qualitative data suggests that these are CAS (Section 8.15).

Social dynamic triggers a strategic response within projects, organisations and institutions. It is pertinent to note that strategy formulation is not restricted to private sector or profit-making organisations, since government departments and organisations also interact with and influence their external environment (see Section 3.3). The nature of this interchange between organisation and environment significantly determines the stability and viability of the ecosystem and this is the focus of this section with a review of the 2010 BIR in Lagos. As the discourse shifts to strategy and decision-making, the significance of the leadership factor groups begins to emerge.

Therefore, the following sections discuss the effects of leadership decision-making on the success of the 2010 BIR. Decision-making is influenced by complex constructs which in turn influence project success. From the CAS perspective and the findings of this study, the building industry in Lagos is complex. The results of this study also suggest that the strategy of LASBCA did not take into account the complexity of the industry in Lagos, particularly, the highly fragmented state of the building industry. It is clear that mental conceptualisation influences leadership decision making and project success, whereby inadequate models of project complexity results in poor decision making and project failure (Vidal, Marle and Bocquet, 2011; Daniel and Daniel, 2018).

A deep scrutiny of the results in Chapter 8 reveals that LASBCA is overwhelmed by tasks of reversing the trend of building collapse. The evidence of the fragmentation of the industry had been discussed in (Chapter 7) and this includes the poor cooperation among key industry stakeholders such as government, financial institutions, property developers and professional bodies. However, the efforts and success of LASBCA appears to be improving following its collaboration with BCPG, a trend which aligns with literature. Generally, organisations that are faced with emerging threats require leadership strategies that are flexible, adaptive and collaborative (Yukl and Mahsud, 2010; McHugh et al., 2016).

Nonetheless, the collaboration between LASBCA and BCPG has resulted in some conflict due to factors such as differences in organisational culture and strategic approach. This conflict was no surprise because as McMillan (2008) argued, people exist in constant competition and collaboration within the different hierarchies of the system, which leads to the emergence of new forms of group organisation and individual behaviour. Additionally, going by Table 4.3 this study found that the decision-making and strategy development approach of LASBCA reflects the classical management principles; being linear, hierarchical, reductionist, controlling, inflexible, uniform, centralised, and closed. The inadequacies of this approach failed to reverse the trend of building collapse in Lagos and as Daniel and Daniel (2018) opined, as projects become more complex and rigorous, traditional management control mechanisms become inadequate.

In contrast, BCPG adopted the complexity science approach to strategy and decision-making; that is non-linear, non-hierarchical, holistic, self-organising, flexible, diverse, networked and open. This strategy accounts for organisation and environment influences and align decision-making with organisation's capabilities and the dynamics of the external environment (see Harrison, 2014 in Figure 3.1). Although these two organisations have similar objectives, which is to reduce building collapse, BCPG has arguably been more successful in this regard. While the effects of LASBCAs' linear strategy resulted in further fragmentation of the building industry and limited progress in the quest to reduce building collapse (Table 7.3), BCPG appear to have made more progress in unifying the building industry stakeholders. Therefore, the following sections compare the strategies of BCPG and LASBCA to discuss their effect on

success at the institutional level using the Complex Adaptive Leadership metaphor (Section 5.2.5). Therefore, the following sections provide evidence of leadership as CAS.

10.3.1 Learning and adaptation

The findings suggest that the professionals involved in the 2010 BIR had developed a deep knowledge of the challenges of policy formulation and implementation in Lagos, therefore, they decided to establish BCPG in parallel with LASBCA to mitigate the weaknesses of government institutions and drive the industry reforms informally. BCPG exhibited learning and adaptation, which are key properties of CAS that distinguishes it from complicated systems (McMillan, 2004; Rezende et al, 2018; Daniel and Daniel, 2018). Lessons learned from previous government reforms were essential for developing a suitable strategy for BCPG. These professionals argued that poor decision-making, particularly the gaps in policy formulation and implementation, has resulted in failure of previous government endeavours. This knowledge compelled the seven built-environment professional bodies to come together to create BCPG as the platform for all industry stakeholders. This new organisation exemplifies leadership dynamics which Luo, et al., (2021) argued would enhance learning in complex systems.

LASBCA and BCPG were established almost simultaneously and at their inception collaboration was extremely challenging. Nonetheless, the leaders of BCPG rallied other stakeholders and contextualised their strategies within the 57 Local Development Authorities (LDA) in Lagos. Their distributed leadership strategy aptly responds to some of the complex and challenging environmental conditions in Lagos (see Chapter 7 and 8). Therefore, they examined the strengths, weaknesses and aspirations LASBCA following which they adopted complexity-related approaches to tackle the problem of building collapse, as well as the fragmentation of the industry. BCPG promptly recognised that tasks such as improving development control, training of trades and building research and development could not be accomplished by government alone due to its human resource and financial limitations. Learning about these limitations resulted in their strategic adaptation. These attributes align with the EFQM excellence model (Figure 3.5), where innovation and learning are key

attributes of leadership, whereby strategy must contextualise organisational dynamics within environmental peculiarities.

Invariably, BCPG has adopted the complexity paradigm shift in their leadership approach, thereby promoting learning, innovation, and adaptive capacity (see Uhl-Bien et al., 2007), particularly exercising the prerogative of choice (McMillan, 2008). In CAS terms, systems must respond to changes in the ecosystem to remain viable and this is the case with BCPG. Their adaptive, collaborative and distributed leadership approach has resulted in an alliance of all building professionals and this has resulted in industry-wide learning and cooperation in Lagos. Through this approach, BCPG complimented the centralised and bureaucratic structure of LASBCA, and the effect of this partnership has resulted in the reduction of the knowledge gap between industry stakeholders. This improved individual and group learning amongst the building industry stakeholders is consistent with (McMillan, 2008), who argued that agents in complex systems must constantly change their structure as they learn about the world.

The traditional form of leadership where the Architect is assumed to lead the team (see *Nigerian Construction Industry Codes on Conditions of Engagement, 1996*) was discarded and replaced with emergent organisational forms that allow for the adaptability of leadership in response to building collapse, amongst other issues. As environmental awareness improved, BCPG exhibited one primary attribute of CAS; the ability to learn from their own experience and adapt to new unexpected conditions (see Aritua et al., 2009). Their strategies took into account peoples' attributes and competencies, organisational (LASBCA) mission and structure, as well as environmental factors such as cultural and norms in Lagos. Ultimately, BCPG developed a partnership with LASBCA to collaboratively mitigate some of the monitoring and control challenges in the building industry through their network of building professionals in all the LDA in Lagos.

BCPG currently have local branches in all the local council areas in Lagos. In this way, the inherent capacity of BCPG to respond favourably to changes in the project environment improved. Their leadership dispersion and learning led to evolution and adaptation, which

are all key properties of CAS (Table 4.2). The dynamic and complex interactions of the leaders and stakeholders led to exchange of ideas which produced adaptive outcomes; such as the widespread advocacy and gradual improvement of the supply chain in Lagos. Therefore, the role of BCPG in Lagos proves that leadership plays a central role in the interaction of other stakeholders and the adaptation of projects, organisation and institutions. The leaders of BCPG continue to focus their resources on strategies which enable its systems adapt to situational developments and this organisation exhibits many of the characteristic of CAS.

Paradoxically, they shifted their leadership strategy from control to an organisational philosophy that emphasises facilitation, promoting social dynamism and managing conflicts amongst all stakeholders. These findings suggest that for BCPG and LASBCA to succeed, learning processes should continue to be contextualised because within complex systems uncertainty and change are constant (see also 3.5.3).

10.3.2 Rejection of individual agency

Clearly, the leaders of BCPG rejected the individualistic approach to leadership; rather, they adopted collaboration as the central theme of their organisational strategy. Their aligns with Alvarenga et al., (2020) who argued that in the modern era, organisational and environmental dynamics have become too complex for decision-making to remain within the purview of an elite group of individuals (see also Hickman, 2010). Collaboration has been mutually beneficial for LASBCA and BCPG, as well as other industry stakeholders. With the understanding that leadership should not be depicted as a personal attribute or the possession of an individual organisation, protagonists in both organisations appear to be breaking down traditional barriers which would then allowed for the synergy between the public and private sectors stakeholders in their quest to reduce building collapse in Lagos.

Responsibility for decision-making in the construction industry has to become increasingly shared and distributed amongst stakeholders if the reforms are to succeed (see Nienaber and Svensson, 2013; CITB, 2018). Additionally, McHugh et al., (2016) argued for collective decision-making and shared leadership intelligence in complex systems to extend the

leadership and decision-making constructs to the collective level of analysis. These constructs are evident in the strategies of BCPG. Professionals that were previously antagonistic towards one another appear to have become friendlier. In one respondents' words;

'In BCPG we have become brothers and sisters, so this antagonism, bickering and rivalry is simmering down. So you will see where the coordinator of a cell is an architect and the secretary is a quantity surveyor. For instance in the Yaba cell, now the coordinator is an engineer and the secretary is a builder; in Ojodu, the coordinator is an estate surveyor and valuer while the secretary is an architect, and so on'.

From the foregoing, the rivalry amongst these stakeholders appears to have waned since the formation of BCPG. The findings suggest that the professionals are all focused on eliminating the menace of building collapse. This inclusive approach of BCPG was extended to the trades and artisans, which has resulted in emergence of new forms of organisation. Particularly, BCPG encouraged and mobilised the artisans into associations such as block-moulders' and concrete workers' associations. BCPG, in collaboration with Standards Organisation of Nigeria (SON) and Lagos State Materials Testing Laboratory (LSMTL), now facilitate regular meetings and free training for these artisans, which has raised the standards in the industry. Therefore, BCPGs' complexity leadership approach influenced the social processes by which patterns of leading and following evolved, particularly within these emergent organisations.

The strategy of BCPG confirms that the leadership and followership roles are not necessarily individualistic paradigms, rather, they are socially-constructed through the actions and engagements of people in social processes (see DeRue, 2011; Rosenhead et al, 2019). Organisations such as BCPG that are faced with emerging threats require leadership strategies that are flexible, adaptive and collaborative (Section 3.4.3). This aligns with McHugh et al. (2016) who advocate that the collective leadership and decision-making approach is more suitable in complex scenarios to annex the power of collective intelligence (Section 3.4.2). Shared responsibility amongst organisational leaders and followers improves organisational thinking at all levels breeding distributed leadership, rather than centralised leadership (Section 3.4.3). Therefore, LASBCA and BCPG should focus their resources on strategies which

enable their systems adapt to situational developments by focusing on promoting social dynamism and managing conflicts in the adaptive space (McHugh et al., 2016).

As BCPG continued to interact with individuals and groups, unprecedented social patterns and networks began to emerge in Lagos and this has resulted in the reduction of the fragmentation of the industry, as well as building collapse. Notably, emergence is a key characteristic of CAS and this process not only creates new order but also makes organisations like BCPG difficult to understand. The unpredictability of BCPG is particularly challenging for LASBCA and other government agencies. From the CAS perspective, people actively seek to exploit and benefit from the circumstances around them (McMillan, 2004; Daniel and Daniel, 2018), which breeds suspicion amongst collaborators in different organisations as they interact in linear and nonlinear fashions. The findings reveal that BCPGs' underlying motive, aspiration and methodology are constantly being questioned by some stakeholders, and are sometimes perceived as an imminent threat. This has resulted in some degree of dissonance amongst these stakeholders.

10.3.3 Dissonant dialogue

Dissonance implies a lack of harmony, a phenomenon that may occur in organisations like BCPG that have multi-directional influence (DeRue, 2011; Rosenhead et al, 2019).). Such organisations avoid a single homogenous organisational culture. Rather, incongruity within the organisation is promoted as a reflection of dissonance in their complex external environment. BCPG is an exemplar of organisations with a complexity leadership structure, which does not seek to control its members or their groups. Rather, their leadership approach aspire to influence how projects and organisations evolve rather than seeking to control its outcomes (see Lewin and Regine, 2003; Daniel and Daniel, 2018).

Therefore, their leadership attribute provides more evidence of the complexity paradigm in leadership. BCPG leaders largely facilitate processes of dialogue that can lead to innovation, rather than command and control. In contrasts, LASBCA was founded on the stringent and bureaucratic civil service 'command and control' structure which has led to culture conflict between these organisations. It is apparent that approaching leadership as a one-directional

influence construct is erroneous and will lead to chaos, particularly in complex systems (DeRue, 2011; Rosenhead et al, 2019). In complex scenarios, leadership influence should be viewed as mutual and reciprocal, which follows a series of interlocking and interdependent acts of leading and following (DeRue, 2011; Rosenhead et al, 2019), a philosophy which BCPG clearly imbibes.

Similarly, the interdependence and connectivity of these organisations with their environment means that the actions or decisions of one party has the potential to trigger a series of cascading effects which may affect other related individuals and systems. In this way, it is virtually impossible to have isolated change of individual parts of the system, which increases the difficulty in predictability (see Andriani 2003, Rosenhead et al., 2019). Again, this unpredictability may explain the resistance of some of the leaders within government towards collaborating with BCPG, since government bodies arguably embrace the 'illusion of control'.

Furthermore, in human social ecosystem, coevolution cannot happen in isolation and this may affect both the form of institutions and the relationships and interactions between the coevolving entities (Mittleton-Kelly, 2003). As BCPG and LASBCA continue to coevolve, most of these controversies are likely to persist for many years to come. Nonetheless, LASBCA and BCPG have continued to work together to reform the industry and create awareness of its challenges. From the broader relational context, if these conflicts, dissonant culture and incongruity are managed properly this could lead to innovation and growth of the industry. In this view, success can be achieved using an approach that solves the problem of meta-coordination by creating a social marketplace where the information-processing roles of leaders and followers can evolve (Pietraszewski, 2020).

The avoidance of a single homogenous organisational culture is important in studies of complexity leadership and this is beneficial for these industry reform partners. Therefore, the role of leadership in complex scenarios is largely to facilitate processes of dialogue that can lead to innovation, rather than command and control.

10.3.4 Bottom-up innovation

The hierarchical perspective of leadership, which is hinged on supervisor-subordinate relationship, led to the fragmentation of the building industry in Lagos. It limits one's ability to explain the effectiveness of non-supervisory leaders and the dynamic of collaborative leadership (DeRue, 2011; Rosenhead et al, 2019). In contrast, BCPG developed organically from the grassroots by adopting the bottom-up approach due to the complexity of the building industry. This promoted spontaneous self-organisation within BCPG as the professionals resident in different localities in Lagos came together in groups to perform tasks and achieve their corporate goals. Interestingly, BCPG has no central regulating system, rather it functions like a complex adaptive system with tendencies to self-structure collective patterns of behaviours as the individual actors interact. In contrast, LASBCA found it difficult to reduce building collapse due to the adoption of the hierarchical and linear approach to problem solving, which is unsuitable in complex project systems.

The findings suggest that the process of decision-making is influenced by numerous variables within the subsystems of the organisational, environmental and leadership factors, which must be understood if the 2010 BIR is to succeed. To transform the building industry in Lagos, leaders need to understand how complex systems work. BCPG focused on three areas of grassroots development. For individuals, they organise capacity-building programmes, skill acquisition schemes and knowledge sharing seminars for the trades such as concrete and steel workers. For organisations like LASBCA, BCPG has helped mitigate their weaknesses by using their wide network of professionals to improve development control. At the same time, society-related strategy include town hall meetings in the various localities to reduce stakeholder fragmentation and improve customer satisfaction (see KPIs in Alkilani et al, 2015).

Therefore, BCPG organises regular stakeholder meetings at the LDAs, drawing attendance from practice, academia, government, contractors, community leaders and so on. This has significantly improved the building industry and in their words;

“We are trying to localise some of these activities and go to the grassroots because we discovered that making noise at just conferences and seminars are not enough. We

(BCPG) even have flyers, we have a lot of programmes organised to enlighten the public about the best practice and where to go if they have complaints with hotlines for people to call. We are all fighting for the same cause. We believe we are all equal”.

Through this bottom-up, people-focused and partnership-driven approach, positive attitudinal change and satisfactory results in the area of building collapse have been achieved. This adaptive capacity of BCPG also improved by decentralising their decision-making systems which improved their decision making speed and ability to deal with uncertainty (Section 4.5.3). Decentralising leadership allowed for a more robust mechanism for responding to environmental change through environmental scanning of events and trends (Section 3.3.3). More stakeholder awareness has been created about the causes of building collapse and the society is improving. Many cells of the BCPG are working hard to raise awareness and check the activities of unscrupulous people. Some cells are reported to be so powerful that they are settling long standing building-related disputes at these town hall meetings. This approach aligns with McEnvoy et al. (2016) who suggested that capacity development for delivering successful outcomes with complex projects is necessary at personal, organisational and environmental levels. Therefore, the in-depth understanding of leadership dynamics (Luo, et al., 2021) and collective decision-making (McHugh et al., 2016) have a positive impact on project success, particularly in complex construction projects (CITB, 2018).

Traditional Property Developers at the grassroots are reported to have joined BCPG which has increased their influence in these localities. Similarly, BCPG has extended its advocacy to the traditional rulers to improve the education and awareness programmes, as well as to limit the activities of the local gangs. BCPG appears to have a national vision and at the time of completing the fieldwork there were suggestions that cells had spread to Abuja and other states in Nigeria. The rapid success of BCPG can also be attributed to their robust feedback strategy. They integrated a linear and non-linear feedback system whereby formal complaints could be made to LASBCA directly, coupled with informal helplines setup for senior members of BCPG resident in the various local government areas. This enables individuals report incidences of professional malpractice promptly and discretely.

The existence of non-linear feedback in complex systems is the main distinction between a complex and complicated system (Andriani 2003). Non-linear feedback loops could have a positive or negative effect on the stability of the system, however, in the case of BCPG this appears to be positive. Following the success of this inclusive and bottom-up approach, previously antagonistic government agencies became more supportive of the work of BCPG. This has improved the public-private collaboration in Lagos with stakeholders widely acknowledging that the strength of BCPG is in its professionalism and widely distributed network of volunteers which have become too large to be ignored by government. Therefore, traditional leadership constructs and professional allegiance have been discarded within BCPG. These professionals all work together more closely to unite the building industry with improved social, cultural and economic ramifications. Overall, the outcome of this study aligns with Derakhshan et al. (2019) who argued that as leadership systems emerge through complex social interactions and the main function of individuals is to make decisions relating to how the organisation interacts with the external environment to guarantee corporate and individual success. This has certainly been the case with BCPG. These outcomes, as well as those in the previous chapters, influenced the revision of the LSR framework.

10.4 REVISED LSR FRAMEWORK

The initial LSR framework in Figure 5.1 was developed through an extensive, interdisciplinary review of literature in the PM, Business Management and Leadership Studies domains. Following the testing of the framework at the pilot and empirical stages of this study, all the subsystems of the framework were found to be valid. Although, this researcher is aware that no single framework can adequately account for the multiple levels and causes of project failure (Denicol et al, 2020), this revision takes cognisance of the limitations of conceptualisation of the existing models of project complexity (see Section 4.4) and the findings of this study, particularly leadership dynamics. The findings confirm that the dynamics of complex systems in construction are largely comprised of these tripartite entities; organisation, environment and leadership, which aligns with Walker and Kalinowski (1994), Soderlund and Sydow (2019) and Geraldi and Soderlund (2018). The findings also confirm that these constructs are all complex, adaptive and systemic. Therefore, the LSR framework were revised to affirm this reality.

10.4.1 The Organisation Segment

This segment retains its four validated subsystems and its complex interactions with the environment is graphically depicted as an intertwined and intricate social ecosystem with both linear and non-linear webs of influence. The interaction between LASBCA and BCPG exhibits the need for clear KPI, which ensures that corporate strategies can be aligned. Therefore, the KPI segment is incorporated as one of the main success paradigms in PM (Section 2.4) to address the argument by Marr (2011) and Parmenter (2020) that the biggest mistake in handling success paradigms would be to fail to link them to organisational strategy.

In this view, KPIs and CSFs are most useful when they align with or are determined by wider organisational strategy (Section 3.2.2). This implies that the framework links the four CSF subsystems with the KPIs through linear loops. Therefore, for all CSF elements to converge for success there needs to be mutually beneficial corporate goals and measurable performance criteria. The KPI in the case of the 2010 BIR was the reduction or elimination of building collapse in Lagos.

10.4.2 The Environment Segment

The non-linear interaction between organisation and environment was confirmed through the PCA (Section 9.15.4; Table 9.59 and 9.60). In the case of the 2010 BIR, the linear and non-linear interaction between LASBCA and BCPG was captured in the events that led to the establishment of the latter. Although the leaders of BCPG met with government officially, they similarly engaged with their peers informally which culminated in the discourse in Section 10.3. Therefore, the feedback loops within the LSR framework were adjusted to reflect both linear and non-linear interactions to depict the dynamics within the ecosystem. Additionally, the seven macro-environment subsystems and one micro-environment subsystem were validated in Chapters 7, 8 and 9. Therefore, these subsystems were retained.

In Section 3.3.3 the discourse on environmental analysis stated that events and trends in the environment trigger environmental stimuli, such as a new government legislation (2010 LASBCA law), which directly and indirectly impact on the CSFs. This necessitates a strategic leadership response, usually in the form of decision-making and strategy. This interplay is

exhibited in the LSR framework to ensure that all elements that influence success and complexity of projects are properly accounted for. Hence, the importance of these environmental and organisational subsystems has been depicted in the revised LSR framework, based on the research findings. Therefore, the nature of the interchange between these constructs significantly determines the stability and viability of the entire ecosystem. Notably, this interchange is managed through leadership systems.

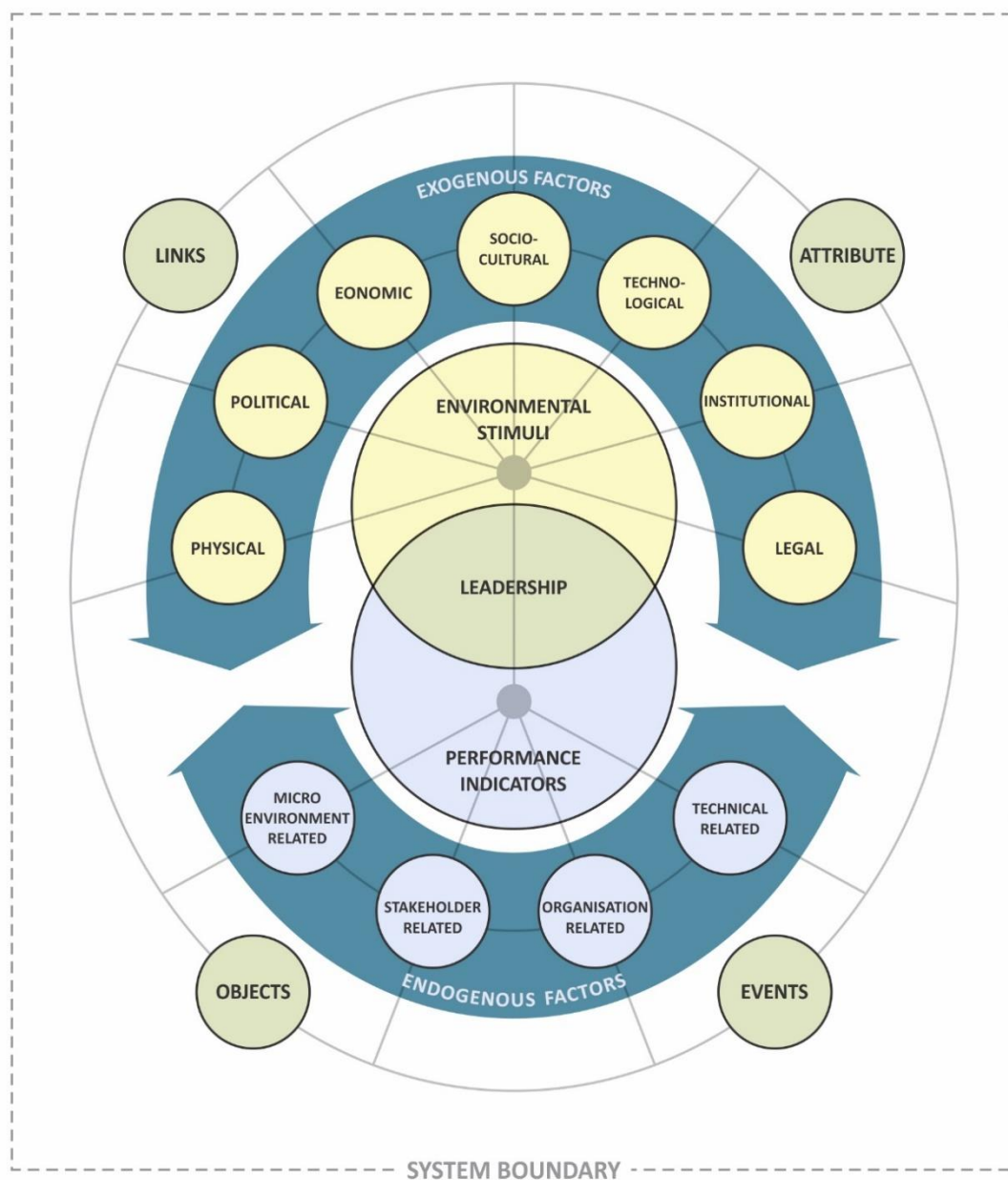


Figure 10.1: The Revised Leadership Systems Response Framework
(Author, 2021)

10.4.3 The Leadership Segment

The study confirms that leadership is embedded at the heart of organisational and environmental systems, rather than a standalone factor group (see Figure 5.1). Similarly, it is clear from this study that decision-making could be improved if the complexity of projects is carefully modelled and understood. Therefore, at the heart of the framework is the leadership response segment where stakeholders from both the organisation and environment systems interact to either improve stability or create turbulence. Notably, the subsystems depicted in the LSR framework do not possess hard boundaries rather they possess permeable, interconnected and interrelated boundaries. Therefore, the subsystems of the organisation and environment have distinct, as well as permeable leadership, social and hierarchical structures which have an impact on the characteristics and complexity of the whole system.

Similarly, these linear and non-linear feedback loops reflect leadership dynamics, which are complex and difficult to predict as these feedback loops transcend elements that are within the control of the leaders, in both the organisation and its external environment. The result of this interaction can be examined as Attributes, Links, Objects and Events. These characteristics are not limited to leadership alone as depicted in Figure 5.1, rather, they are ubiquitous to the entire ecosystem which informed further revision of the model. In this study, the focus has been on events such as building collapse, 2010 BIR and leadership decision-making. The success of the distributed leadership strategy of BCPG also gives credence for the revision of the structure of the LSR framework.

Therefore, leadership is both endogenous and exogenous to projects and this conceptualisation would improve decision-making of project managers, leaders and other stakeholders. The results of the inferential statistics in Section 9.15 made this clear and the foregoing aligns with the studies by Mamedio and Meyer (2020), Muller et al (2012), and Daniel and Daniel (2019). As project systems remain characteristically complex, leadership is central to adaptation and success. Particularly, without leadership to drive the agents in the organisation and environment the systems becomes chaotic. Therefore, the findings of this study validated the structure of the model (Section 9.15), necessitating its revision based on the reality of the interplay between its factor groups.

The LSR framework provides a conceptual, theoretical and practical guide for understanding the phenomenon of complex project systems and the interplay of organisation, environment and leadership. The new model reflects this complex reality in line with the emphasis on the broader conceptualisation of endogenous and exogenous factors (see RPM movement in Section 2.2.2). Therefore, the revised framework provides an interpretive approach to social reality based on the events in the Building Industry in Lagos. The nature of these constructs and underlying presumptions of their relationship as explained in this study distinguishes the LSR framework as a unique and novel model of project complexity.

10.5 ADDRESSING THE AIM AND OBJECTIVES

As mentioned in Section 1.3, the first objective of this study was to examine the key factors and concepts influencing project success. This was achieved through a critical review of relevant literature in Chapters 2 and 3, covering the traditional and strategic eras of PM respectively. It was discovered that the factors that influence project success in PM literature are grouped as Critical Success Factors, which have endogenous and exogenous dimensions. Similarly, success is measured using success criteria known as Key Performance Indicators. Stakeholders satisfaction was the success measure for this study. These are the main paradigms in PM success literature and their influence on project outcomes is immense.

Additionally, these paradigms have been combined to build integrated frameworks in PM. To investigate the efficacy of these paradigms in the strategic era of PM, the co-dependency of the organisation and the environment was examined in Business Management literature, which led to the emergence of relational leadership constructs. Studies in leadership literature were also reviewed to examine paradigms and gaps in conceptualisation. Overall, at the end of the interdisciplinary critical review of literature it was discovered that project complexity has three dimensions; organisation (with four subsystems), environment (with seven subsystems) and leadership (embedded in all eleven subsystems).

In response to Objective 2, these paradigms, constructs and their subsystems were further examined through a critical review of Models of Project Complexity (MPC) in Chapter 4. Gaps in existing models were identified. Majority of the reviewed studies corroborated the

existence of organisational and environmental constructs. Surprisingly, very few models included leadership or human-related factors in spite of evidence of its importance to project success. Particularly, the background chapters suggest that the omission of this distinct construct within models of complexity represents the gap in PM knowledge that this study addresses. This limited conceptualisation provided motivation for this study and informed the inclusion of the leadership segment in the LSR framework.

Furthermore, it was also discovered that inherent complexity can be examined along four dimensions; Attributes, Links, Objects and Events. These attributes were merged with all other aforementioned paradigms and constructs to develop the LSR framework in Chapter 5 to fulfil Objective 2, based on a review of PM, Business Management and Leadership Studies literature. This new model of complexity extends the work of Walker and Kalinowski (1994) and responds to call for new models by the Rethinking Project Management movement (Winter et al., 2006; Svejvig and Andersen, 2015; Rezende et al., 2018; Geraldi and Soderlund, 2018). This new model can be used primarily as a decision-making tool by researchers and practitioner. The interplay between these factors provides an indication of the complexity of projects.

For Objective 3, the researcher started by embarking on the pilot study to examine the challenges of the context of Lagos (see Chapter 7). This created a basis for revising the research design and justification of the empirical phase of the study. The primary aim of the pilot phase was to test the efficacy of the LSR framework, as well as validate the research strategy, methods and data collection instruments. Therefore, the key factors influencing project success were further appraised using extant literature specific to Lagos and combined with field data from the pilot study. This further verified the existence of the aforementioned constructs and their influence on project success.

Invariably, this process confirmed the efficacy of the conceptual framework for use in the main study to address the two research questions. The results of Objective 3 are presented in Chapter 7 and 8 where the data from institutional level leaders, along with those at the project and organisation level of the building industry in Lagos, are presented to discuss the factors that affect building construction success. The data was collected in response to the

first question relating to why project fail in Lagos, particularly in the light of building collapse, as well as the success of LASBCA. Therefore, the results on the challenges of building construction projects as presented in Chapter 8 are discussed in Section 10.3.

Furthermore, based on Objective 4 and in response to Question 2 these respondents were asked to reflect on the reforms in Lagos and how leadership strategies and processes could be improved. The qualitative and quantitative data were analysed and the results presented in Chapter 9 and discussed in Section 10.2. This last data collection phase combined the two-stage qualitative data collection process with the questionnaire survey, as well as extant knowledge to present evidence of the complexity of projects systems.

This triangulation of data improved the research outcomes and the findings of this mixed method research have been discussed in the preceding sections of this chapter, particularly the effects of the contrasting leadership decision-making strategies of LASBCA and BCPG. Therefore, all the research questions have been answered and the aim of the study achieved. For Objective 5, conclusions have been drawn on the interplay between organisation, environment and leadership in Section 8.15, 9.16 and 10.4.

In conclusion, the greater complexity of the business environment affects projects and organisations, which will also cause decision-making to be more complex (Gemunden et al. 2018) It is expedient to put in place decision-making tools and models, especially in complex projects (Abbasianjahroni et. al, 2014). Events such as the global COVID-19 pandemic have disrupted both projects, organisations and institutions resulting in adaptive responses from leadership the world over. Initiatives such as remote working, social distancing and virtual classrooms and other innovations in governance, science and technology continues to evolve based on learning and adaptation this improves the likelihood of human and organisational survival, as well as environmental stability. Construction projects, organisations and industries has been impacted by these and other environmental events which gives credence to the value of this research. Therefore, the LSR framework and the outcome of this study reflect the interconnection of project systems with leadership dynamics as the common denominator which explains affirms this study's focus on leadership decision making. Finally, the next section presents implications of this study for PM research and practice.

10.6 CONTRIBUTIONS TO KNOWLEDGE

10.6.1 Theoretical Contributions to Knowledge

This study contributes knowledge towards the conceptualisation of project complexity, thereby improving project conceptualisation and decision-making to open new vistas of future research. It responds to PM literature's lack of an explicit theory (Musawir et al. 2020) by adopting the Complexity theory as a credible lens in Project Studies (Mamedio and Meyer, 2020). Although, the application of complexity theory can be found application in construction PM literature (Whitty and Maylor, 2009; Daniel and Daniel, 2018), its use in the building construction industry in Lagos, Nigeria is novel.

Therefore, the CAS metaphors used in this study improves the conceptualisation of projects when combined with the LSR framework as a tool to facilitate further research and create an opportunity for other researchers to validate the outcomes of these studies. Particularly, this study is significant with regard to extending the study by Walker and Kalinowski (1994).

Walker and Kalinowskis' study was critical in advancing the use of systems theory in construction project management which was many years ahead of its time but had received limited attention from the research and industry stakeholders; possibly because these authors did not provide a comprehensive conceptual model. The LSR framework addresses this gap in knowledge in the light of the Rethinking Project Management movements' call for new models that reflect the complexity of projects (Winter et al., 2006; Svejvig and Andersen, 2015; Rezende et al., 2018; Geraldi and Soderlund, 2018).

10.6.2 Methodological Contributions to Knowledge

Mixed method is unpopular in PM research; particularly so in construction industry in the context of developing countries like Lagos, Nigeria. Therefore, the use of the Exploratory Sequential Mixed Methods approach in Lagos, Nigeria is novel. As Cameron et al., (2015) argued, this approach will promote a level of methodological sophistication that is essential for studying complex phenomena like project systems. This aligns with calls from authors like Cloete (2017) and Padalkar and Gopinath (2016) who argued that a pluralistic and more

pragmatic approach to methodology is necessary if PM and construction research is to overcome its lacks of robust research methodologies and advance towards theory building.

Additionally, there is a dearth of research that explicitly use the retroduction strategy in social science (Blaikie 2000; Zachariadis et al., 2014). This is more evident in the context of Lagos, Nigeria. This methodological robustness helped with the development and validation of the unique LSR framework because it addressed some of the methodological issues noted in PM research. Therefore, the retroductive strategy and Exploratory Sequential Mixed Method approach are rarely used in construction PM and this is a significant contribution to knowledge. The retroductive steps are clearly discussed and can be replicated to validate the efficacy of the LSR framework as a decision-making tool and conceptual lens for research.

10.6.3 Practice Contributions

The LSR framework is primarily a decision-making tool which can be used in construction PM practice to develop decision making systems and risk management protocols. This framework sufficiently conceptualises the complexity of factors that influence success within organisation, environment and leadership constructs (see Rolstadas et al. 2015; Nixon et al. 2012; Henry, 2018). This new framework will help accelerate the paradigm shift from the classical approach of management which involves the planning and control fixation to the more contemporary complexity approach which is grounded in the learning and adaptation paradigm (see Daniel and Daniel, 2018).

Daniel and Daniel (2018) also suggest that such frameworks can be used to map mental models of decision makers to guide the evolution from the deterministic constructs of regulation to the non-deterministic constructs of complexity, uncertainty and emergence. Therefore, the LSR framework has the potential to reduce project risks, inform decision making and improve project success (Luo et al., 2020; Zaman et al., 2020; Qureshi and Kang, 2015). This framework helps improve the future of project management where projects will have to adapt and innovate to keep pace with increasingly complex and uncertain conditions that cannot be accounted for in front-end plans (see Davies, 2017 pg. 60 in ARUP 2017).

The model of complexity presented in this study is not intended to enable prediction, rather it should be thought of as a means of exploring possibilities, particularly those that would otherwise not be apparent. Models are problem-solving aids, not solutions in themselves. It is expected that these research outcomes will create knowledge to help practitioners and researchers re-evaluate and change the way they view the world of projects. The limitations of existing models of project complexity represents a significant gap in knowledge as recognised in the RPM movement. Therefore, this study bridges the gap between theory and practice in PM through the development and validation of the LSR framework.

10.7 LIMITATIONS OF THE RESEARCH

10.7.1 Methodological Limitations

At the start of this study, the survey questions were derived from literature based on the study by Hughes (1989) due to the paucity of studies on environmental factors in construction project management literature. Hughes research was the only study at the time of commencing the fieldwork that clearly examined the various dimensions and subsystems of the external environment. It provided evidence of the lack of research on the project environment in construction literature, thus further giving credence to the need for the LSR framework. This approach was criticised after pilot testing for two reasons; firstly, the tool contained too much specialist jargon which made comprehension difficult for the survey respondents; secondly, this study is quite dated and may not align with current knowledge.

Therefore, the Hughes' (1989) tool was found to be unsuitable to address the research objectives and its use was discontinued after the pilot study. To address this limitation, the research design was revised from Explanatory Sequential Mixed Method to Exploratory Sequential Mixed Method approach to ensure that the qualitative phase (interviews) preceded the questionnaire survey. In this way, the structure and language of the questionnaires were based on the issues discussed by the interviewees and based on their understanding of the challenges in Lagos, Nigeria. Therefore, complex abstractions were removed in the main study which improved the response rate and quality of the returns.

10.7.2 Field Limitations

The researcher experienced a lot of difficulties scheduling meetings for the interviews; as well as recruiting participants for the survey. Online and postal survey were found to be less successful based on the recommendations of gatekeepers during the pilot study. This is because the target research population is comprised of extremely busy project practitioners. Therefore, the decision to fully partner with the Nigeria Institute of Architects in the quantitative phase was informed by the limited resources available to the researcher, especially time and funding. Although this choice and reasoning has been fully justified in this study, the researcher is aware that the preponderance of Architects in the survey may create some bias. Nonetheless, this does not invalidate the outcome of the study because the survey was used predominantly to examine the validity of the LSR model using Principal Component Analysis (PCA). PCA is the first step towards conducting more advanced statistical analysis like Structural Equation Modelling, which is the recommended for further research. Therefore, the next quantitative step of this study (post PhD) will recruit participants more widely to include Project Managers and all other building industry practitioners.

10.8 FURTHER RESEARCH RECOMMENDATIONS

Firstly, PCA is a linear measure of correlation of variables which was used to provide evidence of the non-linearity of the variables in this study. It is recommended that the quantitative aspects of this study could be repeated in future using Structural Equation Modelling which permits more advance and in-depth analysis of the nonlinearity. Data collection in the quantitative phase was also extremely challenging, tedious and resource dependent. More cases could be added in future research to improve the survey outcomes.

From the leadership perspective, project and construction managers need to improve upon their leadership skills to increase successful project outcomes and create a high-level performance. (Farler and Haan, 2021). Most individuals can develop leadership attributes and capabilities through appropriate structured training and interventions (CIOB, 2008; Ofori and Toor, 2012; CITB, 2018; Farler and Haan, 2021). Investigating new ways to improve leadership training in the light of project complexity is recommended for further research.

This study focused only on the institutional level of project-driven endeavours. Further research could assess this phenomenon at individual/teams, project and organisation levels in line with the research agenda proposed by Geraldi and Soderlund, 2018 (see Table 2.1). This study also used the LSR framework as a lens to examine stakeholder satisfaction regarding the challenges of building collapse and construction industry reform in Lagos, Nigeria. Recommendations are made for further research to examine this phenomenon using other KPIs such as cost, time, quality or health and safety.

From the typology perspective, whilst this study focused on building construction, further research could address other types of construction projects such large scale engineering and infrastructure projects (Hyvari, 2006), because different types of projects have different requirements (Musawir et al., 2020). From the context perspective, it is clear that environmental influences pose considerable influences on project outputs and outcomes (Jugdev and Muller, 2005; Walker, 2007; Dille and Söderlund, 2011; Soderland and Sydow, 2019) and this study could be repeated in other context, in developed and developing countries, to fully understand the environmental influences that influence project success.

Dimensions of success consist of two distinct concepts namely; 'project management' success and 'project' success. Project management success denotes that the construction projects achieve the predetermined goals, particularly based on the traditional time, cost and quality factors, while project success is assessed by taking into consideration the overall goal and purpose of the project or organisation (Radujkovic and Sjekavica, 2017; Sebestyen, 2017; Ma and Fu, 2020). Further research could examine success at the traditional level based on the project lifecycle models (see CIOB 2014).

Furthermore, this LSR study addressed the gap in Pinto and Mantels' work by analysing both environmental and organisational factors. Yet these factors account for only 45% by variance of the causes of project failure. This implies that the majority of the factors that influence success are not accounted for in both studies. This could be a subject for further research, particularly in the human-related and leadership factor groups of projects, to further understand how these systems impact project success or failure.

Finally, following the study of Leadership 'Events' in this research using the ALOE framework in Table 5.2 and Section 5.4, further research could examine Leadership 'Attributes' such the effects of age, training, years of experience and leadership style on ability to model and manage complex projects; Leadership 'Links' such as the organisational structure hierarchies of Building Collapse Prevention Guild; and Leadership 'Objects' such as exploring the effectiveness of leadership decision making tools in construction practice;

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APPENDIX A



CONSENT FORM – INTERVIEWS

Critical Leadership Responses to Environmental Complexities Influencing Construction Performance in Lagos

DEPARTMENT OF REAL ESTATE AND CONSTRUCTION
FACULTY OF TECHNOLOGY, DESIGN, & ENVIRONMENT
OXFORD BROOKES UNIVERSITY, OX3 0BP UK

Ifonima Offiong Essien, Ph.D. Student / Principal Investigator
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Dr Ramin Keivani, Postgraduate Research Tutor
Contact: rkeivani@brookes.ac.uk; +44(0)1865483919(UK)

Please initial box

I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reasons.

I am aware that this project is research and I agree to take part in the study.

I confirm that I understand the implications the small sample size may have on my anonymity and accept the measures to be taken to address this.

I agree that my data gathered in this study may be stored for a period of 10 years, after I have been de-identified, in a specialist data centre and may be used for future research.

Please tick box

YES NO

I agree to the interview being audio recorded.

☐☐

I agree to the use of de-identifier quotes in publications.

☐☐

Name of Participant

Date

Signature

Name of Researcher

Date

Signature

APPENDIX B

**DEPARTMENT OF REAL ESTATE AND CONSTRUCTION
FACULTY OF TECHNOLOGY, DESIGN, & ENVIRONMENT
OXFORD BROOKES UNIVERSITY, OX3 0BP UK**



Ifonima Offiong Essien, Ph.D. Student / Principal Investigator

Contact: ifonima.essien-2012@brookes.ac.uk; +234(0)8066879200(Nigeria) / +44(0)7831029708(UK)

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Dr Ramin Keivani, Postgraduate Research Tutor

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PARTICIPANT INFORMATION SHEET - INTERVIEWS

Critical Leadership Responses to Environmental Complexities Influencing Construction Performance in Lagos

The content of this document is to be explained in person by the researcher to the participant(s).

Invitation paragraph

You are being invited to take part in a research study and your contact was sourced from
(to be inserted as appropriate e.g. Architects Registration Council of Nigeria – ARCON Compendium of Chartered Architects). Before you decide whether to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study?

The purpose of this study is to investigate and understand the influence of Project Complexity on Decision Making on Project Success in the Lagos, Nigeria by drawing on the experiences and perceptions of Construction Leaders in the Building Construction Industry

This segment of the fieldwork will run for 3 – 6 months from (Date :.....) If you decide to take part in this study, you will be asked to:

(1) Talk about your experiences and any issues relating to the project complexity in Lagos with particular reference to your perception on building collapse and the building industry reforms 2010

(2) Discuss ways in which leadership can respond to poor construction output and outcomes.

Why have I been invited to participate?

You have been invited to participate as you have direct experience in the study area and fall into the leadership category of the Nigerian construction industry following your long years of professional experience in the industry.

Furthermore, your experience and perceptions of the subject of this research are deemed invaluable to the successful completion of the study. The researcher hopes that at least 20 people will contribute their knowledge to the study.

Do I have to take part?

No, it is entirely up to you to decide whether to partake in this study. There will be no disadvantage to you if you do not take part, the researcher will take care with any testimonies given and your confidentiality will be strictly protected.

However, if you decide to partake in the study, you will be given this information sheet to keep as a record and you will be requested to sign a consent form. If the interview is recorded via audio, your consent will be recorded on tape.

If for any reason you decide not to take part, you can withdraw at any time and without explanation. If you decide to withdraw after having already given testimony, this information will be omitted from the study at your request. Equally, sections of your testimony may be omitted at your request

What will happen to me if I take part?

If you decide to take part in the study, you could expect the following appropriate time-commitment as a guideline and example:

Meet the researcher and spend about 60 minutes (you will decide the length of time) telling him about your experience on how Project Complexities influences Building Construction in Lagos. This meeting will take place at a location of your choice and on a date of your convenience between (Date:)

What are the possible disadvantages of taking part?

There will be no disadvantages or risks to you if you take part, but it will require some of your time. The researcher will try to arrange meetings to suit you as much as possible. Any information you give will be confidential, more information on information security is given below. The research is not intended to focus on personal matters but on professional experiences acquired from working in the study area.

What are the possible benefits of taking part?

The research seeks to provide new knowledge and yield measurable benefits in the following areas,

Academic / Conceptual Contribution

This research aims to develop a conceptual framework for assessing both internal and external influences to project success. Notably, previous frameworks have limitations which have failed to reverse the trend of poor construction performance, especially in developing countries. In the 21st century, new paradigms propose an approach that will ensure construction success throughout its lifecycle, and to stakeholders' satisfaction.

Professional / General Contribution

The new framework and knowledge so provided will enable construction practitioners plan effectively during the conception of construction projects, with a view proffering pragmatic responses for the design and construction stages. Successfully planned and executed projects will accrue economic, social and environmental benefits to all stakeholders within and beyond the construction industry.

Will what I say in this study be kept confidential?

Yes, your name will be de-identified – meaning that your name and location will be replaced by a code or pseudonym in order to protect confidentiality and anonymity. Furthermore, copies of the transcribed interview will be forwarded for your perusal, revision, endorsement or withdrawal before analysis of the data. In all instances, your consent will be sought and obtained before data so derived is processed for use in the study, in line with ethical requirements. Your testimony will be stored in secure storage at Oxford Brookes University for 10 years and may be used for other research purposes subsequently.

What should I do if I want to take part?

If you wish to take part, you may contact the researcher(s) via email or telephone numbers provided. .

What will happen to the results of the research study?

The results of the research will be presented in a PhD thesis at Oxford Brookes University and, where appropriate in academic journals and at international conferences.

Who is organising and funding the research?

The researcher is carrying out this research as a doctoral study in the Department of Real Estate and Construction, Faculty of Technology, Design & Environment at Oxford, Brookes University, UK. Funding for the three-year programme was provided by University of Uyo, Akwa Ibom, Nigeria in conjunction with the Tertiary Education Trust Fund (TETFund) Nigeria.

Who has reviewed the study?

This research has been approved by the University Research Ethics Committee of Oxford Brookes University.

Contact for Further Information

If you need further information, please contact persons with details provided, by telephone or email. If, at any point, you have any concerns about the way in which the study has been conducted, you can contact the Chair of the University Research Ethics Committee of Oxford Brookes University. They can be contacted by email on ethics@brookes.ac.uk.

Thank you for taking time to read this information sheet.

Date

APPENDIX C



**DEPARTMENT OF REAL ESTATE AND CONSTRUCTION
FACULTY OF TECHNOLOGY, DESIGN, & ENVIRONMENT
OXFORD BROOKES UNIVERSITY, OX3 0BP UK**

Ifonima Offiong Essien, Ph.D. Student / Principal Investigator

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PARTICIPANT INFORMATION SHEET – QUESTIONNAIRE SURVEY

Critical Leadership Responses to Environmental Complexities Influencing Construction Performance in Lagos

Invitation paragraph

You are being invited to take part in a research study. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

What is the purpose of the study?

The purpose of this study is to investigate and understand Project Complexity and Success of Building Construction Projects in Lagos, Nigeria by drawing on the experiences and perceptions of Construction Leaders in the Building Construction Industry.

This segment of the fieldwork will run for 3 – 6 months from (Date :.....) If you decide to take part in this study, you will be asked to:

The purpose of this study is to investigate and understand the influence of Project Complexity on Decision Making on Project Success in the Lagos, Nigeria by drawing on the experiences and perceptions of Construction Leaders in the Building Construction Industry

The fieldwork will run for 6 months from (Date:)

If you decide to take part in this study, you will be asked to:

(1) Fill in questionnaires with questions relating to your perceptions and experiences of the project complexity in Lagos with particular reference to the incidences of Building Collapse

(3) Respond to questions on ways in which Construction Leadership can strategically respond to the impact of project complexity on construction output and outcomes.

Why have I been invited to participate?

You have been invited to participate as you have direct experience in the study area and fall into the Leadership category of the Nigerian construction industry following your years of professional experience in the industry. The researcher hopes that at least 300 people will contribute their knowledge to the study.

Do I have to take part?

No, it is entirely up to you to decide whether or not to partake in this study. There will be no disadvantage to you if you do not take part, the researcher will take care with any testimonies given and your confidentiality will be strictly protected.

However, if you decide to partake in the study, you will be given this information sheet to keep as a record. This study will take place between (Date:)

If for any reason you decide not to take part, you can withdraw at any time and without explanation. If you decide to withdraw after having already given testimony, this information will be omitted from the study at your request. Equally sections of your testimony may be omitted at your request

What are the possible disadvantages of taking part?

There will be no disadvantages or risks to you if you take part, but it will require some of your time. Any information you give will be confidential, more information on information security is given below. The research is not intended to focus on personal matters but on professional experiences acquired from working in the study area.

What are the possible benefits of taking part?

The research seeks to provide new knowledge and yield measurable benefits in the following areas,

Academic / Conceptual Contribution

This research aims to develop a Conceptual Framework for assessing both internal and external influences to construction project success. Notably, all previous frameworks were limited to tactical or internal influences, which have failed to reverse the trend of poor construction performance, especially in developing countries. In the 21st century, new paradigms propose an approach which will ensure construction product success throughout its lifecycle, and to stakeholders' satisfaction.

Professional / General Contribution

The new framework and knowledge so provided will enable construction practitioners plan effectively during the conception of construction projects, with a view proffering pragmatic responses for the design and construction stages. Successfully planned and executed projects will accrue economic, social and environmental benefits to all stakeholders within and beyond the construction industry.

Will what I say in this study be kept confidential?

Yes, you will be de-identified – meaning that your name and location is not a requirement for the study in order to protect confidentiality and anonymity. Analysis of the data will be done by aggregate, for further confidentiality, and all information will be stored in secure storage at Oxford Brookes University for 10 years and may be used for other research purposes subsequently.

What should I do if I want to take part?

If you wish to take part, you may contact the Principal Investigator via email or telephone numbers provided.

What will happen to the results of the research study?

The results of the research will be presented in a PhD thesis at Oxford Brookes University and, where appropriate in academic journals and at international conferences.

Who is organising and funding the research?

The researcher is carrying out this research as a doctoral study in the School of the Built Environment, Faculty of Technology, Design & Environment at Oxford, Brookes University, UK. Funding for the 3 year programme was provided by TETFund and University of Uyo, Nigeria.

Who has reviewed the study?

This research has been approved by the University Research Ethics Committee of Oxford Brookes University.

What to do with completed questionnaires?

When you have completed filling-in the questionnaire, please contact the Principal Investigator via email or telephone numbers provided for direct collection.

Contact for Further Information

If you need further information, please contact persons with details provided, by telephone or email. If at any point you have any concerns about the way in which the study has been conducted, you can contact the Chair of the University Research Ethics Committee of Oxford Brookes University. They can be contacted by email on ethics@brookes.ac.uk.

Thank you for taking time to read this information sheet.

APPENDIX D

QUESTIONNAIRE

This questionnaire will take approximately 15 minutes to complete. The data gathered here shall not be communicated in a form that would identify participants without permission and the inclusion of your personal information is optional. Please tick in the appropriate boxes to indicate your answers.

PART A

Personal Information

Biographical Data

1. Name (Optional):
2. Your Gender (Optional):
3. Your Age: Under 30 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60+ ☐

Professional Background

1. Please indicate which of these professional disciplines best describes your area of practice;
Architecture ☐ Engineering ☐ Quantity Surveyors ☐ Builders ☐
Town Planning ☐ Land Surveyor ☐ Estate Surveyor and Valuer ☐
Contractors ☐ Industry Regulators ☐ Others (please specify)
2. What Category of Professional Membership do you currently hold?
Associate Membership ☐ Full Membership ☐ Fellow Membership ☐
Non-Member ☐ Others (please specify)
3. How many years of post-qualification experience do you have?
Strictly Under 5 ☐ 5 – 10 ☐ Strictly Over 10 ☐

Professional Experience in the Study Area – Lagos, Nigeria

1. What is the nature of your professional experience in Lagos?
Work there presently ☐ Worked there previously ☐
2. How long (years) is your work experience in Lagos?
Strictly Under 5 ☐ 5 – 10 ☐ Strictly Over 10 ☐
3. In which sector of the Building Construction Industry have you worked?
Government Establishments ☐ Professional Consultancy (Private Practice) ☐
Research and Academia ☐ Construction Companies ☐ Others (please specify)

PART B

The following set of statements suggests ways in which the building construction industry in Lagos can be improved. These have been drawn from interviews with construction experts such as yourself. Please read the statements carefully and kindly rank your responses by circling the appropriate numbers in the following tables. Note the range of ranking as follows; 1 = STRONGLY DISAGREE to 5 = STRONGLY AGREE

	VARIABLES	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
1	Collaboration between government and building construction professionals is essential for building industry improvement	1	2	3	4	5
2	All stakeholders must be enlightened about best practice and involved in the reforms of the building industry	1	2	3	4	5
3	Professional ethics should be enforced by the various institutes and penalties issued against defaulters	1	2	3	4	5
4	Government and professionals must embark on knowledge sharing to bridge the knowledge gap between them	1	2	3	4	5
5	Professional specialization should be maintained and overlapping roles should be avoided to reduce rivalry	1	2	3	4	5
6	Only academically-qualified and professionally-certified persons should be involved in building design and construction projects	1	2	3	4	5
7	Regular Continuous Professional Development programmes are essential for all technical stakeholders	1	2	3	4	5
8	Government institutions need to be strengthened, well-equipped and empowered to fulfil their mandates	1	2	3	4	5
9	Government needs to improve development control both at the plan approval and construction delivery stages	1	2	3	4	5
10	Training and certification of the construction workforce is essential, especially for the artisans and technicians	1	2	3	4	5
11	Cultural re-orientation of all stakeholders is necessary to improve patriotism, attitudes and social values	1	2	3	4	5
12	All building professional specialisations must be represented in the government regulatory agencies	1	2	3	4	5
13	Government should make its' processes more transparent and reduce corruption in its ministries and parastatals	1	2	3	4	5
14	Proper project planning and detailed documentation should be provided by the building professionals	1	2	3	4	5
15	Improvement of technical education and re-establishment of schools are necessary to sustain a skilled workforce	1	2	3	4	5
16	Improve land acquisition and building approval processes by deploying appropriate technology and automation	1	2	3	4	5
17	Professional bodies need to be restructured to make them more effective in promoting ethics and professionalism	1	2	3	4	5
18	Improve the legal framework for the building construction projects and the entire industry	1	2	3	4	5
19	Improve the quality control regime of building materials through agencies such as Standard Organisation of Nigeria	1	2	3	4	5
20	Sincerity of all stakeholders is essential	1	2	3	4	5
21	New and appropriate government legislation is necessary	1	2	3	4	5
22	Proper choice of contractors through pre-qualification processes	1	2	3	4	5

	VARIABLES	Strongly Disagree	Disagree	Neither Agree or Disagree	Agree	Strongly Agree
23	Payment of professional fees by clients should be enforced by the professional bodies and government	1	2	3	4	5
24	Involvement of host community in monitoring physical development will improve development control	1	2	3	4	5
25	Welfare and salaries of government employees should be improved to boost staff motivation and diligence	1	2	3	4	5
26	Project financiers and banks should be actively involved at building project implementation stage	1	2	3	4	5
27	Improvement of the national economy will lead to an improvement of the building industry	1	2	3	4	5
28	Research and development should be promoted to ensure sustainable innovation in the building industry	1	2	3	4	5
29	Quacks in the industry should be arrested and prosecuted	1	2	3	4	5
30	Indigenous building technology should be developed	1	2	3	4	5
31	Sufficient advance payment sums should be given to contractors to help reduce the effects of inflation and fluctuation on projects	1	2	3	4	5
32	Establish a regulatory agency which is totally independent of government	1	2	3	4	5
33	Government should establish more material testing laboratories across the State	1	2	3	4	5
34	Proper project funding by the client is paramount	1	2	3	4	5
35	Professional bodies and the State government should adopt and implement the National Building Code	1	2	3	4	5
36	Experts in industry and academia should form strategic partnerships to aid training, research and innovation	1	2	3	4	5
37	Transparency and openness is essential in the building laws and regulatory processes to foster stakeholder confidence	1	2	3	4	5
38	Stakeholders should borrow and/or adopt foreign technology	1	2	3	4	5
39	Government needs to review its' policy on the importation of building materials and finishes which lack local substitutes	1	2	3	4	5
40	Professional fees should be reviewed downwards in view of the economic condition of the country	1	2	3	4	5
41	Risk management framework should be an integral part of the project planning process to prevent project failure	1	2	3	4	5
42	Government regulators should outsource material testing functions to private firms	1	2	3	4	5
43	Government should improve road infrastructure to make remote areas of Lagos accessible for development control	1	2	3	4	5

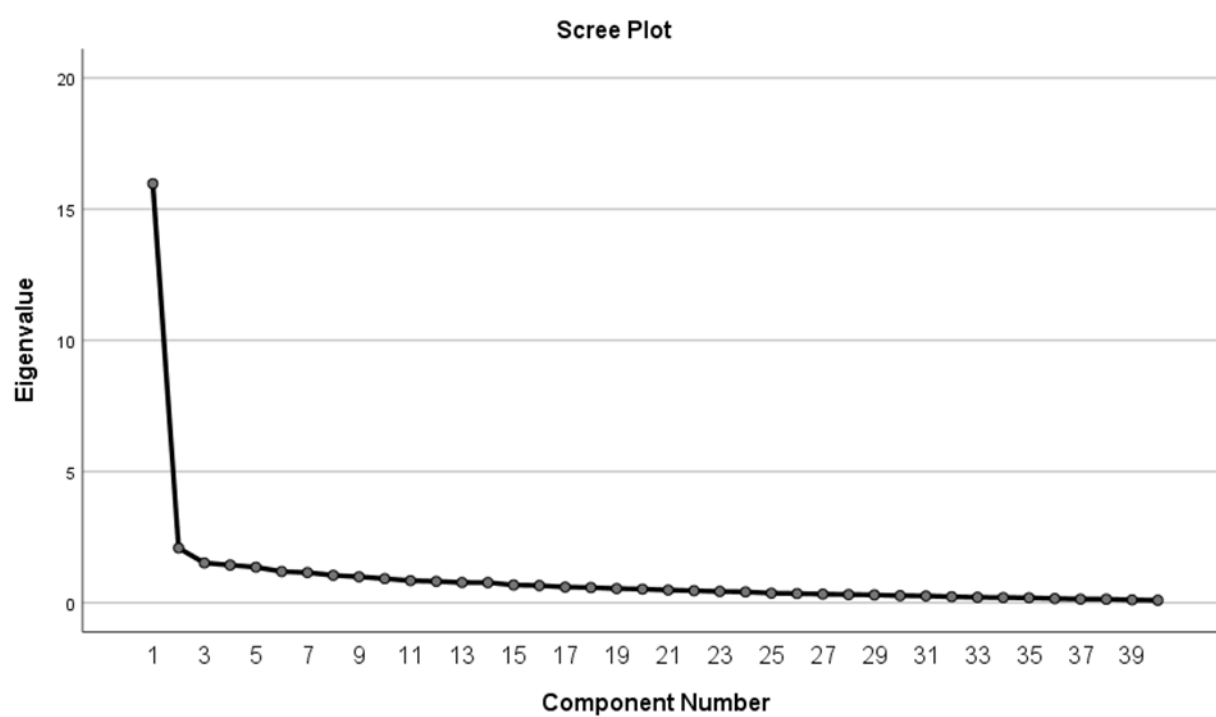
APPENDIX E

Total Variance Explained

Component	Total	Initial Eigenvalues		Extraction Sums of Squared Loadings		
		% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.973	39.932	39.932	15.973	39.932	39.932
2	2.089	5.223	45.155	2.089	5.223	45.155
3	1.519	3.797	48.953	1.519	3.797	48.953
4	1.439	3.598	52.551	1.439	3.598	52.551
5	1.359	3.398	55.948	1.359	3.398	55.948
6	1.193	2.984	58.932	1.193	2.984	58.932
7	1.153	2.883	61.815	1.153	2.883	61.815
8	1.049	2.624	64.439	1.049	2.624	64.439
9	.995	2.487	66.926			
10	.921	2.303	69.229			
11	.847	2.117	71.346			
12	.818	2.046	73.392			
13	.773	1.934	75.326			
14	.771	1.928	77.254			
15	.680	1.700	78.954			
16	.660	1.651	80.605			
17	.601	1.503	82.107			
18	.583	1.457	83.565			
19	.543	1.357	84.922			
20	.523	1.307	86.229			
21	.489	1.221	87.450			
22	.462	1.156	88.606			
23	.435	1.089	89.695			
24	.416	1.039	90.734			
25	.369	.923	91.657			
26	.352	.880	92.537			
27	.332	.830	93.367			
28	.316	.789	94.156			
29	.301	.754	94.909			
30	.274	.685	95.594			
31	.265	.661	96.256			
32	.234	.585	96.841			
33	.210	.525	97.366			
34	.200	.501	97.867			
35	.193	.482	98.349			
36	.166	.416	98.764			
37	.145	.362	99.127			
38	.139	.348	99.474			
39	.113	.282	99.756			
40	.098	.244	100.000			

Extraction Method: Principal Component Analysis.

APPENDIX F



APPENDIX G

Rotated Component Matrix^a

	Component	
	1	2
Stakeholders-b-All stakeholders must be enlightened about best practice and involved in the reforms of the building industry	.856	
Organisation-a-Professional ethics should be enforced by the various institutes and penalties issued against defaulters	.765	
Stakeholder-a-Collaboration between government and building professionals is essential for the building industry to be improved	.735	
Institutional-e-Improvement of technical education and reestablishment of schools is necessary to sustain a skilled workforce	.685	.316
Projects-a-Proper project planning and detailed documentation should be provided by the building professionals	.681	.393
Organisation-c-Regular Continuous Professional Development programmes are essential for all technical stakeholders	.646	.313
Stakeholders-c-Government and Professionals must embark on knowledge sharing to bridge the knowledge gap between them	.611	.474

Legal-a-Improve the legal framework for the construction industry and building projects	.610	.406
Institutional-b-Transparency and openness is essential in the building laws and regulatory processes to foster stakeholder confidence	.608	.450
Project-b-Proper choice of contractors through pre-qualification	.603	.332
Political-b-Government should make its processes transparent and reduce corruption in its ministries and parastatals	.592	.431
Technological-a-Improve land acquisition and building approval processes by deploying appropriate technology and automation	.580	.314
Institutional-a-Government needs to improve development control both at the plan approval and construction stages	.563	.340
Technological-b-Research and development should be promoted to ensure sustainable innovation in the industry	.557	.490
Institutional-d-Training and certification of the construction workforce is essential, especially for the artisans and technicians	.554	.369

Institutional-c-Improve the Quality Control Regime through agencies such as Standard Organisation of Nigeria	.506	.449
Political-a-Government Institutions need to be strengthened, well-equipped and empowered to fulfil their mandates	.494	.463
Technological-c-Indigenous building technology should be developed	.449	.379
Sociocultural-a-Cultural reorientation of all stakeholders is necessary to improve patriotism, attitudes and social values	.423	.417
Stakeholders-e-Only qualified and certified professionals should be involved in building design and construction projects	.362	
Project-c-Sufficient advance payment sums should be given to contractors to help reduce the effects of inflation and fluctuation on projects		.648
Project-d-Risk management framework should be an integral part of the project planning process to prevent project failure	.364	.638
Economic-c-Improvement of the national economy will lead to an improvement of the building industry	.326	.635
Economic-a-Project financiers and banks should be actively involved at building project implementation stage		.630

Institutional-h-Government should establish more material testing laboratories across the state		.604
Legal-b-Professional bodies and the State government should adopt and implement the National Building Code	.357	.599
Political-c-Welfare and salaries of government employees should be improved to boost staff motivation and diligence		.593
Stakeholders-d-Experts in Industry and Academia should form strategic partnership to aid training, research and innovation	.498	.586
Stakeholders-f-Sincerity of all stakeholders is essential	.434	.578
Economic-b-Proper project funding by the client is paramount	.362	.577
Organisation-d-Professional bodies need to be restructured to make then more effectively in promoting ethics and professionalism	.407	.571
MicroEnvironment-a-Involvement of host community in monitoring physical development will improve development control		.565
Physical-a-Government should improve road infrastructure to make remote areas of Lagos accessible for development control	.436	.548

Organisation-e-Payment of professional fees by clients should be enforced by the professional bodies and government		.521
Political-d-Government needs to review its policy on the importation of building materials and finishes which lack local substitutes		.505
Legal-c-New and appropriate government legislation is necessary		.496
Institutional-f-All building professional specialisations must be represented in the government regulatory agencies	.396	.470
Legal-d-Quacks in the industry should be arrested and prosecuted		.467
Institutional-g-Establish a regulatory agency which is totally independent of government		.454
Organisation-b-Professional specialisation should be maintained and overlapping roles should be avoided to reduce rivalry		.331

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

APPENDIX H

