An Institutional Taxonomy of Adoption of Innovation in the Classic Professions

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Abstract

The study of technical innovation in Professional Services has attracted growing interest among scholars, who have sought to analyze the process of organizational change and service transformation. However, very little attention has been devoted to understanding the process of adoption and diffusion of technical innovation in professional sectors. In this paper, we suggest that the relevance and peculiarity of institutional dynamics at play in the professional sectors warrant a specific focus aimed at laying out how they affect adoption and diffusion of technical innovation.

In particular, we highlight that cultural-cognitive and normative pillars, embedded in the classic or regulated professions, may significantly insulate professionals from efficient-choice lenses and act as either drivers or barriers of adoption of technical innovations depending on the nature of the technology in question. Our proposed hypothesis is that institutional mechanisms act as drivers for the adoption of trajectorial innovations i.e. technologies that improve existing sets of practices and routines, and as barriers for paradigmatic innovations i.e. technologies that substantively alter existing practices and/or strip away certain tasks from the hands of professionals.

Finally, we illustrate the role that social norms play as transmission mechanism of cultural-cognitive and normative pressures.

1. Introduction

The study of innovation in professional services has seen rising attention among scholars, who have sought to analyze the process of organizational change and service innovation in professional services firms (Hinings at al., 1991; Dougherty 2004; Salter and Tether, 2006; Anand et al. 2007; Gardner et al., 2008; Smets et al., 2012; Barratt and Hinings, 2015). Such a growing interest is partly motivated by the wider societal benefits that innovation in services is expected to bring with it. For instance, much attention has been recently devoted to illustrating the impact that AI-enabling technologies in the medical and in the legal sectors will likely generate in terms of improved professional judgement and wider access to the public goods of healthcare and justice (Reddy et al, 2019; Susskind and Susskind, 2015).

In spite of such a growing interest on organizational change in professional services firms, very little attention has been devoted to understanding the process of adoption and diffusion of technical innovation in the professions. In fact, these aspects seem to have been deferred to more generalist studies on adoption and diffusion of technical innovation in organizations and sectors (e.g. Rogers, 2003). However, the relevance and peculiarity of *institutional dynamics* at play in the professional sectors warrant a more specific focus aimed at laying out how institutional elements affect adoption and diffusion of technical innovation (Scott, 2008; Nordenflycht, 2010).

Numerous studies have hitherto investigated the relevance of institutional elements in shaping organizations' decisions concerning the adoption and diffusion of innovation (e.g. Johnson, 1972; Ostlund, 1974; March and Olsen, 1976; March, 1978; Dosi, 1982; DiMaggio and Powell, 1983; Abrahamson, 1991; Kostova and Roth 2002; Geels, 2004; Alexander, 2012; Fuenfshilling and Truffer, 2014; Coccia, 2019a and 2020). At the same time, significant work has been devoted to laying out the specific institutional mechanisms at stake in the professional context (e.g. Meyer and Rowan, 1977; Larson, 1977; Abbott, 1983; Mannen and Barley, 1984; Torres, 1991; Friedson, 1994; Meyer, 1994; Anheier et al., 1995; Breiger, 1995; MacDonald, 1995; Burt, 1997; Knorr-Certina, 1999; Meyer and Jepperson, 2000; Scott, 1995, 2001, 2008; Faulconbridge and Muzio, 2009; Nordenflycht, 2010).

In particular, Di Maggio and Powell (1983) laid out a list of institutional mechanisms – coercive, mimetic and normative pressures – that allegedly shape organizations' decisions, especially in the professional sectors. Scott (2008) further expanded on how such mechanisms unfold by highlighting three main institutional pillars – regulative, normative and cultural-cognitive – which shape the 'rules of the game' in the professional domain. In this respect, a common theme in the study of the professions consists in highlighting the role of professionals as both authors and recipients of institutions (Scott, 2008). In these studies, professionals are often described as crafters of 'epistemic cultures' that 'create and warrant knowledge' (Scott, 2008, p. 224), and as individuals that identify with their own occupation and attach normative value to their role and contribution to society (Mannen and Barley, 1984). These aspects are taken to explain a distinctive connotation of professionals as partly unmotivated by profit or financial gains (Abbott, 1983), insofar as they are partly rewarded by non-monetary incentives related to their contribution to societal well-being by performing high knowledge-intensive tasks.

Building on Scott's institutional accounts of the professions, in particular of the 'classic' (or regulated) professions that comprise law, accounting, architecture and medicine (Nordenflycht, 2010), we illustrate how the cultural-cognitive and the normative pillars shape specific attitudes towards the adoption and diffusion of innovation that set the professional context apart from other industries and warrant prudence in employing efficient-choice lenses. In doing so, we focus on individuals (qua professionals) rather than on organizations or professional services firms. In fact, although we acknowledge the further layer of institutional complexity

that organizations and firms add to decisions about adopting innovation, we defend our approach on the grounds that decisions about adoption in professional services firms can, to a certain extent, be reducible to professionals' decisions. Such a consideration stems from the fact that, unlike other organizations, professional services firms are normally led by professionals who are themselves embedded in the institutional dynamics that shape the rule of the game in the professional domain (Nordenflycht, 2010).

Our motivation for examining the adoption and diffusion of innovation in the classic professions is two-fold. On the one hand, we wish to illustrate how individuals' values, beliefs and heuristics have key consequences at the organizational level and can retain explanatory power in accounting for how adoption and diffusion take place in the professional context (Nelson & Winter, 1982). On the other hand, recent data-driven technological advancements such as artificial intelligence (AI) are expected to bring significant disruption to long-established professional practices (Brooks et al., 2020; Xu and Wang, 2019; Agrawal et al., 2019). Although such technologies may yield benefits through increases in productivity, by means of improving professional judgments, and may facilitate wider access to crucial public goods (e.g. justice and healthcare), they are thought to replace certain tasks and processes that define individuals' work and, in so doing, "can also elide or exclude important human values, necessary improvisations, and irreducibly deliberative governance" (Pasquale, 2019, p.1). In light of these changes in the wider technological landscape and the implications for professionals, we examine how institutional mechanisms shape specific attitudes towards the adoption of innovation in the professional context.

In our analysis, we build on Dosi's (1982) distinction between technological paradigms and trajectories as a further explanatory framework. While Dosi analyzes paradigms and trajectories from the perspective of innovators, in an effort to disentangle the role that demand-pull and technology-push dynamics play in driving different kinds of innovation, we employ the distinction from an adopter's point of view, with the aim of highlighting how different kinds of innovation elicit different adopter responses. In this respect, we characterize trajectorial innovations as preserving already existing sets of practices and routines, while improving their efficiency, and as supporting the adopters in performing their tasks; whereas paradigmatic innovations are assumed to substantively alter practices and routines and strip away entirely certain tasks from the hands of the adopter.

We argue that the distinction between paradigms and trajectories can fruitfully inform the study of adoption and diffusion of innovation in the professional context. Our main hypothesis is that Scott's cultural-cognitive and normative mechanisms exert pressures, which, in turn, shape opposing attitudes, according to whether innovations are instances of paradigmatic or trajectorial shifts. In fact, we suggest that cultural-cognitive and normative mechanisms act as drivers of adoption and diffusion of trajectorial innovations, whereas they act as barriers in the context of paradigmatic shifts in technology. More specifically, we formulate the following hypotheses:

H1: *Professionals would form favorable attitudes toward innovations that preserve already established practices and routines whilst improving their efficiency.*

H2: *Professionals would form unfavorable attitudes towards innovations that substantively alter the set of already established practices, routines and heuristics, and that would require new skills in order to be deployed.*

H3: *Professionals would form unfavorable attitudes towards innovations that would displace or strip away from them highly knowledge-intensive tasks.*

We provide two rationales for our hypotheses which are grounded in two distinct, though related, institutional mechanisms: cultural-cognitive and normative pressures. First, technological paradigms give rise to practices and routines around which professionals develop their skills and heuristics. In particular, since professional tasks are embedded in practices shaped by technological capabilities, professionals define their expertise around tasks that are largely entrenched with technological paradigms. As a result, we argue that cultural-cognitive mechanisms, while generating positive attitudes towards innovations that are seen as competence-enhancing, by virtue of improving the efficiency of existing sets of practices and routines, shape negative attitudes towards innovations that are perceived as competence-destroying, by virtue of altering practices and routines around which professionals develop their heuristics and skills (Tushman & Anderson, 1986). In fact, the adoption of such innovations is a time-consuming process that may require rapid internalization of brand-new pieces of knowledge and radical changes in professionals' heuristics (Brynjolfsson and Hitt, 2000; Dosi and Nelson, 2010).

The second rationale, on the other hand, concerns normative mechanisms and is grounded in Mannen and Barley and Scott's characterization of professionals as individuals who strongly identify with their own occupation and who attribute normative value to it (Mannen and Barley, 1984; Scott, 2008). In particular, we describe professionals as intrinsically motivated to pursue realization beyond economic incentives (Deci & Ryan, 2010; Coccia, 2019b) and as constantly seeking recognition for their role in contributing to societal welfare by means of performing high knowledge-intensive tasks. In this respect, we hypothesize that normative mechanisms would shape negative attitudes towards paradigmatic innovations, such as AI-enhancing technologies, that would strip away high-knowledge intensive tasks from the hands of professionals or scale back the relevance of their professional judgment. In fact, professionals may see shifts in technological paradigms as ultimately threatening or trivializing their existing role.

Our hypotheses highlight that institutional mechanisms at stake in the professional context, while creating a fertile soil for the adoption of trajectorial innovations, are likely to generate a certain resistance to the adoption

of paradigmatic changes. In fact, cultural-cognitive and normative pressures may offset prospective efficiency gains attributed to technical innovations and undermine the process of adoption.

Furthermore, following Bicchieri (2006), we show that, for such resistance to emerge, it is not necessary that all professionals share a similar normative attachment toward professional values, ideals and roles. This is, we argue, because attitudes are often codified in social norms which shape empirical and normative expectations of professionals and 'invite' them to comply, regardless of their inner normative beliefs about the values of the profession, their contribution to societal well-being and the trade-offs linked to innovation. Even though some professionals may not share normative values and ideals that are attached to the profession, their behavior and decisions about courses of actions is largely shaped by normative expectations and informal sanctions underpinned by professional values. In this respect, we illustrate how social norms grounded in professional values, practices and routines may invite professionals to reject paradigmatic innovations in spite of idiosyncratic beliefs.

The remainder of the paper is organized as follows: in the first section, we outline the institutional lenses in analyzing the adoption and diffusion of innovation in the professional context by highlighting the peculiar characterization of the classic professions; in the second section, we explore the role that two main institutional mechanisms – Scott's cultural-cognitive and normative pillars – play in shaping attitudes toward the adoption of innovation in the classic professions; in the third section, we introduce the distinction between paradigmatic and trajectorial innovations from the standpoint of adopters and lay down our main hypothesis for the adoption and diffusion of innovation in the professional context; in the fourth section we illustrate how social norms could perpetuate resistance to the adoption of innovation in the face of mixed normative beliefs among professionals. Finally, we conclude by suggesting that the present work opens up an interesting path of empirical research aimed at verifying our hypotheses about the relevance that Scott's cultural-cognitive and normative pillars play in shaping professionals' attitudes toward paradigmatic innovations, and by highlighting the policy implications emerging from the present work.

2. Theoretical Background

2.1 Institutions in the Classic Professions

Most studies focusing on the adoption and diffusion of innovation, reviewed and integrated by Rogers (2003), have been developed under two broad and complementary perspectives. On the one hand, researchers have approached adoption from an efficient-choice approach. This suggests that decision-making procedures concerning adoption are modeled under assumptions of relative certainty about technological capabilities and organizational goals, and in the absence of institutional constraints that would limit the freedom and independence of organizations (March, 1978). Therefore, innovations are evaluated, and eventually adopted or rejected, according to their ability to bring about one's desired outcomes.

Other studies, on the other hand, have stressed the relevance of institutional factors as key determinants of organizations' decisions of adoption (e.g. Abrahamson, 1991). These studies frame decisions of adoption in conditions of relative uncertainty, and as constrained by formal and informal rules of conduct which are an integral part of their own institutional environment. In particular, in their work on institutional isomorphism, DiMaggio & Powell (1983) set the stage for the study of institutional determinants shaping organizations' decisions, identifying three main mechanisms - coercive, mimetic and normative pressures - that substantively affect organizations' decision-making procedures and heuristics, and which drive organizations towards converging to similar structures.

These two different approaches in framing decision-making procedures concerning adoption shape two distinct explanatory frameworks for the diffusion of innovations, which yield substantively different interpretations of why the diffusion or rejection of innovations takes place. In particular, as Kimberly (1981) and Rogers (1983) point out, the efficient-choice approach implicitly embeds a pro-innovation bias insofar as organizations facing choice scenarios concerning adoption are modeled as instrumentally rational and as operating independently from formal and informal institutional constraints, and in a context of relative certainty about technology and organizational goals. As such, they provide little scope for further investigations on whether diffused technologies are, indeed, efficient. If the assumptions hold empirical scrutiny, diffused technologies are by definition apt to pursue organizational goals (Abrahamson, 1991).[1]

Conversely, approaches embedding relaxed assumptions concerning certainty about technological capabilities and organizational goals (e.g. March & Olsen, 1976), and introducing institutional dynamics as key determinants in choice scenarios concerning adoption, leave room for such investigations. In fact, if technological capabilities and organizational goals are only partially known, and if organizations are subject to formal and informal pressures (e.g. regulatory frameworks, cultural dynamics), the diffusion or persistence of inefficient technologies may arise also as a result of instrumentally rational choices.[2] In this conceptual paper, we analytically explore the adoption and diffusion of innovation within the professions exclusively from an institutional standpoint. The main reason is the peculiar characterization of professionals, who 'more so than any other social category, the professions function as institutional agents — as definers, interpreters, and appliers of institutional elements' (Scott, 2008, p. 223).

As a first step, to clear away some ambiguities, we lay out a more specific account of the professions on which we focus in this paper. A useful taxonomy is offered by Torres (1991) and later refined by Nordenflycht (2010),

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[1] Inefficient technologies may persist or be adopted and diffused only in cases of collective action problems.
[2] For instance, organizations may be unable to fully assess technological capabilities and adopt technologies that are ultimately inefficient with respect to pursuing organizational goals, and mimetic mechanisms may drive diffusion of such technologies despite their inefficiency. Alternatively, lack of certainty with respect to organizational goals may lead to adoption and diffusion of technologies that are unsuited to help pursuing organizational aims that become clear at a later stage.

who extends Torres' classification to Professional Services Firms. Specifically, Torres proposes four main explanatory variables in order to analyze the professions: knowledge base, regulation and control, ideology, and association. Knowledge base refers the knowledge-intensive character of the professions, which highlights that professional outputs largely depend upon a body of complex knowledge that is possessed by individuals and is partly embedded in organizational routines (Morris & Empson, 1998; Starbuck, 1992). Regulation and control, on the other hand, capture professions' monopoly over the use of their knowledge base; in particular, professions can regulate the use of professional knowledge more or less autonomously in order to exclude non-professionals or to limit competition among them. Ideology refers to the presence of values, beliefs, formal professional codes of ethics, and informal institutions (e.g. norms and conventions) that prescribe certain behaviors.[3] Finally, Torres emphasizes that professionals are often part of a central professional association that, through educational institutions, codes, norms, and licensing, facilitates the first three features.[4]

Torres' taxonomy is not merely meant to help us distinguish professional services from other sectors, but also to capture differences within the professional spectrum. In fact, Nordenflycht (2010) notices that, although knowledge-intensity is common to all professional occupations (i.e., tech developers, consulting, advertising, health-related professions, law, accounting and architecture), self-regulation and ideology are specific features of a sub-set of the professions, that is the classic (or regulated) professions, i.e. law, accounting, medicine and architecture.[5] Compared to other professional contexts, the classic professions exhibit a larger control over their knowledge base through the use of self-regulation which 'mutes competition' from two different sources: first, by means of exerting control over certifications, the professions create barriers in order to access the occupation; second, by ruling out a range of commercially competitive behaviors, they soften unfettered competition among professionals (Nordenflycht, 2010, p. 164).

Similarly, and unlike other professional contexts, the classic professions are pervaded by an intricate ensemble of values, beliefs, codes of ethics, conventions and norms surrounding professionals' behavior. Scott (1995, 2001 and 2008) has categorized these 'ideology' elements as falling under two main institutional pillars, namely the cultural-cognitive and the normative, which, in turn, shape the regulative aspects. The cultural-cognitive elements refer to professionals' shared lenses in interpreting the world. Here, Scott emphasizes that similar educational paths, shared practices, and common routines lead to the homogenization of professionals' skills and heuristics which, in turn, create a shared perspective in analyzing work-related problems and in seeking solutions within a profession.

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[3] On the self-regulative feature of the professions see also Scott (2008); on how such a feature is often used as a means to mute competition, see Cox, DeSerpa, & Canby (1982), Morrison & Wilhelm (2004), Gross & Kieser (2006).
[4] Nordenflycht (2010) rightly points out that association merely captures how professional knowledge, self-regulation and ideology are enhanced, and as such, does not constitute a characterizing feature.
[5] Nordenflycht (2010), p. 166.

The normative pillar, on the other hand, refers to values, beliefs and resulting norms and codes of ethics that govern professionals' conducts. These elements, Scott (2008) notices, are mutually reinforced with the cultural-cognitive pillar, but mostly emerge from homogenous educational paths and network effects within a profession (DiMaggio & Powell, 1983). In fact, the classic professions posit strict formal requirements on educational paths that individuals have to undertake in order to obtain professional qualifications. Importantly, such paths are riddled with normative ideals concerning what is entailed by being a member of a professional sector, which scopes professionals ought to pursue, which moral duties they have to fulfill and how a profession contributes to societal well-being.[6]

Moreover, such values, ideals and beliefs, along with the high knowledge-intensive character of professional tasks, can be regarded as partly shaping the attractiveness of a profession. There is an argument to be made that individuals who pursue careers in the classic professions are partly rewarded by intangible incentives stemming from the normative pillar. In particular, values, ideals and resulting formal and informal ethical codes of conduct, along with the highly skilled character of a profession, shape the higher social status that is normally attached to it, which partly motivates individuals to become professionals and progress in their careers (Abbott, 1983; Mannen and Barley, 1984; Deci & Ryan, 2010). In other words, individuals who undertake professional paths are only marginally sensitive to economic incentives in the context of their occupation. Rather, they seek rewards that are entrenched with values and ideals attached to their profession.

Therefore, we argue that the ubiquity of cultural-cognitive and normative elements in context of the classic professions strongly warrant an institutional approach in analyzing adoption and diffusion of innovation. In fact, these two pillars seem to substantively insulate professionals' behavior and decisions from narrow efficiency calculations, including decisions about adoption of innovation. Furthermore, they equip individuals with a peculiar perspective through which they analyze and evaluate their practices, routines, and role as professionals, which calls for institutional lenses in making sense of their conducts and decisions.

2.2 Adoption of Innovation in the Classic Professions and the Institutional Pillars

In the rest of the paper we narrow down the scope of our investigation to the classic (or regulated) professions in an effort to disentangle the role that institutional forces play in the process of adoption and diffusion of innovation. In this respect, an appropriate starting point is to spell out in more details how Scott's ideology elements could insulate professionals' evaluation of innovations from the efficient choice approach.

We therefore start by looking at the cultural-cognitive pillar, which Scott describes as ultimately shaped by the bundle of practices, routines and resulting heuristics that are established in a particular professional sector. The

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[6] For instance, in their educational path, medical professionals learn about the underlying values and ideals of the profession which are codified in the 'Hippocratic Oath'.

cultural-cognitive element, thus, covers 'descriptive' aspects. It highlights that, in the context of their occupation, professionals develop common practices, routines and heuristics in performing their tasks. Although such practices may be initially adopted for the sake of efficiency gains, their persistence goes beyond efficiency calculations. Practices and routines define professionals' knowledge base and skill set and equip them with fixed and stable ways to interpret problems and seek for solutions. Consequently, professionals may become more or less consciously attached to these practices, as they ultimately shape their professional expertise and set them apart from non-professionals.

For instance, imagine Betty, a lawyer operating in the field of human rights, develops or adopts a sophisticated model for predicting European Court of Human Rights' decisions. The model, let us assume, works by categorizing different elements of the cases (e.g. textual evidence from the Convention and ECHR's admissibility criteria, applicant's memorandum, evidence presented before the court, etc.) under three main labels: win, uncertain, lose. As a result of the categorization procedure, Betty is able to tell, with a certain confidence, which outcome is more likely. Betty, thus, develops a set of skills that help refine her method for categorizing elements under each label, up to the point where she forms simple heuristics that allow her to perform such a knowledge-intensive task almost effortlessly. Her acquaintance with the model represents, in itself, a skill she has formed in due process, which defines her expertise. In this respect, if Betty is offered to adopt a radically different predictive model, she would have to acquire a different set of skills that would define a new expertise: she would have to form acquaintance with the new model, its main elements, labels, and develop new heuristics to perform the categorization task effortlessly. Moreover, if the model has proven successful in the past, Betty has prima facie instrumental reasons to stick with it until a relevant set of circumstances change. In fact, unless presented with overwhelming evidence of the superior predictive power of the new model, she would have no reasons to explore new practices and routines that would require a whole new set of skills.

Therefore, in this example, cultural-cognitive elements more or less explicitly shape Betty's positive attitudes toward the model she has already adopted. On the one hand, Betty worries about abandoning practices and routines that proved helpful in performing certain professional tasks. On the other, she is reluctant to give up on practices and routines around which she has shaped her skill set and that define her expertise. Importantly, in some regards, when a new model starts to be adopted, Betty ceases to be a professional, in that she loses her professional expertise.

Furthermore, cultural-cognitive elements such as practices and routines, by virtue of being shared by most professionals belonging to a certain sector, and by virtue of similar educational paths, network effects and mimetic mechanisms (DiMaggio & Powell, 1983), define a shared grammar which facilitates coordination and cooperation. Similar practices and routines lead, in fact, to homogeneous sets of skills across professionals,

and foster their ability to communicate in ways that are perfectly intelligible to one another. As such, the adoption of innovation may come at the cost of undermining coordination and cooperation within a profession.

For instance, early adopters of 3D-echocardiography among cardiologists formed new skills in diagnosing cardiopathies which were based around the new imaging tool. Despite the fact that 3D echocardiography significantly reduced false-positives and false-negatives in diagnosing certain pathologies, it came at the cost of undermining cooperation among cardiologists with different expertise. This saw cardiologists whose sets of skills were formed around 2D-echocardiography initially struggle to interpret new images and offer their professional opinion. [7]

Therefore, cultural-cognitive elements, in some regards, insulate decision-making procedures about the adoption of innovation from strict efficiency calculations and as a result warrant a certain prudence in analyzing adoption from an efficient-choice approach. Indeed, professionals are not merely bound by a degree of uncertainty surrounding the efficacy of new practices and routines, but also form positive attitudes towards current sets of routines insofar as they have developed their skill set and professional expertise around them.

At the same time, professionals may understandably value the coordinating influence that similar practices and routines exert within a sector. This means that choices about the adoption of innovation are also influenced by the fact that new practices and routines, which require new skill sets, may undermine cooperation within a profession. In other words, choices about adoption of innovation cannot be taken individually and independently by professionals, as they pose coordination problems within professional services firms and/or within a profession. Finally, cultural-cognitive elements, seldom remain confined to an informal level. Professionals' practices and routines often end up by being codified in regulatory frameworks that formally constrain professionals' choices about adopting innovation (DiMaggio & Powell 1983), thus further undermining the appropriateness of an efficient-choice approach in analyzing the adoption of innovation in the classic professions.

Normative mechanisms, on the other hand, capture a distinct set of aspects underpinned by professionals' normative attitudes. Specifically, through educational paths and network effects, professionals internalize values, ideals and beliefs, or live in institutional environments permeated by norms emerging from such values (Pasquale, 2019), which are often also codified in formal regulatory frameworks, that further insulate behaviors and decisions from a straight-forward efficient-choice approach. Such normative elements are constitutive parts of the professional context as they shape, even at the very outset, an individual's choice of becoming a professional. Following Abbott (1983) and Mannen and Barley (1984), we have suggested that the choice of becoming a professional is partly influenced by intangible elements such as belonging to a category of highly

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[7] Lang et al (2009) analyze coordination problems resulting from adoption of 3D-echocardiography in asking whether such technologies should be implemented in clinical routines.

skilled workers, performing high knowledge-intensive tasks, obtaining recognition for pursuing higher or noble scopes, contributing to societal well-being, and acting in accordance with values and ideals that attach a certain social status to the profession (Table 1 below summarizes the main aspects of the cultural-cognitive and normative pillars). Therefore, in some regards, professionals tend to be only partly responsive to economic incentives in that they also seek for higher forms of rewards.

Table 1. Institutional Pillars in the Classic Professions

Institutional Pillars in the Classic Professions	Description	Example
Cultural-Cognitive Pillar	Describes professional practices and routines over which professionals build their heuristics, skills and expertise.	Professionals' expertise is partly built on practices and routines shaped by a technological paradigm. Cardiologists, for instance, build their expertise on devices such as ECG, CMRI, etc.
Normative Pillar	Includes individuals' normative beliefs on the worth of their professions, formed through common educational paths, codes of conduct, and network effects.	Professionals are motivated by intangible rewards such belonging to a category of highly skilled individuals pursuing noble scopes. Lawyers, for instance, attribute normative value to legal reasoning and the pursuit of justice.

As a corollary, decision-making procedures about adopting innovations are also constrained by normative elements that insulate professionals from an efficient-choice approach. Here, we wish to highlight two main constraining effects: first, and as suggested by Rogers (1983), values and ideals surrounding the professional context generate restrictive *compatibility criteria* for innovations that can be adopted (i.e. innovations that are perceived to not meet the standards posited by normative ideals and values surrounding a particular profession); second, and less intuitively, professionals' sensitivity towards intangible elements can undermine the adoption of innovations that displace them from performing high knowledge-intensive tasks and threatens their privileged status as repositories of knowledge and skills aimed at interpreting work-related problems and finding solutions.

As an instance of the former constraining effect, we may refer to adoption of technologies that could potentially compromise the fiduciary duty between professionals and clients. For example, codes of ethics in the classic professions stress the relevance of the fiduciary duty of confidentiality that professionals owe to their clients.

Such a normative element may raise the bar for adopting cloud-based technologies that could potentially expose clients' private information to security breaches.[8] In fact, formal or informal codes of ethics may call for further layers of protections or for safer encryption's mechanisms. Although these restrictions may be interpreted as emerging strictly from efficiency calculations, they are often the expression of values and ideals that bring professionals to overemphasize the normative relevance of compliance with the fiduciary duty of confidentiality, in spite of potential gains that might arise from employing cheaper and less secure technologies.[9]

As an instance of the latter constraining effect, we may aptly refer to the adoption of AI technologies that could potentially displace professionals from some of their tasks or require costly re-skilling processes in order to perform radically new tasks (see Table 2 below which provides some examples of how AI-based technologies impact practices and routines in the classic professions).

Table 2. Examples of innovations and their impact on the Classic Professions

Classic profession	Examples of disruptive innovations	Impact on existing practices/routines
Law	*Document Assembly*: automates the creation of documents from templates, enabling the drafting of documents such as legal contracts in a fraction of the time required through labour-intensive work	Significantly reduces or altogether eliminates traditionally labour-intensive tasks involving human lawyers.
	Legal Research / Document Review: Helps to form a case strategy based on previous outcomes in similar cases	Significantly reduces the need for labour-intensive work, disrupting traditional business models based on billable hours. Reduces the need for knowledge-intensive professional work.
	e-discovery: uses natural language processing and machine learning to identify, collect, and produce electronic information to assist with a law suit or investigation	Reduces knowledge-intensive professional work normally required in reviews carried out by human lawyers.
	Automated contract review: AI-enabled technology that enables	Reduces knowledge-intensive professional

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[8] See, for instance, Brooks et al. (2020) in which the authors highlight a significant reluctance among legal professionals to use the cloud due to fears of data breaches and ensuing reputational damage. The lack of use of such infrastructural technology, which is critical for the use of other advanced data-driven technologies, further stymies the adoption of other innovations, especially those enabled by AI.
[9] See, for instance, Carpanelli & Lazzerini (2019) on the use and misuse of technology in the legal sector.

	contract remediation by identifying relevant clauses and assessing for fairness and risk.	work normally required in contract reviews carried out by human lawyers.
Accounting	*Robotic Process Automation (RPA)*: automates a range of labour-intensive tasks involved in areas such as audit and tax work	Replaces the accountant in many traditional tasks requiring human expertise, such as bookkeeping and reporting. Requires re-skilling and may lead to deskilling in the longer-term.
	AI-enabled auditing: systems that analyse 100% of the dataset of audited companies, as opposed to random samples, without requiring human input	Reduces knowledge-intensive professional work and the importance of professional judgment in auditing.
	Chatbots: Resolve common queries from users such as when bills are due, latest account balance, and status on accounts	Reduces client interaction, automates traditional practices, and reduces billable hours.
Medicine	*AI-assisted medical imaging*: enables automatic recognition of complex medical imaging data patterns and provides analysis of radiographic characteristics*	Requires upskilling, reduces the knowledge intensity of related medical tasks, and scales back the relevance of professional judgment. Deep learning algorithms may even replace the need for trained radiologists in certain key tasks.
	Remote patient monitoring (RPM): enables the remote monitoring of patients digitally through data collected from an array of wearable and other devices and smartphone applications	Reduces or eliminates in-person patient consultation and monitoring and raises questions with regard to patient privacy and confidentiality as data is being collected and transmitted digitally.
	Decision support system: generates a list of potential diagnoses based on a given set of symptoms	Reduces the knowledge intensity of diagnosis tasks, scaling back the relevance of professional judgment.
	Robotic surgical system: enables precision surgery through robotic arms	Requires medical professionals to upskill and obtain certification in order to operate the robotic system.

Architecture	*Automated floor plan generation system*: employs parametric architecture to generate an array of floorplan designs that customers can choose from	Reduces the knowledge intensity of architectural design work and replaces tasks traditionally carried out by architects. May negatively impact demand for human creativity and lead to deskilling.
	AI-assisted site analysis systems: analyse job sites, performs network analysis, and identify potential risks and hazards	Reduces or completely eliminates tasks traditionally carried out by architects.
	Generative design tools: generate possible design scenarios for urban planning based on a set of inputs such as geographic space, regulatory aspects, weather patterns, etc.	Reduces the knowledge intensity of architectural work and reduces or eliminates certain tasks carried out in, for example, traditional neighborhood planning. Architects play a more marginal role in planning, which may lead to deskilling.

For instance, imagine Betty, a neuro-radiologist, is offered to adopt a new device whose machine-learning algorithm allows for punctual diagnosis of pituitary adenoma. Such a high knowledge-intensive task is normally left in the hand of radiologists, whose professional judgement represents the one and only resort for complex diagnosis. In some regards, indeed, medical professionals undertake their career path partly because they feel rewarded from performing highly knowledge-intensive tasks, for the recognition they receive for contributing to societal well-being through their professional judgement.

Surely, Betty can retain her ability to exercise her professional judgement overruling the result of the diagnostic device; and she could also profit by adopting it, insofar as it would allow her to double the amount of diagnoses she performs. Yet, we may reasonably suppose that she experiences a sense of displacement in imagining that her professional judgement is ultimately less needed. In fact, if she values her profession partly on the basis of intangible incentives such as her ability to contribute to societal well-being through performing high knowledge-intensive activities, one of her main motives for embarking into her professional path ceases to exist. Moreover, the widespread adoption of AI devices in diagnostic could potentially demand a re-skilling process for radiologists, who, for instance, would need to specialize in training AI devices as opposed to refining and exercising their professional judgement. In this respect, the adoption of AI technology would substantively change the nature of Betty's work toward directions she cannot predict at the outset, and that she may not like.[10]

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[10] Recent literature points to similar developments in legal services, where AI-enabled technologies that significantly speed up traditionally labor-intensive functions are expected to transform how the business of law is carried out (Brooks

Another constraining effect which stems from normative elements over the adoption of innovations concerns changes of social structures (Barley, 1990; Anheier et al., 1995; Breiger, 1995). In particular, technical change affects social relationships within a firm or profession by virtue of creating new interdependencies across different roles. Specifically, Barley documents how the introduction of technologies in medical imaging has levelled social relations between radiologists and technicians by virtue of generating a dependence of radiologists' work on the skills of technicians, thus partly threatening the privileged social status of the former. In this respect, professionals who strive to maintain their social status in their relationships with colleagues may form negative attitudes toward innovations that would potentially undermine their independence in performing work-related tasks.

The normative pillar, thus, seems to equip professionals with lenses and perspectives that could substantively affect decisions about adoption of innovation. Such lenses go beyond mere efficiency calculations insofar as professionals are not merely moved by economic incentives, but rather seek for intangible and higher rewards that are can potentially be displaced by the adoption and diffusion of innovation. Consequently, the classic professions call for an institutional approach in analyzing the determinants of technological change, as efficient-choice approaches would miss out on relevant elements that affect professionals' decision-making procedures.

3. Theoretical Framework
3.1 An Institutional Taxonomy of Adoption of Innovation

In the previous section, we have highlighted how institutional mechanisms, falling under Scott's cultural-cognitive and normative pillars, may insulate decisions about the adoption of innovation from efficiency calculations and warrant institutional lenses in making sense of how such decisions take place. In this respect, while the efficient-choice approach seems to embed a pro-innovation bias in analyzing diffusion (Downs and Mohr, 1976; Kimberly, 1981; Rogers, 1962, 1983; Rogers and Schoemaker, 1971; Van de Ven, 1986; Zaltman et al., 1973), the institutional approach seems to portrait the opposite scenario. In particular, when agents' decisions about adoption are modeled as autonomous, under assumptions of perfect rationality, and as taking place in a context of certainty about technological capabilities, effective innovations are naturally adopted and sets of practices and routines are constantly being updated.

When, on the other hand, we employ institutional lenses in analyzing adoption, and factor in the cultural-cognitive and normative pillars, agents are modeled as constrained by a wide variety of aspects that shape a

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et al., 2020) as well as what it means to be a lawyer (Susskind and Susskind, 2015). Although the short-term impact may only marginally affect the legal profession, AI "may provide impetus for a complete overhaul in the way legal services are provided" (Alarie et al., 2018, pp.123).

certain reluctance to change. In some sense, the institutional approach seems to embed an anti-innovation bias, as it paints a state of affairs in which existing practices and routines are likely to be sub-optimal. In this section, we wish to problematize such an overly simplistic take in an effort to disentangle the role that the cultural-cognitive and the normative pillars play in affecting decisions about the adoption of innovation according to the nature of innovation. A good starting point is offered by Dosi's work on technical trajectories and paradigms.

Building on Kuhn's (1962) account of scientific paradigms, Dosi (1982) characterizes technical progress as moving along two broad directions: paradigms and trajectories. Dosi's approach, we suggest, combines two main elements: an epistemological and an institutional aspect. In particular, Dosi defines technology as a 'set of pieces of knowledge, both directly "practical" (related to concrete problems and devices) and "theoretical" (but practically, applicable although not necessarily already applied), know-how, methods, procedures, experience of successes and failures and also, of course, physical devices and equipment' (Dosi, 1982, p. 151) on the one hand; and as consisting of 'particular expertise, experience of past attempts and past technological solutions, together with the knowledge and the achievements of the "state of the art" […which] includes the "perception" of a limited set of possible technological alternatives and of notional future developments' on the other hand (Dosi, 1982, p. 152).

Both the epistemological aspects and the 'perceptual' element on the limited set of technological alternatives shape the distinction between paradigms and trajectories. Specifically, a technological paradigm is characterized as a 'model and pattern of solution of *selected* technological problems, based on *selected* principles derived from natural sciences and on *selected* material technologies' (Dosi, 1982, p. 152, emphasis in original). The idea of selected technological problems, principles and material technologies highlights that paradigms are constituted by pieces of knowledge which exhibit an exclusion effect. In particular, paradigms shape the direction of technical progress by means of selecting problems and the lenses through which problems are to be solved and embody 'strong prescriptions on the *directions* of technical change to pursue and to neglect' (Dosi, 1982, p. 152, emphasis in original). Conversely, technological trajectories are defined as patterns of problem solving within a technological paradigm. Essentially, trajectorial changes in technology do not select problems or pieces of knowledge, but rather generate incremental changes in our ability to solve already selected problems in a context of already selected pieces of knowledge.

Dosi's distinction between paradigms and trajectories is meant to show that both technology-push and demand-pull theories of innovation are not sophisticated enough to account for the nature of technical change. In particular, demand-pull accounts fail to appreciate that shifts in technological paradigms can hardly be driven by market-mechanisms, as prices are unable to signal the demand for yet unknown pieces of knowledge and technological problems, while technology-push approaches underestimate the ability of market mechanisms

to perform well within technological trajectories, as prices can meaningfully drive incremental innovation within a paradigm.

In this paper, however, we use Dosi's distinction between paradigms and trajectories from the perspective of the adopter. In particular, we define trajectorial innovations as embedding incremental changes in the adopter's ability to solve already selected problems by means of improving already existing practices, routines and heuristics, in a context of already internalized pieces of knowledge. Paradigmatic innovations, on the other hand, are characterized as innovations that substantively alter existing practices, routines and heuristics and that offer better solutions to both already selected and newly identified problems, and that require new pieces of knowledge in order to be successfully deployed.

When analyzed from the perspective of the adopter, paradigmatic and trajectorial innovations may embed opposite connotations which reflect Tushman & Anderson's distinction between *competence-destroying* and *competence-enhancing* (Tushman & Anderson, 1986). In particular, while trajectorial changes improve existing sets of practices and routines, without rendering 'obsolete skills required to master the old technologies' (Tushman & Anderson, 1986, p. 442), paradigmatic shifts generate discontinuities in the process of making a certain product or delivering a certain service which may hinder the relevance of previously acquired knowledge. Dosi and Tushman & Anderson's distinctions exhibit a particularly relevant explanatory power in analyzing the adoption of innovations in the professional context. Specifically, we suggest that the pervasive role of cultural-cognitive and normative elements elicit different attitudes towards the adoption of trajectorial and paradigmatic innovations precisely on the ground of their diverse connotation as respectively competence-enhancing and competence-destroying (see Figure 1).
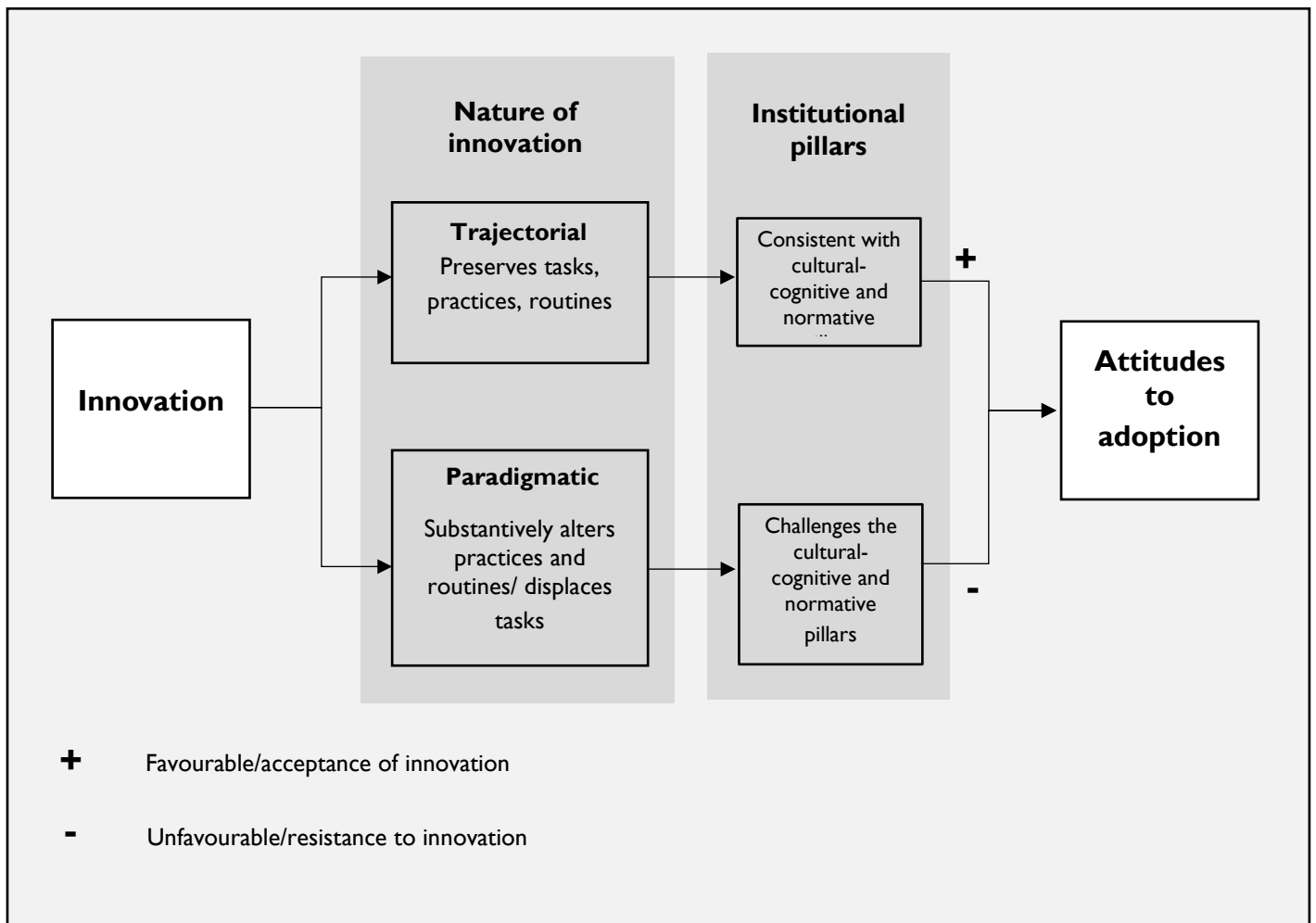
Nature of innovation

Institutional pillars

Innovation

Trajectorial
Preserves tasks, practices, routines

Consistent with cultural-cognitive and normative ..

+

Attitudes to adoption

Paradigmatic
Substantively alters practices and routines/ displaces tasks

Challenges the cultural-cognitive and normative pillars

-

+ Favourable/acceptance of innovation

- Unfavourable/resistance to innovation

Figure 1. A model of adoption of innovations in the Classic Professions

Let us turn back to our hypotheses in order to spell out our contributions. First, (H1) suggests that cultural-cognitive and normative pillars would shape the emergence of favorable attitudes towards trajectorial innovations. The rationale underpinning this hypothesis consists in that such innovations improve the adopter's ability to solve already selected problems (competence-enhancing) without substantively altering existing sets of practices, routines and heuristics around which professionals have built their own skills, and without requiring the rapid internalization of new pieces of knowledge. In this respect, cultural-cognitive elements should not constitute a barrier towards the adoption of trajectorial innovations, as incremental changes do not undermine professional skills nor require costly re-skilling processes on the part of professionals. In fact, such innovations empower the adopters in their problem-solving activity by means of improving their practices and routines.[11] In a similar vein, normative pressures should not constitute a barrier towards the adoption of trajectorial innovations. In fact, by assumption, incremental innovations in professional practices and routines do not entail stripping away high knowledge-intensive tasks from the hands of professionals who attach normative value to them, nor they alter the structure of social relationship by means of creating new

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[11] The cultural-cognitive pillar may thus also act as a driver of trajectorial innovation as suggested by Coccia (2017).

interdependencies across professional roles. Trajectorial innovations, indeed, are characterized as merely improving practices and routines without displacing tasks from professionals or redistributing them across different roles.

Second, (H2) and (H3) respectively suggest that cultural cognitive and normative pillars would shape the emergence of unfavorable attitudes towards paradigmatic innovations. Specifically, the rationale underpinning (H2) consists in that paradigmatic innovations are set to substantively alter already established sets of practices and routines around which professionals have built their own expertise and heuristics. In this respect, radical innovations would bring with them the burden of costly re-skilling processes and internalization of pieces of knowledge which are new to professionals. Therefore, cultural-cognitive pressures are likely to elicit a certain reluctance towards the adoption of paradigmatic innovations. (H3), on the other hand, suggests that paradigmatic innovations, by means of displacing tasks from the hand of professionals, or by redistributing tasks across different and new roles, would undermine intangible incentives which partly reward professionals. In fact, we have characterized professionals as individuals who attach normative value to their contribution to societal welfare, by means performing high knowledge-intensive tasks, and who enjoy the privileged social status that comes with their peculiar role. In this respect, paradigmatic innovations may be perceived as threatening values and normative beliefs about the relevance of professional roles which shape crucial incentives for professionals. Hence, normative pressures may elicit unfavorable attitudes towards the adoption of paradigmatic innovations and undermine their diffusion.

3. 2 Social Norms as a Transmission Mechanism of Cultural-Cognitive and Normative Pillars

In this final section, we briefly outline a response to one plausible objection to our explanatory account. In particular, one may plausibly claim that cultural-cognitive and normative elements can hardly be shared by all members of a certain profession. As such, professionals who do not attach normative relevance to contributing to societal well-being through performing high-knowledge intensive tasks, or that would welcome paradigmatic innovations and the re-skilling processes they bring with them, would act as early adopters and pave the way for a substantive change in the classic professions. In this respect, although our account of professionals' attitudes towards adoption of innovation may be broadly correct, one may suggest that cultural-cognitive and normative elements at stake in the professional context cannot undermine the adoption of paradigmatic innovations but can, at most, slow down the process of diffusion.

Such an objection has important merits in that it highlights that similar educational paths and network effects in the professionalized workforce may not achieve perfect homogeneity in a given profession (Beckert, 2010). In fact, some professionals may exhibit idiosyncratic sets of attitudes and values which clash with prevailing cultural-cognitive and normative elements in a given profession. These individuals, one may plausibly claim, can overcome the reluctance to change and constitute the main drivers of paradigmatic innovations. This

particular objection would suggest that we may be better off in analyzing innovation in the professions with efficient choice lenses given that cultural-cognitive and normative elements cannot prevent idiosyncratic professionals from pursuing the adoption of efficient technologies that would force other professionals to adapt. However, this objection assumes that a professional's conducts and decisions are merely the expression of their set of values, preferences and goals and are not affected by other people's normative attitudes or by beliefs over other people's normative attitudes. Specifically, such an objection ignores the relevant role that social norms play in making people converge on undertaking courses of actions they otherwise would not pick.

The study of norms is not new in the literature on the adoption and diffusion of innovation, having been introduced primarily by Ajzen and Fishbein's large body of work on the Theory of Planned Behavior and Reasoned Action Approach which emphasize the role of *subjective norms* in affecting individual decision-making procedures (see Fishbein, 1968; Ajzen & Fishbein, 1980; Ajzen, 1991; Fishbein & Ajzen, 2010). In particular, the concept of subjective norms highlights that people's perception of other people's attitudes toward a certain behavior plays a crucial role in shaping one's intention to perform it and this includes beliefs over the opportunity to adopt a certain technology (e.g. Liker & Sindi, 1997; Teo & Pok, 2003; Wei et al. 2011). A more refined and analytic account of norms, which also stresses the relevance of individuals' expectations, has been recently offered by Bicchieri (2005) and defines a social norm as follows:

> Let R be a behavioral rule for situations of type S, where S can be represented as a mixed-motive game. We say that R is a social norm in a population P if there exists a sufficiently large subset $P_{cf} \subset P$ such that, for each individual $i \in P_{cf}$:
> Contingency: i knows that a rule R exists and applies to situations of type S;
> Conditional preference: i prefers to conform to R in situations of type S on the condition that:
> (a) Empirical expectations: i believes that a sufficiently large subset of P conforms to R in situations of type S;
> and either
> (b) Normative expectations: i believes that a sufficiently large subset of P expects i to conform to R in situations of type S; or
> (b') Normative expectations with sanctions: i believes that a sufficiently large subset of P expects I to conform to R in situations of type S, prefers i to conform, and may sanction behavior.
> A social norm R is followed by population P if there exists a sufficiently large subset $P_f \subset P_{cf}$ such that, for each individual $i \in P_f$, conditions 2(a) and either 2(b) or 2(b') are met for i and, as a result, i prefers to conform to R in situations of type S (Bicchieri 2005, p.11).

Bicchieri's account suggests that social norms are ultimately sustained by two kinds of individuals' expectations. First, through observation of regularities, individuals form empirical expectations (i.e. beliefs over the fact that other members of a certain population P will conform to R in situation S); second, through their interactions with others, individuals form normative expectations (i.e. beliefs about other people's beliefs on whether to conform to R in situation S). Empirical and normative expectations, with associated informal sanctions, invite convergence on a certain rule even when individuals lack inner reasons to conform to it. In fact, conditional preferences for coordination, along with the cost of sanctions associated with deviation from the norm, alter the payoffs' structure of the choice scenario and invite convergence.

For instance, suppose that Betty is keen on buying the new diagnostic device that allows her to diagnose the pituitary adenoma. She is not moved by intangible rewards such as being recognized for her contribution to societal well-being but rather wants to contribute to societal well-being, even in spite of the potential displacement of her professional judgement. However, she observers that other colleagues choose not to adopt. Moreover, by speaking with some of them, she notices a certain widespread hostility towards the new technology and comes to fear informal sanctions if she chooses to adopt. As a result, let us assume, she chooses to coordinate with her colleagues. Therefore, although Betty exhibits idiosyncratic preferences that clash with the prevailing values among her colleagues, the expectation of informal sanctions make her refrain from pursuing her favorite course of action (i.e. adopting the new diagnostic tools). As such, she evaluates the cost of informal sanctions as larger than the benefits of adopting the new technology.

Social norms, in other words, transform mixed motive non-cooperative games into coordination games, by virtue of increasing the costs for pursuing courses of action that deviate from the norm. In particular, informal sanctions, or the expectation of such sanctions, make prospective deviants reconsider their best response to other people's strategies, in the face of cost associated with such sanctions. In this respect, professionals who exhibit idiosyncratic values or preferences may still be unable to drive the adoption and diffusion of paradigmatic innovations if they belong to a professional sector in which the cultural-cognitive and the normative pillars are pervasive, and in which the cost of deviation from professional norms is perceived as excessively large. Social norms in this instance would drive conformity with other people's behavior even in the face of tangible personal gains.

4. Conclusions

In this paper we examined how institutional mechanisms shape specific attitudes towards the adoption and diffusion of innovation in the classic professions. Specifically, we looked at how these institutional mechanisms set the professional context apart from other industries and warrant prudence in employing efficient-choice lenses. In doing so, our paper makes three main contributions to the literature. First, we have shown that the classic professions call for institutional lenses in analyzing the process of adoption and

diffusion. In particular, following Scott (2008), we highlighted how the cultural-cognitive and the normative pillars insulate professionals from efficient-choice approaches in evaluating innovations. Second, we have proposed a set of hypotheses about adoption of innovation in the professions that turn, on the one hand, on professionals' attitudes shaped by cultural-cognitive and normative elements, and, on the other, on the nature of innovation according to Dosi's distinction between technical paradigms and trajectories. Here, we have proposed that institutional mechanisms would bring professionals to become drivers of adoption and diffusion of trajectorial innovations, but also generate an incentive to reject paradigmatic innovations. Third, we have shown that the rejection of paradigmatic innovations can take place even in a context in which some professionals do not share the values and preferences underpinned by the normative pillar. In fact, social norms can make idiosyncratic professionals converge on dominant courses of actions, through informal sanctions.

While our paper makes key contributions to the debate on the adoption of innovation in the classic professions, we also acknowledge a number of limitations to our theoretical framework. First, decisions about adoption cannot be explained merely by reference to institutional pillars as efficient-choice lenses retain important explanatory power even in contexts that are pervaded by cultural-cognitive and normative elements. In this respect, our work calls for further explorations on how institutional pillars and financial incentives interact in shaping professionals' attitudes towards adoption of innovation. Second, in contexts of technological uncertainty (e.g. lack of technological maturity of a paradigmatic innovation), risk attitudes may better predict adoption decisions than professional attitudes (e.g. the lack of technological maturity surrounding AI tools specific to the classic professions may shape risk averse attitudes toward adoption that may possess crucial explanatory power). Third, the professional contexts seem to progressively move towards a process of de-institutionalization, which may undermine the relevance of institutional lenses in analyzing the process of adoption of innovation. For example, the entrants of new corporate players in the classic professions (e.g. Amazon Law), along with the emergence of entrepreneurial professional services firms (Reihlen & Werr, 2015), may shape a progressive change in the nature of professionals' connotation, hindering sets of values and norms that have characterized the classic professions thus far.

Notwithstanding the aforementioned limitations, we argue that the present work may open up a stimulating path of empirical research aimed at analyzing the role of institutional mechanisms in processes of adoption and diffusion of innovation in the classic professions. In particular, more specific analyses on the different relevance that normative elements play in each of the classic professions may lead to a further taxonomy that distinguishes professions according to the degree to which the normative pillar insulates professionals from the efficient choice approach in evaluating and adopting innovations. In this respect, the development of AI technologies relative to various professional sectors represents a fertile soil for academic investigation.

The present work contains important insights for policy makers which are worth briefly unpacking. If our hypotheses hold empirical scrutiny, it is reasonable to expect a substantive reluctance to adoption of

paradigmatic innovations within the classic or regulated professions without market forces (from which professionals are partly insulated) or regulatory bodies acting as coercive mechanisms. In fact, it is reasonable to suppose that cultural-cognitive and normative pillars are currently standing in the way of the adoption of technologies that would substantively change the nature of professional work. This aspect warrants particular attention given policy goals associated with the adoption of technologies within the professions (e.g. increased productivity, increased professional expertise, etc.) and public goods that governments seek to achieve through paradigmatic technological shifts, such as access to justice through AI enabling technologies in the legal sector (Susskind and Susskind, 2015).

At the same time, coercive mechanisms, aimed at fostering the adoption of technologies in the classic professions, seem to posit a crucial trade-off which is worth exploring. Forcing technological change may threaten the interplay of cognitive-cultural and normative elements which partly make the professions able to attract young talent. Specifically, values attached to the professions, along with beliefs surrounding the societal contributions of professionals through their work, constitute a great source of attraction for motivated young talent who decide to pursue professional career paths. In this respect, policy intervention aimed at fostering changes in technology that would substantively alter the nature of professional work must take into account the need for preserving the normative elements that shape the attractiveness of professional work. Such a tradeoff assumes practical and urgent relevance with reference to the process of adoption of AI technologies within the classic professions and, in turn, with policy goals connected to the adoption and diffusion of such technologies. For instance, the adoption of AI technologies in the legal sector is thought to bring about the creation of an essential public good such as widespread access to justice. In this respect, much of governments' efforts are aimed at fostering the technological shift which would substantially alter the nature of the work of legal professionals. According to our conceptual analysis, reluctance to change is to be expected, but policy interventions aimed at fostering technological change should also be aimed at preserving cultural-cognitive and normative pillars that shape the attractiveness of the legal profession. In this respect, we suggest that a plausible path is offered by Bicchieri's (2016) reflections on norms' change. In particular, instead of forcing technological change, policy makers may focus on weakening professional norms against the adoption of innovations, in an effort to foster technological experimentation in a professional sector. Differently from coercive mechanisms, norms' manipulation aims at producing bottom-up changes and can be tuned to preserve institutional elements that permeate a social order or group and define its identity.

Finally, given the nature of the relationships hypothesized by our conceptual framework, we believe this warrants a discussion about its generalizability. While in this paper we focused specifically on the adoption of innovation in the classic professions, which provide a coherent context that facilitates the examination of the hypothesis that we put forward, we believe that the relationships addressed may also apply to other contexts. Therefore, we suggest that our conceptual framework on the adoption of innovations calls for further exploration beyond the classic professions as well as outside the professional domain. The pervasive role of

institutional mechanisms, shaped by cultural-cognitive and normative pillars, is not exclusive to the classic professions and may affect other sectors in which hyper-specialization (Malone et al, 2011) gives rise to the emergence of people's self-identification with their occupation. In this respect, it is reasonable to expect that reluctance to adoption of paradigmatic innovations may arise in sectors where individuals start to develop normative attachments to practices, routines and high knowledge-intensive tasks they perform. Cultural-cognitive and normative pillars, indeed, are by nature dynamic and the institutional lens may prove to possess explanatory power if applied to newly emerging professions. We therefore encourage future research to extend our work and examine the adoption of innovation through an institutional lens, and to test the hypotheses put forward in this paper, both outside the classic professions and in other contexts.

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