Professionals' Use of ICT in Hospitals: The Interplay Between Institutional and Rational Factors

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Abstract: This study gathered novel evidence on the interplay between the organizational and the individual mechanisms that affect the continued use of Electronic Medical Record (EMR) in hospitals. Our model integrates mechanisms inspired by both Institutional Theory (i.e., organizational expectations, change culture and alignment of meaning systems) and Technology Acceptance Models (i.e., perceived usefulness and ease of use). Tested on hospital professionals, our results point out the predominant role played by rational, individual-level mechanisms and the interplay with organizational expectations, as the only institutional factor that affects the continued use

through both direct and mediate relationships.

Keywords: Healthcare, Hospital, Electronic Medical Record, ICT, Technology Use, Technology acceptance.

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1 Introduction

The mechanisms that drive the use of Information and Communication Technologies (ICTs) within organizations remain a controversial issue, especially in professional settings such as healthcare (Gastaldi et al., 2012). A still fragmented and puzzled theoretical frame fosters this controversy as the fields of organizational studies and information systems have explained employees' adoption of ICTs in two significantly different, sometimes conflicting, ways.

Organizational studies conceive organizations, in particular professional ones, as strongly institutionalized settings in which individual behaviours are bounded by a complex combination of regulations, social norms and cultural systems (Butler, 2011). Employees' decision to engage with new technologies and, thus, with new practices is not entirely based on rational thinking, but it is affected by the influence of the overarching structures, rules, social norms and culture in which they are embedded (Scott, 1995; Radaelli et al., 2017).

Information systems research, vice versa, has mostly adopted user acceptance models, which emphasise individuals' rational and volitional assessment of the costs and benefits they would attain from the new technology (Gastaldi and Corso, 2012). This approach is particularly valuable in professional settings, such as healthcare, where employees, being professionals, own expert knowledge that is heavily regulated and inaccessible to managers, and grantees them significant autonomy with respect to innovations and change of professional practices (Barczak et al., 2006; Mura et al., 2016). In this view, individuals engage with new technologies, when they rationally "accept" it and the consequences of its adoption. Acceptance is the consequence of two main factors: the perceived ease of use and the perceived usefulness (Davis et al., 1989; Chau and Hu, 2002; Venkatesh et al., 2003; Wade et al., 2017), that are evaluated rationally by the individual.

These theoretical perspectives elicit very different strategies for the adoption of new ICTs. Institutional theory argues that individuals reinforce the status quo, often 'mindlessly' since the "institutions embodied in routines rely on automatic cognition and uncritical processing of existing schemata, and privilege consistency with stereotypes and speed over accuracy" (Lawrence et al., 2009; p. 15). So, this theory calls for the introduction of new symbolic systems, relational systems, routines and artefacts that convey new structural, normative and cultural conditions favourable to the adoption of new technologies (Currie, 2012). By contrast, models based on user acceptance build on individuals' self-determination and rationality, and call for strategic and promotional interventions that fit processes, structures and/or technologies with their perceptions of ease of use and usefulness.

Both research streams have independently tried to incorporate elements of the other theory to enrich their explanatory power. User acceptance models have increasingly explored the effects of social influences and organizational conditions on user acceptance as well as their effects on the perceived usefulness (e.g. Chang et al., 2007; Tate et al., 2015), consolidating new proposals such as TAM2 (Venkatesh and Davis, 2000) or

UTAUT (Venkatesh et al., 2003). Similarly, recent institutional studies argued that the institutional influences are not "cognitively totalizing structures [and] even when actors are subject to institutional influences, they can develop a practical consciousness" (Battilana and D'Aunno, 2009; p. 47). Hence, it is conceded that individuals' self-determination – constrained and bounded as it may be – plays a significant role even in highly-institutionalized settings (Leca et al., 2008; Radaelli et al., 2017).

Although these valuable efforts, the integration of the two theories is still fragmented and puzzled. In fact, scholars from information studies incorporated social influences and organizational conditions without referring to well-established theories (e.g. Lewis et al., 2003; Wade et al., 2017), thus offering a partial and not theory-driven view of how the users' rational choice about new technologies might be shaped by factors that are external to the users themselves. On the other side, scholars of organizational studies incorporated elements from the information systems field to explain the behaviour of organizations – the locus of their researches – overlooking the choices made by individuals (e.g. Mignerat and Rivard, 2009; for an exception, see Jensen et al., 2009). Additionally, even if each stream of research acted to incorporate contributions from the other one, no previous study tested empirically their explanatory power either as competitive or integrated theories.

From these arguments stems the main theoretical contribution of this study, that aims at furthering the still ongoing debate about the mechanisms that drive the use of ICTs within organizations, by gathering first empirical evidence about:

- The direct effect of institutional and individual factors on the use of ICTs by individuals in organizations;
- The mediated effect – by individuals' perception of ease of use and usefulness – of institutional factors on the use of ICTs by individuals in organizations.

These effects have been formalized in a theoretical model that has been developed by the integration of the main antecedents of the acceptance models and the institutional theory. This model is tested in the context of hospitals as professional organizations and assesses hospital professionals' use of Electronic Medical Records (EMRs). Hospital is an exemplary setting to test the model since past research strongly supports both acceptance models (Pai and Huang, 2011; Ryu et al., 2003; Chang et al., 2007) and institutional explanations (Currie and Suhomlinova, 2006; Thomas and Hewitt, 2011).

The coexistence of these results offers the ideal setting where to investigate either the competitive or integrative explanatory power of the two theories. In particular, we have the opportunity to gather original insights on: 1) how TAM and institutional factors affect the acceptance and use of new technologies; and 2) if and how the two perspectives (individual and institutional) are interdependent and should be combined to provide an integrated understanding of how to maximise technology acceptance and use within professional organizations. Additionally, by building and testing the model in the healthcare setting, where the conundrum between individual and institutional theory is evident, our study aims to derive practical implications for a more effective adoption of ICTs also in other professional settings.

2 Theoretical Model

In this section, we develop our theoretical model. The model incorporates three hypotheses. The first hypothesis is elaborated from the institutional theory and posits the direct effect of institutional expectations, meaning systems, and change culture on the actual use of the technology. The second hypothesis is derived from the user acceptance models and posits the direct effect of individuals' rational assessment of usefulness and ease of use on their use of the technology. The third hypothesis blends the two theories, posing an indirect effect of institutional factors, mediated by individuals' perception of usefulness and ease of use, on the use of the technology.

2.1 Institutional Factors

The institutional theory provides a structuralist explanation about the adoption of technologies in organizations. According to this perspective, behaviours do not fully depend on a rational assessment of its costs and benefits. Rather, actors are embedded in contexts – such as organizations, departments, supply chains, regions and states – with institutionalized rules, norms and culture that shape and limit their decisions (Barley and Tolbert, 1997; Scott, 1995). The 'iron cage' in which actors operate includes three pillars (Scott, 2001). First, actors are influenced by regulative pillars, i.e. they have to abide by regulations, rules and procedures which establish what they can and cannot do. Dedicated agents monitor compliance with these rules, and sanction infringement so that the costs of non-compliance can discourage divergent behaviours. Second, social actors are influenced by normative pillars, i.e. the expectations and norms that social groups elaborate regarding what constitutes an appropriate behaviour in specific circumstances. These norms shape what the actor should do to achieve the desired performance, and to fit into the social group. Infringements are monitored and sanctioned by members of the social group and may cost a loss of status, privileges or even membership. Finally, actors are influenced by cultural pillars, i.e. mental schemes, frames and symbolic representations shared within the social group to which they belong. Actors do not interpret reality by themselves but take cues and clues from what other people do and believe, and from how other people make and give sense. Over time, social actors do not question these interpretations, but take them for granted to inform their actions.

The institutional theory applies at different levels of analysis, e.g. to explain the agency of firms in the industrial field where they operate, of professional groups in a state; or employees in an organization (Besharov and Smith, 2014; Lawrence et al., 2009; Tolbert and Zucker, 1999). Each level of analysis presents peculiar 'carriers' of regulative, normative and cultural influence (Scott, 2003). States, for instance, carry regulative influences through laws, while professional groups through membership rules, and organizations through plans and budgets.

In our study, we will focus on the interplay between individual professionals and the organization in which they are embedded. The overall idea is that professionals display similar behaviours with the use of new technologies because they are exposed to similar carriers of regulative, normative and cultural influences.

Following previous research (e.g. Lawrence and Suddaby, 2006; Kellogg, 2009; Currie, 2012), the organization uses three 'carriers' of institutional influence.

First, organizations carry a regulative influence through strategic documents, industrial plans and budgets, which outline the organizational expectations for the short, middle and long terms (Scott, 2003; 2008). These instruments incorporate managers' understanding and re-elaboration of external and internal pressures – i.e. what is needed to accommodate regulators' demands, customers' (patients') needs, and workforce possibilities (Frooman, 1999; Jensen et al., 2009; Oliver, 1991). Hospital managers, in particular, elaborate key performances that individuals, groups and departments need to achieve for superior quality and safety, as well as targets to accomplish to avoid sanctions (Ferreira and Otley, 2009; Malmi and Brown, 2008). In the absence of rules that can fully compel professional employees into using EMRs, organizations can still use semi-coercive mechanisms – such as plans and budgets to clarify the expectations of the organization as well as highlight possible incentives and sanctions. So, we hypothesize that the more the organisation provides coercive or persuasive mechanisms that direct or control practice, the more the individual professionals are likely to comply with these expectations in search or fear of retribution.

Second, organizations carry their normative influence through multiple forms of peer influence – i.e. supervision from experienced mentors, training from specialists and day-today interactions with colleagues (Bauer et al., 2007; Cable and Parsons, 2001). Given how healthcare professionals possess unique clinical knowledge that only disciplinary peers can match, the normative influence enacted through peers is generally understood as one of the most potent enablers of professionals' compliance to new behaviours (Abbott, 1988; Von Nordenflycht, 2010). Peer influence is specifically meant to align individuals towards a shared understanding of what is appropriate in the organization and can be specifically used to create a generalized belief that the new technology is important and appropriate. The more the meaning system across professionals are cohesive and aligned towards the adoption of a new technology, the more the individual professionals are likely to adhere to this social norm without challenging it with personal beliefs or needs. Doing differently may in fact cause problems with his/her status in the organisation and in the professional group.

Third, organizations carry a cultural influence through day-to-day initiatives and discussions that normalize the use of technologies in practice or signal the need for a change toward more/better use of technologies (Schein, 2010). The more organisation shares a strong idea that the status quo is inadequate to meet customer needs and a change is required, the more the individual professionals are likely to expect and contribute to change by enacting local but meaningful behaviours.

We hypothesize that professionals' use of technologies is aligned with the organizational expectations (acting as rules on what would be rewarded or sanctioned), shared meaning systems (acting as social norms on what is appropriate) and change culture (acting as shared interpretations about the importance or inevitability of change) in the organization in which they are embedded. We thus expect insignificant variation across professionals in the same organisation, and high uptake of the new technology:

> *H_1: Individuals embedded in contexts characterized by higher organizational expectations of technology use (a), higher peer influence toward technology use (b), and higher change culture (c) display higher rates of continued use of a new ICT system.*

2.2 Rational Factors

TAM provides a different explanation to the adoption and use of new technologies. TAM was first conceptualized in the '80s, when Davis and colleagues noticed that employees resisted the use of technologies made available to them by the organizations (Davis, 1989; Davis et al., 1989). The authors reasoned that fostering the acceptance of technologies was the key to sustain their adoption. In turn, the acceptance of technology was shaped by the intention expressed by the employees to use the technology in the future. As such, once they shed light over the factors which determine the employees' intention to use the technology in the future, organizations could work on these to increase acceptance, and thus to increase the use of technology by employees.

Originally, the factors determining the intention to use a technology were taken mostly from the Theory of Reasoned Action (TRA; Fishbein and Ajzen, 1975) and the Theory of Planned Behaviour (TPB; Ajzen, 1991). TAM has undergone a number of modifications that originated different models, such as the TAM2, which adds a variable about the social influence towards adoption (Venkatesh and Davis, 2000), the UTAUT, which reasons about the influence of performance expectancy (Venkatesh et al., 2003). For the sake of our study, we rely upon the original model, which is still most commonly used and consistently proved as effective. Additionally, the potential role of social influence is already captured by the inclusion of institutional factors (H_1).

Several studies in the information systems literature have extensively demonstrated that professionals' use of a new technology is directly explained by their perception of usefulness and ease of use (Venkatesh et al., 2003; Gupta et al., 2008; Lankton et al., 2014; Walsh, 2014). The role of user acceptance has been also specifically investigated with regard to EMRs in hospitals (Hayrinen et al., 2008; Walter and Lopez, 2008). We expect our study to confirm such findings, and thus we hypothesize the following:

> *H_2: Individuals' perceived usefulness (a) and perceived ease of use (b) of a new ICT system are positively correlated with its continued use.*

2.3 Mediation Effects

H_1 assumes that individuals would use EMR beyond, or even without, a rational assessment of its advantages. If unmediated by a user acceptance model, that hypothesis would suggest that individuals (in our case, professionals) do not decide to use an EMR, but are rather induced/urged by institutional factors. By contrast, H_2 assumes that institutional influences are bypassed by the individual, i.e. the perception of usefulness and ease of use is fully determined by a rational assessment of the technology, and fully determines the decision to adopt the technology.

An alternative view suggests that the regulative, normative and cultural influences – operated through explicit organizational expectations (e.g. in plans and budgets), the alignment of meaning systems (e.g. because of peer influence) and a culture of technological change – does not determine individuals' behaviours, but their rational assessment of the new technology. The institutional influences represent relevant information affecting, in particular, how professionals perceive the usefulness and/or ease of use of a new technology. This interpretation is consistent with more recent viewpoints of institutional theory, according to which individuals embedded in organizations with

stronger institutional influences are more likely to perceive the usefulness and ease of use of a new technology, but still retain enough practical consciousness to rationalize its adoption (Pozzebon, 2004; Lawrence and Suddaby, 2006).

We argue that institutional factors affect individuals' perceptions of ease of use and usefulness. Such links, if proven, would extend findings on the antecedents of the TAM, which have thus far focused mostly on psychological, technological and contingent factors (e.g. Karahanna and Straub, 1999; Legris et al., 2003). More precisely, organizational expectations, peer influence and change culture have selected impacts on the TAM-based antecedents. Specifically, organizational expectations tend to outline what behaviours individuals, groups and expectations need to perform to help the organization reach its targets. Strategic documents, industrial plans and budgets point out that certain behaviours – e.g. the use of EMRs – are particularly useful. As such, they encourage individuals to appreciate the benefits. They are less likely instead to inform individuals' appreciation for the ease of use of a given technology, as these individuals would be convinced by practical experience (Ferreira and Otley, 2009; Grafton et al., 2010). Peer influence is likely to inform individuals' perceived usefulness of new technologies, such as EMRs. Professionals who see their peers operate a new technology can see the benefits stemming from such use. Thus, they may grow more convinced that they could achieve similar results by imitating their behaviours (Ajzen, 1991). While peers may suggest that the new technology is also easy to use, this is likely to be less influential to individuals. Professionals hold very personal attitudes towards, knowledge of and experiences with new ICT systems. So, the ease experienced (and shown) by some individual may not convince other professionals, especially when these have lower knowledge and fewer experiences. We hypothesize that a positive change culture is likely to have an influence on ease of use rather than perceive usefulness. In the former regard, a positive change culture regarding ICT is likely to increase individuals' disposition towards 'trying out' the new technology and accept the challenges of its use (Damschroder et al., 2009; Nilsen, 2015; Tucker and Nembhard, 2007). A positive change culture – being general and open-ended – is less influential on individuals' perception that the ICT technology 'here and now' is appropriate and effective. Organizational expectations and peer influence provide more direct expectations and influence that the 'specific' ICT solution would solve problems and improve performances. We thus hypothesize the following hypothesis:

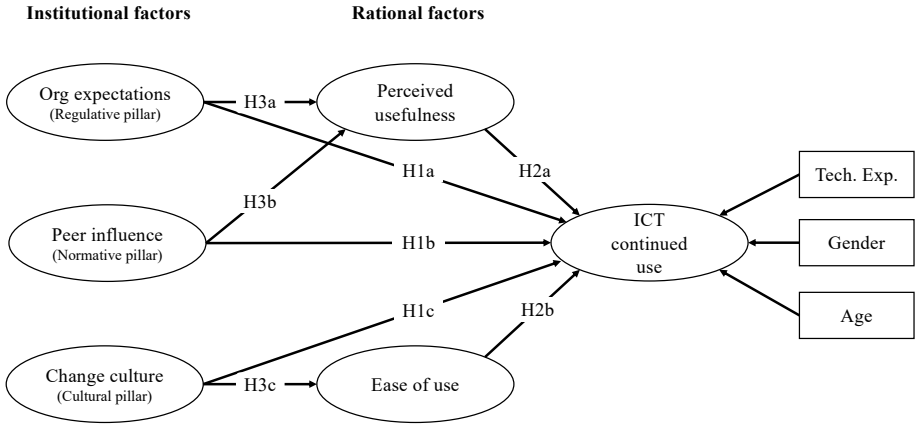
> *H_3: Organizational expectations (a) and peer influence (b) are positively correlated to individuals' perceived usefulness of a new ICT system while a change culture (c) is positively correlated to individuals' perceived ease of use of a new ICT system.*

2.4 Research Model

Consistently with the hypotheses above, Figure 1 describes our research model. The research model includes also three control variables, which are consistent with past research on user acceptance models (Agarwal and Prasad, 1999; Morris and Venkatesh, 2000). These studies highlighted that technological experience, age and gender may control for the continued use of technologies. Individuals who are more experienced with the use of technologies tend to use new technologies more, as they are more comfortable with change, more attuned towards change, and more familiar with their use (Venkatesh and Morris, 2000). Past research suggests that age may be negatively correlated with the use of

technologies, i.e. younger individuals are more familiar and open to new technologies (Chung et al., 2010). Differently, past research suggests that there might be gender differences in the acceptance of technologies. Evidence has not been consistent however, with some studies showing men to accept technologies more than women, while others showed the opposite or insignificant differences (Lai and Li, 2005; Venkatesh and Morris, 2000; Yuen and Ma, 2002).

Figure 1 Research model



3 Research Methodology

3.1 Research Settings

Our research is set in hospitals, which are professional service organizations. Von Nordenflycht (2010) argued that these organizations present at least one of three distinctive characteristics that differentiate them from more traditional firms:

- *Knowledge intensity*: it indicates that output production "relies on a substantial body of complex knowledge" (p. 159).
- *Low capital intensity*: it indicates that output production "does not involve significant amounts of nonhuman assets, such as inventory, factories and equipment, and even intangible nonhuman assets like patents and copyrights" (p. 162).
- *Professionalized workforce*: it indicates that the output producers present "a particular knowledge base" (p. 163) acquired over long years of certified development and training, and inaccessible to managers, employees, and users. The acquisition and deployment of this knowledge is highly regulated, so that "a profession has a monopoly on the use of that knowledge; that it regulates that monopoly autonomously..., and that such regulation not only excludes non-professionals but also mitigates competition among professionals" (p. 163). Professionalized workforce also

presents a specific ideology, that "refers to the professional codes of ethics as well as less explicit norms that define appropriate behaviour for professionals" (p. 163).

Hospitals present all three characteristics, and particularly they are highly knowledge-intensive, their workforce is highly professionalized, and they involve moderate degrees of capital intensity – insofar as the important nonhuman assets, such as biomedical technologies, are subordinated to professional considerations (Abbott, 1988; Friedson, 1988; Muzio et al., 2013; Gastaldi et al., 2018).

Because of these features, hospitals represent a relevant setting for our study. The heavy regulation on the nature and use of complex knowledge, and the logics/ideology of service appropriateness, in particular, significantly influence on professionals to replicate the status quo (Friedson, 1988; Llewellyn, 2001; Suddaby and Viale, 2011; Thomas and Hewitt, 2011). As a matter of fact, hospitals have represented one of the most privileged settings for theory-building in previous institutional research (Suddaby and Viale, 2011; Currie, 2012; Micelotta and Washington, 2013). At the same time, professional workers, and particularly healthcare professionals, are highly autonomous actors. While they are supposed to follow guidelines and care pathways, professionals are also expected to make complex decisions outside of these boundaries, and use their expertise to legitimize such decisions (Abbott, 1988; Friedson, 1988). Hence, hospitals represent a privileged setting to study the coexistence of institutional influences and individual self- determination.

3.2 Questionnaire Design, Measures and Control Variables

We surveyed the literature to identify valid measures for related constructs and adapted existing scales to measure the different constructs mentioned in the theoretical background. Measures associated with user acceptance models, and continued use of the ICT have been derived and adapted from Venkatesh et al. (2003). Past research is relatively scant of empirical measures of institutional factors (mostly investigated through qualitative methodologies). We thus decided to adapt scales from non-institutional studies to institutional purposes, and specifically derived the measures for organizational expectations, peer influence and change culture respectively from Ajzen (1991), Ravlin and Meglino (1987) and Khoja et al. (2007). All indicators were measured using a seven-point Likert scale.

Since the scales drawn from the literature were in English, the initial questionnaire was developed in English, then translated into Italian. The Italian version was then translated back into English by another expert, and the translated English version was checked against the original English version for discrepancies.

There were two preliminary assessments of the questionnaire. First, we submitted it to academics in the field of ICT-driven innovation in healthcare for their review. Next, we pre-tested it in a hospital, which we visited to conduct face-to-face discussions with healthcare professionals. Based on the feedbacks, we modified the wording of some questions and added or deleted some others, in order to ensure that the items were understandable and relevant to professionals. The complete scales are listed in Table 2.

3.3 Sampling and Data Collection

Data were collected from four hospitals in Northern Italy whose EMRs proved to be mature and highly performing. This choice relies on the willingness to limit potential confounding factors related to EMRs whose implementation was still in progress and not consolidated. The choice has been supported by analysing the investments in EMRs made by more than 100 Italian hospitals from 2008 to 2013. The four selected hospitals were the ones with the most mature systems according to the well-established and respected HiMSS EMRAM^{TM} ranking[1].

For each hospital, we identified a key informant, who typically was the Chief Information Officer (CIO), knowledgeable about EMR usage within the hospital. We contacted the key informants by telephone in order to obtain their preliminary agreement to participate, and to select randomly a sample of 60 respondents in each hospital.

We mailed the questionnaire to these respondents, along with a cover letter highlighting the study's objectives and potential contributions. The cover letter also clarified that the survey was related to a scholarly research project, whose success was dependent on accurate and objective responses.

Follow-up telephone calls, mailings and face-to-face visits were used not only to improve the response rate (Frohlich, 2002), but also to address potential missing data issues. Out of four hospitals and the 240 people contacted, a total of 60 usable questionnaires were collected (actually we collected 94 questionnaires but 34 of them were not completely filled and, thus, have been discarded). The number of actual respondents mirrors previous studies that acknowledged the difficulty to collect primary data from healthcare professionals (e.g., Mura et al., 2013). A profile of the respondents is presented in Table 1.

Table 1 Respondents' main characteristics

Hospital	Respondents	Technological experience*	Female respondents	Respondent age (in years)
Hospital 1	34	18.91	14	48.88
Hospital 2	9	14.00	8	47.78
Hospital 3	4	17.50	4	49.75
Hospital 4	13	9.54	0	39.83
Overall/ average	60	16.00	26	46.86

* measured in years of

To assess potential late response bias, we compared early and late responses on their EMR continued use (Armstrong and Overton, 1977), with a t-test showing no significant differences. No significant differences emerged also from comparing respondents vs. non respondents. More generally, by considering also the questionnaires that were not completely filled, we checked that the answers contained no specific biases. Finally, we showed the aggregated results to hospitals' key informants who confirmed that the

[1] EMRAM stands for *Electronic Medical Record Adoption Model*, and is an eight-step process that allows to analyse a hospital's level of EMR adoption, chart its accomplishments, and track its progress against other healthcare organizations. For more information, see http://www.himssanalytics.org/emram.

provided answers were representative of the overall population sampled. Only in hospital 3 this operation was not accomplished due to the very low number of respondents.

Finally, being all data collected from a single respondent, Common Method Variance (CMV) might be a concern. With this regard, we followed Podsakoff et al. (2003)'s recommendations for both ex ante remedies ex post tests. First, as told, before administering the survey, we pretest carefully the items to ensure that ambiguous, vague or unfamiliar terms were not included. Furthermore, in the cover letter we guaranteed respondent confidentiality and emphasised that there were no correct or incorrect answers and encouraging respondents to provide independent and honest answers. Then, before we tested our hypotheses, we conducted Harman's single-factor test on the key variables of our theoretical model. The outcome of the test indicated minimal evidence of method bias (Harman, 1967).

3.4 Measurement Model

To test our research model, we employed the Partial Least Square (PLS) approach using Smart PLS (Oh et al., 2012), supported by a set of robustness checks, following the indication provided by Peng and Lai (2012). This components-based approach is appropriate to accommodate the presence of mediation relationships and to test them through boot-strapping. The dataset satisfies the criterion that the sample size should be at least 10 times larger than the largest number of structural paths directed at any one construct (Chin et al., 2003).

Table 2 shows the measurement scales of the reflective constructs investigated by our research model. The measurement model consists of six multi-item constructs with a total of nineteen indicators. We used several tests to determine the convergent and discriminant validity of the constructs. We controlled through an exploratory factor analysis that all item loadings between an indicator and its posited underlying latent variable were sufficiently high — with no relevant cross-loadings — and that both composite reliability (CR) and average variance extracted (AVE) were above the recommended threshold of 0.7 and 0.5 respectively (Fornell and Larcker, 1981).

Table 2 Measurement properties of reflective constructs

Constructs	Items (corresponding to the survey questions)*	Loading	CR	AVE
Organisational expectations (Regulative pillar)	**A**. I very much agree with most of the objectives set by the hospital managers	0.819	0.749	0.502
	B. I am often in conflict with hospital managers on the priorities I should pursue in daily practice [**]	0.604		
	C. I mostly disagree with the choices of the hospital managers about EMR	0.686		
Peer influence (Normative pillar)	**A**. My most esteemed colleagues believe that I should regularly use the EMR	0.865	0.934	0.826
	B. My most esteemed colleagues regularly use the EMR	0.928		
	C. The colleagues who I consider the best believe that EMR use is essential for the organisation	0.932		
Change Culture (Cultural pillar)	**A**. In our hospital, change is not perceived as a necessary evil, but as something to be promoted and supported	0.842	0.836	0.718
	B. I think that my hospital spurs its employees to reflect on how to improve job practices	0.853		
Perceived	**A**. Using the EMR enables me to accomplish tasks more quickly	0.842	0.896	0.685

usefulness	**B**. The usage of EMR significantly enhances the effectiveness of my job	0.880		
	C. The usage of EMR significantly improves my productivity	0.855		
	D. The data in the EMR are sufficient to make my decision-making effective	0.723		
Ease of use	**A**. It has been easy to me to become skilful at using the EMR	0.878	0.901	0.696
	B. I can get the EMR to do what I need to do	0.829		
	C. The EMR is easy to use	0.833		
	D. In a short period of time I have become an expert in using the EMR	0.794		
ICT continued use	**A**. Using the EMR has become a habit for me	0.833	0.886	0.722
	B. I can't do without using the EMR	0.849		
	C. Using the EMR is natural to me	0.867		

** All items were measured on a 7-point Likert scale, where 1 = strongly disagree, 2 = moderately disagree, 3 = somewhat disagree, 4 = neutral (neither disagree nor agree), 5 = somewhat agree, 6 = moderately agree, and 7 = strongly agree*

*** The question is written in negative form to strengthen the statistical analysis and the representativeness of collected data*

To further test for discriminant validity, we compared the squared correlation between two latent constructs and their AVE estimates (Fornell and Larcker, 1981). These constructs meet the validity condition of the AVE estimates exceeding the squared correlation between each pair of constructs (see Table 3). No further issue emerges in terms of latent variable correlations.

Table 3 Correlation matrix

Variables	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***
1. Org. expectations	**0.709**								
2. Peer influence	0.468	**0.909**							
3. Change culture	0.137	0.270	**0.847**						
4. Perceived usefulness	0.468	0.662	0.136	**0.827**					
5. Ease of use	0.317	0.431	0.343	0.478	**0.834**				
6. ICT continued use	0.376	0.554	0.348	0.669	0.688	**0.850**			
7. Tech. experience	0.190	0.145	0.249	0.310	0.223	0.249	**1.000**		
8. Gender	0.024	-0.158	0.008	0.148	-0.044	-0.149	0.133	**1.000**	
9. Age	0.027	-0.054	0.137	-0.100	-0.299	-0.073	0.110	-0.077	**1.000**

The square root of the average variance extracted (AVE) is shown in bold on the diagonal. Correlations are in the lower triangle of the matrix.

Since our theoretical model includes both institutional and individual level latent variables, we also checked if individuals' perceptions of institutional factors (i.e., organizational expectations, peer influence, and change culture) have sufficient variance to be still measured at the individual level. In this way, we can meaningfully relate the institutional factors perceived by each individual to the rational factors (i.e., perceived usefulness, ease of use, ICT continued use).

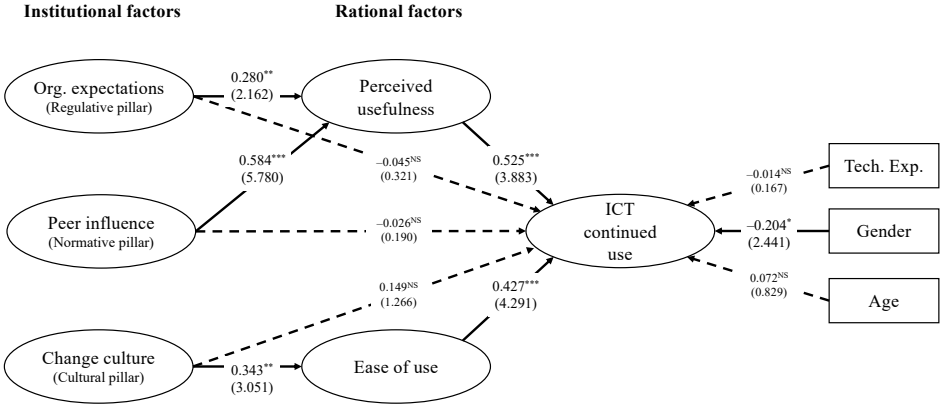
In order to test our hypotheses, we tested the level of significance for all paths through bootstrapping and then the PLS algorithm following the instructions of Peng and Lai (2012) for PLS.

4 Findings

Before proceeding to test the hypotheses, we checked for the absence of intraclass correlation. Figure 2 shows the results of the hypothesis testing; continuous arrows depict significant path, while dotted arrows display non-significant paths.

As for the hypothesis testing, H1 states that individuals embedded in institutional contexts with higher institutional pressures display higher rates of continued use of new ICT systems. As shown in Figure 2, the relationships between organizational expectations, peer influence and change culture with continued use of EMR are all not statistically significant (respectively: β = -0.045, -0.026 and 0.149; t = 0.321, 0.190 and 1.266). As such, H1 is not verified.

Figure 2 Path model results



*(*** = p-value < 0.001; ** = p-value < 0.01; * = p-value < 0.05; NS = not significant; the value of the test statistic is in brackets)*

H2 states that individuals' perceived ease of use and perceived usefulness of a new technological system are positively correlated with its acceptance and continued use. Results confirms this hypothesis (respectively: β = 0,525 and t = 3,883; β = 0,427 and t = 4,291).

H3 states that the institutional pillars are positively correlated with the professionals' perceived ease of use and usefulness. The results provide support to H3. In facts, organizational expectations and peer influence are positively related to perceived usefulness of the EMR, and the relationships are statistically significant (respectively: β = 0.584, 0.280 and t = 5.780, 2.162). Change culture is positively related to the perceived ease of use (β = 0.343; t =3.051).

Furthermore, results show that a negative and statistically significant relationship exists between continued use of EMR and the professionals' gender ($\beta = -0.204$; $t = 2.441$). Positive relationships exist between continued use of EMR and the age and technological experience, though both are not statistically significant (respectively: $\beta = 0.072$ and $t = 0.829$; $\beta = -0.014$ and $t = 0.167$).

5 Discussion

In hospitals, institutional and user acceptance theories do not represent orthogonal explanations of individual behaviours. Key features of professional work demand both institutional conformity and a demand of autonomous decision-making (von Nordenflycht, 2010). Professionalized workforce in hospitals must conform to strict regulations on the nature and use of their expert knowledge, and must conform to established ideologies of service appropriateness. At the same time, professionals are expected to use their expertise to make complex decisions that might go beyond the boundaries of guidelines and care pathways (Abbott, 1988; Friedson, 1988; Suddaby and Viale, 2011).

Our study sought to better clarify the relationship between the two theories, i.e. if and how organizational expectations, meaning systems and change culture represent institutional factors shaping the perception of usefulness and ease of use toward isomorphism; or if they represent organizational factors informing the perception of usefulness and ease of use. Our main contribution is testing both configurations, and showing – against initial expectations – that the latter effect is prevailing.

The preponderant institutional studies dictated the initial expectations, showing that regulative, cultural and technical forces shape the way in which individuals conceive 'usefulness' and 'ease of use'. The institutional perspective provides an important conundrum. If individual decision-making is heavily shaped by the regulative, cultural and technical forces, professionals embedded in the same institutional context should display isomorphic perceptions of the 'usefulness' and 'ease of use' of new practices or technologies. The existence of heterogeneous forms of agency in a heavily institutionalized setting was traditionally conceived as a 'paradox' in this literature (Holm, 1995; Battilana and D'Aunno, 2009). If so: (i) a large chunk of professional work is the 'mindless' replication of the status quo and translation of institutionalized patterns into practice, and (ii) professional autonomy is less substantial as expected, as decision-making is informed primarily by mac-ro-level regulations, social norms and taken-for-granted beliefs.

Our study did not find evidence of such isomorphism. Professionals developed distinct perceptions of organizational features and displayed different behaviours regarding EMR use. Indeed, organizational expectations, the alignment of meaning systems, and change culture were significantly linked to professionals' perceptions of ease of use and usefulness. The lack of isomorphic mechanisms suggests that these are organizational factors, which professionals process before developing their own perception of ease of use and usefulness. These results oppose the notion that professionals succumb 'mindlessly' to institutional pressures. Professionals are likely to use their status and knowledge to mediate the institutional pressures and make individual decisions about the new technology. Professionals are not entirely 'free' from these institutional pressures, as the assessment of EMRs is informed by organizational expectations, meaning systems and change culture.

We suggest that the nature and purpose of EMRs explain this result. In the absence of coercive mechanisms (i.e. the non-use cannot be sanctioned), institutional pressures toward

EMR use are primarily normative (i.e., the organization has binding expectations about EMR use, with which professionals comply out of social obligation) and/or mimetic (i.e., EMRs fit with existing taken-for-granted beliefs and logics of action, so professionals should support their adoption) (Scott, 2003). None of these two effects are likely to be present with the introduction of EMRs.

First, EMRs do not fully fit with established logics of clinical appropriateness, i.e. they do not fully support them nor fully antagonize them. EMRs are promoted by early enthusiasts in the professional workforce as significant advancements to clinical appropriateness, and in particular to service quality, stability and reliability. At the same time, they are promoted by managers and policy-makers as sources of efficiency, standardization and constant monitoring. These logics are often regarded sceptically as managerial intrusion into professional practice (Llewellyn, 2001; Thomas and Hewitt, 2011). The ambiguous implications of EMR for service appropriateness are likely to increase professionals' attention toward the implications of the new technology.

Professionals must act as 'arbiters of risk' (Currie, 2012), constantly monitoring the appropriateness of service changes as their morals, status and privileges depend on it (Abbott, 1988; Freidson, 1988). Hence, the perception of ease of use and usefulness are likely to play an expanded role in a professional context like hospitals. While other users might decide to 'play around' with new technologies, or at least experiment with them – professionals are likely to demand usefulness and ease of use to increase the appropriateness of their care. With technologies playing an instrumental role toward the broader goal of appropriateness, healthcare professionals appear particularly careful to rationalize the use of new technologies.

Second, healthcare professionals have remarkable power and status against managers and other professional groups, and they shield themselves from social obligations outside their peer group (Abbott, 1988; Llewellyn, 2001; Thomas and Hewitt, 2011). Earlier research has already evidenced that high-status professionals (i) regard with suspicion changes attempted by external actors – i.e. their rational and volition decision-making is triggered by new symbolic systems, relational systems and artefacts; and (ii) actively defend their autonomy against external attempts of institutional change by making key decisions about the use of tools and technologies (e.g. Currie, 2012; Micelotta and Washington, 2011).

In summary, organizational expectations, ad-hoc meaning systems, and a change culture are potential institutional carriers (Scott, 2001, 2003), which could stimulate the EMR use. However, the nature of 'who' carries such influence, and 'what' it is influenced explain why and how healthcare professionals play a mediating role in assessing the pros and cons of new technologies. Managers and IT enthusiasts carrying the institutional idea of diffusing EMR use are typically separated from (or even subordinated to) professional users – hence they have limited influence on their decision-making. Furthermore, the institutionalized logics of appropriateness are such that professionals watch carefully any innovation and change, and need to ask themselves if the addition increases or threatens the quality of care. As a result, professionals are likely to mediate institutional influences with their autonomous and complex decision-making.

6 Limitations

Despite the contributions, the study presents a number of limitations that future research might address. The cross-sectional nature of our study does not allow drawing definitive inferences on how and why hospital professionals decided to use EMR, and how and why others did not, even though we ground our hypotheses on past studies and we can show significant correlations. Future studies might adopt a theory-building approach and collect longitudinal data to improve our understanding of EMR adoption.

Furthermore, while the limited number of observations is sufficient to determine the lack of institutional influences on professionals' decision-making, we suggest future studies to expand the pool of hospitals in the dataset in order to confirm our results as well as explore the role of possible contingent factors affecting the EMR use.

We focused on purpose on highly mature hospitals in term of EMR to clearly isolate the linkages targeted in our theoretical model and rule out potential confounding factors due to early stage adoption or implementation issues. Therefore, in the future a more heterogeneous sample might shed light on the differences between best performers and laggards.

Finally, while healthcare is a paradigmatic context for generalizing our findings to other professional organizations (e.g., schools, consultancy companies, etc.), other, more traditional, organizations might present peculiar strategies to stimulate the use of new ICTs. We suggest that future studies might expand the set of organizations under investigation to increase the generalizability of results.

References

Abbott A. (1988) The System of Professions: An Essay on the Division of Expert Labor, Chicago (IL): University of Chicago Press.

Agarwal R., Prasad J. (1999) Are Individual Differences Germane to the Acceptance of New Information Technologies? Decision Sciences, Vol. 30, No. 2, pp. 361–391.

Ajzen I. (1991) The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, Vol. 50, No. 2, pp. 179–211.

Armstrong J.S., Overton T.S. (1977) Estimating Nonresponse Bias in Mail Surveys. Journal of Marketing Research, Vol. 14, No. 3, pp. 396–402.

Barczak G., Kahn K.B., Moss. R. (2006) An Exploratory Investigation of NPD Practices in Nonprofit Organizations. Journal of Product Innovation Management, Vol. 23, No. 6, pp. 512–27.

Barley S.R., Tolbert P.S. (1997) Institutionalization and Structuration: Studying the Links Between Action and Institution. Organization Studies, Vol. 18, No. 1, pp. 93–117.

Battilana J., D'Aunno T. (2009) Institutional Work and the Paradox of Embedded Agency, in: Lawrence T.B., Suddaby R., Leca B. (Eds.) Institutional Work: Actors and Agency in Institutional Studies of Organization, Cambridge (UK): Cambridge University Press, pp. 31–58.

Bauer T. N., Bodner T., Erdogan B., Truxillo D.M., Tucker J.S. (2007) Newcomer Adjustment During Organizational Socialization: A Meta-analytic Review of Antecedents, Outcomes, and Methods. Journal of Applied Psychology, Vol. 92, No. 3, pp. 707.

Besharov M.L., Smith W.K. (2014) Multiple Institutional Logics in Organizations: Explaining Their Varied Nature and Implications. Academy of Management Review, Vol. 39, No. 3, pp. 364–381.

Butler T. (2011) Compliance with Institutional Imperatives on Environmental Sustainability: Building Theory on the Role of Green IS. Journal of Strategic Information Systems, Vol. 20, No. 1, pp. 6–26.

Cable D.M., Parsons C.K. (2001) Socialization Tactics and Person-Organization Fit. Personnel Psychology, Vol. 54, No. 1, pp. 1–23.

Chang I.C., Hwang H.G., Hung W.F., Li Y.C. (2007) Physicians' Acceptance of Pharmacokinetics-based Clinical Decision Support Systems. Expert Systems with Applications, Vol. 33, No. 2, pp. 296–303.

Chau PYK., Hu PJ. (2002) Examining a Model of Information Technology Acceptance by Individual Professionals: An Exploratory Study. Journal of Management Information Systems, Vol. 18, pp. 191–229.

Chin W.W., Marcolin B.L., Newsted P.R. (2003) A Partial Least Squares Latent Variable Modelling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study. Information Systems Research, Vol. 14, No. 2, pp. 189–217.

Chung J.E., Park N., Wang H., Fulk J., McLaughlin M. (2010) Age Differences in Perceptions of Online Community Participation Among Non-users: An Extension of the Technology Acceptance Model. Computers in Human Behavior, Vol. 26, No. 6, pp. 1674–1684.

Currie G., Suhomlinova O. (2006) The Impact of Institutional Forces Upon Knowledge Sharing in the UK NHS. Public Administration, Vol. 84, No. 1, pp. 1–30.

Currie W.L. (2012) Institutional Isomorphism and Change: The National Programme for IT–10 Years On. Journal of Information Technology, Vol, 27, No. 3, pp. 236–248.

Damschroder L.J., Aron D.C., Keith R.E., Kirsh S.R., Alexander J.A., Lowery J.C. (2009) Fostering Implementation of Health Services Research Findings into Practice: A Consolidated Framework for Advancing Implementation Science. Implementation Science, Vol. 4, No. 5, pp. 50–64.

Davis F.D. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, Vol. 13, No. 3, pp. 319–339.

Davis F.D., Bagozzi R.P., Warshaw P.R. (1989) User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science, Vol. 35, No. 8, pp. 982–1003.

Ferreira A., Otley D. (2009) The Design and Use of Performance Management Systems: An Extended Framework for Analysis. Management Accounting Research, Vol. 20, No. 4, pp. 263–282.

Fishbein M., Ajzen I. (1975) Belief, attitude, intention and behavior: An introduction to theory and research, Reading (MA): Addison-Wesley.

Fornell C., Larker D.F. (1981) Structural Equation Models With Unobservable Variables and Measurement Error: Algebra and Statistics. Journal of Marketing Research, Vol. 18, No. 3, pp. 383–388.

Freidson E. (1988) Profession of Medicine, Chicago (IL): University of Chicago Press.

Frohlich M.T. (2002) Techniques for Improving Response rates in OM Survey Research. Journal of Operations Management, Vol. 20, No. 1, pp. 53–62.

Frooman J. (1999) Stakeholder Influence Strategies. Academy of Management Reviews, Vol. 24, No. 2, pp. 191–205.

Gastaldi L., Corso M. (2012) Smart Healthcare Digitalization: Using ICT to Effectively Balance Exploration and Exploitation Within Hospitals. International Journal of Engineering Business Management, Vol. 4, Special Issue on Digital and Mobile Economy, pp. 1–13.

Gastaldi L., Lettieri E., Corso M., Masella C. (2012) Performance Improvement in Hospitals: Leveraging on Knowledge Asset Dynamics Through the Introduction of an Electronic Medical Record. Measuring Business Excellence, Vol. 16, No 4, pp. 14–30.

Gastaldi L., Pietrosi A., Lessanibahri S., Paparella M., Scaccianoce A., Provenzale G., Corso M., Gridelli B. (2018) Measuring the Maturity of Business Intelligence in Healthcare: Supporting the Development of a Roadmap Toward Precision Medicine within ISMETT Hospital. Technological Forecasting and Social Change, Vol. 128, No. 1, pp. 84–103.

Grafton J., Lillis A.M., Widener S.K. (2010) The Role of Performance Measurement and Evaluation in Building Organizational Capabilities and Performance. Accounting, Organizations and Society, Vol. 35, No. 7, pp. 689–706.

Gupta B., Dasgupta S., Gupta A. (2008) Adoption of ICT in a Government Organization in a Developing Country: An Empirical Study, Journal of Strategic Information Systems, Vol. 17, No. 2, pp. 140–154.

Harman H. (1967) Modern Factor Analysis. Chicago: University of Chicago Press.

Häyrinen K., Saranto K., Nykänen P. (2008) Definition, Structure, Content, Use and Impacts of Electronic Health Records. International Journal of Medical Informatics, Vol. 77, No. 5, pp. 291–304.

Holm P. (1995) The Dynamics of Institutionalization: Transformation Processes in Norwegian Fisheries. Administrative Science Quarterly, Vol. 40, No. 3, pp. 398–422.

Jensen T.B., Kjærgaard A., Svejvig P. (2009) Using Institutional Theory with Sensemaking Theory: A Case Study of Information System Implementation in Healthcare. Journal of Information Technology, Vol. 24, No. 4, pp. 343–353.

Karahanna E., Straub D.W. (1999) The Psychological Origins of Perceived Usefulness and Ease-of-Use, Information and Management, Vol. 35, No. 4, pp. 237–250.

Kellogg K.C. (2009) Operating Room: Relational Spaces and Microinstitutional Change in Surgery. American Journal of Sociology, Vol. 115, No. 3, pp. 657–711.

Khoja S., Scott R.E., Casebeer A.L., Mohsin M., Ishaq A.F.M., Gilani S. (2007) e-Health Readiness Assessment Tools for Healthcare Institutions in Developing Countries. Telemedicine and e-Health, Vol. 13, No. 4, pp. 425–432.

Lai V.S., Li H. (2005) Technology Acceptance Model for Internet Banking: An Invariance Analysis. Information and Management, Vol. 42, No. 2, pp. 373–386.

Lankton N., McKnight D.H., Thatcher J.B. (2014) Incorporating Trust-in-Technology into Expectation Disconfirmation Theory. Journal of Strategic Information Systems, Vol. 23, No. 2, pp. 128–145.

Lawrence T.B., Suddaby R. (2006) Institutions and Institutional Work, in: Clegg S.R., Hardy C., Lawrence T.B., Nord W.R. (Eds.) Handbook of Organization Studies, London (UK), Sage, pp. 215–254.

Lawrence T.B., Suddaby R., Leca B. (2009) Institutional Work: Actors and Agency in Institutional Studies of Organizations, Cambridge (UK): Cambridge University Press.

Leca B., Battilana J., Boxenbaum E. (2008) Agency and Institutions: A Review of Institutional Entrepreneurship. Working Paper 08-096. Harvard Business School.

Legris P., Ingham J., Collerette P. (2003) Why Do People Use Information Technology? A Critical Review of the Technology Acceptance Model. Information and Management, Vol. 40, No. 3, pp. 191–204.

Lewis W., Agarwal R., Sambamurthy V. (2003) Sources of Influence on Beliefs about Information Technology Use: An Empirical Study of Knowledge Workers. MIS Quarterly, Vol. 27, No. 4, pp. 657–678.

Llewellyn S. (2001) Two-Way Windows. Organization Studies, Vol. 22, No. 4, pp. 593–623.

Malmi T., Brown D.A. (2008) Management Control Systems as a Package—Opportunities, Challenges and Research Directions. Management Accounting Research, Vol. 19, No. 4, pp. 287–300.

Micelotta E.R., Washington M. (2013) Institutions and Maintenance: The Repair Work of Italian Professions. Organization Studies, Vol. 34, No. 8, pp. 1137–1170.

Mignerat M., Rivard S. (2009) Positioning the Institutional Perspective in Information Systems Research, Journal of Information Technology, Vol. 24, No. 4, pp. 369–391.

Morris M.G., Venkatesh V. (2000) Age Differences in Technology Adoption Decisions: Implications for a Changing Work Force. Personnel Psychology, Vol. 53, No. 2, pp. 375–403.

Mura M., Lettieri E., Radaelli G., Spiller N. (2013) Promoting Professionals' Innovative Behavior through Knowledge Sharing: The Moderating Role of Social Capital. Journal of Knowledge Management, Vol. 17, No. 4, pp. 527–544.

Mura M., Lettieri E., Radaelli G., Spiller N. (2016) Behavioural Operations in Healthcare: A Knowledge Sharing Perspective. International Journal of Operations and Production Management, Vol. 36, pp. 122-124.

Muzio D., Brock D.M., Suddaby R. (2013) Professions and Institutional Change: Towards an Institutionalist Sociology of the Professions. Journal of Management Studies, Vol. 50, No. 5, pp. 699–721.

Nilsen P. (2015) Making Sense of Implementation Theories, Models and Frameworks. Implementation Science, Vol. 10, No. 1, pp. 53–65.

Oh L., Teo H.H., Sambamurthy V. (2012) The Effects of Retail Channel Integration Through the Use of Information Technologies on Firm Performance. Journal of Operations Management, Vol. 30, pp. 368–381.

Oliver C. (1991) Strategic Responses to Institutional processes. Academy of Management Review, Vol. 16, No. 1, pp. 145–179.

Pai F.Y., Huang K.I. (2011) Applying the Technology Acceptance Model to the Introduction of Healthcare Information Systems. Technological Forecasting and Social Change, Vol. 78, No. 4, pp. 650–660.

Peng D.X., Lai F. (2012). Using Partial Least Squares in Operations Management Research: A Practical Guideline and Summary of Past Research. Journal of Operations Management, Vol. 30, pp. 467–480.

Podsakoff P.M., MacKenzie S.B., Lee J.Y., Podsakoff N.P. (2003) Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. Journal of Applied Psychology, Vol. 88, No. 5, pp. 879-903.

Pozzebon M. (2004) The Influence of a Structurationist View on Strategic Management Research. Journal of Management Studies, Vol. 41, No. 2, pp. 247–272.

Radaelli G., Currie G., Frattini F., Lettieri E., (2017) The Role of Managers in Enacting Two-Step Institutional Work for Radical Innovation in Professional Organizations. The Journal of Product Innovation Management, 34, pp. 450–470

Ravlin E.C., Meglino B.M. (1987) Issues in Work Values Measurement, in: Frederick W.C. (Ed.) Research in Corporate Social Performance and Policy (Vol. 9), Greenwick (CT): JAI Press, pp. 153-183

Ryu S., Ho S.H., Han I. (2003) Knowledge Sharing Behavior of Physicians in Hospitals. Expert Systems with Applications, Vol. 25, No. 1, pp. 113–122.

Schein E.H. (2010) Organizational Culture and Leadership (Vol. 2). London: John Wiley & Sons.

Scott W.R. (1995) Institutions and Organizations, Thousands Oaks (CA): Sage

Scott W.R. (2001) Institutions and Organizations (2nd Ed.), Thousands Oaks (CA): Sage.

Scott W.R. (2003) Institutional Carriers: Reviewing Modes of Transporting Ideas Over Time and Space and Considering their Consequences. Industrial and Corporate Change, Vol. 12, No. 4, pp. 879–894.

Scott W.R. (2008) Lords of the Dance: Professionals as institutional agents. Organization Studies, Vol. 29, No. 2, pp. 219–238.

Suddaby R., Viale T. (2011) Professionals and Field-level Change: Institutional Work and the Professional Project. Current Sociology, Vol. 59, No. 4, pp. 423-442.

Tate M., Evermann J., Gable G. (2015) An Integrated Framework for Theories of Individual Attitudes Toward Technology. Information and Management, Vol. 52, No. 6, pp. 710–727.

Thomas P., Hewitt J. (2011) Managerial Organization and Professional Autonomy: A Discourse-based Conceptualization, Organization Studies, Vol. 32, No. 10, pp. 1373–1393.

Tolbert P.S., Zucker L.G. (1999) The Institutionalization of Institutional Theory. In S.R. Clegg, C.Hardy (Eds). Studying Organization. Theory & Method. London, Thousand Oaks, pp. 169–184.

Tucker A.L., Nembhard I.M., Edmondson A.C. (2007) Implementing New Practices: An Empirical Study of Organizational Learning in Hospital Intensive Care Units. Management Science, Vol. 53, No. 6, pp. 894–907.

Venkatesh V., Davis F.D. (2000) A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Studies. Management Science, Vol. 46, No. 2, pp. 186–204.

Venkatesh V., Morris M.G. (2000) Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior. MIS Quarterly, Vol. 24, No. 1, pp. 115-139.

Venkatesh V., Morris M.G., Davis G.B., Davis F.D. (2003) User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, Vol. 27, No. 3, pp. 425–478.

von Nordenflycht A. (2010) What is a Professional Service Firm? Toward a Theory and Taxonomy of Knowledge-Intensive Firms. Academy of Management Review, Vol. 35, No. 1, pp. 155–174.

Wade V, Gray L. Carati C. (2017) Theoretical Frameworks in Telemedicine Research. Journal of Telemedicine and Telecare, Vol. 23, No. 1, pp. 181–187.

Walsh I. (2014) A Strategic Path to Study IT Use Through Users' IT Culture and IT Needs: A Mixed-method Grounded Theory. Journal of Strategic Information Systems, Vol. 23, No. 1, pp. 146–173.

Walter Z., Lopez M.S. (2008) Physician Acceptance of Information Technologies: Role of Perceived Threat to Professional Autonomy. Decision Support Systems, Vol. 46, No. 1, pp. 206–215.

Yuen A.H., Ma W.W. (2002) Gender Differences in Teacher Computer Acceptance. Journal of Technology and Teacher Education, Vol. 10, No. 3, pp. 365-382.