INSTITUTIONAL AND INDIVIDUAL FACTORS AS ANTECEDENTS OF HEALTHCARE DIGITAL SOLUTION ACCEPTANCE

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ABSTRACT

Digital transformation has profoundly impacted the healthcare sector by enriching service delivery, renovating business models, revising organizational configurations and processes. Through an exploratory research design, this study focuses on the interplay between institutional and individual factors to explain which ones may influence the use of a digital solution among health professionals within hospitals. Data have been collected through a survey administered to nursing coordinators in an Italian hospital. Results show that the key factors predicting the intention of using a digital solution in professional settings are the peer influence of colleagues and the perceived usefulness of the solution. Theoretical and empirical implications are discussed.

Keywords*: Technology Acceptance Model; Institutional factors; Individual factors; Perceived usefulness; Perceived ease of use*

1. INTRODUCTION

Digitalization has contributed in reshaping the healthcare industry by enriching service delivery (De Benedictis et al., 2020; Gastaldi et al., 2018), renovating business models (Baird & Raghu, 2015), revising organizational configurations (Hossain et al., 2019) and processes (Jussupow et al., 2021).

Digitalization of healthcare has gained a momentum after the outbreak of the Covid-19 pandemic, as digital technologies allowed to delivering healthcare services remotely (Ting et al., 2020) or enhanced decision making related to Covid-19 (Gudigar et al., 2021). However, the rapid diffusion of digital technologies in healthcare organizations has created disorganised knowledge on the matter, revealing how digital transformation in healthcare represents a promising research steam for theory and practice (Kraus et al., 2021).

As the need for digital innovation in hospitals is evident (Cucciniello et al., 2016; Lettieri & Masella, 2006), more effort is needed to explain the organizational and managerial implications of their adoption (Kraus et al., 2021). In fact, the mechanisms guiding the adoption and continuative use of digital technologies within these organisations remain a not fully understood issue (Gastaldi et al., 2018), as it has been explained recurring to different, often conflicting, theoretical perspectives. Previous *works* (Butler, 2011), especially concerning professional organizations, focused on the role played by institutional arrangements in terms of individual behaviours through a complex combination of regulations, social norms and cultural systems. According to these studies, the employees' decision to engage with new technologies and, consequently, with new practices, is not based on their rational thinking, but it is mainly affected by the influence of the overarching structures, rules, social norms and culture in which they are embedded (Radaelli et al., 2017).

Conversely, information systems research has mostly adopted user acceptance models, derived from the seminal Technology Acceptance Model (TAM) by Davis (1989).

According to this research stream, the adoption of novel technologies is the result of the rational evaluations made by employees on their usefulness and ease of use and social pressures that are relevant when exercised by peers, in particular in professional organizations.

As a result, the current understanding of what drives the adoption and continuative use of digital technologies in professional organizations is still hazy (Kraus et al., 2021). In this sense, scholars and practitioners might investigate to what extent user acceptance models and institutional frameworks might be integrated into a unique, coherent theory to explain professionals' engagement into new behaviours and practices as a result of the adoption of new digital solutions.

From this perspective the healthcare sector represents an interesting case to be investigated, as the workforce is made up of professionals, endowed with expert knowledge that is inaccessible to managers, who thus cannot easily mandate change or new practices (Åmo, 2006). In this sense, doctors and nurses have considerable autonomy concerning innovations and the related changes in their professional practice (Barczak et al., 2006; Mura et al., 2016) and they engage with new technologies when they "accept" them rationally, as well as the consequences of their adoption. Acceptance is the consequence of two main factors: perceived ease of use and perceived usefulness, both rationally evaluated by individuals (Davis, 1989). However, hospitals are institutionalized settings, where social norms, culture, rituals and languages bound behaviours and practices of professionals (Jacobs et al., 2013).

Considering these premises, this paper aims at analysing to what extent institutional arrangements and rational evaluations might coexist and affect each other, and which strategies hospital managers should design and implement to promote and sustain the adoption and continuative use of digital solutions.

To assess this gap, this study elaborates and tests a model aimed at revealing the potential interplay between rational and institutional factors. Through an exploratory research design, we developed a theoretical model grounded on both user acceptance models and institutional theories. Consequently, a questionnaire has been elaborated and administered to a sample of 132 healthcare professionals in a large hospital in Northern Italy. Results shed light both on the role of institutional and individual factors in influencing individuals' intention to use new technologies within a healthcare organisation.

The paper is organized as follows. Firstly, the main aspects concerning the theoretical background are presented, including technology acceptance models and the role of institutional factors influencing acceptance, along with the stemming conceptual framework which is hypothesized. In the methodology section, we describe our explorative approach and the quantitative techniques used in analysing data. Afterwards, results are presented, introducing the main implications for managers and researchers. Finally, we conclude with suggestions for future research along with the limitations of our study.

2. THEORETICAL BACKGROUND

2.1 TECHNOLOGY ACCEPTANCE: AN OVERVIEW

Institutional and individual perspectives elicit different strategies for the adoption of new digital solutions. The institutional perspective 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). By contrast, user acceptance models suggest for strategic and promotional interventions that fit individuals' self-determination and rationality, reinforcing their perceptions of ease of use and usefulness respect to processes, structures and/or other technologies (Gastaldi et al., 2019).

Both research streams have independently tried to incorporate elements of the other stream to enrich their explanatory power. User acceptance models have increasingly explored the effects of social influences and organisational conditions on user acceptance as well as their effects on the perceived usefulness (Chang et al., 2007; Tate et al., 2015), consolidating new theories such as TAM2 (Venkatesh & Davis, 2000) or UTAUT (Venkatesh et al., 2003). Similarly, recent institutional studies argued that the institutional influences are not "cognitively totalising structures [and] even when actors are subject to institutional influences, they can develop a practical consciousness" (Battilana & D'Aunno, 2009). It is conceded that individuals' self-determination – constrained and bounded as it might be – plays a significant role even in highly-institutionalised settings (Radaelli et al., 2017).

Although these valuable efforts, the discussion about the value of integrating the two theoretical perspectives is still fragmented and far from a shared understanding. Scholars from information science incorporated social influences and organisational conditions without discussing the underlying assumptions of the theories where they stem from (Lewis et al., 2003), 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 organisational studies incorporated elements from information science to explain the behaviour of organisations – the locus of their research – overlooking the micro-level perspective about the choices made by individuals (Jensen & Aanestad, 2007; Mignerat & Rivard, 2009). Recent contributions (De Benedictis et al., 2020) investigated their explanatory power either as competitive or integrated theories. Against this background, this study aimed at gathering novel insights on which mechanisms drive the adoption and continuative use of novel digital solutions within hospitals by integrating user acceptance and institutional models.

Among the user acceptance models, the Technology Acceptance Model (Davis, 1989), focuses on modelling computer users and showing the variables influencing the possible acceptance and adoption of new technologies, on the basis of individuals' perceived usefulness as individuals' "degree to which a person believes that using a particular system would enhance their job performance", and individuals' perceived ease in terms of "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989). According to the model, such two variables are able to influence together individuals' intention to use digital solution. Moreover, institutional theory, which recognizes the significant organizational effects associated with the increase of cultural and social forces (Hillebrand et al., 2011), is at the basis of the three forces that constitute the developed institutional systems discussed by Scott (Scott, 2008) as the key elements that, associated with activities and resources, offer stability and meaning to social life. In particular, individuals are embedded in institutional pillars limiting the scope of their rational assessment and direct the engagement of specific behaviours in terms of regulative pillars, normative pillars, and cultural pillars. Specifically, while regulative pillars regard the existence of regulations, rules and processes whose breach is monitored and sanctioned, normative pillars introduce a social dimension of appropriate behaviours in the organization; conversely cultural pillars emphasize the use of common schemes, frames, and other shared symbolic representations that create an attachment to the appropriate behaviour.

By considering these premises, in the context of this paper we decided to consider the peer influence among hospital colleagues as a normative factor, as did by Gastaldi et al., 2019, not focusing on cultural pillar since respondents had highly similar cultural background.

2.2 INDIVIDUAL FACTORS

The role of user-related characteristics and individual differences has been widely debated in literature among several industries (Agarwal & Prasad, 1999; Burton-Jones & Hubona, 2005).

Similarly, different approaches investigated the phenomenon of technology acceptance, since the Technology Acceptance Model, TAM (Davis, 1989) and its subsequent versions TAM 2 and TAM 3 (Venkatesh et al., 2003) the UTAUT model "Unified Theory of Acceptance and Use of Technology", and UTAUT 2 (Venkatesh et al., 2003, 2012).

TAM represents an effective model for understanding the choices of acceptance of technologies by the users involved. Indeed, by considering the model characteristics, contrary to the TAM2 and UTAUT models, which limit institutional factors to peer-related social norms, the TAM model seems to be the most suitable for the purpose of this work. The model suggests that users who must interact with new technologies are influenced by some individual factors that determine how and when they will use the new tools. In the original proposition, the TAM model (Davis, 1989), explains the intentions and behaviours related to the use of technologies based on two individual-related variables in terms of perceived usefulness and perceived ease of use. Thus, while perceived usefulness influences the degree to which individuals believe that adopting a particular system would enhance their performance of their job, the perceived ease of use refers to the degree to which individuals believe that adopting a particular digital system would be free from effort. Simplifying, while perceived usefulness measures individuals' possible utility in terms of ability of a digital solution to be used advantageously, the perceived ease of use measures the complexity of using the digital solution, and thus the difficulty level or the required effort in using such solutions. This implies that individuals tend to use new technologies on the basis of their beliefs referred to the possibility of doing a better job. Furthermore, even if the potential user believes that a given technological tool may be useful, they may, at the same time, believe that digital solutions, and generally new technologies, may be difficult to use and that the effort required to use it can be offset by the benefits he derives from it (Davis, 1989). Thus, we hypothesize that:

H1. Individual factors in terms of perceived usefulness, and perceived ease of use, positively and directly affect individuals' intention to use digital solutions.

H2. Individuals' perceived ease of use positively influences their perceived usefulness.

2.3 INSTITUTIONAL FACTORS

From an organizational perspective, research has revealed how the use of technology may affect the employees' well-being and performance, also through the interaction between peers and managers. Indeed, human resources are functional to the achievement of business objectives, to the reduction of work demands and related physiological and psychological costs, or to stimulate personal growth, learning, and development

(Demerouti et al., 2001). Work resources, and generally employees at all levels, may have a motivational potential that facilitates work involvement and can lead to excellent performance. Thus, the role of the organization's expectations and peer influences could be central in the adoption of digital solutions. For instance, according to Cheung & Vogel (2013), the determinants of the technology acceptance model are the major factors influencing the adoption of the technology, and the peers influence significantly affects the relationship between individuals' attitude and intention to use digital technologies. More specifically:

H3. Institutional factors in terms of organizations' expectations and peer influence, positively and directly affect individual factors and their intention to use digital solution.

H4. Organizations' expectations positively affect peer influence.

Figure 1 describes our theoretical model and the four hypotheses. Our conceptual framework also includes two control variables that are consistent with past research on user acceptance models (Agarwal & Prasad, 1999; Morris & Venkatesh, 2000), which suggest that professional age may be negatively correlated with the use of technologies e.g., for by considering that younger individuals are more familiar and open to new technologies (Chung et al., 2010), and that there might be differences in the acceptance of technologies when the complexity in terms of number of medical devices to be managed is higher.

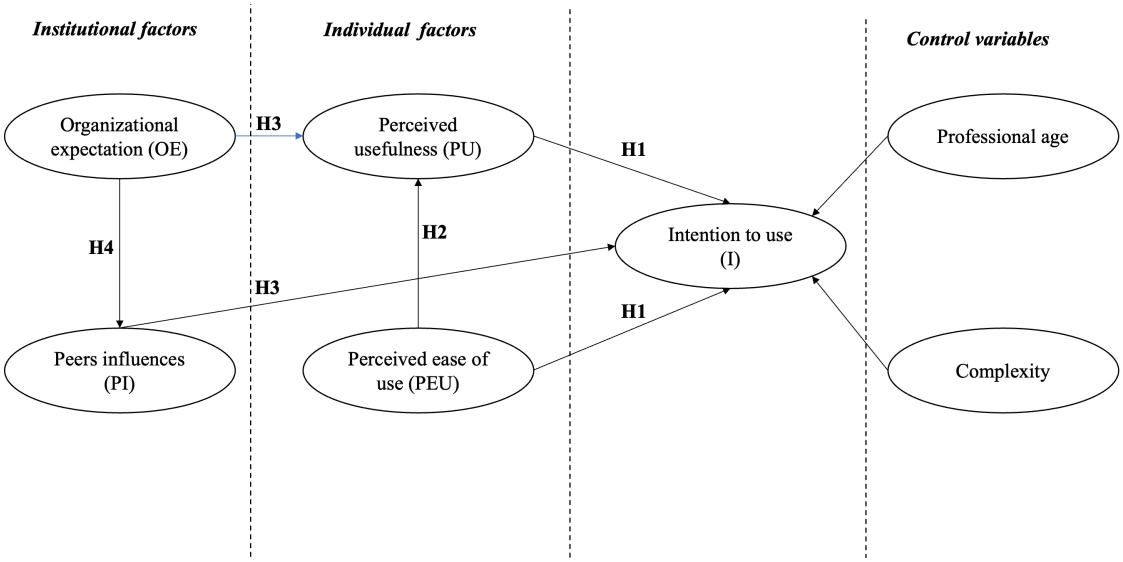

Figure 1. The proposed conceptual framework

3. MATERIALS AND METHODS

To test the proposed conceptual framework and our hypotheses, we administered a survey to a sample of health professionals enrolled in an Italian hospital, which was chosen as the research setting. The choice of a unique research setting offers the opportunity to avoid confounding factors due to the heterogeneity that different hospitals might show in terms of different strategies, legacy, professionals' behaviours, and technology infrastructure (Yin, 2014). The digital solution under investigation is a

medical technology management software to be daily used by department nursing coordinators in order to report medical equipment failures or to monitor the corrective and preventive maintenance of the medical equipment of the hospital. The assessment was based on a questionnaire delivered within the hospital. A convenience sampling strategy was adopted, in particular the non-probability sampling method, which is based on data collection from a population of members who were conveniently willing to be involved in the study (coordinators of departments of one leading Italian hospital).

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 intention to use of the digital solution have been derived and adapted from Venkatesh et al. (2003). Measures associated with institutional factors have been derived from Gastaldi et al. (2019). In this study the organisational expectations as a regulative pillar and referring to the degree of adhesion to the expectations of the Clinical Engineering Department (CED) goals. All indicators were measured using a 7-point Likert scale as in Davis (1989). There were preliminary assessments of the questionnaire and pre-tested it with face-to-face discussions with hospital 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.

Data were collected from nursing coordinators of departments one hospital in Northern Italy. The questionnaire has been administered online together with a cover letter highlighting the study goal. The cover letter also clarified that the questionnaire was related to an academic research project, whose success was dependent on accurate and objective responses.

A reminder by email after the first week and by telephone after 10 days were enacted. After two weeks, a second reminder was sent by email. 164 subjects were contacted and 137 complete answers were collected. The number of actual respondents confirms, as highlighted in previous studies, the difficulty to collect primary data from hospital professionals (Mura et al., 2013).

To test the proposed conceptual model by leveraging on the collected data, the Structural Equation Modelling method (Hoyle, 1995). has been implemented. We adopted Anderson & Gerbing (1988) comprehensive, two-step analytical strategy to test the hypothesized model presented in Figure 1. In addition, we have also given the Comparative Fix Index (CFI; Bentler, 1990), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) to gage model fit. CFI was considered to be the best approximation of the population value for a single model, with values greater than or equal to 0.90 considered indicative of good fit (Medsker et al., 1994). The SRMR is a standardized summary of the average covariance residuals. A favorable value is less than 0.10 (Kline, 1998). The RMSEA is a measure of the average standardized residual per degree of freedom. A favorable value is less than or equal to 0.08, and values less than or equal to 0.10 are considered “fair” (Browne & Cudeck, 1989). The statistical analyses have been performed by using the software Stata 14.1®.

4. RESULTS

Regarding Cronbach’s α (Table 1), all scales exhibited good reliability because considering a p-value < 0.05 as significant, thus showing α values above the threshold of .70 (Nunnally, 1994).

Variable	Code	Cronbach's α	AVE	CR
Intention to use	*I*	0.95	0.8402	0.9544
Perceived usefulness	*PU*	0.93	0.6956	0.9320
Perceived ease of us	*PEOU*	0.94	0.7425	0.9452
Organisational Expectations	*OE*	0.93	0.7519	0.9236
Peer Influence	*PI*	0.95	0.8653	0.9506

Table 1. Measurement properties of constructs (Cronbach's Alpha, AVE and CR)

As depicted in Table 1, the validity of convergence has been measured through Average Variance Extracted (AVE) and Construct Reliability (CR). We controlled that both composite reliability (CR) and average variance extracted (AVE) were above the recommended threshold of 0.7 and 0.5 respectively (Fornell & Larcker, 1981).

	OE	***PI***	***PU***	***PEOU***	***I***
OE	0.8671				
PI	0.7157	0.9302			
PU	0.7763	0.6406	0.8340		
PEOU	0.5067	0.3590	0.5810	0.8617	
I	0.7590	0.6615	0.8000	0.5125	0.9166

Table 2. Correlation Matrix

To further test for discriminant validity, we compared the squared correlation between two latent constructs and their AVE estimates (Fornell & Larcker, 1981). These constructs meet the validity condition of the AVE estimates exceeding the squared correlation between each pair of constructs (Table 2).

The perceived usefulness has a significant influence on the intention to use (β = 0.59) and greater than all the other paths to the intention. The hypothesis of the direct influence of the perceived ease of use on the intention to use, instead, is not supported, while it is supported the hypothesis of the ease of use on the perceived usefulness (β = 0.25). The peers influence, instead, significantly affects the intention, with a coefficient of 0.25, while the impact on perceived usefulness is not significant. The organization's expectations have a significant effect on both perceived usefulness and peers influence, in both cases with very high β values (0.55 and 0.72 respectively). Coordinators who therefore perceive a pressure from Clinical Engineering department sharing common objectives, are more likely to perceive the usefulness of the investigated technology management medical software, with respect to those who do not care or do not share the expectations of Clinical Engineering department. In addition, the expectations of Clinical Engineering department have a strong impact on the Peer influence and therefore on the social pressure among the coordinators. Finally, that none of the two control variables included in the model has a significant effect on the intention.
Figure 2 shows the synthetic results of the hypotheses testing.

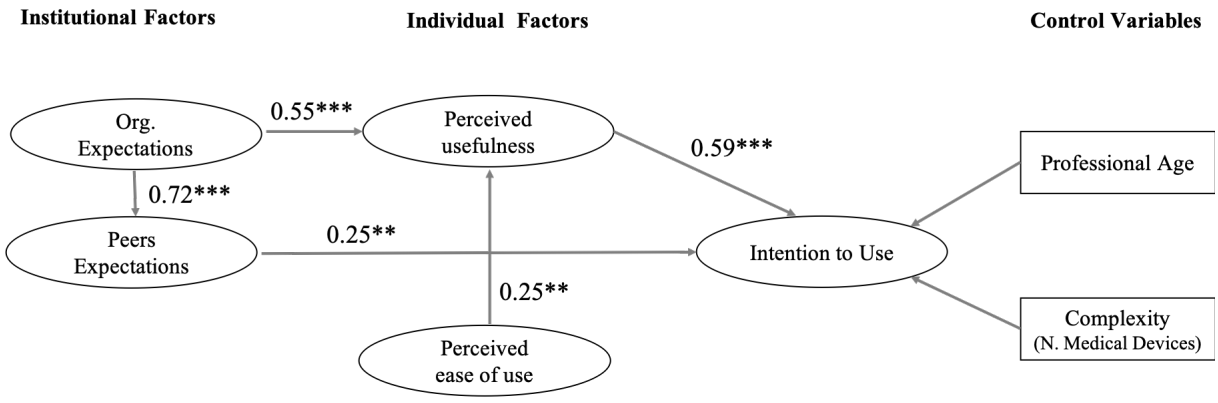

Figure 2 – Results of the Path Model
Notes: *** = p < 0.001; ** = p > 0.01; * p < 0.05

5. DISCUSSION AND IMPLICATIONS

Results show that the coordinators' intention to use the software is mainly influenced by their perception of the software's usefulness, which is the main factor influencing the actual usage. Users, therefore, tend to form their own intention to use a system, in this case, technology management software, mainly on their expectation that the medical technology management software itself will increase their performance. The coordinator tends to be more "pragmatic" in their decisions to use the proposed software, and consequently accepts a technology based on the evaluation of usefulness rather than that of ease of use. The nursing coordinator, as a professional figure, is thus more comparable to physicians rather than other nurses (such as first-line). In other words, a coordinator will use a technology when s/he considers it useful for their routine activities, and is willing to learn how to use it, even if this may require an extra effort.

Secondly, institutional factors also have an impact, albeit less important, on intention. The influence and pressure exerted on a coordinator by his peers influence their intention to use the medical technology management software Therefore, the coordinators form their own intention to use the proposed software also on the basis of the potential benefits in terms of reputational image and social status that would result from its use. The perceived usefulness is influenced by two other factors: the expectations of the organization and the perceived ease of use. A coordinator thus builds their evaluation about the usefulness of the technology primarily based on the expectations that the Clinical Engineering department has towards the coordinators. The coordinators then, as hypothesized by Gastaldi et al. (2019), exploit their knowledge to mediate institutional pressures and influences and make individual decisions about a new technology. Moreover, the perceived usefulness is conditioned by the perceived ease of use of the departmental management software in general. The intention of use is also influenced, albeit to a lesser extent, by the social pressure within the group of hospital coordinators. In detail, when a coordinator perceives that the organization expects them to adopt a specific technology, s/he also feels the pressure from of their peers. The expectations of the organization, therefore, are also perceived by the rest of the coordinators, which, as a group, exerts a social pressure on the individual member to foster the use of that medical technology management software. The pressure at the organizational level, then, is transferred at group level and, subsequently, at the individual level. In this sense, the coordinator is not fully comparable to the physician: if the doctor is not influenced by the

opinions of others, the coordinator also evaluates the suggestions and the indications of their peers to make decisions regarding the use of a technology. What other coordinators think about the software, therefore, may influence the intention of use of a coordinator, who still does not have the permission to use the software as well. The influence of peers, however, does not significantly impact perceived usefulness: if a coordinator perceives a social pressure from peers to use the technology management software, it directly impacts on the intention to have and therefore to use it.

Our findings support our hypotheses, by confirming that both theoretical perspectives have proved to be able to explain the intention of professionals to use new technologies and the explanatory power due to the interplay between individual and institutional factors. Furthermore, our study shed the light on the different role of organisational expectations as regulative pillar and peer influence as normative pillar.

6. Conclusions

This study sought to better clarify the relationship between institutional and individual factors of the intention to use a technology management medical software in a hospital setting by department coordinators. Our results confirmed the positive role played by the perceived usefulness as driving individual factor to the intention to use the medical technology management software confirming the relevance of the adoption of TAM models in the healthcare sector. In the study, the institutional factors (organisation's expectations and peer influence), derived from institutional theory, is aimed at exploring the pressure that a hospital professional might perceive from the goals set by hospital managers. Findings shed light on the significant positive role played by the peer influence factor as institutional factor supporting previous studies in clarifying the relationship between the two theories, i.e. whether and how organizational expectations represent institutional factors that shape the perception of usefulness and ease of use towards isomorphism.

In line with previous study (Gastaldi et al., 2019) in the absence of coercive mechanisms, institutional pressures toward the medical technology management software use are primarily normative and/or mimetic. Hospitals are intended as professional bureaucracies where professionals feel more the pressures from peers rather than from managers. In this view, hospital managers can leverage on lead peer influence (i.e., innovation champions) to motivate, generate and manage change and generate a virtuous circle inside the hospital to motivate the use of the medical technology management software by department coordinators.

From the academic viewpoint, the study offers an original perspective that combines organizational theories and models of technology acceptance to explain the acceptance of a technology management medical software by ward coordinators in the hospital. In particular, the results confirm the importance of individual variables, not only as directly related to the acceptance of new technologies, but also as important mediators between institutional variables and acceptance, thus highlighting and confirming the importance of the connections between organizational studies and information science.

Despite the original contributions, this study suffers from at least two limitations that should be addressed by future research. First, the research project is based on a single case study, which may underpin the generalization of results.

We suggest replicating the study in other centres and/or to perform a multi-center study to explore the role that hospital characteristics in terms of strategy, legacy, etc. may have on the structuring of both the organization and the individual factors investigated in this study. Further research should consider hospitals where similar technology management medical software are already mature technologies, thus enabling the investigation of

actual use and what factors could facilitate / inhibit the translation of the intention to use into the actual use.

REFERENCES

Agarwal, R., & Prasad, J. (1999). Are Individual Differences Germane to the Acceptance of New Information Technologies? *Decision Sciences*, *30*(2), 361–391. https://doi.org/10.1111/j.1540-5915.1999.tb01614.x

Åmo, B. W. (2006). Employee innovation behaviour in health care: The influence from management and colleagues. *International Nursing Review*, *53*, 231–237. https://doi.org/10.1111/j.1466-7657.2006.00455.x

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411–423. https://doi.org/10.1037/0033-2909.103.3.411

Baird, A., & Raghu, T. S. (2015). Associating consumer perceived value with business models for digital services. *Eur. J. Inf. Syst.* https://doi.org/10.1057/ejis.2013.12

Barczak, G., Kahn, K. B., & Moss, R. (2006). An Exploratory Investigation of NPD Practices in Nonprofit Organizations. *Journal of Product Innovation Management*, *23*(6), 512–527. https://doi.org/10.1111/j.1540-5885.2006.00221.x

Battilana, J., & D'Aunno, T. (2009). Institutional work and the paradox of embedded agency. In B. Leca, R. Suddaby, & T. B. Lawrence (Eds.), *Institutional Work: Actors and Agency in Institutional Studies of Organizations* (pp. 31–58). Cambridge University Press. https://doi.org/10.1017/CBO9780511596605.002

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238–246. https://doi.org/10.1037/0033-2909.107.2.238

Browne, M. W., & Cudeck, R. (1989). Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research*, *24*(4), 445–455. https://doi.org/10.1207/s15327906mbr2404_4

Burton-Jones, A., & Hubona, G. S. (2005). Individual differences and usage behavior: Revisiting a technology acceptance model assumption. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, *36*(2), 58–77. https://doi.org/10.1145/1066149.1066155

Butler, T. (2011). Compliance with institutional imperatives on environmental sustainability: Building theory on the role of Green IS. *The Journal of Strategic Information Systems*, *20*(1), 6–26. https://doi.org/10.1016/j.jsis.2010.09.006

Chang, I., Hwang, H.-G., Hung, W., & Li, Y.-C. (2007). Physicians' acceptance of pharmacokinetics-based clinical decision support systems. *Expert Syst. Appl.* https://doi.org/10.1016/j.eswa.2006.05.001

Cheung, R., & Vogel, D. (2013). Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers & Education*, *63*, 160–175. https://doi.org/10.1016/j.compedu.2012.12.003

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*, *26*(6), 1674–1684. https://doi.org/10.1016/j.chb.2010.06.016

Cucciniello, M., Lapsley, I., & Nasi, G. (2016). Managing health care in the digital world: A comparative analysis. *Health Services Management Research*, *29*(4), 132–142. https://doi.org/10.1177/0951484816674032

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, *13*(3), 319–340. https://doi.org/10.2307/249008

De Benedictis, A., Lettieri, E., Gastaldi, L., Masella, C., Urgu, A., & Tartaglini, D. (2020). Electronic Medical Records implementation in hospital: An empirical investigation of individual and organizational determinants. *PLOS ONE*, *15*(6), e0234108. https://doi.org/10.1371/journal.pone.0234108

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499–512. https://doi.org/10.1037/0021-9010.86.3.499

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.2307/3151312

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*, *128*, 84–103. https://doi.org/10.1016/j.techfore.2017.10.023

Gastaldi, L., Radaelli, G., Lettieri, E., Luzzini, D., & Corso, M. (2019). Professionals' use of ICT in hospitals: The interplay between institutional and rational factors. *International Journal of Technology Management*, *80*(1–2), 85–106. https://doi.org/10.1504/IJTM.2019.099768

Gudigar, A., Raghavendra, U., Nayak, S., Ooi, C. P., Chan, W. Y., Gangavarapu, M. R., Dharmik, C., Samanth, J., Kadri, N. A., Hasikin, K., Barua, P. D., Chakraborty, S., Ciaccio, E. J., & Acharya, U. R. (2021). Role of Artificial Intelligence in COVID-19 Detection. *Sensors*, *21*(23), 8045. https://doi.org/10.3390/s21238045

Hillebrand, B., Nijholt, J. J., & Nijssen, E. J. (2011). Exploring CRM effectiveness: An institutional theory perspective. *Journal of the Academy of Marketing Science*, *39*(4), 592–608. https://doi.org/10.1007/s11747-011-0248-3

Hossain, A., Quaresma, R., & Rahman, H. (2019). Investigating factors influencing the physicians' adoption of electronic health record (EHR) in healthcare system of Bangladesh: An empirical study. *Int. J. Inf. Manag.* https://doi.org/10.1016/j.ijinfomgt.2018.09.016

Hoyle, R. H. (1995). The structural equation modeling approach: Basic concepts and fundamental issues. In *Structural equation modeling: Concepts, issues, and applications* (pp. 1–15). Sage Publications, Inc.

Jacobs, R., Mannion, R., Davies, H. T. O., Harrison, S., Konteh, F., & Walshe, K. (2013). The relationship between organizational culture and performance in acute hospitals. *Social Science & Medicine*, *76*, 115–125. https://doi.org/10.1016/j.socscimed.2012.10.014

Jensen, T. B., & Aanestad, M. (2007). Hospitality and hostility in hospitals: A case study of an

EPR adoption among surgeons. *European Journal of Information Systems*, *16*(6), 672–680. https://doi.org/10.1057/palgrave.ejis.3000713

Jussupow, E., Spohrer, K., Heinzl, A., & Gawlitza, J. (2021). Augmenting Medical Diagnosis Decisions? An Investigation into Physicians' Decision-Making Process with Artificial Intelligence. *Information Systems Research*, *32*(3), 713–735. https://doi.org/10.1287/isre.2020.0980

Kline, R. B. (1998). *Principles and practice of structural equation modeling* (pp. xiv, 354). Guilford Press.

Kraus, S., Schiavone, F., Pluzhnikova, A., & Invernizzi, A. C. (2021). Digital transformation in healthcare: Analyzing the current state-of-research. *Journal of Business Research*, *123*, 557–567. https://doi.org/10.1016/j.jbusres.2020.10.030

Lawrence, T. B., Suddaby, R., & Leca, B. (2009). Introduction: Theorizing and studying institutional work. In T. B. Lawrence, R. Suddaby, & B. Leca (Eds.), *Institutional Work* (pp. 1–28). Cambridge University Press. https://doi.org/10.1017/CBO9780511596605.001

Lettieri, E., & Masella, C. (2006). Measuring the value and sustainability of internet-based ICTs in healthcare organisations. *International Journal of Healthcare Technology and Management*, *7*(3/4), 319. https://doi.org/10.1504/IJHTM.2006.008439

Lewis, W., Agarwal, R., & Sambamurthy, V. (2003). Sources of Influence on Beliefs about Information Technology Use: An Empirical Study of Knowledge Workers. *MIS Quarterly*, *27*(4), 657–678. https://doi.org/10.2307/30036552

Medsker, G. J., Williams, L. J., & Holahan, P. J. (1994). A Review of Current Practices for Evaluating Causal Models in Organizational Behavior and Human Resources Management Research. *Journal of Management*, *20*(2), 439–464. https://doi.org/10.1177/014920639402000207

Mignerat, M., & Rivard, S. (2009). Positioning the Institutional Perspective in Information Systems Research. *Journal of Information Technology*, *24*(4), 369–391. https://doi.org/10.1057/jit.2009.13

Morris, M. G., & Venkatesh, V. (2000). Age Differences in Technology Adoption Decisions: Implications for a Changing Work Force. *Personnel Psychology*, *53*(2), 375–403. https://doi.org/10.1111/j.1744-6570.2000.tb00206.x

Mura, M., Lettieri, E., Radaelli, G., & Spiller, N. (2013). Promoting professionals' innovative behaviour through knowledge sharing: The moderating role of social capital. *Journal of Knowledge Management*, *17*(4), 527–544. https://doi.org/10.1108/JKM-03-2013-0105

Mura, M., Lettieri, E., Radaelli, G., & Spiller, N. (2016). Behavioural operations in healthcare: A knowledge sharing perspective. *International Journal of Operations & Production Management*, *36*(10), 1222–1246. https://doi.org/10.1108/IJOPM-04-2015-0234

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. *Journal of Product Innovation Management*, *34*(4), 450–470. https://doi.org/10.1111/jpim.12385

Scott, W. R. (2008). Approaching Adulthood: The Maturing of Institutional Theory. *Theory and Society*, *37*(5), 427–442.

Steiger, J. H. (1990). Structural Model Evaluation and Modification: An Interval Estimation

Approach. *Multivariate Behavioral Research*, *25*(2), 173–180. https://doi.org/10.1207/s15327906mbr2502_4

Tate, M., Evermann, J., & Gable, G. (2015). An integrated framework for theories of individual attitudes toward technology. *Information & Management*, *52*(6), 710–727. https://doi.org/10.1016/j.im.2015.06.005

Ting, D. S. W., Carin, L., Dzau, V., & Wong, T. Y. (2020). Digital technology and COVID-19. *Nature Medicine*, *26*(4), 459–461. https://doi.org/10.1038/s41591-020-0824-5

Venkatesh, Morris, Davis, & Davis. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425. https://doi.org/10.2307/30036540

Venkatesh, V., & Davis, F. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, *46*, 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, *36*(1), 157–178. https://doi.org/10.2307/41410412

Yin, R. K. (2014). *Case Study Research*. SAGE Publications.