The Cognitive Foundation of Healthcare Organizations' Digitalization:
The Behavioral Strategy Perspective

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Abstract

The digitalization of hospitals requires a collective effort from divergent professional groups (the management team, healthcare professionals and IT engineers) that have distinctive knowledge domains, professional interests and work routines. Understanding the cognition, emotion and social behavior across the groups is at the heart for the groups to seek common ground while reserving differences. Drawing on behavioral strategy theory, we reveal the dynamics of developing strategic actions for digitalization by involving actors with diverging interests in decisions. This contributes to our knowledge on healthcare digitalization by identifying the cognitive foundation at the individual and group levels. In so doing, our study extends behavioral strategy research by exploring the cognitive conditions that address the discordant interests of multiple actors in a decision and promote intra-organizational coalitions.

Introduction and theoretical background

An increasing number of public hospitals have embraced digital transformation in their strategic goals, considering it as a potential way of improving healthcare service quality and reducing healthcare cost (Agarwal et al., 2010; Fichman et al., 2011; Karahanna et al., 2019; Sánchez-Polo et al., 2019). Digitalization of healthcare organizations has been studied from different perspectives, such as the changes in organizational structure and institutional mechanisms due to the digital transformation in healthcare sector (Balasubramanian et al., 2021; Dhagarra et al., 2019), knowledge generation through emerging digital technologies (Foshay and Kuziemsky, 2014; Pavlou et al., 2007; Przhedetskiy et al., 2019; Wang et al., 2018; Wang et al., 2018) and adoption/resistance of digital technologies among healthcare professionals (Bhattacherjee and Hikmet, 2007; Panahi et al., 2016; Singh et al., 2018; Venkatesh et al., 2011). While these research streams have investigated the opportunities and challenges in embracing digital healthcare, they often look at the digitalization of hospitals at the organizational level. This neglects the complexities and dynamics of the strategic actions within the organization.

The digitalization of hospitals requires a collective effort from divergent professional groups, i.e. management teams, healthcare professionals and IT engineers. These three groups are characterized by stark differences in professional interests, working routines, pathways to career development and approaches to problem-solving (Davenport, 2005; Heugens and

Lander, 2009; Karahanna *et al.*, 2019; Kash *et al.*, 2013; Kim *et al.*, 2012; Sivagiri, 2019; Van Beveren, 2003; Wu and Hu, 2012), where tensions arise between the groups due to these differences. We argue that the strategic goal of digitalization drives them into a relationship that resembles a "forced marriage", requiring them to find ways to find common ground while maintaining their differences. Consequently, building bridges between the groups and forming the basis for their collaboration is riddled with conflicts and challenges. To address such conflicts and challenges, it is important to understand the human cognition, emotion, motivation, social interactions and network of the groups. Therefore, this study grounds the strategic actions of digitalization on realistic assumptions about human cognition, asking the question: *What are the cognitive mechanisms that bridge divergent professional groups and form the basis for inter-group coalitions?*

Behavioral strategy provides a useful theoretical lens to analyze the micro-foundation of cognitive and motivational conditions that allow the hospitals to pursue the strategic actions of digitalization. This study follows Powell et al. (2011) that argued "*behavioral strategy merges cognitive and social psychology with strategic management theory and practice. Behavioral strategy aims to bring realistic assumptions about human cognition, emotions, and social behavior to the strategic management of organizations and, thereby, to enrich strategy theory, empirical research, and real-world practice*" (p. 1371). Current empirical studies on behavioral strategy have focused on the cognition of a single decision actor/group, e.g. managers' emotion regulation that underpin their dynamic managerial capabilities (Hyu and Zott, 2019), workplace anger among employees (Gedes et al. 2020), emotions of top managers and key persons in cross-border M&As (Hassett et al., 2018). However, it is unclear how the individual cognition and emotions scale to collective behavior within a group and how the social behavior and interactions across divergent professional groups affect the strategic actions in an organization.

To bring the theory closer to the empirical facts and integrate strategy research with strategy practice, this research adopts a case study design. The research is based on a Chinese hospital that has engaged in digitalization since 2006. We use an inductive approach to develop helpful theoretical categories and generate valuable theoretical insights. Based on 40 interviews and six participant observation sessions with the top management team, healthcare professionals and IT engineers in the hospital, the research maps out the interplay between these groups as they develop strategic actions for the digitalization from 2006 to 2018. Focusing on each phase of the process, the study reveals how cognition interacts with emotions, motivations, social behavior and social interactions between these three groups and how these changes affected the strategic actions in the digitalization.

Method

This research was conducted in the form of an in-depth case study at a Chinese hospital that has engaged in digital transformation since 2006. The case study organization, with 2000 beds and 2516 members of staff, is the largest public hospital in one of the least developed cities in China. It engaged in digitalization for three reasons. First, the Chinese government pushed public hospitals to implement Healthcare Information Systems (HISs) by linking a hospital's level of digitalization to the funds available to it. Second, the hospital had another key source of revenue, healthcare service charges, in which it competed with six other public hospitals and 13 private hospitals in acquiring and treating patients in the same area. HISs

provided potential ways to improve the service quality and reduce cost. Third, the hospital was inspired by its peers in more developed cities. By the end of our investigation in 2018, the hospital successfully implemented five central HISs. This included over 100 sub-systems that were supplied by over ten HISs service firms. The systems were implemented and maintained by the IT Center which had nine members of staff. The hospital was an exemplary case in that it made extensive efforts in implementing HISs. This implementation process was characterized by the conflicts, cooperation and communication across the divergent professional groups, which offered an excellent venue for studying the cognitive underpinning across the groups in the digitalization process.

The authors collected extensive data on the digital transformation of the hospital through three methods – semi-structured interviews, participant observation and archival data. 40 semi-structured interviews were carried out in the hospital in November 2018. Each interview lasted from 40 minutes to two hours, resulting in a total of 36 hours of recorded data. All interviews were recorded and transcribed. The interviews were complemented by six instances of participant observations and field notes of how the healthcare professionals used HISs in their daily work and how the IT Center responded to healthcare professionals' enquiries. We also collected archival data including meeting minutes of the IT Center and the chat records between IT engineers and healthcare professionals in *Wechat* groups. Though the research is still work in progress it we presented our preliminary findings here.

Preliminary findings

The data analysis revealed that the hospital went through four phases along its digital transformation, in which the three professional groups went through a journey of managing conflicts, seeking for common grounds and eventually forming an integrated effort (Figure 1).
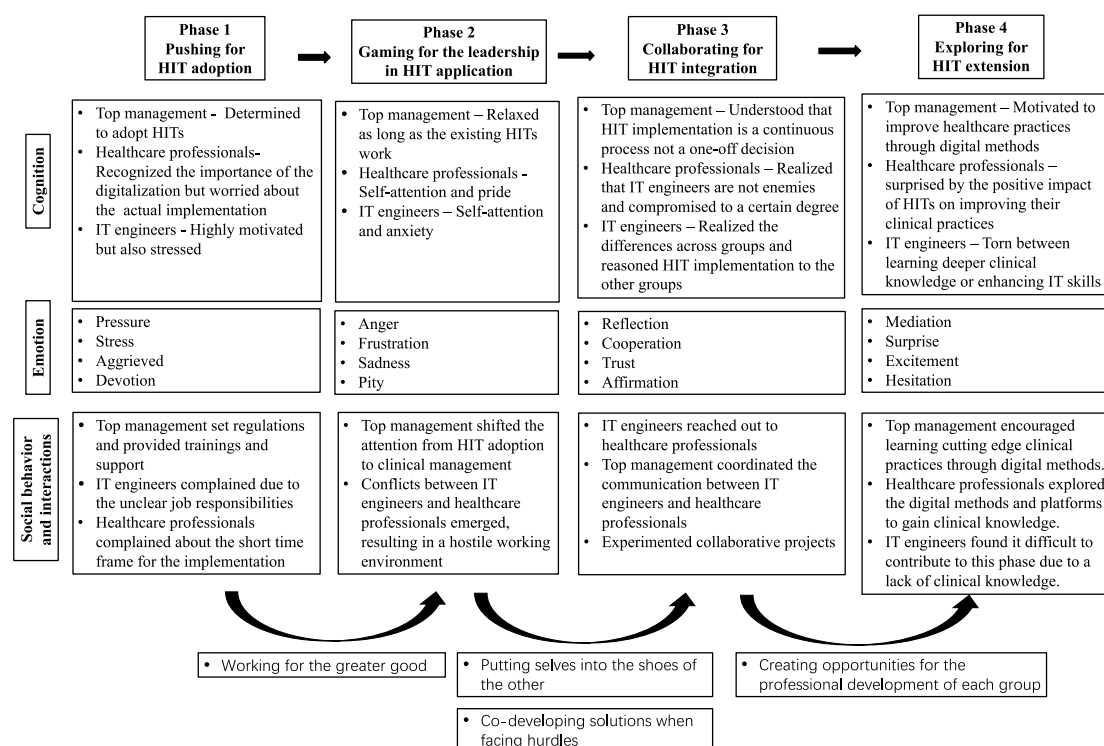

Figure 1. Cognitive foundation of healthcare organizations' digitalization

The hospital engaged in digitalization in 2006 because the government set up HIS standards for public hospitals. This phase was characterized by the dominant power of top management who decided to adopt HISs and pushed for the HIT knowledge development across the departments. Although the determination of the top management team encouraged the HIS implementation in a timely manner, healthcare professionals and IT engineers were under great pressure. While the healthcare professionals reacted with stress, IT engineers professed devotion to the system. Obviously, they did not get along. The head of the IT center noted "*we were so fed up with the requests like fixing TVs and video cameras. It was like nobody understood what we do.*" A few healthcare professionals felt disregarded and abandoned by the hospital. This cheapened the experience of working in the hospital. For example, a healthcare professional said "*they (the hospital) could have been more patient to us. I may not learn things as fast as they (IT engineers) do because I am old. However, they need to understand that with all the contributions we have made, we do not deserve this (push)*" (Interviewee 31). This situation changed when the top management team went above and beyond to in justify why the hospital needed to transform digitally. They made sure the professional groups understood how the government had encouraged and pushed for the digital transformation of public hospitals during a series of dissemination the meetings. Top management also constantly compared the hospital's healthcare services with the advanced peers in developed cities, discussing the potential of HISs to improve the service quality and effectiveness with healthcare professionals. Doctors who visited or had studied at more advanced hospitals were asked to share their experiences in pioneering HISs in the departments. Seeing the possibility of working towards a better and stronger hospital motivated doctors to accept the initiative of digitalization. By the end of phase one, a majority of healthcare professionals practiced HISs in their clinic works.

In phase two, after the HISs initially accepted, the top management shifted attention from HIS implementation to clinical management because they believed clinical practices are at the heart of a hospital. However, the management team overlooked the emerging conflicts between the healthcare professionals and IT engineers. Healthcare professionals believed that "*Any adjustment of the systems would aim at improving the clinical practices, in which we (healthcare professionals) should be able to decide what works the best for us.*" (Interviewee 27) The head of the IT center said "*They (healthcare professionals) almost viewed us as their enemies. It seemed that we caused problems in their works and added more workload to their daily job. One of our colleagues (an IT engineer) even went into a physical fight with a doctor.*" The result of this phase was frustration between these two groups, resulting in a hostile working environment.

In phase three, the IT center reflected that "*I cannot believe that we spent so much time to deal with all these unnecessary conflicts. We could have used the time to do something more meaningful, like developing more advanced IT knowledge, organizing more workshops for knowledge sharing, or getting to know basic clinical practices*". (Head of IT center) The head of a clinical department also commented that, "*I think we (healthcare professionals) were just not comfortable with the fact that we were challenged by a department that was not in our expertise area. Most doctors do not see themselves as IT experts and they did not care about the systems to be honest. The bottom line was the systems should make the (clinical) work easier but not harder. We neglected the learning curve, that is, once we were capable of*

using the systems, the clinical works did get easier. We wasted too much time on thinking who leads who. " (Interviewee 35) The top management also realized that they should have paid attention to the conflicts between the two groups. IT engineers reached out to healthcare professionals by organizing meetings and initiating pilot projects with the aim to improve HISs by co-developing solutions. These pilot projects gradually built trust between the different groups. Eventually, the groups started stepping outside of the comfort zone, creating new knowledge at the intersection between clinical, IT, and management. The connections between the stakeholder were enhanced and strengthened accordingly, which in turn, stimulated knowledge exchange and interdisciplinary projects. The success in knowledge integration was largely due to the sharing environment promoted by top management. As commented by the head of IT center, "*people often misunderstand the role of IT center. They thought IT center takes full responsibility for digitalization [...] However, digitalization actually requires everyone to participate and engage, including clinical departments, administration office, finance department, and many other departments. No one should be a spectator. We can create a shared understanding of what digitalization is only when all people take part in (the digitalization process)*." (Head of IT center)

The key in phase four was to stimulate healthcare professionals' enthusiasm for enhancing and extending their clinical knowledge through digital methods and channels. Healthcare professionals surprisingly found out that IT skills could enable them to access the latest clinical knowledge and keep up with the knowledge explosion in medicine. This realization motivated them to learn more about HITs like telecommunication and digital healthcare platforms. This leads to integration of IT and clinical knowledge but IT engineers felt frustrated that they can contribute little in this phase due to their limited clinical knowledge. Although IT engineers built essential clinical knowledge in phase three, this knowledge was not enough for them to, for example, evaluate the creditability of medical information on digital platforms. Consequently, the IT center acted more passively compared to the previous phases. They mostly completed tasks assigned by top management, e.g. building the internal communication platform. This raised the question, to what extent IT engineers need to learn clinical knowledge. The head of IT center commented that, "*we face the dilemma of whether spend time on gaining more clinical knowledge or spend time on improving our IT knowledge. I struggled with this question myself because I was afraid that the IT center got marginalized as merely a supporting department. We may need to continuously learn (clinical knowledge) from healthcare professionals. However, I think, fundamentally, we are IT engineers and IT (knowledge) should always be the core of our center*." (Head of IT center)

Conclusions

This research reveals the dynamics and complexities in forming a basis for the intergroup coalitions in order to achieve the digitalization of healthcare organizations. It investigates the cognition in the context of emotions, social behavior and interactions across the divergent professional groups in the four phases of the digital transformation. This paper aims to contribute to the literature on digitalization of healthcare organizations (Agarwal et al., 2010; Fichman et al., 2011; Karahanna et al., 2019; Sánchez-Polo et al., 2019) by taking the behavioral strategy as a theoretical lens, which addresses the interplay between divergent professionals and reveals the cognitive foundation for the group interactions. Moreover, this

research contributes to the behavioral strategy theory (Powell et al. 2011) by moving beyond the investigation of cognition and emotions of a single decision actor/group (Ashkanasy et al., 2017; Geddes et al., 2020; Hassett et al., 2018; Huy, 2012; Huy and Zott, 2018), in which it explores the cognitive underpinnings of decision groups dynamics. This provides a valuable reference for organizations to pursue strategic actions that can achieve digitalization in the context of diversified decision actors with diverging interests.

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