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Abstract: This study suggests ambidexterity as a guiding innovative perspective for healthcare organisations. Based on case illustrations from medical practitioners, a definition of healthcare ambidexterity and a desirable direction for operational capabilities are provided. As a theoretical implication, experiential capability should be chosen in the case of a low degree of control and a high degree of collaboration, while a high degree of control and a low degree of collaboration should indicate a focus on lean capability. This research makes a contribution to provide a clear understanding of 'healthcare ambidexterity' and an articulation of the practical development of operational capabilities.

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1   Introduction

Ambidexterity – exploiting previous experiences while exploring new knowledge and ideas at both the individual and organisational levels – can be a suitable strategic capability for designing and managing healthcare organisations. In other service sectors, ambidexterity has been accepted as a conceptual leadership tool to invigorate adaptability and alignment through an entire organisation in service industries (Birkinshaw and Gibson, 2004; O'Reilly and Tushman, 2013). However, in healthcare organisations, handling organisational coordination through realising ambidexterity has been neither straight forward nor easy. Not a few healthcare providers have difficulties innovating due to insufficient information sharing and collaboration and resistance to changes, which lead to the slow responses to and the resulting dissatisfaction of patients (Dobrzykowski and Tarafdar, 2015; Merlino and Raman, 2013; Senot et al., 2016). In reality, organisational innovations are inevitable, but the guiding principles or strategies are not clear to the people at the level of healthcare organisation administrators or senior management.

Malik et al. (2017) showed that ambidexterity could be applicable in healthcare settings. They stated that when healthcare organisations are equipped with relevant human resource management practices, individual-level ambidexterity could be employed in healthcare service systems. Other scholarly findings supported this notion with instances of healthcare managers' articulation of exploitation and exploration fitted to managerial accounting goals (Bohmer, 2010; Kaplan and Porter, 2011). Yet, current studies have not clearly articulated what ambidexterity means for healthcare organisations. Specifically, the studies so far have not been clear in defining what ambidexterity means at the organisational and individual levels together. When there is a clear understanding of healthcare ambidexterity at the organisational level and an articulation of practice development at the individual level, senior management could benefit in setting their strategies and making decisions in resource utilisations.

The purpose of this study is to explore the concept of ambidexterity in healthcare organisations using case illustrations and presentation of research propositions. This study defines *ambidexterity* in healthcare organisations as the individual and collective collaboration of medical (and managerial) exploitation and exploration, interacting with operational capabilities. This study asks the following questions: what does it mean to possess ambidexterity in healthcare organisations? How could the operational capability of ambidexterity be developed in healthcare organisations? To answer these questions, this study identifies the dual aspects of ambidexterity (i.e., exploitation and exploration) and the components of operational capabilities necessary for ambidexterity. Based on case illustrations from medical practitioners working in various healthcare organisations (i.e., paediatrics, nursing home and university hospital), propositions with theoretical

implications are discussed. Lastly, we discuss the limitations of this research and suggest directions for future research.

2 Ambidexterity and operational capabilities

2.1 Ambidexterity in general: contextual ambidexterity and structural ambidexterity

Ambidexterity has two dimensions: exploration and exploitation (O'Reilly and Tushman, 2004, 2013). Exploration accompanies the learning process, which is the continual or sometimes interspersed series of searching, finding, and propagating new ideas and knowledge and enabling organisational members to take risks in implementing experiential strategies and to accomplish organisational growth (March, 1991; Morgan and Berthon, 2008; O'Reilly and Tushman, 2004). On the other hand, exploitation provides the opportunities to leverage hindsight and accumulated knowledge, which makes it possible to achieve situational innovations. Exploitation mostly appears when there are organisational needs to innovate or to grapple with internal and external problems (O'Reilly and Tushman, 2004). During problem-solving processes, members naturally seek relevant information from other members, standard operating procedures, and rules. In spite of the apparent mutual exclusiveness of exploitation and exploration, sustaining and growing a business actually demands that the two be aligned within the same organisational boundary (Bjelland and Woold, 2008; Morgan and Berthon, 2008) Table 1 shows both the exploitative and exploratory aspects of various organisational elements.

Table 1   Two extremes of ambidextrous organisations

Alignment of	Exploitative business	Exploratory business
Strategic intent	Cost, profit	Innovation, growth
Critical tasks	Operations, efficiency, incremental innovation	Adaptability, new products, breakthrough innovation
Competencies	Operational	Entrepreneurial
Structure	Formal, mechanistic	Adaptive, loose
Controls, rewards	Margins, productivity	Milestones, growth
Culture	Efficiency, low risk, quality, customers	Risk taking, speed, flexibility, experimentation
Leadership role	Authoritative, top down	Visionary, involved
Organisational governance	Control	Collaboration

Source: O'Reilly and Tushman (2004)

The success of ambidexterity, therefore, depends on the dynamic combination of exploitation and exploration (He and Wong, 2004). Here, *dynamic* means determining the level of exploitation and exploration based on judgement and analysis of situations. Individuals' cognitive and behavioural amalgam of exploitation and exploration is widely found from the top management team down to the functional working levels within an organisation (Lubatkin et al., 2006; Sarkees and Hulland, 2009). An individual worker's

timely concurrent effort to integrate exploitation and exploration is called *contextual ambidexterity* (Birkinshaw and Gibson, 2004; Jansen et al., 2005).

Contextual ambidexterity is a series of problem-solving sub-actions to search, predict, and estimate the possible domain of solutions (Holmqvist, 2004). Extending an individual's contextual ambidexterity to the level of organisational structure and strategy formulation and to the level of higher leadership positions to employ organisational resources is structural ambidexterity. Andriopoulos and Lewis (2009) describe it as dual structures and strategies, or differing efforts to focus on either exploitation or exploratory innovation. Structural ambidexterity is revealed in the visible artefacts of organisational structures used to dominate the patterns of underlying work processes.

2.2   *Ambidexterity in healthcare organisation*

Healthcare organisations, which are the representative organisations whose purpose is to mould people, are not based on the same standardisation principle in their core functions as are manufacturing firms (Katz and Kahn, 1966). Rather, facing customer needs, timely decisions should follow on what should be chosen among exploitation, exploration and ambidexterity (Marabelli et al., 2012). Since patients are not 'equally specified' in the clinic, it is difficult to make the entire process of medical treatments standard. Beyond the level of standardised treatment processes, medical practitioners should show their discretion over the situations at hand. Bohmer (2010) states that modern healthcare organisations must be capable of simultaneously optimising the execution of standardised processes for addressing the known while learning how to address the unknown.

When the customers are already in the hospital, the time lag in which an individual employee may impact organisational performance becomes short. This calls for the necessity of deploying and utilising medical knowledge and resources with perfect timing (Christensen et al., 2009; Herzlinger, 2006). Accordingly, healthcare organisations employ unique organisational structures where a solid understanding of their competence should be precedent to the correct treatments (Blank, 2013). Accountability needs to be aligned with the rules and behavioural standards of the whole organisation. Thus, discussing capability and ambidexterity in healthcare industry necessitates a consideration of both the individual level and the organisational level simultaneously.

3   Operational capabilities in healthcare organisations

Application of operational practices in healthcare organisations has been going on for some time (Goldstein and Naor, 2005; Graban, 2009; Li et al., 2002; Shah et al., 2008). For instance, Goldstein and Naor (2005) analysed the degree of using operations-related quality practices in the US hospitals. They reported that hospitals' ownership and control highly favoured the employment of those practices. However, these studies might not see the fundamental reasons why those practices could be applied differently for each healthcare organisation.

Thus, turning our interest from practice implementation to the underlying principle-based capabilities can be justified in the sense that the attributes of those capabilities impact the owners of the work process rather than the process itself. And, it is the workers who affect work processes based on their changed mindsets (Barley and

Kunda, 2001; Bjelland and Wood, 2008; de Treville et al., 2006; Siggelkow and Levinthal, 2005).

Generally, medical practitioners have to directly and closely interface with patients for treatment. To give emergent and situational responses, medical treatment methods and solutions need to be prepared in advance and applied within the boundary of expertise in a short amount of time. On the other hand, difficult diseases require medical specialists' educated guesses through caution and repeated experimentations. In the organisational and knowledge management viewpoints, university hospitals are usually co-located with schools of medicine to educate medical students and to preserve past experiences, knowledge, and methods, scaffolding new medical information and treatment ideas. The market encounter (e.g., customers' preference for new medical services, disruptive technology innovation coming from competing healthcare organisations) and resulting strategic plans affect organisation members' decisions to alternatively focus on exploitation or exploration in the types of organisational structure deployment (Li and Lin, 2008). Therefore, this study asserts that operational capabilities consist of lean, experiential and managerial capabilities.

3.1 Lean capability

Lean capability is based on predetermined diagnosing and treatment for well-understood diseases (Bohmer, 2010; Shah et al., 2008). Lean capability can ignite the learning atmosphere. So, it is possible, to some extent, to foster very innovative ideas in a well-defined clinical pathway. But it may be confined in the short-term and temporal memory for moving to the next stage of implementation (Gupta et al., 2006). Lean capability enables one to seek efficiency through exploiting existing knowledge within a healthcare organisation. So, lean capability is akin to the dimension of exploitation in ambidexterity. Lean capability has four components (Shah et al., 2008):

- *Simplicity:* Work routines of diagnosing and curing well-understood diseases should be designed in the simplest way possible so that members within an organisation can easily understand the procedures and communicate well.

- *Connectedness:* Processes, or organisation members working on a certain process, should be clearly organised without the possibility of confusion. This capability forms reliable expectations to smoothly implement the next or future process steps.

- *Standardisation:* Work procedures should be designed in standardised ways so that organisation members do not waste time and resources in implementing the designated processes with expected outcomes.

- *Improvement:* Processes have to be designed and implemented to be open to innovations. Enabling members to voluntarily suggest better methods or ideas about diseases should be guaranteed.

3.2 Experiential capability

In contrast, experiential capability governs the treatment of complicated and not-so-well-understood diseases, and allows doctors' discretion in the process. This is because the complicated process of interacting with novel or emerging diseases is not to be standardised (Bohmer, 2010). As with exploration, experiential capability could not

completely exclude imposing fairly rigid procedures in an unknown area (e.g., how much does doctors' discretion cost a hospital and patients?). But experiential capability seeks useful knowledge for growth (Brown and Duguid, 1991). Due to the knowledge intensiveness of healthcare services, this capability complements lean capability. Experiential capability has four components:

- *Prediction:* Prediction is presciently diagnosing medical problems for the near and distant future and garnering relevant physical and pathological information to handle them (Bjelland and Wood, 2008).

- *Improvisation:* Improvisation focuses on the unplanned cognitive and behavioural reactions upon facing unexpected situations, resulting in more improved future routines out of careful deliberations (Bjelland and Wood, 2008).

- *Process crafting:* Emergent situations sometimes result in congested gridlocks and so break the predetermined linkages among assigned people and processes. Some tasks may be unexpectedly processed in tandem. In these erupted situations, leadership and the skill of process crafting enables members to change the order of distracted working processes and jump into the contiguously related tasks in order to mitigate the confusion and to establish the state of connectedness of processes (Gratton and Erickson, 2007).

- *Communities of practice:* Communities of practice among doctors, nurses, social workers and staffs play the role in medical process improvement. Beyond the assigned specific tasks, social gatherings and informal talks among practitioners should function as the source of collaboration as well as the network for mediating and preserving professional information and knowledge (Brown and Duguid, 1991).

3.3   Managerial capability

Managerial capability could be one of capabilities supporting lean and experiential capabilities in healthcare operations (Leonard-Barton, 1992). Managerial control and collaboration specifically determine the directions of organising work processes and the level of resource deployment (Rothaermel and Alexandre, 2009; Sundaramurthy and Lewis, 2003). There are two components in this capability:

- *Control:* Control is leaders' efforts to require their members to pursue the predetermined organisational goals with rules, standards and routines. In healthcare organisations, it is important to guide members to keep the rules to provide better services and to allocate the right resources to achieve the right purpose. The way of treating patients or assigning them to the pertinent practitioners should be checked regularly (Bohmer, 2010).

- *Collaboration:* Collaboration is defined as individuals' orchestrated mutual activities of sharing and contributing toward common goals (Gratton and Erickson, 2007). Seeking staff's cooperation while welcoming practitioners' different ideas and perceptions of given situations are necessary to finding better treatment solutions for difficult diseases (Bohmer, 2010; Sundaramurthy and Lewis, 2003).

Lean and experiential capabilities could partially overlap. Especially, the improvement component in lean capability could have a broader scope with the help of the

four components in experiential capability. So, as the knowledge about diseases is accumulated, the domain of applying lean capability could be extended. In this study, lean and experiential capabilities are included as operational capabilities in contextual ambidexterity, which governs the expertise providers (i.e., doctors, nurses). In conjunction with lean and experiential capabilities, managerial capability realises structural ambidexterity because it regulates how to assign patients for the right treatments and to properly manage the resources. Figure 1 illustrates this concept.

Figure 1 Subcomponents of operational capabilities and ambidexterity
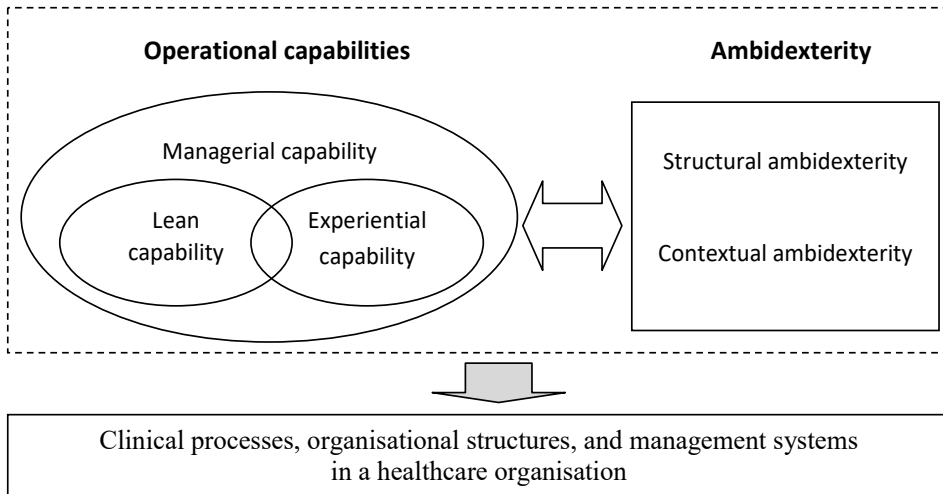
4 Case illustrations

Following through the purpose of using cases that Eisenhardt (1989) and Gilbert (2005) emphasised in support of generating a theory and propositions, this research interviewed two nurses and one doctor as participants. They were chosen purposely because each of their workplaces is representative of places where each capability dominates (Yin, 2009). The questions were given to the participants in the forms of face-to-face conversations and protocol-based short written surveys. The question items asked about their workplaces and environment, work processes, their level of allowed discretion, and the organisational problems they encounter. In order to avoid any perceptual bias of participants, words such as *ambidexterity* or *operational capabilities* were not uttered during the interviews.

4.1 Case 1: Nurse A in paediatrics

- *Workplace:* The hospital where Nurse A works was built in the 1880s and has been in the Best Top 10 Workplaces for hospital employees. The main task of the clinic where Nurse A belongs to is to take care of premature babies or congenitally abnormal babies. Professional knowledge is required for providing their care. The

work schedule is not always busy, and sometimes there is peaceful time to in which to care for the babies.

- *Work environment:* The work environment is more family-like and friendly, compared to the previous workplace where Nurse A worked. There people were very individualistic and uncooperative, and treating emergent patients was the main task. The current workplace does not have many emergent patients. Accordingly, the workers feel less stressful by themselves and with one another.

- *Work process:* The level of control varies depending on the situations. Sometimes, it is tightly controlled and sometimes loosely controlled. Cooperation with other nurses and doctors is well done and aplenty. For instance, when there is a difficult guardian to be dealt with, it is possible to ask for help from senior level nurses or sometimes doctors, especially when guardians want to talk to doctors for satisfactory answers. The workplace allows much discretion. Doctors prescribe and nurses apply, but when the nurses think the prescription is not agreeable (e.g., too much medicine or too large a meal), they could ask the attending doctors and confirm the prescription order. When there is trouble with a patient's guardians regarding the visiting policy, nurses could confirm with a charge nurse or follow the direction from the head nurse.

- *Organisational issues:* The workplace lacks in the supervision of medical equipment supplies. One nurse could take most of the supplies and dispose them when they do not need them, while other nurses may go lacking. The managerial guideline on hospital expenses charged to patients is so strict that some patients, as they fill out applications for funding support from financial institutions, end up requesting informational help from nurses.

4.2   Case 2: Nurse B in hospice

- *Workplace:* The workplace is a hospice facility, providing care for patients whose remaining life spans are within six months. The state government periodically audits all managerial activities, and patients are dealt with according to Medicare guidelines. Medical equipment and supplies for hospice patients (e.g., incontinence items, hospital beds, wheelchairs and air mattresses) are provided in a timely manner.

- *Work environment:* The current work environment focuses on helping patients face a peaceful end. Nurses are independent in their work and are allowed to exercise some level of discretion. Medical environment is seemingly changing to emphasise a precautionary approach to care in order to save costs.

- *Work process:* All work processes are strictly controlled by government guidelines. The tasks are to visit patients regularly and to give necessary treatments according to patients' symptoms. Even in emergent situations, all employees depend on standard procedures and manuals. There is an inter-disciplinary team (IDT), whose members are the chaplain, registered nurses, certified nursing assistants, bereavement coordinator, social workers, volunteers and medical director. Information sharing with other disciplines is essential. Team members have a regular weekly meeting and discuss each case, so there is little managerial confusion due to lack of communication.

- *Organisational issues:* The organisation has difficulty hiring the right people for the right position. It has a high turnover rate.

4.3   Case 3: Doctor C in university hospital

- *Workplace:* Doctor C works at an academic medical centre, in a university setting, that is interested in clinical care of patients, research and education, Doctor C formally serves as a medical professor, but his roles vary. He sees patients and provides clinical care for their health. He conducts social science research on physicians' religious beliefs and moral development as physicians. He also teaches undergraduates and medical students on clinical topics and other topics related to medicine.

- *Work environment:* The current workplace emphasises clinical productivity and research grants. In other words, the workplace is driven primarily by financial considerations (whether doctors can bring in money to the academic medical centre through seeing many patients, or whether they can bring in grant money to the organisation). Sometimes, this financial emphasis conflicts with what may be good for patients and the well-being of the workers in the department.

- *Work process:* His work process enables a lot of independence and independent goal setting. For example, he chooses what kind of research he wants to investigate. He chooses what kind of teaching he wants to be involved in. To a certain extent, he can choose what kind of settings he wants for patient care. But there are work processes that are beyond his control and usually driven more by financial motivators rather than whether it makes their work meaningful or takes into consideration the doctors' well-being. He tries to follow his conscience. Sometime when he feels that the work processes are not good, he speaks up to the management and asks for change. But when they do not listen, then he sometime chooses to step out of the environment and work in other areas that better fit his conscience and his personal goals and interests.

- *Organisational issues:* Due to too much emphasis on financial purpose, doctors got burned out with frustration and setbacks.

4.4   Discussion

Case 1 reveals an organisation where experiential capability is strong because process crafting and improvisation of the nurses are allowed in their work processes. Managerial capability is executed in tandem with weak control and strong collaboration. The task relationships with other practitioners are not that strict and can be improvised. And, communities of practice are formed, so cooperation among doctors and nurses is easy to be found. A high level of structural ambidexterity is found in Nurse A's work process, which is fitting due to the variability of conditions presented by the babies requiring care in her department. In this Case 1, coordination is more important than control as managerial capability, so the organisation reveals the need to strengthen its resource management (i.e., medical equipment supply items).

On the other hand, Case 2 is representative of a lean-capability-managed healthcare organisation. Managerial capability is mainly about tight control. The work relationship

between medical practitioners and back-office workers is via a computerised system, not face-to-face. The lean capability to maintain connectedness and standardisation in work processes is accomplished through the control-based managerial efforts. At the same time, the organisation has observed a high turnover rate of skilled workers due to the fact that the highly standardised work environment does not allow any exercise of individual contextual ambidexterity and discretion.

Case 3 finds that a large institute for treatment and research is more exploration-oriented than a smaller peripheral structure predominantly involved in standard and less complex cases. However, in this organisation, operational capabilities may not match with financial strategic goals. It is because senior management alone sets the goals. There is a need for a two-way conversation on the topics that are matching between the operational capabilities found in doctors and staffs and the related organisational goals. Being able to detect and manage in a timely manner a possible misalignment between objectives and operational capabilities present within the organisation may constitute a dramatic source of managerial improvement.

5   Propositions and managerial implications

5.1   Propositions

Different combinations of lean, experiential, and managerial capabilities result in various levels of ambidexterity. This implies that the interdependence between work processes and organisational capabilities brings about the differentiated organisational forms to cope with external and internal uncertainties (Barley and Kunda, 2001).

When the levels of organisational control are low and allowed discretion is high, there can be greater opportunities to utilise possible alternatives at an individual level. The preexisting routines or standards for customers become stodgy, and so new trials are intriguingly eligible and mutually empowering among team members, resulting in epiphanies for the problem. Alternative trials cause organisational members to work collectively to improve the solution, instead of solely relying on personal experiences. The efforts to extend individuals' contextual ambidexterity to the level of organisational structure and strategy formulation are essential in order to enable structural ambidexterity. In these situations, experiential capability prevails. Thus, this research develops the following Proposition 1:

Proposition 1: When experiential capability is employed, a high degree of control and high degree of collaboration should be applied to realise a high level of structural ambidexterity.

Organisations with meagre resources might be in a worse situation, being perplexed with how to deal with the issues of concern. In situations where two capabilities (i.e., collaboration and control) are conflicted, one should dominate the other, depending on the situation. This research presumes that the relative dominance of collaboration without the loss of control would be ideal. Collaboration's relative dominance implies that tasks need team members' combined capabilities, so that collective creativity in experiential capability should be obtained. Collaboration in this context tends to favour innovation efforts through organisational structure (via structural ambidexterity) rather than

invigorating individual creativity (via contextual ambidexterity). Thus, this research develops the following Proposition 2:

Proposition 2: When experiential capability with some lean capability is employed, a low degree of control and a high degree of collaboration should be applied to realise a high level of structural ambidexterity.

Under controllable situations, new impressive solutions are not always necessary because individuals rely on the existing routines that sufficiently function well and respectively suffice for the involved members. Rather than seeking advice from luminaries of the internal organisation, simply following the prescribed standards is the winning strategy to solve problems. Out of repeated behavioural patterns, the opportunity to provoke innovations can be high by applying lean capability, resulting in a strengthening of contextual ambidexterity within an organisation. Thus, this research develops the following Proposition 3:

Proposition 3: When lean capability is employed, a low degree of control and a low degree of collaboration should be applied to realise a high level of contextual ambidexterity.

A low degree of managerial control and some degree of collaboration render the tasks to be leveraged with lean capability at an individual level, so not much experiential capability is used except for a small amount of improvised skills. Incremental innovations at individual levels are possible instead of an organisational agreement on creative pursuits. The opportunities to improve contextual ambidexterity appear more frequently. Thus, this research develops the following Proposition 4:

Proposition 4: When lean capability with some experiential capability is employed, a low degree of control and some degree of collaboration should be applied to realise a high level of contextual ambidexterity.

5.2 *Managerial implications*

As the cases implied, well-implemented operational capabilities can play the role of strengthening effective cost and resource management. Unnecessary treatment processes can be eliminated by applying lean and experiential capabilities, respectively, to relevant situations and processes. Deviations from well-defined processes are considered, and with much focus, the waste resulting from deploying too much time and resources on the processes to which lean capability are applied can be prevented. Also the high degree of resource utilisation can be assured because the organisation and the medical teams are able to recognise and decide which resources are required for specific diseases through the right implementation of operational capabilities and desirable realisation of ambidexterity. More fundamentally, operational capabilities make it possible to pertinently apply the right medical knowledge and methods to the needed patients. Thus, a clear and effective understanding of medical processes can lead to medical cost reductions to the satisfaction of healthcare service providers and consumers alike (Kaplan and Porter, 2011).

6   Conclusions

Ambidexterity makes innovations valid within an organisation for both the present and the future. To achieve ambidexterity, healthcare organisations need to carefully consider the operational capabilities to employ. Specifically, to achieve better contextual and structural ambidexterity to satisfy customers' needs, healthcare organisations need to employ lean, experiential, and managerial capabilities in an insightful manner. Lean operational capability complements or strengthens experiential capability under the condition that appropriate managerial capability is deployed. As managerial implications, the propositions describe that experiential capability should be chosen in cases where a low degree of control and a high degree of collaboration are applied, while a high degree of control and a low degree of collaboration should focus on lean capability.

As one of the limitations, more situational variables could have been included in our theoretical discussion. For instance, the evolutionary aspects of ambidexterity or the interactive adaptation process within an organisation's network could have been considered (Riccaboni and Moliterni, 2009). The timeline of market transition in the industry is an important factor to consider when describing how ambidexterity should be changed within a healthcare organisation. Additionally, the effort to be connected to an external network explains how healthcare organisations accommodate social network technologies. These future scholastic advances will further enrich this study's contribution in discussing and applying ambidexterity in the context of healthcare organisations.

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