

The Challenges of Health Units During Covid19: Qualitative Analysis in the Lens of Dynamic Capacities

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Abstract: In all sectors, whether public or private, the current organizational context is characterized by technological, economic, political, social, and cultural changes, which affect the ongoing relations between countries and companies. In the public sector, the political factor and its political cycles are more present, as well as social and human responsibilities in health allow us to differentiate our study environment from all the others. Currently, during the pandemic phase, according to the need for adaptation and dynamics of the Health Units, this was even more visible. Dynamic capabilities (DCs) need to be renewed to respond to emerging changes in the environment, and organizations must develop their capabilities to sustain good levels of performance. Therefore, CDs play an essential role in the performance of organizations. The main objectives of this study are to study the HC in Health Units during the initial phase of the COVID-19 pandemic, with the objective of developing a mapping of indicators that would allow a more efficient response to the organizational and structural changes of the Health Units, users' needs (whether COVID or non-COVID). This article presents preliminary data from an investigation still ongoing on the topic. As contributions, we highlight how the study helps to identify the relationships between the various capacities, relating the importance of technological capacity, human resources capacity and the special importance given to learning resources (through routine activities).

Key Words: Dynamic capabilities; Health organizations, Qualitative research, COVID-19.

1. Introduction

Strategic Management represents a field of multidisciplinary research that has evolved rapidly with various theories and approaches in recent decades. It was the criticisms of the Theory of Resources and Capabilities that led Teece and Pisano (1994) to present the perspective of DC, becoming one of the most notorious approaches in the field of strategic management, however, still difficult to measure and operationalize today from a practical point of view and with great weakness in terms of theoretical conceptualization. In all sectors, public or private, the current context of organizations is characterized by technological, economic, political, social, and cultural changes, which affect relations between countries and companies.

In the public sector, the political factor and its cycles are present in a higher dimension, as well as social and human responsibility in health, allowing us to differentiate our study environment from all the others. In this environment of constant change, we can consider that all public sector Health Organizations feel, daily, the need to innovate and respond to demand, with increasingly differentiated technology and the need to position themselves in the market, improving the market perspective. in relation to the service provided. The DCs are renewed to respond to changes in the environment, and organizations must assemble capacities to sustain a good performance. In this segment, DCs have an essential role in the performance of organizations.

In this sense, the present study seeks to contribute to a broader understanding of the DC phenomenon in health organizations and to a focus on chief nurses or team leaders, which is a recent area of study that has not yet been explored, during the pandemic phase. The present investigation seeks to study the DC in Public Health organizations during the initial pandemic phase COVID-19, aiming to develop a mapping of indicators that allowed to respond more efficiently to the organizational changes and structures of the Health Units, as well as to the needs of the Users (whether COVID or non-COVID). The paper is structured as follows. After the present introduction, a state-of-the-art DC, after which the methodology adopted in the study will be explained. The results of the DC will then be analyzed in health organizations and to a focus on chief nurses or team leaders

and finally the conclusions, with recommendations of future investigations. This article presents preliminary data from an investigation still ongoing on the topic.

2. Literature Review

Dynamic Capabilities (DC)

The DC concept stems from company growth theory (proposed by Edith Penrose in 1959) that characterizes the set of resources, and their repercussions through the resource-based theory of Wernerfelt (1984), subsequently adjusted by Barney in 1991. A DC represents “the capacity of an organization to create, expand or modify its resource base” (Helfat et al., 2007, p.1). The original proposition of the DC concept came from Teece. According to authors including Teece et al. (1997), DC constitutes the aptitudes and abilities of companies to integrate, build and reconfigure internal and external competences to respond to changes in their surroundings environment swiftly. DC thus reflect the potential of companies to resolve problems systematically, shaped by the aptitude to detect opportunities and threats and take timely decisions to appropriate changes to their respective resource bases (Barreto, 2010).

There are various theories around the DC concept even while Eisenhardt et al. (2010) base their approach on psychological and organizational theories and center their attentions on flexibility and efficiency. According to Barreto (2010), studies should compare the effects of distinctive environmental conditions (different industries or different timeframes) as there is still only scant research explicitly approaching just which types of company are most susceptible to benefitting from DC. More recently, Fernandes et al. (2017), through a bibliometric study with recourse to co-citations, apply cluster analysis and factorial analysis to identify five distinct approaches to DC: digital capabilities, knowledge capabilities, absorption capabilities, strategic capabilities and resources and capacities. However, according to these same authors, the lack of empirical validation has ensured that the concept remains under construction and hence empirical advances shall return a better theoretical understanding of DC. This shortcoming had already been subject to identification back in 1999 when Barreto argued that the DC concept and its fundamental concepts are not appropriately operationalized (Barreto, 2010). Years later, Newbert (2007) proposed that there is only a low level of empirical support for the DC approach while Barreto (2010) considers the operational implementation of DC a task remaining for the future.

According to Zollo and Winter (2002), the DC interrelate with the activities that organizations develop and adapt to their routines in a systematic and relatively predictable fashion. In this way, while the common capacities incorporate the efficiency of daily activities based on the best technology and qualified staff (Winter, 2003), the DC focus on improving organizational efficiency, aligning operational routines to the external environment and the broader sweep of organizational objectives. Thus, Zollo and Winter (2002) describe DC as a stable pattern of learning of a collective activity through which the company generates and systematically modifies its operational routines and seeks to leverage improvements in its levels of efficiency. Learning is a process through which the organization acquires new knowledge and adapts to the internal and external changes of the environment to remain sustainable and developing (Chen, 2005; Pacheco, Ferreira & Simões, 2021, 2023; Costa et. al, 2023).

Graça, Simões & Loureiro, 2019a defends that companies acquire knowledge that may be utilized to resolve identical situations in the future when resolving problems. Thus, this enables analysis of what worked well and poorly in the past, enabling companies to embark on problem resolution processes. This type of choice, between the application of old and new learning and knowledge frequently gets characterized as the choice between exploitation (when there exists the capability to take advantage of the resources and competences existing in the company thereby ensuring their current viability) and exploration (exploring new opportunities in striving for future viability). Due to questions of security and success in the short term, exploitation, almost always receives greater valuation than exploration, considering that the latter represent a greater likelihood of failure and error.

In a rapidly changing environment, knowledge management can reduce response time for implementation and new techniques, and knowledge creation can improve DC, making organizations more prepared and flexible in a dynamic environment (Lesser & Prusak 2001, Sher & Lee, 2004). The absorptive capacity, as defined by Zahra and George (2002) in learning, is defined by Lichtenthaler (2009) as the ability of an organization to use external knowledge through exploratory and routine learning processes. Organizations should pay special attention to knowledge management to improve DC in turbulent environments (Sher & Lee, 2004). Knowledge articulation is a fundamental path for the evolution of the dynamic competitiveness of a company. Teece et al. (1997) also argue that DC should be developed based on the articulation of knowledge and the learning process, and the articulation of knowledge has been increasingly recognized as an important mechanism for DC development in

organizational routines (Teece, 2016, Zollo & Winter, 2002), and can promote competitive capacities that can evolve to unique advantages (Eisenhardt & Martin, 2000).

3. Methodology

Characterization of the Health Sector

The study population consists of 90 Health Organizations, subdivided by Health Center Groups, Public Business Hospitals, and Local Health Units. Firstly, it is important to briefly present the organization and structure of health organizations in Portugal. At the Primary Health Care level, the Health Center Groups constitute a structure comprising of several Health Centers, which include, in addition to the Family Health Units (USFs), a series of other functional structures always based on the classic triad of Primary Health Care professionals: doctors, nurses and administrative staff (Miguel & Brito de Sá, 2010). In terms of Hospital Health Care, the hospital governance models for public hospital care in Portugal have remained identical since the legislation enacted in 1968 (Vaz, 2010; Graça, Graça, Simões & Loureiro, 2019b, Pacheco *et al.*, 2021, 2024). Currently, Hospitals (or Hospital Centers when including more than one health organization), defined as public business entities, hold the following strategic objectives (Vaz, 2010): Greater and better access for citizens; Professional development and merit; and Economic sustainability. Recently, the health paradigm in Portugal has changed following the launching of Local Health Units, which began to expand in 1999 with the implementation of the Local Health Unit in Matosinhos, to improve the interconnection between primary health care and hospital care through the integrated provision and management of all levels of health care (Loureiro *et al.* 2018; Loureiro *et al.* 2021a; Loureiro *et al.* 2021b; Loureiro *et al.* 2023).

In this investigation, mixed methods will be used to test propositions and hypotheses under study, previously developed and that make up the research model, based on evidence collected from interviews, questionnaire survey and analysis documentary. In this way, the investigation aims to be: i) exploratory, with the function of bringing new knowledge about the profile of CDs existing in the Health Sector; ii) descriptive, because it seeks to discover the frequency with which some of the phenomena, as well as their nature/characteristics; iii) explanatory, because it is intended to contribute, in this way, to a better understanding the behavior/acting and performance of the Health Sector, considering takes into account the variables under study. Thus, based on the mixed approach and the specific objectives of the investigation, one can group research methods essentially within the scope of DC Learning, several interviews will be carried out to consolidate the studies collected and evaluate some future lines of investigation. The third study is a scope work qualitative, and uses the interview survey, applied to logistics managers of organizations public, private and social sectors. In Portugal, Primary Health Care is structured into 47 Health Center Groups while Hospitals, Hospital Centers and Local Health Units are structured into 43 Health Organizations. Of the organizations participating in the study, we received 6 responses from leaders and chief nurses, 2 of whom work in Primary Health Care; 3 in Hospital Care, and 1 in Local Health Units. The data were collected through a semi-structured interview, which presents a structuring guide, and the questions are ordered and related to each other (table 1).

Table 1: Interview Questions

DIMENSION	QUESTIONS
ADAPTATION	1. How has the organization adapted to respond to new diseases? In the last decades, what organizational changes have you seen? Do you consider that these adaptations contributed to face this new reality (covid-19)?
	2. How did the team you lead adapt to the pandemic? What are the main changes?
LEARNING	3. Regarding the 1st wave of Covid 19, what lessons were learned? Are you ready now? If so, how?
NEW FEATURES	4. What resources are now being used that were not used before? Have these new features contributed to improving the organization's performance?
TECHNOLOGY	5. At a technological level, is the organization prepared to face these new challenges? Do they have enough resources? Necessary skills? What adaptations must be made?
HUMAN RESOURCES	6. Are Human Resources recognized for their knowledge, and is it used to improve the services provided? Do you consider that this recognition has been increasing after the arrival of the Pandemic?

To select the organizations under study, the following criteria were considered (Yin, 2014): i) prior knowledge of covid-19 patient; ii) the organizations under study were chosen because of the ease of access to information; iii) collection of information in real context; and iv) integrated organization in sectors in constant change, in which the difficulties of management resources are based on the main strategic axis and where knowledge and experience have an important role. The interviews were conducted from December 10 to 18, 2020 and lasted, on average, between 27-34 minutes. Several internal documents have been analyzed, but for reasons of data restriction, they are not disclosed here. The interviews were carried out with four leaders and chief nurses from Portuguese health organizations in the Lisbon and Tagus Valley regions, in the various areas: Primary Health Care; Hospital Care, and Local Health Units.

4. Analysis and Discussion of Results

Adaptation

Problem solving skills are a process of change through learning (Probst & Buchel, 1996; Silva et al., 2014). Regarding the skills for future tasks needed to solve problems and improve procedures, that is, adaptability, according to the interviewees: *E1: Issues related to hygiene defined as institutions have been adapting to changes; E2: training, technology introduction and digitization throughout the various processes; Already, at the level of the E3: Increasingly, associations tend to structure themselves with a view to an increasing number of pathologies, specifically chronic ones, which is associated with an aging population and a consequent increase in its morbidity. In the last decades, there has been a structure both in terms of services, in other words, specialties, and in terms of teams, increasingly more qualified and specialized, which fortunately requires a better adaptation to face this harsh reality of the covid-19, teams are increasingly able to mobilize, although there are more and more specialists (in terms of nursing) these are more dynamic professionals, with better knowledge and differentiating experiences, which undoubtedly enriches care in complex situations such as those we currently live; E4: Hospitals are structures and trained to adapt whenever necessary. Nurses have more and more differentiated training, which allows a timelier adaptation to external changes; E5: More and more the profile of the patient has been changing and multiplying his comorbidities. Currently, hospitals are organized by specialties, but perhaps the current organization is not the best in a pandemic situation. The screening systems or the lack of response from PHCs also do not help hospitals; That way, E6: The example of the response that was given to COVID, shows that the Hospital is prepared for new realities and that it adjusts quickly to needs.*

The necessary adaptation in the Health Units studied, focus not only on the urgent need to introduce technology and digitalization in terms of Health Care, but also on the need for leadership, teamwork, and a lot of training. Organizations are structured with a view to an increasing number of chronic pathologies, which is associated with an aging population and a consequent increase in its morbidity. The teams seek to adapt through in-service training, updating processes and creating routines. The organization of hospitals by specialty may not be beneficial, considering the pandemic, according to some respondents. Another important point in adapting to the pandemic is the reinforcement of stocks and materials, although overall respondents agree that the Health Units are prepared for new challenges. The following table presents a summary of the interviews carried out in the adaptation dimension.

Table 2: Summary of the interviews - adaptation

Dimension	E1	E2	E3	E4	E5	E6
Adaptation	The introduction of Technology and Digitization	A lot of Process Training, Teamwork, Leadership	In-Service Training and Training.	More Differentiated Formation.	Triage Systems or the unresponsiveness of Primary Health care also do not help Hospitals.	Changes in the team structures in training, simplify processes and increase our stocks.

Learning

Information sharing may not only be internal, but also through suppliers and the surrounding environment, and information and learning economies can be achieved, and synergies between organizations are also developed through the sharing of intangible resources (knowledge and information) (Lane & Lubatkin, 1998, Schilke, Hu & Helfat, 2018, Zahra & George, 2002, Simões et al., 2012, Simões et al., 2014). Regarding the first wave of the pandemic, it is important to know what lessons have been learned. Thus, according to the interviewees:

E1: Infrastructures and human resources are included, no matter how much they increase; That way, E2: The need for a stable team allows not only a better adaptation to needs, but also great internal and learning

dynamics. The more routine the activities, the better prepared and the better the performance of the team; E3: Routines are now more internalized, as in everything, learning is continuous, and today we are more prepared than during the first wave, although the capacity for response is today reduced due to the demand that exists. Resources start to run out, although better prepared

Already, at the level of the E4: It is a daily, constant learning that gets better every day and the best results. The knowledge already acquired is always an advantage in the face of everyday difficulties; E5: The routines already implemented and defined, allow to improve processes, and minimize existing errors. We learn by making mistakes, but we try to minimize the error so that more and more quality attention is provided; E6: Many learnings were made during the first wave. From changing processes, changing routines, needing constant adjustments, often without prior information. We participated several times and were promoters in the pedagogy and dissemination of information for health education. This was one of the main units of the hospital and it is becoming increasingly important for the hospital to serve as a guiding thread as good health practices and the population. Digital channels can minimize the number of hospitalizations and provide health gains.

Although infrastructures and human resources are limited, or rather not infinite, to have internal dynamics and learning, a stable team is important to better adapt to the needs of the service. Routines needed to be internalized, as well as trying to minimize error through continuous process improvement. The pedagogical routines, focusing on health education, were also an innovative process that had to be acquired during the first wave of the pandemic. In short, all respondents focus on these main ideas (see following table).

Table 3: Summary of the interviews - learning

DIMENSION	E1	E2	E3	E4	E5	E6
Learning	Infrastructure and Human Resources are Limited.	A stable team allows great internal and learning dynamics. Routine activities.	Routines; Continuous Learning.	Daily Learning, continuous improvement.	Acquired Knowledge; Routines; We learn by making mistakes.	Change in processes, changes in daily routines. Promoters in pedagogy and dissemination of information for health education; innovate.

New Features

Knowledge creation can improve DC, making organizations more prepared and flexible in a dynamic environment (Lesser & Prusak 2001, Sher & Lee, 2004). It is important to know which new resources to use and how they improve the organization's performance:

E1: The reinforcement in terms of Human Resources allows to bridge the existing gaps and somehow better manage the teams; E2: Human resources there is a higher rate of absence; and Material resources There have been some material shortcomings at the beginning of the pandemic. There is a need to use technology to minimize the distance between the patient and the family; E3: That way, we maintain the same resources as before, although the absenteeism rate has increased, largely due to anxiety-related losses. The team mobilized is today more united, but exhausted, since to compensate for the failures, it is necessary to sometimes assign extra-ordinary shifts; E4: Not only the medical equipment that is public knowledge, but all the human and technological resources available to be able to respond to all requests.

On the contrary E5: There was a need to use more human resources to respond to the pandemic, but also to try to use other types of tools never used: as pedagogical strategies through YouTube; use of radio communication means in a covid environment, etc.; E6: All resources were used. We try to guarantee the minimum in response to needs. To improve performance, there needs to be another type of adaptation and more effective planning.

The various necessary resources involved the reinforcement of human resources, but not only. There was a need to reinforce materials (stocks) and technological tools (to help in the patient-family relationship), but also in the various medical equipment. Still, there was a use of other tools, such as pedagogical strategies through the internet and means of communication, as well as other types of equipment previously not used in the Health Units, which were required to minimize the effects of the necessary leave. The following table presents a summary of the interviews conducted in the new resources dimension.

Table 4: Summary of the interviews - New Features

DIMENSION	E1	E2	E3	E4	E5	E6
New Features	Reinforcement at the level of human resources better manage teams	Greater lack of Human Resources; Material Resources; Technology.	Absenteeism rate has increased.	Medical equipment – Human and Technological resources.	Human resources; Pedagogical strategies; Technology	All resources were used. More effective Planning.

Technology

While common capabilities incorporate the efficiency of daily activities based on the best technology and qualified personnel (Winter, 2003), the DC focuses on improving organizational efficiency, aligning operational routines to the external environment and the broader reach of organizational objectives (Zollo & Winter, 2002). In this way, *will the organization be prepared to face these new challenges? Do they have enough resources? Experience needed? What adaptations should be made?*

E1: There has been a concern about replacing technological equipment, creating conditions to improve information systems; E2: That way, more training and greater integration of the various systems and units is required, for example, in response to COVID. It is necessary to create new conditions to respond to the access of the visitors and in this way, through technologies, contact with the sick family.

Even so, E3: Yes, I believe that there are technological resources adequate to the needs, I believe that more training in this field, updating knowledge would be important. But now it is not a priority. It is necessary to integrate and interconnect the various systems and existing health structures.

E4: There are no technological systems to meet the needs of communicating with families at a distance, making it necessary to use personal mobile phones. It was necessary to digitize areas such as information for the family member or companion, who now cannot enter; E5: We need to improve the relationship between the various services, several hospitals, integrate computer systems in a more advanced and digital way. This will help a lot in the management of pandemic situations like the one we are experiencing.

Even so, E6: Technological resources are always accurate, but also when there is more management and technological capacity there is a need for each team member. Total dependence on technology can also have weaknesses, if there are difficulties in accessing the internet, which can invalidate the whole process.

There has been a concern about replacing technological equipment, creating conditions to improve information systems. However, when increasing the information systems, there is a need for training and qualification of its users. There is also an urgent need for the integration and interconnection of the various existing health systems and structures. As a future suggestion, there is the need to create digital communication capacity between professionals, families, and users. The table below shows the summary of the interviews carried out in the technological dimension.

Table 5: Summary of the interviews - Technology

DIMENSION	E1	E2	E3	E4	E5	E6
Technology	Replacement of technological equipment, creating conditions to improve information systems.	Training to integrate the various systems. Necessary to create new technological conditions for the family-patient.	More Training in this field, updating knowledge.	Integration and Interconnection of the various technological systems; Digitize information to the family member or companion.	Integrate computer systems.	Greater technological management capacity in each team member.

Human Resources

Knowledge management can reduce response times for implementation and new techniques, and knowledge creation can improve DC, making organizations more prepared and flexible in a dynamic environment (Lesser &

Prusak 2001, Sher & Lee, 2004). Regarding the knowledge and recognition of professionals, it has varied after the arrival of the pandemic. According to the interviewees:

E1: In March, at the beginning of the pandemic, there was some recognition from the guardianship and the community; E2: Recognition is something that needs to be valued across the NHS. The better the professionals, the better the services provided. Knowledge is accumulated over the years, from routines, from learning and in my opinion, the more knowledge the greater and better the results achieved; E3: As I mentioned earlier, knowledge is dynamic and continuous, and today we are much better prepared and with much improved levels of knowledge about the situation compared to the beginning of the pandemic. Undoubtedly, this knowledge is the key to the success of the services provided.

Even so, E4: The recognition of nurses is something that is urgent to resolve from a financial point of view, not least because they are the main pillar of the NHS.

E5: More and more professionals do more, but they are more tired, devalued and worn out. It is important to have a more effective talent recruitment and retention policy. There is an urgent need to recruit trained professionals with the capacity to innovate, adapt and respond to all the needs of the NHS; E6: Knowledge is not everything. It is necessary to know how to apply it, but also to be able to absorb information and define learning strategies.

In short, according to the interviewees, it is agreed that to be recognized, knowledge is necessary. However, Health Units need a more effective talent recruitment and retention policy. There is an urgent need to recruit trained professionals, with the capacity to innovate, adapt and respond to all the needs of the Health Units. Knowledge is not everything, as it is necessary to know how to apply it, but also to be able to absorb information and define learning strategies. The following table presents the summary of the interviews carried out in the Human resources dimension.

Table 6: Summary of the interviews - Human Resources

DIMENSION	E1	E2	E3	E4	E5	E6
Human Resources	Recognition of Guardianship and community.	Recognition is something that needs to be valued.	It is the key to the success of the services provided.	The recognition of Nurses is urgent.	More tired, devalued and worn out. More effective talent recruitment and retention policy.	To be able to absorb information and define learning strategies.

Finally, in the following illustration, a theoretical map is made with the main terms taken from the interviews.



Figure 1: Summary of the interviews

As a map of ideas and indicators, we can consider that: i) health technology and equipment, were the most public and critical in the management of the pandemic; ii) learning and training, were especially important in creating knowledge and processes to create better responses to users; iii) the integration of processes and human resources were, from the perspective of the interviewees, an advantage in the management of the pandemic; iv) recognition, and in this case, a motivation influences the response given to the population, in the Health Units studied. More than just “the capability of an organization to create, expand or modify its resource base” (Helfat et al., 2007, p.1), this systematic literature review encountered various studies that consider measuring DC involves the dimensions of knowledge, learning, and technology.

Correspondingly, and in keeping with the systematic review of the DC, we may affirm that the studies published form three large groups around the DC concept: i) Company Performance; ii) Innovation Performance; and iii) Human Resource Management. Measuring the relationship existing between the DC and Company Performance incorporates three such capabilities: i) Marketing, ii) Technologies, and iii) Operations, with this relationship mediated by variables depicting the turbulence/dynamism of the environment surrounding the respective company. In terms of this relationship, Curado & Bontis, 2006 have already demonstrated how these operational capabilities act as mediators in the relationship between DC and performance.

We can corroborate with Teece (1998) when he states that organizations must know the assets to be developed and which ones to abandon, being a decisive element in the success of the organizational equation. So, we can say that DC can help the Health Units' response to the COVID-19 pandemic.

5. Conclusion

Firstly, the present study aimed to study CD in Collective Health organizations during the initial phase of the COVID-19 pandemic, with the objective of developing a mapping of indicators that would allow a more efficient response to the organizational changes and structures of the Units as well as the needs of Users (whether COVID or non-COVID). The instrument developed and applied to nurses of health organizations made it possible to verify that, at the level of strategic management and DCs, these institutions must accompany the development of other areas or sectors, being increasingly important during pandemic phases, consider the importance of CDs to improve the efficiency of Health Units (Graça et al., 2019).

DC are operationalized in health organizations, through three major dimensions i) Marketing, Operations and Technology Capacity; ii) Innovation Capacity and iii) Human Resources Capacity, subdivided into nine areas: i-a) Marketing Capacity; i-b) Capacity of Operations; i-c) Technological Capacity; ii-a) Management; ii-b) Development; ii-c) Transaction; ii-d) Integration; iii-a) Processes and iii-b) Knowledge. In the Marketing dimension, Operations and Technology, it appears that DC are the use and adaptation of technology to needs of the organization, using formal and routine procedures, through continuous learning from past processes and statistical models, studying the changes external to the organization, creating tools to communicate and promote the brand and using internal capabilities. The evidence found in this dimension (Marketing, Operations and Technology) is related to the conclusions obtained in studies by Eisenhardt and Martin (2000), who stated routine as a learning mechanism and CD development, but also the use of errors and small flaws, which allow greater motivation in learning and the process.

Thus, DCs emerge as “the ability of an organization to create, expand or modify its resource base” (Helfat et al., 2007, p.1), but also the ability to learn, gain knowledge and boost a technology organization, always seeking to improve performance levels (Fulk & DeSanctis, 1995; Grant, 1996; Bontis, 2002; Curado & Bontis, 2006; Loureiro et al., 2019a; Loureiro et al., 2019b; Loureiro et al., 2019c).

References

- Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management*. 36(1), 256-280.
- Bontis, N., e Fitz-enz, J. (2002). Intellectual capital ROI: a causal map of human capital antecedents and consequents. *Journal of Intellectual Capital*. 3(3), 223–247.
- Chen, G. (2005). Management Practices and Tools for Enhancing Organizational Learning Capability. *Advanced Management Journal*. 70(1), 4-35.
- Costa, P.; Pacheco, A.; Simões, J; Loureiro, R. & Lopes, E. R. (2023). Knowledge transfer in the craft beer business networks in Portugal. *Proceedings of the European Conference on Knowledge Management, ECKM, 2024*, 3, pp. 1760–1767.
- Curado, C., e Bontis, N. (2006). The knowledge-based view of the firm and its theoretical precursor. *International Journal of Learning and Intellectual Capital*. 3(4), 367-381.

- Eisenhardt, K. M., R. Furr, C. B. Bingham (2010). CROSSROADS—micro foundations of performance: balancing efficiency and flexibility in dynamic environments. *Organization Science*, 21(6), 1263–1273.
- Eisenhardt, K., e Martin, J. (2000). Dynamic capabilities: what are they?. *Strategic Management Journal*. 21(10-11), 1105-1121.
- Fernandes, C., Ferreira, J., Raposo, M.L., Estevão, C., Peris-Ortiz, M., Rueda-Armengot, (2017). The dynamic capabilities perspective of strategic management: a co-citation analysis. *Scientometrics*, Akadémiai Kiadó. 112(1), 529-555.
- Fulk, J. e DeSanctis, G. (1995). Electronic Communication and Changing Organizational Forms. *Organization Science*, 6(4). 337-349.
- Graça, V., Simões, J., Loureiro, R. (2019a). Performance evaluation factors for better organizational performance: Case study in the health sector. Proceedings of the European Conference on Knowledge Management, V.2, 1224–1228.
- Graça, V., Simões, J., Loureiro, R. (2019b). Indicators for the evaluation of performance in health organizations. Proceedings of the 15th European Conference on Management, Leadership and Governance, 499–504.
- Grant, R.M. (1996), Prospering in dynamically competitive environments: organizational capability as knowledge integration, *Organization Science*. 7(4), 375-388.
- Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M. A., Singh, H., Teece, D. J., Winter, S. G. (2007). Dynamic capabilities: Understanding strategic change in organizations. Malden, MA: *Blackwell*.
- Lane, P.J., e Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic Management Journal*. 19(5), 461-477.
- Lesser, E. e Prusak, L. (2001). Preserving knowledge in an uncertain world. *MIT Sloan Management Review*. 43(1), 101-102.
- Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of Management Journal*. 52(4), 822-846.
- Loureiro, R., Ferreira, J., Simões, J. (2019a). Learning Dynamic Capabilities in healthcare organizations – a qualitative research. *Health Systems Management Journal*, 8(3): 283- 296.
- Loureiro, R., Ferreira, J.J.M., Simões, J. (2019b). Learning dynamic capabilities in logistics managers: A qualitative research. Proceedings of the 15th European Conference on Management, Leadership and Governance, 455–464.
- Loureiro, R., Ferreira, J.J.M., Simões, J. (2019c). Learning dynamic capabilities in healthcare organizations: A qualitative research. Proceedings of the 33rd International Business Information Management Association Conference, IBIMA 2019: Education Excellence and Innovation Management through Vision 2020, 2019, pp. 4660–4667.
- Loureiro, R., Ferreira, J.J. and Simões, J. (2021a). Approaches to measuring dynamic capabilities: Theoretical insights and the research agenda. *Journal of Engineering and Technology Management*, 62, 101657, ISSN 0923-4748.
- Loureiro, R. J. P., Ferreira, J. J. M. and Simões, J. M. M. (2021b). “Dynamic Capabilities in public sector: Theoretical insights and research agenda”, *International Journal of Business Excellence*, Switzerland. 25 (2), 233–260. DOI: 10.1504/IJBEX.2021.119458.
- Loureiro, R., Ferreira, J.J. and Simões, J. (2023). Understanding healthcare sector organizations from a dynamic capabilities perspective. *European Journal of Innovation Management*, 26 (2), 588-614.
- Loureiro, R., Brou, E., Simões (2018) J. Economic Fundamentals for Vertical Integration, *Health Systems Management Journal*, São Paulo, 7(3),315-329, setembro/dezembro.
- Miguel, L. S. & Brito de Sá, A., 2010. Cuidados de Saúde Primários em 2011-2016: reforçar, expandir, Lisboa: Ministério da Saúde.
- Newbert, S. L. (2007). Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. *Strategic Management Journal*. 28(2) 121-146.
- Pacheco, A., Fernandes, C., Ferreira, J., Simões, J. (2021). The entrepreneurial university and innovation: A systematic literature review. Proceedings of the European Conference on Innovation and Entrepreneurship, ECIE, 2021, pp. 683–691.
- Pacheco, A., Ferreira, J., Simões, J. (2021). Entrepreneurial orientation in universities: A systematic literature review. Proceedings of the European Conference on Innovation and Entrepreneurship, ECIE, 2021, pp. 692–700.
- Pacheco, A., Ferreira, J., Simões, J. (2023). The Role of Higher Education Institutions and Entrepreneurial Orientation in the Creation and Development of Academic Spinoffs. *Journal of Entrepreneurship*, 32(3), pp. 495–524.
- Pacheco, A. I. G., Ferreira, J., Simões, J., Veiga, P. M, Dabic, M. (2024). Mechanisms for facilitating academic entrepreneurship in higher education. *International Journal of Entrepreneurial Behaviour and Research*, article in press, 2024.
- Schilke, O., Hu, S., Helfat, C. E. (2018). Quo vadis, dynamic capabilities: A content-analytic review of the current state of knowledge and recommendations for future research. *Academy of Management Annals*. 12(1),390–439.
- Sher, P. J., e Lee, V. C. (2004). Information technology as a facilitator for enhancing dynamic capabilities through knowledge management. *Information and Management*. 41(8),933–945.
- Silva, M., Simões, J., Sousa, G., Moreira J., Mainardes, E. (2014). Determinants of innovation capacity: Empirical evidence from services firms. *Innovation: Management, Policy and Practice*, 16(3), 404–416.
- Simões, J.M.M., Ferreira, A.A.V., Morais, R. & Coelho, G. (2014). Dynamics of innovation networks: The role of HEIs in venture creation. Proceedings of the European Conference on Knowledge Management, ECKM, 2014, 3, pp. 885–892.
- Simões, J., Jose Silva, M., Trigo, V., Moreira, J. (2012). The dynamics of firm creation fuelled by higher education institutions within innovation networks, *Science and Public Policy*, 39(5), 630–640.
- Teece, D. J., and Pisano, G. (1994). The Dynamic Capabilities of Firms: an Introduction. *Industrial and Corporate Change*. 3(3), 537–556.

- Teece, D., Pisano, G., Shuen, A. (1997). Dynamic capabilities and strategic management, *Strategic Management Journal*. 18(7), 509–534.
- Teece, D.J., (2016). Dynamic capabilities and entrepreneurial management in large organizations: toward a theory of the (entrepreneurial) firm. *European Economic Review*. 86(C), 202-216.
- Wernerfelt, B., (1984). A Resource-Based view of the firm. *Strategic management journal*. 5(2), 171–180.
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*. 24(10), 991-995.
- Zahra, S., e George, G. (2002). The Net-Enabled Business Innovation Cycle and the Evolution of Dynamic Capabilities. *Information Systems Research*. 13(2), 147-150.
- Zollo, M., e Winter, S. G. (2002). Deliberate Learning and the Evolution of Dynamic Capabilities. *Organization Science*. 13(3), 339-351.