



Strategic management of ambidexterity: A critical literature review

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Abstract

This study undertakes a systematic review to gain insight into existing empirical studies on the field of ambidexterity, to synthesize and categorize the antecedents, outcomes and moderators of ambidexterity and develop suggestions for future research. Based on a systematic literature review of 92 articles published in 46 peer-reviewed academic journals from 2000 to 2020, various research perspectives were synthesized into a comprehensive framework of ambidexterity. We developed a conceptual model of ambidexterity grounded in selected theoretical lenses to advance our understanding of the different antecedents, moderators, and outcomes of ambidexterity. A fine-grained understanding of ambidexterity is presented that contributes to management literature by synthesizing ambidexterity published research findings and identifying the mechanisms of effective ambidexterity. This study is valuable when aiming to map the development of the ambidexterity field over time and improve organizational performance.

Keywords: Strategic management, ambidexterity, literature review.

1. Introduction

An increasing number of researchers believe that ambidexterity is the capability of a company to optimize efforts towards both innovation and efficiency and that it is of central importance to the competitive advantage and financial performance (Morgan and Berthon, 2008). Despite the fact that the mechanism of improving ambidexterity has become a central topic within the literature on management, it is probably one of the least understood areas (e.g. Turner et al., 2013). It is recognized that research on ambidexterity is of vital interest to both managers because it ensures company survival in the long term, and researchers because they consider exploring a challenging and promising area for theory building in management (Hughes, 2018).

Nevertheless, there has been insufficient effort by scholars to map extant research in a systematic way (Christofi et al., 2020; Centobelli et al., 2019). In addition, previous research displays contradictory empirical evidence regarding the relationship between ambidexterity and different dimensions of organizational performance (Cao et al., 2009; He and Wong, 2004; Tushman and O'Reilly, 1996). The link between ambidexterity and organizations' outcomes remains rather implicit so far. The current literature is inconsistent, reporting different and also often contradictory findings on the influence of various determinants of ambidexterity, causing confusion and misunderstanding (Rosing and Zacher, 2017). Firms' survival and expansion strongly dependent on a better understanding of the determinants that influence their capability to be ambidextrous in order to increase their performance (O'Reilly and Tushman, 2011). Moreover, previous research on ambidexterity stems from heterogeneous samples, varying in terms of industry settings, environmental contexts and organizational size (Birkinshaw and Gupta, 2013). Thus, the literature needs a rigorous synthesis and a consistent set of antecedents and moderators of ambidexterity to be recognized (Suzuki, 2019; Rosing and Zacher, 2017; O'Reilly and Tushman, 2013).

The above issues are the motives behind and the gaps that are addressed in this paper, as the current body of research on antecedents, moderators and outcomes of ambidexterity are synthesized into a conceptual framework contributing to identification of the mechanisms for effective ambidexterity and improved organizational performance. To achieve our purpose, it was decided to apply a systematic review as the best methodological tool (Snyder, 2019) in order to provide a transparent assessment of extant literature about the ambidexterity field. By

integrating findings and perspectives from many empirical researches, the present literature review can address research questions on ambidexterity with a power that no single study has. This approach can be the collective evidence in the ambidexterity research area and the basis for building a new conceptual model that engages in theory development. In both cases, this study will be valuable when aiming to map the development of the ambidexterity field over time.

Based on the above, the purpose of our literature review is: (a) to summarise existing research, to provide an updated review and analysis of the empirical literature between 2000 and 2020 on the field of the ambidexterity research. Thus, this paper is an attempt to systematically chart out the knowledge, the theoretical conflicts and inconsistencies that exist in research on ambidexterity; (b) to identify and analyse the antecedents of ambidexterity as many factors are examined, and the role of moderating variables is also included in the discussion; (c) to clarify the effect of ambidexterity on organizations' outcomes and categorize these outcomes according to practical performance dimensions; (d) to make a methodological contribution by introducing analytical methods that are fully consistent with the 'systematic' literature review method (Tranfield et al., 2003); (e) to propose a conceptual framework as a strategic agenda to show evidence on a meta-level uncovering areas in which more research is needed; (f) based on the identification of knowledge gaps and inconsistencies in the current state of the literature, to suggest promising paths for future research on the field of ambidexterity. In essence, this study contributes to management literature by synthesizing ambidexterity published research findings and identifying the mechanisms of effective ambidexterity. It addresses those specific actions required for a manager in order to implement and operate an ambidextrous strategy (O'Reilly and Tushman, 2011).

To make the above contributions the paper proceeds as follows: first, after a description of the organizational ambidexterity concept, we set out the methods and criteria that were used to review the literature. Second, the descriptive properties of the studies reviewed are summarized and evaluated along three dimensions: (a) fieldwork characteristics; (b) sampling and data collection; and (c) statistical analysis. Third, content and data synthesis of the research is presented. Finally, discussion and conclusions are presented along with directions for further research.

2. Organizational ambidexterity

Raisch and Birkinshaw (2008) defined ambidexterity as "an organization's ability to be aligned and efficient in the management of today's business demands while simultaneously adaptive to changes in the environment". It refers to a firm's ability to develop and use new resources and skills (exploration of resources) while making efficient use of the resources already available (exploitation of resources) (Hafkesbrink and Schroll, 2014). The concept has been taken into consideration by scholars to enlighten their field of study and has entered multiple areas of research, including strategic management (Lubatkin et al., 2006), innovation and technology management (Ambos et al., 2008; He and Wong, 2004; Tushman and O'Reilly, 1996), organizational learning, organization theory and behaviour (Benner and Tushman, 2003; Gibson and Birkinshaw, 2004) and operations management. Organizational ambidexterity comprises the ability of an organization to create sustainable capacity in a dual context, by balancing resource exploration, with resource exploitation (Tushman and O'Reilly, 1996). We conceptualize ambidexterity as the degree to which exploration and exploitation are in balance (Fourne et al., 2019). The simultaneous pursuit of exploration and exploitation is feasible and beneficial for organizational performance (Jansen et al., 2009; He and Wong, 2004). According to March (1991), exploration refers to experimentation with new alternatives and opportunities; it helps organizations develop new knowledge via activities such as search, variation, risk-taking, and innovation that can help them develop offerings which are new and potentially radical. On the other hand, exploitation refers to the refinement and extension of existing competencies and capabilities; it helps organizations leverage extant knowledge through activities such as selection, implementation, production, and execution. In other words, ambidextrous organizations are able to implement both incremental (i.e. exploitative) and revolutionary (i.e. exploratory) changes (Tushman and O'Reilly, 1996). March (1991) discussed exploration and exploitation as two central strategies of organizational learning that are contradictory, but nevertheless both crucial to organizational performance and survival. Moreover, the capability of ambidexterity has long been linked to firms' short-run and long-run performance (Lubatkin et al., 2006; Gibson and Birkinshaw, 2004; He and Wong, 2004). Thus, this paper responds to a call for more research is examines the strategies for increased ambidexterity and whether ambidexterity leads to success (Suzuki, 2019; Sahi et al., 2019; Raisch et al., 2009; Raisch and Birkinshaw, 2008).

3. Methodology

3.1 Systematic literature review

In terms of methodology, we choose the systematic literature review as a research method because it can broadly be described as a systematic way of collecting and synthesizing previous research, meeting the requirement of developing clear and precise aims and objectives (Tranfield et al., 2003). An exhaustive, effective and well-conducted literature review collects all available information and creates a firm foundation for advancing knowledge and facilitating theory development. Thus, the methodological rigor of reviews of the management literature will be

strengthened (Thorpe et al., 2005). Considering that, ambidexterity studies are characterized by a diversity of measurement and types of analysis; we follow the Zou and Stan (1998) approach and use a vote-counting technique as the most appropriate (Sousa et al., 2008). This technique will summarize for each antecedent, the number of studies that report a significant positive effect on ambidexterity providing a clearer picture for the reader (Sousa et al., 2008). In this study we followed the work of Tranfield et al. (2003) with the key points as summarized by Denyer and Neely (2004). The three steps are: the development of clear and precise aims and objectives; a comprehensive search of all potentially relevant articles; and a balanced, impartial and comprehensible presentation of the results (Centobelli et al., 2019; Turner et al., 2013).

3.2 Data collection

Following previous studies (e.g., Khosravi et al., 2019) this search included empirical studies from peer-reviewed journals as well as practitioner literature, because these can be considered validated knowledge and are likely to have the highest impact on the field. In the planning stage, a review protocol was designed based on the objectives of the study. The electronic databases searched were ScienceDirect, Web of science, Wiley, ABI/Inform and Scopus as the same databases have already been used in previous reviews (e.g. Nandankar and Sachan, 2020; Khosravi et al., 2019) and they contain the major journals in which this subject is discussed. We searched all issues of the journals from 2000 up to and including the last issue of 2020 that was available on-line on september 15, 2020. We select this period as the phenomenon of ambidexterity has been the object of intense research during the last 15 years.

After deciding on the purpose and type of review, in the first, the execution stage, we developed and searched keywords in the publications’ titles, abstracts and keywords (Christofi et al., 2020; Keupp et al., 2012; Thorpe et al., 2005; Tranfield et al., 2003). The searched keyword was ‘ambidex*’ (to include the words ‘ambidextrous’ and ‘ambidexterity’) as a broad, ‘umbrella’, term. First, a pilot test of the review process and protocol was tested on a smaller sample. Thus, the process was adjusted before performing the main review (Snyder, 2019). Moreover, all authors of this paper selected articles to ensure the quality and reliability of the search protocol.

Based on search criteria, we executed the main screening resulting in roughly 2340 papers. When face with too many hits, a good way to handle this sample is to re-consider and use some criteria to reduce this large number of papers (Snyder, 2019). Consistent with prior approaches (Keupp et al., 2012; Tranfield et al., 2003), we performed key words searches to identify the most relevant articles from these journals. We used the searched keywords ‘ambidexterity’ and ‘ambidextrous’, any of the phrases ‘organisational ambidexterity’, ‘innovation ambidexterity’, ‘individual ambidexterity’, ‘contextual ambidexterity’, ‘exploration and exploitation’, ‘ambidextrous leadership’, and ‘ambidextrous organisation’, in either their titles, abstracts or keywords and retained 1631 articles.

Due to duplicates, a large number of hits is quite common in the first round of a systematic literature review search. After removing the duplicates from the list of articles, the sample was reduced to 1012 titles. To classify which of these 1012 articles fit the focus and scope of this study the authors reviewed and analysed them (Denyer and Neely 2004). Following the studies of Snyder (2019) and Keupp et al. (2012), the extent to which the articles focused on antecedents, outcomes and moderators of ambidexterity was assessed by reading and rating each article’s title and abstract on separate four-point scales anchored at ‘not at all’ and ‘clearly’. The papers were evaluated for inclusion criteria; theoretical and empirical criteria; quality criteria; relevance; and a common data extraction format. We classified an article as relevant if the average score across all authors was 3.0 or above on both scales (Keupp et al., 2012). This process brought down the number of studies to 149. In order to minimize subjective interpretation biases, the authors read each of the 149 articles and independently analysed the research focus, data and methods, variables (if applicable), antecedents, moderators and results. The authors then selected 92 papers based on the inclusion criteria (Snyder, 2019). In the next stage, data from the 92 studies were extracted and synthesised for the purpose of a systematic literature review (Khosravi et al., 2019). This systematic review and rating process were as inclusive as possible to avoid eliminating potentially valuable contributions to the study. The above-described steps are presented in table 1.

Filter	Description	Web of Science	Scopus	Science Direct	Wiley	ABI Inform	Total
Step 1	Articles with selected keywords	250	647	432	67	235	1631
Step 2	After deleting duplicate articles						1012
Step 3	After rating each article’s title and abstract and eliminating the non-relevant articles						149
Step 4	After reading the full articles and eliminating the non-relevant articles						92
Final sample for systematic literature review							92

Table 1. Steps in the identification and selection of papers

3.3 Descriptive statistics of included studies

This section reports the main outcomes obtained from the distribution of the selected literature showing the journal title of the 92 different management papers. From these papers, 2 were rated as interview, 1 as case study, 1 as literature review, 1 as meta-analysis, 6 as conceptual, 1 with content analysis, 1 as quantitative study and the remaining 79 used survey data and subsequent statistical analysis. Most of them were published in the *Journal of Business Research* (n=8) and *The International Journal of Human Resource Management* (n=7). Along with the ABS (Association of Business School) 2018 journal rankings, it is noteworthy that 52 % are rated as 3* or 4*, indicating the academic significance of the subject.

From the number of studies investigating ambidexterity since 2000, we can notice an increase in publications from 2014. Though the ambidexterity concept was born more than 30 years ago, the appeal of ambidexterity as a research area is still growing and it has not remained frozen in time but has evolved over the years, including new issues and new dimensions (e.g. innovation ambidexterity). In order to find the countries where the research on ambidexterity is carried out, a simple counting of papers was conducted. The United Kingdom (n=11), China (n=10), and the United States of America (n=9) were the countries with the highest contribution, moreover, research in multiple countries (n=8) and Spain (n=8) represent a significant proposition. Despite the fact that countries such as Germany, Denmark or Sweden are well-recognized ambidexterity countries in Europe, they seem less prolific in ambidexterity research. The vast majority of the studies reviewed involved samples drawn from multiple industries followed by high technology and service firms rather than consumer products.

The size of samples used ranged from a minimum of 3 to a maximum of 2150 firms, with a mean around 217 that was a satisfactory sample as it allows for more sophisticated statistical analysis. The CEO, managers, employees and managing directors provided the information requested. It appears that some of the studies reviewed here collected data from more than one informant in the same firm. The use of multiple informants to collect data on organizational variables is preferable to a single informant, but the use of single informants is appropriate when they provide more accurate information because of their knowledge (Sousa et al., 2008). To the used survey data, from the selected studies, subsequent statistical analysis such as factor analysis, discriminant analysis, multiple regression analysis or structural equation modelling (SEM) was performed. Regression is the most popular analytical approach used by researchers followed by SEM as the next widely adopted method. This indicates that the level of statistical sophistication has improved using more complex models in the literature to assess ambidexterity issues.

4. Content and data synthesis of the research: a multi-level approach

After conducting the literature review and selecting the final sample, we proceeded to the third stage, the data synthesis, in order to condense text into fewer content-related categories (Khosravi et al., 2019). Thus, the collected literature was textually analysed to derive a set of suitable categories with precise reference to ambidexterity types, antecedents and outcomes of ambidexterity as well as associated moderating effects.

4.1 Categorization of ambidexterity concepts

The ambidexterity investigated in the 92 selected papers was at different terms. The majority of the research on ambidexterity has been conducted at the organizational level. Nevertheless, ambidexterity scholars view ambidexterity in an organization at different levels such as organizational, contextual, structural, behavioural and individual (Simsek, 2009), while recently we have seen two more concepts such as innovation (Chen and Liu, 2018) and quality ambidexterity (Herzallah et al., 2017). Figure 1 provides the frequency of the most commonly used levels of ambidexterity on which each selected article focuses.

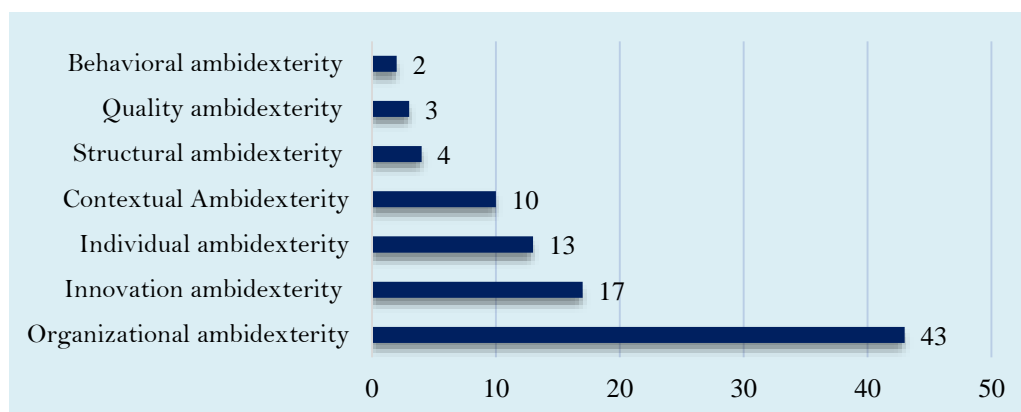


Figure 1. Frequency of ambidexterity types used in articles

Innovation ambidexterity is defined as the relevance of combining exploratory and exploitative innovations for sustainable superior performance. Scholars conceptualized innovation ambidexterity as business activities intended to pursue exploitation and exploration simultaneously (Simsek, 2009; Smith and Tushman, 2005). It captures the simultaneous pursuit of discontinuous innovations, which aim at entering new product-market domains, as well as incremental innovations, which aim at improving existing product-market positions (He and Wong, 2004). Raisch and Birkinshaw (2008) propose that the theory of innovation ambidexterity requires extension to consider the simultaneous effects of structural, contextual and leadership characteristics in achieving explorative and exploitative activities.

Individual ambidexterity: Researchers have started to argue that ambidexterity cannot be fully understood by focusing solely on the organizational level because ambidexterity has consequences for teams and individuals within ambidextrous organizations. Organizational mechanisms may be required to enable ambidexterity at the individual level; thus, ambidexterity has been largely discussed in the context of larger organizations by way of the term '*individual ambidexterity*' (Volery et al., 2013). In any organization, regardless of its size or network structure, ambidexterity relies on individual employees becoming and remaining engaged in the innovative processes at work (Caniels and Veld, 2016). It is also important to take into account that individuals at different levels of seniority in an organization will undertake different types of actions when exploring and exploiting. Top management team (TMT) processes and capacities play a major role in the organizational capacity to effectively manage opposing demands (Carmeli and Halevi, 2009).

Contextual ambidexterity happens when the same employees manage to divide their time between exploitation and exploration. Gibson and Birkinshaw (2004) showed that through contextual ambidexterity, organizations can encourage individuals to make their own decisions as to how to divide their time between alignment and adaptability-oriented activities. It helps to resolve the tension between exploration and exploitation by suggesting that these activities permeate all functions and levels in an organization (Lavie et al., 2010). Essentially, contextual ambidexterity emphasizes the integration of exploration and exploitation within a single business unit but allows for differentiated effort in both activities. The advantage of contextual ambidexterity over traditional approaches is increasingly recognized in research and business practice.

Structural ambidexterity operates at a sub unit level involving the creation of distinct sub systems and structural units having unique competencies, processes and organizational culture for meeting the current demands of the market and exploring newer market opportunities (Benner and Tushman, 2003; Simsek, 2009). Structural ambidexterity creates organizational units and teams dedicated to exploitation and exploration. This spatial differentiation allows each unit to have its own competencies, systems, incentives, processes, and culture and therefore to organize to be the best in each activity (Nowacki and Monk, 2020). Structural separation may buffer exploration from exploitation and helps to overcome resource and routine rigidity (Tushman and O'Reilly, 1996).

Quality ambidexterity is defined as a firm's ability to allocate the essential resources for being successful efficiently and simultaneously to engage in quality exploration and quality exploitation practices (Herzallah et al., 2017). Quality exploitation is defined as the quality management practices that aim to control stable and familiar processes and improve the efficiency and consistency of manufacturing or service processes. On the other hand, quality exploration is defined as the quality management practices that are used to gain new insights into process innovation and exploration of the unknown (Zhang, 2009). This concept is a recent term in literature as studies characterize the quality management practices as exploitation and exploration (Asif and de Vries, 2015; Zhang et al., 2014), and there is a growing interest in quality ambidexterity as an antecedent of competitive strategy and performance (Herzallah et al., 2017).

Behavioural ambidexterity is defined as an individual's behavioural capacity to engage in and alternate between opposing behaviors (i.e., exploitative and explorative behaviors) (Smith and Tushman, 2005). Behavioural ambidexterity views the organization's capacity to concurrently pursue alignment with the present market demands and adaptability to generate and meet future market demand without necessarily having structurally separate units for the same (Gibson and Birkinshaw, 2004). Exploitative behaviors pertain to actions related to efficiency, increasing productivity, control and certainty, and variance reduction, while explorative behaviors refer to actions such as search, discovery, autonomy, innovation and embracing variation, and ambidexterity is about performing both simultaneously (Kauppila and Tempelaar, 2016; O'Reilly and Tushman, 2013).

4.2 Antecedents of ambidexterity

Mature firms increasingly face an important strategic dilemma: How can they become ambidextrous? And especially how can they achieve and sustain exploitation and exploration to ensure their future viability? (Sahi et al., 2019). Indeed, there are many roads to organizational ambidexterity. The answer to these questions could be the antecedents as those are the characteristics that reflect the structural; learning and culture of an organisation, being the capabilities that help organizations develop a competency in ambidexterity (Raisch et al., 2009). The antecedents of ambidexterity are interesting to scholars because of the challenge of developing a capability with two underlying components, exploration and exploitation, which emerge from distinct knowledge processing capabilities (Floyd and Lane, 2000).

The 92 selected studies were thoroughly examined in a search for antecedents and moderators of ambidexterity. Our literature review discovered as many as 88 different antecedents that reflect organizational characteristics as the key enabling factors in ambidexterity. In order to classify these organizational related antecedents within the proposed framework, an effort was made to group them according to the underlying construct that they attempted to measure. We categorised these antecedents into eight categories, namely: *organization culture, quality management, knowledge management, organizational context, and organizational strategy, top management teams (TMT), human resources and leadership* antecedents. As Table 2 shows, of the 8 organizational categories affecting ambidexterity, ambidextrous leadership, TMT behavioural integration and organizational culture are the most frequently cited antecedents.

List of antecedents	Frequency of use	List of antecedents	Frequency of use
Organizational Context antecedents		Top Management Teams (TMT) antecedents	
Organizational internal context	4	TMT behavioral integration	5
Organizational Trust	3	TMT learning capability	2
Organizational structure	3	TMT composition	2
Organizational discipline	2	TMT cross functional interfacing mechanisms	1
Organizational support	2	TMT Transactive memory system	1
Dynamic capabilities	2	TMT Characteristics	1
Firm size	2	TMT's internal processes	1
Stretch	1	Organizational culture antecedents	
Financial slack	1	Organizational culture	5
Integrating capabilities	1	Shared vision	3
Prior experience	1	Organizational diversity	2
Behavioral context	1	Structural differentiation	2
Contextual approaches	1	Innovative culture	2
Meta-routines	1	Cultural distance	1
Contextual alignment	1	Culture of empowerment	1
Technological portfolio	1	Family Culture	1
R&D intensity	1	Knowledge sharing culture	1
Quality Manag. antecedents		Organizational strategy antecedents	
Process management	2	Entrepreneurial orientation	3
TQM framework	2	Innovativeness	3
Continuous improvement	1	Proactiveness	2
Commitment to quality	1	Risk-taking	2
Commitment to EFQM	1	Internal orientation	1
Customer satisfaction	1	Market orientation	1
Quality controls	1	Relationship with business units	1
Quality Management System	1	Relationship with executives	1
Core QM practises	1	Relationship with venture capitalists	1
Infrastructure QM practises	1	Ambidextrous firm strategy	1
Leadership antecedents		Ambidextrous oriented decisions	1
Ambidextrous leadership	5	Supplier management	1
Leadership humility	1	Strategic slack	1
Leadership processes	1	Strategic selection capabilities	1
Opening leadership behaviour	1	Centralization	1
Closing leadership behaviour	1	Decision risk	1
Authentic leadership	1	Innovative direction	1
Empowering leadership	1	Social relationships	1
Distributed leadership	1	Social integration	1
Leader complex behavioral	1	Spatial separation	1
Transactional leadership	1	External engagement	1
Transformational leadership	1	Knowledge Management antecedents	
HR antecedents		Ambidextrous learning	2
Senior team antecedents	3	Organizational knowledge	1
HR practice	2	Knowledge heterogeneity	1
Training and development	2	Learning orientation	1
Job enrichment schemes	1	Knowledge management capability	1
HR systems	1	Data and information analysis	1
Employee characteristics	1	Relationship learning in teams	1

Table 2. Antecedents of ambidexterity of studies reviewed

Organizational context antecedents are the most frequently cited. They refer to organizational factors and contingencies that can potentially influence a process and the way it is executed altering the desired outcome (Asif, 2017). The character of an organizational context antecedent has the potential to play a central role in building on the notions of hosting exploration and exploitation that enables individuals to choose between and demonstrate both alignment (exploitation) and adaptability (exploration) (e.g., Gibson and Birkinshaw, 2004). Ghoshal and Bartlett (1994) framework for organizational effectiveness puts forward the assumption that superior renewal efforts are facilitated and even supported when management consciously creates a fitting behavioural context. The organizational context encourages the individuals to innovate more (Gibson and Birkinshaw, 2004), while supporting them to manage their time to maintain the equilibrium among the incompatible demands for exploitation and exploration.

The second category of *organizational strategy antecedents* is based on the current and future needs and expectations of the stakeholders. Thus, to realize their strategies, organizations must develop and deploy policies, plans, goals and processes based on the capabilities of their people and their partnerships and resources (Kafetzopoulos and Gotzamani, 2019). Organizational strategies include management programs, systems, structural forms, relationships, etc. that show the path to achieving the objectives of the organizations. Adopting strategy in firms such as proactiveness, risk taking or market orientation leads to enhanced organizational ambidexterity because firms with this strategic posture create opportunities that enable the introduction of new products and brands ahead of competitors (Okpara, 2009). Organizational strategy antecedents have a positive effect on organizational ambidexterity as they reduce the conflicts between exploration and exploitation, attach more strategic attention to emerging market demand and thus reduce the internal resistance to radical change (Cho and Hambrick, 2006).

Organizational culture antecedents: Organization culture is ‘the underlying values, beliefs, and principles that serve as a foundation for an organization’s management system as well as the set of management practices and behaviors that exemplify and reinforce those basic principles. The success of an organization depends on the competencies of its leaders and the organizational culture those leaders create (Al Matrooshi et al., 2016). The development of more efficient and effective processes and the alignment of organizational culture to support new processes are critical for successful change to occur. An ambidextrous organizational culture, consisting of organizational diversity and a shared vision, is positively associated with contextual ambidexterity (Wang and Rafiq, 2014). In a nutshell, organizational culture can be leveraged to stimulate exploitation and exploration endeavors, and therefore, is an antecedent of ambidexterity (Asif, 2017). O’Reilly and Tushman (2011) showed that a strong, common identity and culture, achieved through the articulation of a common vision and common values throughout the organization, can help the firm integrate explorative and exploitative units, which contributes to ambidexterity at the firm level (Junni et al., 2015).

Leadership antecedents are considered crucial in achieving ambidexterity. As key leaders in organizations, senior executives are regarded as playing an important role in fostering ambidexterity (Raisch and Birkinshaw, 2008). Gibson and Birkinshaw (2004) examine the role of leaders in creating stretch, discipline, support, and trust to build a supportive context for contextual ambidexterity. Nemanich and Vera (2009) focus specifically on the role of transformational leadership in promoting ambidexterity and innovation (Le, 2020). Research shows that transactional leadership promotes exploitation, whereas transformational leadership promotes exploration (Lee et al., 2019; Jansen et al., 2009). Leaders stimulate exploration by stimulating thoughts in a new direction to increase the variance of follower behaviors. They also stimulate efficiency and decrease the variance of follower behaviors, thus fostering exploitation as opposed to exploration (Rosing et al., 2011). It is suggested that leaders need to be both task and relations oriented in the management of large teams (Turner et al., 2013). From the dynamic perspective proposed by complexity theory, leaders can be seen as adapting to the complexity of environmental stimuli to influence what others think and do through their interactions with them and as having an important role in enabling ambidexterity.

The importance of *Top Management Teams (TMT) antecedents* in the context of ambidexterity is supported by many theories and empirical studies (Lubatkin et al., 2006). TMT behavior, is defined as information sharing, joint decision making, and collaboration between TMT members. Studies have examined the TMT actions and decisions with the ambidextrous orientation of a firm, and they have shown that a behaviorally integrated TMT is positively associated with organizational ambidexterity (Venugopal et al., 2020). Lubatkin et al. (2006) argue that SMEs in particular have to rely more on the ability of their TMT to attain ambidexterity, because SMEs have fewer hierarchical levels and their top managers are more likely to play both strategic and operational roles. The ambidextrous orientation of a firm is influenced by the TMTs, either directly through their abilities to manage resources and make the strategic decisions to meet the paradoxical demands of ambidextrous firms (Carmeli and Halevi, 2009) or through their abilities in designing and facilitating the effective deployment of ambidextrous HR architectures for the employees (Kang and Snell, 2009). Tushman and O’Reilly (1996) suggested that ambidexterity is largely driven by TMTs as “the internal processes that enable them to handle large amounts of information and decision alternatives and deal with conflict and ambiguity”.

Quality management antecedents: Quality management practices were previously thought of as promoting exploitation but dampening exploration (Benner and Tushman, 2003). However, the more recent literature suggests that quality management practices can be designed to support both exploitation and exploration (see, e.g. Asif and De

Vries, 2015; Zhang et al., 2014). This suggestion has much in common with the interesting research of Asif and de Vries (2015) and Luzon and Pasola (2011) that attempted to show how the role of quality can be related to creating ambidexterity. Quality creates a favourable and fertile atmosphere or platform for developing ambidexterity as many of the characteristics of ambidexterity are found to be affected by some dimensions of quality (Perdomo-Ortiz et al., 2006). Organizations which apply quality practises may gain above average returns due to their ability to understand the market needs before their competitors (Kalmuk and Acar, 2015). Quality initiatives aim to reduce variation through a series of quality control techniques and by streamlining a variety of processes. Thus, quality management practises are important drivers for contributing to the development of new and quality products/services that improve organizational ambidexterity (Kafetzopoulos et al., 2015).

Human resources antecedents: Human resources are defined as collective knowledge, skills, abilities and traits at the unit level. In this sense, it is imperative to identify, understand and develop the differential characteristics of human resources which are ideal for exploitation and exploration. The ambidextrous organizations constantly need to ensure that staff competencies are appropriate for performing exploration and exploitation in both research and service. Prior research has provided meaningful implications for creating ambidextrous organizations by identifying the role of human resource management (Kim, 2019) and examined the premise that employee characteristics influence ambidexterity (Junni et al., 2015). For example, Chang et al. (2009) points out that employee characteristics influence business unit ambidexterity. Employee technology transfer experience, training and networking capabilities enhance the number of ambidextrous outputs. An ambidextrous organizational context consists of a combination of employee and leader characteristics, human resource practices, organizational structure and social relationships (Kauppila, 2016).

Knowledge management antecedents: Knowledge management is the process of acquiring, sharing, using and developing knowledge in an organization (Sharifkhani et al., 2016). Within this category, several studies suggest that organizational knowledge is a driver of ambidexterity. The fundamental concept is that management of knowledge may help firms in reducing complexity and risks. Knowledge management helps in managing the existing knowledge as a resource exploited not only as input in the firm's processes, but also in the creation of new knowledge during different exploration processes. It can trigger ambidexterity by enabling transfer and creation of new knowledge, thus leading to the development of novel ideas (De Souza Bermejo et al., 2015). Swan et al. (1999) believe that knowledge management should have the objective of improving both knowledge exploitation and exploration, thus pursuing the ambidexterity that consequently improves firm performances.

4.3 Organizational outcomes

Scholars in multiple disciplines have emphasised the critical role of ambidexterity for organizational renewal and performance (Ambos et al., 2008; Gibson and Birkinshaw, 2004; Benner and Tushman, 2003). In this literature review, we found that ambidexterity has been linked to a wide range of outcomes. As Table 3 demonstrates, our selected set of studies focused primarily on financial performance (Venugopal et al., 2020), market (Hughes, 2018), and innovation outcomes (Rosing and Zacher, 2017). A more limited set of studies has considered outcomes such as effectiveness – efficiency (Schnellbacher et al., 2019).

List of ambidexterity's outcomes	Frequency of use	List of ambidexterity's outcomes	Frequency of use
Financial performance outcomes		Innovation outcomes	
Organizational performance	32	Innovation capability	5
Financial performance	7	New product innovation outcomes	4
Revenue growth	2	Team innovation	1
Operational performance	2	Effectiveness - efficiency outcomes	
Firm Survival	1	Department efficiency	1
Manufacturing performance	1	Department effectiveness	1
Market outcomes		Creativity	1
Market orientation	3	Operational and supply chain agility	1
Entrepreneurial orientation	3	Environmental sustainability	1
Competitive advantage	2		
Customer capital	1		
Cost Leadership	1		
Differentiation	1		

Table 3. Outcomes of ambidexterity of studies reviewed

The first category is related to *financial performance outcomes*. Early research suggested a positive association between ambidexterity and financial performance. We expect that when the organization successfully pursues organizational ambidexterity, this should enhance its financial performance because while exploration helps

encounter rapid obsolescence of products and services, exploitation ensures system efficiency and a steady stream of cash flows (Jansen et al., 2006). Studies indicate that exploitative and explorative innovation interact with each other, and positively affect the sales growth and financial performance (He and Wong, 2004). Cao et al. (2009) and He and Wong (2004) have examined the comparative effects of the balanced and combined dimensions of ambidexterity on the financial performance of a firm. Both studies provide empirical support for the effect of combined ambidexterity on firm financial performance. Lubatkin et al. (2006) also reveal that the ambidextrous organization gains better financial performance. Chen (2013) empirically shows that a strategy that is characterized by ambidexterity and international expansion enhances firm performance, because the focal firm can not only adapt quickly to market demand but also respond flexibly to the demand.

The second category is related to *market outcomes*. Literature abounds with evidence suggesting that firms mastering both exploitative and explorative capabilities together (organizational ambidexterity) can achieve competitiveness and outperform to other firms in the market (O'Reilly and Tushman, 2013; Cao et al., 2009; He and Wong, 2004). Exploitative and explorative activities can complementarily strengthen firm competitiveness in the market (Tsai and Ren, 2019). From the organizational learning theory, it appears that a high degree of exploitation can act as a learning absorptive capacity and, thus, improve firms' effectiveness in exploring new knowledge to consolidate existing customers and markets, as well as renew products. Ambidexterity enables firms to realize ongoing market growth through overcoming path-dependencies and inertia, while new resources and capabilities achieved through the development of new products, can improve the response to local customers, and can increase the speed to market (Zhan and Chen, 2013; Wu, 2007).

The third category is related to *innovation outcomes*. Ambidexterity was related to firms' ability to simultaneously pursue double-loop and single-loop learning, incremental and radical innovation, stability and transformation in organizational adaptation (Raisch and Birkinshaw, 2008). Wang and Rafiq (2014) find significant relationships between ambidextrous organizational culture, contextual ambidexterity and new product innovation outcomes. Exploration and exploitation, if managed properly, can be complementary organizational activities in the innovation process within a business unit (Gibson and Birkinshaw, 2004; Simsek, 2009). Ambidexterity can provide valuable working practices and organisational structures that can advance the ability of organisations to adopt new technology and enhance both to disruptive innovation and to incremental innovation (Raisch and Birkinshaw, 2008; Tushman and O'Reilly, 1996).

Effectiveness - efficiency outcomes: The integration of exploration and exploitation enhances performance by enabling an organization to be flexible and effective without losing the benefits of stability, routinization and efficiency (Simsek, 2009). The study of Tuan (2016) concludes that organizational ambidexterity affects positively and significantly not only the supply chain agility but also its sustainable growth. Moreover, there is a positive effect of ambidextrous behaviour on departmental effectiveness and efficiency through higher team performance. In fact, ambidexterity leads indirectly to improved departmental effectiveness and efficiency via enhanced team performance and establishes also a direct effect on departmental effectiveness and efficiency regardless of team performance (Schnellbacher et al., 2019).

4.4 Moderating effects

A key characteristic of the organizational theory discipline is its emphasis on a firm's environment. The literature suggests several moderators to explain conflicting findings in respect of the organizational ambidexterity construct. Research can be categorized into two fields: studies analysing how environmental conditions (a) moderate the relationship between antecedents and ambidexterity, and (b) moderate the relationship between ambidexterity and outcomes (Raisch and Birkinshaw, 2008). Several studies on organizational ambidexterity's antecedents include references to external boundary conditions. For example, Siachou and Gkorezis (2018) expected environmental dynamism and role ambiguity to moderate the relationship between leadership and organizational ambidexterity. Moreover, several studies suggest moderators to explain the relationship between different types of ambidexterity and outcomes. For instance, market orientation has been defined as the firm's capability to enhance the relationship between organizational ambidexterity and organizational performance (Peng et al., 2019). Soto-Acosta (2018) empirically determined that innovation ambidexterity may generate a competitive advantage for firms in dynamic environments. Heirati et al. (2017) also found that new product performance is increased by the combined dimensions of ambidexterity when slack resources and social network capability are involved as moderators in their relationship. Table 4 shows the several moderators that literature suggests explaining the relationship between antecedents and ambidexterity as well as between ambidexterity and outcomes.

4.5 The conceptual model

The results of our systematic literature review of the 92 selected studies are represented in a conceptual model in figure 2. Grounded in various theories central to ambidexterity, serving as a basis for categorizing (Khosravi et al., 2019) the studies were thoroughly examined for antecedents, outcomes and moderators of different types of ambidexterity. Then, all the distinguishable factors were classified in the proposed model. As the model shows, ambidexterity was categorised into seven main types. The antecedents were categorised into eight categories and the

outcomes into four main subcategories. We also categorised the moderators as antecedents - ambidexterity moderators and ambidexterity - outcomes moderators respectively.

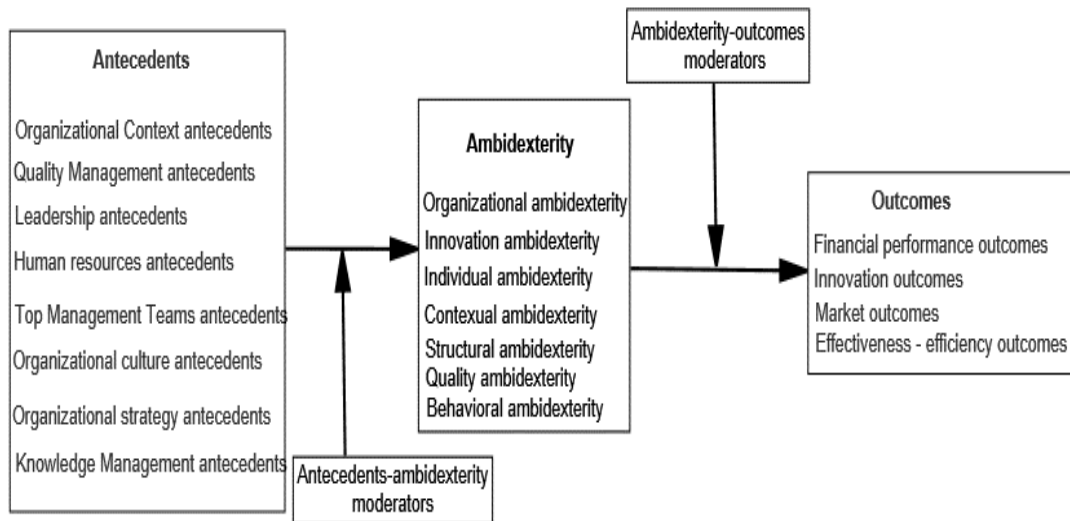


Figure 2. The proposed conceptual model of ambidexterity

Factors	Relationship
Moderation of the relationship between antecedents and ambidexterity	
Environmental dynamism	Leadership and organizational ambidexterity
Absorptive capacity	Technological portfolio and innovation ambidexterity
Role ambiguity	Empowering leadership and organizational ambidexterity
Transformational leadership	Shared vision, social integration, contingency reward and organizational ambidexterity
Industry competitiveness	Firm maturity, financial slack, strategic slack and ambidexterity
Management support	HR systems and employees' behavioural ambidexterity
Cooperative interdependence, Controversy	Constructive, Learning orientation and individual ambidexterity
Moderation of the relationship between ambidexterity and outcomes	
Environmental dynamism	Ambidextrous learning and organizational performance
	Innovation ambidexterity and organizational performance
	Organizational ambidexterity and organizational performance
Market orientation	Organizational ambidexterity and organizational performance
Competitive intelligence	Organizational ambidexterity and supply chain agility
Networking	Organizational ambidexterity and organizational performance
Firm size	Ambidextrous learning and organizational performance
Slack resources, Social network capability	Organizational ambidexterity and new product performance
Task conflict, Resource competition, Reward interdependence, Informational justice	Contextual ambidexterity and organizational performance
Organizational social exchange, Organizational social capital	Smbidextrous leadership and entrepreneurial orientation
Internal rivalry, External rivalry	Contextual ambidexterity and organizational performance

Table 4. Moderators of ambidexterity of studies reviewed

5. Discussion and conclusion

Developments in the ambidexterity literature over the last two decades indicate many inconsistencies, competing theoretical predictions and persisting knowledge gaps (De Clercq et al., 2013). Additionally, many issues pertaining to ambidexterity are still little understood. This has resulted in the use of a wide variety of measures and dozens of names to label a diverse set of independent variables. Accordingly, this lack of agreement makes it very difficult to compare the findings from different studies and obstructs theory development in the ambidexterity literature. There is a need, therefore, to move towards frameworks and conceptualizations that explain ambidexterity of firms in a more convincing manner. This paper has addressed these problems reported in the ambidexterity field by providing the first comprehensive review since Raisch and Birkinshaw (2008) and Simsek (2009), answering a call by Christofi et al. (2020) for a systematic literature review on ambidexterity.

Recent recommendations suggest that a review should describe in enough detail how it was conducted, the overall research strategy, the inclusion and exclusion of articles in order to minimise the selection bias (Snyder, 2019). To our knowledge, we offer the first systematic and transparent review of extant research, followed by a synthesis on the ambidexterity which maps extant literature about the subject, underlining main concepts and theories as well as their findings. Thus, it has developed a holistic picture of what existing empirical studies have found. Consistent with recent suggestions that the methodological rigor of reviews of the ambidexterity should be strengthened (e.g. Christofi et al., 2020; Suzuki, 2019; Rosing and Zacher, 2017; O'Reilly and Tushman, 2013), we analysed 92 articles published in 46 journals constitutive of the ambidexterity field over the period 2000–2020. This review demonstrates an appropriate strategy for selecting articles and capturing data and insights to offer something beyond a recitation of previous research. We relied on and combined different management theories – organizational theory, institutional theory, contextual theory and resource-based theory – to validate our claims.

Our main contribution in this paper concerns the consolidation of a large body of knowledge on ambidexterity into a parsimonious, theoretically grounded, multi-dimensional framework that organizes extant literature and provides a better understanding within and across multiple levels of analysis. The proposed model, connects eight constructs of determinants with seven types of ambidexterity and four dimensions of outcomes, taking into consideration the moderating role of many moderators. Ambidexterity researchers (Christofi et al., 2020; Asif, 2017; Raisch and Birkinshaw, 2008) have been working for some time on the theoretical development of models, but until now, the existing research has lacked a systematic review to give directions to companies as to what the most critical issues are which can enable them to distinguish themselves from their competitors. The model formulated in this study is potentially better specified compared to alternative models because it is comprehensive and also includes all the important dimensions in the ambidexterity field. It offers a good starting point for future empirical research on one or more of the identified ambidexterity antecedents or outcomes presented in this study.

The second contribution of the paper is that its findings indicate that: (1) there has been an increasing academic interest in the subject by high rated academic journals, especially during the last five years; (2) more studies have been conducted in China, UK and USA; (3) the majority of the studies focused on samples from multiple sectors while the importance of high-tech and service firms was also identified; (4) the majority of the ambidexterity studies continue to focus on all sizes of firms, small, medium and large firms; (5) it seems that some of the studies reviewed here collected data from more than one informant in the firm; (6) the level of statistical sophistication has improved as most of the studies used regression or SEM as the statistical method; (7) many studies used a variety of moderating variables between both antecedents – ambidexterity and ambidexterity – outcomes relationships. Moderator variables are at the very heart of scientific enterprise and the importance of testing moderating effects is clearly supported by Sousa et al. (2008).

The third contribution is that the study groups and presents the various types of ambidexterity encountered in the selected papers. The literature identifies individual ambidexterity (Schnellbacher et al., 2019), contextual and structural ambidexterity (Asif, 2017; Gibson and Birkinshaw, 2004), or organizational ambidexterity (Liu et al., 2019) as the major types of ambidexterity (Turner et al., 2013). However, observations from our base set paint a slightly different picture. The data in figure 3 suggest that organizational is the most studied ambidexterity type while innovation ambidexterity and then individual ambidexterity are also two noteworthy types which have been investigated. Furthermore, there have been other types of ambidexterity discussed in the literature such as contextual, structural, quality and behavioural ambidexterity. Such grouping will help us make sense of the various typologies used in ambidexterity research.

The fourth contribution of this study is the recognition and categorisation of antecedents which support the achievement of ambidexterity. Antecedents have received significant attention from academics and practitioners all over the world, providing interesting business insights. For example, Simsek (2009) noted three distinct sets of antecedents of ambidexterity: dual structures, organizational context, and TMT characteristics. Moreover, some valuable contributions have been made by Raisch and Birkinshaw (2008) and Asif (2017). The fact that Raisch and Birkinshaw (2008) presented a model and centered their attention only on three categories (structural, contextual and leadership-based antecedents) provides a motive to expand this conceptualization of ambidexterity's antecedents. It is noteworthy to observe that researchers working with restricted types of antecedents do not recognize the pivotal role

of other co-categories that increase the organization's ability to attain ambidexterity (Simsek, 2009). Enriching the structural and contextual explanations, scholars have recently started to examine TMT characteristics, innovation, quality, culture or knowledge management that can directly enable the organization to manage and embrace the contradictions they face. The present study provides an enhanced understanding of the antecedents of ambidexterity. We identify 88 antecedents, we have determined which of them are most apparent in literature and may play the most important role in achieving ambidexterity, then we group these antecedents into eight main categories. This categorization is presented in Table 4 and enables us to understand, in a fine-grained manner, how to achieve ambidexterity in practice. The results of this study build on existing theory concerning the importance of antecedents' category providing support for the encouragement of ambidexterity in companies in order to lead to restructuring and growth. These findings can help managers to adapt and apply more kinds of antecedents at different organizational levels, resulting in a more structured approach to ambidexterity. More specifically, this framework can be a guide for companies on how to orchestrate ambidexterity using the right mix of different antecedents' categories.

The fifth contribution of this paper to the body of knowledge in management refers to the categorization of the outcomes of ambidexterity. Mixed empirical evidence exists about the effects of ambidexterity on an organization's outcome (Junni et al., 2015; Raisch and Birkinshaw, 2008). When studies deploy one-dimensional indicators of firm performance, such as sales growth (e.g., He and Wong, 2004), they may thus run the risk of producing biased estimations of ambidexterity's contributions to the firm's overall success. Several researchers in literature have proposed ways and tools to measure business outcomes from ambidexterity using sub-dimensions such as financial performance, market performance, innovation performance and non-economic performance (Cegarra-Navarro et al., 2016). Thus, outcomes have been operationalized by different indicators including accounting versus market, production versus financial, and past versus future performance (Gunday et al., 2011). Thus, studies should consider multiple outcomes dimensions (Simsek, 2009). Consistent with prior research, the present study categorized multiple measures of outcomes to attain robustness of results (e.g., financial performance, innovation performance, market performance, effectiveness – efficiency). This review builds on the Raisch and Birkinshaw (2008) study by proposing a consistent taxonomy of outcomes that can now be systematically used in future studies. Within this framework, it is possible to clarify the effects of various types of ambidexterity on organizational outcomes. Therefore, one of the contributions of the present study concerns the deeper understanding of exploitation and exploration outcomes which may guide future studies to develop new advantages and theories for effective ambidexterity.

Lastly, this study took into consideration all variables used as moderators in the selected papers and split them into two groups: first, the moderators of the relationship between antecedents and ambidexterity and second, the moderators of the relationship between ambidexterity and outcomes. The literature suggests that all these moderators explain the conflicting findings in respect to the organizational ambidexterity construct. This paper answers key questions proposed by several scholars about moderators and important boundary conditions for the adoption of ambidexterity (Gibson and Birkinshaw, 2004). The presentation of 24 variables used as moderators offers new insights helping reconcile the inconsistent results in the extant literature. The finding that environmental dynamism moderates both, the impact of antecedents on ambidexterity and the impact of ambidexterity on business outcomes highlights the need for managers to continue to focus on developing exploitation and exploration in dynamic environments. In so doing, they will be able to fill the gaps that may open up in such environments and capture the niche market segments.

Future research directions

As this is a theoretically based study, further development of the preposition is crucial. In the case of theories already used in the ambidexterity field, researchers can take their cue from the existing study and apply new theories with greater awareness and use consolidated points and frameworks to ground research. As a general consideration, the use of management theories in ambidexterity research should be improved. Researchers could investigate ambidexterity based on the Socio-Technical System theory, which attaches the same level of importance to both technical and social sub-systems, in order to achieve better firm performance. The Resource Based View is also a promising theory in ambidexterity research: for example, it could be used to identify the key resources needed to achieve the expected technical (operational and financial performance) and social outcomes (improved attitudes of employees). Moreover, future studies may expand our study to other cross-national samples and explicitly include national culture and organizational culture as a suitable platform for the generation of ambidexterity. Extensions of the present research may include understanding the influence of cultural collectivism as an antecedent in ambidexterity implementation; the role of dimensions such as power distance, masculinity vs. femininity, uncertainty avoidance, long-term vs. short-term orientation and the efficacy of ambidexterity capability at different stages of their implementation. Another omission in the proposed theoretical framework is how exploitation and exploration interact with one another in improving organization-wide performance. Finally, future research should analyse in depth the role of QM practices and especially the EFQM Excellence Model as an important antecedent to expand the model.

Works Citation

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