International Joint Conference on Industrial Engineering and Operations Management- ABEPRO-ADINGOR-IISE-AIM-ASEM (IJCIEOM 2020)

Toward the Development of Sales and Operations Planning (S&OP) Capabilities: Meta-Characteristics of a Taxonomy

Frédéric Niko Patrice Nicolas[1], Bernd Hellingrath[2], Antônio Márcio Tavares Thomé[3]

Abstract Sales and operations planning (S&OP) is a crucial process that can benefit organizations in achieving a competitive advantage. Previous studies have shown that a successful implementation of S&OP requires more than just capital investment into technology. This research explore the theoretic grounds for a taxonomy of S&OP. It thereby draws on established theories to propose meta-characteristics for such a taxonomy. The utilized methodology follows the taxonomy development process by Nickerson et al. (2013) and represents the first step towards a complete taxonomy. This study rigorously works through the literature of the resource-based view, dynamic capabilities view, and ambidexterity to lay the foundations for a theoretically found taxonomy. The consideration of dynamic capabilities in the context of S&OP opens the opportunity for further research on S&OP agility. As this study only represents the first out of seven development steps, the research's explanatory power remains to be validated. The study is the first of its kind to attempt to join S&OP with the founded theories, namely the resource-based view and the dynamic capabilities view, and to propose the grounds for a classification of the attributes of S&OP that support firms in facing their competitive advantage.

Keywords: Sales and Operations Planning; Resource-Based View, Dynamic Capabilities, Ambidexterity, Taxonomy

1 Introduction

Sales and operations planning (S&OP) is a tactical planning cycle aiming to balance demand and supply plans and align various business functions' performance to support the strategic business plan (Feng et al., 2008). The process thereby supports an organization to effectively respond to changes in the environment and resulting variability in both demand and supply (Goh and Eldridge, 2019; Muzumdar and Fontanella, 2006). The successful implementation of S&OP can result in the key benefits: increased sales revenue, improved resource allocation, and, consequently, higher profits (Cecere et al., 2009; Hulthén et al., 2016; Ivert et al., 2015).

A wide range of literature has identified attributes of S&OP through various means, such as maturity models and frameworks (e.g. (Grimson and Pyke, 2007; Hulthén et al., 2016; Pedroso et al., 2017; Thomé et al., 2012; Wagner et al., 2014). These attributes in the form of enablers, mechanisms, and dimensions frequently share a similar purpose: to identify what makes S&OP successful. A beneficial impact on firm performance and hence the firm's competitive advantage has been associated with those firms that show higher levels of integration and S&OP maturity (Danese et al., 2018; Thomé et al., 2014). Yet, despite the extensive literature, not all firms have been able to capitalize on their investments into S&OP. While the literature on S&OP is rapidly expanding, there is limited work that is empirically grounded on established theories, thus rendering the comparison and findings of a cumbersome process. The lack of research in this direction hinders practitioners in effectively developing S&OP in their organizations, and thereon limits further research on extending S&OP. Therefore, it is important to explore how organizations can

[1]Frédéric Niko Patrice Nicolas (e-mail: frederic.nicolas@wi.uni-muenster.de)
Dpt. of Information Systems and Supply Chain Management, University of Münster, 48149 Münster, Germany

[2]Bernd Hellingrath (e-mail: bernd.hellingrath@wi.uni-muenster.de)
Dpt. of Information Systems and Supply Chain Management, University of Münster, 48149 Münster, Germany

[3]Antônio Márcio Tavares Thomé (e-mail: mt@puc-rio.br)
Dpt. of Industrial Engineering, Pontifical Catholic University of Rio de Janeiro, 22451-900 Rio de Janeiro, Brazil

proficiently develop and deploy the resources and capabilities specific to S&OP. The goal of this study is thus to provide a first contribution towards a clear understanding of the constructs that are employed in S&OP and to contribute to academia by proposing the theoretic grounds upon which these constructs can be mapped.

The success of collaboration in supply chains, and thus also of practices such as S&OP, can be understood through the theoretical underpinnings of the resource-based view (RBV) (Ramanathan and Gunasekaran, 2014). Thus, it is no surprise that since its conception, the RBV or resource-based theory has become an influential theory in various management fields such as strategy, marketing, and information systems (Wade and Hulland, 2004). Furthermore, previous researchers point towards the RBV for further research on how S&OP can contribute to generating a competitive advantage (Kristensen and Jonsson, 2018) or have partly incorporated RBV into their research (Hollmann et al., 2015). The RBV or resource-based theory considers resources as the sum of a firm's assets, competencies, and capabilities (Hall, 1993). Therefore, it characterizes a firm's competitive advantage through the bundle of resources it possesses (Wójcik, 2015). The perspective of the RBV could thus complement previous research on S&OP, which finds that resource management is important for S&OP (Noroozi and Wikner, 2017). Reaching beyond the traditional RBV, the dynamic capabilities view (DCV) and ambidexterity theory can further characterize the firm under changing environments. The rationale for selecting these theoretical groundings is that the RBV provides a robust basis upon which the firm's resources can be identified and evaluated (Mikalef and Pateli, 2017), the DCV expands the static view of the RBV to incorporate environmental changes (Teece et al., 1997), and the ambidexterity theory ties the concept of RBV and DCV together. Thus, classifying S&OP's attributes into a taxonomy with the characteristics of the RBV complemented by the DCV supports firms to explain the rent-yielding properties of organizational capabilities (Makadok, 2001; Mikalef and Pateli, 2017).

This paper paves the way to delineate and classify the capabilities of S&OP grounded on the resource-based theory by showcasing how the RBV in conjunction with DCV and ambidexterity can be utilized as a meta-dimension to classify attributes described in the literature into a theoretically found taxonomy. Therefore, this research conducts the first out of seven steps towards the development of a taxonomy (Nickerson et al., 2013). The proposed meta-dimensions contribute to S&OP's theoretical foundation and are a precursor for a taxonomy that will serve organizations as guidance towards successful S&OP.

The paper is organized as follows: First, a brief overview of the literature on the resource-based theory, dynamic capabilities theory, and ambidexterity, as well as S&OP, is given. Secondly, the methodology for the development of a taxonomy with meta-characteristics is described. Then the meta-characteristics for the attributes of S&OP based on the constructs of the RBV and DCV are described. This paper ends with a conclusion and outlook on further research.

2 Theoretical Background

2.1 Sales and Operations Planning

S&OP centralizes the planning and decision-making of various functions and business plans into a single organization-wide process. S&OP's core purpose lies in balancing demand and supply plans and bridging strategic to operational plans by aligning various functions (Feng et al., 2008; Thomé et al., 2012). It thereby integrates the management on both horizontal and vertical levels to develop a rolling horizon plan covering the tactical planning horizon (typically three to 18 months) (Thomé et al., 2012). When developed to higher maturity stages, S&OP covers intraorganizational and interorganizational coordination of plans and becomes an essential part of supply chain management (Grimson and Pyke, 2007; Tuomikangas and Kaipia, 2014; Wagner et al., 2014).

Numerous studies have examined S&OP from distinct perspectives. As such, in their studies, Thomé et al. (2012) synthesize the literature into four dimensions, Kristensen et al. (2018) have identified contextual variables that influence the process, Tuomikangas et al. (2014) identified six coordination mechanisms, and Pereira et al. (2020) have examined S&OP from a modeling perspective. Further, Pedroso et al. (2017) identify ten maturity models for S&OP, which describe 18 different dimensions, ranging from technology

to supply chain integration, over various maturity stages. These studies – and many more – have each identified some attributes that enable the efficient or effective execution of S&OP within the firm. Thereby the attributes of the individual contributions share commonalities under which they can be classified. As such, a common ground Becker et al. (2010) found that maturity models often lack a strong theoretical grounding, yet many attributes described in maturity models can be understood in the context of the RBV and the DCV. However, there has been little effort in delineating and classifying the resources and capabilities of S&OP. Thus, this study aims to develop the theoretical foundations upon which the attributes described in the literature can be depicted through the constructs of the RBV and DCV to structure the field for further research. The resulting meta-dimensions form the basis for a taxonomy, allowing practitioners to consciously choose which resources and capabilities are more appropriate to develop for their organization or whether they are better at developing new ones.

2.2 Resource-Based View

The resource-based theory takes its origins in the work of Penrose (1959), who pioneered the firm's resource perspective (Wang and Ahmed, 2007; Wójcik, 2015). The term "resource-based view" was put forward by Wernerfelt (1984), who argues that considering a firm's resource portfolio leads to immediate insight. The RBV theory gained popularity after the studies of Prahald and Hamel (1990) and Barney (1991) (Wang and Ahmed, 2007; Wernerfelt, 1995). While Wernerfelt (1984) considers resources as those "tangible and intangible assets which are tied semipermanent to the firm" (p. 172), Barney (1991) defines firm resources as "all assets, capabilities, organizational processes, firm attributes information, knowledge, etc. controlled by a firm" (p. 101) that are linked to the firm's performance. Therefore, according to Barney (1991), a firm's resource should have the so-called VRIN attributes - valuable, rare, imperfectly imitable, and non-substitutability – to yield a sustained competitive advantage. While the VRIN attributes of resources have been widely adopted, the scope of the term resources has been challenged (Wójcik, 2015). In contrast to Barney (1991), Hall (1993) argues that resources comprise the sum of the firm's assets and competencies, while capabilities are developed based on these resources (Wójcik, 2015). The aforementioned is in line with Wang and Ahmed's (2007) supposition that organizational routines, processes, and capabilities are developed based on the firm's resources.

This study adopts the view of Hall (1993) and Wang and Ahmed (2007) on resources. Thereby an asset is characterized by one's ability to possess said asset, while a competence is one's ability to perform an action (Hall, 1993). Capabilities thus refer to a specific skill of a workforce or of the organization itself. In conformity with Barney's (1991) subdivision of resources into physical capital resources, human capital resources, and organizational capital resources, this study assumes that solely the physical capital resources can consist of both tangible and intangible resources in the form of assets and that human capital resources and organizational capital resources consist of intangible resources in the form of competences. Physical capital resources comprise assets such as technological systems and specialized equipment, but also trademarks or patents. While the latter two are in their essence intangible, none physical goods, they can be made tangible through documents, and as such, traded as an asset. Human capital resources, such as training and experience, and organizational capital resources, like reporting structures and coordination systems, always remain intangible.

Within the RBV, the perspective of capabilities has evolved (Wójcik, 2015). In alignment with the definition of resources, this study also follows the definition of capabilities by Wang and Ahmed (2007):

> *"Capabilities refer to a firm's capacity to deploy resources, usually in combination, and encapsulate both explicit processes and those tacit elements (such as know-how and leadership) embedded in the processes."* (Wang and Ahmed, 2007, p. 35)

Thereby - as Wójcik (2015) points out - capabilities differentiate from routines. According to Winter (2003), routines are characterized by a pattern of interactions that form a collective behavior, and are undertaken repeatedly and are based on tacit elements. Capabilities are shaped by the conscious decisions made, while routines are shaped unconsciously. In themselves, capabilities can be further subdivided into various hierarchical levels. Hooley et al. (1998) propose three levels: strategic, functional, and operational.

Strategic capabilities comprise the organization's ability to "identify and interpret the environmental trends and industry events affecting the organization" (Hooley et al., 1998, p. 102). Functional capabilities, on the other hand, encompass the capabilities related to specific functions within the firm. Operational capabilities refer to the skills of individuals in the organization and to specific tasks set for them.

2.3 Dynamic Capabilities View and Ambidexterity

Ambidexterity addresses a firm's challenge to align its resources in the quest to manage today's business demand efficiently (*exploitation*) while adapting to the dynamic environment to address the business demand of tomorrow (*exploration*) (Gibson and Birkinshaw, 2004). For continuous long-term success, a firm thereby needs to bridge the gap between exploitation and exploration to master both adaptability and alignment (Birkinshaw and Gibson, 2004). Various views have been developed on how firms can achieve ambidexterity: Sequential, structural, and contextual (O'Reilly and Tushman, 2013). In the sequential view, firms successively interchange between exploitation and exploration (O'Reilly and Tushman, 2013). Structural ambidexterity suggests simultaneously pursuing exploitation and exploration by employing separate subunits inside the firm (O'Reilly and Tushman, 2013). Lastly, contextual ambidexterity refers to a firm's capacity to simultaneously achieve exploitation and exploration (Birkinshaw and Gibson, 2004). Thereby, Birkinshaw and Gibson (2004) suggest that contextual ambidexterity relies on the business context that encourages individuals to judge by themselves on a balance between alignment and adaptability. In a study on the application of all three approaches to ambidexterity, Kauppila (2010) concludes that firms are likely to use a combination of structural and contextual ambidexterity at both intra-organizational and inter-organizational levels (O'Reilly and Tushman, 2013).

According to O'Reilly and Tushman (2008, 2013), ambidexterity is "about developing the capabilities necessary to compete in new markets and technologies that enable the firm to survive in the face of changed market conditions" (p. 330). While the RBV has focused on the exploitation of firm-specific resources and capabilities, with dynamic capabilities, a further extension has evolved within this theory (Teece et al., 1997). These dynamic capabilities build on the exploratory ability of the firm. Dynamic capabilities are thereby defined as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516). The DCV distinguishes from the RBV as the dynamic capabilities rely on the firm's resources and the market position, extending the perspective beyond the firm's boundaries (Schreyögg and Kliesch, 2006; Teece et al., 1997). As such, dynamic capabilities emphasize a firm's constant pursuit for re-creation (Wang and Ahmed, 2007). This places dynamic capabilities "at the heart of the ability of a business to be ambidextrous" (O'Reilly and Tushman, 2008, p. 190). Given the close interrelations between ambidexterity and dynamic capabilities, various authors have identified ambidexterity to in itself be a dynamic capability (Jansen et al., 2009; O'Reilly and Tushman, 2008; Teece, 2007). O'Reilly and Tushman (2013) argue that ambidexterity "is reflected in a complex set of decisions and routines that enable the organization to sense and seize new opportunities through the reallocation of organizational assets" (p. 332).

3 Methodology for Taxonomy Development

Taxonomies have been widely developed to classify objects of interest (Nickerson et al., 2013). Thereby, the term taxonomy has been used inconsistently and often confused with classifications and typologies by previous researchers (Nickerson et al., 2013). The term classification can "refer to both the system or process of organizing objects of interest and the organization of the objects according to a system" (Nickerson et al., 2013, p. 338). Both typologies and taxonomies are types of classifications. Bailey (1994) defines taxonomy as empirically or inductively defined, while a typology is conceptually or deductively defined.

According to Nickerson et al. (2013), there are three different approaches to taxonomy development: adhoc (intuitive), deductive (conceptual), and inductive (empirical). Furthermore, deductive and inductive approaches can be combined into a hybrid approach. In such a hybrid approach, the researcher combines deductive and inductive perspectives (Nickerson et al., 2013).

This study follows a hybrid-approach based upon the approach of Nickerson et al. (2013), which is in line with the design-science guidelines of Hevner et al. (2004). Nickerson et al. (2013) propose a seven-step process that offers a path for both an empirical and a conceptual approach. The initial steps of the process are thereby identical for both approaches: (1) Determine meta-characteristics, (2) determine ending conditions, and (3) decision to begin with an empirical or conceptual approach. When choosing the empirical approach, the steps are: (4e) Identify (new) subset of objects, (5e) Identify common characteristics of group objects, and (6e) group characteristics into dimensions to create (revise) taxonomy. For the conceptual approach, on the other hand, the steps are: (4c) Conceptualize (new) characteristics and dimensions of the objects, (5c) Examine objects for these characteristics and dimensions, and (6c) Create (revise) taxonomy. After the sixth step, the path rejoins for the final step: (7) check if the ending conditions have been met. If the ending conditions have not been met, the researcher is pointed back to repeat the process from step (3) and can again choose with which approach to continue, thereby enabling the author to incorporate the knowledge gained in the previous iterations.

This study aims at developing the meta-characteristics as the first step towards a full taxonomy for the resources and capabilities of S&OP. Thereby the meta-characteristics can be based on a theory that serves as the foundation for the taxonomy (Nickerson et al., 2013). The meta-characteristics should fulfill two requirements: (i) "the meta-characteristics should be based on the purpose of the taxonomy" (Nickerson et al., 2013, p. 343), and (ii) each identified characteristic of the taxonomy must be a logical consequence of the meta-characteristics (Nickerson et al., 2013; Soto Setzke et al., 2020). The meta-characteristics should thus meet the requirements of the intended users and structure the characteristics of the taxonomy. As a taxonomy's characteristics must be mutually exclusive and collectively exhaustive (Soto Setzke et al., 2020), said condition likewise applies to the meta-characteristics. The development of the meta-dimensions for a capabilities perspective of S&OP is described in the following section.

4 Meta-Characteristics of S&OP

We start this discussion by elaborating on the intended purpose and use of the taxonomy, delineating the constructs and levels for each theoretical perspective's pertinent constructs, and finally describing how they interrelate as meta-characteristics for sales operations planning.

The intended purpose for taxonomy is to delineate and classify the attributes of S&OP that enable the efficient and effective execution of an S&OP process and thus yield a competitive advantage for the firm. This study argues that the RBV and DCV are a valuable addition to the research on S&OP. Although the S&OP process is frequently manifested in various forms, the resources and capabilities that build the S&OP process's core are assumed to prevail. Contemplating S&OP through the RBV and DCV offers the possibility to link the S&OP process to the firm performance. Thereby, practitioners can draw from the resulting taxonomy to guide their efforts to contrive and evolve their S&OP process, while the theoretic foundation provides a valuable contribution to academia. The impact of a taxonomy can be more significant when it leads to theory (Varshney et al., 2015). When a taxonomy leads towards a theory, it is called a taxonomic theory (Gregor, 2006). Thereby, Varshney et al. (Varshney et al., 2015) propose a prescriptive framework with the necessary conditions for a taxonomy's constructs to be considered a taxonomic theory. The development of such characteristics that meet the conditions for a taxonomic theory can be a ponderous process. This study thus utilizes founded theories with its established constructs to lay the foundations of a taxonomy. Drawing the meta-characteristics from pre-existing constructs can significantly reduce the development process and simultaneously ensure the taxonomy's theoretic viability.

As previously mentioned, the proposed meta-dimensions build on the RBV and DCV. As the S&OP process is not solely a static organizational process, but also dynamically evolves with environmental and technological change, the traditional resource and capabilities constructs can be insufficient to describe the firm's capabilities regarding environmental changes. The study thus adopts the constructs assets and competencies as resources, functional and strategic capabilities form the RBV, as well as dynamic capabilities, form the DCV. Thereby capabilities can be described as a higher-order formative construct (Gupta and George, 2016). To position dynamic capabilities along with the resource-based view, Wang and Ahmed (2007) propose the following hierarchical structure: Resources (zero-order), capabilities (first-order), core capabilities (second-order), dynamic capabilities (third-order). This study adopts the

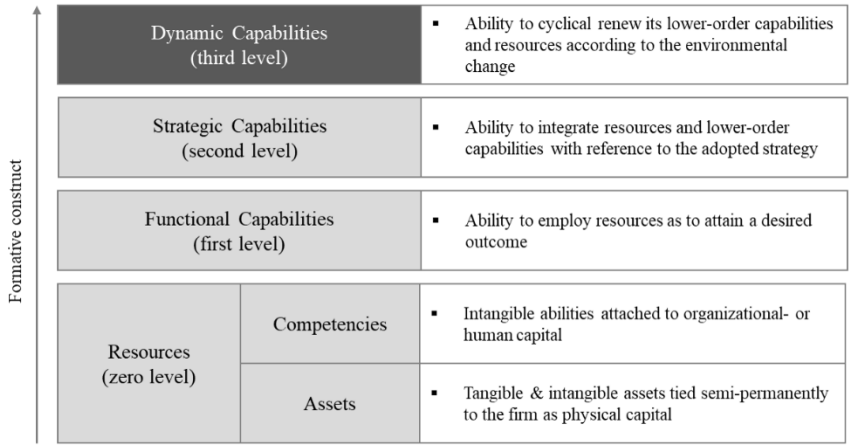

Fig 1. Meta-characteristics of S&OP

hierarchical structure of Wang and Ahmed (2007). Fig. 1 illustrates the structure. Thereby resources follow the aforementioned definition. Functional capabilities resemble the first-order capabilities of Wang and Ahmed (2007) and the operational and functional capabilities of Hooley et al. (1998). They are the ability to employ resources to attain the desired outcome and thereby crucial to sustaining the income stream. Strategic capabilities equate to Wang and Ahmed's (2007) core capabilities and are a bundle of resources and lower-order capabilities based on their strategic value. The strategic capabilities are thus crucial to the competitive advantage of the firm. Finally, dynamic capabilities refer to the firm's exploration and are essential for changing lower-order capabilities and resources. The dynamic capabilities further rely on the firm's market position and thus connect the constructs to the firm's environment. Each capability can be described as a formative construct of the subordinate constructs.

The individual assets and competencies are the foundation for the operational execution of S&OP and ensure its functionality. These key resources, the sum of the assets and competencies, must fulfill the VRIN criteria to stand out as factors that influence firm performance. In S&OP, those assets could be the availability of adequate data for the process or the availability of an S&OP workbench. On the other hand, competencies could be the established meeting structures as organizational capital and meeting participants' collaborative skills as human capital.

Building on the resources, the functional capabilities refer to those abilities associated with the ability to perform the planning process on a tactical time horizon. It is the ability to employ the resources in a structured form to manage today's business needs so that the S&OP process can be successfully executed, e.g., the ability to consolidate the information and employ this to derive a consensual plan. The functional capabilities thus address the exploitative nature of the firm. While it can be debated whether the S&OP process itself constitutes a functional capability (Faffelberger, 2018), this study argues that the concept of S&OP reaches further. S&OP can represent a collection of sub-processes that themselves are capabilities that need to be classified. Furthermore, the various dimensions of S&OP, as well as its integrative characteristics, result in higher-order capabilities that are associated with S&OP.

The exploration is further addressed with strategic capabilities. While the functional capabilities are related to performing the S&OP process, the strategic capabilities describe the firm's ability to develop the S&OP process and steer the S&OP process according to its strategy. The strategic capabilities might thus include digital capabilities or capabilities related to the supply chain network's strategic evolution.

While the functional and strategic capabilities and the firm's resources depict the firm in a fixed state, the dynamic capabilities further draw from market position to influence the process. Dynamic capabilities refer to the exploratory nature of the firm. They describe how the firm utilizes and exchanges its lower-order capabilities and resources in the constant pursuit to adapt to changing environments. The dynamic capabilities can alter and ultimately dissolve the behavioral patterns described by functional and strategic capabilities (Schreyögg and Kliesch, 2006). The degree to which the dynamic capabilities are manifested can influence whether the firm pursues structural or contextual ambidexterity.

Finally, the dynamic capabilities can explain derogations from the prescribed processes. The unique ability of dynamic capabilities to draw insights from the firm's market position enables it to develop and transform the lower-order constructs. Describing S&OP through the perspective of dynamic capabilities thus offers the ability for a renunciation of the rigid viewpoint of S&OP and to instead perceive S&OP through an agile perspective. In this context, agility can be defined as the firm's capacity to efficiently and effectively redirect its resources toward creating and protecting higher yield activities as the circumstances warrant (Teece et al., 2016). Thereby, dynamic capabilities can, e.g., refer to abilities that go hand-in-hand with the application of S&OP optimization software (Grimson and Pyke, 2007). A specific manifestation could thus be the ability to utilize scenario planning as part of the S&OP process (Schlegel and Murray, 2010). Scenario planning offers the ability to imagine possible future scenarios, and firms with strong dynamic capabilities might alter their resource base to adapt to the possible outcomes (Teece et al., 2016). Teece et al. (2016) identified that scenario planning aids generative sensing, which is a form of agility. Furthermore, the broader field of IT-enabled dynamic capabilities has been identified to support organizational agility (Mikalef and Pateli, 2017), and also recent publications have investigated capabilities for business analytics and big data analytics (e.g. Chae and Olson, 2013; Cosic et al., 2015; Fosso Wamba and Mishra, 2017; Mikalef et al., 2017) that, in turn, could potentially influence the concept of S&OP. Although the IT-enabled capabilities have recently gathered increased interest by researchers, the dynamic capabilities are not limited to technological dimensions of S&OP. Dynamic capabilities relating to other dimensions, such as event-driven meetings that supersede scheduled meetings (Grimson and Pyke, 2007), reflect an agile view on S&OP.

5 Conclusion

S&OP is an established practice in numerous organizations. For these organizations, it is important to leverage the full potential that S&OP can offer to improve performance and thus gain a competitive advantage. Nevertheless, the lack of a unified theoretical found perspective of S&OP hinders organizations from releasing their full potential. This study's primary goal is to present an approach to characterize S&OP based upon a robust theory. The RBV has been applied to diverse management fields, and yet it has not been utilized to characterize the resources and capabilities of S&OP. This study provides the foundation to connect S&OP with the RBV and DCV as kernel theories, and thus suggests an approach for the development of a taxonomy, with the meta-dimensions based on established constructs of the RBV and DCV. This research opens the path to further research in this area, namely, developing a taxonomy of S&OP capabilities.

The proposed meta-dimensions on the theoretical bases of the RBV and DCV for S&OP paves the way for the further development of a taxonomy for the resources and capabilities of S&OP. The utilized constructs thereby open the taxonomy up for a variety of purposes and audiences. By including the concept of ambidexterity and the perspective of dynamic capabilities, the proposed meta-dimensions further offer the ability to describe the transformation of S&OP through external influences, as such developments, like the rapid rise of information technology and its concurrent adoption in business processes, can be described (Dutta and Bose, 2015). The perspective of dynamic capabilities further contributes to evolving S&OP beyond the traditional view as a rigid process. It reflects the agile components of S&OP and opens the opportunity for further research on the progression of S&OP towards an agile process. However, as the literature on both the RBV and DCV remains divided on the definition of critical terms, the theory lacks universal clarity. The RBV and DCV should not be considered a panacea for S&OP. Future research could thus draw from other established theories that are more suitable to their respective purpose.

References

Bailey, K. (1994), *Typologies and Taxonomies - An Introduction to Classification Techniques*, *Journal of the American Society for Information Science*, Vol. 47, SAGE Publications, Inc., available at:https://doi.org/10.4135/9781412986397.

Barney, J.B. (1991), “Firm Resources and Sustained Competitive Advantage”, *Journal of Management*, Vol. 17 No. 1, pp. 99–120.

Becker, J., Niehaves, B., Poeppelbuss, J. and Simons, A. (2010), “Maturity Models in IS Research”, *ECIS 2010 Proceedings*, p. 42.

Birkinshaw, J. and Gibson, C. (2004), "Building Ambidexterity Into an Organization", *MIT Sloan Management Review*, Vol. 45 No. 4, pp. 47–55.

Cecere, L., Barrett, J. and Mooraj, H. (2009), *Sales and Oeprations Planning: Transformation from Tradition.Pdf*.

Chae, B.K. and Olson, D.L. (2013), "Business analytics for supply chain: A dynamic-capabilities framework", *International Journal of Information Technology and Decision Making*, Vol. 12 No. 1, pp. 9–26.

Cosic, R., Shanks, G. and Maynard, S.B. (2015), "A business analytics capability framework", *Australasian Journal of Information Systems*, Vol. 19, pp. S5–S19.

Danese, P., Molinaro, M. and Romano, P. (2018), "Managing evolutionary paths in Sales and Operations Planning: key dimensions and sequences of implementation", *International Journal of Production Research*, Taylor & Francis, Vol. 56 No. 5, pp. 2036–2053.

Dutta, D. and Bose, I. (2015), "Managing a Big Data project: The case of Ramco Cements Limited", *International Journal of Production Economics*, Elsevier, Vol. 165, pp. 293–306.

Faffelberger, J. (2018), *Implementing Sales and Operations Planning in an Electronics Company Using an Action Research Approach*.

Feng, Y., D'Amours, S. and Beauregard, R. (2008), "The value of sales and operations planning in oriented strand board industry with make-to-order manufacturing system: Cross functional integration under deterministic demand and spot market recourse", *International Journal of Production Economics*, Vol. 115 No. 1, pp. 189–209.

Fosso Wamba, S. and Mishra, D. (2017), "Big data integration with business processes: a literature review", *Business Process Management Journal*, Vol. 23 No. 3, pp. 477–492.

Gibson, C.B. and Birkinshaw, J. (2004), "The antecedents, consequences, and mediating role of organizational ambidexterity", *Academy of Management Journal*, Vol. 47 No. 2, pp. 209–226.

Goh, S.H. and Eldridge, S. (2019), "Sales and Operations Planning: The effect of coordination mechanisms on supply chain performance", *International Journal of Production Economics*, Vol. 214 No. March, pp. 80–94.

Gregor, S. (2006), "The Nature of Theory in Information Systems", *MIS Quarterly*, Vol. 30 No. 3, pp. 611–642.

Grimson, J.A. and Pyke, D.F. (2007), "Sales and operations planning: an exploratory study and framework", *The International Journal of Logistics Management*, Vol. 18 No. 3, pp. 322–346.

Gupta, M. and George, J.F. (2016), "Toward the development of a big data analytics capability", *Information and Management*, Elsevier B.V., Vol. 53 No. 8, pp. 1049–1064.

Hall, R. (1993), "A framework linking intangible resources and capabiliites to sustainable competitive advantage", *Strategic Management Journal*, Vol. 14 No. 8, pp. 607–618.

Hevner, A., March, S., Park, J. and Ram, S. (2004), "Design Science Research in Information Systems", *MIS Quarterly*, Vol. 28 No. 1, pp. 1–38.

Hollmann, R.L., Scavarda, L.F. and Thomé, A.M.T. (2015), "Collaborative planning, forecasting and replenishment: a literature review", *International Journal of Productivity and Performance Management*, Vol. 64 No. 7, pp. 971–993.

Hooley, G., Broderick, A. and Möller, K. (1998), "Competitive positioning and the resource-based view of the firm", *Journal of Strategic Marketing*, Vol. 6 No. 2, pp. 97–115.

Hulthén, H., Näslund, D. and Norrman, A. (2016), "Framework for measuring performance of the sales and operations planning process", *International Journal of Physical Distribution & Logistics Management*, Vol. 46 No. 9, pp. 809–835.

Ivert, L.K., Dukovska-Popovska, I., Fredriksson, A., Dreyer, H.C. and Kaipia, R. (2015), "Contingency between S&OP design and planning environment", *International Journal of Physical Distribution & Logistics Management*, Vol. 45 No. 8, pp. 747–773.

Jansen, J.J.P., Tempelaar, M.P., van den Bosch, F.A.J. and Volberda, H.W. (2009), "Structural differentiation and ambidexterity: The mediating role of integration mechanisms", *Organization Science*, Vol. 20 No. 4, pp. 797–811.

Kauppila, O.P. (2010), "Creating ambidexterity by integrating and balancing structurally separate interorganizational partnerships", *Strategic Organization*, Vol. 8 No. 4, pp. 283–312.

Kristensen, J. and Jonsson, P. (2018), "Context-based sales and operations planning (S&OP) research", *International Journal of Physical Distribution & Logistics Management*, Vol. 48 No. 1, pp. 19–46.

Makadok, R. (2001), "Toward a synthesis of the resource-based and dynamic-capability views of rent creation", *Strategic Management Journal*, Vol. 22 No. 5, pp. 387–401.

Mikalef, P., Framnes, V.A., Danielsen, F., Krogstie, J., Olsen, D.H., Vetle, A.F., Krogstie, J., et al. (2017), "Big Data Analytics Capability: Antecedents and Business Value.", *Pacis*, No. August, p. 136.

Mikalef, P. and Pateli, A. (2017), "Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fsQCA", *Journal of Business Research*, Elsevier B.V., Vol. 70, pp. 1–16.

Muzumdar, M. and Fontanella, J. (2006), "The Secrets to S & OP Success", *Supply Chain Management Review*, Vol. 10 No. 3, pp. 34–41.

Nickerson, R.C., Varshney, U. and Muntermann, J. (2013), "A method for taxonomy development and its application in information systems", *European Journal of Information Systems*, Vol. 22 No. 3, pp. 336–359.

Noroozi, S. and Wikner, J. (2017), "Sales and operations planning in the process industry: A literature review", *International Journal of Production Economics*, Vol. 188, pp. 139–155.

O'Reilly, C.A. and Tushman, M.L. (2008), "Ambidexterity as a dynamic capability: Resolving the innovator's dilemma", *Research in Organizational Behavior*, Vol. 28, pp. 185–206.

O'Reilly, C.A. and Tushman, M.L. (2013), "Organizational ambidexterity: Past, present, and future", *Academy of Management Perspectives*, Vol. 27 No. 4, pp. 324–338.

Pedroso, C.B., Calache, L.D.D.R., Lima Junior, F.R., Silva, A.L. da and Carpinetti, L.C.R. (2017), "Proposal of a model for sales and operations planning (S&OP) maturity evaluation", *Production*, Vol. 27, pp. 1–17.

Penrose, E.T. (1959), *The Theory of the Growth of the Firm*, John Wiley, New York.

Pereira, D.F., Oliveira, J.F. and Carravilla, M.A. (2020), "Tactical sales and operations planning: A holistic framework and a literature review of decision-making models", *International Journal of Production Economics*, Elsevier B.V., Vol. 228 No. October 2020, pp. 1–28.

Prahalad, C.K. and Hamel, G. (1990), "The Core Competence of the Corporation", *Harvard Business Review*, Vol. 68 No. 3, pp. 79–91.

Ramanathan, U. and Gunasekaran, A. (2014), "Supply chain collaboration: Impact of success in long-term partnerships", *International Journal of Production Economics*, Elsevier, Vol. 147, pp. 252–259.

Schlegel, G.L. and Murray, P. (2010), "Next Generation of S&OP: Scenario Planning with Predictive Analytics & Digital Modeling", *The Journal of Business Forecasting*, Vol. 29 No. 3, pp. 20–30.

Schreyögg, G. and Kliesch, M. (2006), "Zur Dynamisierung Organisational Kompetenzen — „Dynamic Capabilities"als Lösungsansatz?", *Schmalenbachs Zeitschrift Für Betriebswirtschaftliche Forschung*, Vol. 58 No. 4, pp. 455–476.

Soto Setzke, D., Opderbeck, L. and Riasanow, T. (2020), "Toward a Taxonomy of Digital Transformation Initiatives", *Twenty-Eight European Conference on Information Systems (ECIS2020)*, pp. 1–11.

Teece, D., Peteraf, M. and Leih, S. (2016), "Dynamic capabilities and organizational agility: Risk, uncertainty, and strategy in the innovation economy", *California Management Review*, Vol. 58 No. 4, pp. 13–35.

Teece, D.J. (2007), "Explicating Dynamic Capabilities: The Nature And Microfoundations of (Sustainable) Enterprise Performance", *Strategic Management Journal2*, Vol. 28, pp. 1319–1350.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Knowledge and Strategy*, Vol. 18 No. 7, pp. 506–533.

Thomé, A.M.T., Scavarda, L.F., Fernandez, N.S. and Scavarda, A.J. (2012), "Sales and operations planning: A research synthesis", *International Journal of Production Economics*, Vol. 138 No. 1, pp. 1–13.

Thomé, A.M.T., Sousa, R.S. and Scavarda do Carmo, L.F.R.R. (2014), "The impact of sales and operations planning practices on manufacturing operational performance", *International Journal of Production Research*, Vol. 52 No. 7, pp. 2108–2121.

Tuomikangas, N. and Kaipia, R. (2014), "A coordination framework for sales and operations planning (S&OP): Synthesis from the literature", *International Journal of Production Economics*, Vol. 154, pp. 243–262.

Varshney, U., Nickerson, R.C. and Muntermann, J. (2015), "Towards the development of a taxonomic theory", *2015 Americas Conference on Information Systems, AMCIS 2015*, No. Gregor 2006, pp. 1–15.

Wade, M. and Hulland, J. (2004), "Review : The Resource -Based View and Information Systems Research", *MIS Quarterly*, Vol. 28 No. 1, pp. 107–142.

Wagner, S.M., Ullrich, K.K.R. and Transchel, S. (2014), "The game plan for aligning the organization", *Business Horizons*, Elsevier, Vol. 57 No. 2, pp. 189–201.

Wang, C.L. and Ahmed, P.K. (2007), "Dynamic capabilities: A review and research agenda", *International Journal of Management Reviews*, Vol. 9 No. 1, pp. 31–51.

Wernerfelt, B. (1984), "A resource-based view of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171–180.

Wernerfelt, B. (1995), "The resource-based view of the firm: Ten years after", *Strategic Management Journal*, Vol. 16 No. 3, pp. 171–174.

Winter, S.G. (2003), "Understanding dynamic capabilities", *Strategic Management Journal*, Vol. 24 No. 10 SPEC ISS., pp. 991–995.

Wójcik, P. (2015), "Exploring Links Between Dynamic Capabilities Perspective and Resource-Based View: A Literature Overview", *International Journal of Management and Economics*, Vol. 45 No. 1, pp. 83–107.