

Organisational Ambidexterity and NPD Performance A Conceptual Framework

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Abstract

New product development (NPD) consists of exploitative activity for incremental product development and explorative activity for radical product development. However, since the functions of exploitative and explorative NPDs are of opposite directions, they compete for scarce resources that make them in trade-off nature. This trade-off nature can negatively affects NPD performance. As a solution to this problem, a concept of organisational ambidexterity has emerged. This concept refers to a firm's ability to simultaneously pursuit exploitative and explorative NPDs that able to achieve the benefits of both worlds. However, as this concept is relatively new, its relationship with NPD performance is still underexplored. In details, structural ambidexterity and contextual ambidexterity that are two types of organisational ambidexterity need to be compared and contrasted to NPD financial and nonfinancial performance since they pursuit exploitative and explorative NPDs in different ways. As such, this study contributes to NPD and organisational ambidexterity literatures through a conceptual framework that shows the relationships between structural ambidexterity, contextual ambidexterity, and NPD financial and nonfinancial performance. A potential setting for empirical study based on this conceptual framework is also addressed.

Key Words: *Contextual Ambidexterity, Exploitative NPD, Explorative NPD, NPD financial performance, NPD nonfinancial performance, Structural Ambidexterity.*

Introduction

New product development (NPD) refers to exploitative activity for building incremental new product and explorative activity for building radical new product (Hohenegger, Bufardi, & Xirouchakis, 2007). Since a single product cannot meet various market needs, firms might need to introduce many new products to satisfy multiple market segments (Kim, Wong, & Eng, 2005). However, exploitative and explorative NPDs are both trade-off in nature (March, 1991). For instance, while NPD success is positively related to existing (exploitative) competencies (Zirger & Maidique, 1990) for refining existing skills and knowledge in NPD (Zhou & Wu, 2010), improvement of these skills is causing explorative of new alternatives to become less attractive (Levitt & March, 1988). In contrast, although explorative is related to product innovation (He & Wong, 2004) for pursuing new skills and knowledge in NPD (Zhou & Wu, 2010), pursuing new skills would reduce the improvement speed of existing skills (Levitt & March, 1988). As a result, many researchers have focused into the trade-off relationships between exploitative and explorative NPDs (Kyriakopoulos & Moorman, 2004).

Although exploitative and explorative NPDs are in trade-off nature, continuous exploitative of existing capabilities is the foundation for explorative NPD, hence it would suggest that exploitative and explorative NPDs are complementary (Yalcinkaya, Calantone, & Griffith, 2007). For instance, research had shown that while explorative alliances are crucial for product under development stage, exploitative alliances are crucial for existing product in market. Hence, while explorative alliances are critical in early stages of NPD, exploitative alliances are critical in later stages of NPD.

In a similar vein, it was found that product development from explorative alliances can predict product market from exploitative alliances (Rothaermel & Deeds, 2004). For these reasons, exploitative and explorative NPDs that are complementing each other would have joint effects on innovation and performance (Lichtenthaler, 2009). As such, although they are in trade-off situation, exploitative and explorative NPDs need to be equally stressed upon. Since there are already many claims on organisational ambidexterity as the answer to the trade-off nature between exploitative and explorative NPDs (Gibson & Birkinshaw, 2004), this capability that refers to a “firm’s ability to simultaneously balance different activities [exploitative and explorative NPDs] in a trade-off situation” (Rothaermel & Alexandre, 2009, p. 759) is very much needed to create complementary and to gain benefits from both worlds.

Since a healthy balance between exploitative and explorative NPDs is crucial for short- and long-term viability of firm (Ahn, Lee, & Lee, 2006), this conceptual paper focuses on organisational ambidexterity for its ability to pursue both activities in a simultaneous way that would explain better NPD performance (Gibson & Birkinshaw, 2004). For a start, this paper aims at building a conceptual framework that shows the relationships between organisational ambidexterity and NPD performance. Prior to this conceptual framework, all related issues, problem statement, and literatures on organisational ambidexterity and NPD performance are reviewed. Lastly, brief discussion on the conceptual framework and suggestion for future empirical study are addressed.

Issues and Problem

While exploitative and explorative NPDs are in trade-off nature, they are equally important since different types of new products are generated by investing in different capabilities (Molina-Castillo, Jimenez-Jimenez, & Munuera-Aleman, 2011). It was argued that this trade-off can be dealt with by ambidextrous firm who is higher at both levels of exploitative and explorative NPDs (He & Wong, 2004). As such, organisational ambidexterity could achieve the goals of NPD portfolios management to maximise overall value of all projects, to create balance between projects, to align projects with firm’s strategy, and to select the best number of NPD projects (Cooper & Edgett, 2001). However, since the concept of organisational ambidexterity is relatively new, the relevant issues are addressed as follows:

Firstly, “although a large body of research has addressed the question of how to successfully manage the individual innovation projects, the management of a firm’s new product portfolio [exploitative and explorative NPDs] has received comparably less research attention” (Salomo, Talke, & Strecker, 2008, p. 560). As a result, even though a clear gap exists in the way to best manage the trade-off between exploitative and explorative NPDs (Molina-Castillo, Jimenez-Jimenez, & Munuera-Aleman, 2011), only a few empirical studies were done to prove their interaction effects (He & Wong, 2004). As a result, no matter how organisational ambidexterity is designed to deal with the trade-off between them (Raisch, Birkinshaw, Probst, & Tushman, 2009), number of studies that have empirically and explicitly measured organisational ambidexterity is considered to be low (Andriopoulos & Lewis, 2009).

Secondly, the interaction term between exploitative and explorative NPDs cannot be used to measure two specific types of organisational ambidexterity, namely structural ambidexterity and contextual ambidexterity. This is because while structural ambidexterity refers to the creation of dual structures to manage trade-off between conflicting demands (exploitative versus explorative NPDs), contextual ambidexterity refers to the behavioral ability where individuals make their own judgment on how to

divide time between alignment (exploitative) and adaptability (explorative) activities (Gibson & Birkinshaw, 2004). Thus, since structural ambidexterity and contextual ambidexterity are different concepts of organisational ambidexterity, they should be empirically examined with different measures. Thus, it would be interesting to observe how well structural ambidexterity fares with contextual ambidexterity in their respective relationships with NPD performance.

Thirdly, so far the literature had focused on structural ambidexterity as a standard approach to deal with trade-off between exploitative and explorative NPDs where separate structures are created for them (Birkinshaw & Gibson, 2004). However, separation of activities in different structures can cause isolation (He & Wong, 2004). For these reasons, firms might also need to be contextually ambidextrous since it complements structural ambidexterity in pursuing different NPDs simultaneously (Gibson & Birkinshaw, 2004).

For instance, while structural ambidexterity is needed to create differentiation between exploitative and explorative NPDs with dual structures, contextual ambidexterity is needed to create integration between dual structures with behavioural and social means (Andriopoulos & Lewis, 2009). Therefore, it would be difficult to investigate the effects of organisational ambidexterity if one of them is excluded since there was no single way to become ambidextrous, and there was also no single leadership model for ambidexterity (Gibson & Birkinshaw, 2004). As such, structural ambidexterity and contextual ambidexterity were treated as equally important and should be investigated together.

To summarise, since organisational ambidexterity is important to create balance between exploitative and explorative NPDs, it should be able to achieve benefits of both worlds with financial gains from exploitative NPD and nonfinancial gains from explorative NPD. Nevertheless, it was discovered that organisational ambidexterity may have some limitations of use if pushed to the upper limit that can also negatively affect NPD performance (He & Wong, 2004). As a result, it would be important to question structural ambidexterity and contextual ambidexterity do they really bring benefits to firm? If yes, which one performs better to NPD performance, structural or contextual? To answer these questions, they should be compared and contrasted to understand their relationships with NPD financial and nonfinancial performance.

Reviews on Organizational Ambidexterity

Basically, the term ambidexterity refers to an ability to use both hands with equal skill. When applied to organisational context in NPD, it refers to a firm's ability to deploy both exploitative and explorative NPDs simultaneously (Luzon & Pasola, 2011). The idea for organisational ambidexterity emerged since firms manage concurrent NPD projects to get benefits from technology transfer but need not compromise the integrity and quality of individual project. In doing so, managing multiple projects demand firms to build and implement specific organisational capabilities with the skills that are not easily acquired (Nobeoka & Cusumano, 1997). According to literature, this can be done with organisational ambidexterity that allows firms to renew their competencies by introducing breakthrough products without destroying the existing business (O'Reilly & Tushman, 2004).

In general, organisational ambidexterity has been defined as a firm's ability to simultaneously create balance between adaptability and alignment (Birkinshaw & Gibson, 2004), efficiency and flexibility (Luzon & Pasola, 2011), and exploitative and explorative (Jansen, Bosch, & Volberda, 2005). This implies organisational ambidexterity can be used to create balance between any two things that are in trade-off nature. However, since organisational ambidexterity is manifested by simultaneous pursuing of exploitative and explorative NPDs (Rothaermel & Alexandre, 2009), study should be focused on exploitative and explorative terms to maintain its original construct (O'Reilly & Tushman, 2013). In the context of this study, organisational ambidexterity refers to a firm's ability to simultaneously pursue exploitative and explorative NPDs (Andriopoulos & Lewis, 2009).

Meanwhile, the most common issue in organisational ambidexterity is on the use of different types of ambidexterity, which is between structural ambidexterity where a firm uses different structures for different NPD projects, and contextual ambidexterity where individuals within a firm collectively and effectively divide time between different NPD projects (Gibson & Birkinshaw, 2004). While ambidexterity that exists in structure is called structural ambidexterity, ambidexterity that lies in behavioural orientation (e.g., individual management ability, capability of top management team, capability embedded in general behaviour of organisational members) is called contextual ambidexterity (Luzon & Pasola, 2011). These terms and concepts of structural ambidexterity and contextual ambidexterity have been widely accepted within literature (Gibson & Birkinshaw, 2004).

In general, structurally ambidextrous firm separates exploitative unit from explorative unit, each with different management, processes, structures, and cultures, but are well integrated under a senior management team (O'Reilly & Tushman, 2004) to allow the structures to be "tightly coupled [within] subunits that are themselves loosely coupled with each other" (Benner & Tushman, 2003, p. 247). As such, in order to become structurally ambidextrous, one needs to have senior teams that have the ability to sense and understand different needs of businesses, that are committed to implement ambidexterity although other members are not ambidextrous, and that communicate a clear vision to allow both exploitative and explorative NPDs to co-exist (O'Reilly & Tushman, 2004). From literature, this capability is commonly manifested by NPD structures where units are specialised in specific functions and focused either on short- or long-term objectives, line and staff departments are separated within organisation, innovation and production activities are separated within organisation, and customers' needs are served from separate departments (Tempelaar, 2010; Jansen, Tempelaar, Bosch, & Volberda, 2009). For this study, structural ambidexterity refers to a firm's ability to create and manage separate structures for simultaneous pursuit of exploitative and explorative NPDs (O'Reilly & Tushman, 2004).

In contrast, contextual ambidexterity is viewed as a meta-level capacity with multidimensional construct, in which the simultaneous pursuit of exploitative and explorative NPDs within a single business unit is built on the processes or systems that encourage individuals to divide their time between activities. This means, while these individuals in their units provide value to current customers, at the same time they also seeking opportunities that exist in the changing environment and must respond accordingly. Therefore, contextual ambidexterity allows individuals in the firm to dynamically and flexibly decide on how to divide time between the rewarded and valued activities of exploitative and explorative NPDs (Gibson & Birkinshaw, 2004). The collective efforts of individuals at pursuing exploitative and explorative NPDs can be exhibited at organisational level of contextual ambidexterity (Schudy, 2010). This happens due to organisational ambidexterity is built in firms to promote a high-performance organisational context and strive for high-level performance management and social support where stronger interaction between stretch, discipline, support, and trust in the business unit context leads to high-level contextual ambidexterity (Birkinshaw & Gibson, 2004). From literature, this capability is commonly manifested by individuals who take initiative and alert to opportunities beyond the confines of their own jobs, that seek out opportunities and cooperative to combines their efforts with others, that act as broker who always looking to build internal linkages, that act as a multi-tasker who comfortable wearing more than one 'hat', and refine and renew their knowledge, skills, and expertise (Fiset & Dostaler, 2013; Mom, Bosch, & Volberda, 2009; Gibson & Birkinshaw, 2004). For this study, contextual ambidexterity refers to collective individual ability to simultaneously divide and manage time between exploitative and explorative NPDs (Birkinshaw & Gibson, 2004).

Although the ways structural ambidexterity deals with exploitative and explorative NPDs were different from contextual ambidexterity, both of them are important to be viewed together. For instance, while structural ambidexterity gives short-term benefits, contextual ambidexterity gives long-term benefits to firm (Birkinshaw & Gibson, 2004). As such, different types of organisational ambidexterity should be investigated on NPD performance to fully understand their consequences (Simsek, Heavey, Veiga, & Souder, 2009). For the purpose of this study, structural ambidexterity and contextual ambidexterity were treated as equally important and adopted for further investigation.

Reviews on NPD Performance

Since NPD performance is a multidimensional concept (He & Wong, 2004), it can be identified from two important dimensions, namely business performance that relates to exploitative NPD, and knowledge performance that relates to explorative NPD (Ahn, Lee, & Lee, 2006). Similarly, capabilities can be measured with market performance that measures market share, sales, and profit, etc. and efficiency performance that measures production cost, and time-to-market, etc. (Krasnikov & Jayachandran, 2008). This implies the criteria for measuring NPD performance are diversified (Wang, Lee, Wang, & Chu, 2009; Ittner, Larcker, & Randall, 2003). For instance, NPD performance can be seen through various perspectives such as accounting, marketing, and operations (Neely, 2002) and various categories such as profitability, market valuation, operational performance, and innovation (Aral & Weill, 2007). Accordingly, since NPD processes are implemented simultaneously within multiple NPD projects (Barczak, Griffin, & Kahn, 2009), it was found that different NPD projects require different types of resources (Song & Montoya-Weiss, 1998) that need different measures over different levels of analyses (Garcia & Calantone, 2002). Because firms that extensively use both financial and nonfinancial measures earn higher stock returns than those that do not (Ittner, Larcker, & Randall, 2003), this study has decided to adopt both criteria to measure NPD performance.

In general, NPD financial performance is usually measured with accounting-based measures (Ittner, Larcker, & Meyer, 2003; McGuire, Sundgren, & Schneeweis, 1988) such as market shares, sales, and profits (Richard, Devinney, Yip, & Johnson, 2009; Brown & Eisenhardt, 1995; Moorman, 1995). In the context of this study, NPD financial performance defines as criteria to measure firm's performance relating to NPD with typical accounting systems (Ittner, Larcker, & Meyer, 2003; Ittner & Larcker, 1998) with market share growth, sales growth, profits, and return-on-investment (ROI). In details, sales growth refers to percentage of change in sales revenue from beginning to end of one period. It is calculated by using the estimate revenue of products where total unit of products produced is multiplied with average sales price of those products (Ishikawa, Fujimoto, & Tomoyose, 2010; Nobeoka & Cusumano, 1997). Profit that is an ultimate dependent variable in management studies refers to a financial gain from investment or business operations after subtracting all of related expenses (Ernst, 2002). ROI refers to net gain from investment divided by cost of investment (Botchkarev & Andru, 2011). It indicates how well skills and resources are matched, organised, and deployed in NPD processes (Song & Montoya-Weiss, 2001). Meanwhile, market share refers to a firm's total share in industry sales (Ishikawa, Fujimoto, & Tomoyose, 2010; Banbury & Mitchell, 1995). The meanings of all of these NPD financial measures are adopted.

In contrast, nonfinancial performance is defined as criteria to measure firm's specific assets relating to NPD that cannot be precisely measured using accounting measures but are the predictors to firm's future financial performance (Ittner & Larcker, 1998) such as innovativeness and quality performance. In details, innovativeness and quality that are intangible in nature should not be simply measured with the amount of money spent on them (Kaplan & Norton, 2004) as their values are indirect (Kaplan, 2008). This happens due to lacks of direct information for intangible assets that has been recognised as deficiency in the existing accounting paradigms (Angelopoulos, Giamouridis, & Vlismas, 2012). Although they cannot be measured accurately with financial performance, firms generate cash flows from the investments in intangible assets since they are more difficult to duplicate by others (Blaug & Lekhi, 2009). As such, nonfinancial criteria are also important to measure NPD performance. In this case both innovativeness and quality performance are adopted for this study as measures for NPD nonfinancial performance.

From literature, innovativeness performance is measured with the creation of new product concept, major technological innovation in the product, and major product innovation as a whole (Pavlou & Sawy, 2011; Wang, Lee, Wang, & Chu, 2009; Kusunoki, Nonaka, & Nagata, 1998). This performance also measured with the numbers of products being introduced by firm that is not new to firm but new to market, that is new to firm but no new to market, and that is new to both firm and market (Wang, Lee, Wang, & Chu, 2009; Yalcinkaya, Calantone, & Griffith, 2007).

Accordingly, quality performance is measured with the improvement in cost of product, in functionality of product, and in elements of technology of product (Pavlou & Sawy, 2011; Kusunoki, Nonaka, & Nagata, 1998). Quality performance also measured with quality of product that is better than firm own other products, that is better than competing (competitors) products, and consumers perception on product that is more reliable than the competing products (Atuahene-Gima, Li, & DeLuca, 2006). For the purpose of this study, innovativeness performance refers to “the extent to which the new product is new to the target market and to the developing firm” (Langerak & Hultink, 2006, p. 206), while quality performance refers to the perception on superiority of product reliability and customer satisfaction related to competing products (Atuahene-Gima & Li, 2004).

Building of Conceptual Framework

As discussed earlier, striking a balance between exploitative and explorative NPDs is crucial for rent creation (Rugman & Verbeke, 2002; Wernerfelt, 1984) since focusing too much on either of them can leads to disaster (He & Wong, 2004; Levinthal & March, 1993). This happens due to exploitative and explorative NPDs that are jointly used positively affect NPD performance (Chu, Li, & Lin, 2011). This implies NPD performance can be effectively improved if firm able to reconcile and harness the trade-off between exploitative and explorative NPDs (Rothaermel & Alexandre, 2009). Because the trade-off between them can be managed with organisational ambidexterity, this study posited structural ambidexterity and contextual ambidexterity to be positively related to NPD financial and nonfinancial (innovativeness and quality) performance. With these relationships in mind, a conceptual framework as shown in Figure 1 is proposed.

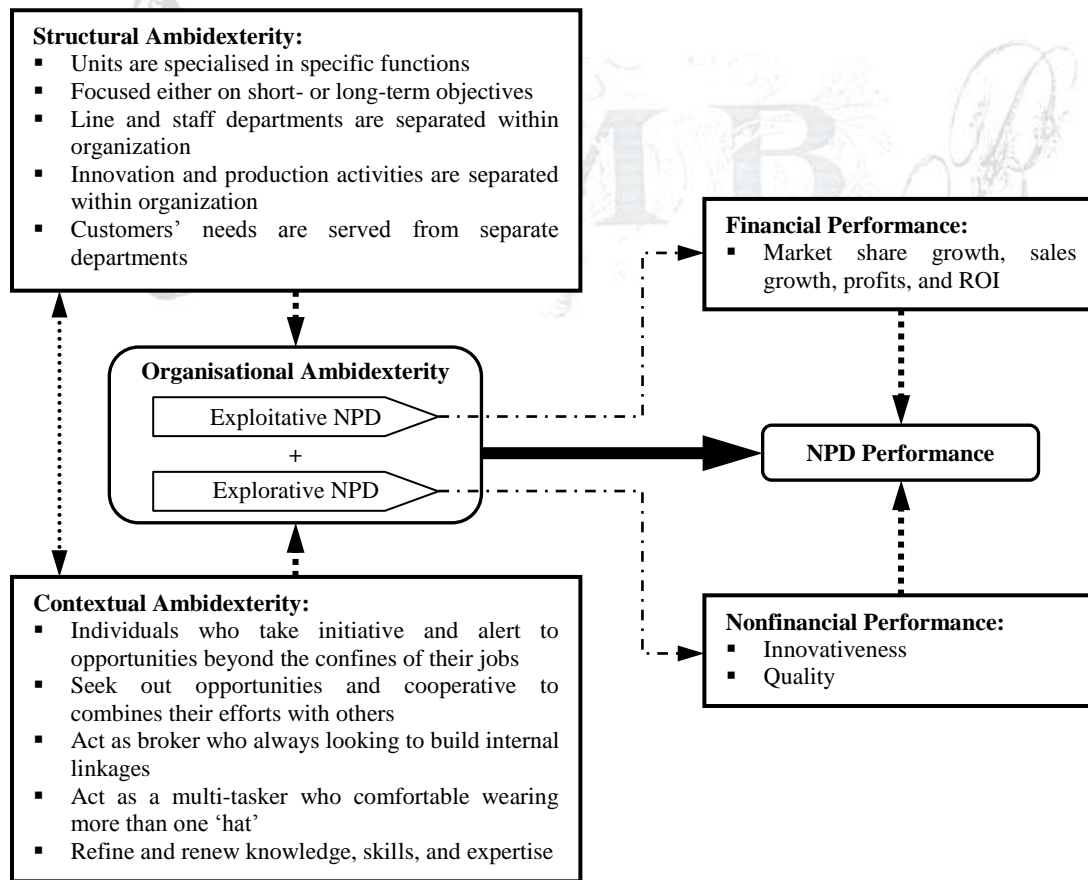


Figure 1 A schematic diagram of conceptual framework

Discussion

Since the most cited articles by He and Wong, Gibson and Birkinshaw, and O'Reilly and Tushman were only dated back in 2004, it was found that serious attention on organisational ambidexterity only started about 10 years ago. Ever since, scholars interest on organisational ambidexterity have grown with the works of Raisch and Birkinshaw (2008), Andriopoulos and Lewis (2009), Cao, Gedajlovic, and Zhang (2009), O'Reilly and Tushman (2009), Rosing, Frese, and Bausch (2011), Voss and Voss (2013), just to name a few. All of these suggested that studies on organisational ambidexterity are relatively new although the concept itself may not. As a result, most of the works of these authors are not surprisingly related to fundamental issues with rooms for improvement.

Accordingly, the idea for this paper is not in any way opposes the works of these authors. Instead, the proposed conceptual framework is to put together and clarify these (related) early works in the context of NPD that involves exploitative and explorative activities. As shown in Figure 1, organisational ambidexterity is manifested by simultaneous pursuit of exploitative and explorative NPDs where the financial (with exploitative) and nonfinancial (with explorative) benefits can be achieved together. As seen through literature, the common accepted measures for organisational ambidexterity are the values of interaction term between exploitative and explorative NPDs. Although the interaction term is widely used in literature such as by He and Wong (2004), this did not describes in a clear way the characteristics of organisational ambidexterity, rather than just showing the measures of exploitative and explorative NPDs combined together. However, since the values of interaction term suggest that the effects of exploitative and explorative NPDs are presented together, it is indeed can be used to represent the effect of organisational ambidexterity that simultaneously pursuit exploitative and explorative NPDs.

Nevertheless, a more detailed way to best describe organisational ambidexterity is with structural ambidexterity (e.g., Andriopoulos & Lewis, 2009) and contextual ambidexterity (e.g., Gibson & Birkinshaw, 2004). As suggested by literature, both types of organisational ambidexterity complement each other as highlighted in Figure 1 with an arrow connecting between them. Since structural ambidexterity and contextual ambidexterity have different characteristics, it obvious that the values of interaction term between exploitative and explorative NPDs were irrelevant to measure any of them. For this reason, it would be appropriate to measure them (in qualitatively or quantitatively) with their own characteristics. For instance, Tempelaar (2010) has measured structural ambidexterity with the characteristics from structural differentiation, but study that has measured contextual ambidexterity with the listed characteristics (see Figure 1) still low. In addition, study that has combined and measured both types of organizational ambidexterity to demonstrate that they can work well to achieve both NPD financial and nonfinancial performance is very rare. As such, a detailed investigation on the operationalization of structural ambidexterity and contextual ambidexterity should be done.

Meanwhile, in the context of manufacturing sector in Malaysia, although a study on exploitative and explorative NPDs with organisational ambidexterity was performed previously (He & Wong, 2004), this early work was not comparing and contrasting between structural ambidexterity and contextual ambidexterity to NPD performance. Besides that, it was using the interaction term from exploitative and explorative NPDs to measure organisational ambidexterity that is irrelevant for structural ambidexterity and contextual ambidexterity. For these reasons, since there was no additional study to enhance this early work, future empirical study that investigates the relationships between structural ambidexterity and contextual ambidexterity with NPD financial and nonfinancial (innovativeness and quality) performance in manufacturing sector of Malaysia based on the proposed conceptual framework is timely relevant.

In summary, this conceptual framework that put together some fundamental issues provides further understanding on the concept of organizational ambidexterity. Besides that, this framework also addressed few areas that need investigations. However, since this framework was built in the context of NPD for its potential for managing various technological capabilities, it may or may not relevant for other settings.

Meanwhile, with limited numbers of literature referred to in building of this framework, obviously more works are needed for its improvement.

Conclusion

This conceptual paper leant on the relationship between organisational ambidexterity and NPD performance. Since the trade-off between exploitative and explorative NPDs can be dealt with organisational ambidexterity, it was posited that this capability should be positively related to the benefits of both worlds with financial gains from exploitative NPD and nonfinancial gains from explorative NPD. Specifically, this paper focused on two types of organisational ambidexterity, namely structural ambidexterity and contextual ambidexterity since they achieve balance between exploitative and explorative NPDs in different ways. Because topics that put together structural ambidexterity and contextual ambidexterity are still underexplored, this paper has proposed a conceptual framework where both of them can be compared and contrasted to NPD financial, innovativeness, and quality performance. With this gap in mind, a potential setting for future empirical investigation was proposed in the context of Malaysian's manufacturing sector. In the meantime, since the concept of organizational ambidexterity seems to have potential for managing various technological capabilities, future study should pay more attentions in this aspect.

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