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ORGANIZATIONAL AMBIDEXTERITY AT INTRA-NPD LEVEL OF ANALYSIS WITH QUALITY – INNOVATION MATRIX

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ABSTRACT

Organizational ambidexterity refers to the firm's capacity to simultaneously exploit existing product offerings with familiar knowledge, and explore new product opportunities with unfamiliar knowledge. Due to this definition, ambidexterity has been commonly studied at inter-new product development (NPD) level. As such, studies at the intra-NPD (in a single NPD) are still rare. Although both exploitative and explorative are critical capabilities for NPDs, with limited resources at hands, most firms will have to do a trade-off between them. As a result, while some firms preferred exploitative NPD, some others have adventured into explorative NPD. Therefore, a single NPD project is the feasible option to most firms at any one time. Although quality is the focus in exploitative NPD, while innovation is the emphasis in explorative NPD, both are imperative to any types of NPD. Thus, it was suggested firm that is capable of creating balance between quality and innovation in a single NPD will be more successful than the others at sustaining competitive advantage. However, creating a balance between quality and innovation in a single NPD is a challenging effort. As a result, this article proposed a quality-innovation (Q-I) matrix to demonstrate the concept of organizational ambidexterity for creating balance between quality and innovation in a single NPD. The Q-I matrix will enhance our understanding on the concept of organizational ambidexterity at intra-NPD level, which is still rarely studied in contrast to the inter-NPD level of analysis.

Keywords: Dynamic capabilities, exploitative NPD, explorative NPD, sequential ambidexterity, simultaneous ambidexterity, sustainable competitive advantage

BACKGROUND

The term ambidexterity refers to the property of being equally skillful with each hand. When applied to the organization, the concept of organizational ambidexterity was introduced. This concept can be loosely defined as a firm's ability to create balance between conflicting activities. Although this concept has been around for quite sometimes, the literatures were only started to increase since 2004 through the early works of, such as Birkinshaw and Gibson, He and Wong, and O'Reilly and Tushman. From there onwards, many studies have been done to further enhance this concept in various set-ups.

In the context of new product development (NPD), this concept was defined as a firm's abilities to simultaneously use both exploitative and explorative capabilities in new products (Jansen, Bosch, & Volberda, 2005). Recently, this concept was further defined as a firm's capacity to simultaneously exploit existing product offerings with familiar knowledge and explore new product opportunities with unfamiliar knowledge (Zaidi & Othman, 2015).

This recent definition of organizational ambidexterity has implied that at least two NPDs must be existed at similar time, where the first NPD is for building new product focusing on incremental improvement (i.e., exploitative NPD), and the second NPD is focusing on building a totally new product without relying on the existing competences (i.e., explorative NPD). In this case, ambidextrous firm can sustain its competitive advantage by pursuing both NPDs simultaneously. As a result, firm can continuously make the financial profits (short-term objective) with exploitative NPD, while securing the future market share (long-term objective) with explorative NPD. However, it was found that this definition has a limitation, where firm can only applies the concept of organizational ambidexterity if there are at least two NPDs existed at any one time. As a result, this article will address the issue of organizational ambidexterity at the intra-NPD (in a single NPD) level that comes with completely different challenge from the commonly studied issue at the inter-NPD (between NPDs) level of analysis. Thus, regardless of the types of NPD, these questions should be asked – What if a firm has only one NPD, will this concept still relevant? If yes, how will this concept be demonstrated at the intra-NPD level of analysis?

Before answering the questions, it should be noted that there have been many works done to explore this concept further. Some of the works have suggested that this concept is not necessarily be achieved only by the simultaneous pursuing of exploitative and explorative NPDs. The literature has shown that this concept can also be achieved by sequential pursuing of exploitative and explorative NPDs (Chen & Katila, 2008). This approach allows the firm to exploit new products with existing knowledge (i.e., exploitative NPDs) at one time, and explore new products with unfamiliar knowledge (i.e., explorative NPDs) at another time. In this sequential approach, both NPDs occurred at different time in contrast to the simultaneous approach where they occur at similar time. Despite of this difference, the sequential approach also shares the same limitation with simultaneous approach, where the organizational ambidexterity is creating balance between at least two NPDs (still an inter-NPD issue) although not necessarily at one time. Hence, either a balance between exploitative and explorative NPDs is created simultaneously or sequentially in time, the previous questions are still relevant and applicable to be asked here.

CONCEPT OF EXPLOITATIVE AND EXPLORATIVE NPDs

In general, there are two types of organizational learning. First, exploitative capability that relates to refinement and production. Second, explorative capability that relates to flexibility and innovation (March, 1991). In the context of product development, they are considered as two types of capabilities for NPD (Greve, 2007). Although exploitative and explorative NPDs are both crucial to NPD performance, they can be traded-offs (March, 1991) as they laid on two different logics that create tensions (He & Wong, 2004). For instance, while exploitative NPDs are used to upgrade the existing product, explorative NPDs are used to develop new product concept (Mohammadjafari, et. al., 2011). In addition, while exploitative NPDs are enhanced with incremental improvement, explorative NPDs are enhanced with radical improvement (Andriopoulos & Lewis, 2009). This unhealthy situation can cause imbalance focus between them, which will negatively affect the overall NPD performance of a firm (He & Wong, 2004). Table 1 shows the characteristics of exploitative and explorative NPDs that may result a trading-offs between them.

Table 1.

The concepts of exploitative and explorative NPDs.

Authors	Exploitative NPDs	Explorative NPDs
Rothaermel and Alexandre (2009)	Existing resources and capabilities	New resources and capabilities
Danneels (2008)	Apply new and/or existing competences/knowledge	Create new competences/ knowledge
He and Wong (2004)	Mechanistic structure; Tightly coupled structure; More control and less variance	Organic structure; Loosely coupled structure; Less control and more variance
Levinthal and March (1993)	Development and use of thing that already known; Support current viability	New knowledge and thing that come to be known; Support future viability
March (1991)	Short-term and certain result; Generate current income	Long-term and uncertain result; Build new capabilities

As focusing too much on exploitative NPDs can cause a success trap, while focusing too much on explorative NPDs can cause a failure trap (Levinthal & March, 1993), previous literature has suggested that both of them should be managed in a balance (e.g., Kim & Atuahene-Gima, 2010). This is important due to the reason that they need to be coordinated and integrated in order to create value (Teece, 2007). However, managing different types of capability is a difficult process. As a result, firms will usually stuck with what they best at doing (e.g., Visser, et. al., 2010). Therefore, firms need to become ambidextrous to manage the tension and to create balance between exploitative and explorative NPDs (Raisch, et. al., 2009). As such, this article argued that the conflicts should be best dealt with the concept of organizational ambidexterity where exploitative and explorative NPDs can be simultaneously pursuit (Rothaermel & Alexandre, 2009).

APPROACHES OF ORGANIZATIONAL AMBIDEXTERITY

There are four tensions that need further attention in organizational ambidexterity. Firstly, the tension between differentiation (i.e., exploitative and explorative NPDs in different organizational units) and integration (i.e., NPDs within similar unit). Secondly, the tension between levels of ambidexterity either at the organizational level or individual level. Thirdly, the tension between static perspective (i.e., sequential pursuit of NPDs) and dynamic

perspective (i.e., simultaneous pursuing of NPDs). Fourthly, the tension between internal and external perspectives of ambidexterity where both exploitative and explorative NPDs can be addressed either internal or external to the firm (Raisch, et. al., 2009). These tensions imply that there are many approaches to create balance between exploitative and exploration NPDs. However, they are all similar in a way that the balance is created between NPDs, which means most of the studies were taken place at the inter-NPD level of analysis.

These tensions have shown that organizational ambidexterity is not necessarily pursuing exploitative and explorative NPDs simultaneously (Raisch, et. al., 2009). It can also be used to make a smooth transition between them (e.g., Taylor & Helfat, 2009). As such, research has suggested that there is no single way to become ambidextrous (Gibson & Birkinshaw, 2004). For instance, depending on the contexts, the simultaneous approach is necessary under dynamic environment, whereas the sequential approach is suitable under stable environment (Chen & Katila, 2008). Table 2 shows the summary of previous literatures on the approaches of organizational ambidexterity.

Table 2.

The previous literatures on two main approaches of organizational ambidexterity.

Authors	Simultaneous	Sequential
Chu, Li and Lin (2011)	▪	
Molina-Castillo, Jimenez-Jimenez and Munuera-Aleman (2011)		▪
Li, Chu and Lin (2010)	▪	
Kim and Atuahene-Gima (2010)	▪	
Atuahene-Gima and Murray (2007)		▪
Ahn, Lee and Lee (2006)	▪	
Rothaermel and Deeds (2004)		▪
Kyriakopoulos and Moorman (2004)		▪

As shown in Table 2, there are two main approaches of organizational ambidexterity. The first approach is to pursue both exploitative and explorative NPDs simultaneously, while the second approach is to pursue each of them sequentially in time. For instance, pursuing exploitative NPDs will strengthen the firm's performance under stable environment, while explorative NPDs will strengthen the performance under turbulence environment (e.g., Molina-Castillo, Jimenez-Jimenez, & Munuera-Aleman, 2011). In sum, Table 2 suggests that the balance between exploitative and explorative NPDs is usually achieved either simultaneously or sequentially in time (e.g., Raisch, et. al., 2009). Further observations also show that these approaches were mostly discussed at inter-NPD level of analysis. Thus, in addition to the four tensions discussed earlier, this article is introducing the fifth tension that is at the level of NPD between inter-NPD (i.e., exploitative and explorative NPDs) and intra-NPD (i.e., in a single NPD, regardless of exploitative or explorative in nature).

IMPORTANCE OF PRODUCT QUALITY AND INNOVATION

It was observed that at least two NPDs are needed to apply the concept of organizational ambidexterity, where the balance between them is created either simultaneously or sequentially in time. Most of these studies were taken place at the inter-NPD level of analysis; however what if firm has only one NPD? Does this concept still relevant to be analyzed at intra-NPD level? As a response, this article argues that the concept of organizational ambidexterity is still relevant to be applied to a single NPD since the different

between inter- and intra-NPDs are just a level of analysis. However, if the exploitative and explorative NPDs are studied at inter-NPD level, what is to be studied at intra-NPD level? According to Zaidi and Othman (2015), any NPD should achieve certain levels of quality and innovation. Thus, either exploitative or explorative in nature, new product must have a mix of quality and innovation (e.g., Molina-Castillo, Jimenez-Jimenez, & Munuera-Aleman, 2011). As such, while creating balance between exploitative and explorative NPDs may be irrelevant to a single product (intra-NPD), it is possible with quality and innovation.

Product quality is a significant factor for successful new product (Gonzales & Palacios, 2002). It is a mean to acquire comparative advantage (Jacobson & Aaker, 1987). It may contribute to the firm's competitive advantage as it relates to the business unit's returns and market share. As such, firm that produces high quality product can perform well in any economic conditions (Kroll, Wright, & Heiens, 1999), improves performance in terms of growth, profitability, and market value (Cho & Pucik, 2005), and increases productivity by reducing the defective rate (Gitlow, et. al., 2005). Thus, since previous study has shown that the quality of newly launched product was usually higher than what the general public is commonly expected (Levin, 2000), 'firms are advised to assess the quality degree of the new product as the main product success determinant' (Gonzales & Palacios, 2002, p. 268).

In contrast, product innovation refers to 'the degree of newness of the firm's product portfolio' (McNally, Cavusgil, & Calantone, 2010, p. 567). There are two categories of newness according to (1) a 'new-to' factor, such as new-to-the-world, new-to-the-industry, new-to-the-scientific community, new-to-the-market, new-to-the-firm, and new-to-the-customer, and (2) a 'new-what' factor, such as new technology, new product line, new product features, new product design, new process, new services, new competition, and new customers and needs (Garcia & Calantone, 2002). Meanwhile, the types of product development can be new-to-the-world, new-to-the-firm, next generation improvements, and incremental improvements where the higher the level of newness, the longer the time it takes to complete the project (Griffin, 2002). Since innovative new product is a mean for which firm creates values to customers, it was found that a high degree of innovation in new product will increase firm's performance (Salomo, Talke, & Strecker, 2008). Therefore, when compared to quality, innovation is also a critical factor for NPD.

In summary, this article defines quality as a perception on the superiority of product reliability and customer satisfaction relating to the competing products (Atuahene-Gima & Li, 2004), and innovation as 'the extent to which the new product is new to the target market and to the developing firm' (Langerak & Hultink, 2006, p. 206). Since both quality and innovation are equally important to NPD performance, where in combination will explain the source of sustainable competitive advantage, this article defines organizational ambidexterity as a firm's ability to create balance between quality and innovation in a single NPD project (intra-NPD level of analysis).

A QUALITY-INNOVATION MATRIX

So far the relevance of studying organizational ambidexterity with quality and innovation in a single NPD has been discussed in early section. Hence, this section will address the second question on how it can be demonstrated at intra-NPD level of analysis. To answer this question, a Q-I matrix is proposed with quality at *y*-axis and innovation at *x*-axis as depicted in Figure 1. This figure shows a quality-intensive NPD in the first quadrant of the matrix. At

the highest level of quality-intensive capability, it will produce a highly reliable product that exceeds the customers' expectation. However, the level of newness (innovation) in this product may be low. Thus, although this product will be known for its reliability, it may not change the nature or redefine the standards. In contrast, the innovation-intensive capability (quadrant 3) that seeks for the highest level of innovation will strengthen the firm's ability to produce product with a cutting-edge technology, but this product may be lacking of reputation for reliability where the initial quality is questionable.

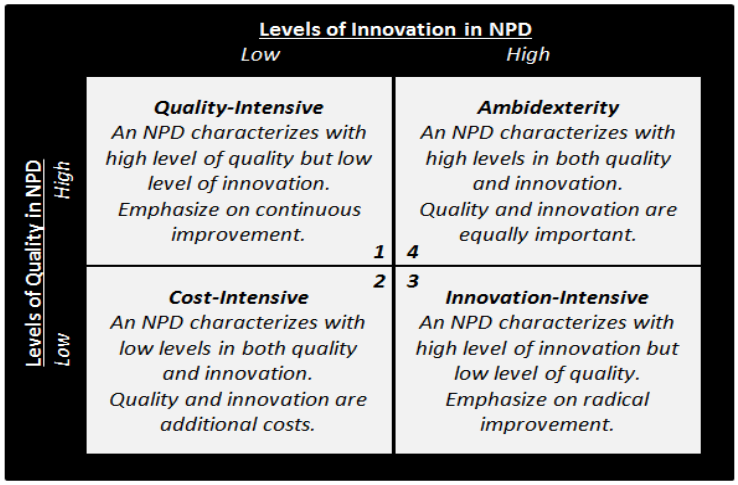

Figure 1. *A Q-I matrix for the concept of organizational ambidexterity at the intra-NPD level*

Meanwhile, a second quadrant focuses neither on quality nor innovation. When the costs of R&D to develop entirely new innovative product is high, while the efforts to achieve the highest level of quality and to develop a reputation for reliability are possibly not within the reach of a firm, a cost-intensive NPD can be the best option. The capability for cost-intensive NPD may be the lowest and less valuable in contrast to the other three capabilities (i.e., quality-intensive, innovation-intensive, and ambidexterity), unless the low cost product comes with high levels of quality and (or) innovation. Meanwhile, NPD with ambidexterity capability (quadrant 4) is characterizes with high levels in both quality and innovation since they are equally important to achieve better overall NPD performance. This suggests that although a new product with high quality (quality-intensive) will do better than a similar product with low quality, while an innovative new product (innovation-intensive) will perform better than a non-innovative new product, having both quality and innovation in a single new product will exceed the advantages in either quality- or innovation-intensive NPD. Thus, the firm ability to create balance between quality and innovation in a new product will be the highest source of NPD performance. In summary, this matrix has demonstrated the concept of organizational ambidexterity with product quality and innovation at the intra-NPD level of analysis. Despite exploitative NPDs are dominated by incremental improvement that is more quality than innovation, while explorative NPDs are dominated by radical improvement that is more innovation than quality, this matrix has suggested that quality and innovation can complement each other to produce a successful new product with ambidexterity.

DISCUSSIONS

This article has found that the concept of organizational ambidexterity was commonly applied between two different NPDs either simultaneously or sequentially in time, means that it was studied at the inter-NPD level of analysis. It was argued that this concept can also be demonstrated to a single NPD at the intra-NPD level of analysis. As this level is still rarely studied, this article has decided to discuss the concept in a single NPD. As a result, this concept was defined as a firm's ability to create balance between quality and innovation in a single NPD project. With this in minds, a Q-I matrix was proposed to create understanding on this concept by looking at the interactions between product quality and innovation in a single NPD regardless of the types. Thus, as this matrix applies to any NPDs either exploitative or explorative in nature, the meaning of 'creating balance between quality and innovation' need to be interpreted with care. This happen due to the reason that while exploitative and explorative NPDs have the characteristics that make them in trading-offs, quality and innovation that are both important to NPD performance can complementally exist in any single exploitative or explorative NPD.

Secondly, organizational ambidexterity can be applied to create balance between quality and innovation within exploitative NPD by adjusting the level of quality with innovation. Similarly, a balance can be created within explorative NPD by adjusting the level of innovation with quality. Therefore, rather than having exploitative NPD that over-emphasized on quality (quality-intensive) but lacking of innovation, or explorative NPD that over-emphasized on innovation (innovation-intensive) but lacking of quality, a right mix of quality and innovation (with ambidexterity) will reduce the drawbacks associated to each of them. Since exploitative NPD will remain exploitative in nature, and explorative NPD will remain explorative in nature, the best balance may not necessarily at the highest levels of both quality and innovation. As such, the meaning of 'high' and 'low' levels in the matrix should be interpreted within the nature of the new product.

Thirdly, competitive advantage can be built with 'the capacity of an organization to purposefully create, extend, or modify its resource base' (Helfat, et al., 2007, p.4). This capacity can further sustain the competitive advantage if it is valuable, difficult-to-imitate, and not easily available at marketplace (Teece, 2007). In relation to the Q-I matrix, each quadrant is characterized with specific capability. For instance, an innovation-intensive NPD is achieved with a capability to purposefully create, extend, or modify new product with innovative resources. Even a cost-intensive NPD is also achieved with a capability to purposefully create, extend, or modify new product with low-cost orientation. As such, if firm does better than the others with any of these capabilities, it can have a competitive advantage. However, it is the capacity of being ambidexterity that creates a sustainable competitive advantage.

Fourthly, in relation to the second point above, it was argued that only a distinctive capability with differential performance is capable of creating sustainable competitive advantage (Teece, 2009). For instance, Apple Inc. that has continuously developed iPhones with high level of reliability (quality), yet still maintained as a technology (innovation) leader can be considered as applying ambidexterity, while Nokia that focused on producing smartphones with improved reliability can be considered as applying quality-intensive capability. Under rapidly changing technology, it was found that Apple Inc. has managed to maintain its existence in a smartphone industry, whereas Nokia that was once a market leader has seriously lost its place in the market. This shows that ambidexterity can sustain the

competitive advantage better than the other capabilities as it possesses differential performance.

Fifthly, despite a cost-intensive capability may be considered as the less important source of competitive advantage with its limited ability to create innovative and reliable new product, this low-cost orientation may not necessarily be treated as inferior. For instance, other capabilities in the matrix, e.g., innovation-intensive may also want to lower the costs of new product while pursuing for higher level of innovation. As such, firm that is capable of producing a reliable, futuristic, and yet affordable product at reasonable price will have higher chances to be successful at the marketplace. Unfortunately, the Q-I matrix was only showing lower levels of quality- and innovation-intensive NPD achieved at lower cost (quadrant 2). This matrix does not shows how a balance can be created at higher levels of both quality and innovation yet lower in cost.

Sixthly, the idea behinds the Q-I matrix may not be new to the social sciences as the principle is quite similar to any existing 2-by-2 matrices. For instance, the way to describe this matrix is indifferent to the BCG matrix although the *y*- and *x*-axes of Q-I matrix are represented by the levels of quality and innovation, while BCG matrix by the market growth and share. However, the BCG matrix is used to map product portfolios, whereas the Q-I matrix is used to demonstrate a single product with the levels of quality and innovation that can possibly be balanced with the concept of organizational ambidexterity. Although the matrix is designed for intra-NPD level, this article is not rejecting any possibility of the matrix to be used at the inter-NPD level of analysis, such as to map firm own products based on the levels of quality and innovation, or to compare firm products with the competitors. Lastly, this article has treated quality and innovation as being equally important to NPD. However, other factors could also influence the success of NPD but not highlighted here. Similarly, the concept of organizational ambidexterity was discussed within the context of exploitative and explorative NPDs. The use of other contexts, such as incremental and radical, or continuous and discontinuous may have different effects on the discussions. All of the highlighted limitations can be studied in future articles.

CONCLUSIONS

The concept of organizational ambidexterity was commonly demonstrated on two types of NPD (i.e., exploitative and explorative), where the balance between them was usually discussed from the perspectives of simultaneous-sequential or structural-contextual at the inter-NPD level of analysis. As a result, this concept was found to be rarely studied at the intra-NPD level of analysis. With this gap in minds, a Q-I matrix was proposed to demonstrate the concept in a single NPD. This matrix has suggested that product can be built with ambidexterity, quality-intensive, innovation-intensive, or cost-intensive capability. Although any of these capabilities can explain the source of competitive advantage, it was argued that ambidexterity is the most distinctive capability to sustain firm's competitive advantage from dynamic capabilities' point-of-view. The Q-I matrix has contributed to better understanding of the concept of organizational ambidexterity. In addition to the four tensions in organizational ambidexterity, this article has introduced the fifth tension at the level of NPD between inter-NPD and intra-NPD, which can be further studied in future.

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REFERENCES

Ahn, J.-H., Lee, D.-J., & Lee, S.-Y. (2006). Balancing Business Performance and Knowledge Performance of New Product Development: Lessons from ITS Industry. *Long Range Planning, 39*, 525-542.

Andriopoulos, C., & Lewis, M. W. (2009). Exploitation-Exploration Tensions and Organizational Ambidexterity: Managing Paradoxes of Innovation. *Organization Science, 22*(4), 696-717.

Atuahene-Gima, K., & Li, H. (2004). Strategic Decision Comprehensiveness and New Product Development Outcomes in New Technology Ventures. *Academy of Management Journal, 47*(4), 583-597.

Atuahene-Gima, K., & Murray, J. Y. (2007). Exploratory and Exploitative Learning in New Product Development: A Social Capital Perspective on New Technology Ventures in China. *Journal of Inter. Marketing, 15*(2), 1-29.

Birkinshaw, J., & Gibson, C. (2004). Building Ambidexterity into an Organization. *MIT Sloan Management Review*, 47-55.

Chen, E. L., & Katila, R. (2008). Rival Interpretations of Balancing Exploration and Exploitation: Simultaneous or Sequential? In S. Shane (Editor), *Handbook of Technology and Innovation Management* (pp. 197-214): John Wiley & Sons.

Cho, H.-J., & Pucik, V. (2005). Relationship between Innovativeness, Quality, Growth, Profitability, and Market Value. *SMJ, 26*, 555-575.

Chu, C.-P., Li, C.-R., & Lin, C.-J. (2011). The Joint Effect of Project-Level Exploratory and Exploitative Learning in New Product Development. *European Journal of Marketing, 45*(4), 531-550.

Danneels, E. (2008). Organizational Antecedents of Second-order Competences. *SMJ, 9*(5), 519-543.

Garcia, R., & Calantone, R. (2002). A Critical Look at Technological Innovation Typology and Innovativeness Terminology: A Literature Review. *The Journal of Product Innovation Management, 19*, 110-132.

Gibson, C. B., & Birkinshaw, J. (2004). The Antecedents, Consequences, and Mediating Role of Organizational Ambidexterity. *The Academy of Management Journal, 47*(2), 209-226.

Gitlow, H.S., Oppenheim, A.J., Oppenhein, R. & Levine, D.M. (2005). Quality Management (3rd ed.). Boston: McGraw Hill International Edition.

Gonzales, F. J. M., & Palacios, T. M. B. (2002). The Effect of New Product Development Techniques on New Product Success in Spanish Firms. *Industrial Marketing Management, 31*, 261-271.

Greve, H. R. (2007). Exploration and Exploitation in Product Innovation. *Industrial and Corporate Change*, 1-31.

Griffin, A. (2002). Product Development Cycle Time for Business-to-Business Products. *International Marketing Management, 31*, 291-304.

He, Z.-L., & Wong, P.-K. (2004). Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis. *Organization Science, 15*(4), 481-494.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M. A., Singh, H., Teece, D. J., & Winter, S. G. (2007). *Dynamic Capabilities: Understanding Strategic Change in Organizations*. USA: Blackwell Publishing.

Jacobson, R., & Aaker, D. A. (1987). The Strategic Role of Product Quality. *Journal of Marketing, 51*, 31-44.

Jansen, J. J. P., Bosch, F. A. J. V. d., & Volberda, H. W. (2005). Exploratory Innovation, Exploitative Innovation, and Ambidexterity: The Impact of Environmental and Organizational Antecedents. *Schmalenbach Business Review, 57*, 351-363.

Kim, N., & Atuahene-Gima, K. (2010). Using Exploratory and Exploitative Market Learning for New Product Development. *Journal of Product Innovation Management, 27*, 519-536.

Kroll, M., Wright, P., & Heiens, R. A. (1999). The Contribution of Product Quality to Competitive Advantage: Impacts on Systematic Variance and Unexplained Variance in Returns. *SMJ, 20*(4), 375-384.

Kyriakopoulos, K., & Moorman, C. (2004). Tradeoffs on Marketing Exploitation and Exploration Strategies: The Overlooked Role of Market Orientation. *International Journal of Research in Marketing, 21*, 219-240.

Langerak, F., & Hultink, E. J. (2006). The Impact of Product Innovativeness on the Link between Development Speed and New Product Profitability. *Journal of Product Innovation Management, 23*, 203-214.

Levin, D. Z. (2000). Organizational Learning and the Transfer of Knowledge: An Investigation of Quality Improvement. *Organization Science, 11*(6), 630-647.

Levinthal, D. A., & March, J. G. (1993). The Myopia of Learning. *SMJ, 14*, 5-112.

March, J. G. (1991). Exploration and Exploitation in Organizational Learning. *Organization Science, 2*(1), 71-87.

McNally, R. C., Cavusgil, E., & Calantone, R. J. (2010). Product Innovativeness Dimensions and Their Relationships with Product Advantage, Product Financial Performance, and Project Protocol. *Journal of Product Innovation Management, 27*, 991-1006.

Mohammadjafari, M., Dawal, S. Z. M., Ahmed, S., & Zayandehroodi, H. (2011). Toward a Theoretical Concept of E-Collaboration through Project Management in SMEs for Reducing Time and Cost in New Product: A Review. *Journal of Applied Science, 11*(1), 174-182.

Molina-Castillo, F.-J., Jimenez-Jimenez, D., & Munuera-Aleman, J.-L. (2011). Product Competence Exploitation and Exploration Strategies: The Impact on New Product Performance through Quality and Innovativeness. *Industrial Marketing Management*.

Raisch, S., Birkinshaw, J., Probst, G., & Tushman, M. L. (2009). Organizational Ambidexterity: Balancing Exploitation and Exploration for Sustained Performance. *Organization Science, 20*(4), 685-695.

Rothaermel, F. T., & Alexandre, M. T. (2009). Ambidexterity in Technology Sourcing: The Moderating Role of Absorptive Capacity. *Organization Science, 20*(4), 759–780.

Rothaermel, F. T., & Deeds, D. L. (2004). Exploration and Exploitation Alliances in Biotechnology: A System of New Product Development. *SMJ, 25*, 201-221.

Salomo, S., Talke, K., & Strecker, N. (2008). Innovation Field Orientation and Its Effect on Innovativeness and Firm Performance. *Journal of Product Innovation Management, 25*, 560-576.

Taylor, A., & Helfat, C. E. (2009). Organizational Linkages for Surviving Technological Change: Complementary Assets, Middle Management, and Ambidexterity. *Organization Science, 20*(4), 718–739.

Teece, D. J. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. *SMJ*.

Visser, M. d., Weerd-Nederhof, P. d., Faems, D., Song, M., Looy, B. v., & Visscher, K. (2010). Structural Ambidexterity in NPD Processes: A Firm-Level Assessment of the Impact of Differentiated Structures on Innovation Performance. *Technovation, 30*, 291-299.

Zaidi, M.F.A., & Othman, S.N. (2015). Structural Ambidexterity vs. Contextual Ambidexterity: Preliminary Evidence from Malaysia. *The Social Sciences, 10*(6), 1200-1207.