ABSTRACT

With increased global competition and growing globalized markets, firms are required to commit not only to new product development (NPD) but also to the globalization of innovation efforts in order to gain an advantage in the turbulent and highly competitive marketplace. This study investigates the global new product adaptation and development. This study develops a conceptual model that captures the four stages of global new product adaptation and development. Managerial and theoretical implications are discussed.

KEYWORDS: Global Product Design Strategy, Product Design Adaptation, NPD Strategy, Global Adaptation

INTRODUCTION

New products have the potential to provide increased sales, profits, and competitive advantage for most firms (Sivadas & Dwyer, 2000). In previous studies, it has been reported that more than one-third of a firm's revenue originates from products that did not exist five years previously (Nambisan, 2003). Thus, innovation and success in the new product development (NPD) processes dominate the survival strategy of firms (Cooper, 2001; Lindič, Baloh, Ribière, & Desouza, 2011; Schilling & Hill, 1998).

In this contemporary age of rapid change, firms in many industries are competing in markets that demand more frequent innovation, shorter product life cycles, and higher quality product (McIvor & Humphreys, 2004; Nijssen & Frambach, 2000). Thus, product performance, quality, costs, and frequency of new product launches, are predominantly affected by successful new product developments. NPD has thus become a key strategic activity in many firms in that new products make an increasingly significant contribution to the firm’s sales and profits yet represent risk and potential failure. Utilization of appropriate tools and techniques in the process of NPD can assist firms in achieving better performances in launching new products (González & Palacios, 2002; Yeh, Pai, & Yang, 2010). Furthermore, new products are increasingly cited as being the key to a firm’s success in the global market, and hence, managers remain under pressure to improve their firm’s NPD performance and manage the potential innovation risk (González & Palacios, 2002; Gupta & Wilemon, 1996; Nijssen & Frambach, 2000). Huang, Stewart, and Chen (2009) have emphasized the importance of the effectiveness of NPD in achieving desired market performance.
Besides the aforementioned research results, there is another important assertion implying that NPD is not just about new products, but rather about shaping the playing field in a larger strategic perspective of a global competitive landscape. It is widely acknowledged that NPD is a source of competitive advantage for firms owing to its function in improving a firm’s financial strength, competitive position in the global marketplace, and its competitive advantage over peer firms (Cormican & O’Sullivan, 2004). Nadeau and Casselman (2008) studied when firms should employ their NPD strategies and demonstrated the resulting interaction with the product life cycle. This result implies that certain NPD efforts have inherent strategic benefits in situations where the firm has a longer-term commitment to that particular product area or there is “competitive damage” that can be inflicted on other firms to ease competitive pressure in entirely different product markets.

NPD is a cornerstone of competitive strategy because the ability to develop and rapidly launch successful new products is a critical cornerstone of the competencies that support sustained business growth in the best firms. In many mature markets, a record of accomplishment for on-time, successful NPD may be required in order to survive strong advances from stiff competition. In light of the fact that product innovations are critical in securing a firm’s competitive advantage in global markets (Jeong, 2003), global NPD is crucial and required by firms competing in industries where markets are already globalized and becoming globalized (Chen, Kang, Xing, Lee, & Tong, 2008).

With increased global competition and globalized markets, firms are required to commit to not only product development but also to commit to globalization of innovation efforts to gain a competitive advantage in the turbulent competitive environment (De Brentani, Kleinschmidt, & Salomo, 2010). Product innovation and the trend toward globalization are two important dimensions driving firms today, and a firm’s global new product development strategy is a primary determinant of performance. This critical issue of global product development process is not well understood due to the debate between adaptation and standardization of global marketing strategy in the past five decades (Boddenwyn et al., 1986; Cavusgil et al., 1993; Calantone et al., 2004). As current research stream on adaptation and standardization focuses on marketing strategy adaptations or modifications in general, few research studies investigate the process of new product adaptation and development in the context of product development including specific types of product modification such as redesign, rescaling, alternative input materials, and varying features (Calantone et al., 2004).

Many previous studies focused on a wide variety of global NPD issues; however, global new product development adaptation and development strategy and processes in the global context has received limited attention (Atuahene-Gima & Li, 2000; Kleinschmidt, De Brentani, & Salomo, 2007). There exist gaps in the literature regarding the process, determinants, and strategy of global new product adaptation and development practices and strategies. This study intends to fill part of this gap by investigating the global new product development process and strategy. Specifically, this study develops a conceptual model that captures the global new product adaptation and development strategy and process by shifting the focus from “why (antecedents)” and “what (performance)” to “how (product development and adaptation procedure)”.

CONCEPTUAL MODEL

Innovative products and new product development capabilities are critical for success in globalized markets. The fundamental strategic step in designing global innovation strategy is
determining what type of new products to introduce in global markets. Previous research primarily focused on the selection of the standardization versus adaptation strategy in introducing new products in global markets as a component of global marketing strategy (Levitt, 1983; Douglas & Craig, 1986; Cavusgil, Zou, & Naidu, 1993; Theodosiou & Leonidou, 2003; Albaum & Tse, 2001). The debate of standardization versus adaptation started in the area of worldwide advertising and extended to the overall marketing mix including product, pricing, promotion, and distribution. Levitt (1983) stipulated that standardized marketing strategy provide customers with low-priced, functional, and advanced products. Collectively, the fundamental argument of standardization supporters is the world markets are becoming more and more homogeneous. Implementing standardized marketing strategy can benefit companies with significant economies of scale, consistent brand image, and reduced managerial costs of coordination and cooperation (Levitt, 1983; Theodosiou & Leonidou, 2003; Yip, Loeve, & Yoshino, 1992).

Proponents of adaptations criticize the standardization as new type of marketing myopic, which oversimplifies the reality of global market. As differences of customer needs, tastes, preferences, and disposal income are great over countries even regions, it is hard to use completely standardized strategy in different international markets. Therefore, advocates of adaptations argue that firms should figure out how to tailor their marketing strategy in order to fit their products and services to the unique local markets (Theodoiou & Leonidou, 2003). Previous research studies developed conceptual models of selecting either standardization or adaptation strategy. These models have identified determinants and consequences of choosing either standardization or adaptation strategy for global markets (Theodosiou & Leonidou 2003; Vrontis 2003; Vrontis et al. 2009).

Although these models have significant theoretical and managerial contribution in managing global marketing and product strategies, these models suffer from several limitations in properly understanding and managing the product adaptation/development process for global markets. First, these models consider product adaptation as a component of the marketing strategy and evaluates in the perspective of marketing strategy. This study investigates product adaptation in the perspective of new product development and innovation management. Second, these models evaluate product adaptations or modifications in general. This study examines specific types of product modification and development that are associated with the degree of adaptation, such as design platform, redesign, rescaling, alternative input materials, and varying features (Calantone et al., 2004). Third, these models focus on the antecedents (Cavusgil, Zou, & Naidu, 1993) and consequences of the selection of standardization or adaptation strategy (Cavusgil & Zou, 1994). This study spotlight detailed implementation process of deciding the degree of adaptation/standardization in new product development process. Next section discusses the process of determining the level of adaption for global markets in the perspective of new product development.

The Proposed Four-Stage Model of Global New Product Adaptation and Development

When firms extend their product-line to the foreign market, the key issue they are facing is how to adapt or develop the products to global markets. This study develops a four-stage model of global product adaptation and development in the perspective of new product development. The proposed four-stage model is presented in Figure 1. The Figure 1 model identifies key features and components of the four stages of global product adaptation and development. Each stage plays an important role in shaping the final level of adaptation and development.
Stage 1: Country Specification and Customer Preferences

In the first stage, firms need to determine country specifications and customer preferences of those countries where new products are introduced. Previous research studies indicate that firms should accommodate the local market conditions such as the existing cultural, political, and economic differences among countries in developing products for global markets (Boddewyn, Sohl & Picard, 1986; Magnusson et al., 2013; Onkvisit & Shaw, 2004). In this stage, two strategic options or the “motivation” of the global product development project should be identified. The first option or motivation is adapting existing products to the country specifications. The second option is to open a new market niche with new products that requires developing new products with both environmental adaptation and local customer preferences adaptation.

The first option of adapting existing products requires firms to determine the degree of adaptation to foreign markets. The important and frequently examined factors in shaping the degree of adaptation are similarity of laws, regulations, and standards to home country are (Calantone et al., 2004; Cavusgil, Zou, & Naidu, 1993; Onkvisit & Shaw, 2004) and intercultural variables such as cultural distance (Cavugil & Zou, 1994; O’Cass & Julian 2003). In order to introduce new products by adapting existing products in global markets successfully, firms need to pay attention to the differences of local regulatory and legal environment. Specifically, government regulations, electrical standards, measurement systems, operating systems, and technological environment are the factors that should be concerned by companies before they start designing and developing new products for global markets (Onkvisit & Shaw, 2004; Schmid & Kortulla, 2011). Undoubtedly, the fundamental rule for targeting foreign markets is following the local regulations and policies. However, products that are well adapted to the regulations and policies do not ensure their popularity or even the acceptance by the local customers. Thus, taking one step further to implement corporate social responsibility (CSR) seems necessary. CSR deployment in product development has become trendy: using environmental friendly material, developing energy-conservative products, and recycling and reusing old product parts by implementing reverse logistics.

The second option of introducing products new to the company to the foreign markets is opening a completely new market niche or broadening the local market base to satisfy customer’s unique needs (Cavusgil, Zou, & Naidu, 1993; Douglas & Craig, 1989). This option usually is driven by the intensity of competition in the local market (Cavusgil & Zou, 1994; Vrontis et al., 2009). Firms need to have customer preferences prioritized to gain the competitive advantages over rivals in a highly competitive market (Cavusgil & Zou, 1994). Under this circumstance, following the regulations/policies and implementing CSR are still important but not enough. The more important thing is to discover, identify, and prioritize the customer’s preferences. Starbucks introduced Chinese preferred flavor tea in China and
decorated typical local stores according to Chinese traditional culture. Kentucky Fried Chicken designed local menu for different stores at different countries. Gree Electric Appliances Inc. of China signed contract with American Whirlpool Corp., agreed to design and develop 20 million air conditioners specifically for U.S. market. The key issue behind the scene is the same—developing products new to the company with the adaptation to the local cultural idiosyncrasies and customer preferences/flavor. This first stage can guide firms to set the correct direction in determining global new product adaptation and development process.

**Stage 2: Platform Adjustment and Development**

The second stage involves determining the platform for new product development. At this stage, product development team can choose either to adjust the existing platform or to build a new platform for new products to be developed for global markets. Before the discussion of the platform implementation, we would like to explain the definition and functions of platform first. The definition of platform ranges from the “set of common components, modules, or parts from which a stream of derivative products can be efficiently developed and launched” to the “collection of assets [i.e., components, processes, knowledge, people and relationships] that are shared by a set of products” (Muffatto, 1999). The view of platform evolves from physical and specific perspective to more abstract and comprehensive perspective, covering not only the sets of common elements but also the product architectural rules and organizational structure. The architectural rules define the geometrical, mechanical, electrical, and software interfaces between platform elements to facilitate planned product offerings. The organizational structure offers means of developing a cross-functional team for the product components integration. Besides the function of identifying the architecture rules of products and developing the organizational structure such as a cross-functional team, platform approach also shapes the product process and defines the boundary of product family. An effective platform strategy, the one that is fit for and align with the corporate overall strategy, has a critical influence on product performance (Muffatto, 1999; Simpson et al., 2005; Ulrich & Eppinger, 2008). In this case, the second stage of determining either platform adjustment or platform development should connect with strategies and information that are generated from the first stage by identifying country specification and customer preferences. Platform design would be based on production process instead of product development. In this way, products that have the similar models can be more easily produced by using the same production process (Whihelm, 1997; Ulrich & Eppinger, 2008). The concept of platform should also consider the multi-product perspective (Jones, 2003; Park et al., 2008), which identifies the boundary of product family. This multi-product perspective aims to define the characteristics of the same set of products, named product family that the platform is going to produce. Different products within the product family have relatively different characteristics which are created to target varied market niches within the product family boundary (Meyer, 1997).

As discussed, platform needs to be established to facilitate product development by specifically identifying the relationships and interfaces between components, organizing organizational structure as a means of cross-functional team, outlining production process, and defining the boundary and features of product family. The implications of platform approach are: planning and developing a set of products or derivatives by employing the same platform; sharing the same production tools, machines, and assemble lines (Ulrich & Eppinger, 2008). Also, platform approach also highlights the importance of product differentiation in satisfying various customer needs. Comparing to the single model approach, platform approach addresses different product features within the same production line. Thus, firms can simply adjust platform according to identified features of local market and preferences of local customers. Or, if the demands from
the local customers cannot be accommodated effectively with existing platforms, then firms need to adopt the second option of developing a new platform. In this stage, we focus on consequences of the platform selection and development to satisfy global customer preferences. Thus, the alternatives for product development team at this stage is adjusting the existing platform by aligning local preferences with existing platform features, or establishing a new platform to cope with the new culture and country specifications at local markets.

Stage 3: Type Selection

The third stage of the model deals with selection of the type of product adaptation in global new product development process. This stage represents global product adaptation and development structure and is developed based on the product component model. When firms consider which part of products should be adapted to local market, the fundamental information they should take into account is information obtained in stage one. Firms usually modify their products according to the information from local customer and local environments. It is logical to link stage one and stage three when moving from stage two to stage three. However, platform design also has substantial impacts on type selection, and vice versa. How platform decision should be made depends on which part of products will be adapted. The architecture rules of products, production process of products, and the boundary of product family also shape the way that the new adapted products are organized. In other words, platform design and type selection interact with each other and influence each other simultaneously. According to the product components model, adaptation type can be selected from one of the three alternative adaptations: support services component adaptation (such as deliveries, warranty, installation, repair and maintenance, etc.), packaging adaptation (such as trademark, brand name, and package, etc.), and core component adaptation (such as design and function, etc.). Firms need to select one of the adaptation types in their global new product development process.

Stage 4: Degree Identification

Final stage is determining the degree of adaptation in the new product development process. The type of adaptation selected in the third stage may not provide the detailed specification of the degree of adaptation for different products. The degree of adaptation is included as a part of the adaptation model in the literature but not well defined or specified in detail. Most previous studies simply used five-point scale to measure the extent of general product adaptation with point 1 equal to none adaptation (minor changes) and 5 equal to substantial adaptation (substantial changes). Commonly discussed types of product adaptation are packaging, brand, design, quality, and function (Albaum & Tse, 2001; Johnson & Arunthanes, 1995; Vrontis, 2005). This study develops a comprehensive metric for identifying and measuring the degree of product adaptation with the identified distinct adaptation types. In addition, previous adaptation models do not provide specific guidelines or classifications that represent the degree of adaptation.

This study presents the degree of adaptation in the form of nine different levels of adaptation. The nine-level adaptation framework identifies three categories of product adaptation with subset components under each one. The three categories include (1) support services components; (2) packaging components; and (3) core components. The first category of adapting support services components to the local market requires firms to adjust their repair and maintenance services, warranty, delivery and installation, as well as instructions according to the local country’s conditions. The goals of support services components adjustment are to follow the foreign country’s regulations, laws, and standards as well as to become competitive in
the foreign market. Supplementary services have gained importance in both academic and practical area and are frequently perceived as a competitive advantage (Asugman et al., 1997; Morschett, 2006). We named this support services adaptation as “Bonus” strategy since it provides supplement services and all else equal, the one with better bonus will win customers.

The second category of adapting packaging components of products to the foreign market asks for label and image modifications, size and unit reconfigurations, and brand name and trademark reconsiderations. When making packaging adaptation, corporate social responsibilities in the local market should be examined. Markets or countries have strong preferences on green packaging or package recycling indicate the necessity of packaging adaptation. Brand name and trademark modifications are not usual in the international business due to the brand consistency and brand familiarity reasons. However, there are cases where firms decide to adapt brand name and trademark. For example, Kraft in China has renamed brand name as a strategic action in achieving market share (Welch, 2012). Packaging change aims to attract local customers by presenting a preferable out-looking; we define this type of adaptation as “Dress up” strategy. The third category of core components adaptation is considered as the highest degree of product adaptation. This type of adaptation requires firms to modify their product platform and material use, the features of design, or the features of functions. Products with the adapted core components become new products to customers. These new products have unique characteristics, functions, or quality. We define this type of product adaptation as “Transformation” strategy.

The benefits and risks of each type of adaptation strategy are varied as well. For the “bonus” adaptation strategy, companies provide quality assurance program (such as warranty) and convenience assurance program (such as delivery) in accordance with legal, ethical, and regulatory environment, as well as customer demand. The benefits of bonus adaptation are straightforward: meet local demands and standards of local people and environment; attract customers by providing good quality and convenience. One risk of “bonus” strategy is the higher costs compared to home country products; extended warranty, delivery, and installation services all constitute extra costs. Local employees management is another potential risk since the extra services are provided in the foreign country, local employee recruitment or home country employee transfer are required. Managing these dynamic employees group at foreign country has risks in diminishing efficiency and efficacy.

Dress up strategy is the most commonly adopted strategy by firms to target global markets. Firms modify products’ packaging according to foreign country’s culture, taste, and tractions. In this way, customers are more likely to be attracted by having comfortable and intimate feeling to the products. However, culture varies across different countries. It is hard to sense and seize the local culture and preferences and make modifications aligned to them. Small mistakes of wrong sensing will lead to the failure of new product development. Also, dressed up products probably will raise the cost of transportation. Last and most important, changing packaging, especially the image, name and trademarks alienate customers from already known brand. The brand inconsistency leads to brand awareness loss and eventually sales reduction.

Transformation strategy is considered as the highest degree of adaptation, which brings firms both critical benefits and harmful risks. From the benefits point of view, products with adapted features and functions enjoy higher customer satisfactions that contribute to profitability. Moreover, transformation requires substantial and critical changes in product development procedures, which can stimulate innovations in organizations. Innovations gain competitive advantages, which usually reflect on cost reduction or product differentiation (Porter, 2011).
However, transformation is costly and these costs do not guarantee the same return. Similarly, the difficulty in capturing local customer preferences and culture features improve the risks of perception errors that have negative effects on product performance (Schmid & Kotulla, 2011).

**DISCUSSION AND CONCLUSIONS**

This study developed a four-stage model of global new product adaptation and development. The proposed model highlights the detailed implementation process of deciding the degree of adaptation and development in new product development process. The focus of this study is on the process of determining the level of adaption for global markets in the perspective of new product development. This study provides new insights for new product adaptation implementation and integration, as well as redefining and re-measuring the level of adaptation.

The four stages proposed in this study can be used in developing theoretical linkages and conceptual models of global new product development. The degree of adaptation and development metrics identified in this study can be incorporated into theoretical models testing the effect of antecedents on the level of global new product adaptation and development. Future research needs to reexamine the effect of the previously indentified antecedents on the level of adaptation and development. The antecedents to be tested in future research include: environmental-related antecedents (similarity in economic, social, cultural, legal); market related antecedents (foreign market size, similarity in marketing infrastructure, distribution infrastructure); consumer-related antecedents (similarity in consumer characteristics, preferences); competition-related antecedents (similarity in competition; structure, nature); product-related antecedents (product type, technological intensity); organizational-related antecedents (country of origin, nature of ownership, organizational structure); and management-related antecedents (international commitment, international experience) (Leonidou, 1996; Schmid & Kotulla, 2011). The metrics can also be used to test the effect of the level of global new product adaptation and development on global market performance. Future research can test the role and impact of adopting the three types of strategies labeled as bonus, trade up, and transformation strategy on market and financial performance of a firm. In addition, future research studies need to identify new product development structure, innovation cultures, market conditions that are favorable for adopting each of the three strategies.

The proposed model provides significant managerial implications for global new product development. When firms are developing new products for global markets, they can follow the four stages proposed in this study and select one of the three types of strategies. As each type of strategies has benefits and risks involved, firms need to assess which strategy fits best to the intended global markets. When companies are entering a foreign market, managers and product development teams should be aware of the differences between home country and foreign countries and develop strategies to accommodate these differences in new product development process. We suggest managers to use our four-stage model to integrate different degree of adaptation in their new product development; and use the degree of adaptation framework to evaluate and reconsider their level of product adaptation for better strategic fit.

**REFERENCES**

References available upon request.