Product Types and Consumers' Culture: an Empirical Examination in the Taiwan

Yen Hsu, Tatung University, Taiwan

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Abstract
Firms must understand consumer culture to design and develop products that meet consumer expectations. When provided with various innovative consumer electronics, consumers make purchase or replacement decisions by referring to their experiences with an existing product, the effects of mental accounting induced by such products, the features of new products, and the marginal benefits from purchasing a new product in the Taiwan market. Survey and statistical analyses of a sample of consumer electronics products (i.e., smartphones and notebooks) produced the following results: First, when faced with multiple new product choices, consumers make different replacement and purchase (RP) decisions. Consumers are more likely to choose products with general enhancements than products with focused enhancements when provided with both options. However, when consumers decide whether to purchase products with alignable enhancements or those with nonalignable enhancements, their choice depends on the product type. Second, regardless of the type of new products that enterprises release, consumers perceive a larger difference in expected future enjoyment (DEFE) between existing and new products, higher mental book value (MBV) and higher RP intentions when enterprises withdraw old-generation products while launching new-generation products.

Keywords: Product design and development, product launch strategy, replacement and purchase strategy

Introduction

Consumer electronics markets are highly competitive because of rapid upgrades and short product life cycles (Damodaran and Wilhelm, 2005). Many firms adopt price reduction marketing strategies to stimulate consumer demand at the expense of profit and image. Because of consumer preferences for novel products, firms introduce new generations of products to maintain market coverage and strengthen competitiveness (Okada, 2006; Xing and Abhary, 2010). To enhance product advantages, the design attributes of a new product, such as its shape, function, and material, must be innovative to attract the attention of consumers, although such features also increase manufacturing costs. Accordingly, formulating effective product launch strategies (PLSs) and conducting product design and development are not only crucial to firm survival and growth, but also closely related to firm performance; therefore, firms must be cautious when handling these two tasks (Claybaugh *et al.*, 2015; Urban and Hauser, 1993; Wu, 2014).

When developing new products, firms often enhance existing products and then introduce them as new products to the market (Crawford and Benedetto, 2014; Ulrich and Eppinger, 2012). For example, after Apple Inc. released the first-generation iPhone in 2007, it subsequently introduced a series of new products in the same line (e.g., iPhone 3G, iPhone 3GS, iPhone 4, iPhone 4S, iPhone 5, iPhone 5S, iPhone 5C, iPhone 6, and iPhone 6 plus, 7). Before release, every new product of Apple Inc. raises consumer speculation regarding the product function and shape, thereby generating a word-of-mouth marketing effect. Although some consumers may have been disappointed about certain new products after they were released, the iPhone has become one of the world's most marketable mobile phones. Another similar example is the ThinkPad notebook jointly created by IBM and Lenovo. After its release, the companies introduced premium options for this line of notebooks, including the Edge series, T series, X series, and various extended models that were anticipated by the market.

This release of iPhone and ThinkPad product series revealed that new products have different consumer implications. From a marketing perspective, consumers may delay purchasing a product when they anticipate the release of a new-generation product, which influences the sale of existing products in the market. Therefore, when firms release a new series of products, they may opt for a product exit strategy, which involves discontinuing the sale of existing products to prevent competition with new-generation products and to retain their market power and an innovative image. For example, after introducing the Galaxy S6, Samsung Electronics discontinued the Galaxy S5. Similarly, LG Corporation stopped selling the G Pro1 after releasing the G Pro2. Nevertheless, many firms have implemented marketing strategies that promote the coexistence of new and old products in the marketplace, in which they continue to sell old-generation products at a reduced price when a new-generation product is released. For example, Apple Inc. reduced the prices of the iPhone 5 and 5S and continued selling them while introducing the iPhone 6 to the market; after releasing the second generation of the iPad Air, Apple continued selling the first-generation pads at a lower price. Similarly, Sony Mobile continued selling the Xperia Z2 at a reduced price after releasing the Xperia Z3 to continue attracting consumers' attention.

For consumers, the most prominent characteristic of new-generation products resides in how they are differentiated from existing products; when the difference is substantial, consumers may a perceive higher risk and learning cost in switching to a new product, or they may perceive greater novelty and benefits from switching, and thus become more willing to purchase a new product (Liu, 2013; Okada, 2006). Furthermore, users and nonusers of existing products may differ in their perceived value toward a new product. In other words, the benefits a product provides depends on numerous confounding factors, and whether consumers already own the product is one such factor. In the highly competitive consumer electronics market, attracting new consumers to purchase a new product is difficult; therefore, the market performance of new products usually relies on the replacement behavior of consumers (Okada, 2006; Ozcan and Sheinin, 2015). Moreover, consumer replacement and purchase (RP) decisions are generally influenced by the marketing strategies adopted when launching a new product; in other words, the selected PLS (e.g., product coexistence vs. product exit) influences the effectiveness of a new product release (Ku *et al.*, 2010).

Ongoing product enhancement and innovative design determine firm performance (Urban and Hauser, 1993). In particular, due to the short life cycle of consumer electronics and the highly competitive consumer electronics market, a firm must consider adding new attributes to new products at the design stage. When a firm decides to maintain the attributes of an existing product instead of adding new ones, it must determine whether it should modify all or part of the existing attributes (Claybaugh *et al.*, 2015). In other words, firms must first recognize the implications that different product innovations and PLSs have on consumers before investigating which product innovations consumers prefer.

Accordingly, this study analyzed how different new product types (NPTs) and PLSs affect consumer RP decisions. This study explore the effects that NPTs as well as product coexistence and product exit strategies have on consumer RP decisions in order to offer practical suggestions on new-product development, design, and marketing strategies.

Literature Review and Research Hypotheses

(1) New Product Types

The term “new product” can mean different things to different people. Crawford and Benedetto (2014) indicated that new products can be categorized according to how new they actually are to the world and to the firm. A commonly used set of categories is as follows: (a) new-to-the-world products (i.e., novel products); (b) new-to-the-firm products (i.e., new product lines); (c) additions to existing product lines; (d) improvements and revisions to existing products; (e) repositioned products; (f) cost-reduced products. New products created through product enhancement (i.e., Categories c to f) account for a large proportion of the market and are the most common type of product innovations (Crawford and Benedetto, 2014; Ulrich and Eppinger, 2012). Accordingly, the present study focused on new products developed through product enhancement. Product enhancement is defined as improving or adding new functionality, attributes, or benefits to existing products in the market to attract new customers by increasing the added value of the product and to generate a

replacement need in customers who currently own the product (Okada, 2006). The distinction between new and existing products depends on their commonalities and differences. New and existing products are more similar when they share more commonalities and fewer differences (Tversky, 1977).

New products can be divided into two types according to whether their enhancements are nonalignable or alignable (i.e., whether new attributes are added; Okada, 2006): (a) Nonalignable product enhancement: New products that undergo this type of enhancement differ completely from the existing ones in functions and benefits, and the structure of their product attributes also differ completely. For example, the Microsoft Xbox 360 game console launched in 2009 differed from the previous generation Xbox in how users can control games. Specifically, the Xbox 360 extended the conventional joystick-based operating mode by incorporating the new Kinect system, a motion-sensing input device that emphasizes the use of body motions and gestures for interactive game control, marking an unprecedented new attribute and a nonalignable product enhancement. (b) Alignable product enhancement: New products are enhanced on the basis of their existing attributes without modifying the structure of these products. For example, Apple Inc. released the first and second generation of the iPad Air in 2013 and 2014, respectively. Both products were enhanced in terms of weight, computing speed, and capacity, although these enhancements were only upgrades to the original attributes. Alignable product enhancement can be divided into two types (Okada, 2006): general enhancement (GE), in which case a new product has all of its major attributes enhanced to the same extent, and focused enhancement (FE), in which case only part of the attributes are substantially enhanced.

Figure 1 illustrates the difference in product enhancement. Assume that a product possesses only two attributes (i.e., Attribute 1 and Attribute 2). When a product receives a GE from the original model (i.e., O → EG), both attributes are upgraded proportionately. The other two types of upgrade depict one of the product's attributes receiving substantial upgrade; O → EF1 represents a new product receiving an FE on Attribute 1, whereas O → EF2 represents a new product receiving an FE on Attribute 2. GEs and FEs are categorized as alignable product enhancements because both enhancements maintain a common structure. When a third attribute Z is added to the original two attributes (i.e., X and Y) of a new product, the diagram in Figure 1 becomes three-dimensional. In this scenario, because the new and old products have different attribute structures, the new product enhancement is nonalignable.

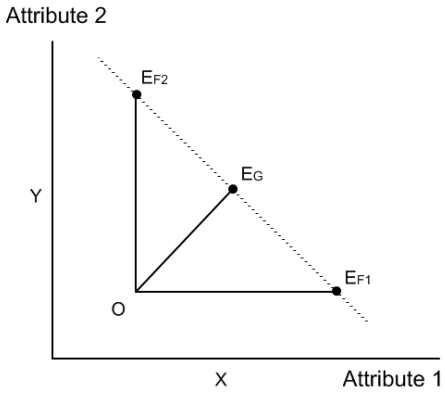

Figure 1: Attributes and types of product enhancement

(2) New Product Replacement and Purchase

Consumer electronics refers to the electronic products that are used in daily life for entertainment, documentation, and communication purposes. Consumers generally possess a certain degree of knowledge and experience with such products, and many choices are involved because of rapid upgrades. Consequently, the decision of whether to purchase such products involves a decision-making scenario centered on product replacement rather than new purchase or repurchase (Ku *et al.*, 2010). Furthermore, how consumers view these products is affected by their experiences. When making replacement decisions, consumers mainly focus on comparing the benefits of new and existing products (Bhat *et al.*, 1998) and the psychological cost incurred by existing products (Okada, 2006). Nevertheless, purchasing a new product can involve a series of complex decision-making steps including identifying needs, collecting information, evaluating choices, and making final decisions. Repurchases involve less complex decision-making steps pertaining to factors such as brand awareness, price, or even packaging preferences (Hoyer, 1984; Hoyer and Brown, 1990).

When purchasing a new product as a replacement, consumers gain fewer marginal benefits compared with when making a new purchase because they already own an older version of the new product. Moreover, consumer preferences may be influenced or altered by their experiences with the existing product; by contrast, consumers making a new purchase have no such experience (Okada, 2006). Consumers purchasing a replacement differ from those making repurchases in that they tend to focus on one brand when searching for information and evaluating purchase options (Bhat *et al.*, 1998; Mosavi and Ghaedi, 2012).

In summary, when purchasing a new product as a replacement, consumers consider continuing to use the existing product if it satisfies their current needs, or they might upgrade to a new product, in which case the existing product may be replaced before the end of its service life. According to mental accounting theory (Thaler, 1999), replacement decisions frequently involve or are impeded by the problem of MBV, whereas new purchase decisions are unaffected (Okada, 2001). Therefore, this study argues that consumers tend to make replacement decisions when they expect a substantial improvement in the enjoyment derived from a new product or when the MBV of the existing product is low.

(3) Product Launch Strategies

Pilot Experiment: This study adopted smartphones and notebooks, which have relatively short life cycles and are sold in highly competitive markets, as the research sample for the following reasons: (a) The two types of consumer electronics products are common in daily life and possess various attributes. (b) Brand owners of the two types of products frequently release a series of new products through product upgrades. (c) The two types of products were selected to minimize gender differences in consumption. To test whether smartphones and notebooks correspond with the aforementioned three descriptions, this study referred to Gammoh et al. (2006) and adopted a convenience sampling method targeting consumers at several consumer electronics retailers for a pilot experiment. The customers were approached after making purchases at the retailers, at which point the experiment was explained to

them. The participants were required to answer the following items, which were measured using a 7-point Likert scale with scores ranging from 1 (strongly disagree) to 7 (strongly agree):

- Smartphones and notebooks are familiar to me.
- Smartphones and notebooks are important to me.
- I am capable of using the basic functions of smartphones and computers.

Formal Experiment: The outcome variable of the formal experiment was the participants' RP decisions. The independent variables were the NPTs and PLSs. A three-factor between-subjects design was adopted to manipulate the three variables—NPT structures (i.e., alignable vs. nonalignable), types of new product enhancements (i.e., GE or FE), and PLSs (i.e., product coexistence vs. product exit)—to generate eight experimental scenarios.

Sampling and Data Collection

The experiment was performed at various consumer electronics retailers. Convenience sampling was adopted to recruit customers visiting and purchasing items from the stores. Upon recruitment, the details of the experiment were explained to the participants. The age of the participants ranged from 19 to 40 years. A between-subjects design was adopted for the survey, whereas a within-subjects design was adopted for the two target products.

A total of 400 questionnaires were distributed in the formal experiment (8 experimental scenarios × 50 participants). During the survey, assistants explained the purpose, process, and rules for answering the questions to the participants. After granting consent, various experimental scenarios were presented to the participants for them to answer the questionnaires. Before the experiment, the participants were required to read the textual and graphic descriptions of the NPTs and then descriptions of the product coexistence and product exit strategies. The assistants answered any questions raised by the participants. Finally, the participants answered the questionnaires about product DEFE, MBV, and RP decisions.

Data Analysis and Results

Table 1 presents the descriptive statistics for the DEFE between the old- and new generation products, MBV of the old-generation product, and RP intentions under the different product enhancement types (PETs; i.e., GE vs. FE) and PLSs (i.e., product coexistence vs. product exit) for the smartphones and notebooks.

For the product type, the overall average DEFE of the smartphones (i.e., 4.72, 5.11, 4.67, 4.89, M = 4.85) was higher than that of the notebooks (i.e., 4.76, 4.91, 4.55, 4.89, M = 4.78), indicating that the participants were more dissatisfied with the smartphones than with the notebooks. The average perceived MBV of the smartphones (i.e., 3.94, 4.90, 3.87, 4.12, M = 4.21) was higher than that of the notebooks (i.e., 3.59, 4.03, 3.31, 4.04, M = 3.74), revealing that the old smartphones provided less value and exhibited a lower level of price worthiness than did the existing notebooks.

Furthermore, regarding the innovation type, the average DEFE between the existing and new products was higher in the scenario of GE innovation than in the FE scenario for both the smartphones (4.92 vs. 4.78) and the notebooks (4.84 vs. 4.72), indicating that the participants were more dissatisfied with GE products than with the FE products. Similarly, the average perceived MBV of the GE products was higher than that of the FE products for both the smartphones (4.42 vs. 4.00) and the notebooks (3.81 vs. 3.68), indicating that the GE products provided less value and demonstrated a lower level of price worthiness compared with the FE products.

Finally, regarding the PLSs, the average DEFEs between the existing and new products were higher in the product exit scenario than in the product coexistence scenario, for both the smartphones (GE: 5.11 vs. 4.72; FE: 4.89 vs. 4.67) and the notebook (GE: 4.91 vs. 4.76; FE: 4.89 vs. 4.55). The overall average DEFE in the product exit scenario was higher than that in the product coexistence scenario (4.95 vs. 4.68). These results indicate that the participants felt dissatisfied with the exiting products, regarding them as the last generation of that type of product. Similarly, the average MBV of the existing product was higher in the product exit scenario than in the product coexistence scenario, for both the smartphones (GE: 4.90 vs. 3.94; FE: 4.12 vs. 3.87) and the notebooks (GE: 4.03 vs. 3.59; FE 4.04 vs. 3.31). The overall average perceived MBV in the product exit scenario was higher than that in the product coexistence scenario (4.95 vs. 4.68). These results indicate that the existing products provided less value and exhibited a lower level of price worthiness compared with the new products.

Table 1: Descriptive statistics on the variable of PET

Product	PET	PLS	Sample size	DEFE	MBV	RP
Smartphone	GE	coexistence	50	4.72 (1.31)	3.94 (0.95)	4.49 (0.98)
		exit	50	5.11 (1.28)	4.90 (1.11)	4.25 (1.65)
	FE	coexistence	50	4.67 (1.03)	3.87 (1.37)	4.58 (1.49)
		exit	50	4.89 (1.36)	4.12 (1.03)	4.32 (1.37)
Notebook	GE	coexistence	50	4.76 (0.95)	3.59 (0.98)	4.17 (1.54)
		exit	50	4.91 (1.64)	4.03 (1.19)	4.35 (1.26)
	FE	coexistence	50	4.55 (1.10)	3.31 (1.62)	4.42 (1.34)
		exit	50	4.89 (1.36)	4.04 (1.51)	4.19 (1.69)
			400	4.81 (1.42)	3.97 (1.34)	4.35 (1.40)

Notes: PET: product enhancement type; PLS: product launch strategy; DEFE: difference in expected future enjoyment; MBV: mental book value; RP: replacement and purchase; Standard deviations are indicated in parentheses

Table 2 presents the descriptive statistics for the DEFE between the old- and new generation products, MBV of the old-generation product, and RP intentions under the different product structures (i.e., PAD vs. PND) and PLSs (i.e., product coexistence vs. product exit) for the smartphones and notebooks.

In terms of product type, the overall average DEFE of the smartphones (i.e., 4.88, 5.04, 4.62, 5.09, M = 4.91) was higher than that of the notebooks (i.e., 4.45, 4.89, 4.75, 4.96, M = 4.76), indicating that the participants felt more dissatisfied with the smartphones than with the notebooks. The average perceived MBV of the smartphones (i.e., 4.52, 4.78, 3.86, 4.12, M = 4.32) was higher than that of the notebooks (i.e., 3.31, 4.04, 3.59, 4.03, M = 3.74), revealing that the old smartphone provided less value and exhibited a lower level of price worthiness compared with the existing notebooks.

In terms of smartphone innovation type, this study observed that the average DEFE between the existing and new products was higher in the PAD scenario (i.e., 4.88, 5.04, M = 4.96) than in the PND scenario (i.e., 4.62, 5.09, M = 4.86), revealing that the participants felt more dissatisfied with the PADs than they did with the PNDs. Similarly, the average perceived MBV of the PADs (i.e., 4.52, 4.78, M = 4.65) was higher than that of the PNDs (i.e., 3.86, 4.12, M = 3.99), indicating that the PADs provided less value and demonstrated a lower level of price worthiness in comparison with the PND.

Conversely, according to the notebook innovation type, the average DEFE between the existing and new products was higher in the PAD scenario than in the PND scenario (4.86 > 4.67), revealing that the participants felt more dissatisfied with PADs than with PNDs. Similarly, the average perceived MBV of the PADs (3.81) was higher than that of the PNDs (3.68), indicating that PADs provided less value and demonstrated a lower level of price worthiness than PNDs did.

Finally, for the PLSs, the average DEFEs between the existing and new products were higher in the product exit scenario than in the product coexistence scenario, for both the smartphones (PAD: 5.04 vs. 4.88; PND: 5.09 vs. 4.62) and the notebooks (PAD: 4.89 vs. 4.45; PND: 4.96 vs. 4.75). The overall average DEFE in the product exit scenario was higher than that in the product coexistence scenario (5.00 vs. 4.24). These results indicate that the participants felt dissatisfied with the exiting products and considered them as the last generation of its type. Similarly, the average MBV for the existing products were higher in the product exit scenario than in the product coexistence scenario, for both the smartphones (PAD: 4.78 vs. 4.52; PND: 4.12 vs. 3.86 and the notebooks (PAD: 4.04 vs. 3.31; PND: 4.03 vs. 3.59). The overall average perceived MBV in the product exit scenario (4.24) was higher than that in the product coexistence scenario (3.82). These results indicate that the existing products provided less value and exhibited a lower level of price worthiness compared with the new products.

Table 2: Descriptive statistics on the variable of NPT structure

Product	NPT structure difference	PLS	Sample size	DEFE	MBV	RP
Smartpho ne	Alignable difference	Coexistence	50	4.88 (1.21)	4.52 (1.64)	4.31 (1.69)

	(PAD)	Exit	50	5.04 (1.34)	4.78 (1.34)	4.26 (1.38)
	Nonalighable difference (PNE)	Coexistence	50	4.62 (1.60)	3.86 (1.41)	4.57 (0.87)
		Exit	50	5.09 (0.94)	4.12 (1.58)	4.16 (0.12)
Notebook	Alignable difference (PAD)	Coexistence	50	4.45 (0.89)	3.31 (1.52)	4.37 (1.12)
		Exit	50	4.89 (1.14)	4.04 (0.83)	4.19 (1.37)
	Nonalignable difference (PNE)	Coexistence	50	4.75 (1.60)	3.59 (0.64)	4.48 (1.41)
		Exit	50	4.96 (1.46)	4.03 (1.18)	4.25 (1.60)
Total			400	4.84 (1.45)	4.03 (1.36)	4.32 (1.34)

Notes: PET: product enhancement type; PLS: product launch strategy; DEFE: difference in expected future enjoyment; MBV: mental book value; RP: replacement and purchase; Standard deviations are indicated in parentheses

Discussion and Conclusion

Firms commonly adopt product upgrades or enhancements as a competitive strategy for new product innovations because of the rapid upgrades and short life cycles of consumer electronics. This study analyzed and explored how certain combinations of NPTs and PLSs for new products affect consumer RP decisions.

Compared with the level of innovation in existing products, new-generation products are more positively correlated with DEFE. Similar to brand extension strategies, product enhancements or upgrades are categorized as product line extension strategies, which are crucial strategies for developing new products. Therefore, with limited research and development resources, employing appropriate product innovation techniques to continuously release new products can affect the perceived DEFE between new- and old-generation products when raising consumer awareness of new products.

Furthermore, the participants in the present study perceived higher MBV and DEFE between existing and new products in the product exit scenario than they did in the product coexistence scenario. Consequently, to facilitate consumer RP decisions, firms should consider adopting a product exit strategy when launching a new product in order to expand consumer-perceived DEFE between new- and old-generation products. Another strategy is to deliberately create the impression of reduced market value and inability to satisfy consumer demand for old products, thereby enhancing the advantages of new products and promoting consumer-perceived DEFE between new- and old-generation products to stimulate RP decisions.

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Contact email: yhsu@ttu.edu.tw