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# Understanding Cross-Product Purchasing Intentions in an IT Brand Extension Context

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## Abstract

This study investigates why some customers of a brand tend to purchase IT products launched by the same brand in a different category, but others do not. Combining insights from marketing and information systems research, we develop an integrative model of cross-category purchases of IT products in a brand extension context. We extend the IS continuance model by integrating brand extension factors such as perceived fit into the new model. Our model is empirically tested using data collected from 342 Xiaomi customers. The results show that in addition to post-acceptance usefulness perceptions and brand satisfaction, the perceived service quality and perceived fit of the initial purchase also have strong effects on consumers' continuance purchase intentions toward a brand extension product. Hedonic and utilitarian expectancy mediate the relationship between consumers' post-consumption views of the initial purchase and their intention of the subsequent purchase of a different product under the same brand.

**Keywords:** IT continuance behavior; IT product purchase; user satisfaction; confirmation; brand extension; structural equation modeling (SEM); partial least squares (PLS).

## 1 Introduction

Intense market competition and technological developments have shortened product lifecycles, such that information technology (IT) product manufacturers need to launch new products quickly to maintain and increase their market share (Jun et al. 2014). In the IT industry, branded products tend to exhibit high similarities and generally rely on the same technology

infrastructure or platform, such as the Android system for different phone manufacturers including HTC, Lenovo, Huawei, and Xiaomi. Because of the high similarity in technology, IT companies endeavor to differentiate their products through branding strategies, especially applying brand extension strategies when launching a new product.

Brand extension refers to a marketing strategy whereby a firm develops and launches a product using an existing brand name from a different product category (Aaker & Keller 1990; Kotler & Keller 2013). This strategy has been shown to reduce new product introduction costs (Swaminathan, Fox, & Reddy 2001) by leveraging the brand equity of the parent brand for the newly released products and reducing the expenses of advertising and trade deals (Broniarczyk & Alba 1994; Völckner & Sattler 2006). Although statistics show that brand extension accounts for approximately 80% of new product introductions (Keller 2008), little is known about the factors that determine the success of brand extension strategies across different IT product categories. For example, the leading computer manufacturer Lenovo first launched its smartphone in China in 2014 with a brand extension strategy, applying its existing brand name “Lenovo” and hoping to leverage its position as a prominent PC vendor with 15% market share (Canalys 2015). Yet the Lenovo smartphone has achieved only a 4.7% share in the smartphone market, well behind its domestic competitors Huawei and Xiaomi (IDC 2015). Some Lenovo PC users were eager to adopt a new Lenovo mobile phone, while others decided to switch to other brands (e.g., Huawei), even the alternative brands had very similar technology and configurations (e.g., same version of Android, equivalent hardware configurations, standards, and prices). Why does the brand extension strategy work for some IT brands but not for others?

In this study, we attempt to solve this puzzle and address the question: what factors impact the success of brand extension strategies for IT products? Specifically, *what factors encourage IT*

*brand users to continue purchasing IT products in different categories from the same brand?* To disentangle this problem and identify factors that influence consumers' continuance purchase intentions toward a brand extension IT product, it is imperative to take a multidisciplinary approach from marketing and information systems given the complex nature of IT products. This multidisciplinary approach response to prior calls for an interdisciplinary approach to develop a more integrated perspective on consumer behavior study of IT-related products and services (e.g., Morgan-Thomas & Veloutsou 2013; Taylor & Strutton 2010). We thus integrate product-level factors, motivational factors in consumer decision making, and the IS continuance model to establish a brand extension model of continuance purchases of IT brand extension products. We use the IS continuance model developed by Bhattacharjee (2001) as a base model and extended this model to address marketing questions associated with brand extensions.

First, although previous marketing literature have extensively examined drivers of brand extension success from a brand perspective, it has yet to explore factors tied to IT products. Previous branding research identifies ten pertinent predictors of brand extension success, such as parent brand experience, perceived fit, and the quality of the parent brand (Völckner & Sattler 2006). However, these factors have not addressed the uniqueness of an IT product in a brand extension setting. Specifically, extant brand extension literature (e.g. Aaker & Keller 1990; Völckner & Sattler 2006) and the expectation-confirmation theory (ECT) (Oliver, 1980) predominantly focus on the fast-moving consumer good (FMCG) brand extension context. Some representative FMCGs include soft drinks, toiletries, over-the-counter drugs, processed foods, meat, fruit and vegetables, alcohol, chocolate, candies, and cleaning products. Compared to IT products involving many sophisticated technical details (e.g., processor, GPU, storage, memory and Wi-Fi Connectivity) and large investments, most FMCGs can be viewed as low-

involvement, non-durable goods that individuals are not required to think carefully about before purchase, due to low cost, short lifespans, and simplicity of choice. Thus, consumers usually form their pre-purchase expectations toward these FMCGs based on mass media information obtained from various channels, such as TV, the Internet and newspapers. In the FMCG context, ECT models consumers' pre-expectations as a key determinant of satisfaction, and the pre-expectation represents a baseline or reference point for consumers to confirm initial expectations and finally form satisfaction. Confirmation is modeled as the consequence of pre-expectation and perceived performance after purchasing and represents a psychological feeling resulting from a cognitive appraisal of the discrepancy between pre-expectation and perceived performance after purchase and use (i.e. first-hand experience). ECT proposes that lower pre-expectation and/or higher perceived performance will lead to greater confirmation, which has a positively impact on increasing the degree of consumers' satisfaction and the likelihood of repurchase intention.

The expectancy confirmation theory has been questioned for its emphasis on pre-purchase expectations and ignoring consumers' potential change in their initial expectations after purchasing. Expectation changes typically occur in the IT product purchase context in which goods are generally replaced over a period of several years (i.e. durable goods) and purchase decisions require consumers to have professional knowledge to make a comparison and choice between various technical parameters. Unlike FMCGs, IT products (e.g., mobile phones, computers and camera) are usually durable, high-involvement goods with technically complex and sophisticated functions and parameters. An IT product typically presents the combined application of various information technologies. For example, a smartphone includes an operating system, a navigation device/component, sensors, and a camera. An individual may consequently increase or decrease his or her pre-expectation to form a new expectation if he or

she realizes that the benefits and/or usefulness of a new product (e.g. a smartphone) is far beyond or below the initial expectation after first-hand experience. Prior studies have found that post-expectations based on consumers' first-hand experience exert a greater influence on consumers' satisfaction than pre-expectation based on third-party information such as others' opinions or media articles (LaTour & Peat 1980; Fazio & Zanna 1981). A key difference between Bhattacharjee's (2001) IS continuance model and ECT is that the former theorizes that post expectation (rather than pre-expectation) plays a vital role in determining IT consumers' satisfaction (please see section 2.1 for a detailed discussion regarding the differences between the two models). From this perspective, we argue that the IS continuance model appears to be more appropriate to serve as a baseline model to explain repurchase intention in the IT product brand extension context in which the pre-expectations formed via second-hand information are more biased and susceptible to change.

Although the existing IS continuance model can serve as a base model for our continuance brand purchase behavior, the model itself is technology focused and does not include factors that represent brand perceptions or offer any underlying mechanism to address consumers' motivations, which are essential to consumer purchases of brand extension products. Therefore, by combining perspectives from marketing literature and IS literature, we gain a better understanding of IT brand extension strategies in the context of consumers' cross-category purchase behavior. In addressing these gaps, this research contributes to brand extension and IT adoption literature in three main ways. First, this study explicates cross-category purchases of IT products in a brand extension context. The model we propose is different with the original IS continuance model because it addresses the cross-category purchase behavior of two different products, whereas the IS continuance model only examines purchase behavior toward one

product. Our model also broadens the scope of the base model by including perspectives from branding and brand extension – such perspectives are absent in the IS continuance model. Specifically, extant IS research acknowledges the importance of technological sophistication on continuance adoptions of an IS system but has not yet incorporated other important decision factors, such as consumers’ perceptions of the services offered by the brand in addition to the evaluations of the technical performance of a system. In other words, traditional IS acceptance theories address questions about which factors affect IS users’ decisions to keep using the same IS system (e.g., an ERP system). Notwithstanding, a more practical question regarding what factors influence consumers to keep purchasing different products from the same brand has yet been addressed. Since companies increasingly use brand extension strategies, and consumers rely heavily on their brand experience to inform their purchase decision, we extend technology continuance theories by incorporating brand extension related constructs, such as perceived service quality of a brand and brand satisfaction.

Second, the existing IS continuance model reveals that both perceived usefulness and satisfaction have positive impacts on IS users’ continuance intentions, but it does not offer potential explanations or identify any potential psychological drivers of these relationships. To disentangle the underlying mechanisms, we uncover two mediators, hedonic expectancy and utilitarian expectancy, which channel the effects of consumers’ brand perceptions (i.e., perceived usefulness and perceived service quality) on brand satisfaction and continuance intentions. Our study thus yields new insights into the mechanisms underlying the relationships between consumers’ brand perceptions and their continuance purchase of the same brand for a different IT product.



Third, we contribute to the brand extension literature by empirically examining the concept of perceived fit of real brand users and measuring their perceptions of a different product, produced by the same brand that the consumers have purchased previously. In addition, we are the first to incorporate perceived fit, an essential brand extension concept, into the IS continuance base model to examine its effect on continuance intentions. Most prior literature examines perceived fit using experiments and convenience samples (Aaker & Keller 1990; Bottomley & Holden 2001; Sunde & Brodie 1993), offering an important foundation for brand extension literature. However, the external validity of the perceived fit measures prompt criticism; it may not be as important as previous research has claimed, in that participants in previous studies make inferences about hypothetical brand extension scenarios, with limited information (Klink & Smith 2001). Even when studies gather field data to examine the impact of fit on brand extension success (Völckner & Sattler 2006), the respondents are potential consumers of a brand, rather than consumers who actually have purchased and used the brand, which may be critical to examinations of brand extensions. We diverge from these previous methods and instead ask consumers who have already bought a product from the brand to evaluate their intention to purchase subsequent IT products launched by the same brand. Therefore, this study fills the research gap by offering empirical insights into the impact of perceived fit on the purchase of brand extension products using real consumers who are actual brand users (i.e., examining the purchase intentions of current Xiaomi users toward newly released Xiaomi products).

The rest of the paper is structured as follows. We present the process of developing our conceptual framework based on our review of consumer satisfaction theories, and describe the existing and extended IS continuance model. We then propose our extended model and the

hypotheses derived from it. After we describe the research methodology used to empirically test the framework, we report the results. We conclude with a discussion of the implications of our findings for theory and practice, as well as suggestions for future research.

## **2 Theoretical foundation and model development**

To develop a theoretical framework to address our research question, we first explored expectation-confirmation theory and the IS continuance model, then applied the IS continuance model in our research context as a base model. Last, we outline the steps of building our extended model, designed to assess cross-product purchase behavior in a brand extension context. Specifically, we integrate factors originating in brand extension and technology acceptance research to theorize a model of cross-product purchasing intentions in the IT brand extension context. We also propose hedonic expectancy and utilitarian expectancy as two motivational factors that may mediate the relationships between post-consumption perceptions of the initial product and purchase intentions toward a brand extension product from the same brand.

### ***2.1 Theories concerning customer satisfaction: The expectation-confirmation theory and the IS continuance model***

In marketing, consumer satisfaction research has been perpetuated by the expectation-confirmation theory (ECT), as developed by Oliver (1980), which we depict in Figure 1. The ECT model regards consumer behavior as three separate but closely related stages: purchase, disconfirmation/confirmation, and response/feedback (i.e., complaining and repurchase). In the first stage, consumers develop an initial expectation of a product or service prior to purchase. During the usage period, they make a cognitive comparison between anticipated performance (i.e., expectation) and actual performance (i.e., perceived performance) and assess the extent to which their expectations have been met. Lower anticipated and/or higher perceived performance

both increase the likelihood of confirmation. The comparison provides a foundation for satisfaction, prompting either a positive response (e.g., repurchase, use) or a negative one (e.g., complaining).

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Insert Figure 1 here

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Bhattacharjee (2001) extends the ECT model to an IS continuance usage model and thereby examines the influence of consumers' satisfaction on their intention to continue using an IS technology they previously adopted. This IS continuance model adjusts the ECT model to an IS context, in three main ways. First, it removes initial expectation and perceived performance, focusing instead on post-acceptance variables, with the argument that the effect of expectation and perceived performance already can be captured by confirmation and satisfaction constructs. As Figures 1 and 2 indicate, the two antecedents of confirmation do not appear in the IS continuance model.

Second, the IS continuance model adds an ex post (post-consumption) perception variable, perceived usefulness, which is particularly important for the final decision to adopt or use IS products or services, unlike the initial expectations that change over time. According to self-perception theory (Bem 1972), consumers continually adjust their expectations as they acquire new information through actual usage. Thus, adjusted ex post expectations, such as product usefulness, replace initial expectations and serve as a new basis for subsequent decision making. Perceived usefulness reflects a cognitive belief; it was initially developed and defined by Davis (1989) in an IS initial adoption context. It refers to the degree to which a person believes that using a particular system will enhance his or her performance (Davis 1989; Davis et al. 1989). Unlike other IT-related beliefs (e.g., ease of use) in prior IS usage, perceived usefulness is the

only user belief, proposed by IS studies, that has a consistent impact on user decisions across temporal stages of IS usage (e.g., Davis et al. 1989; Karahanna & Straub 1999). Thus, the IS continuance model predicts that perceived usefulness is a determinant of satisfaction, with a constant influence on subsequent IS continuance usage decisions.

Third, the revised model adds two new relationships: (1) a direct impact of *perceived usefulness* on *IS continuance intention*, in addition to its indirect effect through satisfaction, and (2) a direct impact of confirmation on perceived usefulness. The perceived usefulness–intention relationship originally was proposed in the technology acceptance model (TAM), relative to an initial adoption stage. According to the IS continuance model, the direct relationship between perceived usefulness and intention also likely exists in a continuance context, because continuance intentions are series of usage decisions, independent of time or behavioral stages. Regarding the relationship between *confirmation* and *perceived usefulness*, prior literature suggests that perceptions of usefulness can be influenced by whether they confirm or disconfirm users’ prior expectations of the products (e.g., Davis et al. 1989; Festinger 1957). That is, users first establish initial usefulness perceptions in the early stages of a new IS. After initial trial, the users may or may not change their current usefulness perceptions, depending on whether their initial expectations have been confirmed or disconfirmed. According to cognitive dissonance theory (Festinger 1957), if users’ initial perceptions are disconfirmed, they experience cognitive dissonance or psychological tension, then increase or decrease their usefulness perceptions to match reality. The IS continuance model echoes this view and suggests that confirmation affects usefulness perceptions. Figure 2 illustrates the key constructs and relationships in this IS continuance usage model (Bhattacharjee 2001).

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Insert Figure 2 here

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## ***2.2 Integrative model of cross-product consumer behavior in the IT brand extension context***

### ***2.2.1 IS continuance model as a base model***

A consumer's decision to keep purchasing a new type of IT product from the same brand mirrors, to some extent, the process by which IS users decide whether to adopt the same IS system continuously. The basic logic for both decisions indicates confirmation → satisfaction → continuance intention (Figure 3). Because of this similarity, and its research focus on continuance intention, we regard the IS continuance model as an ideal base model that we can use to address our central research question. Applying IS adoption/continuance models originally developed in organizational settings to a consumer use context is not alien in IS and consumer behavior research. Instances of such work include: Venkatesh et al. (2012), who examine the boundary conditions of the unified theory of acceptance and use of technology (UTAUT) model (Venkatesh et al. 2003) and make an extension in a consumer context to explain the purchase behavioral intention of a mobile Internet service; Bruner and Kumar (2005), who apply TAM to a consumer context (handheld Internet devices); and Hsiao and Chan (2014), who extend Bhattacharjee's (2001) IS continuance model into the consumers' continued use of mobile advertising context. A key difference between workplace and consumer contexts is that in the latter, a hedonic factor is typically important in addition to factors related to the utilitarian aspect (Childers et al., 2002; van der Heijden 2004). From this basis, we propose new constructs and relationships, after summarizing propositions that we adopt, with minor modifications, from the IS continuance model.

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Insert Figure 3 here

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The influence of satisfaction on continuance intention has been examined in different research contexts (e.g. Morgan-Thomas & Veloutsou 2013; Oliver 1993). Accordingly, we propose that a consumer's level of brand satisfaction also affects his or her intention to purchase from the same brand again. Brand satisfaction can capture the influence of brand experience on consumers' decisions to keep purchasing a new type of IT product launched by the same brand. This reasoning leads to our first proposition:

*P1: Consumers' level of brand satisfaction is positively associated with their continuance intentions to purchase a new IT product launched by the brand in a different category.*

The relationships among perceived usefulness, confirmation, satisfaction, and continuance intention, as developed by Bhattacharjee (2001) in a technology acceptance context, may also apply to cross-product purchasing behavior in a brand extension context. Four propositions summarize these links:

*P2: The extent of consumers' confirmation is positively associated with brand satisfaction.*

*P3: The extent of consumers' confirmation is positively associated with perceived usefulness.*

*P4: Consumers' perceived usefulness is positively associated with brand satisfaction.*

*P5: Consumers' perceived usefulness is positively associated with their continuance intentions to purchase a new IT product launched by the brand in a different category.*

To ensure the rigor of the extended model, we begin by assessing this base model first. Thus, in our hypotheses testing, we examine P1–P5 in parallel with seven new hypotheses (H1–H7) that we propose in the next section. By testing these propositions, we impose a complex control on the extended model; validating the base IS continuance model also increases the external validity of our extended model.

Despite the similar logic behind the IS continuance model and our research, it is insufficient to answer questions raised by cross-category purchases of brand extension products, and some fundamental differences require theoretical extensions of the IS continuance model. First, the IS continuance model only involves one product (i.e., one information system), but a brand extension model involves at least two different products. For example, a consumer might have already purchased a Xiaomi smartphone, and then is faced with the decision of whether to buy a Xiaomi smartwatch. Second, satisfaction in the IS continuance model cannot adequately represent consumers' brand satisfaction for the current study, because it only focuses on users' perceptions of a single IS system, and specifically their perception of its usefulness. However, in a brand extension context, we seek a comprehensive view of consumers' brand satisfaction, including perceptions of the brand and the services it offers. Thus, brand satisfaction is a more complicated concept than satisfaction with the technology aspect of an IS product. These major differences motivate us to extend the IS continuance model by modifying the original constructs, incorporating new brand extension concepts, and illustrating newly proposed relationships in the extended model.

### ***2.2.2 Brand extension model development and hypotheses***

Because the IS continuance model mainly focuses on technology acceptance and users' continued usage of an IS, it does not offer insights into brand-related decisions. Thus, to address our research question regarding cross-product purchases of a brand extension, we modified the IS continuance model to incorporate brand and behavioral components. Specifically, our model development encompasses the following theoretical reforms: (1) replace the concept of satisfaction with brand satisfaction; (2) introduce a marketing factor, perceived service quality as an ex post perception variable, in the model; (3) include perceived fit as an important antecedent

of brand extension success; and (4) include hedonic and utilitarian expectancy as two potential mediators of the relationship between post-consumption perceptions of the initial product and purchase intentions toward additional products from the same brand.

First, brand satisfaction replaces the satisfaction construct in the IS continuance model. In the IS continuance context, satisfaction refers to a pleasurable or positive emotional state resulting from an appraisal of using a new IS (Bhattacharjee 2001). However, the concept of satisfaction in our research denotes consumers' affective reactions (i.e., perceived usefulness and perceived service quality) to a specific brand, based on their prior experiences with the brand.

Second, we incorporate perceived service quality as an important marketing construct in the extended model. Consumers' brand experience consists of two main dimensions: product experience and the service experience associated with the product. The former refers to consumers' perceptions about the product's functioning, including assessments of the ingredients and features; the latter entails an evaluation of the intangible services associated with the product, including customer services and delivery speed (Sivakumar et al., 2014; Carlson & O'Cass 2010). To capture these dimensions of consumers' brand experience, marketing scholars measure consumers' perceptions of tangible aspects of a brand, such as product-related attributes, as well as intangible aspects, such as services associated with the brand (e.g., Donovan & Jalleh, 1999; Laurent & Kapferer 1985). The IS continuance model reflects a technology usage perspective, such that it only measures technology aspects of a product and is silent about the service element. Therefore, for a complete understanding of the brand experience, we include not just the *perceived usefulness* construct from the IS continuance model to measure experience with IT products but also a *perceived service quality* construct to capture intangible elements of those products.



Furthermore, the IS continuance model suggests a continuous association between perceived usefulness and confirmation, in that consumers update their evaluations based on the confirmation or disconfirmation of their initial expectation (Bhattacharjee 2001; Davis 1989; Davis et al. 1989; Doong & Lai 2008; Lankton et al. 2016; Venkatesh & Goyal 2010). Following a similar process, confirmation should influence perceived service quality (Torres, 2014; Gijzenberg, Heerde & Verhoef 2015), such that consumers first establish their initial expectation of the brand's service quality, which may be low or high, because they lack any experience with it. After consumers purchase the brand and experience its services, they can either confirm or disconfirm their initial expectation, then use this information to form their perceptions of service quality. If consumers confirm their expectations, their perception of service quality should increase. We thus posit:

*H1: Favorable consumers' confirmation positively influences their perceptions of service quality.*

In the IS continuance model, perceived usefulness is an essential belief about IT product or technology-related attributes that consistently influence consumers' behavior across different usage stages (e.g., Adams et al. 1992; Mohammadi 2015). Marketing literature offers empirical support for a similar relationship between service quality and intentions (e.g., Carlson & O'Cass 2010; Cronin et al. 2000; Wang et al. 2016). Because perceived service quality is indispensable to consumers' evaluations of the expectation–performance discrepancy (Lee et al. 2000; Parasuraman et al., 1988), which parallels the use of perceived usefulness to measure brand experience and has been examined in various settings including tourism (e.g., Chen & Chen, 2010; Ryu & Han 2010), Transportation (e.g. Chen, 2008) and Mobile service (e.g. Kuo et al. 2009), we propose:

*H2: Favorable consumers' perceived service quality positively influences their (a) brand satisfaction and (b) continuance intentions to purchase a new IT product of the brand in a different category.*

Third, we incorporate perceived fit as an important antecedent of a brand extension. Unlike the continued use of a single system in the IS continuance model, continuance purchases of IT products in a brand extension context involve at least two different IT products of the same brand. In the first stage, consumers build their brand experience by using an IT product, such as a smartphone launched by Xiaomi. Their experiences with the Xiaomi smartphone increase their first-hand information, knowledge, and familiarity with the Xiaomi brand. These updated beliefs then affect their confirmation process (Eveleth et al. 2015; Lankton et al. 2016; Qazi et al. 2017), and their resulting cognitive beliefs determine their satisfaction or dissatisfaction with the brand. This information influences their decision in stage 2, when they go to purchase a different IT product, such as a smartwatch, from Xiaomi.

Because the brand extension process involves at least two products, we must address the question of perceived fit, which refers to whether consumers believe that the people, facilities, skills, and other resources used to make product X (e.g., smartphone) positively contribute to the production of an extension product Y (e.g., smartwatch), which would validate the extension product as useful and effective (Aaker & Keller 1990; Swaminathan 2003; Swaminathan et al. 2001). According to Aaker and Keller (1990), perceived fit is one of the most significant factors for brand extension success, along with perceived quality. Replications of Aaker and Keller's (1990) work converge in showing that perceived fit drives the success of a brand extension (see Bottomley & Holden 2001; Bottomley & Doyle 1996; Sunde & Brodie 1993; Albrecht et al.,

2013; Verhellen, et al. 2016). Thus, any brand extension study must include this important concept.

When a parent brand introduces a new product in a different product category, the perceived fit of the parent brand with the extension product category can significantly affect consumers' preferences for the extension products (Helmig et al. 2007; Sichtmann & Diamantopoulos 2013; Völckner & Sattler 2006; Verhellen, et al. 2016). For example, if Xiaomi were to extend into the smartwatch market, consumers may believe that it possesses the required skills, facilities, sales channels, and other resources to develop and distribute a smartwatch, because its existing electronic products (i.e., parent products) and smartwatches both belong to the electronics sector and are similar in terms of basic technologies and infrastructure. Notwithstanding, perceived fit also pertains to consumers' perceptions of whether the brand can offer the same level of service quality for the extension that it has for the parent products (Kim & John 2008; Broniarczyk & Alba 1994; Kim & John 2008; Völckner et al. 2010). Therefore, in our brand extension model we include perceived fit and examine whether positive associations with the initial product (e.g., Xiaomi smartphone in stage 1) persist and apply to the extended product (e.g., Xiaomi smartwatch in stage 2). Following prior brand extension research, we argue that a high degree of fit or consistency with the parent brand should significantly influence consumers' intentions to purchase new products. Thus, we hypothesize:

*H3: Favorable consumers' perceived fit positively influences their continuance intentions to purchase a new IT product launched by the brand in a different category.*

Fourth, our extended model includes intrinsic motivation and extrinsic motivation, namely hedonic expectancy and utilitarian expectancy, as mediators of the relationship between the ex post variables and continuous purchases of additional IT products from the same brand. Drawing

on motivation theory, prior IS acceptance research identifies hedonic (intrinsic) and utilitarian (extrinsic) expectancy as motivations for individual purchases of IT products in consumer contexts (Childers et al. 2002; Davis et al. 1992; Turel et al. 2010; van der Heijden 2004). In the same vein, the marketing literature asserts that the hedonic and utilitarian aspects of a product drive consumer behaviors and attitudes (e.g., Voss, Spangenberg, & Grohmann, 2003). As Batra and Ahtola (1991, p. 159) assert, “consumers purchase goods and services and perform consumption behaviors for two basic reasons: (1) consummatory affective (hedonic) gratification (from sensory attributes), and (2) instrumental, utilitarian reasons.”

Hedonic expectancy implies that consumers expect to experience enjoyment, fun, or pleasure (Venkatesh et al. 2012) from purchasing and using a product (e.g., playing games on a smartphone). Utilitarian expectancy instead refers to consumers’ expectation that purchasing and using a product will enhance their task performance or improve their work efficiency (e.g., using the smartphone to schedule tasks). For decades, consumer behavior researchers have acknowledged that consumers expect to obtain hedonic or utilitarian outcomes from the products they purchase (e.g., Ozkara et al. 2017; Liu & Forsythe, 2011; Guo & Barnes, 2011; Pascual-Miguel et al. 2015; Zhu & Meyer 2017). We introduce these two complementary constructs to capture a consumer’s motivations for purchasing a brand extension product. For example, smartphone users might expect hedonic value from using the phone to browse YouTube videos but also expect work enhancement from using it to keep track of the time or reply to work emails. Thus, we propose both intrinsic and extrinsic motivations as antecedents of consumers’ continuance purchase intentions.

*H4: Favorable (a) hedonic expectancy and (b) utilitarian expectancy of using a new IT product positively influences consumers' continuance intentions to purchase new products launched by the brand.*

These hedonic and utilitarian expectations in turn might mediate the impact of post-consumption factors (i.e., perceived usefulness and perceived service quality) on purchase intentions toward a brand extension product. Self-perception theory (Bem 1972) suggests that after acquiring new information through the use of a previously purchased product, customers adjust their perceptions of post-consumption factors, including perceived usefulness and perceived service quality. These adjusted perceptions replace the initial expectations in consumers' cognitive memories and serve as the new bases for subsequent decision processes (Bhattacharjee 2001; Hsu et al. 2006; Bhattacharjee et al. 2008; De Guinea & Markus 2009). In this research, perceived usefulness and perceived service quality are grounded in users' first-hand experience with the Xiaomi products they have used. As shown in Figure 3, in the IT brand extension context, we argue that a user's post-consumption expectation from IT product X of brand A not only replaces the initial consumption expectation in the consumer's cognitive memory as the basis for determining subsequent cognitive processes, such as satisfaction with the use of IT product X of brand A, but also changes their upcoming pre-consumption (initial) expectation regarding newly developed products from the focal brand (i.e. product Y of brand A in this case). As mentioned earlier, prior continuance studies (e.g. Bhattacharjee 2001; Fazio & Zanna 1981) mainly focus on examining users' continuance usage behavior of the same product and thus propose that initial expectation is formed through others' opinions and third-party information reports. In the brand extension context involving two different products from the same brand, we believe that the post-consumption, expectation tempered by their first-hand

usage experience of the first product (i.e. product X of brand A), will influence their pre-purchase expectation of a new product developed by the same brand (i.e. product Y of brand A).

Thus, adjusted perceptions of perceived usefulness and perceived service quality influence consumers' expectations of hedonic and utilitarian aspects; if they believe the perceived usefulness of a smartphone is high and the phone helps them improve their task performance (i.e., utilitarian value) (Kim et al. 2007), and the amusing ringtones also bring them enjoyable experiences (i.e., hedonic value) (Turel et al. 2010), these beliefs should also lead to positive expectations about the utilitarian and hedonic aspects of other products. If the perceived service quality of the brand is high, because it provides useful product information online (i.e., utilitarian value) (Ledden, Kalafatis & Mathioudakis 2011) and cheerful customer service (i.e., hedonic value) (Wang et al. 2010), consumers' purchase intentions also may increase (Chitturi et al. 2007, 2008; Kivetz & Zheng 2017), because they likely believe that this brand is capable of offering utilitarian and hedonic value for its brand extension products. We thus propose extending the IS continuance model as follows:

*H5: Favorable consumers' perceived usefulness positively influences the (a) hedonic expectancy and (b) utilitarian expectancy of using a new IT product launched by the brand in a different category.*

*H6: Favorable consumers' perceived service quality positively influences the (a) hedonic expectancy and (b) utilitarian expectancy of using a new IT product launched by the brand in a different category.*

Parallel to perceived usefulness and perceived service quality, brand satisfaction offers another post-consumption factor, reflecting experience with the initial product (Nam et al 2011; Arteaga et al. 2010) and having an important effect on subsequent brand or product expectations

(Gupta & Stewart, 1996; Angelova & Zekiri et al. 2011). Thus, the two pre-consumption expectations developed in the proposed model (i.e. hedonic and utilitarian expectations) might mediate the relationship between this brand satisfaction and continuance purchase intentions. If consumers are highly satisfied with the brand for example, this brand satisfaction likely increases their purchase intentions (Kuo et al. 2009; Ledden et al. 2011; Qazi et al. 2017; Wang et al. 2010) toward a brand extension product, because they anticipate that the hedonic and utilitarian aspects of the new product also will satisfy their future needs (Hellén 2011; Venkatesh & Goyal 2010; Kim et al. 2007).. However, if they are unsatisfied with the previous product, they may think the hedonic and utilitarian value of the future product will be disappointing too (Kim & Forsythe 2008), such that they are less likely to purchase more products from the same brand. Since consumers are likely follow this psychological process when deciding whether to buy brand extension products, we predict:

*H7: Consumers' level of brand satisfaction is positively associated with the (a) hedonic expectancy and (b) utilitarian expectancy of using a new IT product launched by the brand in a different category.*

In these latter three hypotheses (H5–H7), we thus propose mediating roles of hedonic and utilitarian expectations in the brand extension model (Figure 4). The effect of the three *post-consumption perceptions* about the initial product (i.e., perceived usefulness, perceived service quality, and brand satisfaction) on *consumers' intention to purchase* a brand extension product is mediated by hedonic and utilitarian expectations. In this way, we extend the IS continuance model by proposing an underlying mechanism that can explain cross-category purchase behavior toward a brand extension product. Our proposed new model (1) integrates initial acceptance of the previous purchase into continued purchases of future brand extension products, (2) predicts

relationships among the post-consumption factors of initial purchase and their impact on the purchase behavior of brand extension products, and (3) proposes two mediators that reflect the underlying psychological process.

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Insert Figure 4 here

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### **3 Study design and methodology**

#### **3.1 Data collection**

To test this model, we seek a brand that is familiar to consumers but not too strong, such that it might overshadow or bias consumers' purchase decisions (e.g., Apple). Decades of customer loyalty can weaken the effect of other factors on purchases of brand extensions. Furthermore, if a brand has not launched brand extension products recently, it cannot provide the data we need to test our brand extension model. Therefore, we identify Xiaomi, which is a relatively new IT brand that frequently launches new brand extension products, as an ideal source for testing our brand extension model. In its short history, Xiaomi has quickly expanded through a brand extension strategy; it is currently the fifth largest smartphone maker in the world (IDC, 2016). Since the release of its first smartphone in August 2011, Xiaomi has gained significant market share and continues to develop wider ranges of consumer electronics products, including smartphones, a smartwatch, smart routers, a smart home device ecosystem, and other products, under the Xiaomi brand.

To obtain data for our study, we conducted an online survey on a leading Chinese web-based survey platform (similar to QuestionPro). The URL of questionnaire was authorized and published on the *official forum* of Xiaomi (<http://www.miui.com/forum.php>). All Xiaomi customers automatically become forum members, to obtain after-sales online support (e.g., driver updates). These forum members received a private message from the forum manager



soliciting their participation in a survey about IT brand continuance purchase and usage. The message described our research purpose, provided the URL of the questionnaire, and, as an incentive, offered respondents the opportunity to register in a drawing to win Xiaomi mobile accessories.

To control for potential common method bias (CMB) and ensure that we captured the necessary data for all stages of IT consumer purchase behavior in a brand extension context, we divided the questionnaire into two parts. The first part included all items except for those measuring behavioral intentions; the second part, issued one month later, measured behavioral intentions to purchase newly released Xiaomi IT products. The survey also included distinct response formats to minimize the threat of CMB, including semantic differential scales, Likert scales, and reverse-coded statements. Invalid and suspicious data were removed (e.g., duplicate IP addresses, unreasonable survey completion times).

the respondents are potential consumers of a brand, rather than consumers who actually have purchased and used the brand, which may be critical to examinations of brand extensions. We diverge from these previous methods and instead ask consumers who have already bought a product from the brand to evaluate their intention to purchase subsequent IT products launched by the same brand. Therefore, this study fills the research gap by offering empirical insights into the impact of perceived fit on the purchase of brand extension products using real consumers who are actual brand users

Prior to the data collection, we computed the required sample size, using the power analysis technique in G\*Power 3.0 (Faul et al. 2007). For our conceptual model to achieve a medium effect size ( $1 - \beta = 0.95$ ,  $\alpha = 0.05$ ), the sample size should be at least 146. Rumors that Xiaomi was developing a smartwatch first occurred in 2015 and were finally confirmed by cofounder Liu

De on April 29th, 2016, who stated that Xiaomi's first smartwatch would be available for purchase (in China) in the second half of the year (Wanjala, 2016; Pratap, 2016). This brand extension scenario provides a natural experiment that allows us to examine realistically the proposal model and hypotheses. The questions for the first part of the online questionnaire were collected on May 1st, 2016; the respondents were Xiaomi customers who had actually purchased and used Xiaomi products. One month later, three questions measuring the purchase intention toward the Xiaomi smartwatch were answered by the same respondents. Specifically, 456 responses were collected in the first part and we send the second part questionnaire (i.e. measuring item of intention) to the 456 responses one month later and received 400 completed responses to the survey. A comparison of the demographic characteristics of 400 respondents and 56 non-respondents in the second part showed no significant differences. After deleting 58 invalid responses, we were left with 342 qualified responses for the quantitative analysis, far greater than the required minimum. All respondents are Xiaomi consumers who live in China's 21 provinces, 4 municipalities, or 5 autonomous regions, except for special administrative regions (i.e., Hong Kong and Macau) and the Gansu province. To test for nonresponse bias, we compared the demographic characteristics of the respondents in early and late waves of data collection and found no significant differences. Likewise, a comparison of the demographic characteristics of early and late respondents in the second wave showed no significant differences.

The descriptive statistics indicate that 55.3% of respondents are women, and most respondents are educated (88% with a degree). Furthermore, 96% of respondents are younger than 45 years of age, primarily because Xiaomi targets young consumers who are accustomed to using computers, tablet devices, and smartphones to access the Internet and shop online. Moreover,

96.3% of respondents use Xiaomi smartphones and phone accessories, such as Xiaomi In-Ear Headphones (48.3%). Thus, more than 80% of respondents claimed to have bought two or more different kinds of Xiaomi products. Considering Xiaomi's relatively recent adoption of a brand extension strategy, it is reasonable to anticipate that some respondents eventually might continue or discontinue buying new Xiaomi products in other categories, due to their satisfaction and evaluation of the products they currently use.

### **3.2 Measurement**

For this research, we used multi-item scale measurements. For most constructs in the research model, we adopted items that had been used and validated in previous studies (see Appendix A). The final version of the questionnaire contained 32 questions (6 general items, 26 scale items). The measure of satisfaction used 7-point semantic differential items; all other items relied on a 7-point Likert scale (7 = "strongly agree" and 1 = "strongly disagree"). Prior to releasing the formal online survey, we conducted pre-tests of the questionnaire among 20 customers who were using at least one Xiaomi product and 20 former customers who had switched to other IT brands. Our goal was to enhance the content validity by checking for any differences in understanding between current and former Xiaomi customers.

Confirmation consisted of three measurement items: product performance (CON1), service quality (CON2), and overall evaluation (CON3). These items measured important aspects that customers expect to obtain from a brand (i.e., product and service). Continuance intention also was measured with three items, including two standard statements and one reversed statement that assessed respondents' overall discontinuance intentions. These six items all came from Bhattacharjee (2001) and Venkatesh and Goyal (2010). To measure utilitarian expectancy, we modified three items from Venkatesh and Brown (2001), and Venkatesh and Goyal (2010).

Hedonic expectancy was operationalized with three items from prior IS studies (Davis 1989; Venkatesh 1999; Venkatesh & Brown 2001). For perceived usefulness, we used four items adopted from Davis (1989) and Davis et al. (1989). The first item assesses overall usefulness in respondents' daily activities, and the other three items tap the performance, productivity, and effectiveness dimensions of IT product usefulness. Service quality was operationalized with three items that we obtained from prior service quality studies (Brady & Cronin 2002; Zeithaml 1988). For satisfaction, we asked respondents to choose a position between two bipolar words on three 7-point semantic differential scales. We adapted these scales from Bhattacharjee (2001) to measure the construct in our study (i.e., IT brand usage experience). We used three items, created by Aaker and Keller (1990), Bottomley and Doyle (1996), and Taylor and Bearden (2002), to measure perceived fit, such that they capture the similarity between the new extension product and the original product, the helpfulness of the firm's resources and skills for the extension, and the congruency between the image of the brand and the extension.

We conducted several tests of the potential threat of CMB. First, we performed Harman's one-factor test by entering all of the principal constructs into a principal components factor analysis (Podsakoff and Organ 1986). Four factors emerged, the first accounting for just 38% of the variance, so CMB does not appear to be a concern. Second, following recommendations from Podsakoff et al. (2003), we performed a single-method factor test, using indicators that measured both their theoretical constructs and a common method latent construct, then re-running the structural model. The results did not change, again suggesting that CMB was not an issue for our data.

## **4 Data analysis and results**

### **4.1 Convergent validity and reliability**

To test for convergent validity and reliability, we used three metrics: average variance extracted (AVE), Cronbach's alpha, and composite reliability (CR). As illustrated in Table 1, all the AVE (0.739 or greater) and CR (0.895 or greater) values for the constructs were satisfactory. The multiple-item constructs also indicate Cronbach's alpha values greater than 0.70, suggesting the high internal reliability of the scales (Nunnally 1978). Thus, the measurement items that we used converged on the same latent construct and demonstrated internal consistency.

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Insert Table 1 here

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### **4.2 Discriminant validity**

To assess discriminant validity, we used the techniques proposed by Fornell and Larcker (1981), Chin (1998), and Henseler (2015). First, we developed a matrix of correlations between constructs with reflective measures. We replaced the diagonal with the square root of the AVE (see Table 2); the square root of the AVE for each construct was greater than the elements off the diagonal. Second, we assessed discriminant validity by comparing the loadings of items for an associated construct and their cross-loadings on other constructs. In our model, all items loaded on their corresponding constructs more strongly than on other constructs (Table 3). Third, the heterotrait-monotrait ratio of correlations (HTMT), a new approach for assessing discriminant validity in variance-based structural equation modeling (Henseler, 2015), produced HTMT values below the 0.90 threshold (Table 4). Finally, as a further test of multicollinearity, we computed variance inflation factors (VIFs). All the VIFs were less than the conservative threshold of 5, so multicollinearity was not a concern. Overall, we thus gain strong empirical support for the discriminant validity of the constructs in our research model.

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Insert Table 2 here

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Insert Table 3 here

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Insert Table 4 here

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### **4.3 Hypotheses testing**

We extended the original IS continuance model by incorporating new concepts and relationships in a new brand extension model. To ensure rigor, we validate the propositions (P1–P5) from the base IS continuance model and test the hypotheses (H1–H7) derived from the extended model. By examining the base model, we provide a warrant of the effectiveness of the original model on which we built our brand extension model.

To evaluate the proposed model and the hypothesized relationships among the constructs, we used partial least squares (PLS) structural equation modeling (SEM) in SmartPLS 3.0M. Each indicator was modeled reflectively. Modern quantitative research uses PLS extensively, because it has notable advantages, such as minimal demands on measurement scales, sample distribution, and sample size. It excels at causal-predictive analyses in which the hypothesized relationships are complex and few bases have been established. Our sample did not display a multivariate normal distribution, as is required by covariance-based SEM (CBSEM) methods (Hair et al. 2011). Moreover, PLS is more suitable for complex models than CBSEM, especially those with multiple endogeneity and mediation analyses, as appear in our research model. Model complexity can increase the total number of parameter estimates and cause model identification and convergence issues in CBSEM (Peng & Lai 2012). Therefore, we used SmartPLS 3.0M for our data analysis.

The results support the five propositions derived from the original IS continuance model, as well as six of our seven hypotheses (see Appendix B). Figure 5 shows the standardized path coefficients and path significance from SmartPLS. We computed the t-statistics and path significance levels for each hypothesized relationship using a bootstrapping method. We also obtained the path coefficients and R-square values by running the PLS algorithm to assess the predictive performance of the structural model. The construct for purchase intentions produced an R-square value of 0.506, indicating that more than half of the intention to buy new IT products in the brand extension context could be explained by respondents' perceptions of usefulness, perceived service quality, confirmation, brand satisfaction, perceived fit, hedonic expectancy, and utilitarian expectancy. These empirical results strongly confirm the explanatory power of our research model.

As we show in Figure 5, we found strong support for most of the relationships in our model. Perceived fit was the strongest determinant of purchase intention (H3), significant at the 0.1% level. In line with P1, brand satisfaction contributed significantly to motivating current brand users to continue buying other products from the same brand in the future. We also found support for H4a and H4b, such that intrinsic and extrinsic motivators significantly influenced consumers' intentions to buy brand extension products, consistent with previous marketing research.

Our research findings fully supported the paths between confirmation and perceived usefulness (P2) and between perceived usefulness and brand satisfaction (P4); they also demonstrated that perceived service quality related significantly to consumers' satisfaction (H2a). This result is understandable, in that we explore an individual consumer's intention to continue purchasing products from the same brand. In strong support of P3 and H1, confirmation was a

significant predictor of perceived usefulness ( $\beta = 0.434$ ) and perceived service quality ( $\beta = 0.480$ ), explaining 18.9% of the variance in usefulness and 23.1% of the variance in service quality.

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Insert Figure 5 here

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In addition to demonstrating the strong relationship between perceived usefulness and IT product purchase intentions in a brand extension context (P5), our model showed that perceived service quality offered another significant predictor of purchase intentions, at a 5% significance level (H2b). Brand satisfaction and perceived usefulness had strong direct effects on hedonic expectancy and utilitarian expectancy, and the four paths (H5a, H5b, H7a, and H7b) were significant at the 0.1% or 1% level. Perceived service quality also related significantly to hedonic expectancy (H6a) at the 1% level. However, our findings did not affirm a path between perceived service quality and utilitarian expectancy at the 5% level of significance (H6b); this relationship only was significant at the 10% level. In this research, we mainly develop the construct of perceived service quality to capture Xiaomi users' evaluations of the intangible services associated with the transaction process. This includes prior and after sales enquiry services, and delivery services. The construct of utilitarian expectancy is used to capture Xiaomi users' expectations that the functions of Xiaomi's newly developed products are useful for enhancing task performance or improving work efficiency. It is plausible that high-level prior and after sales enquiry services and delivery services do not determine the usefulness of Xiaomi products after purchase.



#### 4.4 Post hoc assessments of mediating effects

We expected hedonic expectancy and utilitarian expectancy to act as mediators between the three post-consumption variables and behavioral intentions. Because the research model contained two mediators, we applied the bootstrapping method suggested by Preacher and Hayes (2008) to test for multiple mediation. Bootstrapping is a nonparametric resampling procedure that does not impose an assumption of normality on the sampling distribution. This method involves repeatedly sampling from the data and estimating the indirect effects of mediators in each resampled data set. From the repeated samplings, we estimated an empirical approximation of the indirect effects, which we used to construct 95% confidence intervals (CI) for the indirect effects. If the confidence interval for a mediator contains zero, the indirect effect of the mediator does not differ from zero, and it cannot act as a mediator. In addition, contrasting the two mediators can show how their indirect effects might be distinguished, in terms of the magnitude of the dependent variable (DV). Following Preacher and Hayes's (2008) recommendations, we applied a bias-corrected (BC) bootstrapping method, which tends to be superior to the Sobel test (Sobel 1982, 1986), or product-of-coefficients approach (e.g., Williams & MacKinnon 2008). The BC bootstrap performs better in terms of both statistical power and Type I error rate (Preacher & Hayes, 2008). Using Preacher and Hayes' SPSS macro, each independent variable (IV) can be tested in a separate model if two or more IVs are included. In each model, one IV may be identified as the primary IV to be examined, and the other IVs may be treated as covariates.

Table 5 shows the results of our tests for mediating effects. First, in a model in which brand satisfaction is the IV (Model 1), with perceived usefulness and perceived service quality as covariates, brand satisfaction exerted a significant total effect on purchase intentions (coefficient

= 0.349, t-value = 6.941). Introducing the mediators, hedonic expectancy and utilitarian expectancy, decreased the direct effect of brand satisfaction on purchase intentions, though it remained significant (coefficient = 0.243, t = 4.867). Thus, utilitarian expectancy and hedonic expectancy partially mediate the impact of brand satisfaction on purchase intentions. The difference between the total and direct effects is the total indirect effect, mediated through utilitarian expectancy and hedonic expectancy; the point estimate is 0.097, with a 95% BC bootstrap CI between 0.046 and 0.168. The CI does not contain 0, so the total indirect effect is significantly different from 0. The specific indirect effects reveal that both hedonic and utilitarian expectancy are mediators; both of their 95% CIs exclude 0. The point estimate of the indirect impact through utilitarian expectancy is 0.042, and that through hedonic expectancy is 0.055, a difference of -0.013. The CI of the contrast contains 0, so the indirect effects of hedonic expectancy and utilitarian expectancy cannot be distinguished in their magnitude. In other words, utilitarian and hedonic expectancy, taken together, partially mediate the impact of brand satisfaction on purchase intentions, with similar magnitudes. As Table 5 shows, we obtain similar findings from Model 2, which includes perceived usefulness as the IV and brand satisfaction and perceived service quality as the two covariates.

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Insert Table 5 here

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Finally, Model 3 relies on perceived service quality as the IV and brand satisfaction and perceived usefulness as covariates. As Table 5 shows, perceived service quality exerts a significant total effect on purchase intentions (coefficient = 0.235, t-value = 4.755). When the mediators, hedonic expectancy and utilitarian expectancy, are introduced, perceived service quality still has a significant direct effect on purchase intentions, but the effect decreases (coefficient = 0.182, t = 3.771). The specific indirect effects show that only hedonic expectancy

acts as a mediator; its 95% CI does not contain 0. The contrast between utilitarian expectancy and hedonic expectancy has a 95% CI of -0.066 to 0.037, so their indirect effects do not differ significantly, even though one is significantly different from 0 and the other is not. Such “apparent paradoxes” can occur “when one of the specific indirect effects involved in the contrast is not sufficiently far from zero” (Preacher & Hayes 2008, p. 886) (hedonic expectancy in this case). In summary, utilitarian expectancy and hedonic expectancy partially mediate the impact of brand satisfaction and perceived usefulness on purchase intentions, whereas the impact of perceived service quality on purchase intentions is only mediated through hedonic expectancy.

## **5 Discussion**

### ***5.1 Theoretical Implications***

The use of brand extensions as a marketing strategy to launch new products is pervasive (Keller 2008). Although marketing studies on brand extension and IS research on continuance usage are abundant, few studies thoroughly illustrate continuance purchase behavior for a brand extension of IT products. Our interdisciplinary model examines cross-category purchases of brand extension products using data collected from real brand users. The findings contribute to the prior literature in a number of ways.

First, our findings advance research at the IS and marketing interface by identifying perceived service quality as an antecedent of brand satisfaction, in addition to perceived usefulness. Whereas IS studies have examined how perceived usefulness affects users’ intentions to adopt the system continuously (Bhattacharjee 2001), they remain silent about the importance of service perceptions for determining the brand experience. Our extended model decomposes ex post perceptions (i.e., brand experience) into two dimensions: perceived usefulness and perceived service quality. Perceived usefulness captures product attribute–related evaluations; perceived

service quality refers to non-product attribute-related elements (e.g., customer service). Together, these two concepts offer a more in-depth understanding of the effect of ex post expectations on consumers' brand satisfaction. The empirical results illustrate that perceived service quality has a significant impact on both brand satisfaction and consumers' intentions to purchase a brand extension product.

Second, this research advances brand extension literature by offering explanations of the underlying processes for purchasing intentions, beyond the mediating effect of satisfaction in prior IS models. Unlike prior theories and models (e.g., ECT, IS continuance), which mainly focus on the direct influence of pre-consumption and post-consumption variables on behavioral intentions, our study investigates the mediated effect of motivation variables on behavioral intentions. By developing and testing two parallel mediators (hedonic and utilitarian expectancy), we provide a theoretical explanation of the impact of post-consumption perceptions on subsequent purchase intentions toward a brand extension product. All three post-consumption variables (i.e., perceived usefulness, perceived service quality, and brand satisfaction) affect consumers' continuance purchase intentions through hedonic expectancy and utilitarian expectancy. This finding contributes to our understanding of the mechanisms through which post-consumption variables influence subsequent brand purchases, through pre-consumption expectations of a new brand extension product.

Third, this study contributes new insights to brand extension literature by empirically testing perceived fit, using real consumer data. The results provide support for the effect of perceived fit on cross-category purchases of brand extension products. Many brand extension studies rely on convenience samples, hypothetical scenarios, and fictitious brands (e.g., Aaker & Keller 1990; Broniarczyk & Alba 1994; Sunde & Brodie 1993; Taylor & Bearden 2002), leading some

scholars to challenge the importance and external validity of the perceived fit construct (Klink & Smith 2001). The empirical results address validity criticisms and confirm the strong effect of perceived fit on consumers' intentions to buy a brand extension product, in line with the original findings from Aaker and Keller (1990) and subsequent empirical work by Bottomley and Holden (2001).

This research also answers calls for a more integrative, multidisciplinary view of consumers' interactions with IT products and services (Morgan-Thomas & Veloutsou 2013). This study offers arguably one of the first conceptualizations and tests of a theoretical model of consumer acceptance of IT products in a brand extension context. By examining consumers' continuance purchase behavior toward new IT products introduced by firms that rely on brand extension strategies, this study extends literature on technology adoption into a relatively new area. In particular, we introduce a complementary brand perspective to current IS theoretical models (e.g., Bhattacharjee 2001) and thus achieve a better understanding of IS continuance behavior in consumer contexts.

## ***5.2 Practical Implications***

This study provides several important implications for brand managers and IT product manufacturers. In particular, brand managers should work to improve their brands' service quality, because it not only influences the formation of consumers' brand satisfaction but also convinces them to keep purchasing new products from other categories. For IT products that use the same technologies as their competitors, brand managers should endeavor to provide exceptional services to consumers and use this service as a differentiation strategy. For example, brand managers should ensure that all external communications (e.g., website enquires, social media posts and customer emails) can be processed in a timely fashion so that existing customers

perceive a high-level service quality. Moreover, brand managers can examine past consumer behavior through different methods (e.g., surveys and trial studies) and accumulate large volumes of reliable consumer data. Subsequently, brand managers can formulate effective marketing campaigns based on simulation and big data analysis and enhance brand and product visibility and quality. Marketing managers can improve consumers' perceptions of service quality by offering fast delivery, easy product returns and repair, and reliable and effective call center services.

Marketing managers may study competitors' products and services and try to identify their shortcomings that lead to customers' dissatisfaction. A specific technique that marketing managers can rely on is to automatically obtain online reviews about competitors' products and services through developing a web crawler. These online reviews are provided by consumers and are widely available, free or low cost, and easily accessible anywhere, anytime. These online reviews provide a rich source of data to understand the advantages and disadvantages of competitors' products and services, which lead to customers' satisfaction/dissatisfaction. Marketing managers may consider use some data mining techniques in the field of natural language processing (e.g., Latent Dirichlet Allocation or LDA) to extract the attributes of products and services from online reviews. These extracted attributes represent different aspects influencing customer satisfaction.

Manufacturers should enhance and communicate about both hedonic and utilitarian aspects of their products, because such features have direct impacts on consumers' subsequent purchases from the same brand and mediate the influence of post-consumption views related to previously purchased products on consumers' purchases of future products. When consumers are satisfied with their prior purchase, their positive perceptions could spill over to their expectations of the

hedonic and utilitarian aspects of the brand extension. For example, if a consumer is satisfied with a smartphone because its connections are always good, its camera takes high quality pictures, and it has some fun ringtones and exciting colors, offered only by this brand, they are likely to believe that the same brand can provide similar hedonic and utilitarian value through its brand extension products. Therefore, IT manufacturers must highlight these two aspects of their products on packages and other marketing communications; sales and service personnel also should be trained to convey these benefits to consumers consistently. IT manufacturers may obtain inspiration for their new products from crowdsourcing, which is a great way to generate innovative ideas from potential customers. In addition, IT manufacturers can also consider implementing Enterprise 2.0 coordination platforms (e.g., Yammer and Slack) in their companies and invite customers to actively participate in new product or service development through these Enterprise 2.0 platforms. By adapting the technologies and philosophies of individual-level Web 2.0 applications (e.g., Facebook, LinkedIn, and Twitter), Enterprise 2.0 platforms add value by enabling task-based communications and coordination across different departments and groups.

The significant impact of perceived fit on consumers' purchase intentions also indicates that companies need to demonstrate the strong fit between the parent brand and the new product categories. Brand managers might emphasize the technological skills and resources the company has and how these advantages can be adopted in subsequent brand extension products. These messages should be delivered through advertising, social media, and sales channels. By doing so, companies can build consumers' confidence in their future products. If consumers believe that the company's resources can be transformed readily to produce products in other categories, they can be more certain about what to expect from future purchases and thus are more likely to buy the brand extension products. For example, brand managers should have a deep understanding of

the target market now and in the future and ensure that brand-related elements (e.g., Web design, graphic design, and advertising slogans) match with further brand extensions.

### ***5.3 Limitations***

Our study is not without its limitations. The first concerns the generalizability of our findings. Our study was conducted in China, where Xiaomi leads the smartphone market; the findings may not apply to countries with more well-established marketing structures or consumer habits. We also cannot claim that our results hold equally in other brand contexts, because some well-established brands may have other, non-branded advantages, such as an extensive sales network. Moreover, the effects of the proposed factors on consumers' purchase intention toward the Xiaomi smartwatch may differ from other IT product manufacturers with different brand equity, brand awareness, brand preference, and unique technology advantages. For example, with respect to Apple, since it is a strong brand with significant positive brand equity and the iOS ecosystem, it is possible that Apple users will continue to purchase new Apple products even if they experience poor customer service and slow server responses, due to a preference for iOS. As a fourth limitation, our sample consists of consumers younger than 45 years, so the findings may not apply to brands whose customers are significantly older. Further research should test our proposed model in other product, brand, and market contexts.

## **6 Conclusions**

This research has sought to develop a brand extension model and address the questions about cross-category purchases of IT products from the same brand. To build our proposed model, we use the IS continuance model as a base and incorporate brand extension-related factors, such as perceived fit, perceived service quality, and brand satisfaction. The unique data set comes from real brand users, enabling us to assess their purchase intentions toward a newly released product.



These field data from existing Xiaomi customers, regarding their purchase intentions toward future Xiaomi products, provide empirical support for our extended model. Perceived usefulness continues to influence users' continuance intentions to buy new IT products from the same brand, but the newly added factors, such as perceived service quality of the brand, perceived fit of the parent brand, and brand satisfaction, also have strong effects on consumers' purchase decisions regarding brand extension products. Noteworthy contributions of this study also include the revelation of two mediators—utilitarian expectancy and hedonic expectancy—that offer additional explanations for the impact of post-consumption factors on purchase intentions toward impending brand extension products.

In summary, this study draws attention to substantive differences between general technology-level adoption and continuance purchases of a brand extension product. We theorize a brand extension model by integrating brand extension factors and underlying motivation constructs. Both the base IS continuance model and the extended model are validated and supported by real consumer data. In the future, we recommend that scholars conduct longitudinal research on brand extensions, with a particular focus on further testing of consumers' continuance purchase decisions regarding an IT brand in multiple waves of new product launches, as well as to capture complex, dynamic changes in individual perceptions (perceived usefulness, perceived service quality).

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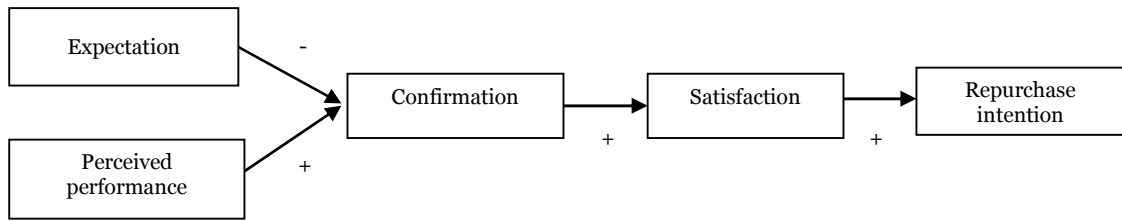
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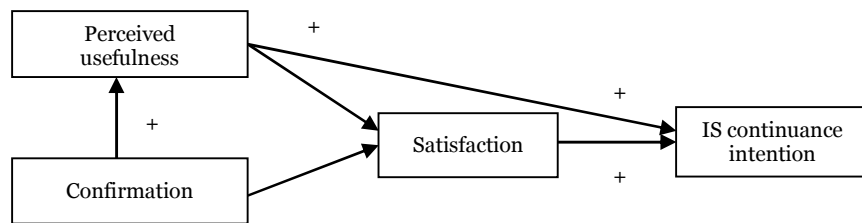
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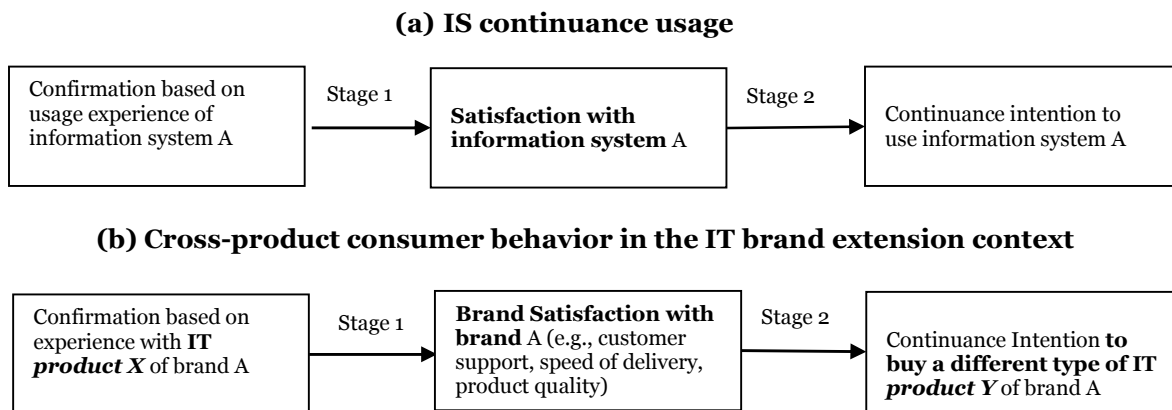
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**Figure 1. Expectation-Confirmation Theory (Oliver, 1980)**

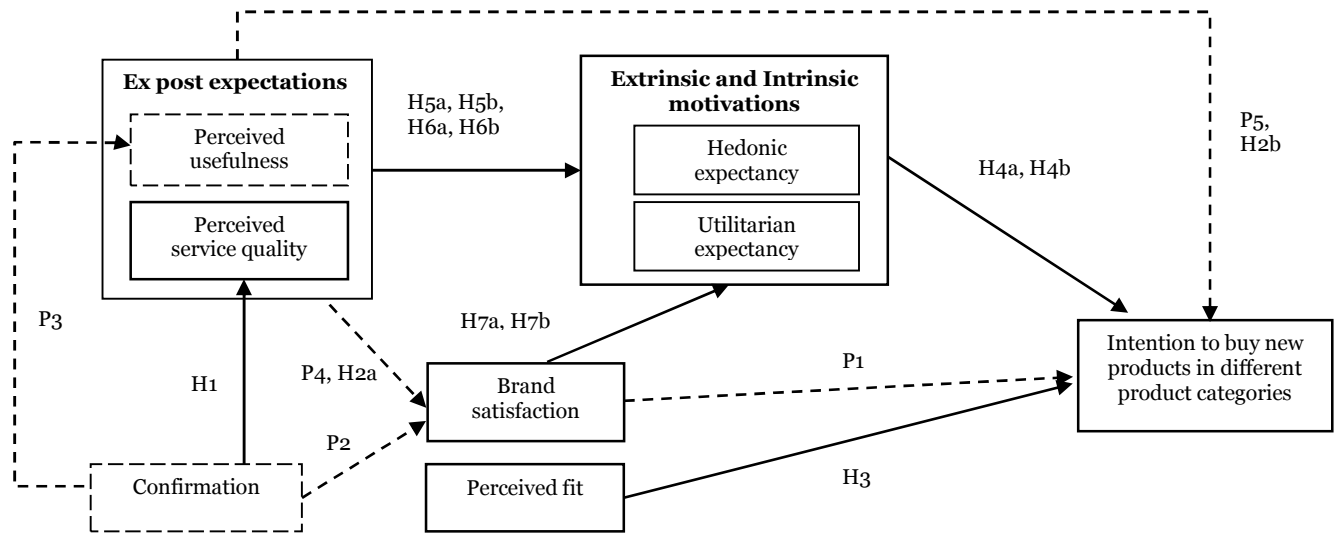


**Figure 2. Extended ECT model: IS continuance model (Bhattacharjee 2001)**



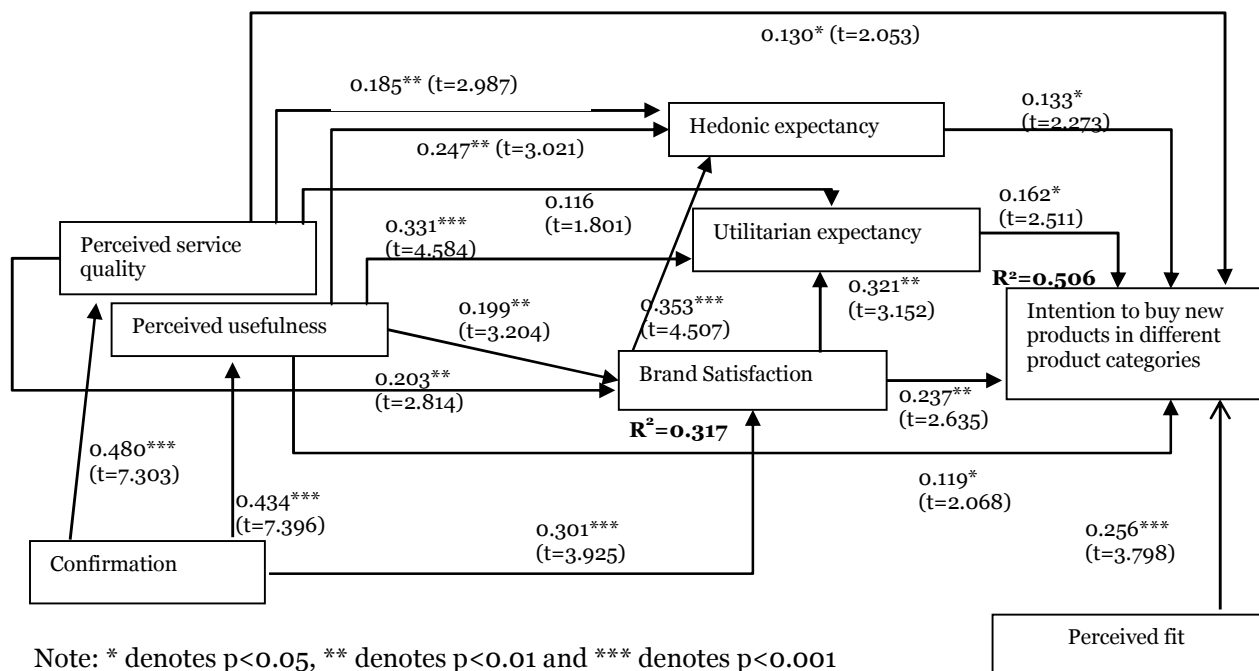
**Figure 3. A comparison between the IS continuance model and our research focus**





**Note:** 1) Dotted-line represents the constructs and relationships proposed in the IS continuance model.

**Figure 4. Brand Extension Model**



Note: \* denotes  $p < 0.05$ , \*\* denotes  $p < 0.01$  and \*\*\* denotes  $p < 0.001$

$R^2 = 0.189$  (Perceived usefulness);  $R^2 = 0.231$  (Service quality)

$R^2 = 0.342$  (Hedonic expectancy);  $R^2 = 0.312$  (Utilitarian expectancy)

**Figure 5. Research model with empirical results**

**Table 1. Convergent validity and reliability measurement**

Construct	AVE	Composite reliability	Cronbach's alpha
Purchase intention (PI)	0.853	0.946	0.914
Brand satisfaction (BS)	0.773	0.911	0.853
Hedonic expectancy (HE)	0.745	0.898	0.829
Utilitarian expectancy (UE)	0.791	0.919	0.868
Perceived usefulness (PU)	0.768	0.909	0.849
Service quality (SQ)	0.813	0.929	0.885
Confirmation (Con)	0.757	0.903	0.839
Perceive fit (PF)	0.739	0.895	0.824

**Table 2. Correlations of constructs (square root of AVE on diagonal)**

	BS	Con	HE	PF	PU	PI	SQ	UE
BS	<b>0.879</b>							
Con	0.485	<b>0.870</b>						
HE	0.491	0.382	<b>0.863</b>					
PF	0.210	0.219	0.288	<b>0.860</b>				
PU	0.417	0.434	0.455	0.190	<b>0.876</b>			
PI	0.533	0.459	0.520	0.439	0.462	<b>0.923</b>		
SQ	0.434	0.480	0.425	0.298	0.432	0.477	<b>0.901</b>	
UE	0.437	0.376	0.538	0.209	0.485	0.496	0.367	0.889

**Table 3. Loadings and cross-loadings**

	BS	Con	HE	PF	PU	PI	SQ	UE
BS1	<b>0.881</b>	0.436	0.450	0.186	0.345	0.475	0.364	0.400
BS2	<b>0.890</b>	0.479	0.398	0.202	0.388	0.489	0.396	0.395
BS3	<b>0.866</b>	0.360	0.449	0.164	0.368	0.441	0.384	0.356
Confirm1	0.438	<b>0.886</b>	0.319	0.212	0.358	0.409	0.421	0.325
Confirm2	0.378	<b>0.882</b>	0.291	0.156	0.403	0.358	0.446	0.293
Confirm3	0.450	<b>0.842</b>	0.388	0.204	0.373	0.433	0.387	0.365
HE1	0.397	0.335	<b>0.882</b>	0.243	0.392	0.502	0.356	0.454
HE2	0.450	0.355	<b>0.877</b>	0.256	0.378	0.417	0.359	0.461
HE3	0.425	0.300	<b>0.831</b>	0.248	0.409	0.426	0.386	0.479
PF1	0.137	0.193	0.206	<b>0.844</b>	0.141	0.338	0.222	0.142
PF2	0.181	0.190	0.224	<b>0.861</b>	0.180	0.361	0.234	0.160
PF3	0.214	0.184	0.303	<b>0.873</b>	0.167	0.425	0.304	0.227
PU1	0.385	0.351	0.428	0.156	<b>0.852</b>	0.395	0.362	0.397
PU2	0.375	0.389	0.378	0.161	<b>0.895</b>	0.427	0.377	0.452
PU3	0.337	0.402	0.391	0.183	<b>0.882</b>	0.392	0.396	0.425
PI1	0.490	0.431	0.504	0.424	0.424	<b>0.919</b>	0.439	0.472
PI2	0.522	0.421	0.489	0.397	0.412	<b>0.932</b>	0.435	0.453
PI3	0.464	0.420	0.447	0.396	0.445	<b>0.919</b>	0.446	0.449

SQ1	0.411	0.438	0.426	0.286	0.385	0.447	<b>0.895</b>	0.352
SQ2	0.391	0.420	0.379	0.267	0.387	0.438	<b>0.921</b>	0.337
SQ3	0.369	0.442	0.339	0.252	0.397	0.401	<b>0.888</b>	0.300
UE1	0.452	0.360	0.485	0.225	0.431	0.513	0.367	<b>0.904</b>
UE2	0.348	0.328	0.475	0.181	0.418	0.403	0.298	<b>0.889</b>
UE3	0.354	0.311	0.474	0.144	0.445	0.394	0.307	<b>0.874</b>

**Table 4. Heterotrait-monotrait ratio (HTMT)**

	BS	Con	HE	PF	PU	PI	SQ	UE
BS								
Con	0.572							
HE	0.585	0.458						
PF	0.246	0.264	0.344					
PU	0.490	0.515	0.543	0.226				
PI	0.603	0.525	0.596	0.501	0.525			
SQ	0.498	0.558	0.494	0.344	0.499	0.529		
UE	0.502	0.439	0.634	0.239	0.565	0.552	0.414	

**Table 5. Summary of the tests of mediating effects**

Total Effect of IV on DV		Direct Effect of IV on DV		Indirect Effects				
Coefficient	T value	Coefficient	t-value		Point Estimate	BC 95% Confidence Interval		
						Lower	Upper	
<b>Model 1: BS as the IV</b>								
0.349	6.941	0.243	4.867	Total	0.097	0.046	0.168	
				Mediators	UE	0.042	0.008	0.115
					HE	0.055	0.010	0.132
				Contrast	UE vs.	-0.013	-.0111	0.078
<b>Model 2: PU as the IV</b>								
0.219	4.469	0.119	2.363	Total	0.100	0.046	0.192	
				Mediators	UE	0.056	0.015	0.129
					HE	0.044	0.009	0.111
				Contrast	UE vs.	0.012	-0.061	0.096
<b>Model 3: SQ as the IV</b>								
0.235	4.755	0.182	3.771	Total	0.053	0.011	0.126	
				Mediators	UE	0.020	-0.001	0.070
					HE	0.033	0.005	0.090
				Contrast	UE vs.	-0.013	-0.066	0.037
IV: independent variable, DV: dependent variable, BC: Bias-Corrected Bootstrap BS: Brand satisfaction, SQ: Perceived service quality, PU: Perceived usefulness HE: Hedonic expectancy; UE: Utilitarian expectancy, PI: Purchase intention								

## APPENDIX A: MEASUREMENT ITEMS FOR RESEARCH MODEL

### 1) Constructs from the Base model: IS Continuance Model

Items	Operational Definition	Construct Items	Sources
Perceived usefulness	A Xiaomi user's perception of the expected use benefits of purchased Xiaomi products.	(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i> ) 1. I find Xiaomi products useful in my daily activities. 2. Using Xiaomi products enables me to accomplish tasks more quickly. 3. Using Xiaomi products increases my productivity. 4. Using Xiaomi products improves my job performance.	Davis 1989; Davis et al. 1989.
Purchasing intention	A Xiaomi user's intention to continue purchasing new Xiaomi products.	(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i> ) 1. I intend to buy a Xiaomi smartwatch in the future. 2. I predict that I would buy a Xiaomi smartwatch in the future. 3. I don't plan to buy a Xiaomi smartwatch in the future ( <b>Reverse coded</b> ).	Bhattacharjee 2001; Venkatesh and Goyal 2010.
Confirmation	A Xiaomi user's perception of the congruence between the expectation of Xiaomi products and their actual performance.	(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i> ) 1. My experience with using Xiaomi products was better than I expected. 2. The service level provided by Xiaomi was better than I expected. 3. Overall, most of my expectations from using Xiaomi were confirmed.	Bhattacharjee 2001; Venkatesh and Goyal 2010.

### 2) Constructs Modified or Added to the Extended Model: Brand Extension Model

Brand satisfaction	A Xiaomi user's feelings about prior Xiaomi products and services via first-hand experience.	<i>How do you feel about your overall experience with Xiaomi products and services to the present time:</i> Very dissatisfied (1) - Very satisfied (7) Very displeased (1) - Very pleased (7) Very frustrated (1) - Very contented (7)	Bhattacharjee 2001.
Perceived service quality	A Xiaomi user's evaluation of the intangible services associated with the transaction process (including prior / after sales enquiry	(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i> ) 1. I find that Xiaomi provides superior customer service. 2. I feel that Xiaomi delivers excellent service. 3. I would say that Xiaomi offers a high-	Brady and Cronin Jr 2001; Zeithaml 1988.

	services and delivery services).	quality service	
Perceived fit	A Xiaomi user's beliefs about whether the new, extended product is consistent or compatible with the parent brand.	<p>(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i>)</p> <ol style="list-style-type: none"> <li>1. I find that there is a global similarity between the parent brand (of the smartphone) and the extension product, Xiaomi smartwatch.</li> <li>2. People, facilities, and skills used in making the original product (smartphone) are helpful for Xiaomi to make the extension product, Xiaomi smartwatch.</li> <li>3. I feel that there is a match between the image of Xiaomi and the smartwatch extension product.</li> </ol>	Aaker and Keller 1990; Bottomley and Doyle 1996; Taylor and Bearden 2002.
Hedonic expectancy	A Xiaomi user's expectation that purchasing and using Xiaomi's new products can bring enjoyment, fun, or pleasure.	<p>(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i>)</p> <ol style="list-style-type: none"> <li>1. I expect that using a Xiaomi smartwatch would be enjoyable.</li> <li>2. I expect that using a Xiaomi smartwatch would be pleasant.</li> <li>3. I expect that using a Xiaomi smartwatch would be fun.</li> </ol>	Davis 1989; Venkatesh 1999; Venkatesh and Brown 2001.
Utilitarian expectancy	A Xiaomi user's expectation that the functions of Xiaomi's new products are useful for enhancing task performance or improving work efficiency.	<p>(1= <i>Strongly Disagree</i> to 7 = <i>Strongly Agree</i>)</p> <ol style="list-style-type: none"> <li>1. I expect that purchasing a Xiaomi smartwatch would be useful in my daily activities.</li> <li>2. I expect that purchasing a Xiaomi smartwatch would enable me to accomplish tasks more quickly.</li> <li>3. I expect that purchasing a Xiaomi smartwatch would increase my productivity.</li> </ol>	Venkatesh and Brown 2001; Venkatesh and Goyal 2010.

## APPENDIX B: RESULTS OF HYPOTHESIS TESTING

### 1) Base Model Testing: IS Continuance Model

	Scale Items	Path Coefficient (t-value)	Hypothesis Test Result	P-value
P1	Consumers' level of brand satisfaction is positively associated with their continuance intention to purchase a new IT product launched by the brand in a different category.	0.237 (t=2.635)	Supported	0.004
P2	The extent of consumers' confirmation is positively associated with brand satisfaction.	0.301 (t=3.925)	Supported	<0.001
P3	The extent of consumers' confirmation is positively associated with perceived usefulness.	0.434 (t=7.396)	Supported	<0.001
P4	Consumers' perceived usefulness is positively associated with brand satisfaction.	0.199 (t=3.204)	Supported	0.001
P5	Consumers' perceived usefulness is positively associated with their continuance intention to purchase a new IT product launched by the brand in a different category.	0.119 (t=2.068)	Supported	0.039

### 2) Extended Model Testing: Brand Extension Model

	Scale Items	Path Coefficient (t-value)	Hypothesis Test Result	P-value
H1	The extent of consumers' confirmation is positively associated with perceived service quality.	0.480 (t=7.303)	Supported	<0.001
H2a	Consumers' perceived service quality is positively associated with brand satisfaction.	0.203 (t=2.814)	Supported	0.006
H2b	Consumers' perceived service quality is positively associated with their continuance intention to purchase a new IT product launched by the brand in a different category.	0.130 (t=2.053)	Supported	0.041
H3	Consumers' perceived fit is positively associated with their continuance intention to purchase a new IT product launched by the brand in a different category.	0.256 (t=3.798)	Supported	<0.001
H4a	Hedonic expectancy of using a new IT product is positively associated with consumers' continuance intention to purchase the new product launched by the brand.	0.133 (t=2.273)	Supported	0.023
H4b	Utilitarian expectancy of using a new IT product is positively associated with consumers' continuance intention to purchase	0.162 (t=2.511)	Supported	0.012

	the new product launched by the brand.			
H5a	Consumers' perceived usefulness is positively associated with the hedonic expectancy of using a new IT product launched by the brand in a different category.	0.247 (t=3.021)	Supported	0.003
H5b	Consumers' perceived usefulness is positively associated with the utilitarian expectancy of using a new IT product launched by the brand in a different category.	0.331 (t=4.584)	Supported	<0.001
H6a	Consumers' perceived service quality is positively associated with the hedonic expectancy of using a new IT product launched by the brand in a different category.	0.185 (t=2.987)	Supported	0.003
H6b	Consumers' perceived service quality is positively associated with the utilitarian expectancy of using a new IT product launched by the brand in a different category.	0.116 (t=1.801)	Not supported	0.072
H7a	Consumers' level of brand satisfaction is positively associated with the hedonic expectancy of using a new IT product launched by the brand in a different category.	0.353 (t=4.507)	Supported	<0.001
H7b	Consumers' level of brand satisfaction is positively associated with the utilitarian expectancy of using a new IT product launched by the brand in a different category.	0.321(t=3.15 2)	Supported	0.002