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Consumer behaviour and disposition decisions: The why and how of smartphone disposition

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ABSTRACT

Although scholars describe consumer behaviour as a process of acquisition, consumption, and disposition, limited research is done on disposition decisions, especially in the context of emerging economies. This paper looks into the early work of Jacoby et al. (1977) and the recent seminal work of Cruz-Cardenaz and Arevalo-Chavez (2017) to determine the relationships between external influences and various disposition decisions on smartphones. In particular, it investigates the effect of brand, price, usefulness, compatibility, product attachment and social influence on three types of disposition decisions. A quantitative approach using a self-administered survey was appropriated. The questionnaire was distributed at the universities in Malaysia, and was subsequently collected from those sites with an acceptable response rate. Partial least squares structural equation modeling (PLS-SEM) was utilized to perform path modeling analysis. The results show that usefulness, product attachment, and compatibility have positive effects on students' decisions to keep their smartphones. While low product attachment and social influence affect them to dispose their smartphones temporarily, the depreciation of value causes them to discard smartphones permanently. Remarkably, brand and price have no significant impact on disposition decisions, indicating that the function of the smartphone, rather than the device itself, matters more in disposition decisions. The study thus provides more insights into consumer behaviour and its implications on sustainable consumption.

1. Introduction

Communication is ubiquitous in all walks of life. Evidently, smartphone has emerged as one of today's most widely used products. Smartphones provide communication services by carrying out several functions of computers and telephones (Thaichon et al., 2016). Consumers are changing from ordinary traditional mobile phones to smartphones not only in developed countries but also developing ones (Wong, 2011). According to the Ministry of Communication (2011) and Malaysian Communication and Multimedia Commission (2014), Malaysia, with 144% mobile penetration, outpaces Indonesia, Thailand, and even the United States. Observers expect this figure to further increase in the coming years, suggesting the high adoption and usage of smartphones in developing economies.

University students are the largest contributors to increasing smartphone sales (Jacob and Issac, 2008). With this technology, they surf the internet, check their email, and connect with peers on the go (Thaichon et al., 2016). In addition, Holley and Dobson (2008) acknowledge that the ever-increasing demands and changing technology dynamics in university environments mean a likely increase in blended learning methods. McKenzie et al. (2013) point out that blended learning models offer a number of benefits: by integrating technology with traditional face-to-face pedagogical methods, universities can meet economic challenges whilst managing student demands for increased flexibility. Hence, smartphones have a particularly big impact on students and institutions of higher learning (Jacob and Issac, 2008; The New Media Consortium, 2011), and it is no surprise that every student owns at least one device.

As electronic device usage has proliferated in recent years, consumers are also disposing of more electronic devices (including smartphones) than ever before (World Bank, 2004). Since 1980, consumers have discarded nearly 800 million cell phones (Susu, 2017). In 2012,

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the total electronic waste generated in Malaysia comprised approximately 10–15% of the total generated scheduled waste (Fatihah et al., 2014). Additionally, manufacturers and dealers of smartphones have also developed strategies to encourage frequent upgrades, feeding on consumers' conditioned responses and leading to over consumption and e-waste (Wilhelm, 2012). By inference, university students' disposed or discarded smartphones represent a significant portion of the total.

Understanding consumer behaviour in various aspects is an ongoing interest among researchers (Luarn and Lin, 2005; Nijssen et al., 2017; Premkumar and Rajan, 2017). Consumer behaviour can be largely divided into three main components: acquisition, consumption, and disposition (Raghavan, 2010). Researchers typically treat acquisition and consumption as the two most important aspects of consumer behaviour and therefore study these topics extensively (Nijssen et al., 2017; Premkumar and Rajan, 2017; Thaichon et al., 2014). Consequently, scholars focus less on the third aspect of consumer behaviour, namely disposition (Lastovicka and Fernandez, 2005; Paden and Stell, 2005; Price et al., 2000; Young and Wallendorf, 1989). As a result, little is known about why and how consumers dispose, especially in the context of developing economies. Specifically, when a smartphone is discarded, it is unclear which aspects of smartphone cause the consumer to make such decision (Al-Jumeily et al., 2014; Martinho et al., 2017). Therefore, the present study looks into smartphone users' disposition decisions, with a focus on university students who own at least a smartphone. The findings not only lead to practical implications for managers and marketers, but also provide a foundation for future research to extend the understanding of consumer disposition behaviour.

2. Literature review

2.1. Disposition behaviour

The study of consumer behaviour builds on various scientific paradigms emerging from the early 1960's (Assael, 1984; Nelson, 1970). Consumer behaviour refers to the buying patterns of an individual person or group of consumers, including spending units such as households or families (Glock and Nicosia, 1964; Mandel et al., 2017). Research in this area focuses on the factors that lead spending units to act as they do. Schiffman and Kanuk (2000), in turn, define consumer behaviour as the decision-making process of individuals when spending funds on items of consumption. However, according to Jacoby (1976), consumer behaviour is the acquisition, consumption, and disposition of goods, services, time and ideas by decision-making units. Accordingly, Engel et al. (1986) emphasize the internal cohesion of the decision-making process, defining it as the act of individuals involved directly in obtaining and using economic goods and services (including the decision processes that precede and determine these acts). Hence, consumer behaviour not only involves purchase or acquisition, but also consumption and even disposition (Al-Jumeily et al., 2014; Martinho et al., 2017).

Many studies of consumer behaviour focus predominantly on expanding and improving on existing theories pertaining to consumer acquisition and consumption (Nijssen et al., 2017; Premkumar and Rajan, 2017; Thaichon et al., 2014). Researchers consider acquisition and consumption as major contributing factors to purchase behaviour, and therefore treat them as marketing's core subjects (Arnould and Thompson, 2005). Recent research continues these trends (Premkumar and Rajan, 2017; Thaichon et al., 2014). The third aspect of consumer behaviour, disposition, receives far less attention and is even ignored. Jacoby, Berning and Dietvorst (1977) claimed disposition behaviour as an integral part of consumer behaviour. Accordingly, Hanson (1980) asserted that disposition behaviour has a strong impact on consumers' subsequent acquisition and consumption intentions. These studies highlight the relevance of disposition behaviour in understanding consumer behaviour and thus the need for further investigation to empirically demonstrate its importance.

2.2. Disposition decisions

Consumer disposition is an attempt by a consumer to get rid of an item that has outlived its intended purpose (Jacoby et al., 1977; Norum, 2017; Raghavan, 2010). Jacoby et al. (1977) provide a useful summary: consumers who want to dispose of a product can (1) keep the product, (2) temporarily get rid of the product, and (3) permanently get rid of the product.

Keeping the product suggests that consumers may continue to use the product for its intended purpose (or for a function other than its originally intended purpose). Consumers may also store the product for later personal use or for someone else who may need it (Agrawal et al., 2016). Getting rid of a product temporarily can involve renting or loaning the product to someone else (Philip et al., 2015). Although the consumer no longer possesses the product, they still own it. Getting rid of a product permanently involves a number of alternatives. For example, the consumer may abandon or discard the product. The former refers to socially unacceptable methods of disposal, such as littering, while the latter refers to socially acceptable disposition, such as using a trash can (Albinsson and Perera, 2009). Secondly, consumers may decide to recycle the product, breaking it down and reusing the ingredients to make something new (Agrawal et al., 2016). A third option is to sell the product directly to other consumers at a yard sale, or to an intermediary such as a pawn shop; this option involves a transference of ownership (Paden and Stell, 2005). Finally, consumers can give away the product, perhaps as a gift or a charitable donation; this option also requires a surrender of ownership (Jacoby et al., 1977).

2.3. Theoretical underpinning

The recent work of Cruz-Cardenaz & Arevalo-Chavez (2017) as well as the early work of Jacoby (1976) on consumer's disposition behaviour are adopted as the theoretical basis for the present study. Particularly, Cruz-Cardenaz & Arevalo-Chavez's (2017) seminal work assesses past 40 years of research on disposition of products and proposes a model that depicts how external influences and consumer's characteristics can affect consumer's disposition and post-disposition behaviours as shown in Fig. 1. Integrated with Jacoby (1976) work, six key external influences are selected to assess their respective relationship with three disposition decisions of smartphones, namely price, brand, compatibility, usefulness, social influence and product attachment. While price and brand of the smartphone are attributed to marketing influences, social influence is attributed to micro-environmental factors (Peter & Olson, 2005). Usefulness, compatibility and product attachment, in turn, are attributed to the product as a possession.

2.3.1. Price

Price is largely defined as the sum of money charged for a good or service, or the sum of values that consumers are willing to exchange for the benefit of using or owning a product (Graciola et al., 2018; Kim, 2019; Kotler and Armstrong, 2007). In other words, price is the perceived value of a good or service at the time of the transaction. Price can change rapidly (especially compared to features and channel commitments) (Thaichon et al., 2016), and has been consistently found to have influence on consumers' buying decisions (Ferris et al., 1988; Graciola et al., 2018; Godey et al., 2012; Lichtenstein et al., 1988; Thaichon et al., 2016).

In less developed countries, price is often the main factor influencing consumer's decision (Kim, 2019; Kotler and Armstrong, 2007). This corresponds to Gentry et al.'s (2001) findings which claim that consumers from developing countries appear to be more motivated by price when it comes to purchase intentions. More importantly, past studies have also shown that premature disposal frequency can be attributed towards price and quality consciousness (Lang et al., 2013; Bianchi and Birtwistle, 2010). Because a smartphone is arguably a combination of shopping and a specialty product that provides

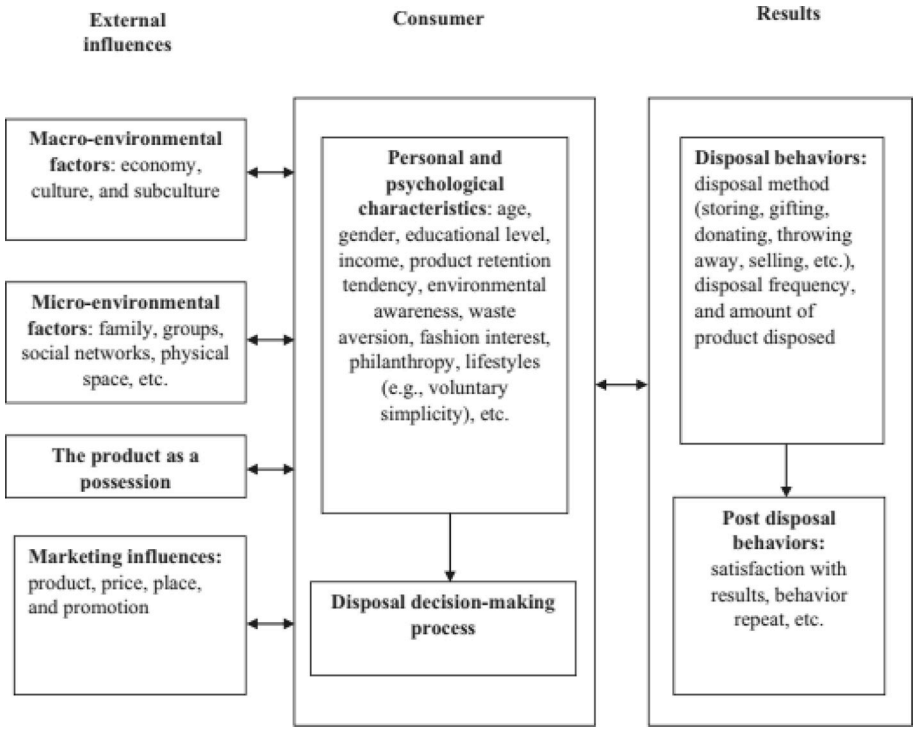

Fig. 1. Model of consumer behaviour on product disposal by Cruz-Cardenaz & Arevalo-Chavez (2017).

communication services, it is necessary to evaluate whether price has any effect on students' disposition decisions.

2.3.2. Brand

Brand represents what a good or service signifies to consumers (Massara et al., 2018; Keller, 1993). Brand is not merely a symbol plus a name; rather, brand involves a relationship between the organization and its customers (Coelho et al., 2018; Kotler and Armstrong, 2007). In addition, the brand name has a strong impact on consumers' perceptions of a product's quality (Azad and Safaei, 2012). When consumers search for, shop for, and consume products, they are generally exposed to utilitarian product attributes. However, they are also exposed to various brand-specific stimuli, such as brand-identifying colours (Gorn et al., 1997; Meyers and Peracchio, 1995), shapes (Veryzer and Hutchinson, 1998), typefaces, background design elements (Mandel and Johnson, 2002), slogans, mascots, and brand characters (Keller, 1987).

In any consideration the world of objects and people are always intertwined, especially when economy grows rapidly with the need to frequently replace objects. Past research has looked into brand from the sociological perspective where the expression of social status via the consumption of the brands is emphasized (Géhin, 1980) as well as from the economic perspective where the applicable price-fixing mechanism which depends on the object's utility value and its exclusiveness is highlighted (Coelho et al., 2018; Kessous et al., 2017). Interestingly, prior literature also posits that consumers from developing countries prefer brands that embody social status as it tends to have a higher perceived quality and symbolic value as opposed to products that do not associate with a favourable brand image (Lee et al., 2016; Sichtmann and Diamantopoulos, 2013). As such, brand is adopted in the study to assess its impact on students' disposition decisions of smartphones.

2.3.3. Compatibility

Compatibility, a characteristic of the product as a possession, is another important element of technological products like smartphones (Thaichon et al., 2016). Compatibility is related to perceived value, generally defined as consumers' overall assessment of the utility of a product based on their perception of what is received and what is given (Zeithaml, 1988). The assessment of what is received varies across consumers (i.e. some consumers want volume, others high quality and convenience). Likewise the assessment of what is given also varies (i.e. some consumers focus only on money spent, others on time and effort). Hence, understanding product compatibility in relation to perceived value provides an avenue for increasing value perceptions (Thaichon et al., 2016).

Given the magnitude of smartphone's compatibility, it explains why university students seek to own the latest models and are willing to pay high prices for them. It represents a trade-off between salient 'give' and 'get' components (Monroe, 1991). Students are found to not only use their smartphones for making phone calls, but also for many other purposes, such as taking photos and surfing the Internet. As such it is interesting to delve into students' disposition decisions of smartphones which were regarded compatible but lose its value gradually due to the launch of new models.

2.3.4. Usefulness

While compatibility concerns consumers' perception, product usefulness is another possession characteristic which is related to meeting their needs and expectations (Henard and Szymanski, 2001; Li et al., 2015; Sohn, 2017). Product usefulness are often referred to as the product's benefits, features, attributes, or utility functions (Gatignon and Xuereb, 1997; Hong et al., 2017; Renko and Druzijanic, 2014). Consumers often evaluate products based on their usefulness. When the products meet their expectations, it would naturally yield positive outcomes (Dodds and MonroeGrewal, 1991; Thaichon and Quach, 2015). As technological products lean heavily on the usefulness construct, and past studies have shown that usefulness is a significant predictor of technology adoption (Mathieson, 1991; Ramayah and Jaafar, 2008).

Given that product characteristics often differ in terms of utility functions, the quality of decision making can be complicated (Hong et al., 2017). Consumers who hesitate in making a purchase show that expected usefulness of the best alternative is one of the main reasons for

their purchase decisions, more so for advanced technological devices like smartphones. The widespread penetration of smartphones and access to high-speed Internet in developing economies nowadays have resulted in increasing purchase activities and materialistic tendencies (Sharma, 2011). While past studies have looked into purchase and adoption decisions, it is thus necessary to assess if the usefulness of smartphones also has an effect on disposition decisions among the students.

2.3.5. Social influence

Social influence, the micro-environmental factor posited by Cruz-Cardenaz & Arevalo-Chavez (2017), is about the change that an individual or a social factor causes in another individual. This change can include attitudes, thoughts, beliefs, feelings, and behaviour (Mason et al., 2007) and can be exerted by any significant others, such as family members and peers (Azjen, 1991). Social influence is often associated with making needed or unneeded purchases (Alexander and Ussher, 2012). Therefore it is conceivable that social influence can result in behavioural change (Hüttel et al., 2018). This is in line with prior literature documenting that consumers make purchase decisions due to social factors, such as to enhance social contacts or to communicate with others (Carter and Gilovich, 2014, Lastovicka and Anderson, 2014).

Ernest et al. (2010) found that acquisition decisions of Malaysian adults aged between 19 and 25 are heavily impacted by direct and vicarious role models (direct role models include parents; vicarious role models include artists and celebrities). On the same note, Young-Lee et al. (2013) postulate that one's disposition behaviour can be influenced by family members, particularly the parents (Joung & Park-poaps, 2013). Given the manner that communication technologies connect people and change the societal landscape, social influence is increasingly pivotal to understanding consumer behaviour. It is therefore imperative to investigate how social influence affects students' disposition decisions of smartphones.

2.3.6. Product attachment

Product attachment, which is related to the product as a possession, is described as the emotional bond that consumers develop towards an object, usually a specific product that has a significant meaning to the owner (Schifferstein and Zwartkruis-Pelgrim, 2008). Consumers who develop attachment to products tend to treat these products with care, are likely to send these products for repair if damaged, and prefer to postpone their replacement (Belk, 1991). In line with the material possession attachment theory (Kleine and Baker, 2004), it is well documented that when there is a strong emotional bond or attachment between the user and the object, the tendency to replace or discard the product will be minimal (Ball and Tasaki, 1992; Mugge et al., 2008).

Past studies have also suggested that consumers who are attached to an object will show certain behavioural signs, such as being protective and sticking to the same product (Haws et al., 2011). Interestingly, product attachment occurs irrespective of the length of ownership (Kleine and Baker, 2004), thus the idea of replacing or disposing an item creates repugnance. In light of the aforementioned, it is necessary to investigate the effect of smartphone attachment on disposition decisions as technological products tend to get upgraded or become obsolete after some time. It is relatively unclear whether students would feel less attached to their smartphones after acquiring a new one.

2.4. Hypothesis development

Based on the foregoing review, this study hypothesizes that brand, price, product compatibility, product usefulness, social influence, and product attachment each have significant effect on university students' decisions to keep smartphones as well as get rid of the smartphones temporarily and permanently. Fig. 2 illustrates the research framework of the current study.

Given the exploratory nature of the study and the lack of empirical findings with respect to disposition decisions towards smartphones, the current study uses non-directional hypotheses. Nevertheless, the direction of the supported hypotheses will be looked into so as to provide more detailed explanation. These hypotheses are formulated as follows:

H_1: Price, brand, compatibility, usefulness, social influence and product attachment will have significant effect on consumers' disposition decisions to keep their smartphones.

H_2: Price, brand, compatibility, usefulness, social influence and product attachment will have significant effect on consumers' disposition decisions to get rid of their smartphones temporarily.

H_3: Price, brand, compatibility, usefulness, social influence and product attachment will have significant effect on consumers' disposition decisions to get rid of their smartphones permanently.

3. Research methodology

This study adopted a quantitative approach rooted in a positivist paradigm. The target population was university students from both public and private tertiary institutions in Malaysia (with the exception of international students and part-time students). University students are selected because they have the ability to make decisions and are more likely to own more than one smartphone. In order to ensure that the sample characteristics match the objectives of the study, purposeful sampling technique was administerd to include only local full-time university students who own at least one smartphone each (Suri, 2011). Power analysis by means of G Power was used to determine the appropriate sample size for the study (Faul, 2009). G Power is an appropriate power analysis and sample size estimation tools when non-probability sampling technique is used. Accordingly, expecting a power of .90 and effect size of 0.15, a minimum sample size of 123 is required.

Apart from demographic details, the questionnaire contained statements pertaining to the nine variables under investigation as shown in Fig. 1. These variables were adapted from the earlier works (Cruz-Cardenaz & Arevalo-Chavez, 2017; Hanson, 1980; Jacoby et al., 1977) and they are measured by either single or multiple items. Recent advancement in methodological research suggests that single-item measures may be preferable in certain situations. The seminal work of Bergkvist and Rossiter (2007) on the use of single-item measures provides both theoretical and empirical justification for parsimonious measurement (Sarstedt et al., 2015). Hayduk and Littvay (2012), on the other hand, advocate the use of a few items as well as "best" items. They believe that "one or two indicators are often sufficient, but three indicators may occasionally helpful" (p.1). Rossiter (2002, 2011) argues for the legitimacy of single-item measures, provided that the object and attribute of a construct is concrete (Sarstedt et al., 2015). Given the concrete attributes of the dependent variables, this study used single-item measures to operationalize price, brand, compatibility, usefulness, and social influence. Therefore, the study used multiple-item measures to assess product attachment and disposition decisions. Finally, the study employed 7-point Likert scale to determine the level of agreement with each item (statement).

The study appropriated a self-administered questionnaire for data collection. The study also employed a pre-test to ensure that respondents understood the instructions and statements in the questionnaire. Two hundred copies of the questionnaire were sent to universities in Malaysia in late 2016, and a total of 172 copies were collected one month later. The response rate exceeds 70% assuring that non-response error is not a concern (Nulty, 2008). After a thorough data screening, 7 responses were removed due to serious data omission, resulting in only 165 useable responses. To assess common method variance, two ex post statistical remedies were executed, namely Harman single factor (Chang et al., 2010; Podsakoff et al., 2003) approach and Kock & Lynn (2012) full collinearity assessment. The results from Harman single factor revealed that the first component explains significantly less than 50 percent of the variance. As shown in Table 1,

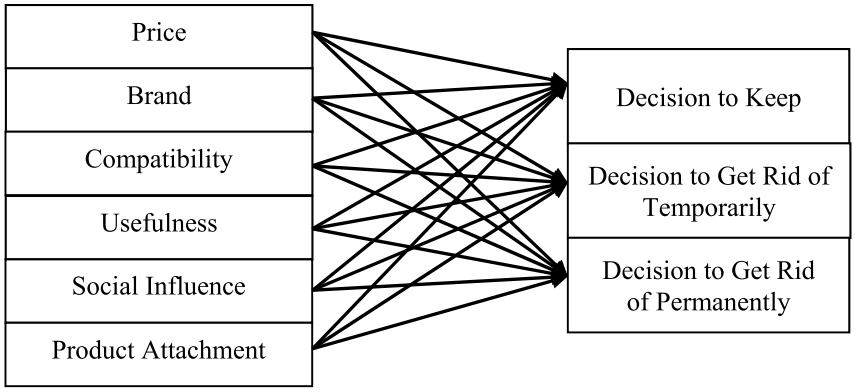

Fig. 2. Research framework.

Table 1
Full collinearity assessment.

Variable	Dummy Variable
Brand	2.533
Compatibility	3.476
Keep	1.125
Price	2.148
Product attachment	1.132
Get Rid of permanently	1.293
Get Rid of temporarily	1.344
Social influence	1.512
Usefulness	3.232

Kock & Lynn (2012) full collinearity assessment yielded a variance inflation factor (VIF) of less than 5 when a dummy variable was regressed against all the variables in the model (Kock & Lynn, 2012; Hair et al., 2017). All in all, these results suggest that common method variance is not an issue in the study.

A post hoc analysis was also conducted to assess the power adequacy of 165 sample size. Kock and Hadaya (2018) suggest two methods to estimate the minimum sample size required for PLS-SEM, namely the inverse square root and gamma-exponential methods. They advocate that power values vary based on sample size as well as path coefficient magnitude and power values increase when both sample size and path coefficient increase. Therefore, by inserting the largest path coefficient into the equation developed by Kock and Hadaya (2018), the minimum sample size required for the model with the power of .80 is 157 (inverse square root) and 143 (gamma-exponential methods). As such, a sample of 165 responses is deemed having adequate power for data analysis.

Variance-based structural equation modeling was adopted to perform latent variable analysis of the study. Partial least squares (PLS) approach is found to be more appropriate for exploratory study and maximizing variance explained (Hair et al., 2017). As such, SmartPLS 3.0 was utilized to perform measurement and structural model assessment (Ringle et al., 2015).

4. Findings

4.1. Demographic profile

Table 2 shows the demographic details of the study's 165 respondents. Not surprisingly, most university students in Malaysia own two or three smartphones. Despite having varied age-ranges, they are all full-time students. Those who are 26 years and above are mostly graduate students.

Table 2
Demographic profile.

Variable		*Count*	*Percentage*
Gender	Male	69	41.8
	Female	96	58.2
Age	18–20	23	13.9
	21–25	107	64.9
	26–30	19	11.5
	31 and above	16	9.7
Number of Smartphones Owned	1	26	15.8
	2	47	28.5
	3	51	30.9
	4	24	14.5
	5	9	5.5
	6 and above	7	4.2

4.2. Measurement model assessment

Measurement model is assessed by looking at construct reliability, convergent validity, and discriminant validity. RIDP4 is removed due to low loading and subsequently low average variance extracted (AVE) score. Table 3 show that all constructs demonstrate high internal consistency, as the composite reliability (CR) scores are higher than the threshold value of 0.7 (Nunally and Bernstein, 1994; Roldán and Sánchez-Franco, 2012). Morever, AVE scores greater than 0.50 indicate that the items loaded on the constructs explain more than 50% of the constructs' variances; thus convergent validity is established.

To assess discriminant validity, Heterotrait-Monotrait (HTMT) ratio

Table 3
Assessment of convergent validity.

Constructs	*Items*	*Loadings*	*AVE*	*CR*
Brand	BRD	Single Item	–	–
Compatibility	COM	Single Item	–	–
Price	PRC	Single Item	–	–
Product Attachment	ATT	Single Item	–	–
Social Influence	SNF	Single Item	–	–
Usefulness	USE	Single Item	–	–
Get Rid of	RIDP1	.594	.612	.861
Permanently	RIDP2	.898		
	RIDP3	.762		
	RIDP4	Removed		
	RIDP5	.841		
Get Rid of	RIDT1	.736	.689	.814
Temporarily	RIDT2	.914		
Keep	KEEP1	.728	.585	.808
	KEEP2	.768		
	KEEP3	.797		

Brand = BRD. Compatibility = COM. Price = PRC. Product Attachment = ATT. Social influence = SNF. Usefulness = USE. Get Rid of Permanently = RIDP. Get Rid of Temporarily = RIDT. Keep = KEEP.

Table 4
Assessment of discriminant validity.

	BRD	COM	RIDP	RIDT	KEEP	PRC	ATT	SNF	USE
BRD									
COM	.602								
RIDP	.199	.266							
RIDT	.188	.275	.798						
KEEP	.365	.607	.134	.419					
PRC	.697	.552	.263	.276	.374				
ATT	.265	.210	.090	.113	.433	.192			
SNF	.490	.382	.193	.283	.347	.344	.282		
USE	.558	.812	.192	.225	.624	.514	.209	.446	

Criteria: Discriminant validity is established at $HTMT_{.85}$.
Brand = BRD. Compatibility = COM. Price = PRC. Product Attachment = ATT. Social influence = SNF. Usefulness = USE. Get Rid of Permanently = RIDP. Get Rid of Temporarily = RIDT. Keep = KEEP.

(Henseler et al., 2015) is used and the results are presented in Table 4. The study confirms discriminant validity among the constructs at $HTMT_{.85}$, indicating that there is no multicollinearity issue between items loaded on different constructs in the outer model.

4.3. Assessment of structural model

Assessing the structural model permits the testing of hypotheses developed for this study. Prior to testing the hypotheses, it is crucial to ensure that there is no collinearity issue among the constructs under investigation. The variance inflation factor (VIF) values for each construct ranges from 1.114 to 3.312 as shown in Table 5. As these values are lower than the cut-off value of 5 (Hair et al., 2014), collinearity of the inner model is not a concern.

To test the study's hypotheses, a 5000 bootstrap re-sampling of the data is conducted (Hair et al., 2014). Table 6 depicts the assessment of path coefficients (relationships) or the effect of independent variables on dependent variables. The results indicate that the data partially support all three hypotheses. While compatibility, usefulness, and product attachment positively affect students' decision to keep a smartphone, social influence and low product attachment are significantly related to a consumer's decisions to getting rid of a smartphone temporarily. Moreover, low compatibility has an inverse effect on the decision to getting rid of a smartphone permanently. This means that university students are not likely to discard smartphones unless they believe the phones no longer carry value. Furthermore, even though many of them own more than two phones, they tend to keep them due to compatibility, usefulness, and product attachment. They might lend smartphones to their friends due to social influence even though the phones are still in good condition. An inverse relationship between product attachment and getting rid of a smartphone temporarily suggests that students might lend old smartphones to others when they find themselves more attached to new phones.

Table 7 shows the quality of the model. Specifically the effect size (f^2) is assessed to determine the substantive impact of the independent variables on the dependent variables. Cohen's (1988) threshold values of effect size are adopted, whereby 0.02, 0.15 and 0.35 represent small, medium and large effect sizes respectively. The results show that all path relationship carry small effect sizes though product attachment has more effect on the decision to keep the smartphone than other path relationships.

Overall, the independent variables explain 8 percent of the variances in decisions to permanently get rid of the smartphone, 11.4 percent in decisions to temporary get rid of the smartphone, and 35.2 percent in decisions to keep the smartphone. To assess if the independent variables have the predictive ability over the dependent variables, cross-validated redundancy approach using a blindfolding procedure with omission distance of 7 was performed. The predictive relevance values for all three dependent variables, namely RIDP (0.033), RIDT (0.046) and KEEP (0.167), are larger than 0, indicating that the independent variables are capable of predicting disposition decisions (Hair et al., 2014).

Brand = BRD. Compatibility = COM. Price = PRC. Product Attachment = ATT. Social influence = SNF. Usefulness = USE. Get Rid of Permanently = RIDP. Get Rid of Temporarily = RIDT. Keep = KEEP.

Table 5
Assessment of multi-collinearity.

	RIDP	RIDT	KEEP
BRD	2.511	2.511	2.511
COM	3.312	3.312	3.312
PRC	2.068	2.068	2.068
ATT	1.114	1.114	1.114
SNF	1.447	1.447	1.447
USE	3.173	3.173	3.173

Brand = BRD. Compatibility = COM. Price = PRC. Product Attachment = ATT. Social influence = SNF. Usefulness = USE. Get Rid of Permanently = RIDP. Get Rid of Temporarily = RIDT. Keep = KEEP.

Table 6
Assessment of path coefficients.

Path Relationship	*Beta*	*SD*	*t-value*
Price → Keep	.067	.130	.519
Price → Get Rid of Temporarily	.171	.122	1.398
Price → Get Rid of Permanently	.185	.121	1.526
Brand → Keep	-.129	.121	1.066
Brand → Get Rid of Temporarily	-.119	.136	.872
Brand → Get Rid of Permanently	-.092	.147	.623
Compatibility → Keep	.227	.127	1.792**
Compatibility → Get Rid of Temporarily	.180	.158	1.140
Compatibility → Get Rid of Permanently	-.254	.138	1.845**
Usefulness → Keep	.308	.115	2.675**
Usefulness → Get Rid of Temporarily	-.018	.181	.100
Usefulness → Get Rid of Permanently	-.137	.151	.911
Social Influence → Keep	.022	.077	.289
Social Influence → Get Rid of Temporarily	.199	.102	1.949**
Social Influence → Get Rid of Permanently	.125	.115	1.089
Prod. Attachment → Keep	.256	.076	3.353**
Prod. Attachment → Get Rid of Temporarily	-.181	.087	2.083**
Prod. Attachment → Get Rid of Permanently	.005	.089	.052

Note: **p < .05.
Brand = BRD. Compatibility = COM. Price = PRC. Product Attachment = ATT. Social influence = SNF. Usefulness = USE. Get Rid of Permanently = RIDP. Get Rid of Temporarily = RIDT. Keep = KEEP.

Table 7
Assessment of explanatory and predictive quality.

	R^2	Q^2	Effect size f^2			
				RIDP	RIDT	KEEP
RIDP	.088	.033	BRD	.004	.006	.010
RIDT	.114	.046	COM	**.021**	.011	**.024**
KEEP	.352	.167	PRC	.018	.016	.003
			ATT	.000	**.033**	**.091**
			SNF	.012	**.031**	.001
			USE	.007	.000	**.046**

5. Discussions

This paper seeks to identify the factors that influence university students' disposition decisions about smartphones in a developing country by referring to the early work of Jacoby et al. (1977) and the recent seminal work of Cruz-Cardenaz & Arevalo-Chavez (2017). Product attachment and compatibility found to be the most dominant factors influencing such disposition decisions. Reasonably, when

university students purchase, use, and repurchase smartphones, they place significant emphasis on compatibility. They believe in trends (Ting and de Run, 2015) and do not regard owning the latest smartphone as materialistic (Ting et al., 2015). The phones could be expensive, but they see value in owning them and using their many functions. Even though most students own more than one smartphone, they do not usually discard their phones permanently. As long as the phones are still compatible and useful in some ways, they tend to keep them unless they feel obliged to lend their phones to their friends in need. As a group, university students see sustainability efforts as alternative measures, especially when it comes to seeking responsible forms of consumption and disposition.

University students might also get rid of their smartphones temporarily when they find themselves to be less attached to the phones, most likely because they have a new phone with a better compatibility or functionality. This underscores the relevance of product attachment, not through the physical make-up of smartphones, but through the perceived value (compatibility and usefulness) of the phones. Most if not all students carry their smartphones throughout the day. Understandably many things can be done through their phones today, including their academic works and discussions. They appear to have a strong connection to their smartphones until the phones break or lose their compatibility.

Interestingly, the study finds that price and brand are not related to disposition decisions. For students, decisions to keep or get rid of their smartphones do not hinge on the brand name or the price they paid. Even though brands like Apple and Samsung are traditionally well-known, university students do not hesitate to purchase new smartphones regardless of the price and brand, and dispose of the existing ones. Again, these results underscore the notion that the physical product itself is not the main factor in students' disposition decisions. Instead, the value and service that the smartphone provides (or fails to provide) determine their disposition decisions. The study thus infers the importance of service quality in understanding students' disposition decisions – and their subsequent acquisition and consumption behaviours.

6. Implications

Although the current study adopts the earlier works on disposition behaviour, it challenges the theoretical generalizability of past models in a product and context-specific scenario. Despite the abundance of studies explaining the importance of price and brand in purchase behaviour, they are found to have no effect on students' disposition decisions towards smartphones in Malaysia. While the study affirms part of the work of Cruz-Cardenaz & Arevalo-Chavez (2017), it quantifies six key influences and thus extends the knowledge about their effect on disposition decisions in a structural model. Evidently, it reinforces the need for a more holistic understanding of consumer behaviour and sustainable consumption (Tseng et al., 2013; Vergragt et al., 2016; Yin et al., 2014).

The findings from the current study also offer practical value to the business practitioners. As consumers demand increasing service quality and performance, understanding consumer behaviour – especially the often-overlooked area of disposition decisions – can give the marketers and managers an edge. When consumers purchase a product for the second time, they have not necessarily discarded their original purchase. For instance, university students buy new smartphones even though their current ones are still compatible and useful. As such, it is important for smartphone sellers and service providers to develop comprehensive plans to facilitate the disposition process and incorporate this phase in targeting and marketing strategies. Doing so will lead to more customer retention and transform customers' disposition decisions into repurchase intentions and behaviour.

7. Limitations and directions of future studies

Notwithstanding an exploratory study with specific objectives, it is limited in several aspects. Firstly, the sample of students was assumed homogenous, thus disregarding the potential differences among students with different personal and psychological characteristics. Secondly, having university students as the target population only will likely compromise the generalizability of the findings to the wider populations and other important segments. Thirdly, the study adopted cross-sectional design and does not measure actual behaviour as well as behavioural change when disposing the smartphones. In light of the aforementioned, future investigations on disposition decisions should take observed and unobserved heterogeneity into consideration. Performing permutation and multi-group analysis using demographic factors, such as gender and social status, could potentially divulge more insights into the phenomenon. Moreover, comparing disposition decisions across different population segments and incorporating psychological or situational factors as moderators in the structural model could also provide more theoretical and practical explanation to the subject matter. It would also be interesting to conduct longitudinal study or experiment on disposition decisions so as to yield results which are more practically meaningful to business practitioners and other relevant stakeholders.

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