

DOES THE GENERATION MATTER FOR MARKETING SMART DEVICES IN A DEVELOPING COUNTRY? 4AS MARKETING MIX MODEL EVIDENCE

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ABSTRACT

This paper investigates the application of 4As marketing mix model on the purchase behavior of different generations to buy smart devices as a new technology. This survey is conducted among different generations of adopters in one of the emerging markets, Malaysia. To forecast the future diffusion pattern of a new technology among different adaptors, it is absolutely valuable to model the diffusion process. Hence, the findings of this paper assist managers to forecast the future diffusion patterns in a rewarding rate. Results showed that acceptability of new technology is affecting the purchasing behavior of early adaptors. Besides, accessibility is influential on almost all adaptors except Generation X. Findings also show that Awareness of new technology is highly valued by almost all of the different members of adopters, whereas Affordability of new technologies affects limited groups of new technology adopters in emerging markets. Generation difference had the fully moderating effect on accessibility and affordability of innovators and early adopters of smart devices while other adopters were partially affected.

KEYWORDS: 4As Marketing Mix Model, Acceptability, Accessibility, Affordability, Awareness, Market Penetration, Smart Devices, Rogers Adoption Theory, Generation

INTRODUCTION

Nowadays, people throughout the world buy an increasing number of smart devices such as smartphones and tablets. The reason for this popularity is that these devices are capable to support multi-task activities, including connecting to the internet as well as providing updated information people may require. One indicator of the popularity of smartphone and tablets is the extent of web surfing by desktop devices as a traditional method on one hand, and by smart mobile devices on the other hand. Based on Monetate Q4 2013 Ecommerce Quarterly Report, customers who purchase online from well-known E-Commerce brands have used their smartphones and tablets during the last quarter of 2013 as twice as the same period a year before. This illustrates the overall website visiting share of almost 27% for smart mobile devices. In terms of ownership, statistical data in the US reveals that adults who possess smartphones and tablets account for 58% and 42%, respectively. (Pew Research Center's Internet & American Life Project, 2013).

However, according to Nielsen survey, the decision of purchasing a smartphone or tablet is affected by age and income of people. Overall, smartphone penetration is more among older people with a relatively higher income. Thus, American marketers have to take advantage of more effective methods to be successful in marketing smart devices among all ages of customers. (Nielsen.com, 2014)

Malaysia, as an emerging market, has shown a double rate for mobile utilization from one-tenth to one-fifth of population only between May 2012 to May 2013 (Pew Research Center's Internet & American Life Project, 2013). It is estimated that Smartphone ownership hit 60% of total population in Malaysia within two years. Although smart tablets have penetrated among only 9% of Malaysian society members, it is estimated that almost one-third of Malaysian will purchase a smart tablet within forthcoming future (Ecommerce.milo.com, 2014).

Although smart devices have gained a lot of popularity among Malaysian, consumers behavior toward this favorite new technology has a blur perspective for marketers and practitioners, because obtaining accurate and suitable data presenting the true view has so far been demanding and expensive. This problem becomes worse due to changing preference of users toward smart phones and tablets.

To solve this issue and to achieve the mentioned marketing penetration rates, it is necessary to know how smart devices penetrate among different ages and generations in Malaysia. Just like the marketing penetration rate dependency to age and income in US, understanding the diffusion rate of smartphones and tablets among different age groups and generations including baby boomers, generation X, and generation Y provides marketers with valuable details over their marketing campaigns strengths and shortcomings. The reason of paying attention to the generation is the fact that age and generation can be the first information which can be estimated about customers, even without opening the discussion with them. Even though generation consideration looks simple but effective, no study or empirical research came to the knowledge of author to fill this gap by utilizing a proper marketing mix framework.

Among all of the marketing mix frameworks such as 4Ps and 4Cs, this study utilizes 4As marketing mix model because this model is highly consumer-oriented which is well-suited for the current market conditions. Organizations are assisted by this model in figuring out whether their products or services are acceptable, affordable, and accessible. Also this model benefits businesses to check the level of customers' awareness about their products. Moreover, this model is an efficient evaluating tool for new-technology products adoption trends, but there is scarcity of research that scrutinizes how 4As affect market penetration of smart devices, especially in Malaysian context. Besides, "Diffusion of Innovation" theory defined by Rogers (1995) is used to investigate the market diffusion pattern of smart devices among different adopters.

Therefore, one of the main objectives of this paper is to survey suitability of 4As marketing mix framework for purchasing behavior of smart tablets and smart phones. This study also contributes to the marketing knowledge by exploring how different generations' behavioral patterns vary in terms of adopting smart devices as an innovative product.

RESEARCH BACKGROUND

Diffusion of Innovations

Marketers can track the suitability of a marketing framework for innovative products through a theory called "Diffusion of Innovations". This theory discusses the processes involved in distributing a new idea or an innovative technology among members of a community. Research over the diffusion concept has been performed by some researchers.

Gabriel Tarde was the first researcher who investigated diffusion notion over the last decades of 19th century (Kinnunen, J. 1996). Then, H. Earl Pemberton (Valente, T.; Rogers, E. 1995) offered organizational diffusion cases like postage stamps, but a comprehensive survey on more than 500 diffusion cases by Everett Rogers (1962) led to “Diffusion of Innovation” theory which is true for adoption processes among people as well as organizations. According to Rogers’ theory, different groups of new technology adopters are Innovators, Early Adopters, Early Majority, Late Majority, and Laggards.

As defined, Innovators are the risk-lover technology adopters who are rich and have a high level of social status and network. Early Adopters are known as the opinion-oriented adopters with the position of high educational background as well as financial liquidity. This group welcomes new technology to improve their social communications and interactions. Early Majority group does not adopt new technologies as fast as the other two groups, and there is usually a long time lag in their adoption. However, they have higher than average social status and they are willing to socialize with Early Adopters. On the contrary of Innovators and Early Adopters, Late Majority possesses limited financial resources and low social status that looks suspiciously to the new technologies benefits. Laggards are the ones who are deeply loyal to the traditions and this group shows a great deal of resistance to new devices or technologies. The members of this group have the least levels of financial position, social status, and communicational networks (Rogers 1962).

Generation

Generation is the generally defined as having offspring. According to the definition of Pilcher (1994), generation is "people within a delineated population who experience the same significant events within a given period of time". Generation is classified into different categories; however, this study uses western world classification which can generally be used for other nations as well.

The first class used in this research is called “baby boomers” who were born from 1943 up to the early 1960s. One of the features of Boomers was that they tended to think of themselves as a special generation, very different from those that had come before them. In the 1960s, as the relatively large numbers of young people became teenagers and young adults, they, and those around them, created a very specific rhetoric around their cohort, and the change they were bringing about (Owram, 1997). The second is called Generation X with the birth dates from the early 1960s to the early 1980s (William Strauss and Neil Howe, 1991). The third and last class under scrutiny in this study is called Millennials, also known as the Millennial Generation, or Generation Y (Horovitz, 2012). Generation Y is the demographic cohort who were born from the early 1980s to the early 2000s.

Although western world generation classification includes more classes, only baby boomers, Generation X, and Generation Y are considered in this study. This is because these classes are able to choose and pay for the smart devices whereas other classes either have died or too young or early to purchase smart devices by themselves.

4As of Marketing Mix Framework

American Marketing Association defined marketing as the processes of establishing and delivering offers which are considered valuable for customers (Ama.org, 2014). Marketers take advantage of different marketing frameworks for their marketing campaigns to create value for customers. Marketing mix framework was first proposed by Culliton (1948). Then, Borden (1964) believed that business processes will be profitable if marketing mix components, which are twelve controllable variables, are properly observed. McCarthy (1964) derived 4P

framework from Borden's framework. 4Ps refer to Product, Price, Promotion and Place. A summary of marketing mix frameworks evolution is given in Table 1.

In 1981, 7Ps framework in service industry was defined, having the addition of three more Ps including Participants (employees and customers), Physical evidence (exterior and interior environmental conditions), and Process (stages of service delivery to customers).

Since consumers increased information was changing the marketing strategy from push base to pull based, the need for a more consumer centered marketing framework arose. This was when 4Cs model was discussed by Schullz, Tannenbaum, and Lauterborn (1993) to lead the manufacturers focus on customers' needs and wants. As it is clear in table 1, each P in 4Ps model is replaced by a more consumer centric C in 4Cs marketing mix framework. Regarding the meaning of first element in 4Cs model, "Consumer Solution" means the way that consumers are satisfied and this is stated as Product in 4Ps. "Cost" (instead of Price) means consumers weigh up the amount of money that they are willing to pay for a specific product or service and they do not mind the production cost pricing. "Communication" is the term stated as Promotion in 4Ps. Companies can communicate with their customers by using a number of channels such as public relations, advertisement, personal selling and so on. With the advent of the Internet and different virtual purchasing methods, Place cannot be a tool in marketing mix. Therefore, companies must consider "Convenience" of buying because current customers are able to easily shift to a more convenient purchase solution.

In 2005, 4Ps model was replaced by SIVA framework as a customer oriented marketing mix model (Dev and Schultz, 2005). SIVA stands for Solution, Information, Value, and Access, which were substitutes for the words used for Product, Promotion, Price, and Place in 4Ps framework, respectively.

Even though the above mentioned marketing frameworks tried to open up the market, a more consumer driven model was lacking on the grounds that products' life cycles were shortening gradually. In these situations, manufacturers had no choice to discover consumers' interests so as to gain more profit within a short period of time. Thereafter, Sheth and Sisodia (2011) introduced 4As marketing mix model with a high concentration on customers required criteria. This model states that companies will accomplish in their marketing campaigns if they successfully fulfill four key roles played by customers. These roles are "Acceptability, Affordability, Accessibility and Awareness". In other words, 4As marketing mix model means that customers will pay for a product or service when they are aware of it, accept it to be useful, are able to pay the cost of it, and have access to it. Accordingly, 4As is a comprehensive marketing mix model with a strong orientation toward customers' expectations. Therefore, this study aims to identify the relationship between each element of 4As (Acceptability, Affordability, Accessibility and Awareness) and different smart devices adopters (Innovators, Early Adaptors, Early Majority, Late Majority, and Laggards).

Awareness

It is a fact that consumers' knowledge of product has direct relationship with their further evaluation power and product diffusion pace (Hirschman, 1981) (Dickerson & Gentry, 1983). However, when consumers do not have necessary knowledge about new innovations, they are either incapable or reluctant to analyze the information related to new products. The difference between the two groups of individuals with high and low level of knowledge is the level of risk perceived by them. While the former tends to try new innovations because of their awareness of the product, the latter refrains to do so due to high level of perceived risk resulting from lack of knowledge. To support, it is proposed in the study of Tichenor

et al. (1970) that consumers with high awareness are more motivated by mass media advertisement to purchase the new innovations rather than the ones lacking necessary knowledge. It is important to know that the adoption lagging groups, such as late majorities and laggards, will adopt the new technology if they become aware enough. Therefore, the following hypothesis can be driven:

- **H1:** Awareness significantly influences Innovators, Early adaptors, Early Majority, Late Majority, and Laggards to purchase smart devices.
- **H2:** Generation significantly moderates the effect of Awareness on smart devices purchasing behavior of different adopters.

Acceptability

As discussed, customers have different levels of perceived risk. Specifically, the higher the risk tendency of customers toward a new innovation, the higher will be the innovation acceptance. New innovation acceptance plays a key role in diffusion process of new innovations. To illustrate, assume the idle work to make better mousetraps when there is no mice around. It is supported by a group of marketers that targeting innovators and early adopters are adequate for new innovations diffusion, though these groups statistically comprise of 2-3% of total adopters who are only social deviant ones. (Sheth, 1981). Contrary to its significance, acceptance patterns of new innovations among different groups of adopters have rarely been scrutinized (Lancaster & Taylor, 1986). However, the following hypothesis is driven with regards to the common sense:

- **H3:** Acceptability significantly influences Innovators and Early Adaptors, Early Majority, Late Majority, and Laggards to purchase smart devices.
- **H4:** Generation significantly moderates the effect of Acceptability on smart devices purchasing behavior of different adopters.

Affordability

It is generally accepted that price places a key role in purchasing new products (Jerome McCarthy, 1964) Since buyers evaluate their purchasing capacity to satisfy their needs and wants, affordability of the consumers play a major rule for the diffusion of a new innovation. Therefore, it is hypothesized that affordability significantly affects purchasing behavior of all adopters:

- **H5:** Affordability significantly influences Innovators, Early adaptors, Early Majority, Late Majority, and Laggards to purchase smart devices.
- **H6:** Generation significantly moderates the effect of Affordability on smart devices purchasing behavior of different adopters.

Accessibility

Since a limited number of literatures have been conducted on the effect of Place in 4Ps marketing mix model on purchase of new products (Kotler, et al., 2005; Boyle, 2009), it can be hypothesized that:

- **H7:** Accessibility significantly influences Innovators, Early adaptors, Early Majority, Late Majority, and Laggards to purchase smart devices.

- **H8:** Generation significantly moderates the effect of Accessibility on smart devices purchasing behavior of different adopters.

RESEARCH METHODOLOGY

This research is conducted by gathering primary data through questionnaire distribution among the sample population. Since all the dependent and independent variables are made up of different components, Structural Equation Modeling (SEM) is used to produce precise, valid, and reliable results.

Five point likert-type questionnaires are provided for respondents to gain the data. This data included the details of their demographic information, smart tablets and smartphones marketing diffusion effectiveness (acceptability, accessibility, awareness, affordability), and personal characteristics classification of respondents based on Rogers' theory for adoption of new technology (innovators, early adopters, early majority, late majority, laggards).

To have a broad view of the buying behavior, 400 individuals having different ages, occupations and educational backgrounds are randomly selected as a sample of the Malaysian society. Sampling method used in this paper is SRS (simple random sampling).

Surveying the moderating effect of generations on the smart devices market penetration is conducted by the use of Structural Equation Modeling (SEM) using Analysis of Moment Structures (AMOS) version 21. The results of the analysis are provided in the following.

RESULTS AND DISCUSSIONS

Convergent and Discriminant Validity

By having a glimpse over the findings of this study, Composite Reliability (CR) is between 0.734 to 0.876. In addition, in this study, AVE is around above 0.5 (Table 2). Thus, the results prove that convergent validity (AVE) and Composite Reliability (CR) exist for the constructs of this study.

Discriminant validity was tested by examining the squared root AVE for each construct against correlations (shared variance) between the construct and all other constructs in the model. A construct will have adequate discriminant validity if the squared root AVE exceeds the squared correlation among the constructs (Fornell & Larcker, 1981; Hair, Black, Babin, & RolphE, 2006).

Path Analysis

Path Analysis for Acceptability

According to the results for Y generation, acceptability had a significant and positive effect on only Early Adaptor for market diffusion of new smart devices, considering a cutting p-value of 0.001 ($B= 0.560, p<0.05$) while the other Rogers adaptors' classification did not show a significant effect by acceptability. Analysis illustrated same results among Baby boomers with only Early Adaptors having significant and positive response by acceptability level with P-value of 0.024 ($B= 0.326, p<0.05$) while leaving other new innovation adopters unaffected. Early adopters and early majority among X generation showed a significant and positive effect of acceptability level for market diffusion of new smart devices, considering a cutting p-values of 0.017 and 0.032 and B values of 0.406 and 0.259, while the other Rogers adaptors' classification did not have any significant effect by acceptability among X generation. (Table 4). Therefore, the second hypothesis is partly accepted for the effect of acceptability on only Early Adaptors, but not on other

adaptors, among all generations.

Table 5 shows the result of moderating effect of three different generations including Y, X and baby boomers on the relationship between acceptability and different group of smart devices adopters in Malaysia. According to these results, generation did not moderate the relation between innovators, early majority, and late majority and acceptability. However, the relationship between early adaptors and acceptability was moderated significantly by generation due to the significant difference between generations Y and baby boomers ($t= 2.052$, $p = 0.041$) while this relationship was not significantly different between generations Y and X ($t= 1.263$, $p = 0.207$) and X and baby boomers ($t= 0.419$, $p = 0.676$). In addition, the relationship between laggards and acceptability was moderated significantly by generation due to the significant difference between generations Y and X ($t= 2.115$, $p = 0.035$), while this relationship was not significantly different between generations Y and baby boomers ($t= -0.2103$, $p = 0.834$) and X and baby boomers ($t= -1.205$, $p = 0.229$)

Path Analysis for Accessibility

According to the results for Y generation all of the groups of respondents had a significant and positive response to accessibility level for market diffusion of new smart devices, considering a cutting p-value of 0.001 ($p < 0.05$). Analysis illustrated the opposite results among X generation having no group showing significant effect of accessibility level with P-value below 0.05. For Baby Boomers analysis revealed that Innovators, Early Adaptors and Laggards had significant and negative effects of accessibility level for market diffusion of new smart devices, considering a cutting p-value of 0.05 ($B < 0$, $p < 0.05$), while this relationship is significant and positive for Late Majority ($B=0.887$, $p < 0.05$). Among Baby Boomers, Early Majority group was the only group which did not have any significant relationship with accessibility effect on purchasing new smart devices ($B=0.096$, $p < 0.05$). (Table 6). Consequently, it can be derived that the fourth hypothesis is accepted partly for the effect of accessibility of new smart devices among almost all of the adopters in generations Y and Baby Boomers, but none of the adopters in generation X. The results for the effect of accessibility on new innovation adoption are consistent with the previous literatures.

Table 7 shows the result of moderating effect of three different generations including Y, X and baby boomers on the relationship between accessibility and different group of smart devices adopters in Malaysia. According to these results, generation moderated the relation between innovators, and accessibility due to the significant difference between generations Y and X ($t= 3.968$, $p = 0.000$), Y and baby boomers ($t= 3.784$, $p = 0.000$), and X and baby boomers ($t= 2.470$, $p = 0.014$). In addition, the relationship between early adopters and accessibility was moderated significantly by generation due to the significant difference between generations Y and baby boomers ($t= 4.494$, $p = 0.000$) and X and baby boomers ($t= 3.174$, $p = 0.002$), while this relationship was not significantly different between generations Y and X ($t= 0.959$, $p = 0.338$). Moreover, the relationship between early majority and accessibility was moderated significantly by generation due to the significant difference between generations Y and X ($t= 5.261$, $p = 0.000$), while this relationship was not significantly different between generations Y and baby boomers ($t= 1.172$, $p = 0.242$), and X and baby boomers ($t= -1.168$, $p = 0.244$). The results also illustrate that the relationship between late majority and accessibility was moderated significantly by generation due to the significant difference between generations Y and X ($t= 2.497$, $p = 0.013$), and X and baby boomers ($t= -2.11$, $p = 0.035$), whereas this relationship was not significantly different between generations Y and baby boomers ($t= -1.204$, $p = 0.229$).

Besides, the relationship between laggards and accessibility was moderated significantly by generation due to the significant difference between generations Y and baby boomers ($t= 3.799$, $p = 0.000$) and X and baby boomers

($t= 3.250$, $p = 0.001$), while this relationship was not significantly different between generations Y and X ($t= 1.212$, $p = 0.226$).

Path Analysis for Awareness

According to the results for Baby Boomers, all of the groups of respondents had a significant and positive effect by awareness level for market diffusion of new smart devices, considering a cutting p-value of 0.001 ($p < 0.05$). For both generations X and Y, analysis showed that Innovators, Early Adopters and Early Majority had significant and positive effects by awareness level for market diffusion of new smart devices, considering a cutting p-value of 0.05 ($B > 0$, $p < 0.05$), while this relationship is not significant for Late Majority and Laggards with X and Y generations ($p < 0.05$) (Table 8). As a result, it is illustrated that the first hypothesis is accepted partly for the effect of awareness of new smart devices among all of the adopters in all three generations, except Late Majority and Laggards in generations X and Y. The results for the effect of awareness on new innovation adoption are consistent with the previous literatures. (Bellizzi et al., 1981; Prendergast & Marr, 1997).

Table 9 shows the result of moderating effect of three different generations including Y, X and baby boomers on the relationship between awareness and different group of smart devices adopters in Malaysia. According to these results, generation moderated the relation between innovators and awareness due to the significant difference between generations Y and X ($t= -6.129$, $p = 0.000$), and Y and baby boomers ($t= -3.130$, $p = 0.002$), while this relationship was not significantly different between generations X and baby boomers ($t= 1.724$, $p = 0.085$). In addition, the relationship between early adopters and awareness was moderated significantly by generation due to the significant difference between generations Y and X ($t= -4.113$, $p = 0.000$), while this relationship was not significantly different between generations Y and baby boomers ($t= -1.743$, $p = 0.082$), and X and baby boomers ($t= 1.187$, $p = 0.236$). However, the relationship between early majority and awareness was not totally moderated by generation. But the results illustrate that the relationship between late majority and awareness was moderated significantly by generation due to the significant difference between generations Y and baby boomers ($t= 2.484$, $p = 0.013$), whereas this relationship was not significantly different between generations Y and X ($t= -0.142$, $p = 0.887$), and X and baby boomers ($t= -1.577$, $p = 0.116$). Besides, the relationship between laggards and awareness was moderated significantly by generation due to the significant difference between generations Y and baby boomers ($t= -5.616$, $p = 0.000$) and X and baby boomers ($t= -3.794$, $p = 0.001$), while this relationship was not significantly different between generations Y and X ($t= 0.656$, $p = 0.512$).

Path Analysis for Affordability

According to the results for Y generation only Early Majority had a significant and negative response from affordability level for market diffusion of new smart devices, considering a cutting p-value of 0.001 ($B= -0.162$, $p < 0.05$) while the other Rogers adopters' classification did not show a significant effect from acceptability. Analysis illustrated results among Baby Boomers with only Laggards having significant and positive effect from affordability level with P-value of 0.01 ($B= 0.815$, $p < 0.05$) while leaving other new innovation adopters unaffected. However, among X generation, no group showed significant effect of affordability level influence due to the P-value figures below 0.05 (Table 10). Thus, the third hypothesis is rejected because of the lack of effect of affordability of new smart devices among all of the adopters in all three generations, except the negative and significant effect of affordability on Early Majority adopters in generation Y and positive and significant effect of affordability on Laggards in Baby Boomers. The results for the effect of affordability of smart devices on their adoption are surprisingly not consistent with the previous literatures.

Table 11 shows the result of moderating effect of three different generations including Y, X and baby boomers on the relationship between affordability and different group of smart devices adopters in Malaysia. According to these results, generation did not moderate the relation between innovators and early majority and affordability among all generations. However, the relationship between early adopters and affordability was moderated significantly by generation due to the significant difference between generations Y and X ($t= 1.987$, $p = 0.048$), Y and baby boomers ($t= -4.243$, $p = 0.000$), and X and baby boomers ($t= -3.335$, $p = 0.001$). The results also suggest that the relationship between late majority and affordability was moderated significantly by generation due to the significant difference between generations X and baby boomers ($t= 2.020$, $p = 0.044$), whereas this relationship was not significantly different between generations Y and X ($t= -1.211$, $p = 0.227$), and Y and baby boomers ($t= 1.626$, $p = 0.105$). Besides, the relationship between laggards and affordability was moderated significantly by generation due to the significant difference between generations Y and baby boomers ($t= -4.193$, $p = 0.000$), and X and baby boomers ($t= -3.368$, $p = 0.001$), while this relationship was not significantly different between generations Y and X ($t= 0.258$, $p = 0.796$).

SUMMARY AND CONCLUSIONS

This paper aimed to investigate the relationship between 4As marketing mix model (Acceptability, Accessibility, Awareness, and Affordability) and adopters of new technology categorized as Innovators, Early Adaptors, Early Majority, Late Majority, and Laggards with different generations. By analyzing the data with SEM, interesting results were created.

Acceptability: Early adaptors in all three generations (Baby Boomers, X, and Y) purchased smart devices because of accepting the usefulness and applications of these new technologies in their life. Early Majorities in only X generation were also affected by acceptability of smart devices while all other groups of adopters in all generations were not influenced by new technology acceptance. Therefore, companies offering new technologies can take advantage of Early Adopters acceptance to increase their market share. This is possibly because of the fact that in Malaysia, the increasing numbers of people are accepting new technologies as a result of more effective marketing and advertising campaigns. This enables early adopters to process information with higher speed and makes their purchase decisions more efficiently. In addition, acceptability of smart devices was not mainly mediate by the generation difference of adopters.

Accessibility: All the adopters in Baby Boomers (except Early Majorities) and generation Y responded to accessibility of new smart phones and tablets since all the adopters including Innovators, Early Adaptors, Early Majority, Late Majority, and Laggards purchase smart devices as a result of having easy access to these products. On the contrary, none of adopters in X generation decided to buy smart devices when it is available and near to them. Thus, companies must provide accessible markets of new technologies for the senior citizens as well as teenagers so that they can effectively increase their market penetration strategy. The reason of this adoption patter as a result of accessibility may rely on Malaysian culture. As previous studies has illustrated, new technologies adoption rate is a function of cultural values (Herbig & Miller, 1993). That is why marketers are highly recommended to investigate the cultural values of the targeted market, such as Malaysia, to be able to implement a successful marketing strategy (Herbig & Kramer, 1993). Therefore, finding of this study, especially with respect to the accessibility effect on new technologies diffusion, is absolutely helpful for marketing practitioners who intent to diffuse effectively in a new immersing market, like Malaysia. As another conclusion for accessibility, generation difference affected the behavior of innovators.

In this regard, the accessibility has the highest effect generation Y to buy smart devices. Hence, managers are highly advised to consider the accessibility of the smart products to increase their sales among innovators. However, other adopters are partially affected by generation difference for accepting the smart devices.

Awareness: Innovators, Early Adaptors, and Early Majority respondents in both X and Y generations purchased smartphones and tablets because of being informed sufficiently through advertisements and/or integrated marketing communications, whereas Late Majority, and Laggards in generations X and Y were not influenced by being aware of smart devices. Awareness played an important role in purchasing new smart devices among Baby Boomers in all respondents' types (Innovators, Early Adaptors, Early Majority, Late Majority, and Laggards). That is why, based on the findings of this study, marketers are strongly advised to put a heavy weight on the advertising and promotional activities to attract customers since product awareness substantially increase consumers' purchases of new technologies. Once the customers are aware of the usefulness and facilities offered by new technologies, they can analyze the cost benefits of its adoption, motivating them to consider a substantial value for acquiring it. Generation difference has been partially influenced the awareness level of adopters, especially innovators and laggards. Thus, advertising and marketing campaigns seems to increase the sale of smart devices among generation Y and baby boomers of innovators as well as generation Y and X of laggards. This point highly assists managers to target the potential customers and efficiently perform market segmentation for their advertisement activities.

Affordability: Surprisingly, having affordable price for smartphones and tablets was only effective among Early Majorities in generation Y as well as Laggards in Baby Boomers. Other adopters did not purchase smart devices just because of being able to pay for them. This plays a key role for manufacturers of new technologies as they must consider that consumers consider other factors, such as acceptability and awareness, more than the price. Hence, companies can enjoy the existence of relative price inelasticity for new technologies, especially in emerging markets. The reason can be explained by the fact that companies provide a lot of purchasing plans, such as installment payments, for the buyers. Therefore, consumers have more eyes on the value that new technologies provide them rather than solely the price. Another support for the finding for affordability relies on the fact that Malaysian government has recently offered attractive incentives, such as RM 200 rebate for generation X with the average income below RM3000 per month to buy smartphones. Hence, new technologies diffusion rate is highly improved by government supports in Malaysia, and price is not playing a significant component for market diffusion rate in this context. Besides, affordability was moderated by all the generations in early adopters group. In this category of smart devices penetration, generation Y was the highest affected group, followed by generation X and at last baby boomers. Hence, marketers are advised to target early adopters' generation difference in their marketing campaigns with more details.

The findings of this study are quite useful for different parties to know the strengths and weaknesses of the market penetration for smart devices as a new technology among emerging markets members. Subsequently, marketing managers, academicians, and practitioners are facilitated to know the adopters groups which are influenced by 4As marketing mix framework. Moreover, those adopters who are not responding to 4As elements but have great potentials to become future customers are recognized. By the use of results of this study practitioners put their efforts to attract more customers while penetrating in the market more effectively for any other new technologies introduction. In addition, psychologists who are conducting research on the purchasing behaviors and focus on the decision making processes of buyers who are confronted with a new technology are able to use the findings of this study as a tool to shed more light for the variables that are

effective in their survey.

However, this study has some limitations. First, the number of sample may not be enough to provide absolutely reliable results. That is why future researches are advised to have more respondents.

Moreover, the lack of enough time and the high cost of collecting data are the limitations preventing this research from being accurate enough.

In the future, researchers are advised to do the same research on other industries with new technologies, including car industry, in the same or other emerging markets to check the significant factors which may enhance market penetration and development of the products.

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APPENDICES

Table 1: Summary of Marketing Mix Frameworks Evolution

Neil Borden (1964)	Jerome McCarthy (1964)	Booms & Bitner (1981)	Schullz, Tannenbaum & Lauterborn (1993)	Dev and Schultz (2005)	Sheth & Sisodia (2011)
Product Planning	Product	Product	Customer Solution	Solution	Acceptability
Pricing	Price	Price	Cost	Value	Affordability
Branding	Promotion	Promotion	Communication	Information	Awareness
Channels of Distribution	Place	Place	Convenience	Access	Accessibility
Personal Selling		Participants			
Advertising		Physical Evidence			
Promotions		Process			
Packaging					
Display					
Servicing					
Physical Handling					
Fact Finding and Analysis					

Table 2: The Result of Convergent Validity

	CR	AVE	MSV	ASV
Lag	0.734	0.50	0.140	0.061
Accept	0.876	0.640	0.248	0.083
Accessibility	0.737	0.501	0.289	0.161
Affordability	0.858	0.668	0.289	0.087
Awareness	0.794	0.574	0.570	0.183
EAdaptor	0.868	0.688	0.248	0.139
EMajor	0.811	0.589	0.570	0.215
Innovator	0.757	0.511	0.383	0.165
LMajor	0.736	0.50	0.272	0.128

Table 3: The Results of Discriminant Validity

	1	2	3	4	5	6	7	8	9
1.Laggards	0.693								
2.Acceptability	0.068	0.800							
3.Accessibility	0.232	0.266	0.699						
4.Affordability	0.255	0.116	0.538	0.817					
5.Awareness	0.139	0.224	0.412	0.333	0.758				
6.EAdaptor	0.357	0.498	0.298	0.130	0.304	0.829			
7.EMajority	0.232	0.313	0.405	0.238	0.755	0.490	0.767		
8.Innovator	0.161	0.276	0.419	0.248	0.577	0.451	0.619	0.715	
9.LMajority	0.374	0.318	0.522	0.291	0.339	0.312	0.393	0.240	0.702

Table 4: The Effects of Acceptability on Market Diffusion Classification for Different Generations

Generation	Path	B	S.E.	C.R.	P
Y	innovator <--- Acceptability	0.166	0.096	1.728	0.084
	EAdaptor <--- Acceptability	0.56	0.093	6.043**	<0.001
	EMajor <--- Acceptability	0.156	0.081	1.914	0.056
	LMajor <--- Acceptability	0.145	0.076	1.907	0.057
	Lag <--- Acceptability	0.096	0.074	1.293	0.196
X	innovator <--- Acceptability	0.219	0.119	1.842	0.065
	EAdaptor <--- Acceptability	0.406	0.17	2.397**	0.017
	EMajor <--- Acceptability	0.259	0.121	2.143**	0.032
	LMajor <--- Acceptability	0.237	0.135	1.762	0.078
	Lag <--- Acceptability	-0.112	0.156	-0.722	0.47
Baby Boomers	innovator <--- Acceptability	0.242	0.16	1.516	0.13
	EAdaptor <--- Acceptability	0.326	0.145	2.252**	0.024
	EMajor <--- Acceptability	0.091	0.125	0.729	0.466
	LMajor <--- Acceptability	0.059	0.118	0.497	0.619
	Lag <--- Acceptability	0.119	0.189	0.63	0.529

Table 5: Multi-Group Path Analysis for Acceptability based on Generation

Path	"B _v -B _x "		"B _y -B _B "		"B _x -B _b "	
	T Value	P Value	T Value	P Value	T Value	P Value
innovator<---Accept	-0.481	0.631	-0.625	0.532	-0.159	0.874
EAdaptor<---Accept	1.263	0.207	2.052*	0.041	0.419	0.676
EMajor<---Accept	-1.077	0.282	0.673	0.502	1.230	0.220
LMajor<---Accept	-0.976	0.330	0.956	0.340	1.195	0.233
Lag<---Accept	2.115*	0.035	-0.210	0.834	-1.205	0.229

Table 6: The Effects of Accessibility on Market Diffusion Classification for Different Generations

Generation	Path	B	S.E.	C.R.	P
Y	innovator <--- Accessibility	0.374	0.119	3.141**	0.002
	EAdaptor <--- Accessibility	0.302	0.084	3.572**	***
	EMajor <--- Accessibility	0.392	0.102	3.843**	***
	LMajor <--- Accessibility	0.53	0.108	4.886**	***
	Lag <--- Accessibility	0.346	0.096	3.607**	***
X	innovator <--- Accessibility	-0.148	0.112	-1.322	0.186
	EAdaptor <--- Accessibility	0.198	0.156	1.266	0.206
	EMajor <--- Accessibility	-0.213	0.114	-1.872	0.061
	LMajor <--- Accessibility	0.22	0.127	1.738	0.082
	Lag <--- Accessibility	0.203	0.148	1.367	0.172

Table 6: Contd.,

Baby Boomers	innovator	<---	Accessibility	-1.08	0.515	-2.099*	0.036
	EAdaptor	<---	Accessibility	-0.831	0.41	-2.025*	0.043
	EMajor	<---	Accessibility	0.096	0.388	0.247	0.805
	LMajor	<---	Accessibility	0.887	0.434	2.043*	0.041
	Lag	<---	Accessibility	-1.812	0.687	-2.639*	0.008

Table 7: Multi-Group Path Analysis for Accessibility Based on Generation

Path	"B _v -B _x "		"B _v -B _{BB} "		"B _x -B _{BB} "	
	T Value	P Value	T Value	P Value	T Value	P Value
innovator<---Accessibility	3.968*	0.000	3.784*	0.000	2.470*	0.014
EAdaptor<--- Accessibility	0.959	0.338	4.494*	0.000	3.174*	0.002
EMajor<--- Accessibility	5.261*	0.000	1.172	0.242	-1.168	0.244
LMajor<--- Accessibility	2.497*	0.013	-1.204	0.229	-2.115*	0.035
Lag<--- Accessibility	1.212	0.226	3.799*	0.000	3.250*	0.001

Table 8: The Effects of Awareness on Market Diffusion Classification for Different Generations

Generation	Path			B	S.E.	C.R.	P
Y	innovator	<---	Awareness	0.369	0.091	4.035	***
	EAdaptor	<---	Awareness	0.196	0.063	3.126	0.002
	EMajor	<---	Awareness	0.755	0.086	8.736	***
	LMajor	<---	Awareness	0.083	0.071	1.171	0.242
	Lag	<---	Awareness	-0.002	0.069	-0.026	0.979
X	innovator	<---	Awareness	1.032	0.131	7.898	***
	EAdaptor	<---	Awareness	0.554	0.155	3.565	***
	EMajor	<---	Awareness	0.894	0.136	6.564	***
	LMajor	<---	Awareness	0.095	0.115	0.829	0.407
	Lag	<---	Awareness	-0.06	0.139	-0.43	0.667
Baby Boomers	innovator	<---	Awareness	0.752	0.177	4.251	***
	EAdaptor	<---	Awareness	0.344	0.148	2.33	0.02
	EMajor	<---	Awareness	0.967	0.161	6.019	***
	LMajor	<---	Awareness	0.306	0.137	2.235	0.025
	Lag	<---	Awareness	0.638	0.212	3.013	0.003

Table 9: Multi-Group Path Analysis for Awareness based on Generation

Path	"B _v -B _x "		"B _v -B _{BB} "		"B _x -B _{BB} "	
	T Value	P Value	T Value	P Value	T Value	P Value
innovator<---Awareness	-6.129*	0.000	-3.130*	0.002	1.724	0.085
EAdaptor<--- Awareness	-4.113*	0.000	-1.743	0.082	1.187	0.236
EMajor<--- Awareness	-1.330	0.184	-1.894	0.059	-0.450	0.652
LMajor<--- Awareness	-0.142	0.887	-2.484*	0.013	-1.577	0.116
Lag<--- Awareness	0.656	0.512	-5.616*	0.000	-3.794*	0.000

Table 10: The Effects of Affordability on Market Diffusion Classification for Different Generations

Generation	path		B	S.E.	C.R.	P	
Y	innovator	<---	Affordability	0.004	0.084	0.048	0.961
	EAdaptor	<---	Affordability	-0.064	0.055	-1.174	0.241
	EMajor	<---	Affordability	-0.162	0.072	-2.259	0.024
	LMajor	<---	Affordability	-0.039	0.066	-0.584	0.559
	Lag	<---	Affordability	0.129	0.065	1.968	0.049
X	innovator	<---	Affordability	-0.094	0.084	-1.124	0.261
	EAdaptor	<---	Affordability	-0.201	0.118	-1.698	0.089
	EMajor	<---	Affordability	-0.012	0.084	-0.139	0.889
	LMajor	<---	Affordability	0.051	0.091	0.56	0.576
	Lag	<---	Affordability	0.109	0.111	0.979	0.327
Baby Boomers	innovator	<---	Affordability	0.065	0.239	0.271	0.787
	EAdaptor	<---	Affordability	0.278	0.16	1.734	0.083
	EMajor	<---	Affordability	-0.058	0.189	-0.306	0.759
	LMajor	<---	Affordability	-0.202	0.185	-1.093	0.274
	Lag	<---	Affordability	0.815	0.314	2.592	0.01

Table 11: Multi-Group Path Analysis for Affordability based on Generation

Path	"B _v -B _x "		"B _v -B _{BB} "		"B _x -B _{BB} "	
	T Value	P Value	T Value	P Value	T Value	P Value
innovator<---Affordability	1.076	0.283	-0.432	0.666	-1.126	0.261
EAdaptor<---Affordability	1.987*	0.048	-4.243*	0.000	-3.335*	0.001
EMajor<--- Affordability	-1.897	0.059	-0.965	0.335	0.384	0.701
LMajor<--- Affordability	-1.211	0.227	1.626	0.105	2.020*	0.044
Lag<--- Affordability	0.258	0.796	-4.193*	0.000	-3.368*	0.001

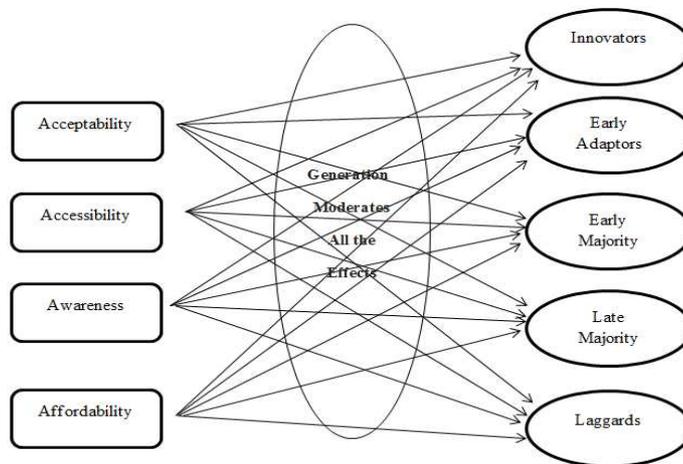


Figure 1: Conceptual Framework