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Long term evolution mobile services and intention to adopt: a Malaysian perspective

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Long term evolution mobile services and intention to adopt: a Malaysian perspective

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Given the swift diffusion of mobile internet and smartphones in Malaysia, long term evolution (LTE) mobile services seems to offer a tremendous business opportunity and current and future market potential. This paper examines the critical factors that may influence intention to adopt LTE. Drawing on the well-known technology acceptance model, the framework is extended by including other variables perceived as pertinent to LTE. The findings show that attitude is the most significant factor in predicting behavioral intentions toward LTE. Other factors include: perceived usefulness, perceived processing speed, personal innovativeness, and image and network effects. These findings offer an extension to Technology Adoption Model, describe LTE, and managerially can be utilized to formulate more effective promotion and pricing strategies.

**Keywords:** long term evolution; mobile services; adoption; TAM; Malaysia

Introduction

Long term evolution (LTE) is a recently introduced telecommunication standard for wireless mobile communication which offers an incomparably higher speed capability compared to the earlier 3G mobile network standard. It also offers an exponential increase in downlink and uplink peak data rate (Dahlman, Parkvall, Skold, & Beming, 2010; Govil, 2007; Smith, 2007) and thus seems to provide the solution to enhance overall user experience for high speed communication and provide opportunities to service providers to save cost, in terms of the more efficient use of radio networks. This, for example, can be seen as the stimulus for Korean users to move from 3G to LTE services with the number of LTE subscribers there exceeding four million in 2012 (Park & Kim, 2013). Recent statistics from International Data Corporation (IDC) indicates that global LTE mobile phone shipments are expected to reach a total of 129.1 million units by the end of 2014.

As with any rapid diffusion of products or services, there has been significant practitioner interest in the growth in LTE penetration and its popularity around the world. However, little research on user perceptions of LTE has been found. The latest data released by the Malaysian Communications and Multimedia Commission (MCMC) shows that there were 36,317 million mobile subscriptions in 2013, representing one of the highest penetration rates in the region at 124.4%. In 2010, a survey showed that Malaysian consumers bought 24% more smartphones than in 2009 accounting for RM4.5 billion on these communication devices (Chan, 2011). This data suggests there may be significant

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business opportunities for LTE mobile services attributable to the increasing affordability of smartphones with the latest technology.

Hence, the primary objective of this paper is to understand Malaysian consumer perceptions of LTE and identify influencing factors that underpin adoption, or intention to adopt. By investigating these factors, greater understanding can be obtained enabling service providers to further segmented marketing. In view of the perception that LTE may be still in an early adoption stage in Malaysia, this paper examines factors affecting user intention toward LTE using the Technology Adoption Model (TAM) as a guidance mechanism.

**Literature review and hypotheses**

In behavioral sciences, human adoption behavior is a primary research theme (Chen, Gillenson, & Sherrell, 2002; Lu, Yao, & Yu, 2005; Wu & Wang, 2005). According to Porter and Donthu (2006), technology acceptance and adoption are explained via two main paradigms. In the first, researchers try to explain an individual’s propensity to utilize new technology by focusing on trait variables. The second paradigm focuses on technological attributes and how these affect individual perception and ultimately use. Generally, TAM is seen as the most extensive and applicable model used to explain the second paradigm (see Venkatesh, 2000).

Numerous successful technological product and service adoptions have been studied and explained using TAM and its extensions. For example, TAM has been utilized in the context of Internet banking (Amin, 2009; Li & Lai, 2011; Lin, Wu, & Nga, 2013), tablet PCs (El-Gayar, Moran, & Hawkes, 2011; Ifenthaler & Schweinbenz, 2013) and M-commerce (Chong, 2013; Shih & Chen, 2013; Wang, Pan, & Cao, 2011; Wu & Wang, 2005). TAM has also been utilized in the area of mobile telecoms technology in discussing adoption behavior (Lu, Liu, Yu, & Wang, 2008; Teng, Lu, & Yu, 2009; Tseng & Lo, 2011).

Essentially, the TAM encompasses two cognitive beliefs, perceived usefulness and perceived ease of use, which then affect user attitudes and lead to intention to adopt the technology. Davis (1989) defines perceived usefulness as ‘the degree to which a person believes that using a particular system would enhance his or her job performance’ (p. 320), and perceived ease of use as ‘the degree to which a person believes that using a particular system would be free of physical and mental effort’ (p. 323). On the other hand, attitude is defined as ‘the users’ preference when they actually utilize particular devices and technologies’ (Park & Kim, 2013, p. 190). and intention to use is described as ‘the degree of the cognitive state of the users’ minds to use specific devices and technologies’ (Park & Kim, 2013, p. 190).

Because consumer behavior has been widely analyzed using the conceptual framework inspired by TAM (Chong, Darmawan, Ooi, & Lin, 2010; Constantiou, 2009), it is anticipated that common relationships and associations can also be applied to LTE services. According to a recent paper by Park and Del Pobil (2013), the framework is appropriate to represent the overall circumstances associated with LTE services and mobile phones. Thus, this study utilizes framework from TAM by incorporating three of its four variables. The three variables are perceived usefulness, attitude, and intention to use.

Perceived ease of use is excluded from this study because several studies of user acceptance in the area of mobile and Internet technologies suggested that perceived ease of use tends to decrease the validity and reliability of a research model (e.g., Cheong & Park,
The decision also is made due to the fact that the process involving LTE for most users is relatively straightforward as mobile devices and applications are becoming very user friendly.

In addition to the original three constructs from TAM, this study examines four external constructs (perceived processing speed, personal innovativeness, image, and network effects) that are likely to have relevance in studying Malaysian user attitudes and their intention to adopt LTE mobile services. The constructs and their relationship will be discussed in more detail in the sections that follow.

**Attitude towards LTE**

Attitude is identified as the cause of behavioral intention (Lu, Yu, Liu, & Yao, 2003; Teo & Pok, 2003). Predicting individual behavior and attitudes are among the most important research topics in the fields of information services and systems (Aarts, Verplanken, & Knippenberg, 1998). The close relationship between specific behavior and attitudes of an individual can be described using the Theory of Reasoned Action (TRA). Since the introduction of TRA, many studies have applied this theory and substantiated that individual behavior can be predicted by intention to use a given service or system. The TRA has also been used in TAM studies (Davis, 1989). In TAM, an individual’s attitude is referred to as the feelings of favorableness or otherwise toward a technology or system. Past empirical studies have shown the existence of attitude and its influence on decisions relating to new technology usage (Hsu & Lu, 2004; Moon & Kim, 2001; Park, Baek, Ohm, & Chang, 2014; Teo & Pok, 2003). Therefore, this leads to the first hypothesis:

H1: Attitude has a positive influence on intention to adopt LTE.

**Perceived usefulness (PU)**

Previous researchers have emphasized the role of perceived usefulness on users’ attitude (Cheong & Park, 2005; Huang, Lin, & Chuang, 2007; Park & Kim, 2013). Individuals who tend to appreciate usefulness have the tendency to undertake certain behavior as they believe it will help them to improve efficiency and job performance (Davis, 1989). Huang et al. (2007) confirm that perceived usefulness has a positive effect on attitude toward mobile learning adoption. Likewise, Cheong and Park (2005) indicate that users’ willingness to use mobile Internet in Korea is strongly influenced by their perception of its usefulness. Park and Kim (2013) state that perceived usefulness is a key determinant of user attitudes toward LTE services and the crucial role of perceived usefulness in TAM. Hence, the second hypothesis:

H2: Perceived usefulness has a positive influence on attitude

**Perceived processing speed (PPS)**

The quality of a particular system or technology is significantly influenced by the processing speed of the system or technology (Aladwani & Palvia, 2002; Park & Kim, 2013; Yoo & Donthu, 2001). Buss (1987) demonstrates that users’ perceptions toward a system or service are strongly associated with the perceived speed of the system or service. Perceived processing speed is defined as the perceived degree of processing speed of a technology and system. In a study of 3G, the speed of uploading and downloading data via wireless network services affects user perceptions of the services (Pagani, 2004). According to Park and Kim (2013), the key strength of LTE over the conventional 2G or
3G is in its fast data exchange speed and this is perceived as the most notable advantage. Therefore, the next hypothesis is posited.

H3: Perceived processing speed has a positive influence on attitude.

**Image (IMG)**

Technology is seen as a force that shapes society, and problems arise when increasing complexity and rate of technological change outpaces the ability of social actors to adapt. Mobile communication is a technological tool initially designed as a mean of communication, but it has now also become a fashion accessory and a symbol of economic status and power (Rippin, 2005). According to Lu et al., 73% of the executive class in the larger cities in China own a mobile phone not only for their convenience but also as a symbol of social status. Image is defined as the degree to which adopting an innovation is perceived to enhance one’s status in one’s social system or group. Teo and Pok (2003) in their study of adoption of WAP-enabled phones found that image has significant influence on behavioral attitude. Empirical results from Ong, Poong, and Ng (2008), also indicate that image has positive and significant association with using 3G services. In the context of this study, image implies that if an individual is to use LTE mobile services, they will gain higher social status. Thus, if one wants to be associated with the above groups, the following hypothesis will apply.

H4: Image has a positive influence on attitude.

**Personal innovativeness (IMG)**

Agarwal and Prasad (1998) indicate that individuals with higher levels of personal innovativeness develop more positive perceptions about the innovation in terms of relative advantage and are more eager to use it. Past empirical studies confirm that consumer innovativeness is a useful predictor of innovation adoption behavior (Hung, Ku, & Chang, 2003; Lu et al., 2005; Yang, 2005). Because the LTE mobile service is still in an early diffusion stage in Malaysia, early adopters will adopt this technology before others. Hence, personal innovativeness is included in the research and postulated as an influential variable on adoption intentions and usefulness belief. Thus,

H5: Personal innovativeness has a positive influence on intention to adopt LTE.

H6: Personal innovativeness has a positive influence on perceived usefulness.

**Network effects (NE)**

It is widely acknowledged that network effects are a key feature of telecommunications industries (Birke & Swann, 2006). Network effects also have a significant direct impact on behavioral intentions to use instant messaging (IM) (Van Slyke, Ilie, Lou, & Stafford, 2007). Peng, Fan, and Dey (2011) in their study of computer technology adoption show that network effects add extra momentum in the adoption process. They conclude that network effects are a powerful economic force; which in general facilitates the adoption of technology. Birke and Swann also strongly indicate that networks effects play an important role in mobile telecommunication, not only impacting the adoption process but also usage patterns. In the context of LTE mobile service, network effects tend to affect consumer adoption intentions. As a network expands, benefits such as high definition...
mobile content, cloud computing, IPTV, video conferencing, and lower pricing will be available as more people adopt the technology. This leads to the following hypothesis:

H7: Network effects have positive influence on intention to adopt LTE.

Research model

Figure 1 depicts the proposed research model of the study. This study proposes that the intention to adopt LTE is driven by the effects of perceived usefulness, perceived processing speed, and image with attitude as the mediator. Both personal innovativeness and network effects directly impact the intention to adopt LTE. The emphasis of this model is on explaining the antecedent beliefs of the perceptions and behavioral intentions.

Methodology

In order to test the hypotheses, a survey questionnaire was utilized, and designed on the basis of the extant research scales proven to exhibit good reliability and validity. Thus measures of behavioral intention (Dickinger, Arami, & Meyer, 2008), attitude (Park & Kim, 2013), perceived usefulness (Liao, Tsou, & Huang, 2007; Pagani, 2004), Perceived Processing Speed (Park & Kim, 2013), personal innovativeness, network effects, and image (Lu et al., 2005; Teo & Pok, 2003) were adapted from previous studies. Variables were measured via 5-point Likert scales, ranging from ‘strongly disagree’ to ‘strongly agree.’ All of the measures for the variables have already been validated in previous research, which are an important consideration and restated with care in the development of this study. A pre-test of the questionnaire was also conducted, involving 18 respondents from senior faculty members and students based at the University of Malaya, Kuala Lumpur. The questionnaire was assessed in terms of ease of understanding, logical consistencies, sequence of items, and contextual relevance and – where necessary – minor corrections were made.

The main survey was administered online; with an introduction to LTE technology placed before the survey. The objective of the introductory page was to create awareness about LTE and not aiming to manipulate the respondents’ views about LTE technology. Hence, the introductory page was descriptive in nature and provides general information.

Figure 1. The research model.
about LTE technology. A total of 591 people responded to the survey, but only 530 completed the survey forms in good order. Incomplete survey is defined as those lacking an answer to any study variable. The cross sectional data collected through the survey were analyzed using multiple regression analysis with the help of SPSS using version 21 software.

Data analysis and findings
Demographically, our respondents were 44% male and 56% female. The sample was pre-eminently aged between 23 and 30. Such age group distribution often occurs in online surveys because this group of respondents tends to spend more time on the Internet than other age groups. The majority of respondents held a college or university degree and about 70% of respondents were working adults with monthly income above Ringgit Malaysia 2000 (above USD700). In general, demographic profile showed that users are relatively young and generally well educated. The result is quite satisfactory; as such users are likely to become the most active and influential consumers in context of mobile communication.

Reliability analysis
There are varieties of methods for calculating internal consistency and one of the most frequently used is Cronbach’s \( \alpha \). In general, a measurement with an internal consistency exceeding 0.70 is considered reliable (Nunnally & Bernstein, 1994; Sekaran, 2006). Results in Table 1 show that the Cronbach’s \( \alpha \) value of all variables exceeds 0.7 and indicate that a high internal consistency of each variable used in this research.

Correlation analysis
Pearson correlation analysis was performed to examine the correlations between the two variables. This approach help determine any possible complication of the analysis, before performing regression. Lapin (1993) states that model stability will be jeopardized in the presence of collinearity among independent variables. According to Field (2005), the correlation coefficient value should not go beyond 0.8 to avoid multicollinearity. From Table 2, the highest coefficient of correlation is 0.733 between PU and PPS, and this value is below the cut-off point of 0.8. Therefore, there are no multi-collinearity issues in this study.

Multiple regression analysis
Multiple regression analysis was performed to test the hypotheses and relationship between independent variables and dependent variable for three submodels: ITA =

<table>
<thead>
<tr>
<th>Table 1. Reliability analysis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Perceived usefulness</td>
</tr>
<tr>
<td>Perceived processing speed</td>
</tr>
<tr>
<td>Personal innovativeness</td>
</tr>
<tr>
<td>Image</td>
</tr>
<tr>
<td>Network effects</td>
</tr>
<tr>
<td>Attitude</td>
</tr>
</tbody>
</table>
ATT + PI + NE, ATT = PU + IMG + PPS, PU = PI. The stepwise method was employed with the criteria of 0.05 for both including in or excluding variables from the final regression model. Regression results are presented in Table 3.

Figure 2 depicts the structural model showing path coefficients for all variables. The findings show that behavioral intention to adopt LTE mobile service is dominantly significant associated with the attitudinal factor \( \beta = 0.421^*, t = 11.338 \). This reaffirms the strong role of attitude as a significant mediator between beliefs and intention to adopt. Consistent with many previous adoption studies (Dickinger et al., 2008; Hung et al., 2003; Pedersen, 2005), attitude is found to be a determinant of behavioral intention. The attitudinal factors that are found to be significant in influencing behavioral intention in this study are perceived usefulness, perceived processing speed, and image. Therefore, it is extremely important for marketers to ensure that consumers develop these positive tendency/attitudinal beliefs toward LTE when promoting this technology.

The important issue of perceived usefulness \( \beta = 0.147^*, t = 4.120 \) as an influential predictor of attitude is consistent with prior empirical research (Chong, Darmawan, Ooi, & Lee, 2011; Hung et al., 2003; Park & Kim, 2013). Although perceived usefulness has weaker effects than perceived processing speed and image in developing attitudinal beliefs, it is still an important finding. In the point of pre-commercial stage, rationally, consumers would decide to subscribe LTE service mostly whenever they believe the mobile service will help them perform their jobs better. With LTE, users will have access to a wide range of services and applications, available conveniently and in a manner

### Table 2. Correlation matrix and mean value.

<table>
<thead>
<tr>
<th></th>
<th>PU</th>
<th>PPS</th>
<th>PI</th>
<th>NE</th>
<th>IMG</th>
<th>ITA</th>
<th>ATT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived usefulness (PU)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived processing speed (PPS)</td>
<td>.733**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal innovativeness (PI)</td>
<td>.068*</td>
<td>.090*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network effects (NE)</td>
<td>.426**</td>
<td>.397**</td>
<td>.310**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Image (IMG)</td>
<td>.365**</td>
<td>.331**</td>
<td>.104*</td>
<td>.290**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention to adopt (ITA)</td>
<td>.552**</td>
<td>504**</td>
<td>.156**</td>
<td>.510**</td>
<td>.449**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>.500**</td>
<td>.543**</td>
<td>.194**</td>
<td>.475**</td>
<td>.390**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.051</td>
<td>3.967</td>
<td>3.481</td>
<td>3.674</td>
<td>2.866</td>
<td>3.771</td>
<td>3.746</td>
</tr>
<tr>
<td>Std. deviation</td>
<td>.5664</td>
<td>.5196</td>
<td>.6061</td>
<td>.5879</td>
<td>.8004</td>
<td>.6250</td>
<td>.6064</td>
</tr>
</tbody>
</table>

Notes: *Correlation is significant at the 0.05 level (two-tailed). **Correlation is significant at the 0.01 level (two-tailed).

### Table 3. Regression analysis.

<table>
<thead>
<tr>
<th>Model</th>
<th>F-value</th>
<th>R²</th>
<th>( \beta ) Coeff.</th>
<th>t-value</th>
<th>Sig.</th>
<th>Hypothesis result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ITA = ATT + PI + NE</td>
<td>127.88</td>
<td>0.494</td>
<td>( \beta = 0.421^*, t = 11.338 )</td>
<td>.000</td>
<td>H1: Supported</td>
<td></td>
</tr>
<tr>
<td>ATT</td>
<td></td>
<td></td>
<td>.209*</td>
<td>7.110</td>
<td>.000</td>
<td>H5: Supported</td>
</tr>
<tr>
<td>PI</td>
<td></td>
<td></td>
<td>.254*</td>
<td>6.152</td>
<td>.000</td>
<td>H7: Supported</td>
</tr>
<tr>
<td>NE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. ATT = PPS + IMG + PU</td>
<td>89.75</td>
<td>0.339</td>
<td>( \beta = 0.369^*, t = 7.068 )</td>
<td>.000</td>
<td>H3: Supported</td>
<td></td>
</tr>
<tr>
<td>PPS</td>
<td></td>
<td></td>
<td>.220*</td>
<td>4.222</td>
<td>.000</td>
<td>H4: Supported</td>
</tr>
<tr>
<td>IMG</td>
<td></td>
<td></td>
<td>.147*</td>
<td>4.120</td>
<td>.000</td>
<td>H2: Supported</td>
</tr>
<tr>
<td>PU</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. PU = PI</td>
<td>80.93</td>
<td>0.133</td>
<td>( \beta = 0.365^*, t = 8.996 )</td>
<td>.000</td>
<td>H6: Supported</td>
<td></td>
</tr>
<tr>
<td>PI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *\( p = 0.05 \).
reflecting user preference; i.e., teleconferencing, and cloud computing, which are limitations in previous telecommunication standards.

Interestingly, perceived processing speed ($\beta = 0.369^*, t = 7.068$) is the strongest significant influence on the attitude toward LTE mobile service. Indeed, as mobile communication has become part of consumer daily lives, the importance of communication speed has always been highlighted. One of the key strengths of LTE over the previous telecommunication standard network services is in its fast data exchange speed. This suggests that overall perceptions of LTE can be enhanced if users believe they can promptly send and receive data via this network. The result of this construct reaffirms the current needs or trends of mobile communications, which is associated with communication speed. In addition, image perception ($\beta = 0.220^*, t = 4.222$) also holds a stronger direct positive effect than perceived usefulness ($\beta = 0.147^*, t = 4.120$) on users’ attitude toward LTE. In the context of this study, image is considered to be an important attitudinal belief of LTE because mobile phone users generally tend to use new technology to create, alter, or preserve a positive image of themselves in relation to others (Hill & Troshani, 2007).

More recently, mobile communication has evolved into a life style product and necessity, so much so that by using it, there is a perception that it projects a certain image of trendy or technological sophistication to the adopter (Bell, 2006; Teo & Pok, 2003). This is an interesting finding, as in the context of Asian culture, particularly Malaysia, the need for social recognition is very strong as a societal value. One of the plausible explanations of this result is the recent economic growth in Asia region, accompanied by sociological cultural change. Thus, there is a pressing need to portray a successful image by having access to displaying and using the latest technology or products that the market can offer. Altogether, these three attitudinal beliefs, perceived usefulness, perceived processing speed, and image explain 33.9% variance of users’ attitude toward LTE.

The study findings also illustrate a substantial influence of network effects ($\beta = 0.254$, $t = 6.152$) on the adoption intention of LTE. This finding is in line with prior research, which indicates that network effects play an important role on the adoption intentions of communication technology innovation (Pagani, 2004; Pagani & Fine, 2008; Van Slyke et al., 2007). Many studies recently have also begun to acknowledge network effects as drivers of adoption (Strader, Ramaswami, & Houle, 2007). In understanding the network

Figure 2. Results of path analysis.
effects, it indicates that respondents refer to innovative friends or contacts that follow communication technology innovations closely, when looking at the acceptance of LTE mobile services. In other words, individuals may be reluctant to be perceived as technological laggards, thus nudging them to adopt a technology often without knowing if they really need the technology. According to Peng et al. (2011), this scenario can be described as early adopters create a ‘bandwagon’ effect so that potential users would wish to follow these earlier adopters and become users of the same technology.

The respondents are found to have personal innovative traits and have a significant impact on perceived usefulness ($\beta = 0.365^*, t = 8.996$) as well as to the behavioral intention ($\beta = 0.209^*, t = 7.110$) to adopt LTE. However, this countermands the study of Lu et al. (2005), which found that personal innovativeness only has a significant influence on perceived usefulness but not on intentions themselves. Kuo and Yen (2009) analytical results also disagreed with those of Lu et al. (2005) and found that perceived usefulness of a technology does not arise even when consumers are willing to try and accept new things. This study indicates that consumers who are more inclined to try new products or who have a higher demand for new technology will find ways to make this new technology useful to help them in their job. Thus, these users are more likely to subscribe to LTE mobile service than others, given its perceived advantages.

Conclusion

Today, user behaviors toward mobile communication services have inexorably become more complex. This paper has analyzed the factors and user characteristics influencing intention to adopt LTE in Malaysia. The results show that adoption intentions of LTE mobile service are dependent upon the influences of perceived usefulness, perceived processing speed, and image through mediator attitude. Further, the results also highlighted that personal innovativeness and network effects show positive association toward adoption of LTE in terms of an individual’s willingness to try a new technology and interaction via their associates who use LTE.

The findings here offer both theoretical and practical implications for marketers and researchers in the field of telecommunication. In terms of theoretical implications, we demonstrate that TAM can be further developed in conjunction with beliefs such as perceived processing speed and image. The findings improve understanding of consumers’ adoption intention of LTE mobile service in Malaysia. Malaysia is one of the region’s fastest growing telecommunication industries. From a practical standpoint, understanding of consumer behavior will help businesses formulate appropriate marketing and development strategies. Based on the findings, it is shown that mobile phone technologies are employed to accommodate various aspects of users’ lifestyles that form elements of social, personal, and information needs; leisure; and work. One interesting marketing attribute of LTE compared to the previous telecommunication standard is that the LTE logo has been trademarked. The LTE logo could – for example – offer a brand image advantage to other previous telecommunication standards and become easily recognizable by consumers to facilitate adoption in the same way that Intel inside did two decades before. Therefore, marketers should promote LTE as a lifestyle product rather than just as a technological innovation. Network effects are found to be a significant factor in this study. This suggests that there are great proportions of mobile users who are motivated by trends in the market and the powerful influence of friends and colleagues, instead of actually subscribing to LTE because of the need for such applications, functions, and features. Hence, it is suggested that marketing communications could also
focus upon peer impact via social media, rather than describing the virtues of new technology to influence intention decisions of consumers in the context of LTE mobile service subscription.

A few limitations need to be identified prior to further research. First, in this survey, the respondents were asked to indicate their perceptions regarding LTE mobile services, where despite an introduction, some respondents may not be sufficiently well informed about this latest technology because it is relatively new in Malaysia. Hence, this study only demonstrates anticipation attributes rather than real experiences of LTE in these circumstances. Thus, although the present study offers valuable insight into understanding of LTE mobile services, it may precede adoptive behavior. It is recommended that research be conducted soon in order to examine consumer perceptions of LTE mobile services, following adoption. For example, research could explore the effects of individual adoption, of the phones, the systems, and service quality (Cheong & Park, 2005; Liao & Cheung, 2011; Park & Kim, 2013).

In conclusion, this study provides a first attempt toward understanding Malaysian consumer attitudes and behavioral intent toward adoption of LTE mobile services. There is already strong evidence that LTE mobile services have the potential to become a standard and popular protocol for in global mobile communication. Nevertheless, in the context of Malaysia, LTE still has some challenges to overcome in order to diffuse more widely.

Notes
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References


