



Understanding student attitudes of mobile phone features: Rethinking adoption through conjoint, cluster and SEM analyses

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ABSTRACT

Young adults have been labelled as one of the most important segments for mobile phones, however there is little empirical evidence to indicate how these young adults value the feature richness of their devices. This research presents a richer view of mobile phone user preferences and perceptions by applying methodologies from the marketing and information systems domains. Conjoint analysis provides insights into how students value various mobile phone applications and tools. Cluster analysis extracts salient and homogenous consumer segments from the conjoint analysis output. Structural equation modelling then explores how antecedents to attitude may differ by the elicited consumer segments.

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1. Introduction

Mobile phone use has been growing dramatically over the last decade. In Europe, mobile operators' revenue has grown at approximately 10% per annum over recent years, such that the mobile sector now ranks among Europe's most important sectors (Jurisic & Azevedo, 2011). Penetration rates for the mobile phone is over 75% in the United States and in certain regions in Hong Kong, Japan and western Europe penetration has already exceeded 100% with subscribers having multiple mobile devices (Hu, Balluz, Frankel, & Battaglia, 2010). Worldwide, there are more than 4 billion mobile phones in use, three-quarters of them in the developing world. Even in Africa, four in 10 people now have a mobile phone (The Economist, 2009).

While mobile phone use has been increasing in all economic and age sectors, university/college students have been labelled as one of the most important target markets (Jurisic & Azevedo, 2011; Totten, Lipscomb, Cook, & Lesch, 2005) and the largest consumer group of mobile phone services (McClatchey, 2006). These young adults have current buying power and potential for huge amounts of future buying power (Jurisic & Azevedo, 2011). For these young adults, researchers have explored multiple facets of mobile phone use, including motivation (Leung, 2007), psychological and health effects (Beranuy, Oberst, Carbonell, & Chamorro, 2009; Johansson, Nordin, Heiden, & Sandström, 2010; Thomee, Harenstam, & Hagberg, 2011), etiquette (Lipscomb, Totten, Cook, & Lesch, 2005), implications on social networks (Auter, 2007;

Subrahmanyam, Reich, Waechter, & Espinoza, 2008), impact on campus life (Quan-Haase, 2008), among others. However research that explores how distinct segments within this population shape their attitudes, and value mobile device functionality is underexplored. While mobile phone manufacturers may assume that the more features and functionalities they add to the devices, the better; there is little empirical evidence to indicate that these young adults value this feature richness.

Further, adoption research in the field of information systems tends to focus on developing and validating causal models that seek to explain the relationships between various constructs that ultimately lead to an endogenous variable such as attitude, satisfaction or intention to use. Typically, such models are assumed to be generalizable across consumer populations. Some researchers have explored the influence of various demographic variables (such as age, gender, culture, and experience) on the various constructs and relationships within the proposed adoption models across various contexts. However, little research in the field of information systems has delved to a more fundamental level of segmenting consumer preferences by perceived feature utility of the technology. Consumer segments that are homogenous in their perceptions of feature utilities and motivations of use, may be heterogeneous by basic demographic variables. A "one-size fits all" adoption model may be misleading as different consumer segments (segmented by perceived feature utilities rather than demographics) may value different constructs or experience different causal relationships in the model. By incorporating various methodologies from information systems and marketing domains, we seek to gain a more comprehensive and richer understanding of mobile phone user preferences and perceptions for young adults. Through this investigation, information systems researchers may

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be encouraged to rethink their assumptions around technology consumers and their preferences. A “one-size fits all” adoption model may not be appropriate in certain contexts, even with further refinement by demographic variables.

In the following sections, theoretical background is provided that outlines the concept of ‘feature fatigue’ and the determinants of attitude formation. An established theoretical model that proposes antecedents to attitude towards use of mobile phones is presented as a basis for investigation. Next, conjoint analysis, which has been widely used in the marketing literature, is used to gain insights into how young adults (specifically university students) value various mobile phone applications and tools. Cluster analysis is performed on the output from the conjoint analysis to extract salient and homogeneous consumer segments that possess similar preferences for mobile phone functionalities. Lastly, structural equation modelling (using PLS analysis), which is widely used in information systems literature, explores how antecedents to attitude may differ by the elicited consumer segments found through the cluster analysis. Conclusions and implications are presented from theoretical and practical perspectives.

2. Theoretical background

While the adage ‘more is better’ may apply to many things in life, this may not always be the case with complex consumer products, such as electronics. In this section, we examine the concept of ‘feature fatigue’, especially as it relates to technology products. We also summarise key theoretical underpinnings of attitude formation for information technology products and services, focusing on attitude determination within the mobile phone context.

2.1. Feature fatigue

Consumers around the world can now purchase a single product that functions as a mobile phone, camera, camcorder, calculator, game console, text-messaging device, MP3 player, alarm clock, Web browser and email device. Economic theory suggests that product attributes/features are linked to consumer demand via an additive utility function (Lancaster, 1971). In other words, the addition of each positively valued attribute or feature should increase consumers’ utility of that product. Additional features can also help manufacturers to enhance and differentiate their products from competitors (Carpenter, Glazer, & Nakamoto, 1994; Mukherjee & Hoyer, 2001). In the technology sector, the marginal cost of adding features to a product is often very low. Each year consumers are able to purchase various technology products with more features and often at a lower cost than the previous year (Freund, König, & Roth, 1997; Thompson, Hamilton, & Rust, 2005). A feature-rich product that seeks to satisfy the needs of heterogeneous consumers may also be more cost effective for a manufacturer compared to producing several feature-streamlined and more narrowly targeted products. As such, consumers often must purchase features they do not want in order to acquire those features they do want. While the owner of a feature-rich product, such as the mobile device described above, may be able to boast about the technological advancements of her device, are more features necessarily better? Will she be satisfied and have positive feelings about her mobile device with its many diverse and complex featured?

Various researchers have examined consumers’ reactions to product feature complexity. Choice task complexity theory (Johnson & Payne, 1985) suggests that greater product feature complexity would require greater consumer effort and that consumers naturally wish to minimise their decision efforts (Wright, 1975). As such, the utility of products that are feature-rich may be nega-

tively impacted by their complexity (Dellaert & Stremersch, 2005). Additionally, consumers may experience negative emotions, such as anxiety or stress, when dealing with highly complex products (Mick & Fournier, 1998). Thompson et al. (2005) coined the term ‘feature fatigue’ referring to the phenomena that too many features may make a product overwhelming, thus leading to consumer dissatisfaction. They draw on usability research to suggest that adding features to products has a negative effect on consumers’ ability to use them and that every additional feature is “one more thing to learn, one more thing to possibly misunderstand” (Nielsen, 1993 p. 155). Thompson et al. (2005) found that increasing the number of features does have a positive impact on consumers’ ratings of a product’s capability. Perceptions of product capability are important in the initial assessment of products before actual use. In fact, consumers give more weight to capability and less weight to usability in their initial product assessments. Interestingly, after product use, usability becomes more important than capability in product assessment. Feature-rich products are no longer perceived as favourably after use, supporting the ‘feature fatigue’ notion. While adding product features may improve the initial attractiveness of a product, it appears to decrease consumers’ satisfaction after using the product. This decrease of consumers’ satisfaction and generation of negative attitudes towards a feature-rich product after use can harm repurchase decisions and lead to lower consumer lifetime values (Thompson et al., 2005).

The above research suggests that a ‘one size fits all’ feature-rich mobile device may have negative consequences on consumers’ attitudes. Consumer segments that are more homogenous in their preferences and use of mobile devices may benefit from smaller feature bundles that match their use. Usability of such devices may be enhanced, as it is not clouded by the addition of unwanted features that make these devices overly complex for consumers.

The next section presents a review of consumer attitude models, in particular within the mobile device domain. An established model is presented as the basis for our investigation. Extant literature has focused on understanding the antecedents of attitude among a heterogeneous population. Here we seek to provide a deeper analysis by identifying more homogenous segments that prefer varying smaller feature bundles and exploring how the antecedents of attitude may differ among such segments.

2.2. Attitude and its antecedents

Attitude is a critical factor in explaining human behaviour. Attitude is not overt behaviour but a disposition that influences behaviour. An individual’s attitude towards a particular object influences his/her intention to perform certain behaviours related to that object, which then leads to actual behaviour related to that object (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). A number of theories explain the attitudes humans hold about objects and their behaviours. The theory of reasoned action (TRA) is the most prominent of such theories (Ajzen & Fishbein, 1980). TRA proposes that actual behaviour is determined by intention to perform the behaviour, which, in turn, is determined by attitude towards the behaviour and subjective norm.

The technology acceptance model (TAM) (Davis, 1989) can be viewed as a derivative of TRA, tailored to IT contexts. While TRA is “designed to explain virtually any human behaviour”, the goal of TAM is “to provide an explanation of the determinants of computer acceptance across a broad range of end-user computing technologies and user populations” (Davis, Bagozzi, & Warshaw, 1989). According to TAM, IT usage behaviour is determined by behavioural intention, which is a function of attitude, and attitude is determined by both perceived usefulness and perceived ease of use.

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