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Exploring and modelling digital natives' intention to use permission-based location-aware mobile advertising

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Abstract Permission-based location-aware mobile advertising (PBLAMA) is a growing phenomenon of interest to marketing practitioners and academics. However, it is unclear what factors influence a user's intention to use or adopt the technology. The objective of this study is to test empirically advertising attitudes, incentives, subjective norms, and perceived behaviour control factors on digital native mobile-phone users' behavioural intentions of using PBLAMA. Multiple regression was used to analyse the results from 260 undergraduate students from New Zealand. The results indicate that digital natives are more likely to adopt PBLAMA if it is entertaining, informative, not irritating, and includes some form of incentive. In addition, subjective norms were found to play a significant positive role, as does the user's confidence (self-efficacy) in use and perceived control.

Keywords mobile advertising; permission-based; digital natives; theory of planned behaviour

Introduction

The rapid growth of mobile advertising derives from organisations' increasing appreciation of mobile advertising's ability to reach almost any person, in any place, at any time (Haghirian & Madlberger, 2005). This unprecedented reach to consumers is an advertising first, and has been strengthened with the recent increase in mobile-phone users, innovation, and convergence of technologies (Mobile Marketing Association, 2010).

Whilst mobile advertising's expected growth has been aggressively projected, modest empirical evidence has been collected to evaluate the expected consumer response. Existing research has shown that privacy issues (Okazaki, Molina, & Hirose, 2012), attitude (Haghirian & Madlberger, 2005; Oh & Xu, 2003), subjective norms (H. H. Bauer, Reichardt, Barnes, & Neumann, 2005), and technology self-efficacy (Compeau & Higgins, 1995; Neill & Richard, 2012) are significant influences on individuals' likelihood of accepting technology generally and mobile

advertising specifically. Although there has been a number of studies investigating and substantiating the impact of privacy on mobile advertising (e.g. Chen, Ross, & Huang, 2008; Gurau & Ranchhod, 2009; Loukas et al., 2012), there is little current research which has tested attitudinal, normative, and self-efficacy, as well as the effect of incentives collectively (cf. Basheer & Ibrahim, 2010).

The objective of this study is not to re-examine or confirm the effect of privacy, but to test empirically additional key factors that may influence individuals' behavioural intentions of using mobile advertising, such as information and entertainment value, credibility, and relevance. This is achieved by incorporating and adapting Ajzen's (1985, 1991) theory of planned behaviour as the guiding research model framework. The theory of planned behaviour has often been used to model and predict behaviours in a variety of situations (e.g. Moons & De Pelsmacker, 2012). The current model explores and tests a number of existing scales, including advertising and web attitudes, subjective norms, the use of incentives, and self-efficacy as antecedents of the behavioural intentions to use permission-based location-aware mobile advertising (PBLAMA). The benefits of this study contribute to both marketing theory and practice. The main extension to marketing theory is that this study will be the first to utilise and test Ajzen's theory of planned behaviour in such a manner, with digital natives, in a mobile advertising context.

The paper reviews existing research with respect to PBLAMA and digital natives. A conceptual model is then developed, followed by a description of the research method and data collection. The research results are then presented and discussed.

Literature review

Mobile advertising, mobile marketing (Tähtinen, 2005), wireless advertising (Krishnamurthy, 2003), or wireless advertising messaging (Petty, 2003) is in its academic infancy, with the first research study published in 2001 (Leppäniemi, Sinisalo, & Karjaluoto, 2006). However, as mobile commerce's utility increases, so does the academic interest in mobile advertising (Okazaki et al., 2012). Currently, little progress has been made in universally defining mobile advertising. The implications of not having a universally accepted definition of mobile advertising hinders the development of a common research agenda or marketing conceptualisation, limiting much of the existing research to technology rather than marketing issues and opportunities.

The Mobile Marketing Association (2008) defines mobile advertising as a form of advertising that communicates to the consumer via a handset. Similarly, Haghirian, Madlberger, and Tanuskova (2005) state that mobile advertising is the transmission of advertising messages via mobile devices such as mobile phones. As recently as 2012, mobile advertising has been defined as 'any marketing communications that generate or support new customer acquisition, with textual or visual messages' (Okazaki et al., 2012, p. 169). All of these definitions are based on an advertising frame of reference, which infers that mobile advertising is a form of 'paid non-personal communication from an identified sponsor, using mass media to persuade or influence an audience' (P. D. Bennett, 1995, p. v). However, the inclusion of a mass advertising biased definition fundamentally contradicts mobile advertising, which is one-to-one, personalised, and interactive (Balasubramanian, Peterson, & Jarvenpaa, 2002).

Leppäniemi et al. (2006) conducted a meta-analysis to identify the reoccurring themes of past mobile advertising definitions, and defined mobile advertising as 'the use of the mobile medium as a means of marketing communications' (p. 38). This definition is used in this study, as it aptly describes mobile advertising without restricting the definition to any specific technology or media. That is, both text-based (e.g. short message service, SMS) and web-based (e.g. MMS, WAP) advertising can be accommodated within the definition.

Through the advancement of location-aware technologies, mobile advertisers can now send messages to cellular subscribers based on their geographic location (Zoller, Housen, & Matthews, 2001). These technologies include Bluetooth, wireless application protocol (WAP), global positioning systems (GPS), radio frequency identification (RFID), augmented reality, and infrared technology (Leppäniemi et al., 2006). This means that mobile advertising can expand from untargeted mass messaging and reach individual consumers with respect to their location and activities. This location-aware capability creates new opportunity and provides a distinct mobile advertising advantage for personalisation and presention of relevant information (H. H. Bauer et al., 2005). The ability of mobile advertisers to use location-aware advertising heightens consumers' concerns for privacy and protection of their personal information (Haghirian & Madlberger, 2005). These concerns illustrate the need for mobile advertising to be permission-based, where the consent of the recipient is required before any mobile advertising activity is enacted (Godin, 1999). Baek and Morimoto (2012) also confirmed that perceptions of text advertising behavioural intentions are significantly influenced by privacy concerns, while Alrubaiee and Al-Nazer (2010) found that consumers demonstrated higher trust in brands who sought their permission before sending mobile advertising.

Digital natives

Digital natives, the net generation, or the millennials are early and substantial adopters of new communication technologies (Howe & Strauss, 2000, 2007). Digital natives are individuals aged between 16 and 30 who have grown up with information and communication technology as a part of their everyday lives and are now dependent on it for accessing information and communicating with others (S. Bennett, Maton, & Kervin, 2008; Prensky, 2001b).

Digital natives also socialise differently to previous generations; they multi-task, respond to digital interactivity, and desire instant gratification and frequent rewards (S. Bennett et al., 2008). It is the combination of these characteristics that makes mobile advertising appealing to this group and this group appealing to mobile advertisers. Their response to new technologies often shapes the success or failure of the technology (Prensky, 2001a).

Theory of planned behaviour and attitudes

The theory of planned behaviour attempts to predict behavioural intentions and actual behaviour through attitudes, subjective norms, and perceived behavioural control towards a specific behaviour (Ajzen, 1991). The theory of planned behaviour is an extension of the theory of reasoned action which supersedes its predecessor through its ability to predict behaviours which have incomplete volitional control (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). This is appropriate in a mobile

advertising context, where the impact of mobile advertising is in part driven by commercial organisations and not solely a voluntary behaviour determined by an individual (Haghirian & Madlberger, 2005). Madden, Ellen, and Ajzen (1992) support the efficacy of using the theory of planned behaviour over the theory of reasoned action because of its ability to explain more variation amongst behavioural predictions.

Behavioural intentions are the indication of the effort an individual is willing to exert in order to perform a particular behaviour. Behavioural intentions, like actual behaviour, are impacted by attitudes, subjective norms, and perceived behavioural control. Attitude towards a behaviour is an individual's level of favourability towards a particular behaviour (Ajzen, 1991). The current study involves a form of advertising (specifically, mobile advertising), and therefore incorporates another facet of attitudinal literature – attitude towards advertising. Attitude towards advertising is the predisposition to respond in a favourable or unfavourable manner to a particular advertising stimulus from a general advertising medium (such as television advertising) and not a specific individual advertisement (MacKenzie & Lutz, 1989). Research investigating attitudes towards advertising across different mediums has shown that not all advertising mediums are favoured equally (Haghirian & Madlberger, 2005). Traditional advertising (such as television and radio) invokes a certain level of pessimism, whereas Internet advertising summons a more favourable response (Elliott & Speck, 1998; Tsang, Ho, & Liang, 2004).

The relevance and personalisation of material and information adds value to marketing communications and is especially relevant to personal advertising media (Baek & Morimoto, 2012; Heinonen & Strandvik, 2005). Wolk and Theysohn (2007) found that relevance was the second most important factor in attracting customers to websites, while consumers were found to be less concerned about privacy when the message was personally relevant (Evans, Patterson, & O'Malley, 2001). Lastovicka (1983), in an attempt to develop metrics to improve advertising copy, found that his relevance and entertainment scales adequately measured the relevance of TV advertisement copy. He also suggested that the scales were situation specific, and additional validation would be beneficial. Ducoffe (1996) found that entertainment and informativeness value positively influenced attitude towards web advertising, while the ability for advertising to irritate and annoy people was a significant negative influence.

Mobile and Internet advertising share similar characteristics, which indicates a higher likelihood of mobile advertising receiving favourable attitudinal responses (Yoon & Kim, 2001). However, expectations of advertising are increasing, and for mobile advertising to succeed, it must build on Internet advertising's success and further captivate the consumer; that is, to provide consumers with the ability to become involved and interact with products, services, and advertisers online and in real time.

Eight variables, adapted from the theory of planned behaviour, the advertising research literature, and information technology related literature, are considered as key factors influencing the intention of digital natives to use PBLAMA. The eight variables are entertainment, informativeness, irritation, credibility, personal relevance, incentives, subjective norms, and perceived behavioural control (PBC).

Entertainment is the ability of an advertisement to promote enjoyment and create positive consumer attitudes by providing a form of escapism, diversion, aesthetic enjoyment, or emotional release (Elliott & Speck, 1998; Shavitt, Lowrey, & Haefner,

1998). H. H. Bauer et al. (2005) considered entertainment one of the two key factors driving mobile marketing, while other research suggests that entertainment significantly affects behavioural intentions towards specific behaviour in a general, Internet, and mobile advertising context (Ducoffe, 1995, 1996; Oh & Xu, 2003). Therefore the hypothesis is:

H_1: Entertainment will have a significant positive effect on the behavioural intentions of using PBLAMA.

Informativeness is defined as the supply of information through advertisement. Researchers have argued that advertising's informative role legitimises advertising and provides the primary reason why consumers approve of it (Ducoffe, 1995; Rotzoll, Haefner, & Sandage, 1989). The literature suggests that informativeness also significantly affects behavioural intentions in a general, Internet, and mobile advertising context (Ducoffe, 1995, 1996; Oh & Xu, 2003). Therefore:

H_2: Informativeness will have a significant positive effect on the behavioural intentions of using PBLAMA.

Irritation is the indignity that people feel when addressed by an inappropriate or irrelevant advertisement, and involves the advertisement's ability to annoy, offend, insult, or overly manipulate individuals (Aaker & Bruzzone, 1985; Shavitt et al., 1998). Irritation is the main reason why individuals complain about advertising (Baek & Morimoto, 2012; R. A. Bauer & Greyser, 1968).

The existing literature suggests that irritation significantly affects behavioural intentions towards behaviour in a general but not in an Internet advertising context (Ducoffe, 1995). Oh and Xu (2003) replicated Ducoffe's (1996) study in a mobile advertising context and found entertainment and informativeness to affect consumers' attitudes towards multimedia significantly in a simulated mobile commerce environment. Irritation was not found to be significant in their study. However, this is thought to be due to the research being conducted in a laboratory environment where participants were actively engaged and unlikely to feel irritated. Their study illustrates the transferability of Ducoffe's attitudinal antecedents to a mobile advertising context, and indicates that further research opportunities exist in testing these factors outside a laboratory environment. This leads to the hypothesis that:

H_3: Irritation towards PBLAMA will have a significant negative effect on the behavioural intentions of using PBLAMA.

Credibility is the consumers' perceptions of advertising's truthfulness and believability (MacKenzie & Lutz, 1989). Haghirian and Madlberger (2005) investigated Austrian consumers' attitudes towards advertising via mobile devices, and found credibility to affect attitudes towards mobile device advertising significantly. They demonstrated credibility's transferability into a mobile advertising context and suggested further research in countries outside of Austria. The existing literature suggests that credibility significantly affects behavioural intentions towards behaviour in an Internet and mobile advertising context (Brackett & Carr, 2001; Yoon, 2002). Therefore the hypothesis is:

H_4: Credibility will have a significant positive effect on the behavioural intentions of using PBLAMA.

Personal relevance, in this study, reflects an individual's involvement and level of satisfaction from an advertisement, and is demonstrated through the advertisements' personal meaningfulness and usefulness. The importance of relevance has been demonstrated in a number of studies investigating direct marketing and websites (Evans et al., 2001; Heinonen & Strandvik, 2005). Personal relevance can be enhanced by advertising which creates meaningful, experiential, and involved advertisements focused towards the recipient (Lastovicka, 1983). Haghirian and Madlberger (2005) suggest that since mobile phones are personal items, relevant advertising to individuals would enhance their attitude towards mobile phone advertising. Although this suggestion has not been empirically tested, it does support other propositions that personal relevance affects attitudes towards mobile advertising (Leppäniemi & Karjaluoto, 2005). Therefore the hypothesis is:

H_5: Personal relevance will have a significant positive effect on the behavioural intentions of using PBLAMA.

Incentives and discounts are methods which are used to persuade consumers to accept advertising (Haghirian et al., 2005; Leppäniemi & Karjaluoto, 2005). Whilst no empirical testing has been completed in the mobile advertising context, the impact of incentives offered by brands and telecommunication companies need to be considered as a factor influencing the intention to use PBLAMA. This study develops a scale to measure incentives with relation to PBLAMA. The scale measures incentives holistically, and through specified brand and telecommunication incentives. The hypothesis is:

H_6: Incentives will have a significant positive effect on the intention of using PBLAMA.

Subjective norms are social pressures from friends, family, and society in general to perform or not perform a specific behaviour, reflecting the way in which the beliefs of influential people surrounding an individual affect that individual's behaviour (Ajzen, 1991). Madden et al. (1992) found numerous studies in which norms significantly affected an individual's behavioural intentions. H. H. Bauer et al. (2005) investigated factors that influenced consumer acceptance of mobile phones as a means of communicating promotional content. Their study focussed on consumer personality, and showed that social norms significantly affected the behavioural intention of accepting mobile advertising. They found that subjective norms transferred into the mobile advertising context, and suggested that further research could find support through the theory of planned behaviour. Therefore:

H_7: Subjective norms will have a significant positive effect on the intention of using PBLAMA.

Perceived behaviour control (PBC) is an individual's perception of the ease or difficulty of performing a specific task or action (Ajzen, 1991). The PBC construct affects people's behaviour through confidence in their ability to perform a specific action (Bandura, Adams, Hardy, & Howells, 1980). This confidence reflects an

individual's belief that by having more resources and fewer obstacles, they are more positive in performing a specific action (Madden et al., 1992).

PBC affects behaviour both directly and indirectly. PBC's indirect effect on behaviour is through motivation, where the confidence an individual has in performing a specific behaviour affects their actual performance (Bandura et al., 1980). PBC's direct influence on behaviour reflects actual control over the behaviour and infers some past experience with it (Madden et al., 1992). Davis's (1989) technology acceptance model expanded on PBC by including the concept of self-efficacy. Self-efficacy is an individual's judgement of their capabilities to perform a specific task or action and has demonstrated a significant influence on behavioural intentions in both computer and mobile advertising contexts (Bandura, 1986; Venkatesh & Davis, 1996). Jayawardhena, Kuckertz, Karjaluoto, and Kautonen (2009) tested consumers likelihood of using mobile advertising in Finland, Germany, and the UK. Their results indicated that although PBC was a significant factor in the willingness to allow the use of personal information in mobile advertising, the influence of PBC decreased over time. This study also illustrated PBC's transferability to a mobile advertising context, and suggested further research opportunities in testing PBC in countries outside of Europe.

Existing literature suggests assisted self-efficacy (confidence in one's capability provided there is support available) and unassisted self-efficacy (confidence in one's capability without explicit external support) significantly affects behavioural intentions towards specific behaviour in a computer-based and mobile commerce context (Compeau & Higgins, 1995; Jayawardhena et al., 2009). Ajzen (2002) suggests that behavioural intentions can be impacted by the level of controllability an individual feels towards a specific task. These three perceived behaviour control dimensions leads to three hypotheses:

H_{8a}: Assisted self-efficacy will have a significant positive effect on the intention of using PBLAMA.

H_{8b}: Unassisted self-efficacy will have a significant positive effect on the intention of using PBLAMA.

H_{8c}: Controllability will have a significant positive effect on the intention of using PBLAMA.

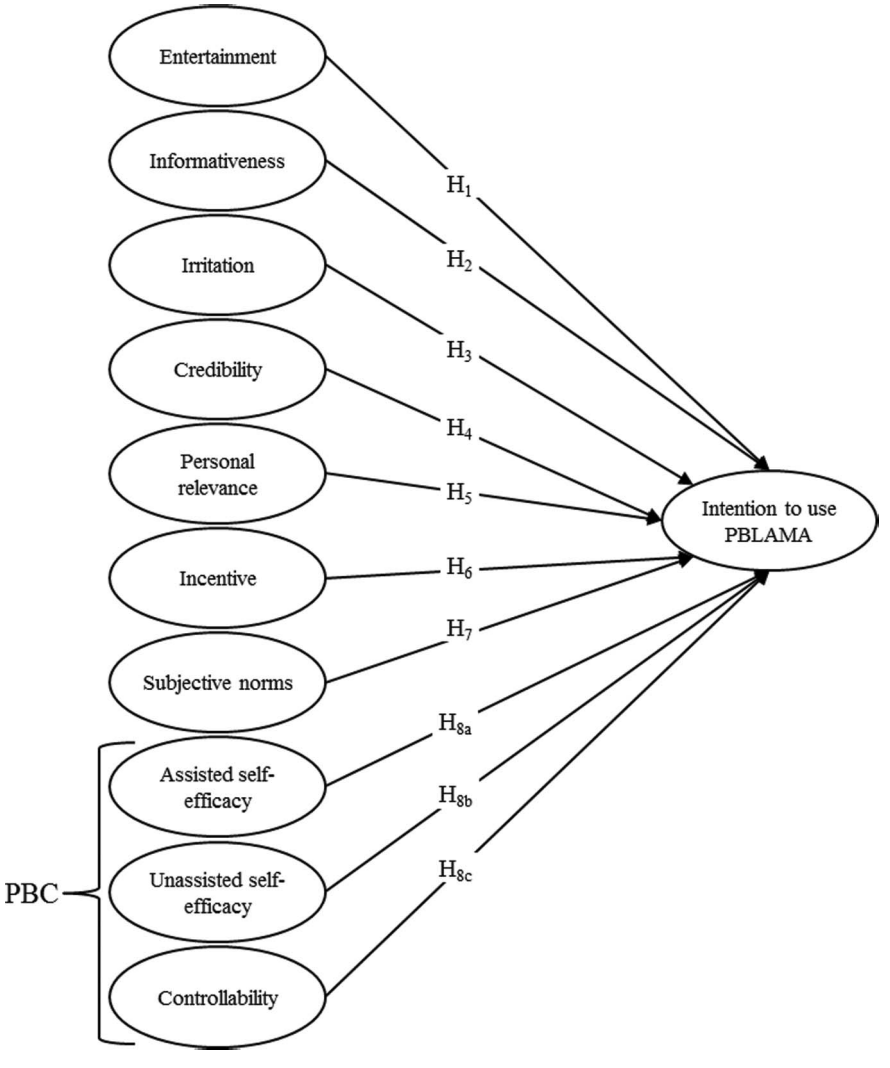
Figure 1 depicts the conceptual model.

Methodology and research design

The sample for this research consisted of digital natives; marketing undergraduate students studying at a university in Wellington, New Zealand. Digital natives are seen as relevant to this study, since mobile phones are relied upon in this grouping's daily life, and digital natives are considered early adopters or rejecters of new technologies, and their response often shapes the success of a new technology (Prensky, 2001a).

The method of data collection for this study was a voluntary online, anonymous, and self-administered questionnaire administered through the university website. A general announcement was made on the website, to the student population, to click

Figure 1 Conceptual model.



on a link which led them to the survey. The online survey was seen as advantageous because the Internet allows quick access to a wide population that can answer the survey at their own leisure, and the target sample were digital natives (Cavana, Delahaye, & Sekaran, 2000).

Data collection

The survey, conducted in 2010, generated 276 responses of which 260 were usable. The respondent ages ranged from 18 to 29, with the majority (50%) aged between 20 and 24 years, 44.6% aged 18 to 19, and the rest aged 25 to 29.

Questionnaire items

Since advertising on mobile phones is increasingly web based, it was considered appropriate to adapt existing web-based scales where available. The scales, apart from the incentive scale, were adapted from the existing literature for the PBLAMA context. The incentive scale was developed and tested specifically for this study. All measurement items consisted of seven-point Likert-type scales, anchored with 1 = 'strongly disagree' and 7 = 'strongly agree'; see Appendix A for the items used, loadings, construct reliability (CR), and average variance extracted (AVE) measures.

The five-item entertainment scale was adapted from Ducoffe's (1996) study of Internet advertising value, and measures the level of entertainment an individual feels towards PBLAMA. Ducoffe's (1996) seven-item informativeness scale was used to measure the level of information an individual feels available from PBLAMA. The four-item irritation scale adapted from Ducoffe's (1996) study of advertising value on the Internet measures the level of irritation an individual feels towards PBLAMA. The three-item credibility scale derives from Brackett and Carr's (2001) study of attitudes of web advertising versus other media. This scale measures the level of credibility an individual feels towards PBLAMA. The six-item personal relevance scale is adapted from Lastovicka's (1983) study of television commercials. This scale measures the level of personal relevance an individual feels towards PBLAMA.

This study includes a newly developed three-item scale to measure incentives with respect to PBLAMA. This scale measures the attitude towards PBLAMA incentives holistically through discounts and specified brand and telecommunication incentives. A pretest with 86 students demonstrated an acceptable Cronbach's alpha (.736).

The subjective norms scale was adapted from Shimp and Kavas's (1984) study of coupon usage. This four-item scale measures the level of subjective norm pressure an individual feels towards PBLAMA. Nine items from the perceived behavioural control scale was adapted from Compeau and Higgins's (1995) study of computer self-efficacy to measure the two aspects of self-efficacy (assisted and unassisted) that an individual feels towards PBLAMA. Ajzen (2002) suggests that behavioural intentions can be impacted by the level of controllability an individual feels. This study adapts scales from two studies to measure controllability (Ajzen, 2002; Compeau & Higgins, 1995). This three-item scale measures the level of perceived controllability an individual feels towards PBLAMA.

This study adapted Venkatesh and Davis's (1996) behavioural intentions to use scale by adding a two-year timeframe to the original two-item scale. This three-item scale measures an individual's perceived behavioural intentions of using PBLAMA within the next two years.

Results

The respondents all fall within the digital natives criteria of 16 to 30 years of age (S. Bennett et al., 2008). The ratio of response favoured females (59%) over males (41%). All respondents indicated that they owned a mobile phone and sent at least one text message per month, with the majority (55.8%) reported sending more than 500 text messages per month. In the context of browsing the Internet using their mobile phone, 56.9% of the respondents indicated they have never done so, while 28.1% responded that they have done so up to 10% of the time, 7.3% indicated they

had done so up to 30% of the time, and the balance of the respondents used their mobile phones to browse the Internet more than 30% of the time.

AMOS was used to conduct the CFA; SPSS version 18 was used to conduct the multiple regression analysis (MRA). An independent samples *t*-test was used to compare the intent to use PBLAMA by gender. There were no significant differences between males ($\bar{x} = 4.47$, $SD = 1.38$) and females ($\bar{x} = 4.31$, $SD = 1.18$), $t(258) = .982$, $p = .327$. A factorial between-groups analysis of variance (ANOVA) was used to compare the average intent to use PBLAMA scores of the three age groups. There were no significant differences between the age groups and intent to use PBLAMA, $F(2, 257) = 1.393$, $p = .250$. Neither did age have any significant effect on the other variables in the model.

Surprisingly, personal relevance did not provide any additional explanatory value to the multiple regression analysis. Although the original scale reported a Cronbach's alpha of .846 (Lastovicka, 1983), the current measurement model results indicated the items used to measure personal relevance did not adequately reflect the underlying construct (CR = .620, AVE = .450). Including the construct in the MRA did not materially affect the overall results, $R^2 = .557$, adjusted $R^2 = .540$, $F(10, 249) = 31.36$, $p < .001$ compared to the results shown in Table 1, and was not a significant predictor for intention to use PBLAMA ($\beta = .032$, $t = .600$, $p = .549$). Therefore it was not included in the final analysis. The three items developed to measure controllability loaded poorly, indicating a potential problem in the measurement of controllability. Mixed results for controllability has been reported in previous studies but is considered an important construct in the current model (Ajzen, 2002). Therefore, controllability was measured by a single item, with a loading of .886, which best captured the feelings of control (or lack of) in a PBLAMA environment.

All other constructs demonstrated adequate convergent and discriminant validity, with items loading appropriately on the respective constructs and each construct reliability (CR) exceeding the generally accepted minimum criteria of .70 (Hair, Black, Babin, & Andersen, 2010). VIF values were within acceptable levels (i.e. <10), therefore multicollinearity was not evident. Goodness of fit criteria were acceptable, RMSEA = .048, CFI = .96, TLI = .95, NFI = .91 (Bagozzi & Yi, 2012); see Appendix A for details.

To estimate the proportion of variance in intention to use PBLAMA that can be accounted for by entertainment, informativeness, irritation, credibility, incentives,

Table 1 Regression model with intention to use PBLAMA as dependent variable.

Variable	B	S.E.	β	*t*-value	*p*	VIF
Intercept	−.941	.494		−1.904	.058	
Entertainment	.312	.058	.300	5.337	.000	1.786
Informativeness	.177	.074	.138	2.386	.018	1.234
Irritation	−.102	.041	−.116	−2.474	.014	1.406
Credibility	.061	.058	.052	1.050	.295	1.885
Incentives	.165	.062	.127	2.641	.009	1.314
Subjective norms	.175	.056	.161	3.111	.002	1.508
Assisted self-efficacy	.097	.062	.084	1.556	.121	1.638
Unassisted self-efficacy	.156	.042	.171	3.724	.000	1.192
Controllability	.087	.036	−.105	2.393	.017	1.095

Note: $n = 260$; $R^2 = .557$; adjusted $R^2 = .541$; $F(9, 250) = 26.64$, $p < .001$.

subjective norms, assisted self-efficacy, unassisted self-efficacy, and controllability, multiple regression analysis was performed. In combination, these factors accounted for a significant 55.7% of the variability in intention to use PBLAMA, $R^2 = .557$, adjusted $R^2 = .541$, $F(9, 250) = 26.64$, $p < .001$. The results of the regression analysis are reported in Table 1.

Discussion

Entertainment effect

H_1 is supported by this research demonstrating that entertainment significantly and positively influences digital natives' behavioural intentions of using PBLAMA. This supports Madden et al. (1992) by illustrating that significant and positive attitudes lead to positive behavioural intentions. These results also support and prioritise H. H. Bauer et al.'s (2005) finding that entertainment and information are drivers of mobile marketing. Entertainment shows the highest explanatory power of all the predictor variables, and illustrates the importance of incorporating entertainment into PBLAMA. As a consequence, the more enjoyable, pleasing, fun to use, and exciting digital natives find PBLAMA, the higher their behavioural intentions to use PBLAMA.

Informativeness and irritation effects

Informativeness significantly and positively influences digital natives' behavioural intentions of using PBLAMA (H_2), consistent with existing findings (Madden et al., 1992; Oh & Xu, 2003). The results from the current study indicate that immediate, timely, up-to-date, and convenient information increases the behavioural intentions to use PBLAMA. Mobile advertisements which are irritating and annoying negatively influence behavioural intentions to use PBLAMA, supporting H_3. This result does not support Ducoffe's (1996) and Oh and Xu's (2003) findings, but does illustrate that Ducoffe's (1995) irritation scale transfers from a general context to a specific context (mobile advertising).

Credibility effect

H_4 is not supported; credibility of mobile advertisements does not have a significant positive effect on behavioural intentions to use PBLAMA. This result does not support previous findings in the Internet and mobile environment (Brackett & Carr, 2001; Haghirian & Madlberger, 2005). However, this result does not necessarily mean that credibility of PBLAMA is not important. A simple explanation is that digital natives may not consider mobile advertising any more or less credible than any other form of advertising.

Personal relevance effect

H_5 was not supported; the relationship between personal relevance and behavioural intentions of using PBLAMA could not be adequately measured, since the construct could not be validated. This result has not been reported in similar previous studies, although different measures of relevance were used in the other studies. For

example, Evans et al. (2001) used semi-structured open-ended questions to assess the effect of relevance; Heinonen and Strandvik (2005) asked participants 'How relevant is the offering?'; while Baek and Morimoto (2012) adapted an existing perceived personalisation scale to measure the effect of relevance. Considering the lack of a consistent personal relevancy scale for mobile advertising, the non-significant result in this study is most likely due to the scale used being designed for the television context rather than a mobile context (Lastovicka, 1983). Previous research has also shown marked difference in attitudes towards different advertising media (Ducoffe, 1995), with mobile advertising being inherently different to mass advertising (Balasubramanian et al., 2002). This may also help explain personal relevance's insignificance.

Incentive effect

Incentives significantly and positively influence digital natives' behavioural intentions of using PBLAMA, supporting H_6. As far as the authors understand, this is the first study to test the role of incentives within a PBLAMA context empirically, and provides evidence that including incentives as part of the marketing mix can make mobile advertising more attractive. The results indicate that incentives and/or discounts on either the product being advertised or the mobile service itself positively influences the individuals' intention to use PBLAMA.

Subjective norms effect

H_7 is supported; subjective norms significantly and positively influence digital natives' behavioural intentions of using PBLAMA. Subjective norms take into account social pressures to perform, engage, or not engage in specific behaviour. Although H. H. Bauer et al. (2005), using a similar scale to the one used in this study, found a weak relationship between subjective norms and behavioural intention, the current results indicate strong explanatory power. This highlights the importance of taking individuals subjective norms into consideration when designing PBLAMA. One interpretation is that referent group acceptance of PBLAMA reduces the individual's perceived risk of adoption.

Perceived behaviour control

The effect of PBC is partially supported by the results; unassisted self-efficacy significantly and positively influenced behavioural intentions to use PBLAMA (H_{8a}) but not assisted PBC (H_{8b}). These results substantiate the view that confidence in one's technical ability is a major positive influence on the intention to use PBLAMA. Surprisingly, providing overt assistance does not appear to have a significant influence. The reason for the latter result is not clear, although Compeau and Higgins (1995) found a similar result and suggested that providing high levels of support actually hinders the development of self-efficacy. Another possible explanation is that those without the technical skills or confidence are sceptical of the value of PBLAMA, and hence assistance would make little difference to the decision to use the service. The lack of perceived control significantly and negatively influenced intentions to use PBLAMA (H_{8c}). This result provides evidence that has not been found in previous research (Karjaluoto & Alatalo, 2007; Merisavo et al., 2007). Both of the previous

studies found that perceived behavioural control had no significant effect on the willingness or intention to use or accept mobile advertising. The current significant result may reflect a more recent cynicism of increasingly pervasive mobile services by digital natives. The results may also indicate a lack of trust in the implementation and use of location-based information, thereby creating a greater need for perceived control (Jayawardhena et al., 2009; Reppel & Szmigin, 2010).

Contribution

Although the influence of entertainment, information, irritation, credibility, personal relevance, and perceived behavioural control has previously been studied separately, this study is the first published research, as far as could be determined, which incorporates both the theory of planned behaviour and significant advertisement factors to investigate the intent to adopt a new mobile advertising technology – PBLAMA, in a non-PBLAMA environment (e.g. pre-deployment).

This study provides insight into the factors which affect the consumer's intention to use PBLAMA which are of importance to both marketing practitioners and academics. In addition, a model for further research and investigation of future advertising medium is validated.

Conclusion

The purpose of this research was to investigate digital natives' intention to use PBLAMA. This has been achieved by utilising Ajzen's (1985, 1991) theory of planned behaviour to explore and test how advertising and web attitudes, subjective norms, the use of incentives, and perceived behaviour control influence PBLAMA behavioural intentions.

The results indicate that for PBLAMA to be successfully adopted, it must be entertaining, informative, not irritating, and include some form of incentive (or discount). Furthermore, to support digital natives' attitude formation towards using PBLAMA, PBLAMA needs to be portrayed as attractive not only to the individual planning to use it, but to the referent people surrounding that individual. This illustrates the importance of communicating the benefits of PBLAMA to a wider group than just the targeted audience, as the people and peers surrounding potential users will have a significant impact on the decision-making process. The effect of subjective norms on PBLAMA adoption appears to follow the classic diffusion of innovation process, where innovators and early adopters play a significant role convincing others to adopt and use new technologies (Rogers, 2003). This is especially important, since simply providing additional information and assistance in using PBLAMA or focusing on its credibility and personal relevance does not appear to make any significant difference to the intent to use PBLAMA. Finally, increasing perceived behavioural control and communicating the control aspect will reduce inhibitions towards using PBLAMA.

Managerial implications

Given mobile advertisings subdued emergence within the New Zealand environment, along with its predicted commercial value, the rewards to marketing practitioners

who effectively harness PBLAMA capabilities are noteworthy. This study provides evidence that digital natives' behavioural intentions towards PBLAMA will be greater if marketers consider and address the influence of each of the seven factors on PBLAMA adoption, and shape their PBLAMA strategy accordingly.

Marketing managers must decide how best to make PBLAMA messaging an enjoyable and pleasant experience. This suggests a user-based focus in selecting features and applications to enhance the PBLAMA experience. Fundamental features and applications to consider include the message type (text or multi-media) and content (relevant message capturing fun and enjoyment). Digital natives process information quite differently from previous generations, and providing interactivity (two-way communication flow or games and fun applications) will increase engagement and acceptance (Prensky, 2001a).

Information value provides the second greatest impact on intention to use PBLAMA. This suggests that organisations utilising PBLAMA must ensure immediate, timely, and up-to-date information is available in a convenient format. In addition, PBLAMA service providers and advertisers should encourage two-way communication features and applications where the recipient in the vicinity can use their mobile phone to ask the organisation important and immediate questions.

The significance of subjective norms indicates it is important for marketing managers to appeal not only to individuals but also to their referent groups. Referent group opinions of PBLAMA will affect individual behavioural response. This suggests that marketing managers should encourage positive PBLAMA word of mouth. A coolness factor, revolving around insight and value, needs to be incorporated through PBLAMA features and applications. A marketing programme could be integrated with the use of incentives and fostering conversation about top brands' use of PBLAMA on social networking sites.

Marketing managers should offer incentives, such as discounts for the marketed brand and or ancillary services (e.g. telecommunications or Internet) in return for consumers allowing the brand to communicate with them via PBLAMA. Convincing consumers to allow brands to advertise to them directly via PBLAMA gives the brand an opportunity to build a relationship with the consumer that no other advertising media can; a personalised, one-to-one, and interactive relationship (Balasubramanian et al., 2002). In order to promote the value of PBLAMA incentives, organisations should utilise other advertising and networking mediums that resonate with the target audience, such as Facebook and other social networking sites (Oblinger & Oblinger, 2005).

The significance of unassisted self-efficacy illustrates that those with technology self-confidence are more likely to adopt PBLAMA than those without a strong technology background. This implies that the innovators and early adopters are the most likely initial target market. The results also imply that marketing managers need to convey and highlight PBLAMA's value and ease of use. This could be implemented by YouTube vignettes and SNS (or WOM) discussions.

Irritation and lack of control are two negative factors which reduce the intention to use PBLAMA. One practical interpretation is that the two factors are considered related by the potential PBLAMA user. Marketing managers and PBLAMA software developers need to ensure that consumers have complete control over the use of PBLAMA; that they have the ability to turn PBLAMA on or off, and that they can choose to restrict (block) specific brands or messages. Respondents in the study were clear that irritating and annoying advertisement would reduce the adoption of PBLAMA. Therefore some form of control is very important to them.

The key message to marketing managers from this research is to appreciate how each of the factors influencing the intention to use PBLAMA can be utilised to engage their target audience. PBLAMA not only has the ability to capture audiences in a new fashion, but also has the capacity to support and extend existing communication efforts.

Limitations

As in all research, there are a number of limitations, including assuming behavioural intentions infer actual behaviour, generalisations based on student (and digital natives) samples, and potential method and non-response bias due to the Internet-based self-administered questionnaire. Future research should consider more fully the impact of personal privacy issues and control.

The main limitation of this study is the unknown difference between an individual's behavioural intentions and actual behaviour. Non-motivational aspects such as requisite opportunities and resources (e.g. time, money, skills, and cooperation of others) may inhibit or enhance the actual behaviour (Ajzen, 1991). Another limitation is the limited number of attitudinal factors considered in the conceptual model. The attitudinal factors were selected from studies investigating attitude indirectly through advertising value; other attitudinal factors may be more relevant (Brackett & Carr, 2001; Ducoffe, 1995, 1996). Although entertainment and informativeness attitudes were proven significant, surprisingly relevancy and credibility were not significant and should be revisited.

A further limitation of the study is the level of generalisation the sample of New Zealand digital natives provides. Whilst New Zealand characteristics can be comparable to other countries, previous research has identified that mobile advertising behavioural intentions vary across nations (Jayawardhena et al., 2009; Xu, 2006). Also digital natives are not representative of people outside the 16–30 age brackes (S. Bennett et al., 2008). While this is a limitation, there is also the added strength of testing PBLAMA on digital natives, as their adoption of new technologies is a key indicator of whether non-digital natives will also adopt the same technologies (Frand, 2000; Oblinger & Oblinger, 2005; Prensky, 2001b; Tapscott, 1999).

Future research

The fact that this study is the first to investigate mobile advertising behavioural intentions utilising the theory of planned behaviour provides many opportunities for further investigation. The use of a limited number of advertising related attitudinal factors and an R^2 of 55.7% suggests there are further motivating variables which describe behavioural intentions to adopt PBLAMA. Of particular interest would be to investigate the role of advertising message frequency, message medium (text, graphic, and voice), different campaigns (e.g. call-to-action vs. brand awareness), and congruency of PBLAMA to the advertised brand.

Qualitative research would provide a richer perspective and deeper understanding of how digital natives perceive the use and benefit of PBLAMA. In particular, a qualitative study would help determine the types and forms of entertainment, information, and incentives consumers find most appealing, and perhaps more importantly, what PBLAMA actions and activities are most irritating. Qualitative research could also be used to understand better the importance and impact of relevancy and personalisation with respect to mobile advertising, permission, and

control. Extending the research to include non-digital natives and/or other countries, including multiple samples of different demographic bases such as age, gender, and household income, would build on the existing model. It would be of particular interest to test whether Ducoffe's (1995, 1996) construct of advertising value as an interlinking construct between attitudinal antecedents and behavioural intentions would alter the influence of irritation, credibility, and personal relevance.

Another research direction could be to test the two-way influence PBLAMA has with other advertising mediums; in particular, the interaction between the Internet, social media advertising, and PBLAMA would be of interest. Given that New Zealand and a number of other countries have not adopted PBLAMA as mainstream, a longitudinal study bridging before and after PBLAMA is adopted could be of considerable interest to practitioners and academics.

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Appendix A: Constructs, survey items, factor loadings, construct reliability, and average variance extracted

Construct/items	Loading	CR	AVE
Entertainment: I think PBLAMA would be			
Enjoyable	.887	.919	.695
Pleasing	.866		
Fun to use	.853		
Exciting	.793		
Entertaining	.762		
Irritation: I think PBLAMA would be			
Irritating	.976	.940	.887
Annoying	.906		
*Deceptive	*		
*Confusing	*		
Credibility: I think PBLAMA would be			
Believable	.857	.823	.613
Trustworthy	.845		
Credible	.625		
Informative: I think PBLAMA would			
Be a good source of up-to-date product information	.856	.877	.641
Make product information immediately accessible	.804		
Be a convenient source of product information	.781		
Provide timely information	.757		
*Supply relevant product information	*		
*Provide timely information	*		
*Supply complete product information	*		
Personal Relevance: I would like PBLAMA to			
Make me think why I would buy or not buy the product	.693	.620	.450
Be meaningful to me	.689		
Make me feel like I am right in the advertisement experiencing the same thing	.656		
*Make me think of how the product might be useful to me	*		
*Have nothing to do with me or my needs	*		
*Give me a good idea	*		
Incentives: I will use PBLAMA if			
The advertisement offers me a discount on the advertised brand/product	.875	.797	.571
I receive an incentive	.735		
The telecommunication firm who sent me the advertisement offers me a discount on one of their services (i.e. cheaper texting or calling)	.639		

(*Continued*)

Appendix A (Continued).

Construct/items	Loading	CR	AVE
Subjective Norms:			
If I used PBLAMA, most of the people who are important to me would regard it as wise	.884	.863	.678
If I use PBLAMA, most of the people who are important to me will regard it as valuable	.799		
People who are important to me would think that I should use PBLAMA	.784		
*If I used PBLAMA, most of the people who are important to me would regard it as useful	*		
Assisted self-efficacy: I would be confident managing PBLAMA			
If someone else helped me get started	.916	.895	.740
If someone showed me how first	.856		
If I could ask someone for help if I got stuck	.805		
*If I have a manual for reference	*		
*If I had seen someone manage it before myself	*		
*If there was inbuilt assistance	*		
Unassisted self-efficacy: I would be confident managing PBLAMA			
Even if there was no one to show me how	.983	.941	.888
Even if I have never used it before	.900		
*If I had a lot of time to process it	*		
Controllability			
The decision to use PBLAMA is beyond my control (rc)	.886	NA	NA
*Whether I use PBLAMA or not is entirely up to me	*		
*The decision to use PBLAMA is completely up to me	*		
Intention			
I will use PBLAMA when it is available	.936	.893	.739
I plan to use PBLAMA when it is available	.933		
I expect to use PBLAMA within the next two years	.686		

Note: AVE = average variance extracted; CR = construct reliability. *Questions deleted from final analysis.

Discriminant validity

	USE	Norms	ASE	Intention	Incentive	Informative	Credibility	Irritation	Entertainment
AVE	**.888**	**.678**	**.740**	**.739**	**.571**	**.641**	**.613**	**.887**	**.695**
USE	**.942**								
Norms	.177	**.824**							
ASE	.334	.231	**.860**						
Intention	.371	.559	.409	**.860**					
Incentive	.322	.235	.476	.454	**.756**				
Informative	.309	.362	.582	.536	.404	**.800**			
Credibility	.283	.375	.266	.460	.230	.483	**.783**		
Irritation	−.026	−.285	−.043	−.373	−.152	−.185	−.316	**.942**	
Entertainment	.209	.529	.287	.664	.398	.541	.470	−.408	**.834**

Square root of AVEs is given on the diagonal. All correlations are less than the corresponding square root of the AVEs. Implied correlations for each construct in the model in the lower half of the table.