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Mobile advertising adoption by multinationals - Senior executives' initial responses

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Abstract

Purpose - Although the wireless internet attracts more and more interest from marketers and researchers, there is little empirical evidence of multinational corporations' (MNCs) adoption of pull-type mobile advertising in global markets. The aim of this study is to fill this research gap, by conducting an empirical survey of the perceptions of MNCs operating in Europe regarding SMS-based mobile advertising adoption.

Design/methodology/approach - The study proposes six basic constructs which are thought to influence MNCs' decision-making process on mobile advertising adoption. On this base, a structured questionnaire is developed. The data are obtained by telephone interviews from 53 senior executives of MNCs' subsidiaries in Spain.

Findings - Hierarchical regression analysis reveals that branding strategy, facilitating conditions, and security and costs are the strongest determinants of MNCs' mobile advertising adoption. Furthermore, discriminant analysis indicates that Japanese, American, and European firms are statistically classifiable according to their cultural affiliation in terms of their perceptions of mobile advertising adoption. Japanese firms are the least willing to use mobile advertising, while their American counterparts are the most motivated in this regard.

Originality/value - While SMS-based mobile marketing has been receiving an increasing attention from both academics and practitioners, there exists little empirical research on this area. In this vein, this study contributes to the literature in two ways. First, the study proposes a conceptual research model based on six basic constructs, which incorporate both theoretical and practical perspectives. Second, the model is tested by empirical data obtained from top managers of MNCs' subsidiaries operating in a European market. The findings of this study thus offer useful insights based on their "hands-on" experience.

Keywords Advertising, Internet Mobile communication systems, Telephony, Multinational companies, Spain

Paper type Research paper

Introduction

The convergence of the internet and wireless technology in the late 1990s has produced a revolutionary telecommunication service: mobile internet. Global mobile operators are now accelerating technological transition from 2G to 3G, while by June 2004 active users of wireless data applications exceeded 115 million worldwide (Smith, 2004). This figure will reach 1.72 billion by 2007, with aggregate subscriber revenue of \$584 billion (Yankee Group, 2003). Such spectacular growth will change not only how we live, but also how firms advertise. Short message services (SMS) has become a new technological buzzword in transmitting business-to-customer messages to such wireless devices as cellular telephones, pagers, and personal data assistants (PDAs). Many brands and media companies include text message numbers in their advertisements to enable interested consumers to obtain more information. This mode of advertising takes advantage of valuable channels of wireless communication to enhance customer relationships, and to carry out direct marketing and promotional activities (Frolick and Chen, 2004).

The adoption of SMS in marketing campaigns is sufficient to demonstrate that e-mail is the wireless application most used by consumers. The messaging frame is now being extended to include multimedia message services (MMS), which combine pictures, video, and sound. Nowhere is this better demonstrated than in Japan, where on an average day one Japanese cellular phone company, NTT DoCoMo, carries between 900 million and 1 billion e-mails to its "i-mode" subscribers (Scuka, 2003). On i-mode, DoCoMo offers a "one-stop-solution" of mobile internet services, which enables users to engage in multiple tasks in one portal: e-mailing, instant messaging, data search, and internet. Users who access i-mode can use SMTP (Simple Mail Transfer Protocol)-based e-mail with a message of up to 500 characters, in comparison to 160 characters in SMS (Eurotechnology, 2003). By 2003, i-mode subscribers had reached 40 million, and it is now expanding to European markets through license contracts and partnerships, with such operators as 3-Plus (Germany), KPN Mobile (The Netherlands), BASE (Belgium), Bouygues Telecom (France), Telefonica Moviles (Spain), and Wind (Italy). Total i-mode subscribers in Europe were expected to reach 1.5 million by the end of 2003 (3G Newsroom.com, 2003).

Intuitively, multinational corporations (MNCs) operating in Europe are now facing more and more pressure to use i-mode technology in marketing strategies. It is commonly pointed out that it is more viable to extend i-mode to Europe than to the USA, given the higher per capita use of mobile phones in Europe and the slow adoption of WAP (Barnes and Huff, 2003). It has been pointed out that i-mode's attractive pricing, simple billing systems, and software content make it an encouraging business model for European mobile players (Baldi and Thaug, 2002). Furthermore, "opt-in" campaigns, with discounts, coupons, and product information, appeal just as much to Europeans as to Japanese (Scuka, 2003). Such arguments have, however, left some important questions unanswered: Does the penetration of i-mode in European markets leverage Japanese MNCs in terms

of mobile advertising? Do American and European firms embrace mobile advertising in the same way as the Japanese do? Unfortunately, very little evidence is available to answer these questions.

The aim of this study is to fill this research gap, by conducting an empirical survey of MNCs' operating in European markets regarding their perceptions of SMS-based push-type mobile advertising. Specifically, Japanese, American and European MNCs are telephone interviewed to identify the primary factors influencing mobile advertising adoption.

In what follows, the significant contributions of the study are first explained, and the relevant literature on mobile advertising is reviewed in terms of six basic constructs: brand strategy, facilitating conditions, location-based services, service costs, regulatory control, and cultural barriers. On this base, eight hypotheses are then formulated. After the methodology is explained in detail, the study findings are discussed and some important limitations are recognised. In conclusion, the managerial implications of the findings are provided.

Significance of the study

An empirical study of mobile advertising is important for three reasons. First, understanding a new information technology and its acceptance can help to reveal the underlying logic of practitioners' strategic decisions in information management. While numerous studies have addressed conceptual issues and conducted general consumer surveys, there is little empirical research available in the literature on MNCs' perceptions of and utilization of mobile advertising. second, research into MNCs operating in European markets provides new insights for both academics and practitioners, because Europe is often referred as a promising but yet unexplored frontier for m-commerce (Baldi and Thaung, 2002; Barnes and Huff, 2003; Maamria, 2001; Scuka, 2003). However, this argument has seldom been examined in an empirical context. Last, as i-mode technology extends in European markets, it is meaningful to ask whether, in comparison to their American and European counterparts, Japanese firms perceive mobile advertising as a distinct form of advertising: that is, do Japanese firms exhibit more positive (or negative) perceptions of mobile advertising adoption because of their i-mode experience, or does their i-mode experience have no effect, with the result that they perceive mobile advertising adoption in the same way as their American and European counterparts? To our knowledge, research on this theme is almost non-existent, and, therefore, the present study will be an interesting and important addition to the literature.

Conceptual framework

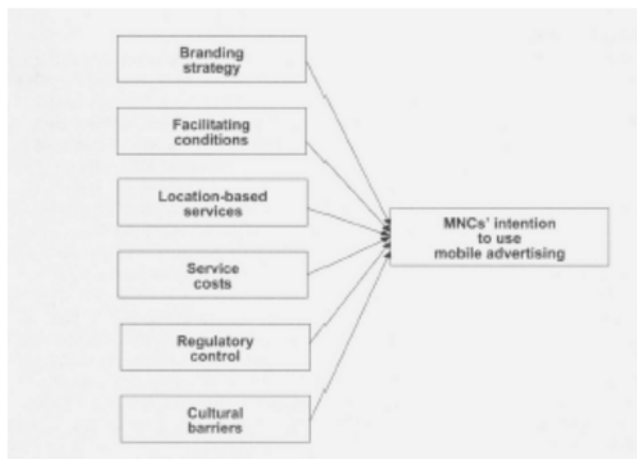
As the preceding section shows, mobile advertising has received much attention from both academics and practitioners. This section therefore establishes a conceptual framework for the study, identifying key determinants of MNCs' decision making on SMS-based mobile advertising adoption.

Prior research indicates that the decision to adopt innovations is primarily based on three factors: environmental, managerial, and organisational (Rogers, 1995). This orientation has been

incorporated in a variety of electronic commerce literature, including WAP services and mobile e-business adoptions (e.g., Hung et al., 2003; Wang and Cheung, 2004). It was therefore decided to conceptualise MNCs' adoption of SMS-based mobile advertising in this context, but focusing on only the first two factors: environmental and managerial. Organisational factors were discarded, because it seems extremely difficult to assess the relationship between central offices and local subsidiaries in terms of mobile service adoption. The level of headquarters' control and the delegated authority of local managers, along with other influences, will be considered in our future extensions. This decision is justified by the exploratory nature of the present study.

In order to choose the most relevant elements associated with each factor, we conducted an extensive literature review on information as well as marketing management. As a result, branding strategy, location-based services, and service costs were determined to be the most important managerial factors in establishing a mobile-based business model, while facilitating condition, regulatory control, and cultural barriers were the most relevant environmental factors for such a model. It should be emphasised that these factors are specifically chosen for the European context, where measures have been taken to integrate markets. Figure 1 shows the research model proposed in this study.

In the following section, these six factors are explained in detail as determinants of SMS-based mobile advertising adoption, along with reasons to justify their inclusion, and the appropriate rationale.



Factors influencing mobile advertising adoption

Branding strategy

Wireless internet offers an effective channel for strengthening customer relationships by means of direct marketing and promotional activities (Frolick and Chen, 2004). In particular, mobile e-mail

has been considered an effective tool to "enhance brand awareness, build or test customer loyalty, and develop or enhance demographic databases" (Mylonopoulos and Doukidis, 2003).

An earlier pilot study conducted by Quios found that in mobile advertising the level of recognition was surprisingly high: 79 per cent of participants recalled 60 per cent of mobile advertising (Barnes, 2003). In addition, firms using mobile e-mail campaigns can attract consumer attention and produce consumer responses to a much greater degree than other direct marketing channels, because such firms can engage in "one-to-one dialogue" with customers (Kavassalis et al., 2003). An experimental survey by Ericsson indicates that 60 per cent of samples liked receiving mobile advertising (Barnes, 2003). Similarly, a survey using popular brands' trial mobile advertising found that as many as 84 per cent of 500 young British adults are likely to recommend the service to their friends, while only 7 per cent are likely to abandon the service (Barwise and Strong, 2002). On the other hand, complementing mobile advertising with other channels, such as the internet, television, print media, and personal contact, allows marketers to maximize campaign effectiveness (Kavassalis et al., 2003).

Some MNCs have already tested mobile advertising in this context. For example, McDonald's conducted a text-messaging campaign in conjunction with a popular TV song contest in the UK, offering concert tickets and backstage passes, while entry in the Coca-Cola Grand Sweepstakes Competition was offered to US college students who sent a text message to a number printed on a Diet Coke can (Dano, 2002).

Facilitating conditions

Needless to say, the technologies associated with mobile communications provide the necessary infrastructure to enable consumers to send and receive SMS-based messages. In an attempt to establish a theoretical framework of wireless internet adoption, based on the technology acceptance model, Lu et al. (2003) suggest that facilitating conditions is one of the most important determinants, along with the ease of using wireless internet. In this light, the integration of competing standards and fragmented systems across countries, cross-network support for SMS, and higher connection speeds are all necessary conditions for a wider transmission of mobile advertising. In addition, the availability of web-enabled mobile handsets with 2.5G or 3G functionality would significantly affect the adoption of MMS-based campaigns.

Further, a wider selection of handsets must be available, to enable consumers to choose their preferred combination of necessary functions and diverse features. However, it has been pointed out that mobile handsets of the same brand sold in Japan and Europe may not be "comparable in terms of their technical features" (Baldi and Thaug, 2002). In Japan, a special emphasis is given to superior colour display using a better input method. For example, Nokia's 7110 WAP allows only four lines of text on a black and white display, while its Japanese counterpart allows for 256-colour graphics, six lines of 16 characters, and a screen resolution of 111×106 pixels in a smaller size (Baldi and Thaug, 2002).

Location-based services

One of the unique features of the mobile internet is "the ability to track the user's position, and tailor services and promotional offers accordingly" (Sadeh, 2002). In this regard, handset makers and service providers are increasingly attracted by the commercial feasibility of applying the satellite-based global positioning system (GPS) to the wireless internet service. A recent forecast estimates that, by 2010, worldwide revenue from location-based services is expected to exceed \$3.6 billion, a substantial increase from \$500 million in 2004 (Phillips, 2004a). A GPS-enabled mobile handset enables users to pinpoint the location of a mobile phone placing an emergency call (Sadeh, 2002). However, today's location tracking applications go far beyond this original definition. For example, on an extended menu of i-mode, "i-area" includes a diverse range of location-based services: weather news, restaurant guide, local hotel information, zoomable maps with an address finder function, and traffic updates and estimation of travel times. In 2003, KDDI, the second largest Japanese operator, began to market a GPS-enabled handset, which enables location-based services to be much more personalised. This facility would give MNCs strategic leverage in mobile marketing, because an individual's behaviour and receptiveness to advertising are likely to be influenced by their location and time, and marketers can thus induce impulse buying by providing the right information for the right place (Barnes, 2003).

Service costs

Another important factor is the concept of service costs. For example, to send or receive one megabyte of data on 2.5G i-mode would cost euro32 (¥0.3) per packet. On the basis of 19 euro cents per 160-character SMS message, European consumers would have to pay euro1,356.98 to send one megabyte of data by SMS, or approximately 62 times as much as the Japanese pay (Scuka, 2003). In addition, European mobile operators have passed on to consumers the additional costs incurred in obtaining 3G spectrum licenses, and this has made any dramatic price reduction impossible (Baldi and Thaug, 2002). Such cost factors adversely affect mobile players' revenues. Mizukoshi et al (2001) provide the following "lessons" learned from i-mode: In Japan, i-mode users link addresses from e-mail to the senders' phone numbers, making it possible to respond to text messages by voice. This capability has important implications for marketers because it allows them to approach i-mode customers with text messages while customer service people stand by for voice replies. In Japan, where subscribers pay per-minute charges for voice calls, additional voice usage can increase network operators' revenues substantially (p. 94). In the same vein, DoCoMo charges third parties a fee of approximately 9 per cent for distribution through i-mode, whereas many mobile operators in Europe normally retain 60 per cent. Instead of buying the content, DoCoMo allows "designated third parties to provide fee-based content and services, and it assists them by handling their billing and collection through the monthly phone bill" (Mizukoshi et al, 2001). If this business model of i-mode service had been transferred through partnership and knowledge exchange, European counterparts

would now charge their content providers much lower fees, and this would in turn encourage MNCs to create their own mobile campaigns.

Regulatory control

The idea behind mobile advertising is very similar to e-mail on the fixed internet, but with one big difference: it is "opt-in". This function is essential to give users total control over what they receive, because consumers' demand for highly personalised messages has to be reconciled with their desire for privacy (Sadeh, 2002). In this sense, European consumers found SMS-based advertising very intrusive and irritating. In a 2002 survey of 3,000 mobile users across Western Europe, most respondents considered intrusive any SMS campaigns to their mobile lasting even 30 seconds (DeZoysa, 2002). Mobile banking users may be also highly concerned with their information security, because mobile banking enables consumers to request that their account balances be sent via SMS. This may become a serious concern for European legislatures, and require them to provide necessary protection of consumers' financial information, given that as many as 46 per cent of Europeans have indicated their intention of using mobile banking (Mallat et al., 2004).

Obtaining permission via opt-in is not difficult in Japan, where as many as 70 per cent of i-mode users subscribe to e-mail newsletters (Scuka, 2003). Nonetheless, this is not free of costs. In November 2001, DoCoMo obtained an injunction against an online dating service for causing system failure and service disruptions by transmitting as many as 900,000 "spams" to i-mode users in one hour (The Japan Times, 2001). Consequently, the Ministry of Public Management approved DoCoMo's plan to unilaterally block unsolicited commercial text messages. In the USA, "the Privacy Foundation (2000) already has placed wireless advertising and privacy as the eighth issue on its top-ten list of the hottest issues for 2001" (Petty, 2003). Similarly, the Mobile Marketing Association (MMA) has attempted to establish industry guidelines for mobile marketers, as follows: MMA members should not send mobile advertising without confirmed opt-in; and such opt-in subscriber permission is not transferable to third parties without explicit permission from the subscriber (Petty, 2003).

Cultural barriers

There may exist significant cross-border differences between European countries in language, lifestyle and media habits. In the case of the mobile phone convergence was rapid, but Europe has not been homogeneous with regard to information technology (De Mooij, 2004). From the MNCs' perspective, such differences may be a serious impediment to adopting mobile advertising, because a single campaign may not be effective in multiple markets. Mobile advertising would be not only costly but also inflexible, if MNCs had to adopt their mobile campaigns according to the country-specific characteristic of each market.

In the same vein, European countries may differ one from another in their cultural attitude to the mobile handset. According to De Mooij (2004), countries with low to medium scores on uncertainty

avoidance, such as the The Netherlands and the Scandinavian countries, are more likely to embrace a new information technology rapidly than countries with high uncertainty avoidance, such as Italy, France, and Germany.

From a broader perspective, the usage of mobile internet in Japan is necessarily associated with daily commuting from home to work by public transportation. Sending and receiving e-mail in the subway, therefore, is a practical and productive way of killing time, especially if voice calls are prohibited during travel (Baldi and Thaung, 2002). In contrast, many European consumers habitually commute by car, and this provides fewer incentives to access the mobile internet. In addition, a systematic "word-of-mouth" helped the rapid diffusion of i-mode in Japan, especially given the "normative beliefs attributed to significant others (friends, colleagues, or family members) with respect to adopting or continuing to use the technology" (Barnes and Huff, 2003). This may partially explain a high subscription rate (almost 75 per cent) to e-mail newsletters among i-mode users, and this makes acceptance of mobile advertising much easier. However, such a "normative effect" cannot be expected in Europe, because some European countries are relatively more individualist than the others. On the other hand, MNCs may perceive such cultural barriers as controllable, because of the accelerating economic and political unification in the European Union.

Hypotheses

On the basis of the preceding discussions, the following hypotheses were formulated to test the principal thesis of the research:

H1. There is a positive relationship between branding strategy and MNCs' intention to use mobile advertising.

H2. There is a positive relationship between facilitating conditions and MNCs' intention to use mobile advertising.

H3. There is a positive relationship between location-based services and MNCs' intention to use mobile advertising.

H4. There is a negative relationship between service costs and MNCs' intention to use mobile advertising.

H5. There is a negative relationship between regulatory control and MNCs' intention to use mobile advertising.

H6. There is a negative relationship between cultural barriers and MNCs' intention to use mobile advertising.

In an attempt to complement the research hypotheses established above, two additional hypotheses were addressed to identify overall differences between the firms:

H7. Japanese, American and European firms differ significantly in terms of their perceptions of the use of mobile advertising.

H8. Japanese, American and European firms differ significantly in terms of their intention to use mobile advertising.

Methodology

Questionnaire items and measures

In the initial phase of questionnaire preparation, 30 question items were created on the basis of the preceding literature review. This questionnaire was pre-tested with local advertising practitioners in Madrid, because pre-tests are considered a useful method of refining research instruments (Craig and Douglas, 2000). In the light of the pre-tests, ten items were removed because of their low relevancy. As a result, the final version of the questionnaire consists of 20 items, which correspond to the six primary constructs of the model: branding strategy, facilitating conditions, location-based services, service costs, regulatory control, and cultural barriers. Each construct was measured on a multiple-item question based on a five-point semantic differential scale, from 1 (strongly disagree) to 5 (strongly agree). An MNC's intention to use mobile advertising was addressed by using a self-assessment item ("Our company is willing to use mobile advertising in European markets"), which respondents had to assess on a five-point differential scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was originally prepared in English, and was later back-translated into Japanese and Spanish following Craig and Douglas's (2000) methodology.

Multinational corporations

This study aims to interview senior marketing executives of MNCs' subsidiaries operating in European markets. It was decided to choose Spain as a research base to conduct the study, because, in terms of foreign direct investment, operations in Spain have been shown to be the fourth most popular among Japanese, American and European MNCs (Nihon Keizai Shimbun, 2001). Spain was also one of the first countries to adopt i-mode, and the penetration of the mobile handset there is among the highest in Europe (NTT DoCoMo, 2002).

A two-phase procedure was adopted to identify target firms' contact information. The first phase of this procedure consisted of identifying a list of MNCs operating in European markets. In this study, an MNC was defined as a corporation that operates with production or marketing facilities in two or more countries. To this end, three principal databases were used. With regard to Japanese firms, the selection was based on Multinational Companies Database created by the Research Institute for Economics and Business Administration at Kobe University (2003), which includes Japanese companies listed in the first section of Tokyo Stock Exchange with foreign direct investment in more than five countries (Kobe University, 2003). American firms were chosen from The Forbes 500s (Forbes, 2003a). Finally, European firms were chosen from The Forbes International 500 (Forbes,

2003b), because this list provides the nationality of each firm. Regardless of nationality, however, companies associated with aerospace and defence, food and drug retail chains, forestry and fishery, general public utilities, health care providers, heavy machines, industrial goods, local banking and insurance, metals and mining, and oil and gas extraction were excluded. The reasons for this exclusion were as follows: because of the nature of the present study, it was considered unlikely that these industries would use SMS-based advertising campaign for their European operations; and companies focusing mainly on their domestic markets are not likely to have sales or marketing functions in their European subsidiaries. As a result, 54 Japanese, 74 American and 47 European firms were identified.

Next, from this initial screening, the second phase of the procedure attempted to single out firms operating in Spain, using the Multinational Companies Database (Kobe University, 2003), the Directory of American Firms Operating in Foreign Countries (Uniworld, 1999), and the Standard Directory of International Advertisers & Advertising Agencies (LexisNexis, 2003) for Japanese, American and European firms, respectively. As a result, 43 Japanese, 47 American, and 31 European firms' Spanish subsidiaries were identified. The corporate website of each firm was found using major search engines, such as Google, Yahoo!, Altavista, and Terra/Lycos, in order to identify the contact person who was responsible and representative in the marketing division of the subsidiary that operates in Spain.

Telephone survey

Usage of telephone interviewing in international marketing research has increased in recent years. The principal advantage of the telephone survey is the ability to cover a broadly distributed sample without requiring a field staff. It also offers a rapid way to obtain information with a relatively low non-response rate (Craig and Douglas, 2000). In addition, in this survey, control over the item definitions was considered especially important because of the novelty of the research subject. It was expected that interviewers would be able to clarify doubts, or answer any questions that interviewees may have had regarding mobile communications. To this end, four bilingual assistants were employed (two Spanish and two Japanese, all fluent in English). During the second and third week of February, 2004, intensive training was provided so that the assistants could gain sufficient skills and knowledge to conduct the telephone interview.

The actual interviewing was carried out during March, 2004, under the supervision of the researcher. It was established that when the target executives were absent or unavailable for the interview, assistants had to ask for an appointment for the next phone call, or about the availability of the person next in seniority in the marketing department to the target executive. As a result, a total of 53 interviews was conducted, with 27, 16, and ten respondents from, respectively, Japanese, American and European firms. The response rate was 43.8 per cent. Descriptive statistics of the firms are given in Table I.

Characteristics	Classification	Percent
Country of origin	Japan	50.9
	USA	30.2
	EU	18.9
Number of EU countries operated in	1-3 countries	3.8
	4-7 countries	58.4
	Over 7 countries	37.8
Type of product	Non-durable goods	37.8
	Durable goods	50.9
	Service	11.3

Table I.
General characteristics of surveyed firms ($n = 53$)

Findings

Using the data obtained through telephone interviews, statistical analysis was conducted to test the hypotheses, in line with the methodological recommendations of Hair et al. (1998) and Tabachnick and Fidell (2001).

Principal component analysis

To establish convergent reliability, principal component analysis with equamax rotation with Kaiser normalisation was carried out. Equamax is a hybrid between varimax and quartimax that attempts simultaneously to simplify the factors and variables (Tabachnick and Fidell, 2001). The rotation converged in 12 iterations produced a clear-cut six-factor solution with a cut-off value of .50 (Table II). Only factors with eigenvalue greater than 1 were retained. It should be recognised that the proposed construct, service costs, was merged into a mixed construct, security and costs. However, because of the exploratory nature of the study, it was considered acceptable to use this six-factor solution for the subsequent analysis.

The extracted factors explain almost 70 per cent (68.6 per cent) of the total variance, and the level of loading is consistently high across the six factors. This indicates that, despite the small sample size, the data exhibit a reasonable stability in terms of parameter estimates. Factor scores were retained as variables with the Anderson-Rubin method to minimise the level of multicollinearity, for the use of regression analysis. The reliability was calculated with Cronbach's alpha for each construct. As shown in Table II, the scores range from .60 to .85, exceeding a cut-off point of .60 suggested by Robinson et al. (1991). Given the exploratory nature of the measurement scheme, the reliability coefficients are considered to be satisfactory for the purpose of the present study.

Hierarchical regression analysis

Hierarchical regression analysis was performed in six steps to empirically test the hypotheses. Each of six independent variable (i.e., factor scores) was regressed on the dependent variable, "MNCs'

intention to use mobile advertising", in order of their expected contributions. The Durbin-Watson test statistic was approximately 2, indicating that the adjacent residuals are uncorrelated.

Furthermore, according to estimations of the histogram of standardised residuals, the normal probability plot, and the scatter plot of standardised residuals against standardised predicted values, the principal three assumptions of multiple regression analysis, respectively, normality, linearity, and homoscedasticity between the predictor variables and errors of prediction, were satisfactorily met (Tabachnick and Fidell, 2001). The results of the analysis are shown in Table III.

By using sequential procedure, the significance of the addition of each independent variable to the previous equation is indicated by the F-value as follows:

- (1) The equation starts with branding strategies, resulting in a significant R-square.
- (2) After step 1, with facilitating conditions in the equation, R-square substantially increased.
- (3) After step 2, the addition of location-based services had no significant effect on the dependent variable of multinationals' intention to use mobile advertising.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
<i>X6: Cultural barriers (eigenvalue = 1.56, variance = 8.66. alpha = 0.72)</i>						
The use of mobile advertising across markets will be limited by linguistic differences ^a						0.820
Within the next decade, mobile advertising will overcome cultural differences in European markets						0.584
Notes: Extraction method: principal component analysis. Rotation method: equamax with Kaiser normalization (rotation converged in 12 iterations). All items were measured on a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). ^a Items were reverse coded						

Predictor variables		Standardised β					
		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
X1	Branding strategy	0.553**	0.553**	0.553**	0.553**	0.553**	0.553**
X2	Facilitating conditions		0.325*	0.325*	0.325*	0.325*	0.325*
X3	Location-based services			0.023	0.023	0.023	0.023
X4	Security and costs				-0.397**	-0.397**	-0.397**
X5	Regulatory control					0.125	0.125
X6	Cultural barriers						-0.115
R^2		0.306	0.412	0.412	0.570	0.585	0.598
ΔR^2		0.306	0.106	0.001	0.157	0.016	0.013
ΔF		22.469	8.987	0.045	17.562	1.771	1.509
Notes: *Significant at $p < 0.05$; ** significant at $p < 0.001$							

(4) After step 3, with security and costs added to the equation, the model exhibited a substantial and significant increment in R-square.

(5) After step 4, the addition of regulatory control led to no significant increase in R-square.

(6) Finally, after step 5, with cultural barriers added to the equation, the prediction of the dependent variables produced no significant improvement in R-square.

H1 addresses the importance of branding strategy, and proposes that it is directly and positively related to the MNCs' intention to use mobile advertising. The results of the hierarchical regression analysis indicate a significant relationship between the two variables. H1 was therefore supported.

H2 entails direct and positive association between facilitating conditions and the intention to use mobile advertising. The findings show the relationship between the two variables was indeed significant in a predicted direction. This lends support to H2.

H3 predicts the significant and positive contribution of location-based services to the MNCs' intention to use mobile advertising. However, the regression model indicates no significant association. Thus, H3 was rejected.

H4 asks whether service costs negatively affect the MNCs' intention to use mobile advertising. However, as previously noted, the factor analysis extracted the items into a mixed construct, security and costs. In the regression model, this variable makes the second highest contribution to the dependent variable. Therefore, H4 was only partially supported.

H5 is related to the effect of regulatory control, which significantly and negatively affects the dependent variable. The results show no significant association, which leads to a rejection of H5.

Finally, the negative influence of cultural barriers on the dependent variable was addressed in H6. As can be clearly seen, the contribution of the variable in the final model was not significant. Therefore, H6 was rejected.

Multivariate discriminant analysis

Next, a multivariate discriminant analysis was employed to test H7, which relates to the significant differences between Japanese, American, and European firms in their perceptions of mobile advertising. The discriminant analysis is appropriate because the MNCs' country of origin is predicted from a set of predictors, which are the factor scores extracted in the preceding analysis. In addition, as a discriminant analysis is typically "a one-way analysis", unequal sample sizes in groups are not considered problematic (Tabachnick and Fidell, 2001). Tests of the skewness and kurtosis of the variables, Box's M test, and levels of Tolerance indicate no evidence of violation of the basic assumptions of discriminant analysis: normality, equality of variance-covariance matrices, and absence of multicollinearity, respectively.

As shown in Table IV, two canonical discriminant functions were both statistically significant at $p < 0.001$, and explain 100 per cent of the variance.

Highest pooled within-groups correlations between predictor variables and canonical discriminant functions were found in: branding strategies and regulatory control in Function 1; and facilitating conditions, security and costs, and cultural barriers in Function 2. Location-based services were statistically insignificant at $p < 0.05$, and, thus, excluded from discriminant function analysis. The resulted centroids of three origins of the MNCs were clearly separated in the territorial map (Figure 2).

Predictor variables	Correlation with discriminant functions	
	Function 1	Function 2
Branding strategy**	0.400	0.188
Facilitating conditions*	0.010	0.395
Location-based services	0.061	0.354
Security and costs*	-0.260	-0.284
Regulatory control*	364	-0.141
Cultural barriers**	0.268	-0.505
<i>Statistics</i>		
Eigenvalue	1.98	0.82
Percentage of variance	70.60	29.40
Canonical correlation	0.82	0.67
Wilks' Lambda	0.18**	0.55**
Chi-square (df)	80.29 (12)	28.48 (5)

Table IV. Function structure matrix of discriminant analysis

Notes: Pooled within-groups correlations between discriminating variables and standardised canonical discriminant functions. Variables ordered by absolute size of correlation within function. Bold figures represent largest absolute correlation between each variable and any discriminant function. * Significant at $p < 0.05$; **significant at $p < 0.001$

Furthermore, the classification table indicates that almost 93 per cent of the cases in the sample were correctly classified by the canonical discriminant functions, which is substantially higher than the random chance rate of 38.6 per cent (Table V). Although the sample was not validated with calibration sample because of its small size, the difference between the discriminant classification rate and the random chance rate was substantial. This leads to the conclusion that the American, European and Japanese firms were statistically classifiable according to their "country of origin" by the discriminant functions obtained from the data. Thus, H7 was supported.

Lastly, H8 examines whether there are significant differences among the MNCs in terms of their intention to use mobile advertising. As seen in Table VI, the mean values of the three countries are statistically distinct at $p < 0.0001$. American firms exhibit the strongest intention to use mobile advertising, while Japanese firms show the weakest intention. This rings true for H8.

The results of hypotheses testing are summarized in Table VII.

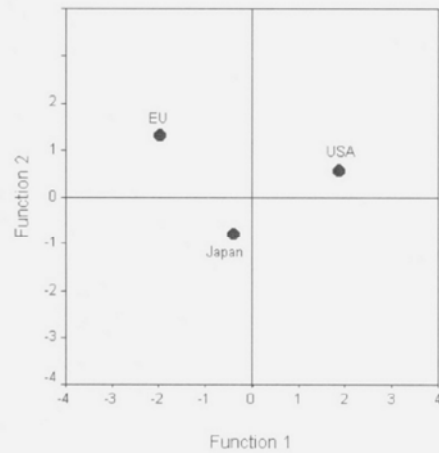


Figure 2.
Centroids of three origins
of the MNCs

Original count	Country	Predicted Group Membership						Total	
		Japan		USA		EU		<i>n</i>	%
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	Japan	25	92.6	0	0	2	7.4	27	100.0
	USA	1	6.3	15	93.8	0	0	16	100.0
	EU	1	10.0	0	0	9	90.0	10	100.0

Notes: Percentage of correctly classified groups: 92.5 per cent; random chance rate: 38.6 per cent

Table V.
Classification table

Limitations

In the attempt to provide a more objective discussion, several important limitations of this study should be recognised. First, because the number of responses used in this study was small, any simple generalisation should be avoided. However, the present study was undertaken in full awareness of the difficulties inherent in any attempt to make quantitative statistical inference about populations from small samples, especially given an insufficient number of observations per predictor variable. Therefore, the findings of this study must be interpreted as an initial response from the practitioners in charge of European markets. Second, while the use of telephone surveys is a practical form of data collection, it did mean that interviews had to be short. In addition, because the target population was upper management, some resistance was encountered. In future, prior notification and requesting an appointment would reduce such resistance. Third, the basic assumption of this study was that the executives involved in Spanish operations would be fully knowledgeable of their firm's operations in other European countries. However, the responses of executives may have been based on their experience of local operations, which may differ from general perceptions at the MNCs' central offices. In addition, the nationality of the executives was not established, so the respondents may have been foreign expatriates or locally recruited Spaniards. Thus, future efforts should be made to identify contact persons or senior executives at MNCs' European headquarters to conduct a second-round survey. Fourth, as reported in the Methodology, the response rate of American and European firms was low, and response bias from these companies may not have been factored out. Many of these firms refused to respond to our survey, because that is their official company policy, given the increasing number of questionnaires they receive. Lastly,

the analysis did not include the results regarding the actual use of mobile advertising by the MNCs. In the original questionnaire, this question was included as a categorical variable, according to the number of countries in which the MNC used mobile advertising. However, as the survey continued, interviewees frequently declined to respond because they lacked specific information. This was inevitable because no prior notification had been sent. Therefore, it was decided to drop this question item from the final analysis.

	Country	Mean	SD	N	F
Table VI. ANOVA for MNCs' intention to use mobile advertising	Japan	1.60	0.893	27	10.151**
	USA	3.25	1.125	16	
	EU	2.20	1.751	10	
	Total	2.21	1.349	53	
	Notes: **Significant at $p < 0.0001$				

	Hypotheses	Results
Table VII. Summary of hypotheses testing	H1. There is a positive relationship between branding strategy and MNCs' intention to use mobile advertising	Supported
	H2. There is a positive relationship between facilitating conditions and MNCs' intention to use mobile advertising	Supported
	H3. There is a positive relationship between location-based services and MNCs' intention to use mobile advertising	Rejected
	H4. There is a negative relationship between service costs and MNCs' intention to use mobile advertising	Partially supported
	H5. There is a negative relationship between regulatory control and MNCs' intention to use mobile advertising	Rejected
	H6. There is a negative relationship between cultural barriers and MNCs' intention to use mobile advertising	Rejected
	H7. Japanese, American and European firms significantly differ in terms of their perceptions on the use of mobile advertising	Supported
	H8. Japanese, American and European firms significantly differ in terms of their intention to use mobile advertising	Supported

Discussion

This study aims at identifying MNCs' principal perceptions of SMS-based push-type mobile advertising and their intention to use it. On the basis of the data obtained from 53 MNCs, our principal propositions were tested by univariate and multivariate analysis. The results were mixed: only the half of eight hypotheses gained empirical support.

The hierarchical regression analysis identified branding strategy, facilitating conditions, and security and costs as the three primary predictors influencing MNCs' intention to use mobile advertising. The contribution of branding strategy in particular is substantial (standardized beta = 0.553), indicating that MNCs are likely to perceive mobile advertising as an effective branding tool to increase brand awareness and image. Also, technological infrastructure and the availability of sophisticated mobile handsets are prerequisites for mobile marketing. As expected, security concerns and unfavourable

pricing systems negatively affect the MNCs' intention to use mobile advertising. On the other hand, the contributions of location-based services, regulatory control, and cultural barriers are not only statistically insignificant, but also trivial in terms of the coefficient magnitude. One reason why location-based services were not identified as a significant factor was that the GPS system is not as widespread in Europe as it is in Japan. In addition, many Scandinavian firms, leaders of sophisticated mobile internet service practitioners, were not included in the study. Admitting the dangers of simple generalisation, the findings of this study may imply that MNCs are concerned to a lesser extent with regulatory and cultural impediments in adopting mobile advertising.

The discriminant analysis indicates that Japanese, American and European firms demonstrate different levels of perceptions on the six proposed factors. Again, only location-based services were not considered as a statistically significant discriminator. A further analysis of centroids plot demonstrates that Function 1 (combined positive effects of branding strategy and regulatory control) clearly distinguishes between American and European firms, in that the former are more affected by such positive effects. Japanese firms are in between. In contrast, Function 2 (combined negative effects of security and costs and cultural barriers offsetting a positive effect of facilitating conditions) clearly separates European and Japanese firms, with the former less concerned with such negative effects. American firms are between the other two, but closer to their European counterparts.

With respect to the intention to use mobile advertising, the Japanese firms show the least motivation. This is somewhat surprising, and contrary to our expectation. Perhaps, despite their advantage in i-mode experience, Japanese firms may feel disadvantaged in foreign markets because of obvious cultural and linguistic problems. This is consistent with the discriminant function analysis: the Japanese firms exhibit more apprehensions regarding cultural barriers, security, and costs. In contrast, the American samples have the most positive attitude towards the usage of mobile advertising. This is consistent with the previous observation in the discriminant analysis: the American firms value most highly the branding effectiveness of mobile advertising.

These findings seem to be consistent with our conceptual framework, in that SMS-based mobile advertising adoption can be examined with respect to the two main determinants of the adoption decision: managerial and environmental factors. By and large, the findings of this study provide modest but solid evidence that more and more firms are positioning SMS-based campaigns as an effective branding medium in their European operations. Also, the firms are likely to perceive facilitating conditions, and security and cost factors, as the main obstacles to be overcome. Given increasing concerns over privacy and service costs in European markets, this interpretation seems to make very practical sense.

One implication of SMS-based campaign as a branding medium can be related to the use of integrated marketing communications (IMC). That is, it seems reasonable to posit that, if the firm conceptualises a new communication technology as a significant part of IMC, it would be more

likely to incorporate it as an effective marketing device (Duncan, 2002). In this vein, the literature suggests that the utilisation of IMC is substantially higher among American firms than their British counterparts, while time and attention devoted to IMC is much greater in American firms than in Japanese ones. The fact that American firms exhibit more positive perceptions toward mobile branding is consistent with recent industry reports; Kellogg's launched an SMS campaign to tie in with offline advertising for its Corn Flakes brand in India (Media Asia, 2004); and a new brand of Kentucky Fried Chicken (KFC), Yum China, promotes its brand image by sending SMS with a uniquely coded "m-coupons", which enable customers to earn further discounts by accessing KFC regular website (Media Asia, 2003).

In this light, Tharp and Jeong (2001) provide an insightful observation on the global network communications agency. They contend that the advertising agency's perspective on IMC seems more relevant, because it is unlikely for MNCs to make such technical decisions as the adoption and planning of mobile-based campaigns. Tharp and Jeong argue that "Global clients want One-stop access' and global planning and implementation abilities from their agency partners", and that agencies are particularly helpful for predicting consumer characteristics in new markets and new media. In addition, larger agencies are expanding their service portfolios horizontally into more specialised expertise, by merging interactive advertising, strategic brand planning, and direct marketing (Tharp and Jeong, 2001). This implies that mobile advertising agencies and mobile content providers may have been consolidated by such large agency networks. Therefore, the presence in Europe of US-based multinational agencies, such as Omnicom Group (which includes BBDO, DDB Needham, TBWA, etc.) and Interpublic Group (which includes Ammirati Puris Lintas, The Lowe Group, McCann-Erickson, etc.) may have substantially influenced the perceptions of American firms.

On the other hand, Japanese firms tend to use their national agencies for almost all operations, including overseas regions. However, while Japanese agencies are very strong at home, their presence in international markets has been very weak. For example, Dentsu (the largest advertising agency in Japan) enjoys as much as 25 per cent market share in Japan, including about 40 per cent of the lucrative television market, whereas it still earns only 6 per cent of its total sales overseas (Layne, 2003).

As far as European firms are concerned, any generalisation should be avoided, because of the small sample size, as indicated previously in the limitations. However, according to recent press reports, there seems to exist some evidence that UK firms may be positioning the mobile medium in conjunction with their media mix strategy, which may well be a part of IMC. For example, Kelleher reports campaigns, provided by Cadbury Schweppes, Sky, Miss World, GMTV and The Observer, as recent examples of the use of SMS "as a direct response mechanism working alongside press and TV" (Kelleher, 2003). Therefore, a logical extension in future research would be to include a

question to address how MNCs perceive the mobile in their media mix strategy, along with the branding issue.

Interesting observations can be drawn from the hypotheses that did not gain sufficient support in this study. With regard to the location-based services, our results may be associated with the low usage of GPS-enabled mobile handsets in Europe. One industry report provides a key explanation for this aspect:

A lack of clear user demand and the recent overspend of the European network operators on 3G licenses (with slower prospects of investment recovery) contributed to the current slowdown in location-based service development. The financial status of many (not all) European telecoms is poor, with limited capacity for further investment in LBS. However, handset-based solutions offer lower investment costs in Europe and availability of GSM/GPS phones in the USA will likely create a spill-over effect into Europe, which exclusively uses GSM technology. We believe that the European market will take longer to adopt GPS-enabled phones, and will not do so before 2004/5 (Styles et al., 2004).

Also, regulatory control was not perceived as a significant predictor in our regression model. This result may be a reflection of the slow but still accelerating deregulation process in the European advertising industry (Cunningham, 1999). However, privacy is a serious issue for European consumers, and will need to be examined further in the future. Similarly, the insignificant association of cultural barriers was somehow surprising, because the literature suggests a high diversity of new information technology among European countries (De Mooij, 2004). One possible interpretation is that there is an increasing number of MNCs that perceive the existence of global consumer segments across borders, and European markets may have been seen as relatively homogeneous. However, in future an effort should be made to explore the effect of cultural factors, along with regulatory control, because these results may be caused simply by a lack of valid observations.

Finally, the findings of the present study provide us with a clear evidence of MNCs' positive perceptions on SMS-based mobile advertising campaigns. This strategic move is consistent with the increasing importance of mobile-based electronic commerce (m-commerce), which has been predicted to climb to euro32.5 billion by 2009, excluding mobile entertainment (Phillips, 2004b). Although the present market for m-commerce is limited to mobile entertainment (ring-tones, games, wallpaper, gambling and so on), new services, such as theatre and movie reservations, electronic payment systems for retail, railway, and airline ticket purchases have already emerged in Japan, in the form of NTT DoCoMo's "mobile wallet" and FeliCa (NTT DoCoMo, 2004). Therefore, European telecom companies may direct their strategies towards more advanced transactional functions, and this may drastically increase advertising and marketing opportunities for MNCs operating in Europe. In this light, a promising future may be opening for MNCs operating in Europe, if they can use mobile-based advertising campaigns in conjunction with these new services.

Conclusions

The findings of this study imply that MNCs' adoption of mobile advertising remains in its infancy, but that it may begin to bloom by employing one of the most important concepts in contemporary marketing: branding. Perhaps, the key to understanding differences in Japanese, American and European MNCs' mobile advertising adoption lies in the extent to which they perceive it as an effective branding medium. To this question, American firms responded most positively, unlike their Japanese counterparts.

Despite the advantage of i-mode experience at home, Japanese firms are the least willing to adopt mobile advertising in Europe. This paradox may partially reflect their heavy dependency on Japanese advertising agencies, whose overseas operations remain very weak. By contrast, American firms have the advantage of a greater presence of US-based agencies on the European continent. Perhaps, despite the lower penetration of mobile internet at home, American firms may have taken into account the availability of such agencies, which are capable of coordinating specialized local media expertise with headquarters' marketing policy.

In this vein, MNCs should consider mobile advertising in a context of effective media mix planning. As demonstrated by the example of McDonald's, one of the most viable ways to employ mobile advertising is in combination with print, television or fixed internet media. Such integrated media mix could not only reduce consumer resistance, but also increase synergic effects. That is, as rapid technological transition reduces the barriers of facilitating conditions and service costs, MNCs' efforts should focus on a potential of this unique medium, which complements integrated marketing communications in global markets.

Sidebar

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