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# What is SMS advertising and why do multinationals adopt it? Answers from an empirical study in European markets

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## Abstract

This study examines the factors associated with the intention of multinational corporations operating in Europe to implement SMS advertising. It hypothesizes that managerial intentions to use this medium are related to the perceptions of four factors: (1) the ability to build brand image; (2) the ability to use location based marketing; (3) the perceptions of how well consumers accept SMS advertising; and (4) the perceptions of the technological infrastructure. Results support the notion that managers from the European Union, Japan, and the United States will be more likely to adopt SMS advertising if they perceive it has the ability to help build the brand. They are also likely to perceive information security as a threat to the ability to “push” the product through the wireless channel. Results also suggest that managers give significant weight to the penetration of the technological infrastructure needed to run the ads through SMS based messaging service.

*Keywords:* Europe; Internet; Mobile; Multinational corporations; SMS (short message services)

## 1. Introduction

The Internet-enabled mobile phone has proliferated rapidly in many markets. Following the first release of WAP (wireless application protocol) in 1998, firms began to send news alerts and location-sensitive ads to mobile users (Sadeh, 2002). Because of the very personal nature of the mobile phone, the use of short message services (SMS) and multimedia messaging services (MMS) for marketing purposes has drastically increased in many parts of the world. For example, a report issued by Portio Research indicates that the annual sales revenue of the SMS market will reach \$50 billion worldwide by 2010, with some 2.38 trillion text messages sent (Halett, 2005). Although MMS is currently used less, it seems clear that a rapid advancement of mobile technology will accelerate the use of visuals, videos, and music in the exchange of messages in the near future. Table 1 summarizes key terms of mobile communication technology.

Some marketers and agencies are taking advantage of this growth by incorporating SMS advertising as part of an integrated marketing communications (IMC) strategy. According to a recent survey, 36% of marketers operating in Europe have used SMS advertising for more than one year, while an additional 39% had begun to use it in the previous six to twelve months (Cutitta, 2005). Recent industry reports indicate that SMS usage in the U.S. market has been catching up with the worldwide growth (eMarketer, 2005). Combined mobile advertising and marketing expenditures are expected to have reached \$115 million and \$253 million, respectively, by 2005, in conservative and aggressive scenarios in the United States. Both scenarios forecast that these figures will double by 2008 (eMarketer, 2005). By 2009, the aggregate growth in the United States and Europe will exceed \$1 billion, with the increasing availability of multimedia content (TMC Net, 2006). Although these numbers are modest compared to major media outlets, such as television, radio, and the Internet, they are representative of a trend toward growth for this new medium.

According to a European survey, 56%, 55%, and 46% of mobile users received SMS ads in Germany, the UK, and Spain, respectively, in 2003 (van Tongeren et al., 2004). Although the figures for Italy and France were somewhat lower, aggregate data

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show that 47% of “Europeans” responded positively to receiving SMS advertising messages. This suggests that the acceptance of SMS advertising is beginning to grow and may have the potential to become an important new mode of interactive marketing communication.

However, academic research on mobile advertising, unlike that on Internet advertising, has seen only modest growth, perhaps because the medium is new and uncertainty remains as to how it will evolve. This makes it difficult to obtain a reliable and valid dataset to examine consumer and firm adoption behavior regarding mobile advertising. Hence, there is a strong need for empirical research in this area.

Here we examine the intention of multinational firms to adopt SMS-based advertising. The firms have subsidiaries located in Spain, including companies headquartered in the European Union, Japan, and the United States. The sample has the advantage of including perspectives from MNCs headquartered in the largest economic regions of the world—Asia, Europe, and North America. The study’s primary objectives are to (1) identify the factors influencing the firms’ managerial intention to adopt SMS advertising and (2) test a structural relationship between these factors and managerial intention to use SMS advertising. To this end, we interview senior executives of MNCs operating in European markets.

In the following sections, we will first define mobile advertising and the associated “push” and “pull” strategies. Then we identify four constructs that may influence firms’ managerial intention to adopt mobile advertising, and develop four hypotheses based on prior literature. Next, we explain our methodology in detail and describe the results, then discuss the managerial and theoretical implications of the study’s findings. In closing, we set out our conclusions and identify the limitations of the study.

## 2. Background and definitions

For definitions associated with mobile-based advertising, we adopt classifications that are derived from general principles of direct marketing, namely the “push-type” and “pull-type” strategies. SMS mobile advertising has typically been considered an application of a *push strategy* in the mobile environment (Barwise and Strong, 2002), meaning that information and marketing activities flow from the producer to the consumer (Spiller and Baier, 2005). In a push campaign, the marketer takes the initiative and sends messages directly to consumer regardless of whether the consumer has agreed to receive the message. Pull strategies involve sending information that is requested by the consumer (Barwise and Strong 2002).

Historically, push strategies have been associated with efforts to boost sales in the short term. In fact, most early mobile messages were promotional in nature, focusing on inducing an immediate purchase. In addition, firms that employ mobile campaigns can attract consumer attention and produce consumer responses to a much greater degree than through other direct marketing channels because they can engage in one-to-one dialogue with customers (Kavassalis et al., 2003).

Notably absent from many discussions of mobile commerce, or “m-commerce,” is the notion that brand building can occur

Table 1  
Key mobile advertising terms

Terms	Definitions
3G	Third-generation mobile communication systems. Key features of 3G systems include a high degree of commonality of design worldwide, worldwide roaming capability, support for a wide range of Internet and multimedia applications and services, and data rates in excess of 144 kbps.
Alert	Short message sent to mobile users to keep them updated about the news, weather, traffic conditions, etc.
FeliCa	A multi-functional electronic wallet with contactless electronic IC chips developed by Sony. In combination with NTT DoCoMo’s “i-appli” (Java-based applications), users can use FeliCa for diverse transactions, such as commuter pass, electronic money, membership card, and movie tickets, among others, simply by waving their phone in front of enabled sensors.
GPS	Global Positioning System. A U.S. government-owned technology based on the use of three or more satellites (triangulation) to provide 24-hour positioning information that indicates the precise location of any compatible receiver unit.
i-mode	NTT DoCoMo’s mobile Internet service. Its portal manages a critical mass of numerous “official” i-mode sites, including e-mail, transaction services such as ticket reservations, banking, and shopping, as well as infotainment and directory service.
MMS	Multimedia Messaging Services. A standard for telephony messaging systems that allow sending messages that include multimedia objects, such as images, audio, video, or rich text, in addition to text messages.
SMS	Short Message Service. A service for sending messages of up to 160 characters to mobile phones.
UMTS	Universal Mobile Telecommunications System. UMTS/WCDMA is the 3G wideband standard jointly developed by Europe and Japan.
WAP	Wireless Applications Protocol. De facto wireless Internet standard capable of running on top of almost any bearer service.
WCDMA	Wideband Code Division Multiple Access. Essentially the same 3G standard as UMTS.

Source: Based on Okazaki (2006), Sadeh (2002), NTT DoCoMo (2003), etc.

effectively in conjunction with the use of a push strategy. M-commerce provides a unique environment in which the firm’s message may facilitate the consumer going to a website, sending a text message, seeking out information from another medium, or even making a purchase. The possibility of these actions makes it more likely to build the brand in conjunction with push promotions. The fundamental premise of this paper is that the ability to brand a product is a primary driver of the managerial intention of large firms to use SMS advertising in m-commerce.

## 3. SMS advertising

One of the first mobile communications technologies to be applied in marketing, SMS is a new technological buzzword for transmitting business-to-customer messages to mobile phones, pagers, and personal data assistants (PDAs). SMS advertising is now a substantial source of revenue for many operators, particularly because it has been incorporated in the “instant messaging culture” among teenagers and young professionals (Sadeh, 2002). Table 2 summarizes recent advances in SMS technology.

One key advantage of SMS is that it can capitalize on the “always on” trend, in which people have access to the Internet virtually the entire day. SMS also allows for more interactivity with the consumer than traditional media. Many firms deliver alerts,

Table 2  
Advances in SMS and its related technology

Year	Advances
1992	The first commercial short message was sent on December 3, 1992, by Neil Papworth of Sema Group from a personal computer to Richard Jarvis of <i>Vodafone</i> on the Vodafone GSM network in the UK.
1994	Nokia began featuring the classical work “Gran Vals” on its wireless phones, which became known as its standard ring-tone. Ring-tone was converted into one of the most successful and profitable mobile tools in combination with SMS.
Late 1990s	The rise of SMS (Short Message Service) advertising began in Europe and some parts of Asia when businesses started to collect mobile phone numbers and send off commercial content.
1999	<i>NTT DoCoMo</i> developed <i>i-mode</i> , which includes a SMS-equivalent service, <i>short mail</i> .
2000	As firms began to send out massive SMS message campaigns, users were informed that there would be a fee for each SMS sent. This led to an immediate and protracted decline in SMS usage.
2001	Nokia began a new service for ring-tones that allow users to change the way their mobile phone rang, using its smart messaging protocol that was built on binary SMS rather than the standard text SMS.
2002	The first MMS-capable phones started to appear. Different manufacturers introduced MMS technologies in different ways. For example, Nokia included MMS directly into its latest phones, while Sony Ericsson introduced phones with EMS (Enhanced Messaging Service). EMS is a halfway technology between SMS and MMS, providing some of the features of MMS (e.g. formatted text, simple pictures, simple audio such as ring-tones, and even some animation), and was designed to work with existing networks.
2003	News service providers such as the <i>BBC</i> have had a simple SMS-based, mobile news service available for some time. <i>Vodafone UK</i> and <i>Fauna &amp; Flora International</i> began to offer a full-featured website providing a wide variety of conservation news stories, discussion boards, field diaries, etc. ( <i>wildlive!</i> ).
2006	As of February 2006, SMS-based mobile marketing is still the most popular method in the industry, with several hundred million advertising SMS messages sent out every month in Europe alone.

Source: *NTT DoCoMo* (2003), *Sadeh* (2002), *Trends* (2006), etc.

news updates, traffic information, or promotional coupons via SMS. In the future, GPS (Global Positioning System) technology may also be incorporated in SMS advertising for those who seek timely information at the right place. For example, in Japan, agencies are conducting experimental transmission of location-based restaurant information to public transportation users (*D2 Communications*, 2005). In this experiment, when users inserted their train pass at the boarding station, the information on their commuting route was sent to the mobile company, which in turn transmitted promotional messages of restaurants located near their destination.

Empirical studies from both academics and practitioners provide insight on some aspects of SMS advertising. In a pioneering study, *Barwise and Strong* (2002) conduct a trial of permission-based SMS advertising in the UK. On recruitment, respondents were paid cash incentives and received more than 100 messages in the six-week trial period. Almost all respondents were satisfied or very satisfied. The study finds that 81% of them had read all messages, 63% responded or took action, and 17% forwarded at least one message. Surprisingly, as many as 84% of respondents were likely to recommend SMS advertising to their friends, while 24% agreed to receive it regularly. Only 7% were likely to abandon the service. Similarly, sporadic industry surveys

report a rather optimistic blueprint. For example, an experimental survey conducted by Ericsson indicates that 60% of consumers liked receiving mobile advertising, while *Quios* finds that the level of recognition of mobile advertising was surprisingly high: 79% of participants recalled 60% of the advertising (*Barnes*, 2002).

In contrast, a study conducted by *Tsang, Ho, and Liang* (2004) evinces more cautious attitudes toward mobile advertising among Taiwanese. Developing a structural model that includes both utilitarian and experiential factors affecting consumer attitudes toward permission-based SMS advertising, the researchers find that (1) consumers generally have negative attitudes toward mobile advertising unless they have specifically consented to it, and (2) consumer attitudes are directly related to consumer behavior. In Australia, *Marinova et al.* (2002) report the results of a similar study in a hotel setting. They find that personalized e-mail advertising exhibits negative effects on customer acceptance, producing “opt-out” requests instead of website visits.

#### 4. Conceptual framework and hypotheses

Given the relative paucity of mobile marketing literature, we follow a discovery-oriented approach, as suggested by *Deshpandé* (1983), combining insights from in-depth interviews with a comprehensive review of the literature on e-commerce, new technology adoption, and information management, as well as insights from existing studies. To develop hypotheses, we conduct a literature review designed to identify factors associated with the intention to adopt mobile advertising. Through this process we find that there are four primary constructs that may be associated with a firm’s intention to adopt the use of mobile advertising: (1) the ability to build the brand; (2) the ability to engage in location-based marketing; (3) the overall concerns regarding privacy and security of SMS messages; and (4) the ability of the technological environment to facilitate SMS advertising.

The conceptual basis for our hypotheses generally does not vary by country. Therefore, we do not make country-specific predictions, but rather hypothesize how a factor affects the motivation to adopt SMS advertising. *Fig. 1* shows our proposed model, and the hypotheses are set out in the following sections.

##### 4.1. Branding building effect

Mounting evidence indicates that mobile advertising has considerable potential to contribute to brand building. Research on the Internet has shown that the perceived level of interactivity is a major determinant of a user’s attitude toward a website, and is even more important than the number of features on a particular site (*McMillan et al.*, 2003). Studies also link the presence of entertaining content to effectiveness. For example, *Raney et al.* (2003) find that including a mini-movie on an automotive website is the most effective method of boosting purchase intention. These results suggest that approaches that are both interactive and entertaining create excitement and have a spillover effect on the brand, regardless of whether a push or pull strategy is employed. *Chiagouris and Wansley* (2000) further assert that the Internet’s most stunning feature is its ability to build brands with customers and prospects. As with the Internet, SMS advertising can introduce



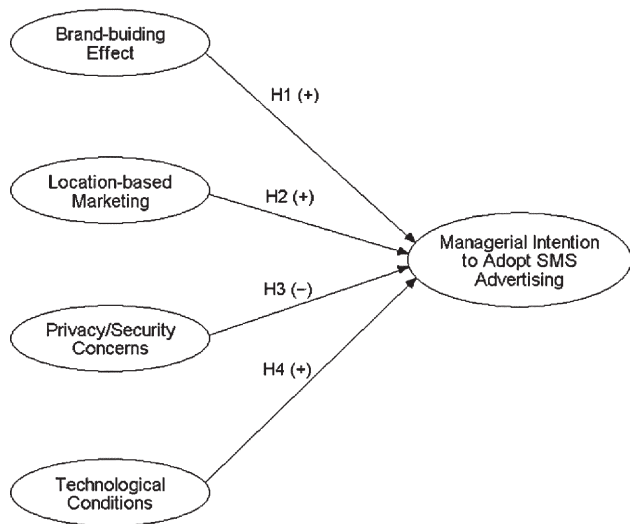


Fig. 1. Research model.

a high level of interactivity, as is the case when a consumer participates in a game or is directed to a website.

In an environment where building brands is a fundamental goal for many managers, the need to build brand equity is likely to be at the center of many marketing decisions. For example, a study of chief marketing officers by Goldman Sachs finds that 56.7% of every marketing dollar was targeted toward branding, and that building brand awareness is by far the most commonly cited answer (55% of respondents) to a question about the biggest marketing challenges that firms face (Ehrlick and Fanelli, 2004). Marketers increasingly think in terms of how advertising contributes to brand equity. Keller and Lehmann's (2003) brand value chain addresses how investments in marketing programs, including advertising, can change the consumer mindset in terms of brand awareness, associations, and/or attitudes toward the product, leading to a sense of attachment and an intention to purchase. In the long run, these positive changes in customer mindsets can lead to improved market performance and shareholder value.

Given the impact the concept of brand equity has had on the marketing field in recent years, we hypothesize that managers' perceptions of mobile advertising's ability to build a brand will be a fundamental determinant of the intention to use this type of advertising. Thus:

**H1.** Firms' intention to use mobile advertising is positively associated with perceptions of mobile advertising's ability to build the brand.

#### 4.2. Location based marketing

Location-based services, such as the ability to provide features like weather forecasts, restaurant guides, hotel maps, address finders, and traffic updates, have been cited as consumer-friendly features of new media (Barwise and Farley, 2005; Barwise and Strong, 2002; Okazaki, 2004; Pagani, 2004). As Okazaki (2004) notes, advanced technologies, such as FeliCa and Bluetooth, enhance the feasibility of applying GPS technology that will allow advertisers to provide real-time offers to subscribers who are

shopping in a specific store, or driving in close proximity to a retail outlet. Consumers do list location-based services as having considerable appeal (Pagani, 2004), so there is ample reason to believe that companies will take advantage of opportunities to engage in pull strategies. Moreover, there will likely be other effective mechanisms for advertising in conjunction with location-specific messages. It may be that advertising messages specifically linked to locations can be placed effectively, in a manner similar to the practice of Internet search engines. Due to the ability to link search engine ads to specific searches made by consumers, search engine advertising has seen remarkable growth over the past few years (Hedger, 2005).

Because of its potential, we predict that the ability to use location-specific messaging will also drive firms' intention to engage in mobile advertising. Our prediction holds for firms based in the European Union, Japan, and the United States. Thus, we hypothesize:

**H2.** Firms' intention to use mobile advertising is positively associated with their perception of the ability of the medium to allow them to pursue location-based marketing.

#### 4.3. Privacy/security concerns

As several studies observe, the penetration of mobile devices is growing throughout much of the developed world (Barwise and Strong, 2002; Okazaki, 2004; Pagani, 2004). However, the mere ownership of these devices does not guarantee that the consumers will readily accept mobile advertising. In fact, growth in terms of the number of companies using mobile advertising is somewhat modest to date (Barwise and Farley, 2005). Some studies show that getting permission to send messages is a prerequisite of effective mobile advertising (Tezinde et al., 2002). This is especially important given that SPAM/SPIM issues are becoming a serious privacy intrusion, and that electronic bulk emails are often rejected or deleted before they reach customers (Petty, 2003).

Clearly, consumers' privacy concerns are an important issue to be taken into account. Although Barwise and Strong (2002) report high levels of enthusiasm for SMS advertising, the context of the study is one in which the consumer consents to receive the messages. Given heightened levels of privacy concerns, it stands to reason that consumer willingness to opt in to any SMS advertising will be an important criterion for companies to consider in assessing whether to use it. Thus, we hypothesize:

**H3.** Firms' intention to use mobile advertising is negatively associated with perceptions of privacy and security concerns of mobile messaging.

#### 4.4. Technological conditions

A related idea is the extent to which a country's technological environment allows a sufficiently high volume of consumers to adopt the technologies that would allow them to be reached by SMS advertising messages. Clearly, appropriate technology is more available in some countries than in others, a fact that is often determined by level of economic development. As all of the

countries examined here are characterized by high levels of technology available to consumers, as well as a growth in sales of mobile devices, we do not believe there is a basis for predicting differences between the European Union, Japan, and the United States. Thus, based on the availability of appropriate devices and technology, we hypothesize:

**H4.** Firms' intention to use mobile advertising is positively associated with perceptions of the sufficiency of the technological environment.

## 5. Methodology

MNCs are first identified using three different directories. The *Forbes 500* is used for American firms, *Forbes International 500* for European firms (Forbes, 2003), and the *Multinational Companies Database* for Japanese firms (Kobe University, 2003). We exclude companies associated with aerospace and defense, food and drug retail chains, forestry and fishery agencies, general public utilities, health care, heavy machines, industrial goods, local banking and insurance, metals and mining, and oil and gas extraction because it is unlikely that these industries would engage in mobile-based marketing for their European operations. From the list of headquarters in the USA, Europe, and Japan, we found subsidiaries operating in Spain and identified 74 as American, 47 European, and 54 Japanese. We made an effort to contact the most senior managers of the subsidiaries in marketing, sales, or advertising activities, presuming that they possess substantial knowledge of the firms' European operations and marketing strategies.

The structured questionnaire consists of twenty questions. Because of the scarcity of empirical research on mobile advertising, most of the questions are newly developed for this study. Qualitative interviews of agency practitioners conducted by one of the researchers, combined with other prior research, are used to identify the primary factors associated with SMS advertising adoption. Five point Likert-type scales are used for each item. Three constructs, namely, brand-building effect, location-based marketing, and technological conditions are used as reflective measures, in that the latent or unobserved factor affects observable indicators. By contrast, the construct of privacy and security concerns are used as a formative measure because the latent factor is viewed as an effect rather than a cause of indicators.

For our purposes, telephone interviewing is preferred over a mail survey, due to its ability to control item definitions. Such control is especially important because of the novelty of the research subject. The expectation is that interviewers can clarify doubts, or answer any questions from interviewees regarding mobile communications. In addition, a telephone survey enables researchers to cover a broadly distributed sample without requiring a field staff, and offers a rapid way to obtain information with a relatively low non-response rate (Craig and Douglas, 2005).

Four bilingual assistants assisted with translation: two Spanish and two Japanese, all fluent in English. During the second and third week of February 2004, they received intensive training so that

they could gain sufficient skills and knowledge to conduct the telephone interviews. When the target executives were absent or unavailable for the interviews, 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, we report the results of a total of 53 interviews with 27, 16, and 10 respondents from Japanese, American, and European firms, respectively, creating a response rate of 43.8%. The executives may or may not have been native expatriates; we did not ask for their nationality. They were asked to describe overall company policy to mobile advertising adoption in European markets. Of the firms included in the sample, 3.8% operated in one to three EU countries, 58.4% in four to seven EU countries, and 37.8% in more than seven EU countries. Only firms marketing consumer products were included in the sample. By type of product, 37.8% produced durable goods, 59.0% nondurable goods, and 11.8% services.

## 6. Results

### 6.1. Partial least square (PLS)

The proposed model and its associated hypotheses are tested using partial least square (PLS), which was preferred over covariance-based structural equation modeling because it uses a least-squares estimation procedure, thereby avoiding many of the restrictive assumptions such as multivariate normality and residual distributions (Frank and Miller, 1992). In addition, PLS was more appropriate for this study because it is primarily intended for predictive analysis in which (1) the explored problems are complex, (2) theoretical knowledge is scarce, and (3) sample size is small (Chin, 1998; Hulland, 1999). The application of PLS requires a minimum sample size of 30; our sample size of 53 met that requirement. Furthermore, PLS works with measurement models consisting of both formative and reflective items (Haenlein and Kaplan, 2004). In our model, the construct of privacy/security concerns is measured with formative indicators, which were optimally weighted and combined using the PLS algorithm to create latent variable scores (Chin, 1998). The software used was SmartPLS version 2.0 M2 (Hansmann and Ringle, 2004).

Following Hulland's (1999) procedure, we analyze and interpret the PLS model in two stages: the measurement model and the structural model. In the first stage, the measurement model is tested by assessing the validity and the reliability on each of the measures to ensure that only reliable and valid measures of the constructs are used before drawing conclusions about the nature of the construct relationships (Hulland, 1999). In the second stage, the structural model is tested by estimating the paths between the constructs in the model, determining their *t*-values and their statistical significance, which are an indicator of the model's predictive ability.

### 6.2. Measurement model

Our test of the measurement model includes (1) the estimation of individual item reliability and (2) the examination

Table 3  
Construct reliability

Construct	Question items	M	SD	CR
Brand-building effect (reflective measure)	Brand awareness of our products will increase through the utilization of mobile advertising.	2.88	.17	.91
	International corporate awareness of our company in European markets will increase due to mobile advertising. Because of mobile advertising, our brand will improve its image.			
Location-based marketing (reflective measure)	Because of mobile communications, marketers will make use of uniform promotional campaigns in several markets (reverse).	3.40	.22	.70
	Because of mobile communications, marketers will make use of localized campaigns more effectively.			
	To maximize the effectiveness of mobile advertising, "location" is a key factor to consider.			
Privacy/security concerns (formative measure)	Government regulations toward mobile messaging will become more restrictive in the future.	3.24	.22	n.a.
	Mobile advertising will be a primary concern of consumer privacy and security control.			
	Attempts by local governments to control the flow of information within and across their boundaries are becoming a major problem of European marketers.			
Technological conditions (reflective measure)	Current connection speed of mobile Internet is appropriate for our marketing purpose.	3.75	.49	.82
	Technological resources required to use mobile communications are available in most EU countries.			
	Most European consumers have access to mobile handsets with Internet connection.			
Managerial intention (reflective measure)	Our company is willing to use mobile advertising in European markets in the future.	1.88	.47	.72
	Our company is actually considering the use of mobile advertising in European markets.			

Note: CR = composite reliability.

of convergent and discriminant validity of the measures associated with individual constructs.

First, we examine individual reflective-item reliability according to the loadings of the items on their respective constructs. Following the generally accepted recommendation, we retain items higher than .70 (Hair et al., 2006). This purification guideline ensures that there is more shared variance between the construct and its measure than error variance. All items with lower loadings were dropped, except for two items that were components of location-based marketing (.46 and .67). These items appeared to be extremely relevant to the construct definition. Due to the exploratory nature of the study, we deem them to be acceptable.

Next, the convergent validity of reflective measures is assessed using Fornell and Larcker's (1981) composite reliability (CR).

Unlike Cronbach's alpha, which represents a lower bound estimate of international consistency due to its assumption of equal weightings of items, the CR offers a better estimate of variance shared by the respective indicators since it uses the item loadings obtained within the nomological network (Hair et al., 2006). As a benchmark, researchers generally recommend .70 as an appropriate reliability for an exploratory study. As can be seen clearly in Table 3, the CRs for the multiple reflective constructs meet this criterion. The CR for privacy and security concerns are not computed because the construct was a formative measure.

Discriminant validity is the extent to which a construct truly differs from neighboring constructs (Hulland, 1999). This is assessed from the latent constructs correlations matrix, reporting the square roots of the average variance extracted (AVE) along the diagonal. The AVE for privacy and security concerns is not computed because the construct is a formative measure. The correlations between the constructs are reported in the lower left off-diagonal elements in the matrix. Fornell and Larcker (1981) suggest that average variance shared between a construct and its measures should be greater than the variance shared between the construct and other constructs in the model. Thus, discriminant validity is satisfied when the diagonal elements (square root AVE) are greater than the off-diagonal elements in the same row and column. As can be seen from Table 4, this condition is met for all the combinations.

### 6.3. Structural model

The PLS structural model and hypotheses were tested computing path coefficients ( $\beta$ ). According to Chin's (1998) recommendation, a bootstrapping procedure using 500 subsamples is performed. For each path, we compute  $t$ -values and the significance of the structural coefficients. Table 5 shows the path coefficients, their  $t$ -values, and significance levels. In PLS, the model's fit is assessed in terms of (1) the  $\beta$  coefficient significance of each path, and (2) the variance explained ( $R^2$ ) in the endogenous factor, to which we therefore turn our full attention in the following section.

Table 4  
Discriminant validity

	Brand-building effect	Location-based marketing	Privacy/security concerns	Technological conditions
Brand-building effect	<b>.88</b>			
Location-based marketing	.61	<b>.69</b>		
Privacy/security concerns	-.27	-.12	<b>n.a.</b>	
Technological conditions	.28	.24	-.34	<b>.78</b>
Intention to use SMS advertising	.69	.52	-.35	.46

Note: Diagonal elements in bold are the square root of average variance extracted (AVE) between the constructs and their indicators. Off-diagonal elements are correlations between the constructs. n.a. = not applicable.

Table 5  
Structural model results

Hypotheses		$\beta$	<i>t</i> -statistics (bootstrap)	Hypothesis testing
H1: Brand-building effect	→ Managerial intention	.51	11.80***	Supported
H2: Location-based marketing	→ Managerial intention	.14	3.47***	Supported
H3: Privacy/security concern	→ Managerial intention	-.12	2.94**	Supported
H4: Technological conditions	→ Managerial intention	.25	7.29***	Supported

\*\*\*  $p < .001$ , \*\*  $p < .01$ , based on  $t_{(499)}$ , two-tailed test;  $t(.001, 499) = 3.31$ ;  $t(.01, 499) = 2.59$ .

H1 addresses the positive and direct association between brand-building and managerial intention to use SMS advertising. This path is significant at the  $p < .001$  level and shows a strong effect ( $\beta = .51$ ). By contrast, H2, which posits that location-based marketing directly and positively affects managerial intention, turns out to have a more modest effect ( $\beta = .14$ ). As H3 suggests, the path from privacy and security concerns to managerial intention was negative ( $\beta = -.12$ ), but it is only marginally significant. With regard to H4, the effect is positive and somewhat stronger ( $\beta = .25$ ), implying that this construct (sufficiency of technological environment) is the second most influential factor in determining managerial intention. Taken together, all the hypothesized paths received empirical support from our data.

Finally, the  $R^2$  values of the endogenous construct (i.e., managerial intention) is over .58, which indicates that almost 60% of the variance of managerial intention to use SMS advertising is explained by the four proposed exogenous constructs. Given the high percent that is explained ( $R^2$ ) in the endogenous factor, along with the statistical significance of all  $\beta$  coefficients, we thus conclude that our PLS model fits the data very well.

## 7. Discussion

This study examines the factors influencing an MNC's decision to adopt SMS-based mobile advertising in European markets. Based on literature from both academic and industry sources, we hypothesize that four factors are involved: perceptions of the ability to build the brand, location-based services, privacy/security concerns of mobile advertising, and technological conditions. From the use of PLS to estimate the parameters of the proposed model, the empirical results suggest that all four factors are significant drivers of the use of mobile advertising, thus corroborating our basic premise.

The finding of central importance to managers is that the single factor most correlated with the intention to adopt SMS advertising is the perceived ability to build the brand. We note that although the mean score for the brand building effect was modest, it has the highest impact on intention. This may indicate that the current stage of its strategic positioning is somewhat transitional: SMS may face a certain skepticism, but managers' intention to use it may actually be high. Our results are also consistent with our assertion that mobile media provide a greater opportunity to simultaneously send out messages and ask for direct response, all

while helping to build the brand. The ability of mobile advertising, under appropriate conditions (e.g., consumers opting in to receive messages from companies they like), to generate action and excitement can be capitalized on by building brand equity. Moreover, it appears that the managers surveyed subscribe to the idea that building brand equity improves firm performance, as is suggested by Keller and Lehmann (2003).

The significant path between location-specific strategy and managerial intention may be a byproduct of two factors. First, well-known brands of nondurable goods are well represented in our sample, and managers may be more likely to see the advantages of this type of promotion for nondurable goods. Second, though it may not yet be clear to companies how to use these types of strategies effectively, in the European context of this study GPS diffusion has been increasingly popular in European countries. Especially for those countries with imported i-mode technology, GPS has been introduced as one of the optional services for use. Thus, in the future it is possible that GPS can be captured not only as a control device for traffic information but also as a marketing device. Pinpointing a target location, such as a retail outlet or restaurant, may be considered convenient in many European cities whose streets are complex. As the service becomes inexpensive, with the reasonable cost compensating for the relatively large investment in such a data transmission system, technological developments and the creative use of geographic positioning systems may drastically change the way to do business in major European cities.

With respect to technological infrastructure apparently superseding consumer acceptance of mobile advertising, managers are likely to believe that through the use of appropriate promotional techniques consumer acceptance will quickly evolve in the short run. Moreover, some studies already suggest that certain market segments, especially younger consumers, are more prone to accept mobile advertising. These segments may be attractive to advertisers, even if the overall market is somewhat slow in accepting mobile advertising.

As expected, a negative association exists between privacy/security concerns and managerial intention. The senior executives who responded to this survey may already be fully aware of problems associated with privacy issues in mobile-based marketing. This is obviously an important hurdle that needs to be overcome by high-ranking managers as well as front-line sales staff in addressing how to obtain permission through opt-in or opt-out features while pursuing effective customer relationship management.

Given the findings of our study, it is reasonable to conclude that leading MNCs operating in European markets are highly motivated in terms of SMS advertising adoption. The acceptance of all hypothesized factors provides solid evidence regarding perceptions of branding effects, location-based marketing, and technological conditions as positive drivers, and privacy/security concerns as negative factors. In other words, given the growing sophistication of mobile communication technology, and if markets provide sufficient infrastructure for high-speed Internet connection via mobile devices with secure connections and privacy protection, firms are willing to adopt SMS as a branding medium. On the other hand, the costs and speed associated with



Web-enabled mobile services provide a key to open this possibility. If a given market does not offer sufficient conditions, firms will be unlikely to adopt SMS, since they will assume that consumers' rejection or opt-out is more likely.

Finally, our overall findings do appear to indicate that at least some advertisers hope to use SMS both for direct response and as a brand-building device. How these objectives can be achieved simultaneously warrants investigation. For many firms, generating brand-building ads is usually the main objective. This objective can be executed effectively only when two strategies are combined, so that (1) firms transmit timely and relevant information and (2) customers are given a chance to seek the desired information in response to such ads. In this light, SMS advertising may be viewed as a practical alternative that is beginning to gain in popularity, at least in some contexts.

## 8. Limitations and future research

To make our findings more objective, we must discuss a few limitations. First, this research should be regarded as an exploratory study that develops preliminary propositions based on managerial insights. In addition, our model includes only four antecedents of managerial intention to adopt SMS advertising. Future research should include some mediators between intention and antecedents, such as managerial perception of cost efficiency or expected sales-generating capacity of mobile advertisements. In addition, to better serve the research purpose, qualitative in-depth interviews with managers may be the first step toward identifying specific reasons to use SMS message. Second, since the sample size in the study is modest, the generalizability of our findings must be interpreted with caution. While the use of PLS here is justified, larger samples always make the research safer in terms of validity and reliability. Third, although the vast majority of the firms interviewed operate in multiple EU markets, the sample consisted of executives who work for the multinational subsidiaries operating in Spain. Future research should focus on managers from more than one country and other regions of the world. Finally, our study was restrictive in terms of limiting the sample to industries in which SMS advertising would appear to be a more reasonable possibility in the short term. Future studies should look at additional industries.

## 9. Conclusion

As with the evolution of advertising on the Internet, any dramatic annual increase in mobile advertising expenditures is likely to take some time. As Barwise and Farley (2005) note, the use of mobile advertising by firms is still limited. However, the findings of this study suggest that managers of firms operating in European markets perceive an opportunity to use mobile commerce as a brand-building device. Given the fundamental importance of brand-building to today's marketers, this perception bodes well for the future growth of mobile advertising. Of course, for the use of this medium to expand, marketers will have to learn how to use it properly.

In this regard, probably one of the most important implications of the present study is how to overcome consumers' negative

perceptions of privacy intrusion by mobile-based promotional messages. This finding makes considerable sense, given the SPAM/SPIM epidemic, which is of great concern to consumers. Moreover, it stands to reason that consumers will be more receptive to messages for brands that they like. The limited research available clearly suggests that opt-in approaches are more likely to be associated with effectiveness. However, it is virtually unknown why consumers choose not to opt-in or avoid mobile messaging. Researchers should further investigate this aspect.

In many respects, mobile advertising provides an opportunity both to engage in relationship marketing with customers and to build brand equity. The ability to provide an interactive exchange affords the opportunity to build excitement for the brand. More opportunities are afforded by this medium due to the availability of sending messages at any time and any place in an "always on" environment. While future technological developments may make the use of location-specific messages more common than we find in this study, it is clear that mobile advertising does offer some unique advantages that at least some marketers should consider capitalizing on.

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