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Abstract

The rapid evolution of B2C e-Commerce alternative interaction channels (i.e., World Wide Web, Mobile Telephony and Digital TV) along with the continuously changing consumer behavioural patterns, has created a strong need for research tailored to the peculiarities and needs of the aforementioned emerging "distance shopping" channels. Stimulated by the these evolutions, this paper focuses on the investigation of consumer attitudes and behaviours against mobile commerce in

Europe, towards identifying the critical success factors for accelerating its diffusion in this particular market. To that end, an online consumer survey ran in three European countries (Germany, Greece and Finland), constituting the research vehicle employed within an exploratory research design setting. Despite the fact that some considerable differences regarding mobile commerce adoption rates and consumer behavioural patterns were observed between the three investigated countries, it was found that mobile commerce penetration in Europe is on its infancy. However, improving mobile devices, designing more user-friendly shopping interfaces, developing effective applications and services, along with reducing prices, influencing opinion leaders and solving security, bandwidth and coverage problems, constitute the critical success factors for accelerating mobile commerce diffusion in Europe.

1. Introduction

Despite the fact that the penetration of mobile phones is much higher than the corresponding penetration of PCs in most industrialized countries (Hampe et al., 2000), PC-enabled Internet commerce dominates the worldwide B2C market. Is this a "paradox" phenomenon? One can claim, that B2C electronic commerce (e-commerce) diffusion could have been much higher through mobile telephony, due to the higher mobile phones consumer adoption rates and corresponding diffusion. However, technology limitations (e.g., limited network bandwidth, limited screen size, etc.) along with the fact that the Web was first designed as a PC application, adequately confront such an allegation. Along the same lines, Digital TV constitutes another emerging technology, which, along with mobile telephony are continuously increasing their market share in the global B2C e-commerce market, offering to the end-customers a series of alternative patterns to conduct "distance shopping" activities. However, it is believed that even Bill Gates of Microsoft cannot predict which of the aforementioned channels will dominate the B2C e-commerce market in the near future. For example, mobile commerce (m-commerce) may dominate the South Europe market, while "traditional" PC-enabled Internet commerce may continue to dominate the Scandinavian market, basically due to the different climatologic conditions. Figure 1, provides a potential classification of future alternative B2C e-commerce evolution scenarios. More specifically, scenario "A" implies that there are significant differences between consumer preferences against the alternative online shopping channels, while scenario "B" refers to the convergence of these channels (i.e., consumers are provided with a single alternative pattern to conduct their online shopping). Finally, scenario "C" refers to the case where there are not any significant differences between the three alternative shopping channels as far as their usage by consumers for distance shopping activities is concerned.

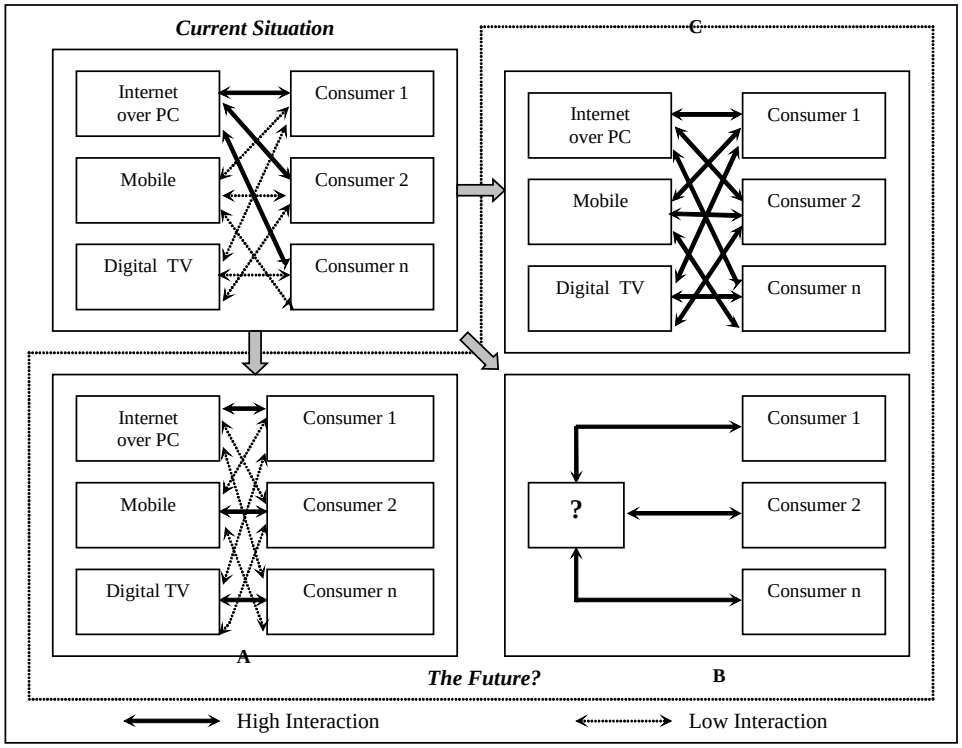

Figure 1: *Future Alternative B2C Electronic Commerce Evolution Scenarios*

Considering the aforementioned rapid technological and business evolutions, along with the continuously changing consumer behavioural patterns, this paper focuses on the m-commerce sector. According to Jupiter Research (2001), the global m-commerce revenues will reach $22.2 billion in 2005, of which $7.8 billion (i.e., 35% of global revenues) will come from Western Europe. Furthermore, according to McKinsey (2001), the mobile phone penetration in Europe will reach 85% in 2005. M-commerce dynamics, therefore, create a strong need for research in this challenging and fast evolving area.

To that end, this paper investigates consumer attitudes towards m-commerce services in Europe. An online survey focusing on the current usage and adoption of these services was conducted as part of the MobiCom project[1]. The major objective of conducting this exploratory type of research was to provide an understanding of marketing phenomena and consumer behavioural patterns in the context of m-commerce in Europe. It is mainly used, therefore, to define the current situation, identify courses of actions and gain research insights towards formulating specific research hypotheses to be tested within

[1] MobiCom project –European Fifth Framework Project IST

corresponding conclusive research designs in the future (Malhotra and Birks, 2000).

2. Consumer Behaviour Research in e- and m-Commerce

Reviewing the B2C e-commerce literature, it is clear that the majority of research efforts until now have focused on the Web over the PC, rather on mobile telephony or Digital TV. However, on the threshold of the 21st century, m-commerce and Digital TV dynamics generate a series of challenging research questions towards building corresponding theoretical frameworks along with providing direct managerial implications and challenging business opportunities. To that end, it is obvious that consumer behaviour analysis must be utilised as a research tool from every modern organisation that deals with commerce (either conventional or electronic) within its strategic marketing planning (Siomkos and Vrechopoulos, 2002). Besides, B2C e-commerce either through the PC, or mobile phone, or Digital TV, has one generic but crucial objective: to satisfy consumers, build strong relationships with them based on loyalty, and enthuse them (ECR 1999). It is evident, therefore, that investigating consumer needs, wishes, preferences, attitudes, characteristics, behaviours, etc., through corresponding consumer surveys, constitutes the only reliable method towards achieving this business objective (Green et al., 2001). In addition, Kotler (2000) states, that customers constitute a basic source that provides the requirements to the organization regarding the development of marketing strategies.

The fact is that online purchases (either through the PC, or mobile phone or Digital TV) constitute a fundamental change for customers and, therefore, a key task for e- and m-commerce is to find out who the actual and potential customers are (Turban et al. 1999). Along the same lines, Petrison et al. (1997) support that thorough knowledge of consumer behaviour, coupled with advances in technology, enable marketers to target customers on a more personalised, customised and segmented basis. However, consumer behaviour in e- and m-commerce has not yet been the subject of much research (Hoffman and Novak 1997, Elliot and Fowell 2000, Vijayasarathy and Jones 2001, Barnes 2002, Green et al. 2001). As a result, little is known about online customers characteristics and the factors influencing their purchase decision (Sieber 1999, Barnes 2002). Similarly, Kardaras and Papathanassiou (2000) support that the contribution of the e-commerce applications to customer satisfaction has not been yet adequately addressed, while "in today's marketspace the consumer is gaining more power as new distribution systems are driving price down, making access to both products and the information needed to compare alternatives easier" (Scultz and Baily 2000, p.50). To that end, Cole and O'Keefe (2000), Miles et al. (2000) and Vrechopoulos et al. (2000), state that

consumer behaviour research is moving beyond the simple application of traditional consumer behaviour models towards a generation of new models, which are more relevant to the online environment. In sum, according to Vrechopoulos et al. (2001) and Barnes (2002), a key task for any kind of electronic commerce activities (i.e., either e- or m-commerce) is to identify the actual and potential customers (i.e., characteristics), to investigate how they are influenced and how they behave (i.e., attitude formulation and behaviour) and to reveal what they really anticipate (i.e., needs, wishes, wants, preferences).

Inspecting the aforementioned preliminary research findings, it is concluded that the need for consumer behaviour research efforts in the context e-commerce through the Web, is strongly related with the need for corresponding research initiatives in the m-commerce context. To that end, the present study aims to support and accelerate the diffusion of m-commerce services, through providing some preliminary research insights regarding consumer attitudes and behaviours against m-commerce in Europe.

3. Research Methodology

A consumer survey was conducted towards meeting the objectives of the present study. An online questionnaire constituted the data collection instrument, while only Internet users participated in the sample. The sampling technique used was convenience sampling. According to Malhotra and Birks (2000), this sampling technique can be used in exploratory research designs like the present one. The questionnaire was launched on to the Internet at the end of March 2001 and the survey lasted for 4 months. The sample comprised of 3730 respondents from three different countries (1047 in Germany; 775 in Greece; 1908 in Finland). The sample, therefore, could be characterized as a representative one within the European m-commerce context (i.e., sampling frame), including one country from Western Europe, one from Scandinavia and one from South Europe. However, as also discussed in the limitations of the study section at the end, only Internet users participated.

The market research methodology included the following steps (Churchill, 1999):

- Development and translation of the questionnaire into different languages.
- Installation of the questionnaire into an online format and pre-testing for identification of possible problems in clarity, comprehensiveness, accuracy and functionality, before it was given out to the sample.
- Informing the target group about the survey via the Internet and other means (e.g., press releases).
- Execution of the survey and collection of answers in a database.

- Extraction of the data and statistical analysis.

Finally, it should be noted that effort was placed to invite the largest possible number of online users to complete the questionnaire. For this purpose, Internet communities (e.g., newsgroups, public mailing lists, vertical and generic portals, etc.) and physical communities (e.g., press releases, leaflets at conferences, meetings, etc.) were used.

4. Analysis of Results and Discussion

The majority of respondents aged between 17-40 years old (73% in Germany; 80% in Greece; 85% in Finland), while females constituted the 17%, 48% and 46% of the German, Greek and Finnish samples, respectively. As far as the educational level is concerned, most of the respondents in Greece (88%) were highly educated (hold university and master degrees), while the same stands for the 36% in Germany and for the 28% in Finland. Finally, 61%, 89% and 35% of respondents live in big towns (>100,000 inhabitants) in Germany, Greece and Finland, respectively.

Almost all Internet users participated in the survey own a mobile phone (90% in Germany; 94% in Greece; 97% in Finland). However, the majority of respondents that do not use mobile phones stated that the main reason for not doing that is that they "do not need it" (57% in Germany; 59% in Greece; 42% in Finland), while the second most important reason for not using such kind of devices was because "it is to expensive" (25% in Germany; 9% in Greece; 27% in Finland). However, as the penetration of mobile phones was found to be very high in all the investigated countries (at least, as far as Internet users is concerned), the aforementioned percentages were actually derived from a small set of observations and, therefore, should be interpreted with caution.

Furthermore, regarding the type of mobile contract (i.e., subscription vs. prepaid), 98% of users in Finland prefer the subscription alternative, while the same stands for the 77% and the 80% of the German and Greek users, respectively. As far as the purpose of mobile use is concerned, 40%, 14% and 44% in Germany, Greece and Finland respectively, reported that they use their mobile devices exclusively for private purposes. Mobile telephony penetration seems to be higher in Finland, as 32% of the respondents reported that they have experience with mobile devices from 4 to 6 years, while the same stands only for the 19% of respondents in Germany and in Greece. On the other hand, regarding the age of the mobile device, it was found that most of German users (42%) own a less than a half-year old device, while most of the Greek users (36%) own a mobile device half to one year old. Finally, most Finnish users (31%) own a mobile device one to two years old. Along the same lines, most of the respondents in all countries reported that they would buy a new mobile device only when "their old phone becomes useless" (42%

in Germany; 33% in Greece; 49% in Finland). However, German and Greek users (28% and 32%, respectively), reported as their second most important criterion for buying a new mobile phone, the supported new technologies (e.g., GPRS), while the same stands in Finland for the better applications provided (21%). On the contrary, the least important criterion for buying a new mobile device for all the countries under study refers to the better games and sounds offered (1% in Germany; 1% in Greece; 2% in Finland). Finally, the majority of the respondents (84% in Germany; 67% in Greece; 72% in Finland) reported that their average daily calling time fluctuates between 0 to 15 minutes, while almost all respondents in the investigated countries spend an average of 38 Euros as their monthly mobile phone expenditure (91% in Germany, 92% in Greece; 89% in Finland).

4.1 Mobile Operator Selection Criteria

Investigating the criteria that customers use in order to select a mobile operator, some interesting differences between the three countries under study are observed (Table 1). More specifically, "low pricing" and "good coverage" were found to be the most important criteria for Germany (23,3%) and Greece (22,6%), while users in Finland select a mobile operator using as the most important criterion, other peoples' attitudes and behaviours (23,1%). In other words, they usually select the same provider that "the people they talk on the phone have selected". On the contrary, this particular criterion was found to be the least important for the Greek users. However, it should be noted that "good coverage" was found to be a very important criterion for all the investigated countries. Finally, "special offers to new subscribers" was also found to be an important criterion for all the countries under study (7,6 % in Germany; 9,6% in Greece; 10,8% in Finland).

Table 1: *Mobile Operator Selection Criteria*

Criteria	**Germany**	**Greece**	**Finland**
Low pricing scheme	23,3	21,3	19,5
Special offers for new subscribers	7,3	9,6	10,8
Good coverage	20,3	22,6	17,3
The phone provided was bundled with the contract bundled with the contract	12,5	9,6	5,4
Reputation	8,6	10,5	10,3
The people I talk on the phone have chosen the same provider chosen the same provider	14,1	2,0	23,1
Company telephone	2,7	11,7	6,1
Good Customer Service	6,4	8,1	4,6
Other	4,3	4,2	2,6

Note: *Numbers refer to percentages (%)*

4.2 Mobile Commerce Services Evaluation

"Information and news retrieval" (15,4% in Germany; 15,5% in Greece) and "e-mail" (23,3% in Germany; 12,8% in Greece) were found to be the most frequently used mobile services in these two countries (Table 2). On the contrary, the most frequently used mobile service in Finland is "entertainment" (35%), while the same service is used only by the 4% and the 7% of mobile users in Germany and in Greece, respectively. Furthermore, the second most frequently used mobile service in Finland was found to be "information and news retrieval" (13,7%), while "banking and financial services" was evaluated as the third one (10,4%). Finally, it is clear that the least used mobile service in all the investigated countries is "shopping". In sum, the majority of respondents in Germany and in Greece (41% and 51%, respectively), do not use their mobile devices for any of the asked services, while the same stands only for the 23% of users in Finland. This particular finding indicates that Finland is a more mature market than the other two in terms of m-commerce diffusion and adoption. It should be noted, however, that the majority of respondents in all these countries, stated that, "if it was possible to buy and pay for cinema tickets with their mobile phone, they would use the service, even if they had never used it before" (40% in Germany; 46% in Greece; 46% in Finland). This finding, undoubtedly, indicates the high potential of m-commerce in Europe.

Table 2: *Mobile Services Used*

Used Services	**Germany**	**Greece**	**Finland**
Banking and financial services	7,4	5,7	10,4
Shopping	0,8	0,6	1,7
Entertainment	4,2	7,0	34,9
Information and News	15,4	15,5	13,7
Travel booking	1,6	2,4	1,4
Ticket reservation	1,8	2,5	4,2
E-mail	23,3	12,8	8,1
Other	3,9	2,1	1,9
None	41,2	51,1	23,2

Note: *Numbers refer to percentages (%)*

Table 3: *Desired/Recommended Mobile Services*

Recommended Services	**Germany**	**Greece**	**Finland**
Banking and financial services	10,9	8,4	13,2
Shopping	1,8	2,6	1,3
Entertainment	7,2	7,9	37,1
Information and News	19,7	15,4	15,5
Travel booking	3,6	3,5	2,0
Ticket reservation	2,9	3,6	4,7
E-mail	31,5	15,3	10,9
Other	3,9	0,6	0,8
None	18,1	42,2	14,1

Note: *Numbers refer to percentages (%)*

Regarding users' recommended and most desired mobile services (Table 3), "e-mail" was found to be the most desired service in Germany (36%), "information and news retrieval" in Greece (15%) and "entertainment" in Finland (37%). It should be noted, however, that 42% of Greek respondents stated that they would not be interested to use any of the asked services, while at the same time only 18% and 14% are not interested for such kind of services in Germany and in Finland, respectively. It is obvious therefore that the diffusion and consumer adoption of m-commerce in Greece is much lower than it is in Germany and in Finland.

5. Critical Success Factors for Mobile Commerce Diffusion

It is clear, that the critical success factors for m-commerce diffusion in Europe are directly related to the reasons that consumers use or not use mobile services along with their corresponding recommendations towards the improvement of such kind of services. To that end, it was attempted to provide an integrated pan-European approach by combing the results of the three different countries under study, towards providing integrated managerial implications for the European m-commerce market (Table 4). Therefore, it was found that the most important reason for utilizing mobile services is the "good price/service ratio" (68%), while "comfort" (55%) and "independence of time and space" (48%), were found to be the second and the third most important reasons, respectively, for using such kind of services. On the contrary, the most important reason for not using mobile services was found to be the "high price of mobile access" (61%), while the second and third

most important reasons for not using such kind of services were found to be "poor quality of service" (56%) and the "luck of security" (53%).

Table 4: *Critical Success Factors for Mobile Commerce Diffusion*

CRITERIA / ATTRIBUTES	Very important	Important	Neutral	Unimportant	Completely unimportant
Reasons for Using Mobile Services					
Good price/service ratio	68	27	3	2	1
Comfort	55	37	5	4	0
Independence of time and space	48	42	6	2	1
Curiosity	1	9	24	28	38
Personalization	13	39	26	19	4
Better Information	18	50	18	11	3
Fun	9	25	28	21	18
It helped in business	35	41	11	9	5
Recognition among my peers	5	3	23	17	52
Reasons for not Using Mobile Services					
Complicated to use	37	42	11	7	3
Lack of security	53	29	8	6	4
Poor quality of service	56	35	5	3	1
High price for mobile access	61	28	6	2	2
Not personalized enough	12	41	28	14	6
Inconvenience of device	30	49	11	7	3
Recommendations towards Improving Mobile Services					
Improved ease of use	30	39	12	12	7
Improved security	39	30	13	10	8
Improved support	19	37	22	15	7
Lower Price	61	22	8	5	3
Improved comfort of device	34	34	16	11	6

Note: *Numbers refer to percentages (%)*

Finally, respondents were asked to evaluate the importance of a list of actions that should be taken by mobile operators towards the improvement of mobile services offered. The majority of respondents (61%) reported that "lower prices" is very important, while 39% of respondents evaluated as very important the "improved security" dimension. Finally, 34% of respondents evaluated the "improved comfort of device" as the third most important dimension.

6. Research Insights and Implications

Inspecting the results in Table 4, it is resulted that business must reduce prices of mobile access and improve the quality of the provided services and customer support. On the other hand, it is obvious that effort should be placed on designing more convenient mobile devices (e.g., large screens), as well as on designing more user friendly and easy to use shopping interfaces and applications. Along the same lines, security and bandwidth problems should be solved and this kind of "solution" should be communicated through specific promotional campaigns to the current and potential users. Finally, emphasis should be placed on coverage strategy, as it proved to constitute a major mobile operator selection criterion.

Applying the diffusion of innovation theory (Schiffman and Kanuk 2000, Ram and Jung 1994) in the case of the present study, it is clear that mobile phone users that have already used m-commerce services in the three investigated countries are called "innovators". According to Brown (1992), innovators are those consumers who first adopt a new product or an innovation. They are few in number (the percentages included in Tables 1-4 indicate that) and are eager to try new ideas and products, are well educated and can afford any financial risk involved in adoption. However, the consumers in a market adopt the same innovation at different times. The next group of consumers that adopt an innovation, therefore, is called "early adopters". Mobile operators should be alerted, as consumers belonging in this particular group are more socially integrated in their local communities than innovators, and are more likely to be opinion leaders. They frequently get in contact with salespeople of new products and play a crucial role as opinion leaders who influence other consumers (Rogers, 1983).

6.1 A Mobile Commerce Research Framework

This survey indicates that business strategies (e.g., price reductions, customer service improvement, etc.) and technological outcomes (e.g., mobile devices improvement, security problems solving, etc.) constitute some critical issues that should be confronted in order to increase the use of m-commerce services in Europe. To that end, the present study supports future research in this area, by providing an m-commerce research framework including the critical business and technology factors that should be further investigated (Figure 2). More specifically, as clearly shown in Figure 2, the critical success factors for m-commerce diffusion, constitute the research outcome of the exploratory type of study conducted herein. The interaction between business and technology factors implies the need for multidisciplinary research initiatives, towards enhancing the ultimate offering. Conclusive research designs can elaborate on the provided critical success factors, towards providing concrete theoretical insights, direct managerial implications and challenging future research directions. To that end, business on one hand will be effectively supported by the corresponding theoretical guidelines and implications, while customers will be able to enjoy high quality of services and support. The

contribution of the present study, therefore, could be summarized on one hand on the development of the "m-commerce critical success factors" framework, which can be effectively utilized towards supporting and guiding future research initiatives and on the other, on the provision of some direct managerial implications and specific future research perspectives.

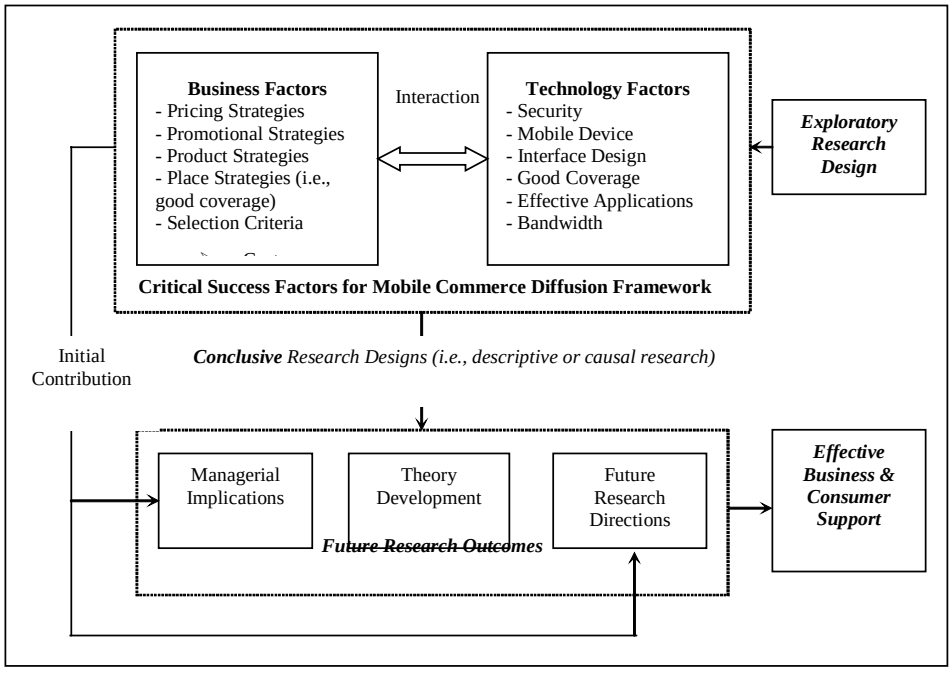

Figure 2: *A Mobile Commerce Research Framework*

6.2 Managerial Implications

The findings of the present study can be utilized within the "market opportunity analysis" part included in the "situation analysis" section of an e-marketing plan (Strauss and Frost 2001, Siomkos and Vrechopoulos 2002). However, in order to set specific m-commerce business objectives and develop corresponding marketing mix strategies and action plans to satisfy these objectives, further research is needed (e.g., SWOT, Supply Side analysis, etc.). Nevertheless, elaborating on the present study findings, a generic m-commerce strategy towards meeting the objective of accelerating m-commerce adoption rates can be proposed (it should be noted that marketing objectives should be measurable; e.g., increase m-commerce consumer adoption rates from 5% to 25%). This is the "penetration pricing strategy". Applying this pricing strategy in the m-commerce industry seems to constitute a challenging business opportunity. It refers to charging a low price for a product or service for the purpose of accelerating its use and correspondingly increase market

share. Besides, this pricing strategy is very effective in price-sensitive markets (Strauss and Frost, 2001), like the European mobile market proved to be. It should be reminded, that respondents evaluated "high price" as the most important reason for not using m-commerce services. In addition, the results of the consumer survey conducted by Koivumaki (2002) also proved that the high cost of m-commerce services constitute the most important reason for not using such kind of services in Europe. Furthermore, it is also concluded that investing on technological issues (e.g., mobile devices, security, shopping interface design, applications, bandwidth, etc.) constitutes another primary area of opportunity towards improving m-commerce services and satisfying customers. All these imply the effective manipulation of the "product" (e.g., devices) and the "promotion" (e.g., communicate security improvement issues) elements of the marketing mix, along with the effective manipulation of the "price" element, as discussed above. Finally, "good coverage" is directly related with the "place" element of the marketing mix and it should be also taken into account as it was found to be a very important mobile operator selection criterion.

6.3 Limitations of the Study

A basic limitation of the present study refers to the sample size and its representativeness. More specifically, this survey will not be representative with respect to the overall population of the surveyed countries (i.e., Germany, Greece and Finland) due to the fact that only Internet users were addressed, while participants were self-selecting. However, running online consumer surveys through the Internet constitutes a common research practice today (e.g., Chae et al. 2002). Furthermore, as far as the second limitation is concerned (i.e., self-selection), Strauss and Frost (2001) state that the major disadvantage of online consumer surveys through the Internet is the inability to built statistically reliable samples. To that end, many online market research firms (e.g., MediaMetrix.com) build consumer panels in order to develop statistical reliable samples through controlling demographic characteristics. On the contrary, however, according to Palmquist and Stueve (1996), self-selection could be an advantage to a survey, in the sense that respondents tend to have a higher interest in certain products and services, like mobile phones and m-commerce in the case of the present study. Furthermore, another limitation of this research is that is does not use any robust statistical test (e.g., ANOVA, t-Test, etc.) towards providing enhanced and more reliable results. However, as explained previously, this research constitutes an exploratory type of research, implying that emphasis was placed on understanding marketing phenomena towards formulating and guiding future research along with providing some generic managerial implications, rather than providing robust statistical results.

7. Conclusions and Future Research Perspectives

The penetration of m-commerce, vary between different countries and markets in Europe. In addition, there were considerable differences observed regarding consumer behavioural patterns, adoption rates and attitudes towards m-commerce among the investigated countries. Finland was found to be marginally more mature market than Germany and Greece in terms of m-commerce adoption, while on the contrary, adoption of m-commerce in Greece was found to be the lowest one. However, except "e-mail" and "information and news retrieval", all the other mobile services (e.g., shopping, travel booking, etc.), are not widely utilised in the investigated countries. Nevertheless, it should not be ignored that 10,4% and 34,9% of users in Finland have already used their mobile phones for online banking/financing and entertainment services, respectively. Besides, 7,4% and 5,7% of German and Greek users, respectively, reported that they have also used mobile banking/financing services in the past. In general, however, it is clear that m-commerce is on its infancy in Europe. To that end, the present study provided an initial understanding of consumer attitudes and behaviours against m-commerce along with revealing the critical success factors for business effectiveness in this particular industry.

The need for continuous research in this fast evolving area is apparent. Future research can elaborate on the present study findings towards developing and testing corresponding research hypotheses within conclusive research designs (i.e., through descriptive or causal research approaches). For example, a potential hypothesis may investigate and test whether there are significant differences (e.g., through the of a t-test) between "Internet shoppers" and "Internet users" (i.e., non shoppers) regarding mobile services evaluation criteria. Such a research can effectively support marketing programs tailored to specific customer needs, characteristics and behaviours. Another challenging future research direction is to develop the profile of "early adopters" (i.e., the group of customers that act as opinion leaders) through corresponding consumer surveys, enabling through that mobile operators to effectively target and "influence" this critical customer segment. Finally, a futuristic but promising research approach, can elaborate on the "future alternative B2C e-commerce evolutions scenarios" included in Figure 1, by inspecting whether there are significant differences between the three alternative "distance shopping" channels, as far as consumer attitudes are concerned. To that end, a robust statistical test like ANOVA is proposed, while "ease of use" and "perceived usefulness" (TAM constructs; Davis 1989) can play the role of some of the dependent variables measured within a descriptive or causal research design.

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