Abstract
As service offerings and technologies constantly develop there seems to be confusion over what we are actually talking about when we talk about mobile services. A requirement for constructing an organized body of knowledge in a specific area of research is the clarity of its basic concepts. Often, we are not specifically interested in defining things but to examine and discuss the subjects of our primary interest we need unambiguous and shared definitions of our key concepts. Although many relevant concepts undoubtedly have clear definitions in the minds of experienced scholars working in the field of mobile offerings, for some reason these definitions are not well articulated or easily found in published form. With a focus on business-to-consumer mobile offerings, this paper addresses this lack of shared definitions. As the main contribution definitions of business-to-consumer mobile services and mobile content services are introduced, existing definitions for related concepts are presented and the nexus of concepts is outlined. The discussion is conceptual in nature and draws from marketing and information systems literature.

Keywords: mobile services, mobile content services, definitions

Mobile Semantics: Defining Concepts and their Interrelationships
JENNI NIEMELÄ

INTRODUCTION
The effect of technology is one of the most profound trends influencing services marketing today as technology enables a wide variety of new service offerings (Bitner 2001). This critical importance of technology in delivering services is well recognized by academics (see, e.g., Bitner et al. 2000; Dabholkar 1996; Meuter et al. 2000). Current examples of new service offerings enabled by technological advancements are mobile services used via small mobile devices (mobile phones, smart phones and personal digital assistants, PDAs). These services are the focus of this paper.

Throughout the 1990s mobile technology started to gain an increasingly important role in society. Mobile phones and connections quickly became widespread. For example in Nordic countries (Finland, Sweden, Norway and Denmark), Great-Britain and Italy the penetration of mobile phone connections was approximately 90 per cent in 2003 (eBird Scandinavia 2004). Looking back to the year 1990 the density of mobile phone connections varied between 0.1–5.5 per cent in European countries with Sweden (5.5 per cent) and Finland (5.2 per cent) holding the lead (David 2003). To continue this description of growth we can take a look at the global figures; there were 10 million mobile subscribers worldwide in 1990 and already 1 billion in 2001 (Jones 2003). In 2005 the number of subscriber connections exceeded 2 billion (GSM Association 2005). In the history of technology adoption this kind of growth is beyond compare (Jones 2003). Although the popularity of mobile services can clearly not be measured by the popularity of mobile devices or connections, their extensive penetration can to some extent be seen as an indication of the potential magnitude of the mobile service phenomenon.

At the moment there are services based on various technologies (such as SMS, MMS, mobile Internet) and during the past few years more diverse and user-friendly services have been developed. For some time Japan’s i-mode system has been a ‘show-piece’ of a successful way to offer mobile services to consumers (see, e.g., Baldi and Thaung 2002; Barnes and Huff 2003; Liang and Wei 2004; Mylonopoulos and Sideris 2006; Yan 2003). In January 2006 NTT DoCoMo’s i-mode had already 45 million subscribers (NTT DoCoMo 2006). The success of NTT DoCoMo and the increasingly global access to services through mobile devices has

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nourished the discussion on the possibilities mobile technology offers. Both academicians and practitioners have eagerly taken part in this debate. Unfortunately the focus of the discussion – the concept of mobile services – has been only vaguely defined (Sørensen et al. 2002). As service offerings and technologies constantly develop there seems to be confusion over what we are actually talking about when we talk about mobile services. In addition, such closely related concepts as mobile commerce and mobile business are used with varying meanings. The fact that not many have had the time to sit down and ponder over definitions may be due to the above described speed of growth and continuous emergence of new possibilities. Some scholars have presumably decided to wait and see where the emerging phenomenon is heading before starting to define it. All in all, studies with more practical approaches have appealed to those in academia. At the same time practitioners have used definitions that accommodate their own business offerings and objectives, thus not necessarily contributing directly to the construction of a definition that could be widely shared by different actors.

Unfortunately this lack of definitions is a shortcoming that poses constraints to the accuracy and intelligibility of research in the field of mobile business. A requirement for constructing an organized body of knowledge in a specific area of research is the clarity of its basic concepts. We are often not specifically interested in defining things but clear and shared definitions for our key concepts are a necessity for a coherent examination and discussion of the subjects of our primary interest; subjects such as the effects of electronic/mobile business, economics of electronic/mobile commerce and electronic/mobile solutions. Willoughby (2004/2005) addresses this need for shared, lucid definitions in his paper, which focuses on technological semantics. Focusing on the word ‘technology’ he states that using a concept with a wide variety of meanings makes it hard to talk about technological matters. It might be impossible to tell whether people expressing seemingly similar things have even remotely similar meanings in mind (Willoughby 2004/2005). The same problem exists in the case of narrower terms (such as mobile services) belonging under the title ‘technology’. In the field of technology good semantics can lead to good practice, whereas poor semantics can lead to poor practice (Willoughby 2004/2005). Although many relevant concepts undoubtedly have clear definitions in the minds of experienced scholars working in the field of mobile offerings,3 for some reason these definitions are not well articulated or easily found in published form. Many comments in this paper might sound self-evident from the perspective of accomplished scholars. Still, it is not sufficient that definitions are clear implicitly – they need to be stated and shared explicitly. When stated and shared, the definitions will aid us in setting the foundations for future research, thus contributing to a growing body of knowledge which, in turn, is as its best a usable tool for practitioners.

With a focus on business-to-consumer services this paper reviews previous attempts to define mobile services and related concepts (i.e., mobile commerce, mobile business). A definition of business-to-consumer mobile services is introduced through an examination of the meaning of mobility and the definition of services. In addition, mobile content services are defined and the concepts of mobile commerce and mobile business explicitly articulated. The discussion in this paper will be conceptual in nature drawing mainly from marketing and information systems literature.

MOBILE SERVICES

As mentioned earlier, finding a definition of mobile services from academic literature is rather difficult. In their paper covering mobile communications and mobile services Siau and Shen (2003) state that ‘mobile services will enable users to make purchases, request services, access news and information, and pay bills, using mobile communication devices’. While this description presents a loose picture of what is meant by mobile services, it can by no means be seen as an actual definition that would clearly set the boundaries and differentiate mobile services from other service phenomena. In the absence of a definition for mobile services, it seems logical to take a look at the meaning of both words separately, that is the meaning of mobile (or mobility) and the meaning of services.

Meaning of mobility

In the context of mobile services mobility is mainly used to refer to human movements that are supported by portable, mobile technologies (Sørensen et al. 2002). Kristoffersen and Ljungberg (1998) distinguish between three mobility modalities, in their model of IT use in mobile settings, those of travelling, wandering and visiting. Travelling refers to the use of mobile ITs while travelling in a vehicle, wandering to the use of mobile ITs during local physical mobility and visiting to the use of mobile ITs in different places for certain periods of time before moving on. These three modalities define mobility from the perspective of human movement. In fact, mobility is often defined simply as the movement of humans in geographical space (Kakihara and Sørensen 2002). In their conceptualization of mobile commerce, Balasubramanian et al. (2002) state that (1) at least one of the parties of communication must be mobile in the sense that his/her/its ability to communicate is not dependent on being at a fixed location at a particular time and (2) this ability to communicate must be continuously maintainable by at least one of the parties during substantial physical movement from one location to another.
This statement takes into account not only human movement but also the temporal aspect of mobility.

Kakihara and Sørensen (2002) argue that in our society being mobile is not merely a matter of travelling or moving around without constraints but rather a matter of interaction. They suggest that there are at least three dimensions of mobility enabled by the diffusion of new ICTs, especially mobile technologies. These dimensions are spatial, temporal and contextual mobility. Spatial mobility refers not only to the movement of humans but also to the movement of objects, symbols or space (cf. virtual space). Temporal mobility refers to time savings and increased speed (i.e., improving temporal efficiency) allowed by new technologies. New technologies also transform the temporal order (i.e., sequence, duration, temporal location, rates of recurrence) of things and people’s interpretation of these changes (Barley 1988, cited in Kakihara and Sørensen 2002). ICTs allow instantaneous and simultaneity of transmission of information (Urry 2000) and multitasking so that one does not have to devote a certain period of time exclusively to one particular person or group. According to Kakihara and Sørensen (2002) if spatiality deals with the aspect of ‘where’ and temporality with ‘when’, contextuality is about ‘in what way’, ‘in what particular circumstance’ and ‘towards which actor(s)’. ICTs affect the contextuality of interaction by allowing diverse interaction modalities, thus permitting more freedom from contextual constraints (e.g., people’s cultural background, particular situation or mood, degree of mutual recognition) (Kakihara and Sørensen 2002).

To conclude, ‘mobile’ in the context of mobile services refers to its simplistic form to the portability of the mobile device used for the services and more comprehensively to the possibilities that these services offer for enhancing the spatial, temporal and contextual mobility in our society.

What is a service?

The notion of software being a service is actually a rather new one. Before the service perspective, software was seen as a product (i.e., as standardized software application packages). The emergent service view in the software domain originated mainly from the development and distribution of Internet-based services. (Sørensen et al. 2002.) Today ICTs in general and also mobile ICTs are regarded as services from the perspectives of both marketing and information technology (see Grönroos et al. 2000; Sørensen et al. 2002). What is a service, then? Traditionally, services have been described with four characteristics in services marketing literature which separate them from tangible goods, namely intangibility, heterogeneity (non-standardization), inseparability of production and consumption, and perishability (Zeithaml et al. 1985). According to Gummesson (1995) the division of goods and services is outdated. In general, as stated by Vargo and Lusch (2004), the marketing discipline has shifted away from the dominant logic that concentrated on the exchange of tangible goods (manufactured products) and towards the exchange of intangibles, specialized skills and knowledge, and processes. This shift is believed to direct marketing towards a more comprehensive logic that integrates goods and services, and provides a richer foundation for marketing thought and practice. Within this new logic services are defined as ‘the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself’ and goods are seen as transmitters of embedded knowledge; as intermediate products that are used as instruments in value creation processes (Vargo and Lusch 2004).

According to Grönroos (1998) the most important characteristic of services is their process nature. This is, in fact, the feature which clearly allows Internet and mobile offerings to be characterized as services. Services are produced in a process in which consumers take part more or less actively and therefore not just the outcome but also the process is consumed (Grönroos 1998). The offering of any physical good or service over the Internet is a service since while acquiring a product or service over the Internet the customer goes through a service process that leads to an outcome (Grönroos et al. 2000). Similarly, the consumption of a mobile offering always requires going through a process (e.g., sending a text message or going to a WAP page) and the customer participates more or less actively in this process to achieve an outcome. The outcome may take various forms; it can be, for instance, an open line for a conversation with a loved one, a ring tone received to one’s mobile phone or parking time for one’s car.

New definitions

Based on the preceding discussion mobile services can be defined as possibilities of enhancing spatial, temporal and contextual mobility in our society by allowing customers to participate in service processes and achieve the outcomes of these processes by using their small mobile devices. The construct of mobile services, as defined here, is a broad one. It essentially includes everything that companies in mobile business can offer to their customers. In academic literature mobile communication services are regarded as one subset of mobile services. For example Baldi and Thaug (2002) see communication (e.g., email, SMS) as one category of entertaining mobile services.² For their part, Coursaris and Hassanein (2001) consider communication applications (voice, SMS, e-mail) to be a subset of various business applications targeting the mobile consumer.
At present most of the attention is given to services where consumers interact with a service provider and as an outcome receive some sort of content (e.g., Anckar and D’Incau 2002; Baldi and Thaung 2002; Coursaris and Hassanein 2001). These services are usually referred to as mobile services or mobile commerce. In this paper it is suggested that these services should be called mobile content services in order to distinguish them from other mobile services (i.e., mobile communication services). In academic literature dealing with mobile business the word content seems to be most often used in connection with the m-business value chain and specifically the roles of content providers, packagers and aggregators (e.g., Barnes 2002a; Coursaris and Hassanein 2001; Turban et al. 2002; Vlachos et al. 2006). Mobile content provided by content providers and delivered in digitized form can include text, audio, graphics and video, and can be aggregated into services that offer for example sports information, travel information and booking, online games, finance news, entertainment, news and shopping (Barnes 2002a). Besides being delivered in digitized form, that is in the marketplace (Rayport and Sviokla 1994), the content can be delivered in the ‘real world’, in other words in the marketplace (e.g., getting a bottle of soda from a vending machine or a bus trip). Therefore, mobile content services can be defined as service processes in which customers participate with their small mobile devices in order to receive some content that is provided by the service provider as an outcome and delivered to the customer’s mobile device or to the customer in any other form.

In addition to communication and content services also different technological ways of transferring data (e.g., GSM, GPRS, EDGE, UMTS (Barnes 2002a)) are sometimes referred to as data services at least by operators (see, e.g., Orange 2005). On the other hand, technological ways of transferring data do not fit under the definition of services as they are not services by themselves but merely technological applications enabling other mobile services (i.e., communication and content services). To conclude, communication services are used for communication that takes place between private individuals (voice, SMS, email and multimedia messaging, MMS). Also in this case some sort of content is created as a result (e.g., conversation, information in text form) but this content is created by the individuals using this particular service, whereas in mobile content services the content is provided by the service provider or its business partners. Both communication and content services can be offered in different forms (e.g., SMS-based, MMS-based, WAP-based) and using different ways of data transfer.

RELATED CONCEPTS

What, then, is the relationship between mobile services and the constructs of mobile commerce? Compared to the attempts to define mobile services the term mobile commerce (hereafter m-commerce) has received considerably more attention. Regardless of this there still exists no formal conceptualization of m-commerce (Balasubramanian et al. 2002; Liang and Wei 2004). Coursaris and Hassanein (2001) state that m-commerce can be seen as a subset of e-commerce (electronic commerce). In a similar vein, Turban et al. (2002) define m-commerce as ‘any e-commerce done in a wireless environment’. Dholakia and Dholakia (2004) use the term m-commerce for e-commerce transactions carried out via mobile, wireless terminals. E-commerce can be defined as a process of buying, selling or exchanging products, services and information over computer networks, that is over the Web (Kalakota and Robinson 2002; Turban et al. 2002). Thus m-commerce is a process of buying, selling or exchanging products, services and information over mobile networks. Turban et al. (2002) use m-business and pervasive computing as terms parallel to m-commerce. If we examine the terms e-business and e-commerce, we notice that they clearly differ from each other. E-business is a larger concept representing all the technological applications and business processes that enable e-commerce transactions (Kalakota and Robinson 2002). The same logic is valid when talking about m-commerce and m-business. M-commerce can be seen as the facade and m-business as everything that goes on behind the scenes (Kalakota and Robinson 2002).

Based on the above given definitions, the relationship between mobile services and m-commerce seems to be quite straightforward. If every mobile offering is a service (i.e., mobile offerings and mobile services are interchangeable terms), then m-commerce is a sub-concept of mobile services and further a sub-concept of mobile content services. It is a sub-concept that covers services that involve the buying, selling or exchanging of products, services or information (i.e., content) over mobile networks; services that somehow help the service provider achieve monetary gain. However, it is worth noting that not everyone agrees with this. For example in Barnes’ (2002a) opinion m-commerce refers to any transaction with direct or indirect monetary value. Stafford and Gillenson (2003) even state that m-commerce is not always transactional and that it is usually more of a support mechanism that provides mobile information and promotion. In a sense these authors are suggesting that m-commerce is an interchangeable term with mobile content services. The competing view, and also the one supported in this paper, is that not everything that happens in an electronic or mobile environment is transactional as the term commerce suggests. Therefore, whenever a company engages in m-commerce, it is offering mobile services and more specifically mobile content services to its customers, but not every company offering mobile content services is offering m-commerce. As a
distinction from m-commerce, the purpose of which is to facilitate transactions, Frolick and Chen (2004) call services without motive or intent of direct monetary gain ‘mobile information’. They define mobile information as information (in the form of text, graphics, video or sound) provided between a company and a customer through mobile communication and note that although there is no motive for direct monetary gain, mobile information is often indirectly associated with cost savings and increased revenue generated by, for instance, increased efficiency or enhancement of customer relationships. Real-life examples of this kind of mobile information are SMS notifications sent to customers when their orders arrive at the specific retail outlet or free SMS news provided by the operator daily to its connection subscribers. Perhaps from the customer perspective the distinguishing feature of these services is their non-transactional nature rather than their information content. Naming non-transactional services ‘mobile information’ does not really separate them from m-commerce as information is also something that is sold and/or purchased in m-commerce. Based on the previous discussion, m-commerce together with non-transactional mobile content services is considered here to be a sub-concept of mobile content services.

EXAMPLES OF MOBILE CONTENT SERVICES

A list of business-to-consumer mobile content services that fit the definition introduced in this article was gathered from six academic articles for descriptive purposes (Anckar and D’Incau 2002; Balasubramanian et al. 2002; Baldi and Thaung 2002; Coursaris and Hassanein 2001; Leem et al. 2004; Siau and Shen 2003). In these papers the authors give examples of mobile services in general, classify different services or suggest potential success applications. Mobile music (downloading music, digital music libraries), mobile news, mobile shopping, mobile games, mobile banking and mobile ticketing (event, cinema, theatre, travelling) were the most often mentioned services in these articles. After the list was compiled it was checked if all these services actually exist. The list was compared with service descriptions found on the web pages of NTT DoCoMo (www.nttdocomo.com) in February 2006. The decision to use NTT DoCoMo’s i-mode as a point of comparison was entirely based on the widely accepted view that NTT DoCoMo’s i-mode is thus far the most successful mobile service concept. Nearly all of the services on the first (academic) list were mentioned on NTT DoCoMo’s web pages. The only services not found were e-books (Baldi and Thaung 2002; Leem et al. 2004), gambling and betting (Baldi and Thaung 2002; Siau and Shen 2003), emergency/roadside assistance (Balasubramanian et al. 2002), damage reports to insurance companies and a service that tracks the location of a child for his/her parents (Anckar and D’Incau 2002). All the services that were found from both sources are listed as examples of mobile content services in Table 1. Whether these services are to be considered as m-commerce or non-transactional mobile content services is dependent on service providers’ motives, in other words whether they aim at direct monetary gain.

TECHNOLOGY INDEPENDENCY OF DEFINITIONS

An important issue yet to be addressed is the technology independency of the service definitions given in this paper. The terms used in this paper so far are by no means the only terms used for describing mobile offerings in academic literature. At least such terms as mobile Internet services (Koivumäki 2002), wireless Internet via mobile devices (Lu et al. 2003) and WAP services (Barnes 2002b) are used. These terms describe web-based mobile services, thus being clearly tied to technological aspects. There is a need for such terms but considering the phenomenon as a whole makes the use of technology independent terms seem more appropriate. When a concept is strongly tied to technology there is a tendency to confuse the technology and the concept itself and, therefore, finding a stable conceptualization is important (Balasubramanian et al. 2002). Gathering a body of knowledge in a certain research area becomes an exhaustive task if the core concepts have to be updated in the occurrence of every small technological change. The constant development of mobile technologies emphasizes the need for stable, technology-independent definitions.

Considering only those services that are based on certain technologies (such as the Internet) to be ‘real’ mobile services or mobile content services is not logical from the standpoint of the consumer. Why would consumers consider a WAP-based service to be more of a true mobile service than a service based on, for instance, text messaging? It can be argued that consumers are more interested in the actual services than in the technology that the services are built on. Overly technological terms can even scare consumers off from trying new services. Neither the term nor the definition should be too strictly tied to technological aspects. Mobile content services can rely on various technologies as long as the technology is wireless and mobile.

CONCEPT INTERRELATIONSHIPS

Figure 1 sums up the previous discussion by outlining the nexus of relevant concepts in the domain of mobile. Based on the definitions introduced and rationalizing done thus far it can be concluded that m-business is a macro concept that encompasses all technological applications and
Table 1. Examples of mobile content services

<table>
<thead>
<tr>
<th>Service</th>
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<tbody>
<tr>
<td>Banking</td>
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<td>Broking/stock trading</td>
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<tr>
<td>Chat (with strangers)</td>
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<tr>
<td>Event information</td>
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<tr>
<td>Fun content (e.g., horoscopes, jokes, fortune telling)</td>
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<tr>
<td>Games</td>
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<tr>
<td>Infotainment (e.g., entertaining news, TV/radio programming information, karaoke information)</td>
</tr>
<tr>
<td>Location information (e.g., nearest service/retail outlet)</td>
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<tr>
<td>Logos, icons</td>
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<tr>
<td>Mapping</td>
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<tr>
<td>Music</td>
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<tr>
<td>News</td>
</tr>
<tr>
<td>Restaurant bookings</td>
</tr>
<tr>
<td>Ring tones</td>
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<tr>
<td>Scanning barcodes, barcode shopping</td>
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<tr>
<td>Shopping (physical products)</td>
</tr>
<tr>
<td>Sports information</td>
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<tr>
<td>Stock information</td>
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<tr>
<td>Ticketing</td>
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<tr>
<td>Traffic information</td>
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<tr>
<td>Travel-related information (e.g., timetables, seat availability)</td>
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<tr>
<td>Vending machine payments</td>
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<tr>
<td>Video (movies, TV, movie trailers)</td>
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<td>Weather information</td>
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</tbody>
</table>

CONCLUSIONS

This paper has examined only services used via small mobile devices. Due to the introduction of wireless computer networks and laptops, computers can also be used as mobile devices. A number of European and American cities have opened or are planning to open wireless networks covering the entire cities. The use of laptops (with wireless network adapter cards) becomes truly mobile as these kinds of wireless networks become increasingly available. However, it is clear that laptops and small mobile devices as terminals are very different.
This becomes evident by merely considering the size of the displays and keyboards or differences in storage capacity. These differences in size and functionality make the service experience very different as well. In addition, certain characteristics of mobile phones create a need for services (e.g., ring tones) that are not relevant in the case of bigger mobile devices. At present it is still necessary to consider services used via small mobile devices and services used via laptops as totally different services.

The aim of this paper has been to clarify the meanings of concepts used in the context of business-to-consumer mobile offerings. It may be that the definitions introduced here are also applicable in the business-to-business context. Since business-to-business services were not covered in this paper, it is recommended that they be given attention in future studies. This paper did not attempt to develop a classification of mobile content services; only a distinction between transactional and non-transactional services was made. A coherent view on classifying mobile content services should be strived for after reaching a consensus on what is meant by mobile content services (i.e., a common definition). Therefore, creating a typification of mobile content services is a challenge for future research.

In this paper it has been emphasized that academics need definitions in order to gather an organized body of knowledge in a specific area of research. Not only academics but also practitioners unquestionably need definitions. Definitions, that is, clear meanings of salient terms, are crucial in making decisions, setting targets and structuring or analysing company performance. Clear concepts with unambiguous definitions help understand and communicate things.

While certain fluidity in the use of language is likely an integral part of academic life, some sort of semantic orthodoxy at the core of the field is necessary (Willoughby 2004/2005). This paper has contributed to this quest for concepts with clear and shared meanings by introducing new and old definitions and outlining their interrelationships. The definitions provided are broad and are thus meant to serve as a starting point for scholars in defining the specific issues that they are about to examine. The discussion in this paper aimed to clarify the thoughts of those working in the expanding area of mobile offerings. As concepts related to mobile offerings have thus far gained very little attention, it is hoped that this paper can inspire more discussion on the basic terms and their definitions.

Notes
1. The term ‘mobile offerings’ is used in this paper as a general term to describe all things offered in a mobile environment.
2. Baldi and Thaung (2002) divide consumer mobile services into pure entertainment and entertaining services. In their taxonomy pure entertainment consists of ‘applications solely accredited to the entertainment industry’ and entertaining services are services ‘that serve a second purpose beside pure amusement (e.g., educational or informational)’.

References


