

December 2002

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Recommended Citation

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Mobile Commerce: A Summary of Quests for Value-Added Products and Services

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Abstract

The first signs of mobile commerce hype are here. Extremely rapid penetration and growth processes are predicted on the basis of some quick descriptions of mobile technology. The roots of these predictions are often found in markets with a low penetration rate of mobile technology. Nevertheless, it should be clear that without real substance in m-commerce products and services the investments in the new mobile technology could still fail. We claim that much more should be known about what actually will be the m-commerce products and services. We will argue that value-added products and services should be understood from the viewpoints of (i) the users, (ii) the producers and (iii) the management. The first results from an expert survey on m-commerce carried out in Finland, Hong Kong and Singapore are used to argue these points.

Key words: *mobile commerce, expert survey, value-added products and services.*

1. Introduction

Mobile commerce (m-commerce) is in many cases of common wisdom (and anecdotal evidence) understood as *electronic commerce products and services offered on mobile platforms*. This is turning out to be unfortunate for several reasons: (i) web-based technology is being squeezed into small mobile devices, (ii) user interfaces, which work well on 17" or 19" screens do not work on the small screens of mobile devices, (iii) the user context for Internet products and services is not the same as the mobile context, and (iv) the choices of products and services are not compatible with the needs of mobile users. The web-metaphor is also unfortunate as it is leading the design of mobile products and services astray, which was seen in the early phases of the WAP in the GSM networks.

There are still not too many definitions of m-commerce available. Keen and Mackintosh [5] have defined m-commerce as the extension of electronic commerce from (i) wired to wireless computers and telecommunications, and from (ii) fixed locations to anytime, anywhere, and anyone. Wireless technology provides the technical basis of mobile commerce, but wireless does not always guarantee mobility.

In a Plenary Address at the ECIS 2001 conference Kalevi Kontinen¹ added a number of distinguishing features to the m-commerce products and services. In his description, the *m* stands for both *mobile* and *multi-modal*, and he identified key features of m-commerce as wireless & anywhere & moving. He then identified four different categories of services in an ascending order of technological challenge:

- mobile client, standard services (for tourism, shopping, health care, logistics, etc.), separate voice,
- + services, aware of a client location,
- + moving services, aware of their own location,
- + services, aware of other clients in vicinity

M-commerce is said to mark the start of a new era in business and will for sure alter the basics of commerce as well as competition. As Keen and Mackintosh [5] have pointed out, e-commerce made the personal computer the window for the user to get to the web and m-commerce built on the wireless devices by which the web comes to the user. Mobile applications will change the way we live, entertain and do business.

M-commerce offers an opportunity to re-invent the customer and to bring the needs of the customer into the interface with the mobile technology. Keen and Mackintosh [5] propose that the very core of the m-commerce is to make the user the centre of the information and communication world in relationships and business operations

¹ Senior VP, Nokia Networks

that create new freedoms for the user. Freedom, is said to make a real difference in how m-commerce customers go about their day, how companies build their options and design new business processes, and how their staff mobilizes the organization's knowledge and communication resources.

May [6] says that when something is mobile it means that its primary usage environment is a mobile one. He classifies mobile commerce services in three categories: (i) base service platforms (e-mail and messaging, web access, voice, location finding and digital content products), (ii) services for customers (travel, ticketing, banking, stock trading, news and sports, gambling, games and shopping), and (iii) services for business (mobile markets and the independent professional, mobile collaboration in action and mobile commerce closes the management loop).

As we have found out in our survey with m-commerce markets, these services exist more in principle than in practice. Several of them appear not to be as attractive as we might think when we take a rapid glance at them. Also, as we will see in the following, there is a need to make more precise distinctions between the user contexts, i.e. "services for business" may well also be "services for customers" (and vice versa) with only some user interface adaptations or some changes of software modules.

Although m-commerce is an emerging field in its early stages there are a number of ideas of what is going to constitute the key success factors for the actors in the global m-commerce arena ([1], [3], [4]) and some material can be collected by following up on news of the m-commerce market through commercial data sources (cf. [7] where this was done with scenario agents).

A point in case is the Accenture M-commerce Roadmap², which offers a number of insights and recommendations. The report starts by offering a number of mishaps and demonstrating that things were not well understood: (i) two major banks developed an m-commerce system to allow customers to download credits to their credit/debit cards; the project was cancelled after two years, due to low consumer interest; (ii) a major telecom company established alliances with a large group of banks for its mobile banking solution; now mobile is not even on their top-ten list of most valuable applications; (iii) another telecom offered several transaction-based applications, but there was not enough take-up to justify the investment. These three cases suggest to a critical reader that it could have been worthwhile to ask the potential customers what would be convenient and value-adding routines for them – building solutions for the customers, and then teaching or persuading them to use them, has always been problematic for the implementation of information systems or most technological innovations.

The Accenture Roadmap goes on to recommend mobile success principles: (i) clearly establish real, pragmatic value for the customer, (ii) minimise the behaviour change required, (iii) establish trust and (iv), build industrial momentum. As we will see in the following, these principles, which are said to have proved themselves

² Available at <http://www.mformobile.com/>

at almost every stage of technological innovation, may not be useful for an understanding of m-commerce products and services.

The introduction of m-Wise (in the MforMobile Comment³), which is a mobile advertising company, shows many of the elements of the hype which persists in the m-commerce arena. Peggy Anne Salz writes: “The exponential growth of SMS coupled with the staggering success of recent advertising campaigns by the likes of Pepsi and McDonald are sure signs to operators and content providers that mobile media, used the right way (and this doesn’t mean spam) can convert passive mobile users into active and enthusiastic customers. Mobile advertising has come a long way in a short time... Since it began in early 2000 the company (m-Wise) has established direct connections and billing agreements with Europe’s leading operators ... Altogether, this gives m-Wise access to a mobile user community of over 130 million.”

In the business-to-employee (B2E) arena a Synchronologic white paper⁴ points to three forces driving the enterprise mobile ROI: (i) boosting mobile productivity, (ii) cutting costs by automating existing processes, and (iii) building competitive advantage. The white paper goes on to demonstrate these advantages with short cases. The Keen and Mackintosh [5] material supports the ideas and insights brought forward in the white paper.

In the following we will introduce and define key elements of m-commerce (in section 2), report on findings from expert surveys carried out in Finland, Hong Kong and Singapore (in section 3), and then formulate some of the operating principles for m-commerce products and services (in section 4), and conclude in section 5.

2. M-Commerce: Key Elements

Let us introduce some structure into this discussion of what constitute the key success factors and propose some classifications along three perspectives: the customer, the producer and the management.

Seen from the perspective of the *customer* the necessary distinguishing elements are (cf. [1]):

1. flexibility, m-commerce products and services should be available anywhere, at any time and anyhow.

³ A service by MforMobile.com, report dated April 30, 2002.

⁴ The white paper *The Future of Enterprise Mobile Computing* is available at www.synchronologic.com

2. value-adding, m-commerce products and services should improve productivity, they should be adaptive to localization and they should be sensitive to customer personalization.
3. a mobile technology basis, m-commerce products and services should use innovative and distinguishing features of mobile technology to enhance the quality of life (e.g. messaging, entertainment, education, information, privacy, etc.).

Seen from the perspective of the *producer* the necessary distinguishing elements are

4. modularity, m-commerce products and services could be built from a core of generic product and service modules, which can be combined to form context adapted products and services; this should support the flexibility element.
5. layers, m-commerce products and services could be built in layers to add attributes and characteristics, which are adapted to (i) customer personalization, (ii) localization, (iii) brand profiles, (iv) privacy, etc.; this should support the value-adding element.
6. bundling, m-commerce products and services could be built through a bundling of modular products and services, which would be a way to make use of the mobile technology basis. Bundling can be done through modules and layers, but can also be mobile technology based.

Seen from the perspective of the *management* the necessary distinguishing elements are

7. value/cost ratios, m-commerce products and services should show good or very good value for cost in comparison with similar products and services; this should form the basis for pricing strategies, and cost and revenue models.
8. production, logistics, marketing and advertising, m-commerce products and services should have innovative features in comparison with similar products and services; this may be a function of the possibilities offered by the mobile technology.
9. business model, m-commerce products and services should use innovative and distinguishing features of mobile technology to support new business models.

We can combine all these elements in an intuitive graphical description (fig 1).

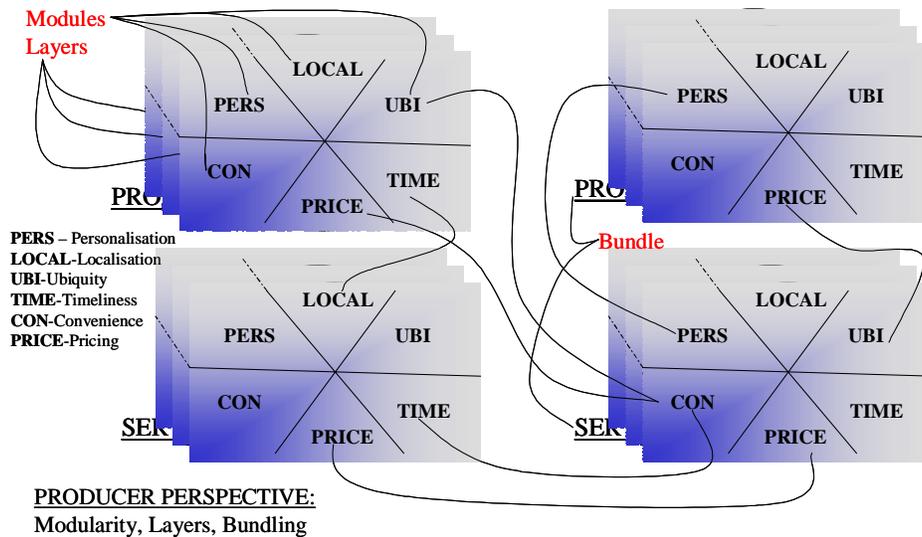


Figure 1: M-commerce, Key Elements of Products and Services

In figure 1, products and services are shown as “thick sets”, which are built with multiple layers (cf. the producer perspective), and each layer may be defined by multiple attributes, which may be the same or different for each layer. The products and services are described with multiple attributes, which represent, for instance, the key success factors, the distinguishing elements (from the user, producer or management perspectives), or some other features, which are essential for the design of good m-commerce product and service combinations. The attributes can be specific for modules and/or layers, and they can be defined for specific products and services, or be specific for bundles of products and services. It appears that we with these simple elements can describe a considerable variety of m-commerce product and service alternatives.

As the distinction between products and services may become blurred as they are produced with digital mobile technology we need to introduce the following distinctive elements:

- *services*: intangible, no ownership is defined;
- *products*: tangible, ownership is defined;
- *digital products*: intangible, ownership is defined
- *digital services*: intangible, no ownership is defined;
- *digital product & service*: intangible, ownership is defined;
- *digital service & product*: intangible, ownership is not defined;

The last two cases point to the possibility that we have proprietary services as part of digital products or that services may have products incorporated, for which no ownership can be claimed. It appears that ownership is a key feature for products – a key feature for services is that the client’s presence is needed. This may then serve as a guideline for building m-commerce products and services. The recent debate about the Napster Internet-site shows that the distinction between products and services is not that clear, and that producers of m-commerce products and service may have problems getting their rights defined and recognized. This is again a key issue for securing revenue from mobile commerce. The copyright to material on the Internet has also recently been debated as David Brooks found out that large parts of the material he collected over five years for his site www.vangoghgallery.com had been copied and used for a competing site – his ownership was not recognized in the court (now the site is owned by Barewalls.com and it is not possible to copy Van Gogh paintings anymore).

The quest for killer applications, which is a common feature in most of the business seminars sold by the key e-business consulting companies, may be a quest in vain. Already from the elements we have introduced above it appears evident that single, outstanding killer applications may be rare and far between. This has also been visible in discussion of m-commerce products and services, in which we have various types of combinations:

- *Killer Cocktail*, a mix in which the components cannot be distinguished (Nokia);
- *Killer Pizza*, a mix in which the components can be distinguished;
- *Killer Bouquet*, a set of components for which the aggregate is more than the sum of its parts (the one we have chosen as our metaphor);
- *Killer Soup*, the more ingredients you put in, the better it gets – an operator will be needed for stirring;
- *Killer Fondue*, as for the soup, but no operator is needed for stirring;

Using these, no doubt rather stirring metaphors, the “killer bouquet” is a bundle of m-commerce products and services, i.e. the type of combination we have shown in fig. 1.

With an understanding of the key features and success factors it appears that the core of the m-commerce products and services is, (i) to develop value-added content, (ii) to make them localization adaptive, (iii) to make them flexible to localization, (iv) to make bundles of products and services ubiquitous and adaptive to moving customers, (v) to ensure timely delivery, and (vi) to build or enhance user freedom.

Then the simple next step is to understand what these m-commerce products and services may be. In order to find out we carried out an expert survey in Finland, France, Germany, Hong Kong and Singapore in 2001-2002 in cooperation with our research partners. Here we will report only some of the results from Finland, Hong

Kong and Singapore - a more thorough analysis of the results and a number of reports are forthcoming.

3. Early Results from the Expert Surveys

In order to get insights into the state, the potential development and the key issues of mobile commerce we conducted expert surveys during June 2001 and April 2002.⁵ A sample of 50 companies operating in the field of m-commerce was selected in all the countries studied. In Finland 31 companies participated in the survey, in Hong Kong 31, and in Singapore 28, and we will show some of the results here. The companies were (i) providers of m-commerce products and services, (ii) providers of m-commerce infrastructures, as well as (iii) providers of consulting and financial services in the area of m-commerce. The survey was carried out using an online questionnaire⁶ on the Internet. We measured the experts' opinions mainly using a forced scale, which requires the respondent to indicate an opinion on the item.

3.1 General Acceptance of M-commerce

Measuring the general acceptance of m-commerce in Finland, Hong Kong and Singapore is hard especially when the experiences from the three markets are still in their infancy. The experts were asked to evaluate a number of m-commerce services and the likelihood of achieving a satisfactory level of turnover within the next 18 months (fig.2). When we compare the profiles we notice interesting similarities as well as differences between the expert opinions in the three countries.

The experts' opinions from Singapore and Hong Kong show that mobile shopping is supposed to have a high potential of success. The opinions differ quite a bit when compared with the Finnish experts. The reason for the big gap between the opinions is not obvious and the explanation may be found in some cultural aspects.

The experts' opinions show that communication applications like SMS are supposed to have a high potential of success. There are, however, differences between the expert opinions, the experts in Finland are more positive than their counterparts in Hong Kong and Singapore. As pointed out by Keen and Mackintosh [5] messaging has been one of the "killer applications" of the Internet, of mobile

⁵ Doug Vogel, City University of Hong Kong, was responsible for the survey in Hong Kong and Lai-Lai Tung, the Nankiang Technological University, in Singapore.

⁶ The questionnaire was originally developed by Manfred Kirschgeorg and his team at HHL (Leipzig), but has been modified and adapted by Christer Carlsson and Pirkko Walden at IAMSR, Abo Akademi University.

phones in Europe and Japan, and of a new generation of wireless devices, such as pagers. Mobile messaging for person-to-person communication is for sure an area for services with a high success potential in Finland, but also in Hong Kong and Singapore.

M-learning and m-education are according to the experts in Hong Kong seen as having a good potential for success. The experts in Singapore, and especially in Finland, do not share this view. Again we assume that it might have to do with some cultural differences or is derived from the fact that in these two countries, with about 5 million inhabitants, it wouldn't become a profitable business within the given time frame.

Mobile banking is seen as having a potential for success, especially according to the experts in Hong Kong. Brokerage is also seen to have some potential according to the experts in Hong Kong and Singapore. The Finnish experts are not as positive, which might reflect the fact that the banking markets are not as developed in Finland as in Hong Kong or Singapore.

Other profitable applications, which are expected to be found especially in the area of entertainment, and which is emphasized by the experts in Finland and Hong Kong; the experts in Singapore are less positive in their opinions.

The experts do not think that m-insurance services will turn out to be profitable in the very near future. Traditionally, the insurance business has involved a lot of face-to-face contact due to the complexity of the services and this might be a barrier for the insurance business to go mobile.

If we were to mark anything as a "killer applications" on the Finnish m-commerce market it would certainly be the SMS. A "killer application" on the Hong Kong and Singapore markets would be the possibilities for mobile shopping, which appear to cover only the selection of products and services, not the payments nor the logistics. The differences are still unexplained, and an interesting fact is that "shopping" was emphasized also by the French sample of experts.

There are differing opinions on "surfing/browsing", which support our earlier discussion of the problems with understanding m-commerce as only an extension of e-commerce. It appears that it may be the case that mobile devices are not seen as good tools for using the Internet, that the surfing and browsing are activities, which belong to workstations and large screens, and to a context where time is reserved for this activity.

Auctions are not seen as a viable activity for the mobile devices, and the reason may again be one of context. Auctions require a focused use of time, which is not a primary expectation for mobile activities.

A bit surprising is that mobile health care is not seen as a key potential activity. The reason is probably that the infrastructure for mobile health applications is still not developed enough.

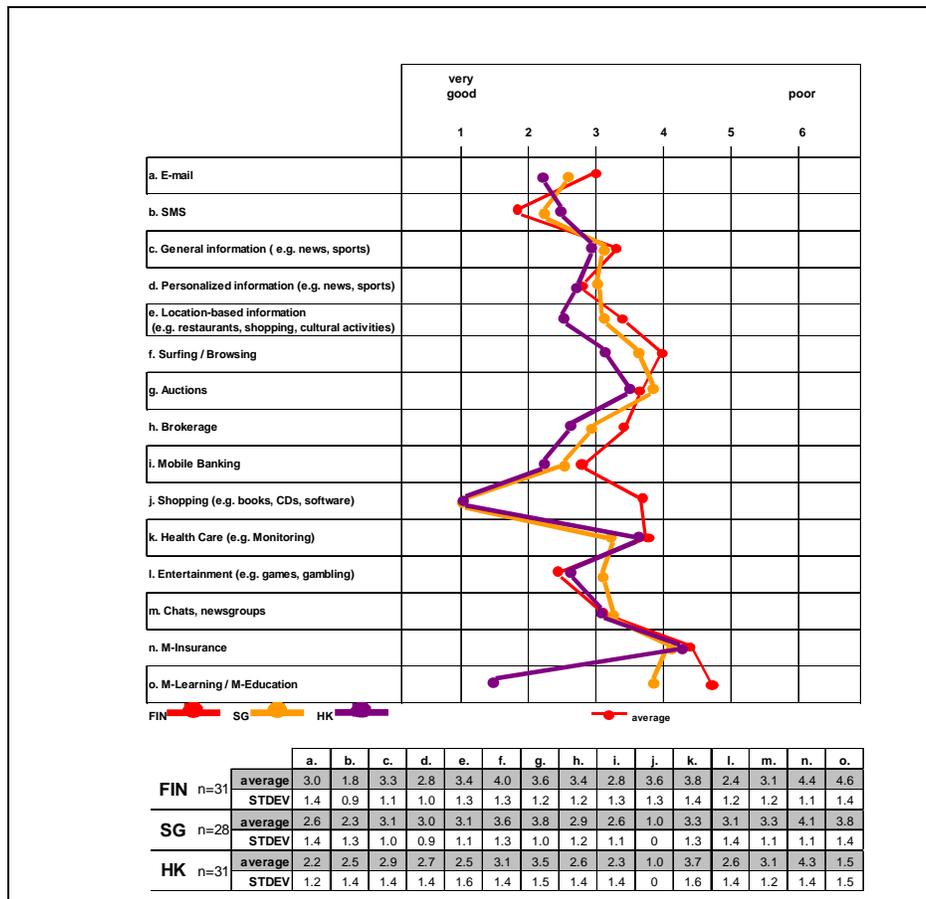


Figure 2: Likelihood of Achieving a Satisfactory Level of Turnover for the M-Commerce Products and Services

The relative importance of the various motivations of both current and future customers of m-commerce products and services show rather slight variations between the experts' opinions in the three countries (fig.3). The four factors with the highest importance are the same according to the experts. The pair-wise variation between Hong Kong and Singapore is less than when compared to Finland. The results show that the key reasons for using m-commerce technology appear to be (i) flexibility on time and location, (ii) time savings and (iii) to get up-to-date information. When designing m-commerce products and services functionality along these lines should be a first checkpoint. These results are in line with our discussion of the key principles for the mobile world.

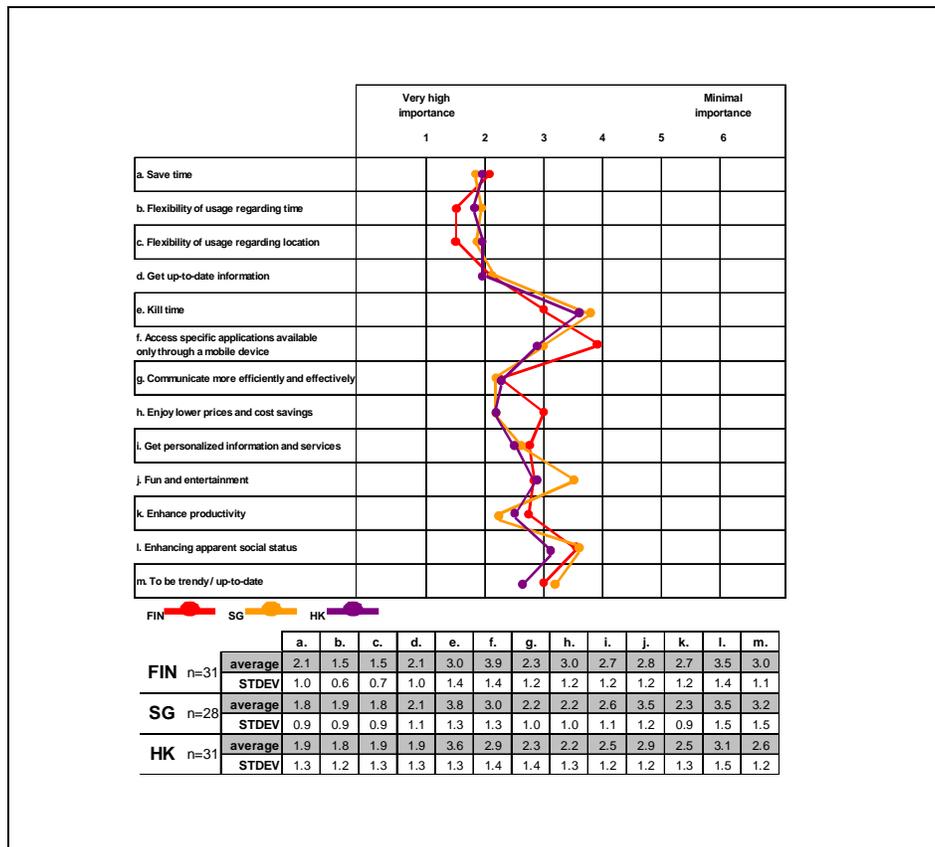


Figure 3: The Relative Importance of the Motivations of Current and Future Consumers of M-Commerce Products and Services

Adoption and the use of m-commerce products and services will depend on the attitudes of the individuals. If consumers feel the anytime, anywhere, i.e. the freedom Keen and Mackintosh [5] are discussing, they will use the products and services. It is obvious that m-commerce products and services must add significant perceived value to the customers.

The experts' opinions support the Keen and Mackintosh propositions, i.e. customers go wireless because of the high level of flexibility that the mobile devices offer both in terms of time and place. Other reasons are to improve productivity in terms of saving time, and to get up-to-date information. There are many studies, which point to the benefits of timeliness, location or convenience for users.

Things, which have to do with the customers' social status, do have some importance, but these factors are not as important as one would expect. Interesting is, that the experts do not think that access specific applications, that would be available only through a mobile device, would be of high importance. The experts

in Hong Kong and Singapore concur on this view, but the Finnish experts think that this point is even less important. The experts may see mobile commerce as complementary to Internet commerce and not as a completely independent business environment. The question of complementary versus independent m-commerce services correspond also with the proposals brought by Cattaneo and Martinoli [2] to different supplier business models and is a key aspect to take into account when analysing the potential demand.

The experts in Hong Kong and Singapore concur on the importance of lower prices and cost savings, which is seen as less important by the Finnish experts. There is also another (not very large) difference, the experts in Hong Kong and Finland regard fun and entertainment as potentially important applications, but they are found less so by the Singapore experts.

4. The Core Issues of Mobile Commerce

The lessons learned from our discussion of the key elements of m-commerce products and services, from the expert surveys and from the work by Keen and Mackintosh [5] point to a number of core issues, which we at this point believe will play some role in deciding the future of m-commerce.

M-commerce products and services will to a large extent be information systems, which are built as systems of modules, which in turn consist of layers for specific features and functionality. Products and services may be bundled together in order to offer enhanced or advanced products and services. The bundles are formed by interconnected information systems, in which the connections are worked out through either the layers or the modules (cf. fig. 1). This forms the basis for the building of *new customer relationships* (cf. [5]), as these will be handled through software, which offers the means for new relationships designs. If the interaction with customers is to be run with software support on mobile devices, we will be forced to find simple but value-adding solutions, i.e. there will be the need for rather a complete business process re-engineering.

If we build new customer relationships, we should gear these to a *redesign of the supply chain* and to new principles for supply chain management. This follows naturally from the concentration of the customer interface to software, which opens the road for building supply chain and logistics solutions with information systems, which integrate to the customer interface solutions. In this way, there is some substance to the claim that m-commerce will form the basis for new forms of commerce and for new business models.

Keen and Mackintosh take one more step (cf. [5]) as they propose that m-commerce will cause a mobilization of the knowledge resources of an organization. This contention can again be understood as a consequence of the technology developed for the forming of new customer relationships and the redesign of the supply chain

– this technology can be used internally in a company to simplify the internal logistics networks. This was supported in the expert survey, in which the most important motivations for m-commerce were: (i) saving time, (ii) flexibility of usage regarding time, (iii) flexibility of usage regarding location, and (iv) getting up-to-date information. Even if these observations refer to the m-commerce products and services, the technology can be used for company-internal purposes as well, and will then have the effects proposed by Keen and Mackintosh.

The key question for m-commerce is to find some way to judge the user-value of products and services, i.e. to find the applications, which will form the basis for viable business models. In [5] the *Braudel Rule* is proposed: *freedom becomes value when it changes the limits of the possible in the structure of everyday life*. This is a very good insight, as it offers a way to screen out products and services offering only *convenience* (like saving time and effort, but they will not change the limits of the possible) or being only a *feature* (offering new options within existing routines). The freedom can be worked out in three different aspects (cf. [5]): (i) relationship freedoms, which add value to the customer relationships, (ii) process freedoms, which add value to the supply chain, in logistics and in business partner relationships, and (iii) knowledge freedoms, which add value through knowledge mobilisation.

A surprising observation is that the freedom test can be worked out in terms of the systems structure we have developed in fig 1. First of all, the freedom dimensions get different interpretations for the customer, the producer and the management perspectives, and it may be the case that product and service features, which fail “the freedom test” for the customer, may be freedom features for the producer and management. Second, the customer may have different “freedom attributes” as an individual as compared to when he/she is the member of a team, a group (with some shared value structure), a family, a work community or a leisure time community. Third, there appears to be different “freedom attributes” for work roles and the roles individuals have in their free time, as the relevance and importance of timeliness, localisation and personalisation (which we identified as key features in fig. 1) get different emphasis.

In our expert survey, SMS is jointly identified as a key m-commerce service, which is likely to achieve a satisfactory level of turnover. The SMS is identified in many studies (cf. also [5]) as “freedom service” and there is no doubt that millions of teenagers all over Europe regard it as a way of “changing the limits of the possible in the structure of everyday life”. It is easy to see that SMS for the customer is a communication tool in both work-related activities and in free time activities – but it is used differently. The producers (~the network operators) strive to build add-on activities and services to the SMS in order to increase the use of network time, and to perhaps create new products and services, which will again have the “freedom attributes” for customers. Seen from a management perspective, the SMS is a way to save costs and resources for exchange of information, to carry out real time co-ordination, to facilitate teamwork, etc.; this will again attract the attention of the producers, which will try to build add-on products and services to facilitate the

management applications; if they are successful, these products and services will again have the “freedom attributes” for the customers and be adopted. And so on.

This suggests the existence of value networks for the actors on the m-commerce arena, and the need for a taxonomy of core features for the m-commerce products and services.

5. Summary and Conclusions

We have discussed a number of visions and we have introduced some key elements of mobile commerce products and services. The first results from a series of empirical studies with experts in Finland, Hong Kong and Singapore show a number of potentials for viable m-commerce products and services.

The m-commerce field is still in the chaotic first stage of market development and there is considerable confusion as to what is going to work and what is going to fail. We, however, propose a number of guidelines for identifying products and services, which may work: (i) working out the constructs from the customer, the producer and a management perspective, (ii) making sure that the products and services are information systems constructs, which are built as modules, layers and bundles, and (iii) that the constructs pass the Braudel Rule test.

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