Mobile Business and Services

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1 Introduction

In terms of business models, mobile commerce (MC) includes relations between customers, operators, ecommerce providers, payment providers, and other parties. There is a growing number of publications on MC sometimes labeled as research. But most of this work should be better called market studies or benchmarks. They highlight different aspects such as the number of prospective consumers, the estimated market volume, etc which do not really provide deeper insights . Well known sources for this kind of information are Arthur D. Little, Ovum, Durlacher, Merrill Lynch, Gartner, Forrester and others. They all try to estimate the perspectives of the mobile market(s) by using figures on mobile phone penetration, SMS usage, mobile internet access etc. Many of the remaining publications are technically oriented (for an overview see e.g. Prasad et al. 2000, Muller-Veerse 2000, Webb 1999). So what we are generally missing are concepts and guidelines for developing the mobile business, which something the MIS field can undertake. It is the purpose of this paper to contribute to a solution by providing a structured view of the major areas from a business point of view.

There are several ways to come to an overview of the research field in a certain domain. One may be a systematic and methodological approach (e.g., a Delphi study) compiling the expert knowledge within a community. Another way might be a systematic survey of the literature and digging for open questions, unsolved problems or applications to be developed. Both ways seem in appropriate in the case of MC. The main reason is time. The field of MC is rather new and rapidly changing. So the community building process is in a very early phase and not many serious publications with a business focus are available.

At this point we should remember the relation between mobile and electronic commerce. Of course we can reduce the discussion to a question of definitions. This position is not very helpful and even shortsighted. It avoids recognition that MC is an emergent field that has its own set of concepts and relationships. The reduced view of understanding MC just as one more electronic marketing channel is understandable from a strategic or marketing point of view. It is not, however, really a help for understanding this new field and even less for supporting practice with reliable data and insights. This does not mean that we will not have one common view (or more of them) in the near future. An impression of this future is given in a short essay on U-commerce by Watson (2000). But before this becomes reality we have to elaborate theories, models and appliances of practical use. And it should not be forgotten at this point that there is still a high economic risk in the mobile business and it is not clear who will be the key players in the next decade. In short, MC is different because of the equipment, the application and the infrastructure currently used. It is this difference that makes research directions necessary.

A first attempt to structure the research field was the hex model by Straub and Watson (2000) is used to explain e-commerce from a stakeholders perspective. This model

covers the basic interactions with various stakeholders whereby the organizations are linked by the supply-chain or further intermediaries. Further models presented in the next sections of this paper concentrate on MC services, MC market players, and the value chain. Beyond this background we suggest to follow a structural approach. This structural approach is related to the need for something like a landscape or a map presenting the relevant areas in a context (dependencies, relations etc.). In other words, there is a need for a general model allowing the integration of partial research results and supporting an incremental process of knowledge accumulation. A preliminary attempt is made after the comparison and discussion of the models already mentioned.

2 Stakeholder Perspective

The stakeholder perspective uses a broad definition of MC based on a prior definition of e-commerce (see Watson et al. 2000). Mobile commerce is *the use of cell phone technology for communications and transactions between an organization and its various stakeholders to improve organizational performance.* Stakeholders include customers, suppliers, governments, financial institutions, mangers, employees, and the public at large. Increasing profitability, gaining market share, improving customer service, and delivering products faster are some of the organizational performance gains possible with m-commerce.

The hexagonal model describes the organization's interactions with various stakeholders (see Fig. 1) developed by Straub and Watson (2000). In their model, the firm is shown to interact with six stakeholders, namely: (1) suppliers or (2) intermediaries, (3) customers (4) government, (5) employees, and (6) investors.
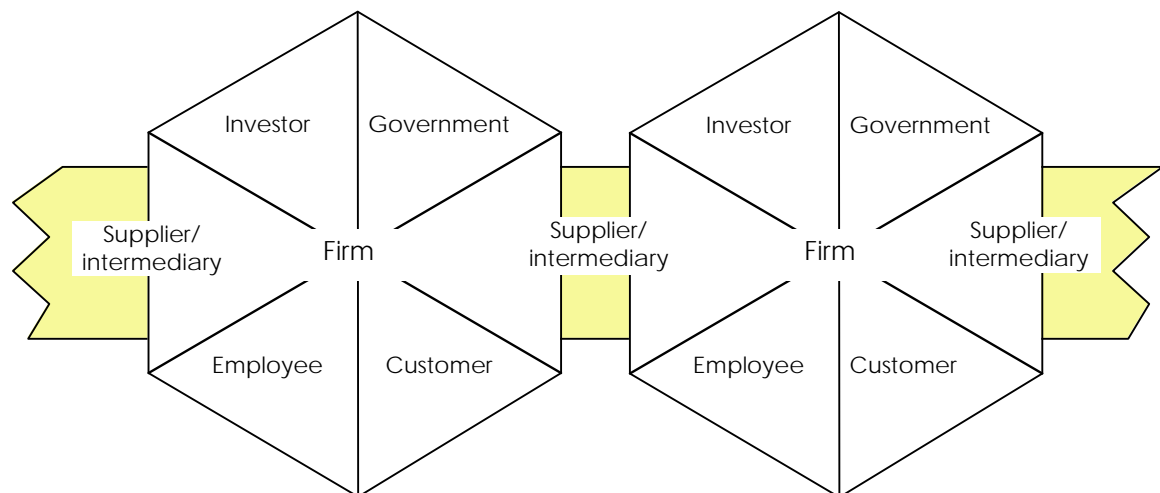

Figure 1. Hexagonal (Hex) Model of Firm Interactions

The hex model indicates the communication and transactions relationships that can potentially be investigated. For example, researchers could study the issues involved in GSM communications between a firm and its investors. In identifying and exploring the research issues posed for each relationship, we concentrate on the goals that a firm is likely to pursue. In the case of the firm/investor relationship, the firm is most likely to be seeking to lower its cost of capital. It is the research questions raised by these relationships that are the dominant focus of the remainder of this section (see Table 1).

Table 1: Stakeholder-driven research issues (Straub and Watson, 2000)

Stakeholder	Firm's goal	Research questions and issues
Investor	Minimize the cost of capital.	How does a mobile information service make a firm a more attractive investment proposition? What information do mobile investors want to pull and what do they want pushed?
Government	Reduce the cost of complying with government regulations.	How can mobile technology reduce the cost of transferring information to governments?
	Influence government decision making.	How can mobile technology be used to influence political and public opinion?
Supplier/Intermediary	Reduce transaction costs.	How can mobile technology reduce supplier/intermediary coordination and information sharing?
	Reduce raw material costs.	How does mobile technology increase the buying power?
Customer	Increase market share and share of a customer.	What mobiles information services do customers value?
	Retain customers.	How can customization increase switching costs?
	Maximize revenue.	What business model maximizes revenue?
Employee	Increase employee productivity.	What organizational tasks can be leveraged by mobile information services? What is the ROI on mobile information services for employees?
	Share knowledge across the organization.	How to design and deliver mobile information systems that make knowledge accessible when and where required?

The research questions raised in Table 1 are, we believe, central issues for IS researchers studying MC. They are large in scope and consequently unlikely to be answered in a single study. We believe a program of research will be more successful when driven by top down issues as this enables a comprehensive investigation to be planned. Key issues can be explored using multiple methods (e.g., experiments to studying to studying the relationship between information and an investor's opinion of a firm to field studies of employee directed mobile information systems).

3 MC Services and Applications Perspective

The growing number of mobile applications leads to a demand for classification as it is almost currently impossible to oversee the whole range of products and services. The framework suggested offers a functional view on mobile applications and services. A main scope of this view is supporting the creation of a company specific portfolio. The underlying idea is that all these applications will be supported by either information, communication or transaction processes or by a combination of them. These basic processes may be seen as „ constructors" on an architectural level. Figure 2 therefore can be used to explain mechanisms or constructions on a higher level.

M-e-Bill
M-Salary
M-Advertising
M-Information Services

information process

M-Navigation
M-CRM
M-Health Care
M-Car Care

M-Retailing
M-Ticketing
M-Reservations
M-Betting

M-Banking
M-Brokerage
M-Auctions

M-Entertainment

communication process

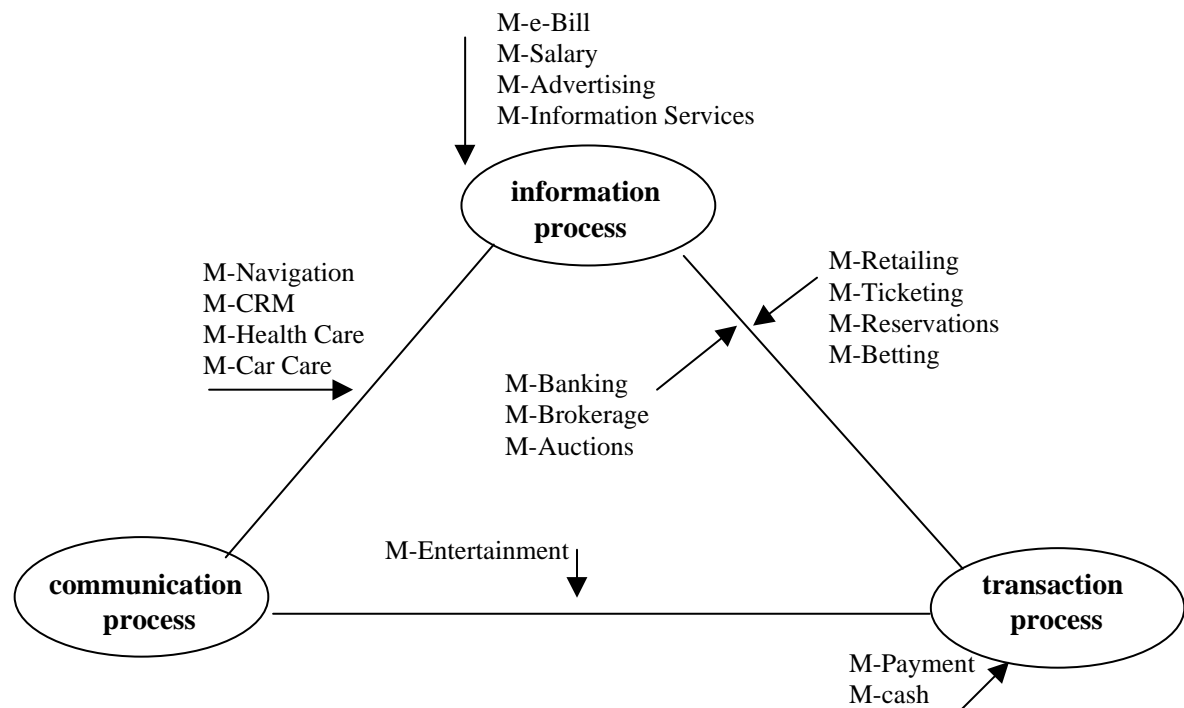**transaction process**

M-Payment
M-cash

Figure 2. Underlying Processes

Relevant research fields are:
- Identification of future applications
- Business development and success factors of mobile applications
- Business models
- Interactions between e- and m-commerce
- User profiling and attractiveness of mobile portals
- Mobile customer relationship management

Of course, the previous classification scheme is not the only way to structuring the emerging and dynamic field of mobile applications. And there will be some overlaps between the different perspectives as well as within the models used to classify the growing number of applications.

Finally a more technical approach focuses on how to develop, implement and test these systems. This leads to several research areas that are very specific and sometimes related to certain devices. For example, the presentation of information (audio, video, text, graphics) not only depends on the information and the task context

but also on device properties and the technical restrictions, like bandwidth, of the underlying network. The following enumeration lists selected research problems:
- mobile engineering and mobile application development
- style guides and usability tests
- mobile content management
- mobile access to data (data bases)
- tool support
- security mechanisms
- standards and protocols

4 MC Market Player (Institutional Perspective)

The institutional perspective helps to identify and supervise market segments, market shares, their growth or decline as well as the relationships between key players in this field. Figure 3 presents an overview which has been adapted from Ovum and similar sources.
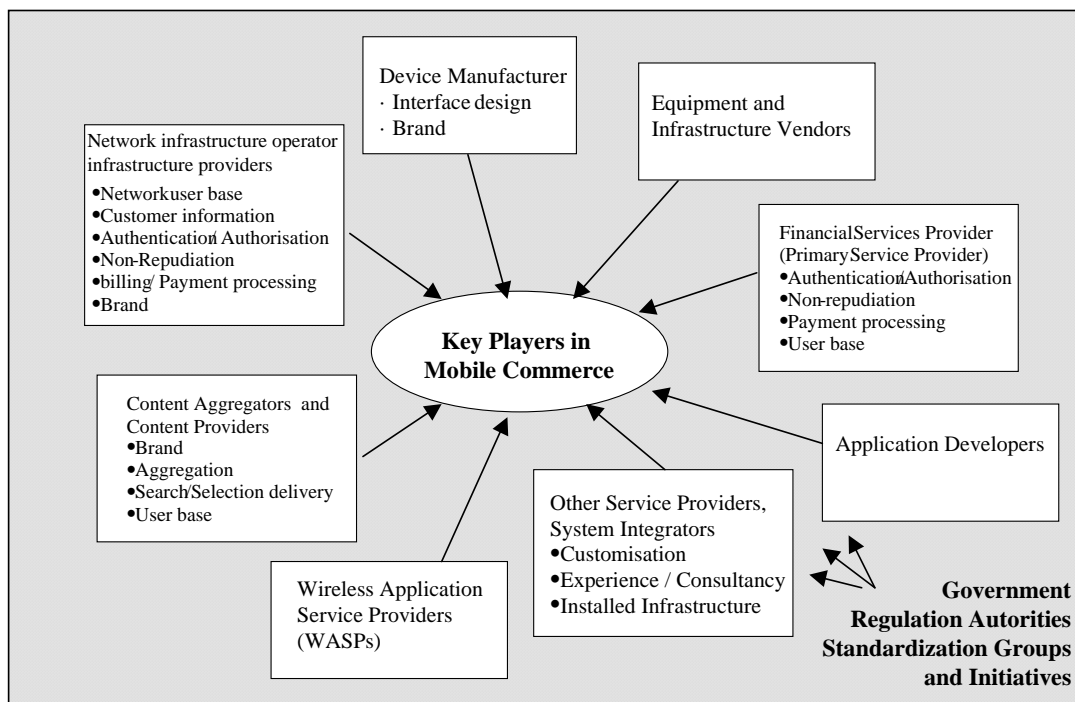

Figure 3. Key Players in Mobile Commerce

Of course, the companies in this market cannot be seen only as independent units. They interact with each other and one way to visualize the interactions is the value chain perspective. Also the stakeholder perspective is of importance and provides interesting insights in the relations between different market participants and segments. Finally, a very interesting approach is the so called MC life cycle as proposed by Varshney/Vetter (2001). This MC life cycle depicts the flows and interactions between highly specialized firms in the mobile business.

Relevant research questions and problems from an institutional or market players perspective are:
- Which alliances will be useful and what are the driving forces for cooperation?
- Interactions between mobile market players

- National differences (e.g., in regulations, adoption or diffusion of technologies or standards)
- General market models on a macro level
- What needs for national or international regulations can be derived?
- Educational needs / mobile professionals

5 Discussion and final remarks

The key focus of the hex model is the firm that uses e-commerce for its business. This makes the model generally valuable for explaining MC and allows the formulation of questions and research directions for each stakeholder´s view. But the model has also disadvantages because it does not cover the whole field and important aspects might be forgotten. For instance what about the core industry (network supplier, equipment producer, ASPs, equipment vendors, standardization organisations or service provider)? Even in these cases the hex model may be used to identify stakeholders and their possible interest. But is this the superior view as these organizations are engaged in the mobile business in different way? This brings us back to traditional views like the value chain or business models which serve as very general instruments for explaining different businesses. Nevertheless the hex model is quite useful and could be adapted to the mobile business without major problems.

The models presented in this paper can be seen as part of an open MC framework which will support systematic investigations and prevent the design of proprietary products and services in an ad-hoc manner. We believe that these models can lead to new insights because they provide a systematic basis for investigation in the sense of a research framework. It is expected that their application will lead to improvements in the interoperability between applications and better interactions between firms in the mobile business.

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