Exploring the User Experience Factors in Designing Successful Mobile Internet Services for Business Use

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ABSTRACT
In the past decade, mobile internet services have been developed for consumer and entertainment usage. More recently, mobile services are starting to enter business contexts in different types of companies in, for example, office work, logistics, construction business, and health care. However, the user experience (UX) with these services depends on their suitability to the workers' needs, tasks and processes in the business contexts. Mobile service UX is affected by a multitude of intertwined factors, including terminal design, service interaction, and compatibility of the technologies used in the companies operating as part of a business network. The context of use is quite complex, and it needs to be analysed and modelled to ensure the success of the services in long-term, goal-oriented usage. This research aims at establishing a model of comprehensive set of factors that affect the UX of mobile services in business contexts. Based on the factors, methods for designing successful mobile services can be developed.

Categories and Subject Descriptors
H5 Information interfaces and presentation (e.g., HCI): User interfaces – theory and methods, Evaluation/methodology; H4 Information systems applications: miscellaneous

Keywords
Mobile internet business services, user experience, usability, design methods

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1. INTRODUCTION
Mobile consumer services such as music, gaming and messaging services have been developed and launched into markets to provide fun, self expression and community experience to their users. More recently, the development of mobile internet services has introduced great potential for benefiting businesses in different fields [1]. For example, health care, construction business, and passenger transport are fields where mobility is a crucial part of the work. If mobile services can be successfully used to support this work, the benefits will be large.

The UX of mobile business services is affected by several factors, such as the design of the service itself, the user's acceptance of the service, the functionality and content the service delivers, as well as the usability and ergonomics of the terminal. In addition, the impacts into efficiency and effectiveness can be studied through mobile usage that is influenced by technology characteristics (i.e., functionality and portability of the device) and task characteristics (i.e. structure and frequency) [3].

In business context, all of the factors need to support the work process which the service is intended to support. For example, in a mobile service for taxi booking, dispatchers, taxi drivers and service providers need to be involved in a design process of the booking system. Similarly, in designing a mobile service for home care workers, different stakeholders involved – nurses, family members and city authorities – will have requirements that are partly overlapping, partly even contradictory (e.g. privacy). We also believe that understanding the different contexts of mobile work [10], the design of successful mobile business services can be ensured since the mobility can be spatial, temporal and contextual, see e.g.[5].

To support the development of successful mobile services, companies have a growing interest in finding suitable methods for designing for and evaluating the factors that affect the success of services. To this end, a thorough understanding of the factors that affect usability – effectiveness, efficiency and satisfaction [4] – is needed. The emphasis may be on effectiveness, i.e. how "fast" the work flow can become, but users will also appreciate pleasant user experience. Furthermore, applicable design methods are needed in different phases of the service development lifecycle. This research aims at establishing a basic framework of these issues from developers', researchers' and end users' perspectives.

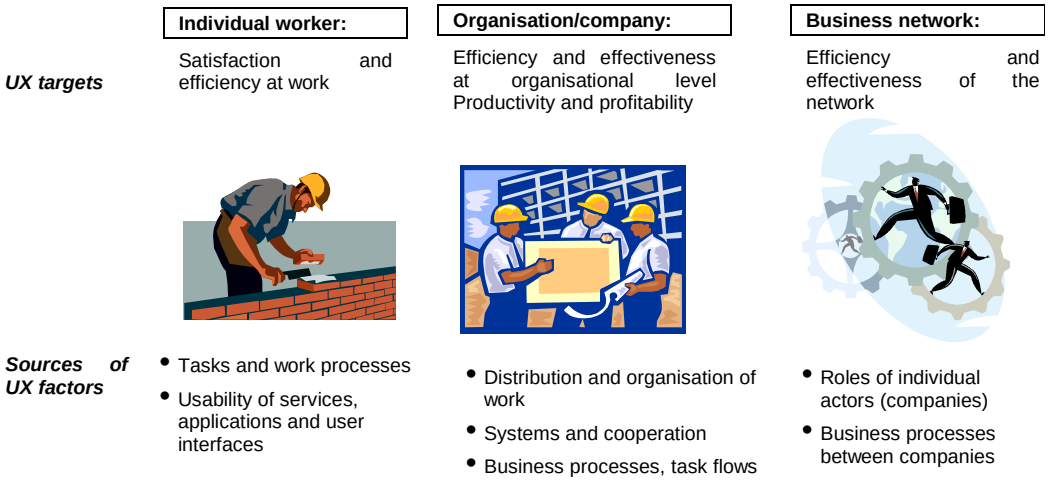

Figure 1**: Levels of mobile service business network and sources of user experience (UX) factors**

2. FACTORS OF USER EXPERIENCE OF MOBILE BUSINESS SERVICES

As illustrated in Figure 1, usability factors of (mobile) business services for work usage can be studied at three related levels:

1. Individual's tasks and work processes
2. Organisational functions and business processes
3. Business network level

From the **individual's** (end user) point of view, UX with information services implies easier task processes, pleasant usage of the application, and more satisfying work. From the **organisation's** viewpoint, good UX contributes to better organisational efficiency and profitability: the service must be easy to deploy, support work tasks and fit the company's or **business network's** activities (i.e. provide concrete benefits). Also issues regarding the impacts on work safety are essential in business contexts. User-centered design of information systems in business context is different than in the context of consumer services as in business context. The approach is broader, including the requirements of the different actors of the entire business network. Moreover, the importance of the value networks is emphasized [7].

The existing user-centered design and evaluation methods have mostly concentrated on the UX and usability of software systems, see e.g. [1], [9], used by well-defined user groups. Methods that would take the aspects of the entire business network into account as essential elements of success do not exist. When considering factors of UX for designing and evaluating the success of mobile internet services, the effects of the following aspects should be observed:

- Different elements of mobile internet services, such as the content; service and handset user interfaces; functionalities, navigation, network; as well as the total effect of these elements in the user acceptance of the service
- The organisational acceptance and efficiency, and how they affect the individual's satisfaction to work and towards the service
- Different success factors and expected business benefits for the business network in which the users and the organisation operate

The UX design approach consists of many layers and viewpoints, thus requiring a broad charting of the factors involved. Based on the defined factors, suitable design methods can be developed.

3. DESIGN METHODS FOR SUCCESSFUL MOBILE BUSINESS SEVICES

The development of mobile services consists of several phases in which the usability factors should be taken into account. In the *pre-implementation phase*, the focus should be on setting the targets for the UX and business process improvement. Context analysis is an essential part of the design, including both users' and organisations' requirements.

In the *design and implementation phase*, the model of UX factors should aid in benchmarking services against earlier, possibly non-mobile versions of the service or against competitors' service offering. Factors can be used as a basis for design guidelines, or for heuristics to evaluate the service prototypes.

In the *marketing and deployment* phase, the factors can be used to illustrate the benefits of the mobile service to potential customers. During the real use, the UX framework can be used in estimating or measuring the success of the different versions of the services.

In the different phases, the design of usable and successful services may be supported by, for example, tools for modelling the business and work processes (e.g., to estimate the potential benefits of the service), checklists (e.g., to make sure that important issues have been taken into account during the development), or questionnaires (e.g., to measure the opinions of the different user groups in relation to the success of the service, to gain feedback on the UX with the service), see e.g. [6].

In our research, we have explored requirements and developed tools for evaluating the success of mobile business services, see [7], [11].

4. FUTURE WORK

In our future work, we will seek to provide findings for following the questions:

1. What are a set of key UX factors of successful mobile services? What is the relationship and characteristics of these UX factors?
2. What are the potential design methods for the user-centered design of successful mobile internet services for business use?
3. What kind of ways there are to evaluate the UX in real world business use?
4. How to combine methods for measuring usability and business performance?

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