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Designing mobile business applications for different age groups

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ABSTRACT

Mobile business applications are changing the way we work and interact. Organizations have to understand why individuals choose to adopt or reject mobile business applications to effectively utilize potential benefits. Researchers and practitioners have to take into account that adopters differ from one another. In this context the demographic change is a serious challenge. Therefore, this paper investigates influential drivers of adoption for mobile business applications and examines how they differ among the rising segment of the digital natives and the increasing share of the greying market. After synthesizing research on adoption as well as on technology acceptance, we propose a new theoretical model. Subsequently, we empirically test our model with a heterogeneous sample of 653 participants using structural equation modeling and multi-group analysis. We find that convenience, perceived quality, enjoyment, perceived ease of use and perceived usefulness influence the acceptance of mobile business applications. The analysis of different age groups reveals that convenience is more important and ease of use is less important for younger users than for older individuals. Finally, we discuss the implications of our findings for designers of mobile business applications.

1. Introduction

When Apple launched its App Store in 2008 the market for software applications (short: apps) changed radically. Suddenly, mobile phones became platforms for software development, delivery and use (Cerf, 2011). Mobile phones provide a basis for creative ideas, user centered business models and new dimensions of utility. Since 2008, revenues from mobile apps distributed through the four major app stores (Apple, Google, Blackberry and Nokia) rose to a total of 2.155 billion US Dollars (Simonite, 2011). The download of mobile apps is expected to grow from 17.7 billion US Dollars in 2011 to 185 billion US Dollars in 2014 (Anthes, 2011). Malizia and Olsen (2011) found an illustrating metaphor:

> "There are as yet not as many apps as there are stars, but each one might shine as brilliantly, showing the extent of human invention and covering every "dark spot," every possible function." (Malizia and Olsen, 2011)

The same authors, on the other hand, doubt that a tremendous number of apps will survive over a long period because human behavior focuses on practical issues like functionality and effectiveness. Thus, the number of available and used apps will decline over the next years.

The mobile working environment is arguably one of those areas, where apps might be able to add functionality and effectiveness. We define mobile business apps as programs that are used in a professional context on highly mobile platforms (i.e., phones, tablets) and are intended to increase efficiency and effectiveness. A study by Beulen and Streng (2002) shows that the use of mobile business applications

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has a direct effect on the user's performance in terms of effectiveness and efficiency. In a more general context, the demands for flexibility, informational ubiquitousness and global mobility shape the work environment of the future and will foster the diffusion of mobile business applications.

To predict the diffusion of business models, knowledge about factors influencing the adoption of mobile applications is essential. A variety of studies analyzed influences on the general adoption of mobile applications or services (Verkasalo et al., 2010; Bouwman et al., 2009). Applying concepts like the Technology Acceptance Model (TAM), these studies conclude that factors like perceived usefulness, perceived ease of use and enjoyment can influence the intention to use a certain technology positively. The question whether these results are applicable for different types of applications and different groups of users, however, remains unanswered. Mobile business applications have specific characteristics, which need to be considered when studying adoption behavior. The classic separation of work life and private life becomes more and more blurred, leaving a number of challenges for the employee, the organizational environment and the technology. Mobile business apps play a crucial role in this constellation. Similar to business software used on conventional computers, mobile business apps have primary performance dimensions, such as usefulness and quality. In addition to conventional technology, mobile business apps' secondary performance dimensions such as convenience and enjoyment are becoming more important. The convenience to work whenever and wherever becomes essential to manage the issues related to the shift between work and life. Furthermore, enjoyment and ease of use gain significance, since intrinsic motivation is an essential driver of effective work under these conditions.

First empirical evidence on mobile applications in work environments reveals that compatibility, usefulness/functionality and perceived ease of use affect the intention to use an application positively (Beulen and Streng, 2002; Wu et al., 2007; Gebauer et al., 2004). Most of the studies conducted so far focus on a specific industry (Wu et al., 2007; Wu et al., 2011) or one type of mobile application, like e-procurement (Gebauer and Shaw, 2004) or hotel reservation applications (Wang and Wang, 2010). None of these studies draw a broader picture by focusing on business applications as a domain of applications. Furthermore, factors influencing the use of business applications, leaving specific industry boundaries behind, are rarely analyzed.

Another important factor that has to be considered when explaining the diffusion of mobile applications among consumer groups is that industrialized societies underlie a tremendous demographic change. For example, more than 39% of the German inhabitants are older than 50 years. In 2020 this share is expected to rise to 50% (Hoffmann et al., 2012). The main reasons for this trend are increasing life expectancy and the high birth rates after the second world war (Moschis, 2003). As a consequence, the so-called “greying workforce” inherits a huge potential for companies (Thompson and Thompson, 2009) and becomes a very attractive market segment (Szmigin and Carrigan, 2001). Although, seniors are becoming a large and promising market segment in many areas, they are yet underrepresented in the mobile commerce sector. In 2006 Forrester reports that the percentage of the generation 50 plus adopting mobile data services is only 8% (Schadler, 2006). Looking at an increasing number of elderly internet users (plus 12% among the 50 to 64 segment) (Reisenwitz et al., 2007), it is a valid assumption that the share of mobile commerce and, thus, mobile application users in the age group 50 plus is about to increase rapidly over the next years. Therefore, designers of mobile applications have to take this important upcoming target group into account. Previous research on the diffusion of mobile applications has not addressed this issue so far.

This study aims to fill these research gaps and contributes to research and practice in the following way. First, our study is the first to predict adoption and use behavior in the increasing market for mobile business applications. Second, we integrate the most important influencing factors of technology adoption in this area in a coherent theoretically-grounded model, which we test empirically. Third, the study explicitly applies a product based view and evaluates differences in the perception of attributes in different age groups. The findings of this research are especially relevant for managers of innovation in the field of new mobile business applications and providers of value added services.

2. Theory

2.1. Research on adoption

Adoption decisions of new technologies by individual users is a well-established research field (Venkatesh et al., 2007). Studies in this context can be distinguished in adoption research and diffusion research. While the latter gives an aggregated view of individual adoption decisions, research on adoption itself focuses on the factors influencing the use of a technology. Both have in common that the goal is to gain insights on the question of why an individual chooses to adopt one technology and rejects another one (Pedersen and Ling, 2003).

Pioneers in this field of diffusion research are Bass (Bass, 2004) and Rogers (Rogers, 1995). Both developed frameworks that aggregate individual adoption decisions (Peres et al., 2010). Due to its comprehensiveness, the model established by Rogers is the most commonly used approach in research. Following Rogers and related works, the adoption rate over time is a bell-shaped curve (Rogers, 1995; Michalakelis et al., 2010). The process leading to adoption is characterized by (1) initial awareness of the innovation, (2) the development of an opinion about it, (3) the decision to adopt or reject it, (4) if it is adopted, the use of the adopted innovation, and (5) reinforcement of the adoption decision. This process is undergone by each individual, leading to either adoption or rejection of the innovation (Rogers, 1995). Managing the adoption and diffusion process successfully is a core concern of both providers of innovative technologies and organizations trying to implement new solutions. Diffusion research is widely applied over a variety of industries like health care, food and ICT (Pedersen and Ling, 2003).

Research on adoption of technologies increased considerably with the introduction of the technology acceptance model, developed by Davis (Davis, 1989). TAM is one of the most widely used models in research on information systems, technology adoption and innovation diffusion (King and He,