

Chapter 7

A Measurement Framework of Mobile Service Adoption

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ABSTRACT

This paper discusses conceptual definitions of mobile service users. These concepts reflect the domains of end-users having an intention to use the service or using the service in practice. This study also defines metrics that measure the adoption of mobile services. In addition, the paper investigates the estimation of costs due to mobile service adoption gaps. The paper demonstrates the use of the invented metrics with a data set collected from a sample of Finnish early-adopter smartphone users in 2007. Based on this data set, a ranking of mobile services is presented based on adoption-related success factors. In addition, the potential loss of perceived end-user value, that is due to adoption gaps, is estimated. The notable conclusion is that though most new mobile services experience significant adoption gaps, the value loss is only 10% in the long-term and 3% in the short-term, relative to the use of existing services.

1 INTRODUCTION

The mobile services market is expanding at a rapid pace. Advanced devices are already widely adopted, but many of the new mobile services are still not in the mass market. (Aarnio et al., 2002) Mature services include voice and text messaging, which are being widely used in the developed countries of the world. The new wave of mobile services includes, for example, Internet brows-

ing (and all the web services accessible with a browser), multimedia messaging (MMS), music and video playback, podcasting, instant messaging, video calls, radio and gaming (Verkasalo, 2007). These mobile services, following voice and text messaging, are in this paper defined as *new mobile services*. These new services are supporting the horizontal expansion of the mobile industry towards functionally new services (Verkasalo, 2008b).

However, the take-off new mobile services is not necessarily rapid. The mobile Internet was

DOI: 10.4018/978-1-4666-0921-1.ch007

first introduced to the market in the late 1990s, in the form of WAP (wireless application protocol). However, not until today have people adopted the mobile Internet in significant numbers (Kivi, 2008). With the exception of the Japanese market (Vesa, 2005), most of the technical innovations of the mobile industry have faced hard times in migrating to the mass market. A key step exists between technology production and consumption – the *adoption process*. The adoption process is here considered as the conversion of end-user interest to actual use of the available services.

The publicity that most of the new mobile services have received during the past ten years indicates that the required technologies have been available for years. Indeed, many of the new mobile services have been technically deployed, both in networks and handsets, for a long time. Still, no actual use or revenue has yet realized from most of these new services. Exemplary failures include WAP, MMS and mobile VoIP. Regarding this observation, this research paper assumes that two key issues should be understood. First, not all of the new mobile services are to attract an equally wide user population as text messaging or voice. Consumers – particularly with regard to the new mobile services – experience heterogenic preferences. In other words, many people expect to receive little or no benefits from using some of the new mobile services. Therefore, the potential user domain for new mobile services is different from the potential domain of mobile voice or text messaging. Secondly, even if a potential adopter has the intention to use a new mobile service, bottlenecks for adoption exist due to other reasons. These reasons might include e.g., pricing, performance, technical difficulties, configuration problems, and unavailability and poor accessibility of the service.

This paper discusses first the differences between the definitions of technology *adoption* and *diffusion*. In addition, heterogenic preferences are discussed, and the key literature of technology adoption is introduced. Then, the framework of

the research paper is introduced, and the inter-relationships between the accessible market, potential market, tipping market and realized market are studied.

The main research questions of this paper are:

1. How the importance of mobile services to end-users can be measured?
2. How can the potential market of mobile services be quantified?
3. How can the propensity to try services (given interest) be estimated?
4. How can the propensity to use services (given interest to try) be estimated?

In order to study the research problems, the paper conducts a rigorous empirical study to prove the practical relevance of the framework. Available end-user research methods are briefly covered, and the chosen handset-based end-user research method is defined in detail (see also Verkasalo & Hämmäinen, 2007). This research paper collects new data from the Finnish smartphone market from 2007, and implements several metrics in bridging the theoretical framework and actual market-level observations.

2 EARLIER RESEARCH

2.1. Technology Adoption and Diffusion Research

Technology adoption is in this paper distinguished from *technology diffusion*. Though various definitions for the terms exist in the literature, this paper defines technology diffusion as the penetration of a technical innovation into the market, whereas technology adoption is considered as a more user-centric process of adopting a technical innovation into actual use.

Technology diffusion is widely studied in the literature. The best-known research of diffusion includes Rogers (1962), who introduced the *diffu-*

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