Chapter 10
Exploration of Adoption of Service Innovations through Technology Road-Mapping: Case of Location Based Services

Tugrul U. Daim
Portland State University, USA

Robert R. Harmon
Portland State University, USA

Haluk Demirkan
Arizona State University, USA

ABSTRACT

This paper utilizes a technology road-mapping approach to demonstrate how a traditional technology management process can be applied to improve planning practices for technology-driven service innovations. With location based services (LBS) as the focus, the paper explores business, market, product and services drivers in developing the technology roadmap. Thus, the study demonstrates that technology management theory and processes from the product domain may be usefully applied to the management of technology-driven service innovations. The case study analysis identified service drivers including security, privacy and mobility as important factors for LBS success. Potentially disruptive service innovations resulting from the convergence of the computer and wireless industries are explored.

INTRODUCTION

The world economy is transitioning from a production-based economy to one that is more dependent on services for employment and wealth creation (Chesbrough & Spohrer, 2006; Demirkan et al., 2009; Spohrer & Maglio, 2008). This transformation has driven rapid research growth in service science and service innovation. Researchers have debated whether or not to differentiate between product and service innovations (Daim et al., 2008; Daim et al., 2009; Lin & Daim, 2008). Some argue that the same fundamentals are valid in either case, while others argue otherwise (Lusch

DOI: 10.4018/978-1-4666-1583-0.ch010

& Vargo, 2006; Vargo & Lusch, 2004). It is our contention in the case of technology-driven service innovations, that tools and techniques that have been successfully applied in the product domain can be adapted to services research. We selected the case of location-based services (LBS) to demonstrate how technology road mapping can support innovation and the adoption of LBS processes. The rapid growth of mobile devices such as cellular phones (especially smart phones), personal digital assistants, and pagers have provided significant opportunities for service innovation.

An increasing number of mobile devices allow people to access the Internet wherever and whenever they want. The emergence of smart phones with GPS capability that operate on fast digital networks has become the key to the development of mobile location services. For some time, researchers have predicted that LBS will be the most common form of context-aware computing (Ljungstrand, 2001). LBS provide spatial and location-dependent information that is targeted to each user's specific location-relevant needs (Benson, 2001; Unni & Harmon, 2006). LBS users can enjoy various types of services such as mobile yellow pages (to find the nearest point of interests), mobile buddy lists (to find friends nearby the current location), traffic navigation (to find the shortest distance to the destination), emergency support services (to find nearest police stations or restaurants) and equipment tracking (Jose & Davies, 1999; Schiller & Voisard, 2004).

Although LBS are considered to be a primary technology service in the wireless space, the adoption process has been very slow. Consider that LBS have great potential for enhancing safety, security, navigation, collaboration, and productivity that is not possible on desktop computers, the slow adoption rate is disappointing (Barnes 2003a; Harmon & Daim, 2009; Oracle Technical White Paper, 2001). The reasons have become clear. Potential customers, both business and consumer, perceive LBS to be complex, costly, and offering insufficient value to warrant adoption (The Economist, 2006). However, with the advent of the GPS-enabled smart phone and 3G networks, the LBS trajectory is about to change. Recent projections indicate that worldwide subscribers of GPS-enabled LBS will grow from 12 million in 2007 to reach 315 million in 2011 (Morse, 2006), and the location-based advertising (LBA) market will be a $2 billion market opportunity by 2011 (Boulton, 2007).

Technology road-mapping, initially used in the 1970's (Probert & Radnor, 2003; Willyard & McClees, 1987), has many applications such as national-technology roadmaps (Diebold, 1995; Prem & Raghavan, 2005; Spencer & Seidel, 1995), industry-technology roadmaps (Ning, 1995), and international-technology roadmaps (Schaller, 2002). Early versions as applied by EIRMA (1997); Koen (1997) and Probert and Radnor (2003) defined technology roadmaps with practical tools for easy implementation. Phall et al. (2003, 2004) provided a method called T-Plan and demonstrated very efficient use of the process. Kostoff and Schaller (2001), Kostoff et al. (2004), Lee and Park (2005) and Rinne (2004) provided additional tools and perspective. Lee and Park (2005), Lopez-Ortega et al. (2006), Newman and Leyerhantz (2001), Kappel (2001), Albright and Kappel (2003), and Groenveld (2007) have applied roadmaps in diverse situations.

However, it is Kameoka et al. (2006) and Nakamura et al. (2006) that first provided the framework for integrating service innovation into a roadmap implementation. Following their work, we proceed with the exploratory application of technology road-mapping to service innovation in the case of LBS. Our major thesis is that the technology road-mapping methodology currently used in the product-innovation domain can also be effectively used to roadmap service innovations. In the next section, we provide an overview of location based services. Then, LBS technology roadmaps with business and market drivers are discussed. Next, we discuss products, services and technology roadmap applications.