

# Chapter V

## Assessing the Future of Location-Based Services: Technologies, Applications, and Strategies

**Robert Harmon**

*Portland State University, USA*

**Tugrul Daim**

*Portland State University, USA*

### ABSTRACT

*Location-based services (LBS) are approaching an inflection point. The continued rollout of the technological infrastructure, the availability of LBS applications, and the market's increasing awareness of their potential value should lead to increasing business opportunities. However, there is still a high degree of uncertainty in the LBS space. Challenges are emerging to the cellular network operator-centric LBS model. Hardware companies, application providers, competing infrastructure technologies (such as Wi-Fi, WiMAX, and satellite networks), and new competitors from the computer and Internet industries are all vying for market position. Customers are becoming interested in location services, but the uptake has been slow. New LBS business models and new strategies need to be considered. This chapter evaluates the future of location-based services through a critical assessment of the technology, service applications, market trends, and strategic issues.*

### INTRODUCTION

Are location-based services (LBS) finally ready to take off? For almost ten years LBS has been heralded as the next killer application in the wireless space. Yet the uptake for LBS has been very slow. Potential customers, both business and consumer, have a poor

understanding of what LBS is. They perceive LBS to be complex, costly, and offering insufficient value to warrant adoption. Mobile operators may be mostly to blame for this. They have been slow to roll out services, targeted niche markets, offered poor service quality, charged high subscription fees, and limited the access of innovative third-party application providers to their

closed networks. In a very real sense the operators' "walled gardens" have choked off promising paths for innovation. Joe Astroth, VP of the LBS division of Autodesk sums it up well: "LBS is the killer application that got killed on the way to the mainstream" (Baig, 2006).

However, this disappointing situation may be about to change. ABI Research projects worldwide subscribers of GPS-enabled LBS will grow from 12 million in 2007 to reach 315 million in 2011 (Morse, 2006). International Data Corporation (IDC) projects the location-based advertising (LBA) market alone to be a \$2 billion market opportunity by 2011 (Boulton, 2007). North America and Western Europe will likely see the greatest growth. In North America, operators such as Verizon Wireless and Sprint with 3G networks have embraced GPS. European LBS has been limited by the lack of GPS capability. However, the continuing rollout of W-CDMA enabled smartphones with GPS chipsets will enable the growth of LBS there.

The extended gestational period for LBS has engendered reevaluation regarding its potential and its role as a standalone class of mobile services. Three key issues will determine the future of LBS:

1. Will LBS be a service category unto itself or will it be an added feature to existing services--adding value by increasing usability and enhancing the user's experience?
2. How will changes in customer expectations of the mobile Internet experience impact LBS?
3. What changes in LBS business models will occur as the mobile operators are challenged by Internet-based business models from competitors such as Google, Nokia, and Apple?

As the Internet and mobile worlds converge and LBS starts to look more promising, competitive issues will abound. The industry dynamics are already in flux as key players in the mobile ecosystem vie for power. Handset manufacturers are including GPS, Wi-Fi, VoIP, and soon WiMAX capabilities on their smartphone platforms that will enable users to bypass cellular networks. Google, with a regulatory boost from the Federal Communications Commission, is pushing to disrupt the market with the potential for a network-neutral open cellular system in the 700 MHz band (Gapper, 2007). LBS application providers are leveraging new handset and network technologies and partnering with other members of the operators' value chain to create innovative applications and to

challenge the operators' channel power. They are also developing applications that enable customers to "free ride" on cellular networks. The basic questions here are: What LBS services do users want, where will that value be generated in the LBS ecosystem, and who will capture it?

The Internet is by its very nature an open system. Anyone can launch a website or an e-commerce service. This is anathema for mobile operators who limit choice and competition with their walled-garden networks. The operators are coming under increasing pressure from customers, regulators, partners, and competitors to open their networks to innovation. With or without the operators' acquiescence, this opening is starting to happen with Wi-Fi and VoIP-capable smartphones. WiMAX, which recently became a 3G standard, will further challenge the operators' closed networks (Allison, 2007). Apple's Wi-Fi-enabled iPhone is the first major breach of AT&T's network and brand dominance. More openness and disruption is on the way which should favorably impact the growth of LBS.

Location-based services (LBS) provide location-specific information, often in context with other mobile applications, which is relevant to the mobile user's real-time choice behavior. These services determine the exact location of the user and can use push and/or pull information methods to respond to queries or suggest possible decision options to the mobile user. Knowledge of the user's location can be used to deliver context-relevant information to customers where and when they are most likely to buy. For mobile network operators, LBS has been viewed as a vehicle to improve average revenues per user (ARPU). This goal is increasingly important to operators as competition continues to erode voice-only ARPU.

The LBS application category emerged in the late 1990s in anticipation of the rollout of 3G cellular networks. However, it was government regulation mandating cellular operators to provide accurate cell phone location data for emergency calls that forced the development and deployment of location technologies. Although E911 in the U.S. and E112 in the EU were intended to increase public safety, they enabled the deployment of the technological infrastructure that is the basis for LBS (Rao and Minakakis, 2004; Unni & Harmon, 2006).

In the U.S., the FCC mandated specific performance requirements for E911 but did not require the mobile network operators to use a specific technology. Verizon Wireless and Sprint were early adopters of GPS capability with other carriers initially adopting

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