Privacy Concerns in the Context of Location-Based Services for Tourism

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Abstract

Location-based services (LBS) are applications of mobile technology that utilize the information about the location of the user. LBS are gaining popularity and are regarded as a suitable instrument for spontaneous access to information for travellers while on-the-go. However, privacy concerns are often raised in conjunction with LBS. Therefore, this paper aims to identify future research needs and directions related to privacy issues and concerns pertaining to location-based services within the tourism context. The present paper explores the topic of privacy and offers research propositions to guide future research in this emerging field of study.

Keywords: Location-based services; research; privacy; travel and tourism.

1 Introduction

LBS offer pervasive services based on tourists' location and, more importantly, create additional value for tourism products and services (Berger, Lehmann & Lehner, 2003). However, while users love the added value provided by LBS, many also fear loss of privacy (Minch, 2004; Perez, 2010a). To date, research in the area of LBS and privacy focuses strongly on LBS system design issues (Rodden et al, 2002; Jorns & Quirchmayr, 2010), user attitudes (Abbas, 2010), and is mostly conceptual (Perusco & Michael, 2007). Research on LBS and tourism has, so far, mainly focused on personal navigation system design and user preferences (Schmidt-Belz et al., 2003), user requirements (Nivala et al, 2009; Murphy & Schegg, 2006), usability (Anegg & Umlauft, 2003), and modules and services (Zipf & Malaka, 2001). Discussions have been centred on the development of mobile tourist guide applications, for example COMPASS (van Setten et al., 2004), and LiMoG (Schwinger et al., 2006). Interestingly, many of these papers mentioned privacy as being critically important; however, present published literature on LBS apps in tourism has not adequately addressed privacy issues (Chen, Ross & Huang, 2008) and related user perceptions through comprehensive empirical research. By synthesizing existing literature, the paper aims to identify and discuss future research needs and directions related to privacy issues in the context of tourism-related LBS.

2   Location-based Services

LBS are technologies capable of providing services personalized to the geographic location of a user based on a given handheld device for a particular purpose predominantly in the domains of emergency and personal safety, navigation, and access to tourist information on the go, which all provide value to the user. There are two broad categories of LBS, namely triggered and user-requested (D'Roza & Bilchev, 2003). Triggered LBS or (*Push services*) rely on an advance condition set-up by users. Such push services are activated by an event, which could be triggered if a specific area is entered or triggered by a timer. User-requested LBS (*Pull services*) require that a user retrieves his/her position for location-dependent information. Present literature also distinguishes between location-tracking services and position-aware services (Barkhuus & Dey, 2003). Location-tracking services offer information about a user's whereabouts to entities other than the user, while location-aware services supply the user (as information requester) with personal location information. Today, LBS uses are actually changing. Users seek LBS services that are fun, entertaining and offer aesthetically pleasing user interfaces. Another trend are emerging social LBS apps where people share their locations with others. Prime examples of such new LBS apps include Google Latitude, MyTown, Yelp, Facebook Places, Foursquare, Urbanspoon, Where, Poynt, Loopt, Whrrl, SCVNGR, Brightkite, and Gowalla. It has been argued that such apps desensitize users about providing location-based information because of the ease with which it happens and the coolness factor that comes with it (Marston, 2010). This, of course, raises questions of which users in what situations actually have privacy concerns and how LBS apps can address these.

3   Privacy

Despite the enormous application potential introduced by LBS for enhancing safety, convenience, and utility in our daily lives as well as our vacations, LBS also raise myriads of privacy issues due to the ability to collect, store, use and disclose the locations of users (Beinat, 2001). Smith et al (1996) identified four dimensions that assess individuals' concerns for privacy (1) the collection of personal information; (2) unauthorized secondary use of personal information; (3) improper access to personal information; and, (4) errors in storing of personal information. While privacy issues are a general concern for Internet services and mobile apps, people are especially wary of location information being abused (Sui, 2004). Therefore, a theory of LBS privacy needs to take specific aspects of LBS into account.

Privacy refers to freedom from unauthorized intrusion (Stone et al, 1983). It can be seen as a right or as an ability to control how information is collected, retained and/or maintained, used and communicated, disclosed or shared (Xu & Teo, 2004). For most individuals, location information is perceived to be highly private (Junglas & Spitzmuller, 2005), and privacy plays a mediating role between user characteristics and behavioural intention to use LBS (Stewart & Segars, 2002). Junglas & Spitzmuller (2006) suggest some users may recognize substantial benefits in using

LBS but may still choose not to take advantage of LBS if privacy concerns are too high. Tourism is a context in which benefits are heightened, suggesting that privacy concerns might be temporarily suspended. At the same time, tourism activities take place in locations outside of the usual realm and are facilitated by often unknown service providers, which would increase risk perceptions and therefore privacy concerns. Consequently, it is argued that privacy studies are needed in the tourism context to address the specific situation of LBS used for travel and tourism purposes.

4   Research Propositions

Failure to protect a user's location privacy can potentially lead to negative consequences such as location-based 'spam' (Clarke, 1999), threats to user's personal well-being and safety (Kaasinen, 2003) and individual privacy invasion (Duckham & Kulik, 2006). More importantly, users' perceptions of the potential of such threats function as a predictor of users' intentions to engage in using LBS (Junglas & Spitzmuller, 2006). As mentioned above, these perceptions are very much dependent on the area in which LBS are applied. Therefore, it is important to study what privacy concerns tourism LBS users have and what influences these concerns. *Proposition 1: Privacy concerns have to be identified for tourism-related LBS.*

Not all LBS are equal. As described above, LBS systems can be pull vs. push and location-aware vs. location-tracking systems. Barkhuus and Dey (2003)'s study indicated that consumers have fewer privacy concerns with location-aware devices. In addition, systems differ in terms of the extent of control they give users over the information collected/shared and the settings. Since privacy fundamentally is about control, these affordances of the technology have to be considered. Also, the benefits that can be derived from different LBS depend on the system capabilities. For example, some systems not only offer information but also present discounts, coupons, loyalty programs, etc. These types of affordances inherent in the system may influence user decisions to use LBS. Further, social sharing seems to be a completely different realm from sharing with service providers and social sharing features could lead to greater privacy concerns. This leads to the second proposition: *Proposition 2: System characteristics/affordances (i.e. control, benefits such as discounts, coupons, loyalty programs and social sharing) influence extent and type of privacy concerns.*

The concrete use context also seems to matter, especially in tourism where the use context is different from everyday use. Context is much more than location and time (Kaasinen, 2005). The type of destination (e.g. information infrastructure available at the destination, main activities, complexity in terms of wayfinding, etc.) can influence the perceived value of LBS. Along the same line, familiarity with a destination can also influence these value perceptions as repeat visitors might need less contextual information but might want recommendations off the beaten track. Information needs vary also based on the type of trip taken (family vacation, adventure travel, etc.). Use context in general influences the benefits derived. *Proposition 3: The specific use context (type of destination, type of trip) influences the perceived benefits of LBS and the extent and type of privacy concerns.*

Trust in the service provider is also a major issue. In the context of tourism, LBS are often provided by unknown local providers. Thus, familiarity and trust with the service providers are critical factors to consider in the tourism context. Based on these considerations, the following is proposed: *Proposition 4: Trust influences extent and type of privacy concerns.*

Recent reports indicate that men are more willing to share their location-information compared to women as are certain age groups (JWire, 2010; Pew Research, 2010). Current LBS users are also mostly tech-savvy and educated (Perez, 2010b). These findings suggest that demographics as well as experiences with LBS and general technology affinity influence privacy perceptions and concerns. Travel experience seems to be another characteristic that influences risk perceptions and, thus, should be considered. The literature also mentions a series of personality characteristics such as locus of control, risk avoidance, desire to control, innovativeness, neuroticism, openness to experience, predisposition to trust, and conscientiousness. This leads to the following proposition: *Proposition 5: User characteristics (e.g., gender, technology affinity, locus of control, personality, travel experience, etc.) influence extent and type of privacy concerns.*

Recently, the aspect of enjoyment and fun of LBS use was identified as important and research shows a positive effect on intentions to use LBS apps (Kirkpatrick, 2010). Perceived enjoyment (PE) is conceived as the extent to which the activity of using computers is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Davis et al., 1992). Considering that tourism is a context in which enjoyment is important, we suggest that privacy concerns might be temporarily suspended if the use is enjoyable. *Proposition 6: Perceived enjoyment (e.g. evoked by engaging content and interactive system features) as a fundamental characteristic of the user-system interaction influences extent and type of privacy concerns.*

5 Conclusion

Current research on users' conceptions of privacy is vital for the development and deployment of LBS, especially in the context of travel and tourism. The future development of LBS applications and the fulfilment of their potential rely much on the advances around standards as well as regulation and legislation related to privacy. Therefore, extensive research is needed on users' conceptions of privacy and how these shape their attitude towards LBS apps. For providers of tourism LBS it is also especially important to investigate the value added by LBS to tourism products and services. It seems that both qualitative and quantitative studies to test the propositions using a variety of methodologies such as scenarios, experiments, field research, etc. are needed to fully understand privacy perceptions and their antecedents. While comprehensive models are useful, it may not be practical to test all of the propositions included in the paper. It is however important that studies build on each other instead of providing isolated evidence. Thus, it is hoped that this paper provides a useful framework for tourism-related LBS research.

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