Barriers seen by potential local Providers of Applications using Location-Based Services

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Abstract. This contribution focuses on obstacles in the adoption of location-based services (LBS) as a tool for potential providers of localised applications and content. The following key question needs to be answered: *What are the key factors preventing LBS from being accepted in their full potential by potential providers and being used as an element of context marketing?* In order to investigate restrictive factors of application of LBS in the German city of Brunswick (Braunschweig) and the surrounding county, this empirical study follows an inductive approach. Five guided focus group discussions were conducted with representatives of relevant sectors for potential LBS usage. These were identified as the *tourism industry*, the *cultural industry*, *journalism*, the *trade and service sector* and the *sports industry*.

Keywords. location-based services, (hyper-)local media communication, context marketing

1. Introduction

With the possibility of accurately locating and tracking a user, LBS allow for various areas of application like navigation, information, entertainment, data analytics and mobile payment (Jagoe 2003, Lee & Kang 2015, Mallat et al. 2004, Xu 2007). The opportunity of locally addressing customers through their mobile devices is of particular interest for businesses with a fixed address (Möhlenhoff et al. 2011). Especially small and medium-sized businesses are predestined to make profit from the benefits of the applica-

tion of LBS (Faber & Prestin 2012). Examples of these businesses include restaurants, bars, hotels, retailers, gyms and cultural sites like museums and galleries among others (ibid). Making use of LBS, owners of these businesses and sites are able "to target consumers directly with context-based personalised marketing messages which could have advertising or promotional nature" (Amirkhanpour et al. 2014). Context marketing refers to the targeted and issue-based distribution of automated advertising media through online channels (Ciaramita et al. 2008, Greve et al. 2011). Despite all potentials there are still some barriers restricting the use of LBS in general, like a poor network coverage, insufficient data volume and data security concerns (Heinemann 2018). As pointed out by Huang et al. (2018), it is important to identify these "challenges and [derive] potential opportunities that help to address these challenges". A few studies have already examined factors influencing LBS usage in specific sectors like tourism (Beier & Aebli 2016, Frey et al. 2015, Uphaus et al. 2019), retail (Kang et al. 2015, Kang & Johnson 2015) and cultural institutions like museums (Kang et al. 2017). All of these studies however focused on the users' acceptance of LBS, while the perception of potential providers remains largely unexplored.

2. Methodology

This contribution aims to bridge this identified gap of research by analysing five separately conducted guided focus group discussions with representatives of relevant sectors for potential LBS usage – one focus group discussion for each of the following sectors: the *tourism* sector, the *cultural* sector, the *journalism* sector, the *trade and service* sector and the *sports* sector. These sectors were chosen because of their high potential for the application of LBS in context marketing (cf. Faber & Prestin 2012, Kang et al. 2017, Kramer et al. 2009, Kjærgaard 2012, Weiss 2013). The guidelines for these discussions covered questions concerning the *fields of application*, the *target group*, the *implementation*, the *barriers for the organisation and end users* and a *general look into the future*. This contribution however will focus on the barriers of LBS adoption. The focus group discussions lasted for approximately two hours each and were held in May 2019 with six to ten participants. The discussions were recorded, transcribed and coded with the QDA-software MAXQDA using a qualitative content analysis based on Mayring's approach. After determining the level of abstraction as well as encoding, context and evaluation units, categories were derived from the semantic content (Ramsenthaler 2013) resulting in a system of eight overarching dimensions with various categories and subcategories. A codebook was created to define the authors' understanding of all codes, and intercoder as well as intracoder reliability were ensured before and after the encod-

ing process for all five coders. Validity was ensured by revising the categories during and after the encoding process (Mayring 2000).

3. Preliminary results

So far, the preliminary results hint at the dimension *barriers of LBS adoption* being a relevant dimension with the second highest number of codes (number one being the *fields of application*). This already supports the assumption that the unfolding of LBS's potential is still being held back by a large number of factors. In the focus group discussion, the participants, who were representatives of businesses and organisations, discussed about both barriers they experienced in their own work as well as barriers they perceived from the contact with customers. Therefore, in our study, the barriers were separated into barriers for end users and intraorganisational barriers. Table 1 depicts different topics that were mentioned multiple times in one or more focus group discussion and therefore considered to be of high relevance.

Certain aspects are especially noteworthy: End users have to download and install an app first in order to use the LBS functionality. Therefore, providers face the challenge to somehow communicate the LBS-app's benefits before a user can actually use it. Already in 2003 Kölmel identified the fact that users often cannot estimate the benefit and usage frequency of LBS apps in advance as an obstacle in LBS distribution. Over the years, this seems to have remained an obstacle and may coincide with the also mentioned users' willingness to pay: For smartphone apps it is particularly important that an explicit benefit is communicated to the user (Dogruel et al. 2017). Furthermore, the danger of overloading the user with information he may not want to receive was another topic brought up in many of the discussions. To counteract this risk, several participants suggested an option selecting only relevant content within apps as an important measure.

From the providers' perspective, the following intraorganisational barriers were especially noticeable: Effort, costs and missing personal resources were brought up the most and seem to be affecting all five sectors. Especially small businesses and organisations do not seem to have the resources to develop LBS apps that could be able to stand out among the market leading competitors. This goes hand in hand with the also mentioned clear market leader position by Google (Haucap & Heimeshoff 2014). A major problem seems to be the challenge of offering a service that market leaders like Google are not yet offering in an already well-established form.

Three aspects were mentioned which prove obstacles for both the provider and the end user: The data protection laws are limiting the providers' pos-

sibilities of collecting user data and therefore limit the potentials of person-alisation, data analytics and a targeted user approach (Fan et al. 2015), while on the other hand professionals are concerned that end users might hesitate to use their services because of privacy concerns (cf. Xu & Gupta 2009, Zhou 2012). Furthermore, a poor internet coverage was mentioned as a barrier of LBS adoption for both sides, as well as an insufficient knowledge about the technology.

Journalists showed the strongest concerns about LBS. They saw particularly strong barriers in the high costs of developing and maintaining an LBS-app.

	tourism	culture	sports	journal-ism	trades / service
barriers for end users					
age-related rejection		[x]			[x]
app must be downloaded/installed				X	X
app must be established			[x]	X	
danger of manipulation				X	
insufficient internet coverage	X				
insufficient knowledge	X		X		
privacy concerns			[x]		[x]
risk of overload	X		X	X	X
willingness to pay				X	
intraorganisational barriers					
costs	X	X	X	X	X
data protection law	X	[x]	X	X	X
effort	X	X	[x]	X	X
Google's market leadership	X			[x]	[x]
heterogeneity of target groups			X		
imitators				[x]	X
insufficient internet coverage	[x]		[x]		
insufficient knowledge	X	[x]	X	X	
low usage expectation	X				
no chance in the free market		[x]		[x]	
no personal resources	[x]	X	X	[x]	

[x] = single mention, X = multiple mentions.

Table 1. Barriers of LBS adoption for end users and businesses

4. Limitations

During the focus group discussions, the aspect of insufficient knowledge about LBS and its functionalities among the potential providers became apparent. Some of the statements could not be evaluated because they did not refer to applications that could be defined as LBS. Examples were the

mentioning of QR codes, which however do not require a localisation of the user (Christmann et al. 2012, Rouillard 2008). Further research in the field should try to ensure a uniform and accurate understanding of LBS's definition in advance (Mack & Tampe-Mai 2012). Doing so might reduce distortions in the resulting category system due to a wrong understanding of the term. Moreover, a larger sample size would ensure a broader spectrum of perspectives and opinions of relevant potential providers to be covered. Additionally, focus group discussions with participants of heterogeneous sectors could reveal interesting new insights into the possibilities resulting from cross-sector collaborations – another frequently mentioned issue in all discussions. This study is also suited for replication in other cities that differ in terms of touristic and entrepreneurial potentials.

5. Conclusion

This research was able to provide some first insights into key factors preventing users and providers from using LBS as a tool for potential providers of localised applications and create a good starting point for future investigations in this field. Even though only representatives of relevant sectors participated in the discussion, it became apparent that there are not only intraorganisational barriers – most of which are related to missing resources for the development of LBS, especially considering the competition in form of the market leader Google –, but there are also many barriers on the end users' side, that potential LBS providers are aware of. Getting users interested in using an LBS *before* they go through the process of downloading and installing an app seems to be a major obstacle, as well as keeping that interest alive while using the app by providing services as adjusted to the users' personal needs as possible. Potential privacy concerns on the user side and constraints caused by data protection laws on the provider side further complicate the realisation of LBS-apps being able to directly address the users' needs. From the authors' point of view, further investigation should focus on how an ideal regional or local LBS-app could be realised without being restricted by data protection – for example: What kind of user data can be collected without raising privacy concerns to a large extent in order to adapt to a user's interests in the best possible way? Further research should pay particular attention to the impact of Google's market leadership in many areas (Beel et al. 2010). In this context, it would also be advisable to discuss the possibility of embedding services like Google Maps into other applications (Boulos 2005). The authors are convinced that further research of the aforementioned remaining dimensions discussed with the focus groups will provide valuable additional insights into key factors influencing the users' LBS adoption in the field of context marketing and hyperlocal media communication.

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