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Here's my location, for your information: The impact of trust, benefits, and social influence on location sharing application use among Indonesian university students

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ABSTRACT

As mobile phones have become nearly ubiquitous, mobile phone applications are also becoming almost indispensable. Applications that enable people to share location information are becoming increasingly popular. What remains unknown, however, are the factors that influence the use of a location sharing application (LSA). A paper-based survey was implemented with 655 students of six universities in Yogyakarta, Indonesia to test the hypotheses proposed for the study. Results of hierarchical regression analysis reveal that students' use of a specific LSA could be attributed to the two types of benefits of using the app (impression management and entertainment) and to competence-based trust in LSA and to their trust in their LSA network members. Furthermore, the impact of social influence on LSA use is also statistically significant.

1. Introduction

Mobile phone devices are increasingly used in Indonesia. With approximately 240 million inhabitants, Indonesia has 220 million mobile subscribers – a 92% mobile penetration (Rao, 2012). Taylor Nelson Sofres (TNS, 2012) also reported that Indonesians are increasingly accessing the Internet through private devices such as mobile phones and portable computers rather than in Internet cafés. Young people are found to be dominating the mobile devices' user population in Southeast Asia and in Indonesia, in particular. These technology savvy users, according to Rao (2012), primarily used their mobile devices to access the Internet for various types of information while they are on the go.

Due to the high rate of mobile device use in Indonesia, the government has been inviting mobile vendors to expand their businesses in the country (Ningsih, 2013). Local Indonesian developers and entrepreneurs regard Indonesia as a solid base for the development of mobile devices alongside mobile applications (Frost, 2012).

Various types of mobile applications are offered in the mobile applications market. One well-known type of mobile application is the Social Networking Site (SNS) applications (ComScore, 2013). The growth of SNSs, in general, has pushed enterprises to develop SNS applications that are accessible through mobile devices. These applications enable users to share users' current location, known as location information, through a global positioning system (GPS) and geo-tagging functions.

Likewise, stand-alone Location Sharing Applications (LSA) are also available, with Foursquare being the most popular example. LSAs, also referred to as Location Based Social Networks (LBSN), function not only as information sharing tools but also as sources of location- or place-related information. Effendi (2013) reported that young Indonesians are increasingly using LSAs as a new way to enhance interactions with friends and family. Foursquare, for instance, is used by approximately 312,000 Indonesian users (We Are Social, 2012), which is the highest number of users in Southeast Asia (Woods, 2011).

Despite the benefits of using LSA, however, there are also reasons for concern related to its use. It has been reported that through various applications, mobile devices can collect users' location information and identity, in order to understand usage patterns of users, and this happens occasionally without users' consent (Wetherall et al., 2011). Location information can be useful for marketing and promotion purposes such as for location-based advertising, which is predicted to be a growing business in the future with people increasingly accessing information through their mobile device (Olenski, 2013). Such advertising shows promotions to users based on their current location or expected

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location (Tsang, Ho, & Liang, 2004). The combination of location information with other data, such as those from SNS, allows enterprises to establish a profound targeted advertising (Bellavista, Kupper, & Helal, 2008; Olenski, 2013).

LSA use, hence, can be a double-edged sword, since its benefits can be countered by privacy concerns. As an emerging technology, studies into the factors influencing LSA use are still relatively minimal. Published qualitative studies into the mechanisms behind the use of LSA and the disclosure of location information have primarily focused on the impact of LSA use benefits such as social interaction and impression management (Patil, Norcie, Kapadia, & Lee, 2012a,b). Furthermore, a more recent study has also investigated the relationship between personality traits and Foursquare use – with conscientiousness strongly correlating with the use of the application (Chorley, Whitaker, & Allen, 2015). What remains unknown, however, is the impact of factors that could be influenced by the LSA provider (benefits, trust, and social influence) on people's LSA use.

The current study, hence, aims at addressing the research question 'To what extent do benefits, trust, and social influence positively affect the use of LSA among university students in Indonesia?'. The research question was answered and its accompanying hypothesis tested using data collected through a large-scale survey with 655 students from six universities in Yogyakarta, Indonesia.

2. Theoretical framework

The Technology Acceptance Model has been one of the dominant theories employed to explain why people opt to use or to continue using a certain product or technology. TAM proposes that people would not hesitate to adopt a product if it is easy to use and is useful (Davis, 1989). However, the use of a certain product may have unwanted consequences too. The risks associated with the use of a specific technology increases the salience of trust as a predictor of technology adoption, as trust, according to Lewis and Weigert (1985), would be irrelevant without risk.

Furthermore, a new technology such as LSA would certainly draw the following of a strong user base, hence the impact of social influence on novel product adoption and use could not be underestimated. A combination of propositions from various theoretical frameworks resulted in a model that predicts the factors influencing LSA use among Indonesian university students.

2.1. Benefits

Rogers (1995) argues that benefits or the relative advantages that a technology offers are important reasons why a technology is adopted. The Technology Acceptance Model (TAM) equate benefit with perceived usefulness (Davis, 1989), while the Unified Theory of Acceptance and Use of Technology (UTAUT) relates benefit with the concept of performance expectancy, which is based on certain variables related to advantage (Venkatesh, Morris, Davis, & Davis, 2003). In one study into LSA use in Indonesia, Widjaja (2012) reported that performance expectancy influences users' decision to accept or reject LSAs and perceived benefit is seen as an important predictor as it can outweigh the negative consequences of using LSA (Zhao, Lu, & Gupta, 2012).

Furthermore, according to the Uses and Gratification Theory (UGT), people select a specific medium if it can gratify users' social and psychological needs (Katz, Gurevitch, & Haas, 1973). McQuail (2005) claimed that people's decision to select a medium is predicated on four considerations, namely, entertainment or diversion, information seeking or surveillance, personal identity, and personal relationship/social interaction. Although UGT was primarily used to explain people's decision to use traditional channel types such as radio and television, the theory has been increasingly applied to studies into the use of new media such as websites and social media (e.g. Dunne, Lawlor, & Rowley, 2010; Krisanic, 2008; Luo, 2002). For this study, 'benefits' are measured in terms of the four channel use considerations McQuail identified.

2.1.1. Impression management

Impression management, referring to the process by which a person strives to control the impression of others toward him or her (Leary & Kowalski, 1990), is similar to McQuail's (2005) 'identity' construct, which pertains to the individual's need to establish a self-reference and the reinforcement of one's values through the formation and confirmation of a distinct identity. Impression management using location information, according to Wang and Stefanone (2013), is a new form of exhibitionism. For instance, users decide to share information about their locations deemed interesting for their network members (Cramer et al., 2011; Lindqvist, Cranshaw, Wiese, Hong, & Zimmerman, 2011), as an attempt to shape those members' view of the users.

In the context of online social network (OSN) site use, impression management is regarded as "the value users derive from being able to improve their self-concept in relation to others using SNS's" (Krasnova, Spiekermann, Koroleva, & Hildebrand, 2010, p. 112). Previous studies have shown that the impression management benefit SNS's offer is a critical indicator of people's intention to use SNS's (Dwyer, 2007; Krisanic, 2008; Tong, Van Der Heide, Langwell, & Walther, 2008). LSA, as a form of a social networking tool, undoubtedly enables its users to manage their online identities and images, and, thus, its use would surely be based on the impression management benefit it affords. In fact, results of two qualitative studies (Patil et al., 2012a,b) indicated that the need to present a positive and interesting impression of oneself (e.g. being cool) is one of the several reasons people have for using LSA. Thus, the first research hypothesis is advanced.

Hypothesis 1a. Indonesian university students' beliefs regarding the impression management benefit offered by LSA positively influence their use of LSA.

2.1.2. Entertainment

People use LSA to satisfy their entertainment needs (Wagner et al., 2010) and to relieve themselves from boredom (Cramer, Rost, & Holmquist, 2011; Lindqvist et al., 2011; Page, Krijnenburg, & Kobsa, 2013). Foursquare, a popular LSA, for example, enables its user to play games while sharing location-related information. A medium possesses an entertainment capacity if it is able to attract, amuse, divert user's attention, and ward off user's boredom (McQuail, 2005). In the context of SNS, entertainment is seen as the "the value users derive from having pleasant and enjoyable experiences on SNS's" (Krasnova et al., 2010, p. 112). In relation to McQuail's (2005) assertion that entertainment drives people to use a certain channel, the second research hypothesis is proposed:

Hypothesis 1b. Indonesian university students' beliefs regarding the entertainment benefit offered by LSA positively influence their use of LSA.

2.1.3. Information search

Aside from desktop computers, mobile devices and their applications are increasingly used for searching useful information online (Lin, Zhang, Jung, & Kim, 2013; Ongena, Bouwman, & Gillebaard, 2012). LSAs in mobile devices employ a positioning

technology, such as GPS, that allows users to obtain information about a particular place. Accordingly, LSAs are viewed as a locative media (Halavais, 2009). By using locative media, more accurate results, relative to collecting information from other places, for instance, from desktop computers, can be generated (Halavais, 2009).

According Krasnova et al. (2010), one of the benefits of using SNS is relationship building as it allows users to increase their social capital through information sharing, which also results in the possibility for other users to obtain different information types. In relation to the use of mobile devices, Lin et al. (2013) revealed that the use of the Internet through mobile devices among teenagers in East Asian cities such as Seoul, Hong Kong, and Tokyo is not just for entertainment but also for information purposes. A similar observation has been reported in a study into the use of mobile devices among young users in the Netherlands (Ongena et al., 2012). It can be assumed, therefore, that information search is also an important predictor of LSA use, hence, the third research hypothesis

Hypothesis 1c. Indonesian university students' beliefs regarding the information searching benefit provided by LSA positively influences their use of LSA.

2.1.4. Information dissemination

Information dissemination is closely tied to McQuail's (2005) 'personal relationship and social interaction' construct. Maintaining an existing relationship and forging new ones require people to share information about themselves and about what they do and what they have done. While traditional media such as television and radio hardly offer users to freely relay information to a particular audience, new media such as OSN sites allow users to disseminate various types of information without any hindrance.

Information dissemination as a benefit of online social networking sites, according to Krasnova et al. (2010), refers to the 'value users derive from being able to efficiently and easily stay in touch with each other on OSNs' (p. 112). Boyd (2010) argues that people's decision to join an online community is partly hinged on the need to share information to their contacts, as sharing information, some researchers argue (e.g. Fusco, Michael, & Michael, 2010; Wiese et al., 2011), provides those who share with a sense of connection to information recipients.

The use of LSA is viewed as a consequence of the need to disclose location information when one is on the go (Barkhuus et al., 2008; Consolvo et al., 2005; Thomas, Briggs, & Little, 2012; Wagner et al., 2010) and to inform others of their current situation (Cramer et al., 2011; Patil et al., 2012a). A couple of studies have also shown that information disclosure is a positive predictor of British and American users' intention to use LSA (Page et al., 2013; Thomas, Briggs, & Little, 2013). Results of previous studies resulted in the next research hypothesis.

Hypothesis 1d. Indonesian university students' beliefs regarding the information dissemination benefit offered by LSAs positively influence their use of LSA.

2.2. Trust

While the use of a certain technology undeniably offers its users with a range of benefits, the risks associated with its use could also not be underestimated. This could also be said of LSA use, as the convenience LSA extends to its users is also coupled with a host of privacy concerns related to the 'storage, transmission, and sharing of data about users' locations and movements' (Tsai et al., 2009, p. 2003). According to Toch et al. (2010), users' perceptions of how their location information are used impact their privacy concerns. As a platform for communication and information dissemination, LSA requires its users to share certain types of information, which could be exploited either by LSA providers (Bellavista et al., 2008) or by third parties (Guha, Jain, & Padmanabhan, 2012). Additionally, members of one's LSA network could also use shared information for unknown purposes with negative consequences for the one sharing the information.

Knowing that information privacy risks are inherent in LSA use, trust becomes an important consideration for people's decision to use LSA. What has been emphasized in the trust literature is that risks and risk perceptions contribute to the relevance of trust (Kee & Knox, 1970; Koller, 1988; Lewis & Weigert, 1985). Knowing that the risk associated with LSA use could be attributed to the actions of the LSA provider and of individuals in the LSA users' networks, trust in the context of LSA use would have two targets: the LSA provider and the members of the users' network.

2.2.1. Trust in LSA

With the increasing commodification of personal information online (Nehf, 2007; Olivero & Lunt, 2004), any information is susceptible to exploitation either by the organization collecting it or by third parties, which eventually compromises the information privacy of the one disclosing the information. Location information is useful for both LSA providers and third parties (Bellavista et al., 2008; Guha et al., 2012). Information disclosed to LSA includes not only location information but also visited interesting places and daily routes, which could generate a location-based profile that is easily accessible for different entities with an appropriate technology (Michael & Michael, 2011). Additionally, Michael and Michael (2011) stated that information disclosed to LSA could be used to generate people's patterns of use and to understand their behaviors.

The US Federal Communication Commission (FCC, 2012) reported that several parties can access users' data on LSA and these parties could either be the LSA provider, wireless carriers, or the mobile device. And without most users knowing it, data collected through LSA could be transferred to third parties (FCC, 2012). Those who are aware of the ways personal information shared to LSA could be violated cite privacy concerns as deterrents to their intention to use the aforementioned emerging technology (Lindqvist et al., 2011).

As information privacy risks could be attributed to the actions of either external parties (e.g. entities with the capacity to gain unauthorized access to users information) or to LSA providers, trust, therefore, could be operationalized in terms of the ability (competence-based trust) and willingness (character-based trust) of the LSA provider to protect its users information privacy. This operationalization is based on McLain and Hackman's (1999) definition of trust as 'a belief that a specific other will be able and willing, in a discretionary situation, to act in the trustor's best interest' (p. 155).

Beldad, De Jong, and Steehouder (2011) argued that competence-based trust, specifically trust in the LSA provider's knowledge and competence to secure users' information from unwarranted third-party intrusion, is expected to counter the perceived risks of unauthorized third-party access to disclosed information for unknown or malicious use. Character-based trust, or trust in the LSA provider's moral propensity to refrain from misappropriating its users' information, Beldad et al. (2011) added, could counter the perceived risks of a LSA provider's tendency to violate its users' information privacy by selling their information or by using the information for other purposes without the users' consent. While the positive effect of trust in an online entity (e.g. online shop, e-government) on information

disclosure is known (Beldad, Van der Geest, De Jong, & Steehouder, 2012; Dinev & Hart, 2006; Malhotra, Kim, & Agarwal, 2004), the differential impact of these two trust dimensions on information sharing is not yet fully understood. This prompted the research hypotheses below.

Hypothesis 2a. Indonesian university students' competence-based trust in the LSA provider positively influences their use of LSA.

Hypothesis 2b. Indonesian university students' character-based trust in the LSA provider positively influences their use of LSA.

2.2.2. General trust in LSA network members

Information shared on LSA could be abused not only by the LSA provider and third parties but also by members of the network of the person sharing the information. In a study by Fusco et al. (2010), respondents mentioned that location information shared with other network members can be used to feed members' appetite for gossip. In another study, it is revealed that users are apprehensive of the fact that the location information they share to their LSA contacts could be misused (Zhao et al., 2012). As it is almost impossible for LSA users to know how information they share to their network members will be used by those members, users can only trust their contacts not to misappropriate the information shared to them (Krasnova et al., 2010). This prompts the next research hypothesis.

Hypothesis 3. Indonesian university students' general trust in members of their LSA network positively influences their use of LSA.

2.3. Social influence

While Technology Acceptance Model proposed that the acceptance of a novel technology could be predicted by its usefulness and ease of use (Davis, 1989), the Unified Theory of Acceptance and Use of Technology suggests that the impact of the users' community and connections on their adoption of a technology must be also be taken into account (Venkatesh et al., 2003). Social influence, in relation to technology adoption, is defined as 'the degree to which an individual perceives that important others believe he or she should use the new system' (Venkatesh et al., 2003, p. 451).

The impact of social influence on technology adoption and adoption intention has been found statistically significant in diverse contexts such as virtual communities participation (Dholakia, Bagozzi, & Pearo, 2004), online game playing (Hsu & Lu, 2004), and blog usage intention (Hsu & Lin, 2008). López-Nicolás, Molina-Castillo, and Bouwman (2008) reported that social influence from friends and relatives is an important predictor of the adoption of mobile services such as a short message service (SMS) and an e-mail application. In a study specifically focusing on LSA use, Widjaja (2012) found out that users adopt LSA because of social influence.

The effect of social influence on technology adoption is most likely due to the need to conform (Young, 2009). Young people, who are the respondents for this study, are considered sensitive to peer pressure (Utz & Krämer, 2009), which would eventually result in their propensity to conform to trends. Results of the various studies described above prompted the last research hypothesis.

Hypothesis 4. Social influence positively influences the use of LSA among Indonesian university students.

3. Methodology

3.1. Sampling procedure

A paper-based survey was implemented with students of six universities in Yogyakarta, Indonesia. The decision to use this survey approach was based on its advantage in ensuring that individuals who agreed to participate will really fill out the questionnaires on the spot, thereby minimizing chances of non-response. The survey questionnaire, with items translated from English to Bahasa Indonesia, was pilot tested with 10 students of a Dutch university to identify statement formulation- and comprehensibility-related issues. Results of the pilot test prompted the modification of the questionnaire items.

Cooperation with 6 universities in Yogyakarta, Indonesia was secured to have the authorization to distribute the survey questionnaires to their students. The survey was implemented for 3 weeks, which resulted in a significant number of students being approached for the study.

3.2. Respondents

After three weeks of data collection, 706 students filled out the survey questionnaire. However, questionnaires from 51 respondents had to be discarded as they were not completed, resulting in questionnaires from 655 respondents used for analysis. Of the 655 respondents included in this study, 63 percent were females ($n = 410$). Respondents' age ranged from 17 to 26, with a mean age of 18.7 (SD = 4.94).

In relation to Internet use through mobile device, results show that, in general, respondents access the Internet, on the average, between 4 and 6 h a day ($M = 2.88$, SD = 1.514). Aside from the use of the Internet through their mobile device, LSA use frequency was also measured in the survey. Two hundred twenty-three respondents (34%) used LSA between 1 and 3 h a day ($M = 1.79$, SD = 1.17). Facebook Place was the most frequently used LSA among the respondents, with 276 users (42.1%). Furthermore, the top-three motivations for using LSA are information sharing, finding a location, and checking-in. Presented in Table 1 is the complete demographic information of the research respondents.

3.3. Measurements

Confirmatory factor analysis, using principal component analysis, was performed to determine whether the 31 items selected for the 9 constructs of the study really measured those constructs. The Kaiser-Meyer Olkin Measure of Sampling Adequacy has a value of .90, which is higher than the recommended value of .60 (Kaiser, 1974). The Bartlett's Test of Sphericity X2 (465) = 11,738.08, $p < .001$ revealed that the correlations among the 31 items were sufficiently high for principal component analysis. Table 2 presents the factor loadings after rotation of the items included in the survey questionnaire.

All the items used for the 9 constructs were measured on a five-point Likert scale with 5 representing 'strongly agree' and 1 'strongly disagree'. A zero option for 'I don't know' was also used for several statements. The four items used to measure 'LSA use' were originally formulated for this study. With an alpha value of .79, the construct is reasonably reliable.

The 'impression management' aspect of benefits was measured with 4 items originally formulated by Krisanic (2008) and has an alpha value of .89, while the 'entertainment' aspect was measured with 3 items by Shu and Chuang (2011) and has an alpha value of .90. The remaining dimensions of benefits – information search

Table 1
Complete demographic information of the survey respondents.

Demographic characteristics		Frequency	Percentage
Gender	Male	245	37.4
	Female	410	62.6
Age	17–18	86	13.13
	19–20	331	50.53
	21–22	149	22.75
	23–24	45	6.87
	25–26	6	0.92
	Preferred not to indicate	38	5.80
Internet use per day	Less than 1 h a day	103	15.70
	Between 1 and 3 h a day	223	34.00
	Between 4 and 6 h a day	151	23.10
	Between 7 and 9 h a day	61	9.30
	Between 10 and 12 h a day	48	7.30
	12 h or more a day	67	10.20
	Preferred not to indicate	2	.30
Specific location sharing application used frequently	Facebook Place	276	42.10
	Foursquare	180	27.50
	Google Latitude	52	7.90
	Google Maps	4	0.60
	Instagram	73	11.10
	Nokia Peta	1	0.20
	Path	67	10.20
	Twitter	2	0.30
Use of the location sharing application per day	Less than 1 h a day	351	53.60
	Between 1 and 3 h a day	188	28.70
	Between 4 and 6 h a day	54	8.20
	Between 7 and 9 h a day	27	4.10
	Between 10 and 12 h a day	16	2.40
	12 h or more a day	16	2.40
	Preferred not to indicate	3	0.50
Total		655	100

and information dissemination – were measured with 4 items (a = .84) from Shu and Chuang (2011) and 3 newly formulated items (a = .81), respectively.

The two 'trust' constructs – competence-based and character-based – were measured with 4 and 3 items, respectively, all based on the scales by Gefen and Straub (2004). Competence-based trust and character-based trust have high alpha values of .88 and .86, respectively. Furthermore, the three items used to measure 'social influence', with an alpha value of .72, were modified versions of the items originally formulated by Venkatesh et al. (2003). Table 3 shows the alpha scores, mean values, and standard deviation values for all the research constructs.

4. Results

To test the hypotheses advanced for this research, hierarchical regression analysis was performed. This type of regression analysis enabled the researchers to determine the effects of the different predictors on the outcome variable in a sequential manner – primarily according to the importance of the independent variables as predictors of LSA use (Burns & Burns, 2008). As benefits were considered the primary contributors to people's adoption of a new form of technology, the four types of benefits – impression management, entertainment, information search, and information dissemination – were entered in the first block of the regression model. In the second block, the trust constructs (competence-based trust, character-based trust, and general trust in LSA network members) were entered. 'Social influence' was eventually entered in the third block of the regression model.

The entrance of the four types of benefits in the first block resulted in an adjusted R^2 value of .31 ($F_{4,650}$ = 73.75; p<.001). When the three trust constructs were added, the adjusted R^2 value rose to .34 ($F_{7,647}$ = 49.64; p < .001). The inclusion of 'social influence' in the last block further increased the value of the adjusted R^2 to .38 (F 8,646 = 50.92; p < .001). The adjusted R^2 value for the complete model signifies that 38 percent of the variance for LSA use could be explained by the 8 independent variables selected for this study.

In the complete model, the variance for Indonesian students' use of LSA could be attributed primarily to the two benefits of LSA use, namely, impression management (b = .15, p < .001) and entertainment (b = .32, p < .001), to users' trust in the competence of the LSA provider to protect users' information privacy (b = .14, p < .001), and to the influence of users' social network (b = .21, <.001). These results support hypotheses 1a, 1b, 2a, and 4, respectively. Additionally, Indonesian students' decision to use LSA is also predicated on the level of trust they have on the members of their LSA networks (b = .11, p < .01), which also supports hypothesis 3.

As the two dimensions of benefits – information search and information dissemination – were not found to positively influence LSA use, hypotheses 1c and 1d, respectively, are not supported. Furthermore, there is also no statistical support for hypothesis 2b, as character-based trust does not positively influence LSA use among Indonesian university students. Presented in Table 4 are the unstandardized and the standardized coefficients of the different constructs hypothesized to influence LSA use among Indonesian university students.

5. Discussion of results

The use of location sharing applications has become phenomenal, especially with the increasing rate of smart phone ownership. Thus far, studies into the factors influencing the use of such applications are relatively minimal. This research contributes to the study of mobile communication by understanding the determinants of people's use of a highly popular mobile application – LSA.

Regression analysis reveals that social influence has a strong impact on LSA use among Indonesian university students. This could be explained by the high level of collectivism characterizing the Indonesian culture (Hofstede, 2001). Individuals from a highly collectivistic culture, characterized by the integration of individuals (from birth onwards) into strong and cohesive in-groups, possess a strong 'we' consciousness (Hofstede, 2001), which is something closely similar to a high level of group identification. Group identification, according to Irwin and Simpson (2013), instigates conformity. As succumbing to social influence is viewed as an expression of the motivation to conform (Young, 2009), the significantly strong impact of social influence could be rightfully expected. This claim can be supported by results of the meta-analysis performed by Bond and Smith (1996) – that people from highly collectivistic countries have a stronger inclination to conform than those from highly individualistic countries.

The benefits that can be derived from using an LSA also amplify application usage. Several studies have reported that the surge in online social networking sites' popularity is primarily attributable to their information, entertainment, and impression management

Table 2
Results of the factor analysis with VARIMAX rotation of the items included in the online survey instrument.

Constructs	Items	Component								
		1	2	3	4	5	6	7	8	9
LSA use	I use LSA regularly					.74				
	I use LSA whenever I can					.72				
	I use LSA wherever I am					.79				
	I use LSA almost daily					.74				
Benefit: impression management	Using LSA makes me a likeable person	.81								
	Using LSA contributes to my image as a cool person	.84								
	Using LSA makes me socially desirable	.83								
	Using LSA improves my image as a pleasant person	.82								
Benefit: entertainment	Using LSA is entertaining			.80						
	Using LSA is amusing			.79						
	Using LSA can make me happy			.74						
	Using LSA is a way to beat boredom			.75						
Benefit: information search	Using LSA helps me in finding nearby location information				.76					
	Using LSA makes it easier for me to find promotion information				.81					
	Using LSA helps me in finding interesting and unique location reviews				.83					
	Using LSA makes it easier for me to find other users' location information				.67					
Benefit: information dissemination	Using LSA enables me to inform people in my network about my whereabouts							.78		
	It is easy for me to tell my contacts what I am doing at present using LSA							.76		
	It is easy to inform people in my network about the current situation of the place where I am located using LSA							.71		
Competence-based trust in LSA	The LSA provider I'm using is competent in protecting my location information		.71							
	The LSA provider I'm using has the knowledge of how to protect users' location information		.84							
	The LSA provider I'm using knows how to protect its users' privacy		.84							
	The LSA provider I'm using uses the right technology to protect my information from third-party access		.79							
Character-based trust in LSA	I can rely on the provider's promise to keep personal information of its users, including personal information, privately						.81			
	I believe that the LSA provider I'm using is honest						.84			
	The LSA provider I'm using keeps the promises it makes						.72			
General trust in LSA network members	In general, users in my network really do care about my privacy									.82
	Users in my network are sincerely concerned about my privacy									.84
Social influence	Most of my friends use LSA								.81	
	Most of my friends recommend that I use LSA								.69	
	People that I know use LSA								.81	

Table 3
Reliability scores and mean and standard deviation values for the different constructs of the study.

Variables	Cronbach's α	Mean	SD
LSA usage pattern	.84	2.99	.91
Benefits – impression management	.89	3.29	.87
Benefits – entertainment	.90	3.70	.76
Benefits – information search	.84	4.01	.59
Benefits – information dissemination	.81	3.81	.64
Competence-based trust in LSA	.88	3.67	.82
Character-based trust in LSA	.86	3.42	.96
Trust in LSA network members	.87	3.39	1.05
Social influence	.72	3.62	.72

functions. Results of the current study also indicate that Indonesian students use LSA because of the benefits that such an application can offer. Interestingly, however, of the four types of benefits initially postulated to impact the application's use, only impression management- and entertainment-related benefits have statistically significant effects on LSA use. Information-related benefits (information dissemination and search) have no bearing on LSA use. What the results clearly suggest is that Indonesians have idiocentric motives for using LSA (e.g. identity enhancement, killing boredom) instead of allocentric motives (e.g. relaying information for other people's consumption).

Considering the risks associated with LSA use, one can expect that trust would play a critical role in the application's uptake, as risk perception increases the salience of trust (Kee & Knox, 1970; Koller, 1988; Lewis & Weigert, 1985). The perceived risks of using LSA can be attributed to the actions of the LSA provider and of the members of the users' network. Information posted by and data collected from users could be exploited by LSA providers and/or misused by network members. It is, therefore, to be expected that one would take trust into account when deciding whether or not to use LSA. Trust in LSA, in this study, is based on the competence and character of the LSA provider. One type of trust seems to matter more than another type, as results of the study show – and in this case, Indonesian students use LSA because they trust the competence of the LSA operator.

The fact that character-based trust in LSA does not positively influence LSA use hints at the risks people perceive when using LSA. Character-based trust is not a relevant predictor of use since Indonesian LSA users may not really be apprehensive that their personal information will be misused by the LSA provider. However, the statistically significant effect of competence-based trust on LSA use could be indicative of the external-based risks people associate with LSA use (e.g. third party information abuse, hacking).

Using LSA for impression management and information dissemination certainly suggests that there is an expectation of an audience – the LSA network members. This is based on the notion that in any communication act, interacting parties have an audience – either real or imagined (Marwick & Boyd, 2010). LSA usage necessitates a person to share certain types of information. As

Table 4
Unstandardized and standardized coefficients of the different constructs hypothesized to Indonesia students' use of a location sharing application.

Models	*B*	SE *B*	*β*	Adj. R^2 (ΔR^2)
Constant	.007	.22		
Benefits – impression management	.19	.04	.18	.31 (.31)
Benefits – entertainment	.48	.05	.40	
Benefits – information search	.17	.06	.11	
Benefits – information dissemination	−.03	.06	−.02	
Constant	−.27	.22		
Benefits – impression management	.18	.04	.17	.35 (.04)
Benefits – entertainment	.44	.05	.37	
Benefits – information search	.12	.06	.08	
Benefits – information dissemination	−.09	.06	−.06	
Competence-based trust in LSA	.17	.05	.15	
Character-based trust in LSA	−.02	.04	−.02	
General trust in LSA network members	.10	.04	.11	
Constant	−.77	.23		
Benefits – impression management	.16	.04	.15***	.38 (.03)
Benefits – entertainment	.39	.05	.32***	
Benefits – information search	.09	.06	.06	
Benefits – information dissemination	−.07	.06	−.05	
Competence-based trust in LSA	.16	.05	.14***	
Character-based trust in LSA	−.03	.04	−.03	
General trust in LSA network members	.10	.03	.11**	
Social influence	.26	.04	.21***	

*** $p < .001$.
** $p < .01$.

mentioned, shared information is subject to abuse not only by the LSA provider but also by members of the user's network. Hence, it only makes sense that people would also take into account the level of general trust they have in their network members when using LSA.

6. Implications and future research directions

The current study is one of the few that looked into young people's use of LSA. Previous studies have explored people's motivation for using a specific LSA, such as Foursquare, (Cramer et al., 2011; Lindqvist et al., 2011) and a couple of studies have also looked into the effects of various benefits on LSA use (Patil et al., 2012a,b). Nonetheless, the impact of trust (in the LSA provider and in network members) and of social influence on the use of such a mobile application is not yet fully understood. This is the gap that the current study tried to fill.

Results of this study has important implications for practice and research. One important practical implication of the study's results is the need for LSA designers to concentrate on strategies that would capitalize on the impact of social influence, considering the variable's effect on research respondents' use of LSA. For instance, application developers could consider actively prompting application users, through a reward system for instance, to promote the application to members of their offline social networks.

As entertainment-related benefits are crucial for the adoption and continuous usage of LSA, application designer should also ensure that application users can fully enjoy the experience of using a certain location sharing application. The inclusion of novel functions such as those related to video editing and photo editing into the application could be one strategy. Additionally, such application should also consider the strong embedding of games, which could be played together by application users, into the application's functions.

Another type of benefit that influences research respondent's decision to use LSA is impression management. As LSA use is predicated on the need to enhance one's image, LSA developers should take into account the integration of a review function that could be used to provide a cue to users' connection that they are currently in a place that is often visited by young people.

Furthermore, considering that competence-based trust is one of the important predictors of LSA use, LSA developers should clearly highlight that appropriate security mechanisms are employed to safeguard application users' information privacy from third-party intrusion. Previous studies (e.g. Aiken & Bousch, 2006; Belanger, Hiller, & Smith, 2002; Yoon, 2002) revealed that the presence of security cues shapes people's assessment of an online entity's trustworthiness. Such cues must be conspicuous enough for users to see and that LSA users must be adequately informed of how their information privacy is protected.

While the current study is the first to test a model for the determinants of LSA usage, there are still certain questions that remained unanswered. First, while it is known that social influence plays an important role in shaping LSA use, the variable 'social influence' concentrates exclusively on the impact of known individuals (e.g. friends) within the users' network, while the effect of individuals with whom the users have no familiar relationships or strong ties, for instance influential public personalities, is virtually neglected.

Second, although the effect of impression management-related benefit on LSA use is statistically significant, the influence of the variable might be related to the size of the audience for the relayed information for impression. Impression management, also referred to as self-presentation (Goffman, 1959), necessitates an audience to be meaningful. According to Gardner and Martinko (1988), the size of people's audience determine their level of self-presentation. Future studies, therefore, could test the possible relationship between audience size and the use of LSA for impression management.

Third, whereas social influence strongly influences LSA use among Indonesian university students, one wonders whether or not such an influence could be attributed to the cultural characteristics of users. Earlier it was argued that people from a collectivist culture, such as the research respondents, are susceptible to social influence – that their actions could be expressions of the need to conform to the group they belong to or to the expectations of individuals who influence them. However, LSA users from an individualistic culture might be triggered by factors, other than social influence, when deciding to adopt the application. Hence, testing the model proposed in this study in a cross-cultural context might be a worthy research agenda.

Finally, although the 'benefit' construct was treated as a multidimensional variable with the inclusion of factors McQuail (2002) regarded as contributing to the adoption of a certain communication channel, the number of 'benefit' dimensions could still be expanded to include other themes not included in this study. For instance, Patil et al. (2012a) found out that LSA use and location-sharing disclosure perform two important functions, namely, journalizing (keeping track of where one has been) and reward accumulation (sharing location information for certain tokens). The inclusion of these extra benefit dimensions in a model would certainly give a more nuanced picture of the mechanism behind people's use of LSA and their disclosure of location information.

7. Conclusion

As mobile phones have become nearly ubiquitous, mobile phone applications are also becoming almost indispensable. Applications that enable the sharing of one's location information are becoming increasingly popular. It is indubitable that such applications extend a range of benefits to their users. Nonetheless, LSA use is not something devoid of any risks, as

information shared during use is susceptible to various forms of abuse – either by application developers or by third parties. The current study has identified the major determinants of LSA use, although it is not claimed that those are the only factors that could influence the application's use.

What is important to note, nonetheless, is the strong novelty aspect of LSA which provides enough opportunities for empirical research into how people incorporate LSA into their lives and how it affects the ways they live. With the results of this study, the researchers hope to have provided a more solid base for empirical studies into the factors contributing to people's use of not only LSAs but also of other types of mobile applications. While the benefits of using different types of mobile applications vary, several determinants of LSA use that have been identified in this research (e.g. trust, social influence) could certainly contribute to people's decision to use other types of mobile applications.

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