

Localized use of information and communication technologies in urban neighborhoods of Seoul:

Experiences, intentions, and related factors

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Abstract

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The past fifty years of rapid and radical urbanization, industrialization, and modernization in South Korea have transformed neighborhoods in Seoul. Neighborhoods that are geographically close units have become socially distant. Networked individuals (Raine & Wellman, 2012) in Seoul feel that their neighborhoods are located at “the ends of the earth,” although they enjoy liberated communities (Wellman, 1979) and intensified connectedness (Ling, 2008) in the space of flow of a network society (Castells, 2000), as well as empowerment through the networked information economy (Benkler, 2006). Neighborhoods have been abandoned as uncharted territory in many residents’ cognitive maps of social life in Seoul.

Important external—in particular, political, social, and technological—forces continue to have the potential to make critical changes in the neighborhoods of Seoul. Politically, the current mayor of Seoul, Won Soon Park, has assigned a high priority to programs that focus on rediscovering and rebuilding Seoul neighborhoods (“mah-eul” in Korean). Socially, grassroots-level resident-led movements and activities are resisting the hyper-capitalization, hyper-rationalization, over-achievement, and over-competition that have characterized Korean society during the last few decades. Many Seoul neighborhoods have embarked on a variety of collective experiments to rebuild neighborly connectedness; these have included efforts to create neighborhood news sites and podcasts, mom-and-pop type bookstores and libraries, and locally based credit unions.

In addition to political and social forces, technological forces have also had a significant impact on neighborhoods in Seoul. Scholars and commentators have focused on the potential for new information and communication technologies (ICTs) to lower the transaction costs for

relating to others and organizing and participating in collective activities (Benkler, 2006; Rheingold, 2002; Shirky, 2008). This potential has become more salient with the advancement of technologies that enhance net-locality (Gordon & de Souza e Silva, 2011), such as mobile and GIS/GPS technologies, location-based services (LBS), locative media (Hemment, 2006; Tuters & Varnelis, 2006), and geo-tagging or augmented reality (Crang & Graham, 2007; de Souza e Silva & Frith, 2012). One of the areas in which we can apply these new ICT capabilities is the urban neighborhood. By using ICTs, people can find, meet, and organize collective activities with their neighbors. There have been many attempts to localize websites, social networking sites (SNSs), blogs, online cafés, and smartphone apps so that new ICT-based services can be used to enhance local communities. Due to the emergence of new ICTs, neighborhood communities have a chance of reviving and re-exploring opportunities that go beyond what Wellman (1979) described as the three community conditions: being lost, saved, or liberated.

It may be more realistic, reasonable, and fair to say that ICTs are both the friends and the enemies of urban neighborhoods (Kim, et al., in press). They sometimes make it easier for urban residents to find and meet other people in their neighborhoods and to share local issues, problems, and solutions. However, the same ICTs also have the ability to keep urban residents in a state of disconnection from their own places of residence, while helping them more strongly connect to others far away, by sharing interests and experiences rather than places. In our previous work (Kim et al., in press), we have described these two possible scenarios, using the terms, “pulling effects” (bringing people closer to their own neighborhoods) and “pushing effects” (pushing people away from their own neighborhoods). Which effect is more prevalent in a particular community depends on many contextual factors, including the local community’s ability to use ICTs to strengthen connections among its members.

Between these two “pulling” and “pushing” scenarios, we have framed the present research so as to focus on identifying the conditions that cause ICTs to work as pulling rather than pushing factors in a community. The current paper has two primary purposes. The first is to assess the degree to which ICTs are used for neighborhood purposes (localized use of ICTs) and to identify the factors responsible for residents’ localized use of ICTs. By examining the ten most popular ICT services in Seoul (mobile instant messengers, blogs, websites, Facebook, Twitter, Online cafés, smartphone apps, online news sites, podcasts, and online video services), we aim to understand the extent to which they are used as localized neighborhood media by Seoul residents. We also hope to identify the factors that determine which individuals become “localized ICT users” and which remain “non-localized ICT users.” Our second purpose is to discover how much potential each ICT service has to be used by current non-localized ICT users as a localized ICT in the near future. To achieve this, we will attempt to identify factors that make non-localized ICT users more likely to consider a localized use for ICTs. These enquiries are theoretically guided by Communication Infrastructure Theory (Y.C. Kim & Ball-Rokeach, 2006) and the Theory of Planned Behavior (Ajzen, 1991).

The role of ICTs in facilitating neighborliness

In *American Calling*, Claude Fischer (1992) cited one scholar who wrote, “[t]he automobile and improved roads, rural social contacts have multiplied many fold, and are now based in increasing measure upon age, sex, and common interests rather than upon kinship and common residence” (p. 200). Although this scholar was discussing new transportation technologies, he articulates a typical reaction to the pushing effect of new communication technologies on local communities. People expressed similar concerns and skeptical or even bewildered responses to the potential negative effects of many “new” older communication

technologies, including the telegraph (Standage, 1998), the radio (Douglas, 1987), and the Internet (Baym, 2010) on local communities. In his study about the early uses of the telephone in 1940s America, Fischer admits that he finds a “few modest changes in localism” made by telephones. He writes, however, that “[r]ather than indicating a *displacement* of local interest, these changes suggest a simultaneous augmentation of local and extralocal activities” (italics added). Recent studies have offered empirical findings that may echo what Fischer described as a simultaneous augmentation of local and extralocal activities (e.g., Hampton, 2007; Hawthornthwaite & Kendall, 2010). The concept of networked individualism developed by Wellman and his colleagues extends this by emphasizing community connectedness liberated from geographical boundaries (Raine & Wellman, 2012; Wellman et al., 2003).

Recent technological developments have made it possible for local residents to come up with creative ways to explore new geographical and social spheres that have been left unexplored, including their own neighborhoods. Many features of the new ICTs have been localized so that urban residents can use them to connect, not only to space-free, non-local information, knowledge, stories, and people but also to the equivalent local resources. Some websites are specially designed to serve local residents by providing local information; one example is the Baby Center community (community.babycenter.com) in the United States. As one of the programs to promote e-government, district governments in Seoul have their own websites to provide information about the services provided by government offices, as well as news and information about things happening in their district neighborhoods.

Blogs and online news sites also have been developed to disseminate news and information about particular local communities. Some examples include DobongN (dobongn.tistory.com) in Seoul, Gorotto Yachiru (www.gorotto.com) in Japan’s Kumamoto

prefecture (Togo, Enomoto, & Kawamura, 2009), Humans of New York (humansofnewyork.com) in New York (and other versions of this site in different places), Gothamist (gothamistllc.com) and its regional sites in Los Angeles, Washington DC, Chicago, and San Francisco, and Uptown Update (uptownupdate.com), serving Chicago's uptown neighborhoods. Some sites have been set up as professional but localized news providers to serve particular neighborhoods or districts, such as DNA info (www.DNAinfo.com) in New York and Chicago (Barry, 2013) and Patch (www.patch.com) in various U.S. regions (J., Johnson, & Nah, 2014).

Some neighborhoods in Seoul have launched localized online video services, where residents produce and provide content for other residents through third-party video distribution services such as YouTube (e.g., Waboshong TV in Seoul), popular SNSs, and other online venues. Some local communities have their own websites to provide video content, such as DCTV (www.dctv.org) in Washington DC (Ali, 2012). Podcasts have also been localized; they produce and share local news, debates on relevant issues, neighborly chats, and personal discussions among neighbors. Examples include Dum of Changshin-dong in Seoul, Curious City in Chicago, and Food Economy in Detroit (Edmond, 2014).

Mobile instant messenger (MIM) apps such as *KakaoTalk* or *Band*, two of the most popular MIMs in Korea, have been used by several regional districts as localized channels for town hall meetings. These MIMs are also used to mobilize residents around local community issues in Korea. Online café or similar web-based meeting places have been set up to function as public spheres where local residents gather to share information and concerns, and to plan actions; examples include the many online cafés for young mothers in local Seoul neighborhoods (some online cafés for moms have more than 100,000 members). Developers in the United States

have set up portal sites such as i-Neighbors (Keith N. Hampton, 2010) and Front Porch Forum (frontporchforum.com) that enable others to create and use localized online cafés.

As smartphone users have rapidly increased during the last few years, smartphone apps have been developed to connect residents to their neighborhoods; these include TownTalk in Korea (dongnemon.com), Locast Civic Media in Brazil (locast.mit.edu/civic), and See Click Fix (seeclickfix.com), Nextdoor (www.nextdoor.com), Everyblock (everyblock.com), Citizen Connect (cityofboston.gov/citizensconnect) and Neighbors for Neighbors (neighborforneighbor.org) in the United States. Even SNSs such as Facebook and Twitter have been localized in various ways. Some local districts in Seoul have pilot-tested Twitter for neighborhood town-hall meetings (The Asia Economic Daily, 2014). Mothers on the Upper East Side of Manhattan meet through the Facebook group, UES Mommas, for mutual support, while Twitter enables local groups such as twitter.com/ESLANacostia in the Anacostia neighborhood of Washington, D.C. and Whooly.net (whooly.net) in New York City and Seattle.

Factors affecting the use of ICTs for neighborhood purposes

Many interesting and creative ways to localize new ICTs have emerged in many different locations including Seoul, as mentioned above. However, the availability of localized ICTs does not guarantee that they will actually be used by local residents. Many localized ICT services disappear while still at an experimental stage, without ever having the chance to exert a significant influence on local neighborhoods. We need to understand what factors cause localized ICT services to actually be used by local residents. Our enquiry into factors influencing the localized use of ICTs has been guided by two theoretical approaches: the Theory of Planned Behavior (TPB) and Communication Infrastructure Theory (CIT).

Theory of Planned Behavior

First introduced by Ajzen (1985), TPB explains individuals' behaviors or their intentions to conduct behaviors by assessing attitudes (negative or positive feelings toward particular behaviors)), subjective norms (the perceived expectations of "referent people" influencing the subject regarding particular behaviors), and the perceived behavioral control (perceived ease of carrying out) particular behaviors). These three TPB variables can be applied to behaviors related to the localized use of ICTs (Baker & White, 2010; Lu, Zhou, & Wang, 2009; Pelling & White, 2009). As an extension of TPB, the technology acceptance model (TAM) has been used to explain how individuals adopt new communication technologies (Davis, 1986; Kwon & Chidambaram, 2000; Liu, Min, & Ji, 2011). Whether individuals use (or intend to use) a new communication technology can be predicted by (or at least associated with) their attitudes toward using that technology, their beliefs about significant others' positive or negative views of technology use, and perceived behavioral control (or self-efficacy). For example, when we try to explain who is likely to use Facebook for neighborhood purposes (i.e., localized use of Facebook), we can refer to three factors based on TPB: (1) whether an individual believes that the localized use of Facebook is a positive (or negative) thing to do (attitude); (2) the individual's sense of whether his or her significant others would consider it positive or negative (subjective norm); and (3) the degree to which the individual feels capable of using Facebook for local affairs (perceived behavioral control).

Communication Infrastructure Theory

In addition to beliefs and attitudes, localized use of ICTs may also be influenced by various contextual factors, such as whether or not one lives in a place that provides reasons and motivations for considering the localized use of ICTs. Communication infrastructure theory (CIT)

provides a theoretical framework for considering factors related to neighborhood contexts as an antecedent for localized ICT use (Kim & Ball-Rokeach, 2006b).

CIT was originally developed to explain the importance of communication resources for building local communities in urban places. One of the core claims of CIT is that when individual residents are able to access an integrative network of resources for storytelling about their neighborhoods, they are more likely to have a sense of belonging, and collective efficacy, as well as a willingness to participate in their local communities. CIT focuses on individuals' connectedness to three types of community storytellers: local media, community organizations, and other residents. CIT posits that individuals' integrated connectedness to a network that incorporates these three storytelling resources (i.e., integrated connectedness to a community storytelling network or ICSN) is the critical predictor of community engagement. During the last decade, many empirical studies conducted in urban areas of the United States and other countries have confirmed this (Kang, 2012; Kim, Moran, Wilkin, & Ball-Rokeach, 2011; Kim, 2013).

CIT proposes a theory-based view of the localized use of ICTs and its implications for ICSN and community engagement. CIT argues that: (1) new ICTs must be part of the communication infrastructure of a community in order to facilitate community involvement (K. N. Hampton, Goulet, & Purcell, 2011; Y.C. Kim, Jung, & Ball-Rokeach, 2007; Matei & Ball-Rokeach, 2003); (2) if new ICTs do not work as part of the communication infrastructure of a community, they may discourage use (Y.C. Kim, 2012; Matei & Ball-Rokeach, 2001); (3) whether new media technology will be incorporated into the communication infrastructure of local civic engagement depends on the existing quality and strength of the community storytelling network (Chen, Dong, Ball-Rokeach, Parks, & Huang, 2012; Hayden & Ball-Rokeach, 2007; Jung, Kim, Lin, & Cheong, 2005; Katz, Matsaganis, & Ball-Rokeach,

2012); and (4) at the individual level, the use of new media by residents will have positive effects on local community engagement if and when the residents have high-level ICSN (Jung, Toriumi, & Mizukosh, 2013; Katz, 2010; Y.C. Kim, 2003; Y.C. Kim, 2012; Lin, Cheong, Kim, & Jung, 2010).

Based on the two theoretical approaches of CIT and TPB, we proposed the following research questions and hypotheses. In our two research questions, we asked how many people had experienced (RQ1) or intended to try (RQ2) the localized use of ICTs. In these two research questions, we included the ten most popular ICT categories in Korea: websites, blogs, mobile instant messengers, online cafés, Facebook, Twitter, smartphone apps, online news sites, podcasts, and online video services.

RQ1. What percentage of Seoul residents have experienced localized ICT use?

RQ2. What percentage of non-localized ICT users intend to try localized ICT use?

We have six hypotheses: the first three assess whether TPB variables (attitude, subjective norm, and informal social control) and ICSN and community engagement variables (neighborhood belonging, community cohesion, informal social control, and participation in community activities) are associated with experiences of localized ICTs). The last three assess whether the same sets of variables are associated with an intention to adopt localized ICT use.

H1. Attitudes (H1-1), subjective norm (H1-2), and perceived behavioral control (H1-3) will be positively associated with an experience of localized ICT use.

H2. ICSN will be positively associated with an experience of localized ICT use.

H3. Community engagement variables—neighborhood belonging (H3-1), community cohesion (H3-2), informal social control (H3-3), and participation in community activities (H3-4)—will be positively associated with an experience of localized ICT use.

H4. Attitudes (H4-1), subjective norm (H4-2), and perceived behavioral control (H4-3) will be positively associated with an intention to adopt localized ICT use.

H5. ICSN will be positively associated with an intention to adopt localized ICT use.

H6. Community engagement variables—neighborhood belonging (H6-1), community cohesion (H6-2), informal social control (H6-3), and participation in community activities (H6-4)—will be positively associated with an intention to adopt localized ICT use.

Method

Data

An online survey was conducted in Seoul between August 6 and August 19, 2013 as part of a larger study examining new media use and community engagement in urban places. Survey respondents were recruited from the online panel directory of a Seoul-based research firm that is highly regarded for its systematic survey execution and high quality outcomes. There are about 1,000,000 people in the panel directory. An email invitation was sent to 8,520 potential respondents who met our study criteria (between the ages of 19 and 59 and residing in Seoul). We used a stratified sampling procedure with three criteria: (1) gender, (2) age (20s, 30s, 40s, and 50s), and (3) residence in 25 sub-districts, called *ku*, of Seoul. Of the 2,352 people who visited an online survey website that we built to carry out this research, 1,305 completed the survey. Thus, the participation rate for this survey was 15.4%. In the final sample, 305 respondents were excluded because: (1) they did not meet our basic stratifying conditions such as region or age; or (2) their answers were suspicious (for example, cases in which the log file showed that the survey was completed unusually quickly). Eventually, 1,000 Seoul residents aged between 20 and 59 from 25 *ku* districts were included in our sample. Only Smartphone

users (n = 901) were included in the analyses. When compared to the most recent census data, our sample is similar to the general Seoul population in terms of gender and age; however, the sample shows slightly higher education and income levels than the general Seoul population.

Measures

Localized ICT use

Experience of localized ICT use was measured by asking “have you ever used any of the ICT services listed below for neighborhood purposes during the past year?” The ICT services listed were as follows: 1) websites, 2) blogs, 3) mobile instant messengers, 4) online cafés, 5) Facebook, 6) Twitter, 7) smartphone apps, 8) online news sites, 9) podcasts, and 10) online video services. The respondents answered either “I have used it” (= 1) or “I have not used it” (= 0).

Intention to adopt localized ICT use was measured for each of the ten ICT services above if respondents had not used the ICT service in question. We assessed how strongly each respondent agreed with the statement “I intend to use [specific ICT service] for neighborhood purposes if it is available in my local community.” Respondents were asked to indicate their level of agreement by using a 5 point Likert scale (1 = “strongly disagree” and 5 = “strongly agree”).

TPB variables

Attitude toward localized ICT use was measured for each of the ten localized ICTs. Respondents were asked to evaluate each ICT channel as a positive or negative potential addition to his/her life by using a five-point Likert scale (1 = “very negative,” and 5 = “very positive”).

Subjective norm was measure for each ICT channel by asking each respondent whether people he or she considered important would consider localized ICT use positive or negative. This was measured using a 5 point Likert scale (1 = “very negative”, and 5 = “very positive”).

Perceived behavioral control was assessed for each ICT channel by asking each respondent how easy or difficult it would be for him or her to use each ICT channel. A five-point Likert scale was used for this variable (1 = “very difficult” and 5 = “very easy”). Means and standard deviations of TPB variables are provided in Table 1.

Community storytelling network variables

Local media connectedness (LC): Based on Kim and Ball-Rokeach (2006b), LC was measured by asking, “How often do you use this service to get local news and information?” for each of 15 media channels including national newspapers, national TV channels, community newspapers, community TV channels, and local radio stations. The respondents’ answers were collected using a 6-point scale (1 = “not at all,” 6 = “always”). For LC, the mean value of the 15 item scores was calculated ($M = 1.43$, $SD = 0.42$).

Intensity of interpersonal neighborhood storytelling (INS). The INS was measured by asking “How often do you talk with your neighbors about anything related to your neighborhood?” (Ball-Rokeach, et al., 2001; Y.C. Kim & Ball-Rokeach, 2006b). The respondents provided their answers on a 7-point Likert scale (1 = “not at all,” 7 = “always”) ($M = 2.91$, $SD = 1.23$).

Scope of connection to community organization (OC): OC was measured by asking respondents whether they were members of each of eight types of community organizations including social clubs, home association meetings, religious organizations, hobby/interest groups, political organizations, educational organizations, volunteer organizations, and community development organizations (Y.C. Kim & Ball-Rokeach, 2006b). OC was created as a scope variable by counting the number of organization types to which each respondent belonged ($M = 0.98$, $SD = 1.26$, Range = 0–8).

Integrated connectedness to a community storytelling network (ICSN): We calculated ICSN

by using the formula proposed by Kim and Ball-Rokeach (2006). This formula is expressed as follows:

$$ICSN = \sqrt{LC \times INS} + \sqrt{LC \times OC} + \sqrt{INS \times OC}$$

where LC is local media connectedness, INS is intensity of interpersonal neighborhood storytelling, and OC is scope of connection to community organizations. Since the scales for LC, INS and OC were different, we standardized their scores to calculate ICSN. (M = 8.89, SD = 3.07, range = from 3.83 to 15.)

Community engagement variables

Neighborhood Belonging (Williams, 2006) was measured using 9 statements, including “In my neighborhood, there are people that I can trust to help solve my problems,” and “When I feel lonely, there are people in my neighborhood I can talk to.” The conventional 5-point Likert scale was used (“1” = “not at all true,” “5” = “definitely true”) (Cronbach’s $\alpha = 0.93$, M = 2.75, SD = 0.95).

Collective efficacy: Following Sampson and colleagues (Sampson, Raudenbush, & Earls, 1997), we measured two collective efficacy variables: *informal social control* and *community cohesion*. Informal social control was measured using 5 items, including, “If there is a safety issue that makes people worry about walking at night in your neighborhood, how many of your neighbors participate in activities to solve this problem?” A 7-point scale was used for these items, ranging from “1” (no one will participate) to “7” (everyone will participate) (Cronbach’s $\alpha = 0.87$, M = 3.75, SD = 0.84). Community cohesion was measured by asking respondents how strongly they would agree with 5 statements, including “People in my neighborhood are willing to help one another,” and “People in my neighborhood share the same

values.” A 5-point scale was used, from “1” (do not agree at all) to “5” (very strongly agree) (Cronbach’s $\alpha = 0.89$, $M = 2.98$, $SD = 0.67$).

Participation in community activities was measured using the question: “How often do you attend neighborhood revitalization meetings held in your neighborhood?” A 6-point scale was used, ranging from “1” (“not at all”) to “6” (“very frequently”) ($M = 1.70$, $SD = 1.28$).

Control variables

Socio-demographical variables such as gender, age, education, income, and home ownership were controlled for statistical adjustment in all analyses conducted in the current study. A summary of the descriptive statistics for these control variables is presented in Table 2.

Results

The first research question concerned the extent to which Seoul residents use localized ICTs. As shown in Figure 1, websites are the most likely online resource to be localized by Seoul neighborhoods: 32 percent of respondents reported having used websites for neighborhood purposes. Websites were followed by online news sites (30%), online cafés (22%), blogs (21%), MIMs (15%), and Facebook (13%).

The second research question in this study was designed to assess how many Seoul residents intended to use each ICT channel for neighborhood purposes. This question was directed only to those who had no experience of using the ICT channel in question for any neighborhood purpose. Figure 2 shows that most respondents intended to use websites (% of respondents likely to use: 33%, mean = 2.85) and smartphone apps (% of respondents likely to use: 32%, mean = 2.85) for neighborhood purposes. They were followed by online news sites (% of respondents likely to use: 28%, mean = 2.74) and blogs (% of respondents likely to use: 26%, mean = 2.73). Respondents were least likely to consider podcasts (% of respondents likely to use: 14%, mean =

2.42) and Twitter (% of respondents likely to use: 15%, mean = 2.43) for neighborhood purposes.

We hypothesized that localized ICT use was associated with TPB variables (H1-1, H1-2, H1-3), ICSN (H2), and community engagement variables (H3-1, H3-2, H3-3, H3-4). A hierarchical logistic regression analysis was conducted for each of the ten ICT channels. Predictors including socio-demographic variables, TPB variables, ICSN, and community engagement variables were entered as blocks, step by step. The results are shown in Table 3. Nigelerke pseudo R^2 values indicated that the models explained 32% to 42% of the outcomes. The model fit χ^2 values of Block 2, Block 3, Block 4 in all models were significant ($p < .001$), indicating that the TPB, ICSN, and community engagement variables were meaningful predictors of whether an individual had experience of localized ICT use. In Block 1, we found that males were more likely to use Twitter ($b = -.761$, $p < .01$) and online video services ($b = -.528$, $p < .05$) for local purposes than females, and older people were more likely to read online news sites for local news than were their younger counterparts ($b = .015$, $p < .05$). High income was generally positively associated with localized ICT use, in all models—except in the cases of podcasts and online video services; homeownership had a significant relationship with localized ICT use for all of the ICT channels except Twitter, smartphone apps, podcasts and online video services.

In Block 2, Positive attitude toward ICT use for neighborhood purposes is associated with actual use for all of the ICT channels included in our study (H 1-1), while perceived behavioral control is generally not significantly associated with localized ICT use (H 1-3), except in the case of smartphone apps ($b = -.273$, $p < .05$). Subjective norms (H 1-2) were positively associated with Facebook ($b = .501$, $p < .01$), online cafés ($b = .280$, $p < .05$), online news sites ($b = .270$, p

< .05), and online video services ($b = .349, p < .05$). In Block 3, the ICSN variable ($b = .257$ to $.458, p < .001$) was positively associated with localized ICT use in all ICT channels (H2). In Block 4, Neighborhood belonging (H3-1) was negatively associated with Facebook use ($b = -.563, p < .01$), and online news site use ($b = -.277, p < .05$). Community cohesion (H3-2) was significantly and positively associated with MIM group chats ($b = .612, p < .05$), while negatively associated with podcast use ($b = -.53, p < .05$). Informal social control (H3-3) was not associated with any localized ICT use variables. The participation in community activities variable (H3-4) was found to be positively associated with localized ICT use in all ICT channels except online cafés, online news sites, and podcasts.

Our second set of hypotheses (H4, H5, and H6) assessed factors influencing the level of intention to adopt localized ICT use among those without any previous experience. We hypothesize that the individual's intention to use ICTs for neighborhood purposes is associated with the TBA variables (H4-1, H4-2, and H4-3), ICSN (H5), and community engagement variables (H6-1, H6-2, H6-3, and H6-4). A hierarchical ordinary least squared (OLS) regression analysis was conducted for each of the ten ICT channels. Predictors including socio-demographic variables, TPB variables, ICSN, and community engagement variables were entered as blocks, step by step. The results are presented in Table 4. The total R^2 values indicate that the models explained 51% to 59% of the variance in the outcomes ($p < .001$). In Block 1, males were found to be more likely to intend to make localized use of MIM group chats ($b = -.174, p < .05$) and Facebook ($b = -.142, p < .05$) than females, while older, richer respondents seemed more willing to make localized use of all ten ICTs than younger, poorer ones ($p < .05$). Homeowners were more likely to intend to make localized use of Facebook ($b = .212, p < .01$), Twitter ($b = .203, p < .01$), online cafés ($b = .169, p < .05$), podcasts ($b = .195, p < .01$) and

online video services ($\beta = .215, p < .01$). In Block 2, attitudes toward localized ICT use were significantly and positively associated with the intention to make localized use of ICTs (H4-1). Subjective norms were also generally positively associated with all ICTs except podcasts and online video services (non-significant) (H4-2). However, perceived behavioral control was not significantly related to the intention to make localized use of ICTs in any of the ICT channels (H4-3). In Block 3, ICSN was positively associated with the intention to make localized use of ICTs in all ten channels (H5). In Block 4, neighborhood belonging was positively associated with the intention to make localized use of MIM group chats ($b = .082, p < .05$), websites ($b = .105, p < .05$), Facebook ($b = .103, p < .01$) and Twitter ($b = .078, p < .05$) (H6-1). Informal social control was significantly and positively associated with the intention to make localized use of blogs ($b = .098, p < .05$), websites ($b = .115, p < .05$), online cafés ($b = .109, p < .01$) and online video services ($b = .131, p < .001$) (H6-2). Community cohesion was positively related only to the intention to make localized use of podcasts ($b = .115, p < .05$) (H6-3). The variable of participation in community activities was not related to the intention to make localized use of ICTs except in being *negatively* associated with the intention to make localized use of Twitter ($b = -.061, p < .05$).

Discussion

Theoretically guided by communication infrastructure theory (Y.C. Kim & Ball-Rokeach, 2006) and theory of planned behavior (Ajzen, 1991), the current paper set out to achieve two purposes: 1) to assess the experiences and intentions of Seoul residents in relation to the localized use of ICTs; and 2) to identify the factors influencing those experiences and intentions.

We found that the localized use of ICTs is not yet popular in Seoul. Only (approximately) one-third of respondents had used websites for local purposes, followed by online news sites

(30%), online cafés (22%) and blogs (11%). Fewer than 20% of respondents had ever used another ICT channel for neighborhood purposes. Among those respondents who had never tried using ICT channels for neighborhood purposes, approximately one-third were willing to consider the localized use of websites (33%). About the same percentage said that they might try smartphone apps (32%). Online news sites (28%), blogs (26%), online cafés (23%), and Facebook (20%) generated less interest than websites and smartphone apps. When it came to both the experience and intention of making localized use of ICTs, positive attitudes towards such behavior were a significant factor in relation to almost all ICT channels considered in the current study. The subjective norm constituted a more consistent factor in relation to intention, rather than experience. Perceived behavioral control (or self-efficacy) did not show a significant association with any of the ICT channels, either in relation to experiences or intention. ICSN was a consistently significant and positive factor in relation to both the experience and intention of making localized use of ICT channels. Among the four community engagement variables, the only one showing a consistent pattern was “participation in community activity,” which was associated with the experience (but not with the intention) of using every ICT channel considered for this study apart from online cafés, online news sites, and podcasts.

The findings of this study have several theoretical and practical implications. First, from the research findings, we can see that various ICT channels could potentially be customized to serve urban neighborhoods. As reported above, the number of people making localized use of ICT channels is not dramatic—nor is the number of those intending to try it. However, if we bring together those with either the experience or the intention of making localized use of ICT channels, the situation looks a little different. The majority of respondents (54%) either have experience or the intention of making localized use of websites. Online news sites (49.2%), blogs

(41.2%), online cafés (39.3%), and smartphone apps (38.8%) also showed potential as localized ICT channels.

These results—showing a consistently significant relationship between ICSN and the localized use of ICT channels—suggest the need for community-level communication infrastructures that would allow ICT channels to be used to build and strengthen local communities (Kim et al., in press). There should be a two-way interaction between ICSN and localized ICT uses. On the one hand, the localized use of ICT channels has the potential to strengthen community storytelling resources and individuals' connectedness to such resources (i.e., ICSN); on the other hand, high-level ICSN would also motivate individuals to find and use various ICT channels for neighborhood purposes.

The tests of TPB variables regarding experience and the intention of making localized use of ICTs were partially successful. The consistent impact of positive attitudes on both the experience and intention of making localized use of ICT channels needs further discussion. The cross-sectional data used in this study limit our ability to make any causal inferences. However, the results do suggest at least two significant points: (1) it is important to develop positive images and perceptions of the localized use of ICT channels; and (2) people with experience of localized ICT use are more likely to view it positively. Subjective norms show consistent findings only in the case of the intention to use ICT channels. These results are affected by at least two facts, as follows: (1) Given the nature of cross-sectional data, it is not easy to remember or interpret the impact of subjective norms on experience; and (2) because the TPB model was originally designed to predict intention, TPB variables should work better for intention than experience. Perceived behavioral control did not show significant results in both experience and intention of making localized use of ICTs.

In terms of the community engagement variables, participation in community activities was the only variable that showed a consistent positive association with experience (but not intention). Other community engagement variables (neighborhood belonging, community cohesion, and informal social control) did not show any consistent pattern. These results would suggest that: (1) it might be too early to see real and significant connections between the localized use of ICTs and community engagement; (2) high-level community engagement does not automatically provide reasons for making use of localized ICTs; and (3) individuals are more likely to use localized ICTs only when they are required to participate in local activities.

This study has several limitations. We have tried not to make any causal inferences, as our research relied on cross-sectional data. All results should therefore be regarded as correlational rather than causal. We used online survey methods that systematically excluded Internet non-users. However, because about 83% of the total population of Korea used the Internet in 2012 (this percentage is likely to be even higher now for a study population with our age and location constraints) and we focused only on smartphone users; we do not believe this is a serious problem. Some variables (in particular the interpersonal neighborhood storytelling variable) were measured using a single item. Although we followed the methods of previous studies in relation to single-item measures, future research should validate the reliability of these measures and, if necessary, develop multi-item measures.

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Table 3. Results of hierarchical logistic regression analyses of experiences of localized ICT use

		MIM group chats		Blogs		Websites		Facebook		Twitter	
		B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio
Block 1	Constant	-2.494 (0.498) ***	0.083	-1.953 (0.436) ***	0.142	-1.594 (0.383) ***	0.203	-2.083 (0.512) ***	0.125	-3.368 (0.592) ***	0.034
	Gender (female = 1)	-0.089 (0.191)	0.914	-0.162 (0.169)	0.850	-0.148 (0.147)	0.863	-0.188 (0.204)	0.828	-0.761 (0.233) **	0.467
	Age	-0.007 (0.009)	0.993	-0.007 (0.008)	0.993	-0.01 (0.007)	0.99	-0.005 (0.009)	0.995	0.007 (0.01)	1.007
	Education	-0.037 (0.117)	0.964	0.062 (0.103)	1.064	0.218 (0.091) *	1.244	-0.169 (0.121)	0.845	0.118 (0.142)	1.126
	Income	0.157 (0.039) ***	1.170	0.102 (0.036) **	1.107	0.082 (0.032) **	1.086	0.092 (0.043) *	1.097	0.124 (0.045) **	1.131
	Homeownership(own = 1)	0.527 (0.205) *	1.694	0.39 (0.177) *	1.477	0.444 (0.154) **	1.558	0.651 (0.222) **	1.917	0.455 (0.238)	1.576
	$\Delta \chi^2 (5)$	29.158***		20.022**		31.847***		18.748**		32.975***	
	Nagelkerke ΔR^2	0.055	0.083	0.034		0.049		0.038		0.072	
Block 2	Attitude	1.093 (0.154) ***	2.982	0.977 (0.139) ***	2.656	0.708 (0.11) ***	2.029	0.882 (0.156) ***	2.416	0.978 (0.166) ***	2.66
	Perceived behavioral control	0.111 (0.108)	1.117	-0.19 (0.102)	0.827	-0.041 (0.089)	0.959	-0.058 (0.123)	0.944	0.054 (0.132)	1.055
	Subjective norm	0.108 (0.154)	1.114	0.064 (0.138)	1.066	0.185 (0.119)	1.203	0.501 (0.171) **	1.651	0.209 (0.17)	1.232
	$\Delta \chi^2 (3)$	99.738***		83.928***		82.348***		92.153***		71.628***	
	Nagelkerke ΔR^2	0.176		0.136		0.118		0.176		0.146	
Block 3	Icsn	0.365 (0.044) ***	1.441	0.451 (0.041) ***	1.569	0.291 (0.031) ***	1.337	0.458 (0.051) ***	1.581	0.388 (0.051) ***	1.474
	$\Delta \chi^2 (1)$	84.733***		159.236***		100.179***		108.326***		70.959***	
	Nagelkerke ΔR^2	0.135		0.225		0.129		0.186		0.135	
Block 4	Participation in community activities	0.317 (0.083) ***	1.374	0.344 (0.078) ***	1.411	0.312 (0.073) ***	1.366	0.326 (0.089) ***	1.385	0.291 (0.091) **	1.337
	Informal Social Control	0.272 (0.192)	1.313	0.074 (0.167)	1.077	-0.175 (0.128)	0.84	0.157 (0.209)	1.17	-0.008 (0.206)	0.992
	Community cohesion	0.612 (0.267) *	1.845	0.017 (0.227)	1.017	-0.039 (0.181)	0.962	0.404 (0.289)	1.497	-0.076 (0.298)	0.927
	Neighborhood Belonging	-0.147 (0.185)	0.863	-0.072 (0.165)	0.930	-0.001 (0.132)	0.999	-0.563 (0.208) **	0.57	-0.171 (0.204)	0.843
	$\Delta \chi^2 (4)$	33.541***		21.886***		19.843**		22.632***		10.958*	
	Nagelkerke ΔR^2	0.05		0.028		0.024		0.036		0.019	
Total χ^2		247.17***		285.072***		234.217***		241.859***		186.521***	
Total R^2		0.416		0.423		0.32		0.436		0.372	

* $p < .05$. ** $p < .01$. *** $p < .001$. N = 901.

Table 3 (Continued)

		Online cafés		Smartphone Apps		Online news sites		Podcasts		Online video services	
		B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio	B (S.E.)	Odd Ratio
Block 1	Constant	-2.722 (0.448) ***	0.066	-2.831 (0.603) ***	0.059	-1.748 (0.388) ***	0.174	-2.133 (0.55) ***	0.119	-2.654 (0.539) ***	0.07
	Gender (female =1)	-0.03 (0.168)	0.971	-0.269 (0.234)	0.764	0.038 (0.15)	1.039	-0.385 (0.223)	0.68	-0.528 (0.215) *	0.59
	Age	0.015 (0.008)	1.015	-0.005 (0.011)	0.995	0.015 (0.007) *	1.015	-0.005 (0.01)	0.995	0.015 (0.01)	1.015
	Education	0.05 (0.101)	1.051	0.016 (0.144)	1.016	-0.118 (0.088)	0.889	-0.069 (0.132)	0.933	-0.107 (0.125)	0.899
	Income	0.071 (0.036) *	1.074	0.109 (0.048) *	1.115	0.073 (0.033) *	1.076	0.053 (0.046)	1.054	0.075 (0.044)	1.078
	Home ownership (own = 1)	0.539 (0.178) **	1.715	0.378 (0.248)	1.459	0.324 (0.156) *	1.382	0.441 (0.235)	1.555	0.332 (0.222)	1.394
	$\Delta \chi^2 (5)$	25.571***		11.661*		20.357**		9.347		17.219**	
	Nagelkerke ΔR^2	0.043		0.028		0.032		0.021		0.036	
Block 2	Attitude	0.831 (0.135) ***	2.296	0.519 (0.156) **	1.681	0.875 (0.12) ***	2.399	1.068 (0.176) ***	2.911	0.72 (0.163) ***	2.054
	Perceived behavioral control	0.039 (0.101)	1.040	-0.273 (0.125) *	0.761	-0.132 (0.09)	0.876	-0.023 (0.132)	0.977	-0.174 (0.126)	0.84
	Subjective norm	0.28 (0.142) *	1.323	0.094 (0.166)	1.099	0.27 (0.127) *	1.310	0.025 (0.188)	1.026	0.349 (0.176) *	1.418
	$\Delta \chi^2 (3)$	98.041***		20.338***		117.658***		67.833***		55.457***	
	Nagelkerke ΔR^2	0.155		0.047		0.17		0.145		0.112	
Block 3	Icsn	0.316 (0.035) ***	1.372	0.376 (0.05) ***	1.457	0.257 (0.031) ***	1.293	0.346 (0.048) ***	1.414	0.364 (0.046) ***	1.439
	$\Delta \chi^2 (1)$	93.017***		69.53***		77.933***		62.865***		74.911***	
	Nagelkerke ΔR^2	0.132		0.153		0.101		0.125		0.14	
Block 4	Participation in community activities	0.129 (0.075)	1.137	0.395 (0.096) ***	1.484	0.066 (0.072)	1.068	0.081 (0.089)	1.084	0.195 (0.085) *	1.216
	Informal Social Control	0.014 (0.155)	1.014	-0.046 (0.212)	0.955	0.2 (0.13)	1.222	0.312 (0.197)	1.366	-0.023 (0.191)	0.977
	Community cohesion	0.307 (0.216)	1.360	0.098 (0.296)	1.103	-0.222 (0.182)	0.801	-0.53 (0.268) *	0.589	0.143 (0.272)	1.154
	Neighborhood Belonging	-0.127 (0.154)	0.881	0.097 (0.211)	1.102	-0.277 (0.138) *	0.758	0.155 (0.203)	1.168	-0.213 (0.191)	0.808
	$\Delta \chi^2 (4)$	6.597		20.906***		9.494*		5.613		6.649	
	Nagelkerke ΔR^2	0.009		0.044		0.012		0.011		0.012	
Total χ^2		223.226***		122.434***		225.442***		145.658***		154.237***	
Total R^2		0.339		0.272		0.315		0.302		0.3	

* p < .05. ** p < .01. *** p < .001. N = 901.

Table 4. Results of Hierarchical regression of the intention to use ICTs

	MIM group chats (n = 762)		Blogs (n = 713)		Websites (n = 612)		Facebook (n = 783)		Twitter (n = 801)	
	B (Beta)	S.E.	B (Beta)	S.E.	B (Beta)	S.E.	B (Beta)	S.E.	B (Beta)	S.E.
Block 1. controls										
Intercept	1.531***	0.182	1.619***	0.195	1.593***	0.222	1.758***	0.185	1.617***	0.174
Gender (female = 1)	-0.174 (-0.085) *	0.072	0.016 (0.172)	0.077	-0.008 (-0.003)	0.089	-0.142 (-0.069) *	0.072	-0.1 (-0.05)	0.069
Age	0.022 (0.235) ***	0.003	0.016 (0.046) ***	0.004	0.02 (0.197) ***	0.004	0.015 (0.156) ***	0.003	0.017 (0.188) ***	0.003
Education	-0.016 (-0.013)	0.042	0.055 (0.126)	0.045	0.062 (0.049)	0.052	-0.013 (-0.011)	0.043	-0.031 (-0.028)	0.040
Income	0.046 (0.103) **	0.016	0.056 (0.026) **	0.017	0.063 (0.132) **	0.020	0.048 (0.111) **	0.016	0.035 (0.083) *	0.015
Homeownership (own = 1)	0.106 (0.052)	0.074	0.053 (0)	0.079	0.012 (0.005)	0.091	0.212 (0.103) **	0.074	0.203 (0.102) **	0.071
ΔR^2	0.089***		0.059***		0.068***		0.066***		0.067***	
Block 2. TPB										
Attitude	0.608 (0.56) ***	0.033	0.614 (0.556) ***	0.037	0.649 (0.557) ***	0.042	0.640 (0.581) ***	0.033	0.617 (0.575) ***	0.032
Perceived behavioral control	-0.011 (-0.01)	0.028	0.010 (0.009)	0.034	-0.038 (-0.031)	0.038	-0.026 (-0.024)	0.029	0.034 (0.031)	0.028
Subjective norm	0.198 (0.162) ***	0.038	0.183 (0.136) ***	0.044	0.219 (0.153) ***	0.051	0.226 (0.169) ***	0.040	0.175 (0.138) ***	0.037
ΔR^2	0.407***		0.395***		0.399***		0.453***		0.423***	
Block 3. ICSN										
ICSN	0.082 (0.226) ***	0.010	0.081 (0.212) ***	0.012	0.106 (0.27) ***	0.012	0.057 (0.158) ***	0.010	0.068 (0.199) ***	0.009
ΔR^2	0.040***		0.036***		0.059***		0.020***		0.032***	
Block 4. Participation										
Community activity participation	-0.037 (-0.036)	0.028	0.021 (0.02)	0.032	0.003 (0.002)	0.036	-0.045 (-0.046)	0.028	-0.061 (-0.067) *	0.026
Informal social control	0.058 (0.046)	0.037	0.098 (0.076) *	0.041	0.115 (0.087) **	0.044	0.067 (0.053) .	0.037	0.068 (0.055) .	0.036
Cohesion	0.028 (0.017)	0.053	0.068 (0.042)	0.059	0.028 (0.016)	0.063	0.003 (0.002)	0.053	-0.003 (-0.002)	0.051
Belonging	0.082 (0.066) *	0.039	0.02 (0.016)	0.043	0.105 (0.081) *	0.046	0.103 (0.083) **	0.038	0.078 (0.065) *	0.037
ΔR^2	0.009**		0.010**		0.016***		0.011**		0.010**	
Total R^2	0.545***		0.501***		0.543***		0.549***		0.532***	

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4 (Continued)

	Online cafés (n = 707)		Smartphone Apps (n = 815)		Online news sites (n = 635)		Podcasts (n = 804)		Online video services (n = 791)	
	B (Beta)	S.E.	B (Beta)	S.E.	B (Beta)	S.E.	B (Beta)	S.E.	B (Beta)	S.E.
Block 1. Controls										
Intercept	1.353***	0.189	1.832***	0.193	1.421***	0.206	1.204***	0.169	1.058***	0.175
Gender (Female = 1)	−0.109 (−0.051)	0.077	−0.089 (−0.04)	0.077	−0.042 (−0.02)	0.082	−0.023 (−0.012)	0.067	−0.089 (−0.043)	0.069
Age	0.026 (0.272) ***	0.004	0.013 (0.125) ***	0.004	0.022 (0.225) ***	0.004	0.026 (0.279) ***	0.003	0.031 (0.324) ***	0.003
Education	−0.02 (−0.016)	0.045	0.084 (0.067) .	0.045	0.033 (0.027)	0.049	−0.062 (−0.055)	0.039	−0.018 (−0.015)	0.041
Income	0.054 (0.121) **	0.017	0.058 (0.124) ***	0.017	0.072 (0.161) ***	0.018	0.058 (0.138) ***	0.015	0.045 (0.101) **	0.015
Homeownership (own = 1)	0.169 (0.079) *	0.079	0.065 (0.029)	0.079	0.049 (0.023)	0.084	0.195 (0.098) **	0.068	0.215 (0.103) **	0.072
ΔR^2	0.117***		0.051***		0.092***		0.128***		0.150***	
Block 2. TPB										
Attitude	0.637 (0.561) ***	0.037	0.662 (0.602) ***	0.032	0.594 (0.542) ***	0.039	0.628 (0.588) ***	0.034	0.679 (0.615) ***	0.034
Perceived behavioral control	−0.037 (−0.032)	0.032	0.018 (0.016)	0.029	−0.009 (−0.008)	0.034	0.034 (0.032)	0.029	0.031 (0.027)	0.030
Subjective norm	0.185 (0.138) ***	0.043	0.227 (0.177) ***	0.037	0.182 (0.144) ***	0.045	0.028 (0.024)	0.038	0.046 (0.038)	0.037
ΔR^2	0.383***		0.509***		0.368***		0.355***		0.390***	
Block 3. ICSN										
ICSN	0.077 (0.203) ***	0.011	0.061 (0.164) ***	0.010	0.092 (0.243) ***	0.012	0.08 (0.239) ***	0.009	0.079 (0.222) ***	0.009
ΔR^2	0.035***		0.021***		0.049***		0.046***		0.039***	
Block 4. Participation										
Community activity participation	0.014 (0.014)	0.030	−0.031 (−0.032)	0.026	−0.056 (−0.056) .	0.034	0.007 (0.008)	0.025	−0.001 (−0.001)	0.025
Informal social control	0.109 (0.084) **	0.040	0.039 (0.029)	0.037	0.072 (0.056)	0.043	0.025 (0.021)	0.035	0.131 (0.104) ***	0.035
Cohesion	0.058 (0.035)	0.058	0.059 (0.035)	0.053	0.072 (0.045)	0.062	0.115 (0.076) *	0.051	0.056 (0.035)	0.050
Belonging	0.012 (0.01)	0.042	0.074 (0.055) .	0.038	0.040 (0.032)	0.046	0.034 (0.028)	0.037	0.040 (0.032)	0.036
ΔR^2	0.010**		0.007**		0.009*		0.008**		0.016***	
Total R^2	0.544***		0.588***		0.519***		0.537***		0.595***	

* $p < .05$, ** $p < .01$, *** $p < .001$.

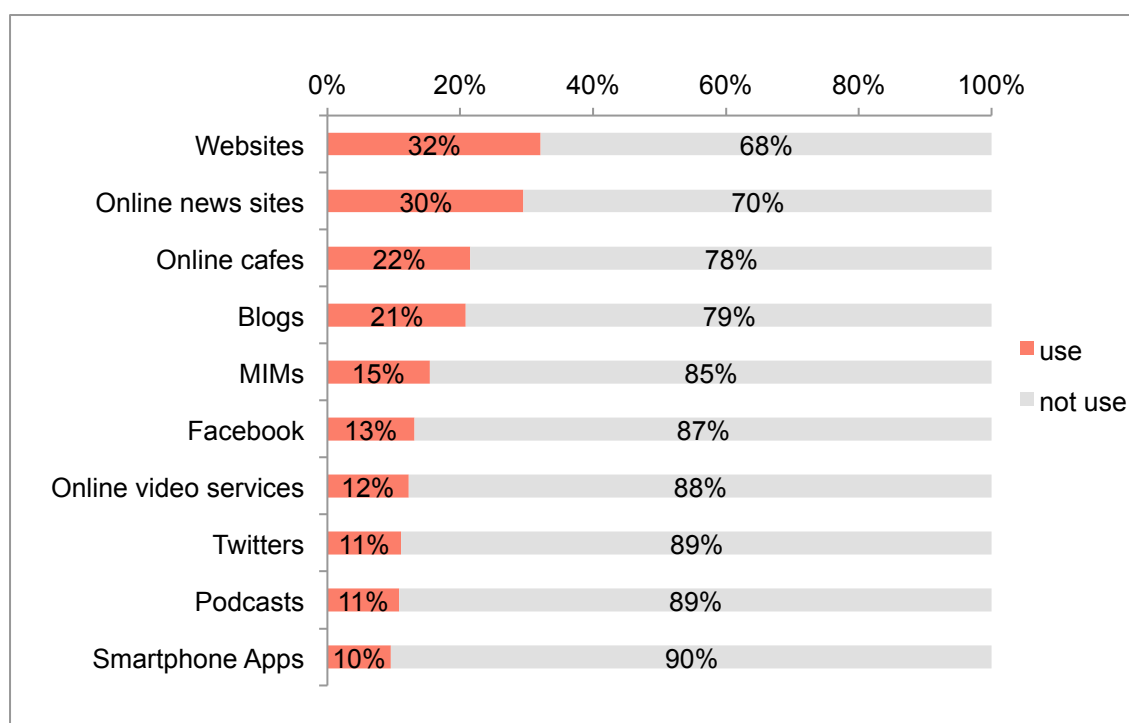


Figure 1. Percentage of respondents who have experience of localized ICT use

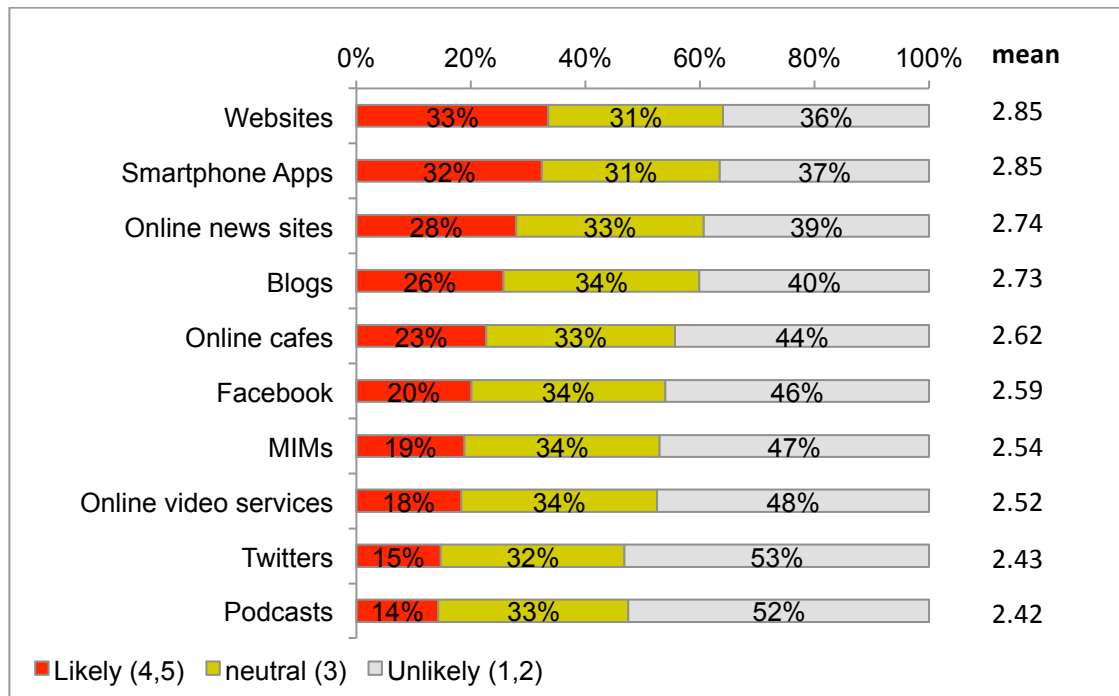


Figure 2. Percentage of respondents (non-ICT users) intending to adopt localized ICT use