

Research Article

What's It For? Expectations of Internet Value and Usefulness in Central Asia

Rebecca Walton

rebecca.walton@usu.edu
Assistant Professor
Department of English
Utah State University
3200 Old Main Hill
Logan, UT 84322-3200
USA

Judith Yaaqoubi

judithy@uw.edu
PhD Student
Dept. of Human Centered
Design & Engineering
University of Washington
423 Sieg Hall, Box 352315
Seattle, WA 98195-2315
USA

Beth Kolko

bkolko@uw.edu
Professor
Dept. of Human Centered
Design & Engineering
University of Washington
423 Sieg Hall, Box 352315
Seattle, WA 98195-2315
USA

Abstract

Research on Internet usage in developing regions typically focuses on user demographics or challenges to usage. However, few studies explore the needs and desires of users in developing regions—that is, what users want from the Internet—and even fewer connect those needs with the skills required to meet them. This article addresses that gap by exploring Central Asian Internet users' expectations of Internet utility and relating those expectations to usage patterns. We found that the users whose expectations were met were those who engaged in a diverse range of online activities. We also investigated the relationship between usage characteristics and diversity of online activities and concluded that frequent and occasional Internet users were equally likely to seek information online, but frequent users engaged in more diverse activities related to interaction with others, entertainment, and financial transactions.

Introduction

Internet usage has diffused globally at unequal rates, particularly in developed versus developing countries. Although Internet use is increasing worldwide, according to the International Telecommunication Union's (ITU) 2011 "Measuring the Information Society" report, only 21.1% of the population in the developing world uses the Internet, compared to 68.8% of the developed world's population. Concerns about the "digital divide"—the gap separating people who can and cannot access the Internet—were widespread in early Internet research (Anderson, Bikson, Law, & Mitchell, 1995; Bucy, 2000; Dickard, 2002). Since the early 2000s, scholars have explored Internet diffusion (Chinn & Fairlie, 2007; Guillen & Suarez, 2005) and usage, including usage within developing and transitioning regions (Chau, Cole, Massey, Montoya-Weiss, & O'Keefe, 2002; Chen, Amershi, Dhananjay, & Subramanian, 2010; Dwivedi, Khan, & Papazafeiropoulou, 2006; Islam & Islam, 2007; Johnson, Pejovic, Belding, & Stam, 2011; Mwesige, 2004; Pan, Wenjie, Jing, & Zheng, 2011; Ratan et al., 2009; Wyche, Smyth, Chetty, Aoki, & Grinter, 2010; Zhao, Lu, Huang, & Wang, 2010).

Much of this research describes user demographics or identifies challenges to usage. However, there is a dearth of research exploring the needs and desires of users in developing regions—that is, what users want from the Internet—and even less research identifies a connection between needs and the skills required to meet those needs. Internet research pioneers DiMaggio and Hargittai urged scholars to focus on how valued or desired outcomes relate to the usage of technologies (2001). Recent work by Pan et al. (2011) introduces a framework useful for doing

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just that—identifying relationships among users' desires, their capacity for technology usage, and their access to the necessary resources. This framework includes three categories of communication potentials: (1) utility expectancy (what people need and what they get or expect to get from using the Internet); (2) utilization capacity (skills relevant to using the Internet); and (3) access (access to the necessary equipment and resources). These categories serve as a useful structure for examining online behavior in resource-constrained environments, as they address challenges to Internet usage that are more common in developing versus developed contexts. For example, developing countries have lower Internet penetration (21.1%) than developed countries (68.8%), indicating that proportionally fewer people are familiar with the Internet. Because people unfamiliar with technologies are less likely to be able to envision how they would use those technologies (Maunder, Marsden, Gruijters, & Blake, 2007), their utility expectancy is likely to be problematically small. Pan et al.'s communication potentials also address utilization capacity, or people's ability to use the Internet to do what they want to do. Again, more limited technology skill sets are associated with users in developing regions versus developed regions (Ashcroft & Watts, 2005; Ratan et al., 2009; Walton, Putnam, Johnson, & Kolko, 2009). Finally, the communication potentials framework addresses Internet access, a significantly greater challenge in resource-constrained environments because of power outages, slow connections, usage costs as a higher proportion of total income, and lack of privacy in public computing environments such as Internet cafés.

This article explores the utility expectancies of Central Asian Internet users and relates those expectancies to usage characteristics with the end goal of supporting efforts to amplify communication potentials. This research comes from the Central Asia Information and Communication Technology (CAICT) project, a longitudinal study of information and communication technology (ICT) use in Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan. The CAICT project includes social surveys, interviews, ethnographic observation, policy monitoring, Web archiving, chat site analysis, focus groups, and design ethnography to investigate ICT adoption and adaptation patterns. The data informing this article primarily come from interviews with 21 Internet

users in Kyrgyzstan and survey responses from 474 Internet users from these four Central Asian nations. The first part of this article explores self-identified needs of Internet users, as well as their expectancies of and experiences with the Internet:

Research Question 1: What are the utility expectancies of Central Asian Internet users?

We used data from semistructured interviews with Internet users in Bishkek, Kyrgyzstan, to address research question 1. The Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan are often taken together as an analytical unit, so the qualitative data from Kyrgyzstan serve as a useful representation of the region, enabling a detailed exploration of regional Internet users' utility expectancies. Compared to quantitative methods, such as surveys, this methodology better enables research participants to direct the information they provide, allowing them to drive discussions of what they believe the Internet can do for them. It also avoids influencing participants by identifying or suggesting utility expectancies. Because this first research question is exploratory, the data collection method balances structure (i.e., empirical questions focusing on participants' use of the Internet and normative questions about who participants believe should or should not use the Internet) with flexibility (i.e., allowing participants to tell stories, give examples, and envision possibilities relevant to Internet usage).

Our second research question builds on question 1, relating utility expectancies and utilization capacity. The interview data, presented in the Results section, indicate that fulfilling Central Asian Internet users' utility expectancies would require diverse online activities: for example, conducting research for school, looking up local news, e-mailing or chatting with relatives, and playing online games. This finding—that fulfilling utility expectancies requires diverse online activities—has implications for utilization capacity, since online activities require corresponding technology skills. This raises questions about how usage characteristics may relate to the diversity of online activities (and, by implication, utilization capacity). For example, do people who are online more frequently engage in a greater diversity of activities? Do early adopters engage in a wider range of online activities compared to people who began using the Internet more recently? Do people

who are online for longer sessions engage in more diverse online activities? The second research question builds on the interview data by seeking trends across survey data from Central Asian Internet users:

Research Question 2: Does the diversity of users' online activities differ based on length of time since initial Internet adoption, frequency of Internet usage, or duration of individual Internet sessions?

The findings from research question 2 have implications for amplifying communication potentials through efforts to influence usage characteristics. These implications are discussed in the Conclusions.

Literature Review

Numerous studies since the late 1990s have explored Internet users (Hargittai & Shafer, 2006; Hoffman & Novak, 1998; Hoffman, Novak, & Schlosser, 2000; ITU, 2011; Ono & Zavodny, 2003) and online behavior (Chau et al., 2002; DiMaggio, Hargittai, Celeste, & Shafer, 2004; Emmanouilides & Hammond, 2000; Hargittai, 2010; Larose, Mastro, & Eastin, 2001). A growing body of literature describes Internet usage and online behavior in developing and transitioning regions, much of it focused on Africa (Johnson et al., 2011; Mwesige, 2004; Wyche et al., 2010), China (Pan et al., 2011; Zhao et al., 2010), and South Asia (Chen et al., 2010; Dwivedi et al., 2006; Islam & Islam, 2007; Ratan et al., 2009). Comparatively little has been published about Internet users in Central Asia (Kolko & Putnam, 2009; Walton et al., 2009).

Some studies identify challenges to use and the ways these challenges affect online activities. For example, Wyche et al. studied the constraints on ICT users in Nairobi, identifying how low bandwidth, limited locations for Internet access, and poor security limited the range and volume of their online activities (2010). Johnson et al. examined traffic and Internet usage in a wireless network in rural Zambia, finding that preventable problems (such as viruses and operating system updates during peak hours) constrained local users' online activities by causing lags in Web browsing and frequent failure of online chat (2011). Chen et al. observed Internet users on a university campus in Kerala, India, performing Web searches and browsing (2010). The challenges users encountered included long wait times while pages loaded, ineffective search queries, and

unavailability of automated assistance for queries caused by network lag (2010).

Other work has identified relationships among online activities and other factors. For example, Furuholt, Kristiansen, and Wahid compared users at an Internet café in Indonesia with users at an Internet café in Tanzania (2008). They found that frequency of Internet usage tends to increase with increased utilization capacity and that users with more Internet experience and users who get online more frequently are more likely to engage in "instrumental" use of the Internet (conducting research, reading news, and seeking information). Zhao et al. applied DiMaggio and Hargittai's (2001) framework of digital inequality to study Internet inequality and outcomes among high school students in China (2010). Regarding online activities, they found that "leisure" use (game playing, entertainment, surfing for fun, and online chat for nonstudy purposes) correlated positively with Internet self-efficacy, which in turn correlated with better academic performance (2010). Ratan et al. tracked the off-duty computer usage of service staff at an office facility in Bangalore, India, finding that computer novices' initial online activities focused primarily on entertainment (e.g., downloading music or videos) but later included e-mail and social networking (2009).

While this research addresses a significant gap by describing Internet usage in developing and transitioning regions, certain geographic regions, including Central Asia, are underrepresented, and the existing studies focus mainly on demographics and challenges to use. This article contributes a rich exploration of self-identified needs of Central Asian Internet users (i.e., their utility expectancies) to the existing literature. Meeting those needs requires a diverse range of online activities, which we further explore by testing the relation of usage characteristics (e.g., frequency of Internet use) to the diversity of users' online activities (e.g., using e-mail, looking for job information, and downloading music).

Methodology

We employed a mixed-methods approach to analyze interviews and survey data, which enabled us to collect rich pictures of utility expectancies while also seeking patterns of utilization capacity (as represented by diversity of online activities) across a large

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body of Internet users. Below we describe our methodology in detail.

Interviews

Twenty-one Internet users in Bishkek, Kyrgyzstan, participated in semistructured interviews conducted by members of the CAICT project in 2009, using a Russian-English interpreter who is a native of Bishkek. Two members of the CAICT project each typed notes during the interviews, later comparing the notes for validity. Most participants were recruited through convenience sampling in public locations, including Internet cafés, parks, and markets, to reach a diversity of participants. Other participants were recruited through snowball sampling using local contacts in Bishkek. Inclusion criteria included using the Internet at least occasionally, being at least 15 years old, and living in Kyrgyzstan. Interviews focused on how participants use the Internet (i.e., empirical questions) as well as their views of who *does* and *should* use the Internet to do what (i.e., normative questions).

The interview sample was gender balanced, with 11 males and 10 females. Interviewees ranged from 17 to 54 years old; the average age was 28. Most interviewees were ethnic Kyrgyz (17), three were ethnically Russian, and one was Tatar. One third of the interviewees were currently students, and the others had completed some form of higher education. Seventeen of the 21 interviewees lived in Bishkek, but 12 were originally from outside of Bishkek. Though interviews were conducted solely in Bishkek, an urban area, many interviewees shared both urban and rural perspectives, having lived in a rural area or having close ties with rural relatives. Although Kyrgyz is the predominant spoken language in rural Kyrgyzstan, Russian is the predominant language in Bishkek, and all interviewees spoke fluent Russian.

Interviews were iteratively coded by the first author, identifying themes across the interviews regarding (1) how participants defined or described the Internet; (2) online activities in which participants engaged; and (3) potential uses of the Internet, whether for the participants themselves or for members of their social networks. Each of these themes was secondarily coded for four categories of online activities: interaction with others, information seeking, financial transactions, and entertainment.

Survey

Data for the statistical analysis of usage characteristics and diversity of online activities come from a broad social survey on patterns of ICT adoption and adaptation in Central Asia. The survey was administered in 2008 to 4,000 respondents: 1,000 respondents per country in Kyrgyzstan, Kazakhstan, Uzbekistan, and Tajikistan. The survey sample was based on government census information on age, gender, ethnicity, and geographic location (Table 1). Survey demographics were comparable in urbanization, sex, and ethnicity. Median ages as shown in Table 1 differ because the population data are based on total population age from birth, whereas the survey targeted respondents aged 15 and older, thus raising the median age for survey respondents.

The survey instrument was designed by researchers from the University of Washington. The survey, containing over 300 variables, was administered by the BRIF Research Group of Kazakhstan. Households were selected by a random walk procedure to capture a random sampling of households. One respondent was surveyed in each selected household. Respondents were chosen by the Kish grid method, a technique used to ensure a random selection of household members. Surveys were conducted in person. No other household member was present, and strict confidentiality was guaranteed. Several steps were taken to guarantee high data quality: (1) approximately 30% of the surveys were checked through a return visit, (2) researchers were trained through workshops and pretesting, and (3) logical inconsistencies were double-checked against the original paper questionnaires and eliminated if necessary.

We identified Internet users through a positive response to the question "Do you use the Internet, at least on an occasional basis?" Affirmative answers were given by 474 survey respondents: 126 in Kyrgyzstan (12.6% of survey respondents), 185 in Kazakhstan (18.5% of survey respondents), 95 in Tajikistan (9.5% of survey respondents), and 68 in Uzbekistan (6.8% of survey respondents). The percentages of Internet users within the total survey populations are comparable to the percentages of Internet users within the national populations—Kyrgyzstan 15.7%, Kazakhstan 11.0%, Tajikistan 8.8%, Uzbekistan 9.0% (ITU, 2008)—and confirm the generalizability of our data set.

Seven analyses of variance (ANOVAs) were run to

Table 1. Survey and Population Demographics.

		Kazakhstan	Kyrgyzstan	Uzbekistan	Tajikistan
Urbanization	Population*	59% urban 41% rural	35% urban 65% rural	36% urban 64% rural	26% urban 74% rural
	Survey	56% urban 44% rural	40% urban 60% rural	36% urban 64% rural	27% urban 73% rural
Median age	Population	30.2 years	25 years	25.7 years	22.6 years
	Survey	38 years	38 years	36 years	35 years
Sex**	Population	47.4% male, 52.6% female	48.2% male, 51.8% female	49.2% male, 50.8% female	49.2% male, 50.8% female
	Survey	45.2% male, 54.8% female	45.2% male, 54.8% female	41.2% male, 58.8% female	48% male, 52% female
Ethnicity	Population	Kazakh 63.1%, Russian 23.7%, Uzbek 2.8%, Ukrainian 2.1%, Uighur 1.4%, Tatar 1.3%, German 1.1%, other 4.5% (2009 census)	Kyrgyz 64.9%, Uzbek 13.8%, Russian 12.5%, Dungan 1.1%, Ukrainian 1.0%, Uighur 1.0%, other 5.7% (1999 census)	Uzbek 80%, Russian 5.5%, Tajik 5%, Kazakh 3%, Karakalpak 2.5%, Tatar 1.5%, other 2.5% (1996 est.)	Tajik 79.9%, Uzbek 15.3%, Russian 1.1%, Kyrgyz 1.1%, other 2.6% (2000 census)
	Survey	Kazakh 44.4%, Russian 39.9%, Ukrainian 3.9%, Tatar 3.0%, Uzbek 2.8%, German 1.1%, Uighur 1.0%, other 3.9%	Kyrgyz 64.7%, Russian 15.9%, Uzbek 9.7%, Tatar 1.8%, Ukrainian 1.4%, Uighur 1.2%, other 5.3%	Uzbek 78.6%, Tajik 6.3%, Kazakh 4.6%, Russian 3.4%, Karakalpak 2.6%, Tatar 1.8%, other 2.7%	Tajik 83.5%, Uzbek 15.1%, Russian 1.4%

*Population data from CIA World Factbook (<https://www.cia.gov/library/publications/the-world-factbook/index.html>).

**Sex represented for ages 15 and older.

assess the effect of frequency and length of Internet use and the duration of the latest Internet session on four dependent measures which represent a spectrum of online activity.

Independent Variables

Survey questions about the frequency of Internet use, length of Internet use, and duration of the most recent Internet session were selected as independent variables to differentiate users (Table 2). We created nominal categories based on the answers to these survey questions.

Frequency of Internet use was determined by analyzing answers to the survey question "How often do you use the Internet?" Possible answers included "Several times a day," "About once a day," "3–5 days a week," "1–2 days a week," "Every few weeks," and "Less often." Using a median split,

respondents were bifurcated into occasional users (2 or fewer days per week) and frequent users (3 or more days per week). Respondents who did not respond ($N = 8$) were excluded. The groups were somewhat evenly distributed: 227 occasional users and 239 frequent users.

Length of Internet use was measured by the months respondents reported having used the Internet. A median split was used to determine the groups. Short-term users ($N = 228$) had used the Internet for 19 months or less, and long-term users ($N = 244$) had used the Internet for 20 months or longer. Two respondents did not answer and were excluded from analysis.

Duration of Internet session was determined by analyzing responses to the question "Thinking about the last time you used the Internet, about how

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Table 2. Independent Variables.

Length of time since Internet adoption		Frequency of Internet use		Duration of latest Internet session		
Short-time user	Long-time user	Occasional user	Frequent user	Less than an hour	About an hour	More than an hour
Internet use for 19 months or shorter	Internet use for 20 months or longer	2 or fewer days per week	3 or more days per week			

Table 3. Dependent Variables.

Interaction with others	Information seeking	Entertainment	Financial transactions
Do you use e-mail?	Do you ever get news?	Do you ever watch video clips on the Internet?	Do you ever buy a product online?
Do you ever send instant messages?	Do you ever research for school or job training?	Do you ever browse the Internet just for fun?	Do you ever do banking online?
Do you ever take part in a chat room?	Do you ever seek information about a job?	Do you ever listen to or download music from the Internet?	Do you ever participate in online auctions?
Do you use a Webcam?	Have you ever used the Internet to get news or information about politics or elections?		

much time did you spend online?" Possible answers were "Four or more hours," "Three to less than four hours," "Two to less than three hours," "More than one but less than two hours," "About an hour," "30 minutes to less than one hour," and "A half-hour or less." Because slightly more than one-third of the survey respondents selected the response "About an hour," responses did not naturally group according to a median split. Therefore, respondents were grouped as follows: (1) less than an hour (*N* = 167); (2) about an hour (*N* = 159); and (3) more than an hour (*N* = 116). Thirty-two respondents did not answer this question.

Dependent Variables

To determine the relation of independent variables to diversity of Internet use, we created four dependent variables from 14 survey questions (Table 3). Questions were grouped into four constructs: information seeking, interaction with others, entertainment, and financial transactions. One point was given per affirmative answer to each question, creating an interval variable ranging from 0 to 4 for interaction with others and information seeking, and 0 to 3 for entertainment and financial transactions.

If an ANOVA led to a significant main effect, *Chi*-square tests were used to further analyze dependent measures. A Bonferroni adjustment was made.

Results

The results of our study are organized by research question. The first section describes utility expectancies of Central Asian Internet users, and the second section presents findings related to the effects from length of Internet use, frequency of Internet use, and duration of individual sessions on the diversity of online activities.

Utility Expectancies

Our first research question explored utility expectancies—what people expect to use the Internet to do. One finding regarding Central Asian Internet users' utility expectancies is that fulfilling their expectancies requires diverse online activities and, therefore, a relatively broad utilization capacity. The most frequently mentioned activities relevant to user needs were information seeking and interaction with others, though entertainment and financial transactions were also mentioned. To identify patterns relevant to utility expectancies, the interview

Table 4. Occurrences of Utility Expectancy Themes.

Type of Online Activity	Contextual Categories			Total Occurrences (across all contextual categories)
	Describing the Internet (normative)	Describing potential uses of the Internet (normative)	Describing their own use of the Internet (empirical)	
Information seeking	20 occurrences (13 interviewees)	46 occurrences (19 interviewees)	95 occurrences (21 interviewees)	161 occurrences (21 interviewees)
Interaction with others	8 occurrences (6 interviewees)	29 occurrences (17 interviewees)	81 occurrences (20 interviewees)	118 occurrences (21 interviewees)
Entertainment	2 occurrences (2 interviewees)	19 occurrences (11 interviewees)	32 occurrences (16 interviewees)	53 occurrences (20 interviewees)
Financial transactions	2 occurrences (2 interviewees)	11 occurrences (4 interviewees)	7 occurrences (6 interviewees)	20 occurrences (10 interviewees)

data were coded first by three broad contextual categories: how interviewees would describe the Internet to a friend or family member, potential uses of the Internet relevant to the needs of interviewees or members of their social networks, and interviewees' own online activities. The data in these categories were then coded for four types of online activities: (1) information seeking, (2) interaction with others, (3) entertainment, and (4) financial transactions. If interviewees mentioned an online activity only as something in which they did not engage (e.g., "I don't buy things online"), the response was not counted because the coding identified utility expectancies (i.e., needs or expectations *relevant to participants*). Looking at the online activities across the three contextual categories, every interviewee ($N = 21$) mentioned information-seeking and communication, while every interviewee except one ($N = 20$) mentioned entertainment. These three categories of online activities, then, appear to be central to fulfilling utility expectancies. Ten interviewees described financial transactions as an online activity relevant to themselves or to members of their social networks. (Three interviewees mentioned online financial transactions only in saying they did not engage in them, and eight interviewees did not mention financial transactions at all.) The number of occurrences is presented in Table 4, broken down by type of online activity and contextual category.

As shown in Table 4, information seeking was the most commonly mentioned utility expectancy, whether interviewees were describing what the Internet is, how people do or should use the

Internet, or their own online activities. Interaction with others was the second most common type of activity in every contextual category, with entertainment consistently third and financial transactions mentioned least often. This finding suggests the importance of online information seeking and interaction with others. Interviewees described a range of specific activities and contexts for both information seeking and interaction with others. For example, several interviewees described how information seeking could benefit people in their work. One interviewee said that his friend, a rural potato farmer, could look up information online, or he could use the Internet to send the friend information about how to benefit his business and collect his yield. Another interviewee described potential benefits of Internet usage for his nephew: "He works in a money exchange office, and it would be useful for him to know updated information about exchange rates every day." Another interviewee worked for a nongovernmental organization whose mission was supported by distributing information posted to an online hub. Because few of the organization's stakeholders had Internet access, the interviewee printed information and presented it in face-to-face meetings. In addition, interviewees described seeking information about available jobs or researching companies with job openings. Fourteen interviewees mentioned the importance of information-seeking for school studies, some explaining that they had helped students find information online and some reporting that people they knew had purchased research papers online: "My sister is a high school student. She frequently uses the Internet for

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school papers to cheat . . . but anyway you are searching for information so you also contribute.”

Interviewees also sought information useful in their home lives and researched topics of personal interest. For example, two interviewees regularly looked up recipes and information about child rearing, and two others searched for travel information. Another interviewee researched medicinal herbs and shared the information with friends, particularly older people who lived in a village without Internet access. News, especially local news, was another popular focus of information seeking, with nine interviewees saying they got news information online, both for themselves and for others. For example, one user read the news online and brought home printouts for his grandmother: “The most amazing [thing] is that even my grandmother asks me to use the Internet to find things for her. . . . [She] asks for political news, only political news.” Interviewees indicated that getting news online gave them something interesting to talk about with others and enhanced their image:

- People who come from the villages, you ask them about politics, and they have no idea. They have a lack of information. If they just looked it up on google.kg, they would have more information; they could talk about it. Otherwise, there is nothing to talk about interesting with these people.
- People like my classmate, he uses [the Internet] even more often than me. He is better than me in all things; he is always funny, and he knows all the news.
- If you tell them [people from her village] something you learned from Internet, they believe it and are impressed that I can use Internet.
- We regularly visit our local forum, and we find out much more information and more truthful information than the news because all channels and radio are state-owned, and from the Internet it's not controlled by them; you can get more information online.

One of the most commonly identified needs met by the Internet was to find information more quickly and easily than through other resources:

- What happens in the country, it is in the Internet in a few seconds; in TV it is two or three days.

- In books there is a lot of needless information and in the Internet if you search for specific information, you get it. You get specific information, the one you want.
- In the university, you have a lot of tasks and have to find information, and it's easy to find information on the Internet; it is harder in the library.
- Before I was familiar [with the Internet] I would search in books, but it was time-consuming and is more effort compared to Internet.

Interviewees also mentioned a range of activities involving interaction with others online. Not surprisingly, the most common method of interacting online was e-mail—mentioned by 14 interviewees. Several interviewees used e-mail—a form of long-distance communication much more affordable than phone calls—to stay in contact with friends and relatives living abroad. E-mail also fulfilled the need to easily share information others might find interesting or useful. Participating in online chat (nine interviewees) and forums (eight interviewees) was another popular activity meeting communication needs. Forums, in particular, met needs for local news, whether political news or news of local happenings like sporting events. Chat was identified as a way to engage with friends, avoid working, and learn about life in faraway places:

I use [chat] to communicate with people from other countries, and it is interesting. You can do search and then chat with people. I chatted recently with someone from New Zealand and from U.S., Russian speakers. It is interesting what kind of lifestyle they have.

Although occurrences of the entertainment theme were less frequent overall than occurrences of interaction with others or information seeking, all interviewees but one mentioned entertainment such as surfing the Web for fun, playing games, and downloading music. This frequency suggests that entertainment is a widespread utility expectancy even while it does not dominate online activity. In addition, much of the communication facilitated by chat met entertainment needs, as did some e-mail communication, further suggesting that entertainment is a widespread utility expectancy. In the same way that information seeking and interaction with others included a range of specific activities, enter-

tainment activities covered a broad spectrum. Activities meeting a need for entertainment included playing games (four interviewees) and downloading content such as music (three interviewees), movies (two interviewees), and books (three interviewees). Eight interviewees referenced entertainment more broadly, saying, for example, that people use the Internet for entertainment, for fun, or for passing time when bored.

Finally, 10 interviewees mentioned online financial transactions as relevant to their needs or the needs of people in their social networks. Certain activities focused on meeting business needs, such as finding a larger market of potential buyers or suppliers:

There are many people like this, like people involved in business. They have good business, but if they use Internet, it would be better. In the U.S. they sell online; why not here? In China I know people who find out where to get goods through the Internet. They can contact and order through Internet. There is one woman who sells T-shirts; she has a computer connected to the Internet, and she knows where goods come from.

Three interviewees mentioned online banking, though none of the interviewees had engaged in online banking themselves. Other interviewees referenced online purchases, including books, a car, a laptop, perfume, and school papers: "On the Internet, everything is ready; you just pay for it." Several interviewees said that delivery of online purchases was a challenge to their financial transactions. One interviewee had mitigated this challenge by purchasing items online and having them delivered to a relative in the U.S., who brought the items in her suitcase on her next visit.

In summary, the qualitative inquiry found that meeting the utility expectancies of Central Asian Internet users required a broad utilization capacity (i.e., engaging in a diversity of online activities). Information seeking was the most common type of activity, and the skills required for information seeking included the use of search engines and online forums. Interaction with others was another frequently mentioned type of online activity, with e-mail, chat, and forums meeting different types of needs. Interviewees described online entertainment in both broad and specific terms, with users downloading different types of content, playing games,

and surfing the Internet for fun. Financial transactions, though the least commonly mentioned group of activities, were described by almost half of the interviewees (10 out of 21). These activities included banking, purchasing, and selling online, activities that would meet a range of needs, such as easily checking one's account balance or accessing items unavailable at local stores. The next section builds on the finding that meeting utility expectancies requires diverse online activities by seeking patterns across a large pool of survey data on Internet users in four Central Asian nations. Statistical tests evaluated whether three Internet usage characteristics correlated with a diversity of online activities.

Diverse Online Activities

While other research has found that technological experience is a predictor for more diverse Internet usage (Furuholt, Kristiansen, & Wahid, 2008; Hargittai & Hinnant, 2008), our analysis of Central Asian users only partially correlated with this finding. We compared the diversity of online activities for users grouped by frequency of Internet use, length of Internet use, and duration of most recent Internet session. The ANOVAs yielded statistically significant differences between users based on frequency of use at the alpha level of 0.05 for the following types of activities: interaction with others, entertainment, and financial transactions (Table 5). Significant differences in the diversity of Internet use between long-term and short-term users were identified in the category "interaction with others." Significant differences in the diversity of use were identified in the categories "interaction with others" and "information seeking" among two of the three duration groups: those whose latest Internet session was more than an hour, and those who were online for less than an hour. The interaction effect was significant only for the combination of frequency of use/length of use and duration of use in the category "interaction with others."

Length of Use

While Furuholt, Kristiansen, and Wahid's study found increased Internet experience to be a significant predictor for "instrumental" use of the Internet, such as conducting research, for users in Indonesia and Tanzania (2008), this does not seem to be the case in Central Asia. No significant difference was found between short-term Internet users (those who started using the Internet within

Table 5. ANOVA Results for Online Activity Constructs.

DVs		IVs			
	Information seeking	Interaction with others	Entertainment	Financial Transactions	
Frequency of Internet use	$F_{(1,415)} = 2.83, p > 0.05$	$F_{(1,412)} = 26.27, p < 0.001$	$F_{(1,425)} = 4.64, p < 0.05$	$F_{(1,423)} = 13.90, p < 0.001$	
	Occasional users $N=204$ $M=2.24$ $SD=0.08$	Occasional users $N=202$ $M=1.15$ $SD=0.08$	Occasional users $N=210$ $M=1.52$ $SD=0.08$	Occasional users $N=210$ $M=.09$ $SD=0.04$	Frequent users $N=225$ $M=.27$ $SD=0.03$
Length of time since Internet adoption	$F_{(1,415)} = 1.67, p > 0.05$	$F_{(1,412)} = 4.04, p < .05$	$F_{(1,425)} = 0.07, p > 0.05$	$F_{(1,423)} = 0.37, p > 0.05$	
	Short-term users $N=209$ $M=2.26$ $SD=0.08$	Short-term users $N=209$ $M=1.31$ $SD=0.07$	Short-term users $N=213$ $M=1.61$ $SD=0.07$	Short-term users $N=212$ $M=.16$ $SD=0.04$	Long-term users $N=223$ $M=.19$ $SD=0.03$
Duration of Internet session	$F_{(2,415)} = 2.68, p > 0.05$	$F_{(2,412)} = 2.51, p > 0.05$	$F_{(2,425)} = 1.71, p > 0.05$	$F_{(2,423)} = 1.57, p > 0.05$	
	Less than 1 hour $N=160$ $M=2.25$ $SD=0.08$	Less than 1 hour $N=159$ $M=1.36$ $SD=0.08$	Less than 1 hour $N=166$ $M=1.51$ $SD=0.08$	Less than 1 hour $N=165$ $M=0.24$ $SD=0.04$	More than an hour $N=114$ $M=0.14$ $SD=0.05$
	More than 1 hour $N=152$ $M=2.23$ $SD=0.09$	More than an hour $N=151$ $M=1.30$ $SD=0.09$	More than an hour $N=156$ $M=1.61$ $SD=0.09$	More than an hour $N=156$ $M=0.16$ $SD=0.04$	

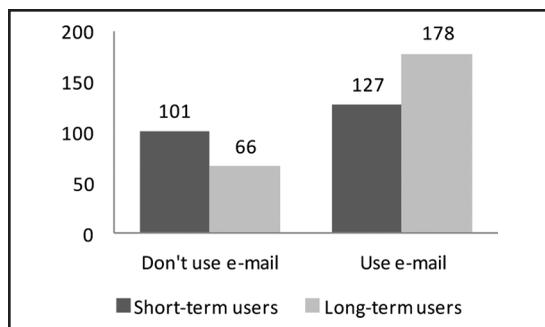


Figure 1. Short-term and long-term users' use of e-mail.

19 months of the survey) and long-term Internet users in the categories of information seeking, entertainment, and financial transactions. Interestingly, these long-term users ($M = 1.52$, $SD = 0.07$) and short-term users ($M = 1.31$, $SD = 0.07$) did differ significantly in how diversely they interacted with others online ($F_{(1,412)} = 4.04$, $p < 0.05$).

To better understand the finding that long-term and short-term users differed in their diversity of online activities in the category "interaction with others," we conducted *Chi-square* tests of independence at the question level with an adjusted alpha level of 0.0125. Long-term users differed significantly from short-term users in use of e-mail: $\chi^2_{(1,472)} = 15.34$, $p < 0.001$ (Figure 1).

Chi-square tests of independence for all other questions in this construct did not show a significant difference: "Do you ever send instant messages?" $\chi^2_{(1,462)} = 5.35$, $p > 0.0125$; "Do you ever take part in a chat room?" $\chi^2_{(1,469)} = 0.64$, $p > 0.05$; "Do you ever use Webcam chat?" $\chi^2_{(1,468)} = 4.85$, $p > 0.0125$.

Duration of Sessions

We explored the relationship between diversity of online activities and the duration of Internet sessions. We expected that users who were online for longer periods at a time would engage in a greater diversity of online activities than those online for briefer periods, but the data did not confirm this expectation. Our analysis of variance showed nonsignificant relations in all four categories: interaction with others, information seeking, entertainment, and financial transactions.

One explanation may lie in the slow Internet con-

nection speed common in Central Asia. In 2008, broadband access comprised less than 5% of all Internet connections in Kazakhstan, 0.06% in Kyrgyzstan, 0.24% in Uzbekistan, and 0.05% in Tajikistan (ITU, 2008). Kolko and Putnam (2009) describe how using a Webmail application can be "an exercise in patience" (p. 6) due to slow access speeds in Central Asia. As described by Chen et al. (2010), slow connection speeds impede other online activities as well, as Web pages can take a long time to load. The fact that users engaged in a similar range of activities regardless of the length of their last Internet session leads us to suggest further research to explore the possibility that connection speed is a primary reason for the consistent level of diversity in online activities. Another possibility regarding the comparable range of activities regardless of duration is that these users may share a similar utilization capacity. If users were not found to significantly differ in their range of skills when grouped by duration of Internet session, it suggests at least one reason why users engage in a similar range of activities: Their skill level may not permit a wider range of activities. This possibility suggests another interesting area for future research.

Frequency of Use

Frequent and occasional Internet users differed significantly in the diversity of their online activities in three categories: interaction with others, entertainment, and financial transactions. Surprisingly, no significant difference was found between frequent and occasional users in the category of information seeking. Figure 2 shows the distribution of the mean scores for each category.

Chi-square tests of independence at the question level (with an adjusted alpha level of 0.004) indicated that frequent users were significantly more likely than occasional users to engage in the following activities: **e-mail** $\chi^2_{(1,466)} = 41.46$, $p < 0.001$; **instant messaging** $\chi^2_{(1,456)} = 23.00$, $p < 0.001$; **browsing the Internet for fun** $\chi^2_{(1,463)} = 13.31$, $p < 0.001$; **buying products online** $\chi^2_{(1,465)} = 9.94$, $p < 0.004$; **banking online** $\chi^2_{(1,463)} = 10.82$, $p < 0.004$; and **participating in online auctions** $\chi^2_{(1,464)} = 10.56$, $p < 0.004$. Interestingly, occasional and frequent users displayed no differences in the following activities: using a Webcam $\chi^2_{(1,462)} = 2.57$, $p > 0.05$; participating in chat rooms

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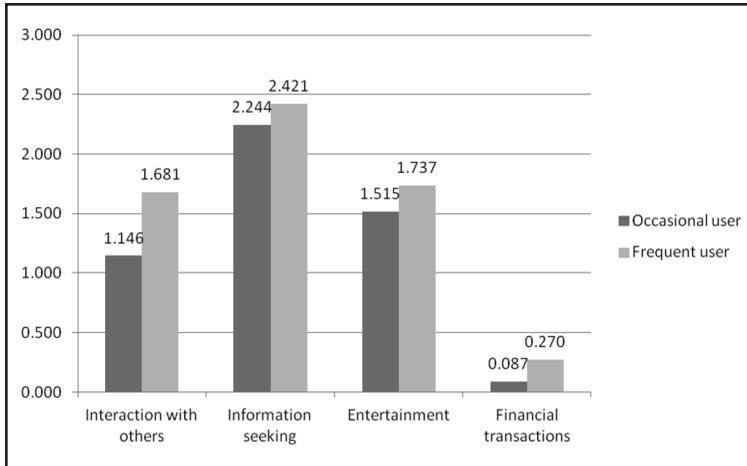


Figure 2. Mean Values for Occasional and Frequent Users.

$\chi^2_{(1, 463)} = 6.40, p > 0.004$; getting news $\chi^2_{(1, 458)} = 5.23, p > 0.004$; research for school or job training $\chi^2_{(1, 464)} = 0.47, p > 0.05$; seeking information about a job $\chi^2_{(1, 464)} = 2.46, p > 0.05$; getting information about politics or elections $\chi^2_{(1, 463)} = 4.43, p > 0.004$; watching video clips $\chi^2_{(1, 465)} = 0.98, p > 0.05$; and downloading or listening to music $\chi^2_{(1, 465)} = 3.06, p > 0.05$.

These results suggest that the latter activities are either necessary or very popular, for they are pursued regardless of restrictions in the technological environment. For example, the finding that occasional and frequent Internet users seek information about politics, conduct work- or school-related research, or seek job information implies the Internet's high value for information-seeking activities, which correlates with findings from the interview data. It also shows that downloading and listening to music, watching video clips, and participating in chat rooms are highly popular activities among both occasional and frequent Internet users in Central Asia.

Other online activities are more likely to be associated with frequent Internet users for several reasons. For example, several of these activities require skills beyond using a search engine (e.g., instant messaging) or are associated with a registration process (e.g., e-mailing, buying a product, banking, participating in an online auction) which is more technically complicated and requires users to engage in some level of identity authentication. Frequent

users are more likely to use e-mail and instant messaging to interact with others. Like long-term users, frequent users seem more likely to have contacts in their social networks who are also online. Communication is a two-way process that is often time-sensitive, and frequent users are more likely than occasional users to be accessible for prompt online communication. Central Asian Internet users are likely to teach people in their social networks how to use the Internet, a finding that suggests at least some of the people they contact through online media can be and have previously

been contacted through other means. Thus, occasional Internet users may not perceive a need to use the Internet for interaction purposes, since they can use other communication methods to contact people in their social networks.

Another online activity that is more common among frequent Internet users is browsing the Internet for fun. This finding suggests that while occasional users are likely to access the Internet to achieve specific purposes, such as seeking a particular type of information, they are less likely to use the Internet for exploratory or undirected activities. Much like the finding above, this suggests that if users can equally effectively pursue an activity offline (such as interacting with people or having fun), then frequent Internet users are more likely than occasional users to pursue online methods. Further supporting this interpretation is the finding that frequent users are more likely than occasional users to engage in online banking, another activity that can just as effectively be done offline. This finding should be accepted with caution: a very small proportion of Central Asian Internet users engage in online banking, so the sample size was small ($N = 30$). However, it does contribute another piece of data to the pattern established by findings related to interaction with others and entertainment.

Differences in the diversity of online activities also relate to location of Internet use, an aspect of Pan et al.'s third communication potential: access. A fre-

Table 6. Locations of Internet Access for Frequent and Occasional Users.

Where do you access the Internet?*	Occasional users	Frequent users
Home	56	128
Work	62	116
Computer club or Internet café	113	71
School	30	18
Friend's home	25	13
Relative's home	11	4

* Multiple selections possible.

Table 7. Most Common Location of Internet Access for Frequent and Occasional Users.

Where do you use the Internet most often?	Occasional users	Frequent users
Home	5	28
Work	6	14
Computer club or Internet café	15	9
School	16	5
Friend's home	5	14
Relative's home	5	12

quency analysis of frequent and occasional users' access locations indicates that frequent users are most likely to access the Internet from home and work. Occasional users are most likely to access the Internet from an Internet café (Tables 6 and 7). These data suggest that ease and cost of access are important factors affecting the diversity of Internet usage. People who have easier access through their work or home go online more frequently and use the Internet more diversely to interact with others, seek entertainment, and conduct financial transactions. This information correlates with research by Howard, Rainie, and Jones showing that in the early 2000s, frequency of Internet use from home was a significant predictor of online activities for users in the United States (2001).

Privacy is an important concern in certain online activities, such as financial transactions and interacting with others. Thus, lack of privacy when accessing the Internet from a public location could contribute to the differences in usage between frequent and occasional users. The results of *Chi*-square tests support this suggestion: Activities that require privacy, such as online banking, e-mail, and instant messaging, are significantly more likely to be

performed by frequent users, who are more likely to access the Internet from private locations.

Interaction

In addition to the main effects of length, frequency, and duration of Internet use, we examined interactions. We sought to identify whether combinations of these factors significantly affected the diversity of users' online activities. The ANOVAs assessed the following combinations: (1) frequency and length of use, (2) frequency of use and duration of Internet session, (3) length of use and duration of Internet session, and (4) all three factors. We found only one significant interaction: a three-way interaction for the diversity of online activities related to interaction with others ($F_{(2, 412)} = 4.67, p = 0.01$). We find this result intriguing and would like to conduct future work to better understand how Internet experience—including the independent variables in this article as well as other factors, such as location and connection speed—affect online activities.

Conclusions

Although much of the recent literature in information and communication technology for develop-

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ment (ICTD) is centered on mobile phone use, the Internet remains a vital area of focus. According to the ITU's most recent report on worldwide ICT usage, "The ICT for development debate is witnessing an obvious shift: The focus is no longer on the mobile-cellular miracle, but on the need for high-speed broadband Internet access" (ITU, 2011, p. iii). As high-speed Internet access gains prominence in ICTD, it is increasingly important to understand what users want to do with that high-speed access (if they get access to it), regardless of the platform they use. This study found that Internet users in Central Asia have a broad range of self-identified needs (i.e., utility expectancies), and that meeting them would require a correspondingly diverse range of online activities (i.e., utilization capacity). Among these online activities, information seeking is most prominent, closely followed by interaction with others. Entertainment and financial transactions are also common utility expectancies. Each of these types of online activities includes several specific behaviors requiring particular online skills and meeting certain needs of users.

In relating the diversity of online activities to Internet usage characteristics, we found that frequency of Internet access has the most significant effects, and the length of time that users have been going online has no significant effects on diversity of activities. This is encouraging news, as it suggests that people new to Internet usage and more experienced users are equally likely to develop the utilization capacity to fulfill their utility expectancies. It also suggests that efforts to amplify people's communication potentials should not focus exclusively on people who are relatively new users. Instead, it may be more fruitful to focus on frequency of use. Frequent and occasional Internet users were equally likely to use the Internet to seek information, but frequent users engaged in more diverse activities involving interaction with others, entertainment, and financial transactions—a finding with several interesting implications. It suggests, for example, that occasional users are more narrowly focused and intentional in their online activities and less likely to explore. Further, it suggests that if occasional users believe they can perform an activity offline equally well, they are unlikely to perform that activity online. Finally, it identifies the value of online activities that offer a wide range of benefits and require

only a narrow, simple skill set—for example, seeking any type of information using a search engine. This article has also shown the significant effect of Internet access from work or home: Central Asian Internet users with access from work or home were online more often and used the Internet more diversely to interact with others, seek entertainment, and conduct financial transactions. This finding has implications for efforts to amplify communication potentials: Because it is associated with frequent and more diverse Internet use, private access may be an important consideration in interventions aiming to increase people's utilization capacity.

This article additionally suggests some interesting avenues for future work, including an exploration of why people who are more likely to access the Internet from home or work engage in more diverse financial transactions. Is it because they are more likely to be affluent and are therefore more likely to have the bank account and credit card that people need to engage in most online financial transactions? Is it because they believe their home or work connection to be more secure than public locations like Internet cafés or shared locations like a friend's home? Future work could also investigate how frequent users learned to perform the diverse range of online activities in which they engage, and what triggers an occasional user to become a frequent one. To amplify other users' communication potentials, future research should investigate the resources and strategies that have enabled frequent users to develop the skills to meet their own online goals. ■

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