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EDITORIAL

There is no question that information and communication technologies (ICTs) have transformed the way we live and work. Computers, mobile phones and, now, smart phones, have connected users to information as and when needed for business, education and leisure. Such transformational ability should, at least in theory, be powerful enough to eradicate extreme poverty, deliver quality universal education, enable gender empowerment, and improve health (United Nations, 2005), potentialities that gave rise to the ICT for development (ICTD) field. And indeed, they have. There are accounts of mobile phones, for example, saving their users money they would have to spend on transport and on income otherwise appropriated by intermediaries (Jensen, 2007). Yet, perhaps surprisingly, instead of rigorous scientific evidence that ICTs have indeed transformed the lives of the poor in radical and innovative ways, more often than not, ICT projects have ended in what development scholar Heeks has described as “failure, restriction, and anecdote” (2009: 4). That is, there are many more accounts of failure, of limited applicability of success, and sometimes mere anecdotal stories of success.

It is to fill this gap between the hoped-for success in transforming lives and the reality on the ground of limited evidence of success, even where there might have been success, that the Strengthening ICTD Research Capacity in Asia (SIRCA) programme was born. SIRCA addresses the need for scientific, replicable, generalisable, collaborative, and actionable impact evaluations produced by the developing world. The Singapore Internet Research Centre (SiRC), funded by the International Development Research Centre (IDRC) of Canada, conceived of this plan to support emerging ICTD scholars.

The goal is simple: scholars who finish the programme should be able to conduct research on ICTD that would be publishable in a good journal that adopts international best practices of the double-blind peer review process. Ultimately, these scholars would be able to share quality research findings with the rest of the world. Hopefully, future failures and restrictions would then be reduced, which would increase the efficiency of investments in development projects by governments and donors. In turn, the savings generated would enable more projects to be conducted, evaluated and successfully scaled. A virtuous cycle is thus created.

In practice, the SIRCA process is a little more drawn out: participating scholars have to submit their project proposals for selection in a competitive process. The winners attend workshops that train them in research methods, engage with mentors and, finally, get the opportunity to present their findings before a critical audience of peers. The heart of SIRCA is the mentorship programme, where senior scholars are assigned as

mentors to the winning proposals. Through these various interactions, SIRCA provides opportunities to share experience and knowledge.

This special issue is the culmination of our shared objective to contribute to the growing field of ICTD by enabling quality research outputs. This double-blind peer-reviewed¹ issue covers a diverse range of ICTD research themes. The projects showcase advancements in scientific, theoretically-driven research currently undertaken in the region. Because all the projects were conducted in Asia, the works presented here provide an alternative perspective on the generally Western-centric research conducted in the ICTD space. The issue focuses on six ICTD projects chosen out of 15 from the SIRCA programme. These articles provide rigorously researched and analysed evidence on how Internet access and mobile telephony have improved the lives of rural and marginalised communities in Bangladesh, China, India and the Philippines. The articles provide a look into how different communities and users have adopted the use of technologies to improve their lives, and give an indication of the nuanced and complex issues involved in the ICTD domain.

From a health perspective, Zheng et al. find that reciprocity and social trust influence rural Chinese doctors' intentions to share electronic medical records. Hechanova et al. examine the adoption of online counselling by migrant Filipino workers in the Middle East, suggesting that online help-seeking behaviour, typically to discuss relationship and homesickness matters, is driven by the felt need and nature of location, in addition to technology acceptance. Mirandilla-Santos finds that political blogging in the Philippines is seen primarily as a medium for information exchange and has yet to create a significant impact in the Philippines, while Raman and Bawa critique the impact of ICT introduction in revenue services and land records for rural citizens in Karnataka, South India. Ashraf et al.'s impact evaluation of two shared-facility service centre programmes in Bangladesh found that ICTs can contribute to individual freedom in the political economic and social spheres of Bangladeshi life. Similarly, Islam's evaluation of a mobile phone service available to Bangladeshi farmers, underlines the importance of understanding the perceived ease of use and perceived usefulness (in terms of efficiency, sustainability, and relevant content) when designing such a service.

The projects are a reminder of the key role that the academy can play in development through well-conducted research. The first steps have been taken. May many more others follow so the path to development will be broad and well-trodden.

Arul Chib and Ang Peng Hwa

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A-List Filipino Political Bloggers and Their Blog Readers

Who They are, Why They Write/Read Blogs, and How They Perceive and Participate in Politics¹

This paper looks at political blogging in a developing, democratic country, like the Philippines. It presents the results of an exploratory-descriptive study of the profile, perception, and activities of 30 A-list Filipino political bloggers and 64 of their readers, who are mostly male, young, college-educated, high-income and veteran Internet users. Bloggers and readers see blogging as a form of political participation that has led to exchanges offline. For both bloggers and readers, there was no significant change in their participation before and after blogging. A blog serves more to keep track of bloggers' thoughts, inform others and over time, formulate new ideas. This is in sync with blog readers' expectation of gaining information and knowing others' views. Readers are highly cynical and moderately efficacious, which may be caused by exposure to blogs that are critical of government. Despite its limited impact, blogs support democracy by allowing expression and encouraging participation despite the odds in Philippine politics.

MARY GRACE P. MIRANDILLA-SANTOS

The emergence of the Internet has changed the nature of political communication and the landscape of political participation. Some scholars, like Grossman (1995), argue that electronic media will enable citizens to participate in politics while others, such as Putnam (2000), are more pessimistic, predicting that electronic media would decrease social capital and inhibit participation.

Studies have suggested how exposure to certain messages through traditional media may be partially responsible for the negative feeling of citizens toward the political system and, as a result, lower level of participation (Sweetser & Kaid, 2008). In contrast, the Internet offers more opportunities for gaining information from multiple viewpoints, which, combined with discussion, can enhance political efficacy and encourage civic and political engagement (Nisbet & Scheufele, 2004 cited in Tedesco, 2007; Kenski & Stroud, 2006). The Internet also promotes interaction, which increases learning about political issues and processes (Hacker, 2000 cited in Tedesco, 2007) and may help overcome cynicism (Tedesco, 2007).

With the advent of Web 2.0 comes the low-cost, interactive, non-hierarchical media, such as web logs or "blogs." These are personal journals or diaries written by individuals with these basic units: the "posts", in reverse chronological order, individual comments logged in

by a submitter with identifying information, date and time of log and static links or "blogroll" (Reese et al., 2007). Blogs are considered a promising citizen-based medium for political expression (Koop & Jansen, 2006), communication (Ward & Cahill, 2007) and participation (Farrell et al., 2008). They allow "bottom-up, grassroots journalism and political discussion" because they are not capital- and labour-intensive, nor geographically distinct (Gill, 2004) and without the centralised direction, large-scale funding and editorial control characteristic of traditional news media (Ward & Cahill, 2007). Despite low readership, there is consensus that blogs play an increasingly important role in public debate, as they attract journalists, opinion leaders and political elites (Drezner & Farrell, 2008) who have wide reach and the power to influence or make decisions.

As in any medium, blogs are as good as the actors behind them. An individual's resources affect blogging and blog reading. As defined by the resource theory, traditional participation in politics requires resources—money, time, civic skills and links to mobilisation networks—to enable even the politically interested actor to engage in certain activities. Similarly, actors participating online need to overcome various constraints: availability of time, money and Internet connection (Best & Krueger, 2005).

Blogs are founded on the blogger's motivation—their reason for blogging and for continuing to do so—which is affected by their personal contexts. Similarly, political participation is founded on an actor's intention to influence the distribution of social goods and social values (Rosenstone & Hansen, 1993) and government action (Verba, Scholzman & Brady, 1995). Thus, knowing

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the motivation of bloggers and how they engage politics is critical to understanding whether blogging can be considered a form of political participation and/or how they may affect political participation, both online and offline (McKenna & Pole, 2004; Wallsten, 2005). An equally interesting question is how readers of political blogs perceive and participate in politics. In the United States, people read political blogs as a news source, a means of political expression, or as a diversion or form of entertainment (Graf, 2006). Readers were found to most likely engage in politics more than non-readers, but very likely to read only blogs whose political leanings accord with their own (Farrell et al., 2008).

In Asia, studies on political blogs have been anchored on their role in disruptive political events or conflicts. In Thailand, online applications, such as blogs, are seen as a two-edged sword—for political mobilisation and for censorship and surveillance by the government (Bunyavejchewin, 2010). In Kyrgyzstan, the *samizdat* (unofficial blog) was found to be a unique and rich source of information during the “tulip revolution” when the local and international press were censored. Blogs can serve to incite or sustain democratisation in Third World countries, even those undergoing uneven economic development (Kulikova & Perlmutter, 2007).

Somewhat surprisingly, there is limited research on blogging that involve countries, such as the Philippines, with a liberal democratic setting and established political and economic systems. Almost 30% of Filipinos go online through private Internet subscription and public access facilities, such as Internet cafes. There is a steadily growing number of blog readers in the country, which reached 90% in 2008 or 3.3 million of its “active Internet universe”—individuals aged 16–54 years going online regularly (McCann, 2008). In 2009, AC Nielsen estimated that one in three Filipino Internet users had a blog (Burgonio, 2009).

Scant research on blogging means almost nil on political blogging. Although political blogs are often featured in mainstream media when there is a hot topic or when they become viral, very little is known about the Filipino political blogger and reader: their profile, motivation, political attitude and engagement in political activities. Pursuing the answers to these questions will greatly contribute to a deeper understanding of how the Internet is being, and can potentially be, used to enhance political participation in a developing country, such as the Philippines, home to democratic institutions and a highly literate population.

This paper presents the results of an exploratory-descriptive study of A-list Filipino political bloggers and their readers—who they are, why they write and/or read political blogs, their attitude toward politics, and whether and how they access blogs for political participation, both online and offline. A survey was conducted among 30 A-list Filipino political bloggers based on the survey designs of McKenna & Pole (2004), which examined the profile of A-list political bloggers and their online/offline political activities (based on Verba et al., 1995) and Ekdale et al. (2007), which looked at bloggers’ motivation for

starting and continuing to write about politics. A survey was also conducted among 64 of their readers based on McKenna and Pole (2004), to determine the readers’ modes of political participation, and Gorospe-Jamon (1998), to determine their political attitude (efficacy and cynicism). The results of these two surveys, although analysed separately, were triangulated with data from semi-structured elite interviews with political bloggers, academics, journalists and communications experts, and three focus group discussions (FGDs), each involving bloggers and readers based in Metro Manila, Cebu (Visayas region) and Davao (Mindanao region) held between February and May 2010.

A-LIST FILIPINO POLITICAL BLOGGERS SURVEY

The blogger survey aims to give a snapshot of A-list Filipino political bloggers, defined here as “established”—stable and enduring in terms of online presence and activities—and “popular”—reputable, widely read prevalent in blogrolls and high traffic (hits from pageviews) in the Filipino blogosphere. There is no consensus on how best to distinguish a political blog from other blogs (Wallsten, 2005). Researchers should exercise prudence in choosing the approach that best suits their objectives. Given the absence of an authoritative Filipino political blog database—absent even in the US—this study drew a population list using a combination of purposive search methods: (a) a “keywords approach” through a web search in Google and Yahoo! of phrases (“Philippine political blog” and “Philippine politics blog”) that appear on tags or blog posts and (b) extracting individual blogs from blog directories. Popular search engines were used to ensure good “searchability”, assuming that the earlier a website appears in a search, the more visitors will access the site. Blogs that appeared on the first 10 pages of the search results were considered. Individual blogs were also extracted from blog directories or ranking sites that appeared in the web search, which include <http://www.topblogs.com.ph/>, <http://www.ratified.org/> and <http://www.blogged.com/>.

All blogs were viewed individually to confirm that they had a general political orientation. The selection criteria include: the word “politics” in the description or a politically relevant word, name, or event in the tags; authorship by a private individual, a Filipino citizen, 18 years of age or above; blog at least one year old,² with recent posts (from March to May 2009) and contact detail available (or active comment feature). A separate ranking process was also undertaken using <http://popuri.us/>³ and <http://pagerankall.com/>⁴. Blogs with low ranking were not included.⁵ There were 44 blogs in the sample and 30 eligible responses generated or a 68-percent response rate.

A-List Filipino political bloggers: Profile and motivations

The A-list Filipino political blogger respondents were found to be dominated by males (80%), 25–34 years old (53%), Manila-based (67%), college-educated (57%), employed (87%), high-income (household earns above USD1,111 monthly)⁶ (70%), veteran Internet users (usage of more than seven years and regular broadband

connection at home or work) (70%). These attributes closely resemble the blogger profile in Technocrati's State of the Blogosphere 2010 report (Technocrati, 2010).

Most have no affiliation to a political group and feel that their views are already somewhat represented by a political party or interest group. All 30 consider their blogs as political in orientation.

Motivations for starting and continuing to blog about politics

To examine motivation for blogging, the study employed the quantitative component of a survey by Ekdale et al. (2007), which presented bloggers with a list of 14 possible motivations for rating to determine their reasons for starting and continuing to write a blog. The rating used a 7-point scale ranging from 0 ("Not at all") to 7 ("Very much"), a deviation from the 11-point rating scale used by Ekdale et al. (2007). Bloggers were also asked an open-ended question on why they started to blog, which yielded more detailed answers that were coded and compared with the survey data.

In terms of the combined top 2 ratings ("very much" and "much"), the top motivators were identified as those significantly higher than the others using Z-test on proportions at 95 percent confidence interval (CI).

The top motivators for *starting* to blog were to "keep track of their thoughts" and to "inform people about the most relevant" and recent information. See Table 1.

"Keeping track of their thoughts" remained a top motivator of bloggers for *continuing* to write, but "formulating new ideas" was also a salient reason. See Table 2.

In response to the open-ended question, the most pronounced reason given was the bloggers' desire "to express their thoughts and opinion" and "to keep writing".

The most consistent non-motivators were "to critique political opponents", "to critique media", "to earn money"—which coincided with the FGD data—and "help organisational cause"—as expected, since 67% of the respondents does not belong to any political group.

Encouraging political participation through blogs

Political activities can be acts of active engagement, which include "conventional" (e.g. voting, standing for office and campaigning for a political party) and "unconventional" acts, which may be "legitimate" (e.g. signing a petition and attending a peaceful demonstration) or "illegal" (e.g. violent protest and refusal to pay taxes) (Faulks, 1999). They can also be "expressive" or "collective" forms of participation (Kim et al., 1999).

Blogger respondents were consistently engaged in "expressive" participation. Most blogs are used to "announce an event" (40%) and encourage readers "to contact a public official". No blogger reported posting a "paid advertisement for politicians".⁷ See Table 3.

Many bloggers encourage readers toward "conventional" participation ("voting") and "unconventional" but "legitimate" participation ("attending a peaceful rally") (22%). A few entice readers to engage in "collective and unconventional" participation ("joining a protest rally") or "signing a petition" (18% each). "Unconventional and illegitimate" activities ("practising civil disobedience") (2%) were the least supported offline. See Table 4.

TABLE 1
Motivations of A-list Filipino political bloggers for starting a blog

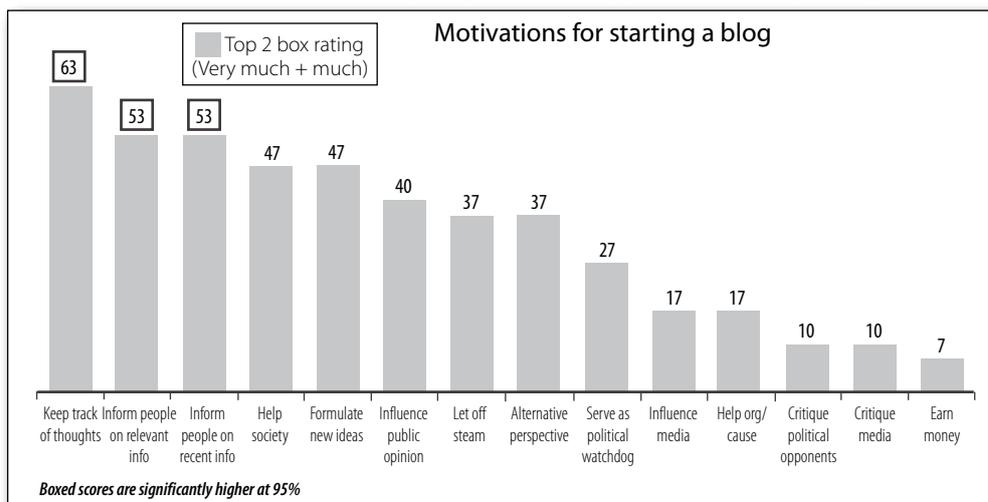


TABLE 2
Motivations of A-list Filipino political bloggers for continuing to blog

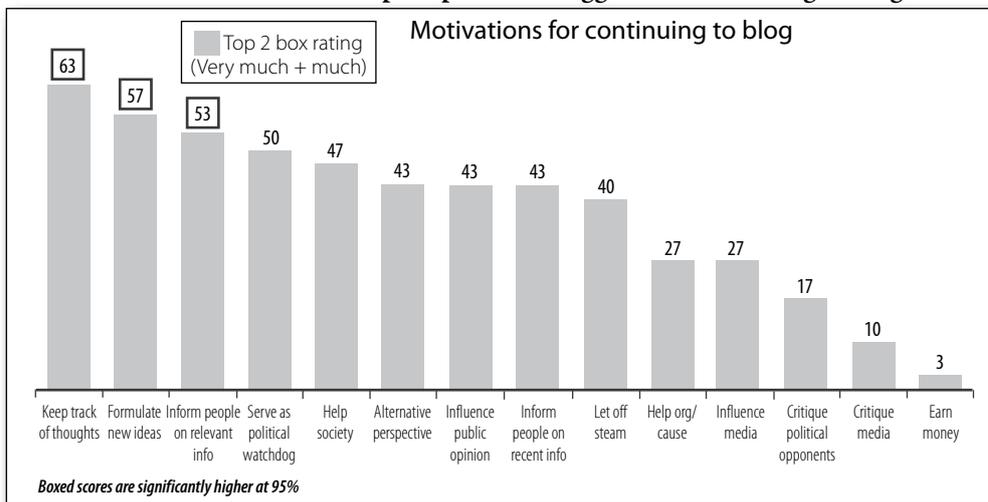


TABLE 3
Have you used your blog to do any of the following activities?

Activity	Frequency	Percentage
Announce an event	18	60%
Encourage readers to contact an elected official	9	30%
Other	6	20%
Free advertising for a candidate	4	13%
Don't know	2	7%
Raise money	1	3%
Paid advertising for a candidate	0	0%
Not applicable	5	17%

TABLE 4
Offline political activities that bloggers encouraged their readers to engage in

Activity	Frequency	Percentage
Vote or register to vote	17	57%
Attend a peaceful demonstration	17	57%
Sign a petition	14	47%
Join a protest rally	14	47%
Join a political group/movement	7	23%
Campaign for a candidate	4	13%
Others:	3	10%
• Engage in charity		
• Participate in elections		
• Be critical and analytical		
Practice civil disobedience	2	7%

An overwhelming majority of bloggers ask readers to “visit other blogs” (87%) and “websites” (73%) and to “write comments on their blogs” (63%). See Table 5.

Bloggers’ political participation

There was no significant difference (Z-test on proportions at 95% or 90% confidence level) in the political activities engaged in by bloggers before and after they started blogging. If anything, there was a decline in the frequency of participating in certain activities, such as “voting.” An exception was “campaigning”, which increased slightly, but probably because the study coincided with the campaign season. See Table 6.

Almost all respondents consider blogging as “a form of participating in politics” (90%) and an activity that “has led to an exchange of ideas among other individuals inside or outside the blogosphere” (93%). Respondents felt that they are “much more” informed, although only “somewhat” sure about their influence on politics or political discourse.

FILIPINO POLITICAL BLOG READERS SURVEY

This survey aims to identify the audience of political blogs and why they read such, determine their political activities and examine their political attitude. Tracking

TABLE 5
Online political activities that bloggers encouraged their readers to engage in

Activity	Frequency	Percentage
Visit other blogs	26	87%
Visit other websites	22	73%
Write/send comments to your blog	19	63%
Join an online cause	15	50%
Sign an online petition	10	33%
Write/send comments to other blogs	10	33%
Join a blogswarm	8	27%
Other	2	7%
Donate money	1	3%
Don't know/ refuse	1	3%
Not applicable	1	3%

TABLE 6
Political activities bloggers engaged in prior to and after creating their blog*

Activity	Prior to creating blog	After creating blog
Voted	87%	73%
Attended a rally, protest or march	67%	60%
Sent e-mail or letters to elected officials	43%	40%
Attended a political fund raiser	20%	17%
Worked on a campaign	37%	40%
Attended a local community meeting	57%	47%
Others	17%	13%
N/A	3%	3%

* No significant difference before and after creating a blog (at 95%, even 90% confidence interval).

down political blog readers also proved difficult. A few studies (Farrell et al., 2008; de Zúñiga et al., 2007; and Graf, 2006) report a similar dilemma about tracing content. Since the audience of political blogs tends to be very small, survey sampling is limited to specific blogs. In the US, extracting such a sample often entails using a database from previous surveys or making phone calls or sending emails to ask people at random whether they read political blogs (Farrell et al., 2008). An alternative was to start with top political blogs as focal points where many readers converge (Drezner & Farrell, 2008).

This study initially followed Drezner and Farrell’s (2008) sampling method, using the same set of criteria as the blogger survey. This process revealed that political blogs share many common readers. Some blog readers tend to leave multiply comments, which facilitated conversation threads with the

blogger and other readers. The content of their comments, however, is beyond the scope of this study.

The extracted blog readers were contacted through the “comments” section of, or contact information provided in, their own blogs. The non-bloggers were contacted through their social networking site (SNS) account, mainly Facebook and Multiply, and micro-blogging site, Twitter.

A sample list of 313 eligible respondents was extracted. The survey was administered through email from December 2009 to May 2010 and generated 64 responses or a 20-percent response rate, considered high by most standards of online surveys.

Filipino political blog reader: Profile and motivations

The demographic and Internet-use profile of blog readers were found to have significant similarities with those of the bloggers. See Table 7.

TABLE 7

Political blogger and blog reader profile (highest frequency)

Profile	Answer with highest frequency	Blogger (%) N = 30	Blog reader (%) N = 64
Gender	Male	80	59
Age	25 to 34 years old	53	48
Location	Metro Manila	67	48
Educational attainment	College	57	69
Employment	Currently employed	87	88
Socio-economic status	Upper income (P50,001 up)	40	42
Internet use (in years)	7+ years	70	66
Internet use (mode)	Broadband subscription at home	87	84
Membership in a political organisation	No affiliation	67	88

Almost all respondents consider blogging as “a form of participating in politics” (90%) that “has led to an exchange of ideas among other individuals inside or outside the blogosphere” (93%). Like the bloggers they read, most do not belong to any political organisation.

Their top reasons for reading blogs were to “keep updated” (34%) and to “read/know other people’s views” (25%) about certain political issues. See Table 8.

When asked about their perceived benefits of reading political blogs, a considerable number indicated “being informed” (28%), followed by “raising social/political awareness,” “validating opinion vis-à-vis others’ views” and “knowing other people’s views” (14% each). See Table 9.

Political activities encouraged by blogs

Respondents indicated that political blogs have encouraged them to “vote” (86%), “sign a petition”

(73%) and “join a protest rally” or “join a political group/movement” (52%) in the *offline* world, and to visit “other websites” (95%) and “other blogs” (94%) and “join a cause” (84%) *online*. Looking at two-population proportions at 95% CI, it was found that the incidence of voting was significantly higher before respondents got into blog reading. This, however, is probably due to the timing of the study. The incidence of “other” activities was also significantly higher after visiting blogs, but most responses indicated “none” and specifics were limited to “writing their own blog” (5%) and “attending the funeral of former Pres. Corazon Aquino” (2%). See Table 10.

Political attitude: Cynicism and efficacy

The study measured two political attitudes: cynicism and efficacy, based on the survey design of Gorospe-Jamon (1998), which drew from Sicat (1970). Political cynicism

TABLE 8

Main reasons for visiting a political blog

Reasons	Frequency	Percentage
Keep updated; gain awareness and more information	22	34%
Know/read views of others	16	25%
Validate my opinion vis-à-vis others’ views	8	13%
Gain more info and learn	4	6%
Know about issues not picked up by mainstream media	4	6%
Weigh critical views/analyses	3	5%
Passive; coincidental	2	3%
Politically-inclined	2	3%
Educate the masses; exchange thoughts	1	2%
Entertainment; opinion	1	2%
Written/recommended by a friend	1	2%
	64	100%

TABLE 9

Main benefits from accessing political blogs according to Filipino blog readers

Benefits	Frequency	Percentage
Be informed	18	28%
Raise social/political awareness	9	14%
Validate opinion vis-à-vis others’ views	9	14%
Know other people’s views	9	14%
Help shape and inform one’s opinion	5	8%
Broaden views/perspective	5	8%
Keep updated	4	6%
Know about issues not picked up by mainstream media	4	6%

TABLE 10
Political activities undertaken before and after accessing political blogs

Activity	Prior to accessing political blogs	After accessing political blogs
Voted	72*	50
Attended a rally, protest or march	50	38
Sent e-mail or letters to elected officials	22	28
Attended a political fund raiser	8	5
Worked on a campaign	27	28
Attended a local community meeting	33	31
Others:	3	16**
None / NA	—	9
Write political blogs/post of their own	—	5
Attended President Aquino's funeral	—	2

* Incidence significantly higher before respondents got into blog reading (at 95% CI)

** Incidence significantly higher after respondents got into blog reading (at 95% CI)

is defined as the “tendency to have a relatively negative view of, or to have negative feelings toward, politically significant objects, such as political institutions and processes (Sicat, 1970 cited in Gorospe-Jamon, 1998). Political efficacy, on the other hand, can be defined in terms of a person’s feelings of competency and beliefs that one’s actions are consequential, which determines a person’s incentive to participate in politics (Abramson & Aldrich, 1982 cited in Kenski & Stroud, 2006) due to a feeling that it is worthwhile to perform one’s civic duties and that an individual can play a role in bringing about change (Sicat, 1970 cited in Gorospe-Jamon, 1998).

The conceptualised measure for political cynicism used is composed of a battery of Likert-type items, with questions referring to the nature of the political process, in general and to the character of politicians, in particular (Gorospe-Jamon, 1998: 40). The scale is based on summated ratings—the higher the total score, the higher the political cynicism. Answers corresponding to certain questions were given points, from 4 (highest) to 1 (lowest). The scores, which may range from 0 to 32, were aggregated and collapsed into three main groups: “low” (1 to 13); “medium” (14 to 22) and “high” (23 to 32). Political efficacy applies the same scoring system and scale.

Six in 10 or 60.3% of the readers manifested a high level of cynicism, which may be associated with their exposure to certain political statements (Sweetser & Kaid, 2008), in this case, political blogs self-rated by their authors as “critical of government/politicians”. This result echoes previous studies that found high levels of cynicism among Internet users (Johnson & Kaye, 1998;

Katz, 1987, cited in Sweetser & Kaid, 2008). Almost 40% manifested moderated cynicism. See Table 11.

TABLE 11
Political cynicism of political blog readers

Cynicism	Percentage (N = 63)*
Low	1.6%
Moderate	38.1%
High	60.3%
Total	100%

* One (1) of the 64 respondents refused to answer all items, so was not included in the count for political cynicism.

Note: Bold text denotes answer/s with highest frequency.

The highest level of cynicism was directed at the “competence of candidates winning the elections” (61.9%), followed by the belief that “many politicians are under the control of vested interests” and that “most politicians are out to gain something for themselves” (54% each). See Table 12.

Almost half (48.4%) of the respondents were found to have only a moderate level of political efficacy, which coincides with their high level of cynicism toward government and politicians. See Table 13.

TABLE 13
Political efficacy of political blog readers

Efficacy	Percentage (N = 64)
Low	12.5%
Moderate	48.4%
High	39.1%
Total	100%

Note: Bold text denotes answer/s with highest frequency.

The highest level of efficacy was associated with “having a say about what the government does” (45.3%), followed by “ways to have a say other than voting” and “understanding what is going on in politics and government”. Respondents showed lowest efficacy in the belief that “public officials care about what one thinks”. See Table 14.

FOCUS GROUP DISCUSSION (FGD) AND ELITE INTERVIEWS

The interviews and face-to-face discussions allowed for further probing into the dynamics of political blogging and other related issues based on the insights of bloggers, blog readers and subject matter experts.

Male dominance in the political blogosphere

The study found a low number of female political bloggers (20% of total). One female blogger offered that women may be leaning toward solitary blogging to avoid arguing with men, who dominate political blogs and tend to be very aggressive when arguing about politics. Another female blogger confessed to having stopped engaging in political debates altogether due to the stress caused

TABLE 12
Political Cynicism Index

	SA	MA	UC	MD	SD	Total
1. "People in other careers usually work harder than people in politics."	20.6%	42.9%	9.5%	20.6%	6.3%	100%
2. "The most competent and deserving candidate usually wins elections in this country."	1.6%	4.8%	1.6%	30.2%	61.9%	100%
3. "Most politicians are mainly out to gain something for themselves."	54.0%	34.9%	0.0%	7.9%	3.2%	100%
4. "Dishonesty seems to be most common in politics than in most other careers."	49.2%	38.1%	0.0%	7.9%	4.8%	100%
5. "Many politicians treat some voters better than they treat others, when they should treat all voters equally."	42.9%	34.9%	17.5%	3.2%	1.6%	100%
6. "In general, politicians are very able people who would succeed in most careers."	6.3%	33.3%	27.0%	20.6%	12.7%	100%
7. "Many of the statements of politicians cannot really be believed."	38.1%	54.0%	4.8%	3.2%	0.0%	100%
8. "Many politicians are really under the control of vested interests."	54.0%	33.3%	6.3%	3.2%	3.2%	100%

N = 63

SA = strongly agree; MA = moderately agree; UC = uncertain; MD = moderately disagree; SD = strongly disagree.
Note: Bold text denotes answer/s with highest frequency.

TABLE 14
Political Efficacy Index

	CA	SA	UC	SD	CD	Total
1. I do not think public officials care much about what people, like me, think."	18.8%	46.9%	7.8%	23.4%	3.1%	100%
2. "Voting is the only way that people like me can have any say about how the government runs things."	17.2%	15.6%	4.7%	23.4%	39.1%	100%
3. Sometimes, politics and government are so complicated that a person like me can't really understand what is going on."	9.4%	28.1%	1.6%	29.7%	31.3%	100%
4. "People like me do not have a say about what the government does."	9.4%	14.1%	7.8%	23.4%	45.3%	100%

CA = completely agree; SA = slightly agree; SD = slightly disagree; CD = completely disagree.
Note: Bold text denotes answer/s with highest frequency.

by mostly aggressive male bloggers who "*take pride in their opinion*" and "*won't accept defeat*".

The number of female readers (41% of total), however, is not too far behind. Whether Filipino women tend to read or comment rather than write political blogs and why would be interesting to explore in future studies.

Blogging and political participation

Although the surveys reveal that blogging has contributed primarily through the provision of up-to-date political information, this can affect the shaping of public opinion. Yvonne Chua of VERA Files (<http://verafiles.org/>) and formerly of the Philippine Center for Investigative Journalism (PCIJ)⁸ emphasises how blogging has aided in creating public consciousness and in intensifying participation, particularly after the "Hello Garci" scandal,⁹ by helping mobilise people (for protest rallies). Online mobilisation, however, needs to be complemented by face-to-face mobilisation, like attending rallies. Blogging,

Chua notes, is already on the decline. Twitter and Facebook are more popular and powerful mobilisation tools (Personal communication, 9 March 2010), a trend seen in a cyber-campaigning study prior to the May 2010 elections (Mirandilla, 2009).

Although blogging may encourage participation, it tends to do so in a small online community of like-minded people. It is observed that Filipino political blogs are polarised; they tend to invite and nurture a following from individuals who, to begin with, agree with the blogger's views. A preponderance of particular sentiments may actually discourage others with a different opinion from reading further or commenting. Dissenting views were often the minority (Chua, personal communication, 9 March 2010). Farrell et al. (2008) made a similar observation of prominent US political blogs, whose left- and rightwing readers overlap only a little, if at all, raising the question of whether blogs facilitate deliberation¹⁰ or foment polarisation (Farrell et al., 2008).

Influence of blogs

The small audience of blogs makes its actual influence on politics less tangible. As communications expert Ronaldo Jabal points out, blogs have minimal influence unless picked up by mainstream media or gets the attention of influential people, particularly the “gatekeepers” (staff, friends and advisers), who filter information for the decision-makers and opinion-leaders (Nisbet & Kotcher, 2009). There is transference of power when credible and popular people, both in the online and offline world, endorse a blog. In the absence of such catalysts, a blog is confined to its online community and its sentiments remain as pure opinion (Personal communication, 23 March 2010).

Clearly, blogs by the common folk, in and of itself, cannot influence people’s views unless it becomes “viral” or exists side by side with other media, says Danilo Arao, blogger (<http://risingsun.dannyarao.com/>) and assistant professor of journalism at the University of the Philippines. Convergence or the necessary complementation of the different forms of media is necessary to effectively shape public opinion. Ironically, one can maximise participation by veering away from the blogosphere and being involved in other ways. Netizens should find ways to use new media in helping institute social change (Personal communication, 24 March 2010).

Blogging and journalism

The low-cost, non-hierarchical and decentralised nature of blogging provides the ordinary citizen a medium for political expression. However, this same nature makes blogging susceptible to criticisms for failing to meet certain journalistic standards, such as accuracy and accountability. Ellen Tordesillas, veteran journalist and top political blogger, cautions about “anything published”, whether offline or online. In traditional media, journalists are disciplined and trained to exercise certain core values—truthfulness, balance, fairness, accuracy, humaneness and accountability—their stories are subjected to editorial review and the publisher has legal accountability. In blogging, the blogger functions as writer, editor and publisher. The foregone editorial filter makes the blogger solely responsible for what she or he writes (Personal communication, 8 February 2010).

The Filipino blogosphere is seeing an increasing convergence of new media and a multi-pronged approach where bloggers utilise SNS and micro-blogging sites to promote their blogs beyond avid online readers. Through the dynamic of online networks, social media increases the likelihood exposing blogs to people of influence, which include personalities in politics and mainstream media. Another recent trend—political blogging by mainstream media journalists or “political j-blogging”—has also been observed. It remains to be seen, however, whether political j-bloggers are transforming or merely normalising the blog as a component of their traditional journalistic practices (see Singer, 2005 for an analysis). Finally, the blogosphere is expanding its audience through major newspapers and TV news programmes—perhaps to influence a particular

audience that is digitally literate—which now allot valuable space and airtime for ordinary citizen bloggers and political commentaries. It is worth exploring if Filipino political blogs are disrupting the usual “straightforward top-down character of mainstream political communication”, as seen in countries like the US, or if a country’s institutional settings place limitations on the transformative impact of blogs (see Ward & Cahill, 2007 for a comparison of US and Australian political blogs).

FINDINGS AND CONCLUSION

The study has determined that A-list Filipino political bloggers and their readers are of a similar profile. Most are young males who have the resources (money, time, literacy and Internet connection) to access blogs and enjoy the geographical advantage of being based in the country’s political capital. The results point to the presence of specific resources in blogging and reading, and to gender disparity, specifically among bloggers but less prominently among readers. This seems to indicate some level of elitism and polarisation—unwittingly or not—in Filipino political blogging

Political bloggers were mostly engaged in expressive, conventional and legitimate forms of participation, online and offline—with no significant difference after blogging. Although most blogs are considered critical of government, a majority of them encourages readers to engage in conventional, lawful activities. This suggests the dominance of critical yet non-hostile actors (moderate left) in the Filipino political blogosphere.

Filipinos start to blog mainly to keep track of their thoughts and as a self-serving form of political expression. Although blogs also serve to inform, they do not set out to influence others. Over time, bloggers continue writing for the same reasons, but, this time, also to formulate new ideas.

Political blogs are unanimously seen as a medium for both providing and acquiring information, which serve to raise awareness and enrich knowledge about political issues. Enhanced political information may have contributed to a high level of cynicism, which may have downplayed the value of resources available to most blog readers who feel only moderately efficacious and uncertain about their influence on politics or political discourse. This may be explained, although not conclusively, by the respondents’ increased knowledge of “real” politics” as exposed by the blogs they read. In addition, the feeling of efficacy may be mitigated by the availability of opportunities and infrastructure, and effectiveness of institutions to enable participation that will lead to legitimate and effective results. This, however, is beyond the scope of this study.

Overall, results suggest that political blogs have yet to create a tangible macro-impact on how Filipinos participate in politics, considering that the contribution of blogs seems limited to information-sharing, for now. Although blogging is generally perceived as having led to an exchange of ideas, it has yet to transcend appreciation of information and views to a more meaningful

deliberation. There seems to be no indication that blogs influence political activities outside the blogosphere, at least when it is “politics as usual”. As a standalone, its reach is limited to a small community of often like-minded individuals who may already be politicised and engaged, to begin with. This is observed in the overlapping networks of readers found across many political blogs analysed. Blogs seem to have more value-added to citizens when there are current and urgent political issues that people want to know more about or know the opinion of other ordinary citizens on. Political blogs gain traction in the public eye when they go viral on Facebook or Twitter, are picked up by mainstream media and/or attract the attention of the gatekeepers. Otherwise, blogs serve as a supplementary means for citizens to: get up-to-date and more detailed information about a particular issue, access in-depth analysis lacking in mainstream media, and share their views with others on particular issues, thus, the ability of blogs to disrupt traditional debate on public issues. While it is difficult to establish whether and how blogs do influence political participation, it is clear from the study that this effect is constrained by a blog’s reach, the online and offline credibility of the messenger—the blogger, and the power and influence of the people who will pass the message on to others.

As a democratic tool, blogging provides an alternative venue for bloggers mostly for self-indulgence in writing, to keep track of their thoughts and to inform others about the most recent and relevant information. This is actually in sync with the expectation of readers who access political blogs mainly to gain information and know others’ views. While blogs do encourage their readers to participate in political activities, there is no indication that they encourage readers to participate more. As for bloggers themselves, there is no significant change in their participation before and after they started blogging. The activities of blog readers did not indicate any positive change, as well. These results may be affected by the lack of opportunities to engage in time-bound political activities, such as voting, and other factors, such as offline infrastructure, which are not covered by the study.

While there is not much consideration for influence in both political blogging and reading, it is promising to note that blogs continue to be used for formulating new ideas, which could lead to more interesting and vibrant online discussions.

Credibility is currency in the blogosphere. A-list political bloggers engage and promote each other but show antagonism toward those they identify as political blogging for money. Blog readers also look to credible bloggers, especially those who have established a good reputation offline or have mainstream media presence.

Finally, it is worth noting an interesting but often sidelined issue that shows the negative side of political blogging. Some bloggers and readers admit to disengaging from online political discussion due to the bickering and personal attacks lodged by other participants. The proposition to censor blogs is also seen as a relevant and critical issue, in line with two recent high profile cases filed against bloggers for allegedly encroaching

on an individual’s privacy and smearing a government official’s reputation. Lastly, blogs are often criticised for lacking accountability, particularly, when they sacrifice accuracy for quick access to controversial information. While this may be more an issue of a lack of training than intentional misinformation, it remains an ongoing debate, which includes issues on self-policing among bloggers and compliance to a set of standard, like the bloggers’ code of ethics put forth by *CyberJournalist.net* (2003).

FUTURE RESEARCH

A number of new research areas may be pursued to support or complement the findings of this research. Many research participants mentioned the catalytic effect of SNS, like Facebook, and micro-blogging site, Twitter, in spreading and making interesting blog posts viral. With the exponential growth in the number of Filipinos subscribing to these online applications,¹¹ Facebook and Twitter have become the more appropriate online tools to use for promoting political activities/events and encouraging people to participate either in online (e.g. petition or call for support or a cause) or offline (e.g. peaceful demonstrations and protest rallies) activities. Facebook is also known to spread blog posts through its “Notes” and “Share” features.

Increasingly, a complementation between traditional and new media is being observed. Given this context where political information and analyses now come from various sources and delivered in different ways, it would be interesting to determine whether and how blogs, micro-blogs and SNS are helping shape and influence the political attitude and views of Filipinos.

Content analysis of political blog posts would be a good supplementary reference to better understand the context and progression of issues being discussed in the Filipino blogosphere. This may include the content of the comments from political blog readers, the exchanges between the blogger and readers, and among blog readers.

Finally, future research is recommended on a new governance development in the country. President Benigno S. Aquino III was elected in May 2010 and now enjoys a high trust rating. Continuing his Obama-like approach in the campaigns, Pres. Aquino opened an official Facebook and Twitter account that are connected to the Official Gazette¹² of the Office of the President, purportedly to open government to feedback from citizens. For the first time in Philippine history, a president wrote a personal reply to a citizen’s note on Facebook.¹³ While part of public relations, making the president accessible, or at least making it appear like so, undeniably affects the way citizens see their government. In the aftermath of a tragic hostage crisis in August 2010,¹⁴ the President was faced with the dilemma of welcoming feedback while regulating comments, which may contain negative information and views. This new dynamic in cyberspace provides a huge challenge and opportunity for democratic engagement by both government and its citizens, and is definitely worth examining.

NOTES

1. This work was carried out with the aid of a SIRCA grant from the International Development Research Centre (IDRC), Ottawa, Canada, and administrative support from the Singapore Internet Research Centre (SiRC), Nanyang Technological University, Singapore. The research project was managed under the Centre for Research and Communication in Manila. The author would like to acknowledge the invaluable assistance provided by Jasmine Ferrer and Joyce Godio to this research.
2. A 2003 Perseus study estimated that of the 4.12 million blogs online at the time, 66% or 2.72 million blogs had not been updated in two months, which could mean they were temporarily or permanently abandoned (Business Wire, 2003; also see Wallsten, 2005 and McKenna and Pole, 2004).
3. Popuri.us is an online tool to check at-a-glance the link popularity of any site based on its ranking (Google PageRank, Alexa Rank, Technorati etc.), social bookmarks (del.icio.us, etc), subscribers (Bloglines, etc), among others.
4. PageRankAll.com is a pagerank checker that does not only provide a PR value but also verifies whether or not the Pagerank is being faked or artificially generated. It also gives a domain's Alexa Rank as well as Backlinks statistics.
5. Google PageRank of "0", Alexa Traffic Rank of "20 million" or above, and Technocrati Authority of "5" or less.
6. Foreign currency exchange rate of USD1 to PHP45.
7. The FGDs reveal that bloggers were often invited to attend "meet-ups" with the May 2010 presidential candidates and wrote about them afterwards.
8. PCIJ is an independent, non-profit media outfit that maintains its own blog, <http://www.pcij.org/blog/>.
9. In June 2005, audiotapes surfaced allegedly featuring President Gloria Arroyo conversing on the telephone with election commissioner Virgilio Garcillano while election results were being tallied (May–June 2004). In a series of recorded phone conversations, the distinctive voice of the President can be heard asking Garcillano about election results (Montemayor, 2008).
10. Political theorists (Habermas, 1984; Dewey, 1954; Fishkin, 1995) define deliberation as discussion among individuals with diverse perspectives, which may help refine their own opinions, develop greater tolerance for different opinions, and perhaps identify common ends and means (Farrell et al., 2008).
11. The Philippines has the highest Facebook penetration among its population age 15 and above among countries in the Asia Pacific (comSCORE, 2010).
12. Republic of the Philippines. (2010). *Official Gazette*. <http://www.president.gov.ph/default.aspx>.
13. Republic of the Philippines. (2010). Response of President Aquino to a Citizen's Note Posted on Facebook. *Official Gazette*, <http://www.gov.ph/2010/09/13/response-of-president-aquino-to-a-citizens-note-posted-on-facebook/>.

14. See Republic of the Philippines. (2010). Statement of President Aquino on the Quirino Grandstand hostage crisis. *Official Gazette*. <http://www.gov.ph/2010/10/11/statement-of-president-aquino-on-the-recommended-actions-after-reviewing-the-iirc-report-on-the-quirino-hostage-taking/>.

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Factors Influencing Physicians' Intentions to Share Electronic Medical Records

An Empirical Investigation in China¹

Influenced by shocks such as SARS in 2003, and a growing rural-urban divide, the Chinese government turned to modern information and communication technologies in an attempt to create a healthcare information system (HIS). HIS was aimed at integrating medical data across the complex healthcare infrastructure and sharing of electronic medical records (EMR). However, there are technological, organisational and socio-psychological influences on individuals' attitudes towards knowledge sharing. Using social capital theory (SCT) and the theory of planned behaviour (TPB), this study investigates socio-psychological factors influencing doctors' intention to share EMR in China. A random survey of 270 physicians across 20 hospitals in Xi'an, Beijing and Shanghai found that the relational (reciprocity) and structural (social trust) dimensions of social capital had an indirect positive influence upon the intention to share EMR, mediated by attitudes toward EMR sharing. These results were similar to the SCT cognitive dimension (loss of knowledge power) influence upon the intention to share EMR. The TPB variables of subjective norms, attitude towards sharing EMR, and perceived behavioural control had a positive relationship with intention to share EMR. Policy implications for health infrastructure are discussed.

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The advent of information and communication technologies (ICTs) has improved the dissemination of reliable information as well as fostered communication, crucial elements within the domain of public healthcare (Chetley, 2006; Eng, 2001), reduced costs and improved overall efficiency (Harrison et al., 2007; Varshney, 2008). As an example of a systemised and advanced ICT, healthcare information systems (HIS) encompass electronic medical records (EMR), computerised physician order entry (CPOE) and decision support systems (DSS). One definition of

HIS refers to "the organisation and delivery of health services and information using the Internet and related technologies", thus suggesting both technological and organisational dimensions associated with networked communities (Pagliari et al., 2005).

In recent years, the rapid deployment of HIS amongst many developed countries has led to significant achievements (Chaudhry et al., 2006). However, the health resources of developing countries such as China are far less than that of developed countries (World Health Organisation, WHO, 2010). To mitigate the widening healthcare supply-demand gap, the Chinese government aimed to use information technology; in particular, the State Council ruled that hospitals should invest a minimum of 5% of earnings in HIS annually. Resources were allocated towards HIS, beginning in the 1990s, building up to an estimated RMB 50 billion (US\$ 6.05 billion) within a decade (Zhanga et al., 2007). As a consequence, HIS diffused widely, particularly in large hospitals based in major metropolis (Zhang & Unschuld, 2008).

By 2009, the Chinese government promulgated reforms in medical policy, setting forth ambitious goals, to "set up functional and shared health information systems and promote the application of hospital information technology" (Ministry of Health of People's Republic of China, 2009). At present, there are advanced HIS in some

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large hospitals. However, most Hospital Management Information Systems (HMIS) emphasised financial management (Guo et al., 2005), rather than patient-centred clinical systems such as EMR (Wang et al., 2004; Tao & Miao, 2003). There is a need to investigate possible reasons for why EMR sharing to benefit patient-care was not seen as a priority while establishing HMIS in China.

Electronic medical records are a core application for patient-care within HIS. Institute of Medicine's CPR Report (Dick & Steen, 1991) defined EMR as "an electronic patient record that resides in a system specifically designed to support users through availability of complete and accurate data, reminders and alerts, clinical DSS, links to bodies of medical knowledge and other aids". EMR is not simply the replacement of a medical record from paper form, but brings an attendant change in the functioning of healthcare organisations, as a result of information sharing. Through EMR sharing, physicians can improve their medical knowledge and access new treatment technology, thus improving overall healthcare service delivery. The historical records of diagnosis and treatment allow for future treatment and can be collated at various provincial, district, state and national levels to allow for epidemic prevention and setting of government public health policies. The ineffective response to the SARS epidemic in 2003, caused by the fragmented public healthcare infrastructure, was a major reason to construct a public HIS (Qin et al., 2005; Liang & Xue, 2004). EMR sharing was seen as important to a variety of stakeholders including physicians, patients, governments, suppliers of pharmacy and others. However, despite regional HIS present in Beijing, Shanghai and Xiamen, formative research suggests that physicians in these large hospitals are unwilling to share EMR through HIS.

There are technological, organisational and socio-psychological reasons for the slow adoption of EMR sharing as an integral part of a robust HIS. The liberalisation of the healthcare system in the 1980s led to wide disparity in provision of medical resources between urban and rural areas within China, both in terms of service delivery as well as investment (Griffiths, 2008; Hsu et al., 2006). Further, because of the complex nature of the public and private healthcare infrastructure, and various levels of operation, a lack of standards and interoperability led to resistance in EMR sharing. While some scholars have studied HIS in China from technological (Zhang et al., 2007) and organisational perspectives efficiency (Dawes & Sampson, 2003; Sharma & Wani, 2006), there remains a need to explore HIS issues from a socio-psychological perspective.

The research questions examined here are: what factors influence physicians' attitudes towards sharing EMR, and how do these factors impact physicians' intention to adopt sharing of EMR? Further, developed world case studies dominate the present literature, while developing countries, such as China, provide a research gap that needs to be filled (Braa et al., 2004; Wang, 2009). Using social capital theory (SCT) and the theory of planned behaviour (TPB), this paper investigates factors influencing physicians' intentions to share EMR.

THEORETICAL BACKGROUND

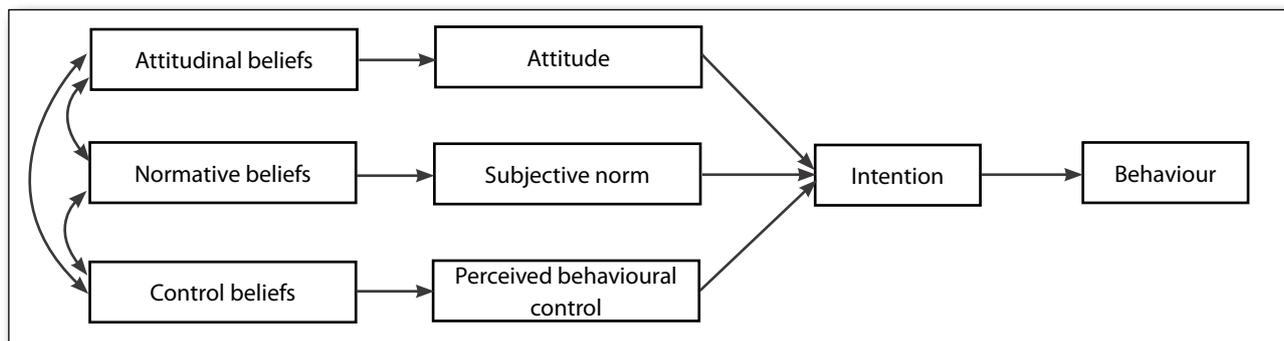
Information and communication technologies have brought great changes to knowledge sharing (KS), overcoming barriers of distance and organisational boundaries. However, in any situation, individual intention plays an important role in the sharing of knowledge. In a number of cases, KS failed to occur optimally because of employees' reluctance (Kankanhalli et al., 2005). Research by Nicolini et al. (2007) shows that sharing of clinical knowledge is difficult because of strong professional boundaries in the medical profession. This suggests that the transfer of medical knowledge will be hampered if physicians are not willing to contribute to EMR systems.

In general, different factors impact KS under varied situations. For example, Staples and Webster (2008) claimed that trust has a positive impact on KS in inter-organisational communication, while Hus (2008) study of KS in the context of blogs suggests that trust has no significant impact on knowledge sharing. Compared with these cases, EMR have different characteristics, as they are shared across organisations, with a number of internal and external stakeholders, leading to a more complex situation. This study turns to social capital theory (SCT) and theory of planned behaviour (TPB) to investigate this issue at the individual level (Bourdieu, 1986; Porters, 1998; Coleman, 1988).

In this research study, we refer to Inkpen et al. (2005) who define social capital as "the aggregate of resources embedded within, available through, and derived from the network of relationships possessed by an individual or organisation—a definition that accommodates both the private and public good perspectives of social capital". Nahapiet and Ghoshal (1998) suggest that there are three specific dimensions of social capital: structural, relational and cognitive. Prior investigations indicate that social capital factors are important to knowledge sharing (Wasko & Faraj, 2005). Chow and Chan (2008) believed that loss of knowledge power and image has significant influence on attitudes toward knowledge sharing. In a related study, Bock et al. (2005) suggested that reciprocal relationships have a positive impact on attitudes toward knowledge sharing.

This study aims to illuminate the factors influencing intention to share EMR; thus leading us to focus on intentions towards sharing of knowledge. The theory of reasoned action (TRA) can explain and predict individual behavioural intentions and behaviour across various settings (Ajzen & Fishbein, 1980). TRA suggests that behaviour is determined by behavioural intention, which is determined by individual attitudes towards behaviour and subjective norms. However, evidence (Ajzen, 1991) indicates that TRA has insufficient explanatory power because individuals do not have total volitional control over their behaviour and are influenced by unmotivated factors such as information, time and money. According to the theory of planned behaviour (TPB) (see Figure 1), an extension of TRA, an actual behavioural intention is determined by individual attitude, subjective norm and perceived behavioural control.

FIGURE 1
Theory of planned behaviour (Ajzen, 1991)



RESEARCH MODEL

The theoretical model for this research combines social capital theory and theory of planned behaviour (Figure 2). The dependent variable is physician’s intention to share electronic medical records. The independent variables derived from TPB are subjective norms, attitudes towards EMR sharing and perceived behavioural control. The three specific dimensions of social capital: structural, relational and cognitive, are postulated as the independent variables of social trust, reciprocity and loss of knowledge power respectively. Within the path model, these independent variables predict attitudes towards EMR sharing, as well as intention to share EMR.

We defined perceived loss of knowledge power as the perception of power and unique value lost due to sharing EMR (Kankanhalli et al., 2005). If physicians consider EMR as private knowledge, they may feel individually replaceable when sharing unique medical knowledge in their possession. This may result in knowledge power shifting from one physician towards others, so that the particular individual may feel sharing EMRs leads to a reduction in his or her uniqueness (Grey, 2001). This would result in a reluctance to share EMR. Therefore, we hypothesise that:

H1A The greater loss of knowledge power is, the lower attitudes towards EMR sharing will be.

H1B The greater loss of knowledge power is, the lower intention to share EMR will be.

Reciprocity is defined as the degree to which a physician believes he or she could improve mutual reciprocal relationships through EMR sharing (Bock et al., 2005; Sparrowe & Linder, 1997). Social capital theory suggests that individuals are motivated by others needs in order to achieve mutually beneficial outcomes (Lin, 2001). When an individual shares EMR with others, she or he is able to reap the benefits from the action performed. Therefore, it is hypothesises that:

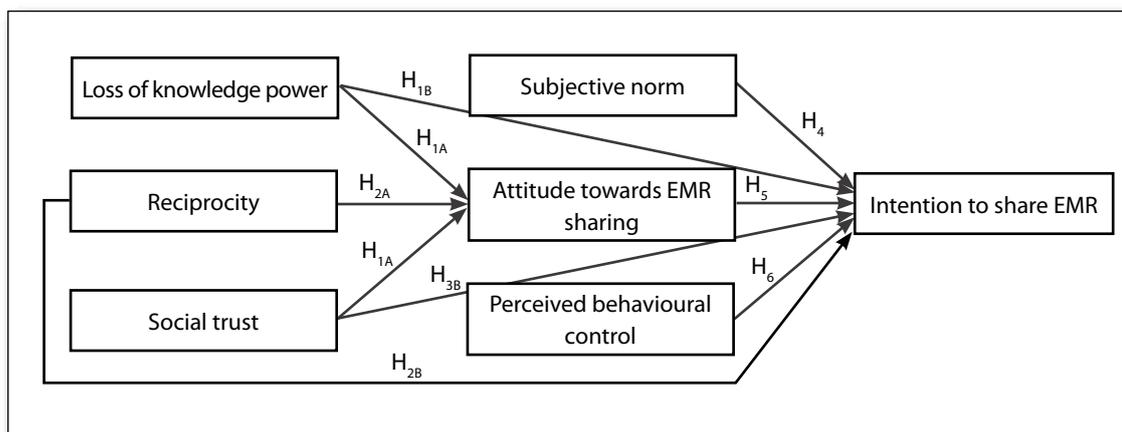
H2A The greater perceived reciprocity is, the greater attitudes towards EMR sharing will be.

H2B The greater perceived reciprocity is, the greater intention to share EMR will be.

Social trust is defined as the degree of one’s willingness to be vulnerable to the actions of other people. Trust has been recognised as an important antecedent to knowledge sharing. When trust exists between parties, they want to learn from each other and engage in cooperative interaction, thus they are more likely to share their knowledge (Napapiet & Ghoshal, 1998). Therefore, it is hypothesised that:

H3A The greater social trust is, the greater attitudes to share EMR will be.

FIGURE 2
Proposed testing model



H3B The greater social trust is, the greater intention to share EMR will be.

Subjective norms are defined as the social pressure to engage in, or abstain from EMR sharing (Ajzen, 1991). Based on the TPB, subjective norms related to knowledge sharing have a positive effect on intention to share knowledge. Existing studies have confirmed that subjective norms have a significant effect on behavioural intention in KS (Bock et al., 2005). If a physician feels that the hospital managers or colleagues expect sharing of medical information, she or he may be more inclined to share EMR. Therefore, it is hypothesised that:

H4 The greater the subjective norms are, the greater the intention to share EMR will be.

Attitudes toward EMR sharing are defined as the degree of a physician's positive feelings about sharing EMR. According to TPB, the function of individual attitudes is based upon belief of expected outcomes and the evaluation of these expected outcomes. The more favourable the attitude of an individual towards a certain type of behaviour, the stronger will be the intention of the individual to engage in said behaviour. Therefore, it is hypothesised that:

H5 The greater attitude toward EMR sharing is, the greater intention to share EMR will be.

Perceived behavioural control (PBC) is defined as the degree of perceived ease or difficulty of performing the behaviour and the amount of control one has over the achievement of personal goals (Ajzen, 1991). EMR sharing needs physicians to code and access medical knowledge into computer systems, a skill they neither trained for, nor expert in. EMR is a complex system that involves the use of computers, management and medicine science (Chiasson & Davidson, 2004). It is widely acknowledged that medical records cannot easily and conveniently be coded through computer channels. Hence, complex computer systems will discourage EMR sharing (Ma & Agarwal, 2007), while the reverse is likely to be true. Therefore, it is hypothesised that:

H6 The greater perceived behavioural control is, the greater intention to share EMR will be.

METHOD

Data collection

Based on the literature review and theoretical background, a structured questionnaire was designed. As the survey respondents were Chinese physicians based in mainland China, the questionnaire was translated from English into Chinese by three native Chinese experts and then back to English, following a generally accepted practice to ensure consistency in cross-lingual surveys (Karahanna et al., 2002).

A total of 270 physicians were surveyed in the field study conducted across 20 hospitals in Xi'an (seven hospitals), Shanghai (six hospitals) and Beijing (seven hospitals) of China from 9 November 2009 to 31 May

2010. A total of 230 questionnaires were successfully collected, representing a response rate of 85%. Apart from two invalid samples with incomplete responses, 228 questionnaires were included in the data analysis. There were 150 (66%) males and 78 (34%) females. Most of respondents were in the age group of 30–49 years, representing 63% of the respondents. In education level, 124 respondents had college and university education, accounting for 54% of the sample.

TABLE 1
Demographic information of respondents

Measure	Items	Frequency	Percentage
Gender	Male	150	66
	Female	78	34
Age	~29	43	19
	30~39	72	32
	40~49	71	31
	50~	42	18
Position title	Internal	28	12
	Residency	130	57
	Attending	70	30
Work experience (in years)	0~5	59	26
	6~10	83	36
	11~15	46	20
	16~	40	18
Education	Bachelor	124	54
	Master	63	28
	Doctor	41	18

Measures

All constructs were measured using a five-point Likert scale, from strongly disagree (1) to strongly agree (5). The final score was the average of those items of each construct.

Attitudes toward EMR sharing were measured by four items ($\alpha = .884$) based on a study by Bock et al. (2005), which included: "my EMR sharing with others is good", "my EMR sharing with others is harmful" (reverse coded), "my EMR sharing with others is an enjoyable experience" and "my EMR sharing with others is valuable to me".

Subjective norms were measured by four items ($\alpha = .904$) based on a study by Bock et al. (2005) that asked the level of the physicians' agreement with the following statements: "my CEO thinks that I should share my EMR with other members", "my boss of department thinks that I should share my EMR with others", "my colleagues think I should share my EMR with others" and "in general, I try to follow the CEO's policy and intention".

Perceived behavioural control was measured by four items ($\alpha = .909$) derived from a prior study (Ryu et al.,

2003). The items included: “for me to share my EMR is always possible”, “If I want, I always could share my EMR”, “it is mostly up to me whether or not I share EMR” and “I believe that there are many controls I have to share my EMR with others”.

Reciprocity was measured using four Likert-scale items ($\alpha = .903$), from a study by Kankanhalli et al. (2005), including: “when I share my EMR, I believe that I will get an answer for giving an answer”, “when I share my EMR, I expect somebody to respond when I’m in need”, “when I contribute EMR to HIS (healthcare information systems), I expect to get back EMR when I need it” and “ when I share my EMR, I believe that my queries for medical knowledge in EMR will be answered in the future”.

Social trust was derived from a study by Chow and Chan (2008) including following three items ($\alpha = .904$): “I know that others will always try and help me out if I get into difficulties”, “I can always trust others to lend me a hand if I need it” and “I can always rely on others to make my job easier”.

Loss of knowledge power was derived from a study by Kankanhalli et al. (2005), including the following four items ($\alpha = .928$), “sharing my EMR makes me lose my unique value”, “sharing my EMR makes me lose my power base”, “sharing my EMR makes me lose my knowledge that makes me stand out with respect to others” and “sharing my EMR makes me lose my knowledge that no one else has”.

Finally, intention to share EMR, based on a study by Bock et al. (2005), was measured by four Likert-scale items ($\alpha = .895$) including “I will share my EMR with others frequently in the future”, “I will always provide my EMR for others”, “I will always provide my EMR at the request of others” and “I will try to share my expertise from EMR with others in a more effective way”.

DATA ANALYSIS AND RESULTS

Measurement model

The constructs were assessed by PLS-Graph Version 3.0, which needs small sample size and places minimal

restriction on measurement scale (Chin et al., 2003). We tested content validity, convergent validity and discriminant validity. Content validity was found by ensuring consistency of measurement constructs and extant literature. Composite reliability and the average variance extracted (AVE) were used to assess convergent validity (Hair et al., 1998). Composite reliability ranged from 0.920 to 0.949 and AVE ranged from 0.742 to 0.823 (Table 2), respectively, all scores are above the acceptable level. We assessed discriminant validity using the square root of AVE for each constructs. These square roots are greater than the correlations between construct. The results indicate that each construct shares larger variance with its own measures than with other measures (Bock et al., 2005), confirming discriminant validity.

Path model

The hypotheses were tested using SPSS 19; the results of which are shown in Figure 3. Path analyses with a series of multiple regression analyses were conducted to (a) examine the impact of SCT dimensions of cognitive, relational and structural dimensions of loss of knowledge power, reciprocity, social trust, upon attitude toward EMR sharing and intention to share EMR, and (b) examine the impact of TPB variables of subjective norms, attitude toward EMR sharing and perceived behavioural control upon intention to share EMR.

H1A and H1B suggested that loss of knowledge power was a significant predictor for both attitude toward EMR sharing and intention to share EMR. While H1A was supported, H1B was not supported. (H1A, $\beta = -.28, p < .001$; H1B, $\beta = .11, .05 > p > .01$). H2A was supported, with reciprocity a significant predictor of attitudes toward EMR sharing ($\beta = .24, p < .001$). However, H2B was not supported ($\beta = -.05, p > .1$). H3A was supported, which indicated social trust is a significant predictor of attitudes toward EMR sharing ($\beta = .31, p < .001$). However, H3B was not supported ($\beta = -.00, p > .1$).

As hypothesised in H4, H5 and H6, subjective norms, attitude toward EMR sharing and perceived behavioural control were significant predictors of intention to share

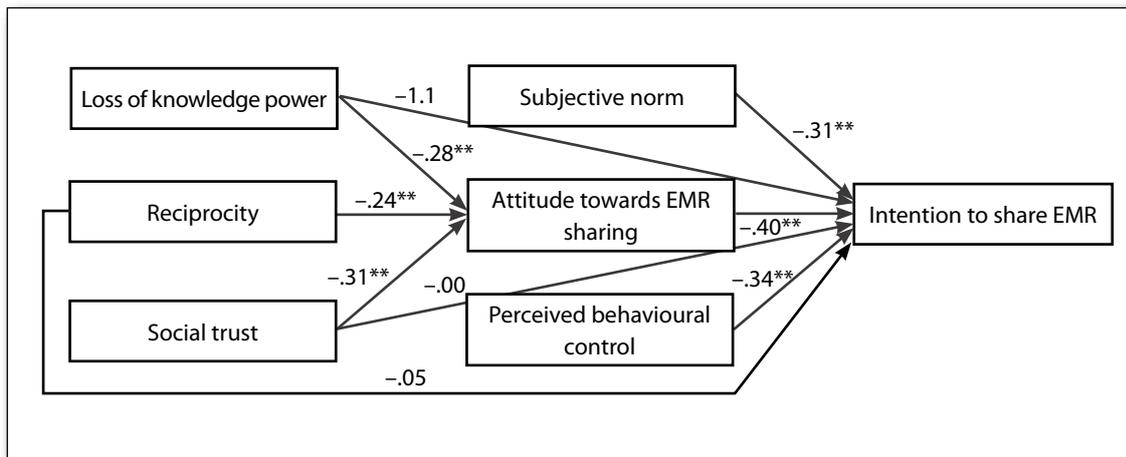
TABLE 2
Confirmatory factor analysis and correlation between constructs

	Alpha	Composite reliability	AVE	AES	ISE	LKP	PBC	REC	SN	ST
AES	0.884	0.920	0.742	0.862						
ISE	0.895	0.927	0.762	0.333	0.873					
LKP	0.928	0.949	0.823	-0.327	-0.046	0.907				
PBC	0.909	0.936	0.785	0.223	0.389	-0.011	0.886			
REC	0.903	0.932	0.775	0.311	0.246	-0.052	0.280	0.881		
SN	0.904	0.934	0.777	0.364	0.325	-0.08	0.221	0.127	0.881	
ST	0.885	0.929	0.813	0.381	0.208	-0.099	0.092	0.354	0.183	0.912

Note: LKP: Loss of knowledge power; REC: Reciprocity; ST: Social trust; AES: Attitude toward EMR sharing; ISE: Intention to share EMR; SN: Subjective norm; PBC: Perceived behavioural control

* The bold text in the diagonal row are square roots of the average variance extracted.

FIGURE 3
Research results



* $p < 0.01$, ** $p < 0.001$

EMR (H4, $\beta = .31$, $p < .001$; H5, $\beta = .40$, $p < .001$; H6, $\beta = .34$, $p < .001$). Taken together, the path analysis showed that the TPB explained the intention to share EMR well. The TPB explained 52% of the variation in intention to share EMR.

DISCUSSION

With the rapid development of computer technologies, medical software has become more mature and easier to use; hence researchers have been concerned with social factors. The findings that support H1–3A suggest that loss of knowledge power, social trust and reciprocity are social capital variables influencing attitudes. These results are consistent with a prior study showing that loss of knowledge power has a positive influence on attitudes (Huang et al., 2008). However, H1–3B indicate that social capital do not directly influence behavioural intentions. This suggests that attitudes might be easier to influence than behavioural intentions, findings that date back as far as Hovland (1951).

The theory of planned behaviour is a general theory that can predict and explain individual attitude and intention. H4, H5 and H6 were supported, which provide additional evidence that subjective norm, attitude and perceived behaviour control have strong influences upon behavioural intentions in the EMR sharing context. This research study indicates that social capital plays an important role for EMR sharing.

The theoretical implications are two-fold. Firstly, this research studied Chinese physicians' intentions from the perspective of knowledge, employing social capital theory and theory of planned behaviour as theoretical frameworks. The combined model has a satisfactory explanation of physicians' intentions ($R^2 = 0.52$). This result suggests that apart from individuals' intention, social capital plays an important role in the sharing of medical knowledge. Secondly, no direct effects were found of loss of knowledge power, reciprocity and social trust on intention to share knowledge, being mediated

by attitudes towards sharing knowledge.

This research study has some practical implications. These results reveal that the loss of knowledge power has strong and negative impacts on physicians' attitudes toward share electronic medical records. In China, physicians believe that medical knowledge confers power, thus protecting it is a form of job insurance. The government should intensify efforts to protect both intellectual property, as well as stabilise health infrastructure so that employees can work collaboratively, rather than protecting intellectual silos. The HIS in China is quite complex, yet is in the nascent stage of development. Many physicians find it inconvenient to use this system. We recommend that HIS designers need to make this system easy to use, thus improving physicians' perceived behaviour control. Besides, the manager should improve education in a group setting to increase the degree of subjective norms about the HIS. We expect these research results will provide policy guidance for the Chinese government within the healthcare sector, and offer useful lessons to other developing countries.

CONCLUSION

An integrated model was developed in our research based on TPB and SCT. This study makes significant contributions to understanding the factors influencing EMR sharing and provides exciting opportunities for future research. The use of ICTs in healthcare leads to complex applications. This is true especially in those developing countries with a fragmented medical infrastructure, spanning advanced urban areas and neglected rural areas. Nonetheless, the advance of modern ICTs, in the form of HIS and sharing of EMR suggests that in the not-too-distant future, it will be possible to integrate the more backward rural health services into those HIS that are being currently deployed in major cities. Planning for this will require answering hitherto unexamined questions. We propose the following questions for further research: What difficulties do rural

physicians encounter when using EMR, technology or social factors? Can advanced urban HIS be integrated with rural healthcare service providers? Furthermore, from a more macro perspective, how can rural physicians improve their health service delivery through ICTs?

NOTE

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An Explorative Study of ICT for Developmental Impact in Rural Areas of Bangladesh

The interest of the World Bank, various agencies of the United Nations and other donor organisations, which in the past supported information and communication technology for development (ICT4D) initiatives under the broad telecentre umbrella, seems to be waning somewhat. There are several reasons for this lack of interest. With the increasing ubiquity of mobile services, those who considered telecentres useful, mainly because of the connectivity they provided, may no longer see a need for them. Many initiatives were considered failures, as they were not financially sustainable beyond the initial funding period. There was also a lack of adequate evaluations to show whether and how these centres had contributed to development objectives. While there are several evaluations of shared facilities, there is no generally recognised framework for such appraisals, which exhibit various approaches, derived from different disciplines, mainly from information systems and to a more limited extent from development studies. Approaching an evaluation of an ICT4D project in a rural setting in Bangladesh from a development perspective, this study, which is informed by the seminal work of Amartya Sen (2001), "Development as Freedom" (DaF), adopts an interpretive qualitative research style and illustrates the importance of understanding the local context. Our findings demonstrate that the two ICT interventions studied in this research had significant impacts on the five freedoms espoused in DaF.

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The potential development impact of various forms of information communication technologies (ICTs) such as telecentres and multi-purpose access centres, in developing countries has been debated since these facilities were first implemented in the 1990s. Calls for further study in this area have been echoed repeatedly since then (e.g. Heeks, 2010; Parmar, 2009; Sreekumar & Rivera-Sánchez, 2008; Warschauer, 2003). Most of the theories and frameworks used in ICT4D

studies have been derived from research in western countries (Mbarika et al. 2005). Though there are several studies addressing the 'impact' on the personal, community and organisation levels from a development perspective, such research is still in its infancy. This research seeks to contribute to this emerging body of knowledge, by collecting and analysing empirical data using a conceptual framework derived from Amartya Sen's conceptualisation of development as freedom within the context of the capability approach (CA), recognised by many scholars such as De (2007) and so on as a suitable framework for analysing ICT4D, as reflected in the increasing number of ICT4D studies informed by this framework.

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Several scholars have applied the CA to ICT4D, or at least referred to a relationship between these, e.g. in terms of using the CA as an analytical framework, including (Barja & Gigler, 2005; De, 2007; Grunfeld et al., 2011; Mansell, 2010; Walsham, 2010; Walsham & Sahay, 2006; Zheng, 2007; Zheng & Walsham, 2008). A common thread in much of the literature linking the CA and ICT is the attention given to capabilities of users to benefit from the technology in ways that will achieve the desired functioning. Despite the growing recognition that various aspects of ICT4D lend themselves to analysis through the CA, not much of

the published research in this field has applied the CA in ways that help clarify the mechanisms through which ICT can contribute to capabilities, particularly from the perspective of the freedoms identified by Sen as being instrumental “to the overall freedom people have to live they way they would like to live” (Sen, 2001: 38). Among researchers who have focused on the freedoms, e.g. De (2007), this was not done from the perspective of users, but rather as an overview of intended and unintended consequences of a land records system (Bhoomi) in India. Also referring to Sen’s freedoms in summarising how ICTs have contributed to the broader development of India, Walsham (2010) based his analysis on a literature review rather than interpretive research.

The ultimate research objective of this study is to develop and test an impact evaluation framework designed to understand the processes through which ICT-based initiatives can contribute to development in a given society, from the perspective of the five freedoms. This study is based on two projects in Bangladesh and it is envisaged that the framework can be applied to other case studies in Bangladesh and in other countries, initially for testing and validation purposes. The research question we seek to answer through this study is: *How can ICT interventions contribute to development in rural areas of Bangladesh?*

Following a brief description of the ICT sector in Bangladesh, with emphasis on the rural context and presentation of the conceptual framework of the study, we describe the methodology used and then interpret the field study results. In concluding we address limitations and recommend a future research agenda for answering the research question.

SCENARIO OF ICT IN BANGLADESH

Bangladesh is a low-income, least developed country, with 55 million, representing 40% of the total population of 138.8 million, living below the poverty line (BBS, 2010). Agriculture is the main livelihood source in rural villages. The literacy rate has yet to make any significant progress, hovering at 62.7%. Income inequality has increased over the past five years.

The Government of Bangladesh has a long history of using ICTs to improve the livelihood of its population. Computers were first introduced in Bangladesh by the Atomic Energy Commission in 1964 (Islam, 2005), followed in the 1970s with use in the financial sector. Personal computers gained popularity in the early 1990s, receiving a real boost in 1998 when the Government exempted computers and ICT accessories from taxes, a move that coincided with substantial price reductions in the global market (Islam & Selim, 2006). The Internet came late to Bangladesh, with UUCP (Unix-to-Unix Copy Protocol) e-mail beginning in 1993 and IP (Internet Protocol) connectivity in 1996. By July 1997 there were an estimated 5,500 IP and UUCP accounts (PAN Asia, 2010). The Government of Bangladesh formulated an ICT policy in 2008 aimed at building an ICT-driven nation, characterised by a

knowledge-based society. In the light of this policy, the Bangladesh ICT sector has grown at a quick pace, with an increased involvement from local and foreign investors and companies (Chowdhury & Alam, 2009). The best known Bangladeshi ICT initiative is probably the Grameen village phone system, from which one of our case study projects has been derived.

From the indicators in Table 1 it is clear that the ICT infrastructure is quite inadequate for a country to enter into the ‘knowledge economy’. The telephone system is outmoded, with only 0.94 telephone lines per 100 people, and unlikely to grow. Growth in access to telecommunications is more likely to be via mobile networks, as demonstrated by the relatively high (31.1%) penetration of mobile services. The low level of computer ownership (2.2%) is also insufficient for a knowledge economy.

TABLE 1
ICT profile of Bangladesh

Fixed telephone lines per 100 inhabitants (Note 1)	0.94
Internet hosts (per 10,000) inhabitants (Note 3)	0.015
Internet users (per 100) inhabitants (Note 1)	0.38
Internet cafés/telecentres (per 10,000 inhabitants) (Note 3)	0.19
Cell phone subscribers per 100 inhabitants (Note 1)	31.1
Number of web sites in the national language (Note 3)	200
Number of websites in English and other languages (Note 3)	600
National bandwidth within the country (Note 2)	68 Mbps
National bandwidth to and from the country (Note 3)	112 Mbps
Computer ownership per 100 inhabitants (Note 2)	2.2
Broadband Internet Subscribers per 100 inhabitants (Note 1)	0.03
Radio sets per 100 inhabitants (Note 3)	6.4
TV sets per 100 inhabitants (Note 3)	10.6

Note 1: 2009. Source: UNCTAD (2010)

Note 2: 2008. Source: ITU (2010)

Note 3: 2007. Source: ITU (2007)

The Bangladeshi government has declared ICT an important sector for national development under its vision 2021 on Digital Bangladesh, and taken action to extend the benefits of ICT to remote rural villages by implementing ICT based development initiatives across the country. Several NGOs have also been active in this pursuit. Not much is known about the influence of these initiatives on development, so this paper will make a contribution in this area, in terms of understanding the how villagers in remote areas perceive they have benefited from ICT initiatives.

Before presenting the approach used for evaluating the projects we outline the theoretical framework informing this research.

THEORETICAL FRAMEWORK OF THIS STUDY

The theoretical framework of this study is informed capability approach (CA) (Sen, 2001). At the heart of the CA is the importance of the “expansion of freedom... both as the primary end and as the principal means of development” (ibid: xii). Development is considered an extension of freedoms, which are viewed as the basic building blocks to development, as well as “the expansion of ‘capabilities’ of persons to lead the kinds of lives they value—and have reason to value” (ibid: 18). This focus on freedom, which distinguishes the CA from frameworks advocating growth at any price, e.g. doctrines suggesting ends justify the means, does not mean that economic variables, such as income, are irrelevant. They are however inadequate for measuring quality of life and livelihoods. In the CA, certain political and social freedoms, such as the freedom to participate in political activities and to receive basic education are considered to be constitutive of development (i.e. they are relevant whether or not they contribute to development and/or growth). Certain capabilities are required to achieve and enjoy freedom. Subject to external constraints, it is then up to each individual and/or community to translate these capabilities into functionings, which describe what a person is actually doing with his or her capabilities.

Focusing on rural areas of Bangladesh, this research develops an impact evaluation framework for understanding the processes through which ICT-based initiatives can contribute to development, where this term is viewed from a CA perspective, i.e. human development is a process of expanding people’s capabilities (ibid). What matters, according to Sen (2001), is what people are capable of being, or doing, with the resources to which they have access.

Access to ICTs, for instance, can lead to the development of capabilities, such as being educated, healthy and participate in governance processes, thereby positively affecting the Human Development Index of a country. Hence, the kind of information which individuals consider important, whether and how they can access such information, and the extent to which they apply it in their daily lives are important questions. This is connected to the concept of choice and people’s freedoms (Gasper & Staveren, 2003) in that where ICT is available, people have the choice whether and how to use it, but only if they have the necessary capabilities.

In applying the CA, we focus on whether and how an ICT project has increased the capability of people to achieve freedoms at the individual and community levels. In particular, we are interested in the five freedoms that Sen suggested would contribute to the general capability of a person to live more freely: political freedoms, economic facilities, social opportunities, transparency guarantees and protective security.

RESEARCH METHODOLOGY

This research follows an interpretive approach through a case study method. An interpretive approach, using qualitative methodologies gives this research scope to address issues of ICT’s influence and impact on development, and assists us in understanding processes, as interpretive research lends itself to investigation of complex human processes within their social context (Evert, 2003; Myers & Avison, 2002; Walsham, 2002). The aim of the data collection was to gather information to answer the research question. A flexible research instrument was designed to enable us to ask questions that could capture the perspectives of participants and respondents within their settings (Evert, 2003; Taylor & Bogdan, 1984).

We applied a purposive sampling procedure to select the ICT4D projects, villages where the projects operated and respondents. Criteria included the length of time an initiative had been in operation (minimum 10 years) and convenience. Respondents included the operator/trainer (in-charge of operations), users, government officials and other villagers who were aware of the ICT4D project. The sample size was not pre-determined and data was gathered from the above categories and from local secondary sources (official records, reports and statistics from the local public offices) during the one month stay in each village. Together these sources formed a rich data set.

Data collection techniques included in-depth interviews, focus group discussions (FGD) and observations. The discussions during the interviews and FGDs centred on the ICT4D projects and their influence and effects on the socio-economic and socio-cultural development, as well as the effectiveness of the ICT programmes and views on facilities offered.

Interviews were voice-recorded in the local language and translated into English by the research team. Thematic analysis (Boyatzis, 1998) was used for field data analysis and this activity assisted us to identify the issues or themes that emerged from interview transcripts. Until recently, qualitative researchers were not very explicit about how they went about assigning units of meaning to their data (Miles & Huberman, 1994). We followed the method of doing this as proposed by Agar, (cited in Miles & Huberman, 1994: 57): “the conventional advice was to go through transcripts or field notes with a pencil, marking off units that cohered because they dealt with the same topic and then dividing them into topics and subtopics at different levels of analysis”. In this method it is expected that topics (themes) or subtopics (sub-themes) recur with some regularity; so, finally, themes or sub-themes are given names. The following four steps show how we identified or discovered issue/themes from the interview transcripts:

1. Highlighted and identified meanings of sentences or paragraphs (in transcripts) that we felt relevant and important to the research objectives/questions;
2. Put a label on each identified meaning within sentences and placed labels on the tables;

3. Grouped relevant labels in order to discover sub-themes;
4. Grouped sub-themes in order to establish over-all themes.

The entire process followed an iterative cycle, the intention being that themes from one study site would guide us to explore similar or new themes in other studies; this was achieved and themes were established. Following Stake (1995), we avoid 'generalisations' and give a clear description of the context along with the interpretation in our case study before introducing the theme statements for each study site, thereby facilitating 'particularisation', as advocated by Stakes.

In this paper we describe particular case studies and interpret the participants' experiences in context; so the focus is on the uniqueness of each case. Taking this approach to our research produced unique knowledge within a particular context.

The quality of research was enhanced through the following measures:

- Triangulation through the various data-collection techniques and data sources for our research, which increased the data validity and reliability and reduced the risk of bias;
- A wide spectrum of perspectives was obtained by in-depth interviews, focus group discussions, observations and document reviews involving different participating groups. This enabled us to obtain interpretations from different participants, as proposed by Benbasat et al. (1987), cited in Myers and Avison (2002);
- We followed Klein and Myers (1999) as a guide to principles for conducting and evaluating interpretive field study research.

RESEARCH SITES

Extensive thought was given to the choice of study sites, which was selected through consultations with officials of two projects: Gonokendras (multi-purpose community access centres) and Grameenphone Community Information Centres (GPCICs) in rural Bangladesh.

Gonokendra (Multi-purpose community access centre) Bangladesh Rural Advancement Committee (BRAC) has introduced community-based village libraries known as '*gonokendra pathagar*' in rural areas under its education and continuing education programmes with the introduction of new ICT programmes; the '*Gonokendra Pathagar*' was renamed to '*Gonokendra*', which stands for multi-purpose community access centre. With over one million members in 2010, there were 2,200 *gonokendras*, 950 of which had ICT programmes. The objectives of the ICT programme are to:

- Increase familiarity with computers in rural communities,
- Promote computer training in rural areas,
- Create access to Information Technology (IT) education (CDs covering basic Health, Mathematics

and English language topics) for rural youth, adolescents and adults,

- Expose rural people to new and modern technologies and develop skills and capacity of librarians, adolescents, youth, general villagers to face future challenges, and
- Give special attention to poor women, girls and disabled villagers. BRAC fully or partially subsidises training fees for these groups.

The intended outcome of the Gonokendra IT programme is to extend access for rural communities to a range of top quality, on-going and financially sustainable IT-based education and information services.

Grameenphone Community Information Centre (GPCIC)

A GPCIC is a shared ICT access facility where villagers can access a wide range of ICT services, such as the Internet, voice communication, videoconferencing, and locally relevant and customised information services on topics such as health and agriculture. With the motto '*Alo Ashbei*' (The light must come), GPCIC is committed to providing high quality access to information through its telecentre based model. This initiative by Grameenphone is consistent with its long term commitment of providing ICT access to previously unserved areas, as it did with the village phone system, through which it became the largest mobile service provider, with 22 million subscribers (43.6% market share) (Bangladesh Telecommunications Report, 2010). There are 556 GPCICs in operation in 450 *upazillas* (sub-districts) in Bangladesh (UNESCAP, 2009). The objectives of this project are to:

- Bridge the "digital divide" by providing information access to rural people,
- Alleviate poverty,
- Provide opportunities for the disadvantaged to gain knowledge through information-based services,
- Build local entrepreneurship and improve capacity, and
- Create employment for unemployed youth.

FIELD RESULTS AND REFINEMENT OF THE CONCEPTUAL FRAMEWORK

As a first step in assessing the development impact from a local perspective, we tried to find out the perception towards development from the interviewees. At the two study sites, we found different views among trainees or users, trainers and officials, respectively, so, in discussing the development dimensions, we use these three broad categories.

This section presents the key findings from the two study sites, described in the form of story-telling by the participants. This format gives a direct voice to their opinions and interpretations of the ICT-led development at the (micro) level, within their natural setting/social context. We interpret the development aspects from two perspectives:

1. The definition of development based on categories identified by the respondents when considering their role at each study site, and

2. The themes arising from our field data, as derived from the interviewees’ comments and experiences.

These are interrelated, because they first assisted us to identify some emergent themes that could be investigated further from the second perspective.

In both analytical perspectives we treat participants’ statements as “proof of concept”. We believe the reliability of our interpretations is reinforced through the provision of statements from many participants, whether these are unique or common within and between different groups and the two sites. For this reason, we include some additional statements on the same themes as part of the issues/themes perspective when revisiting the outcomes from the respondents’ categories. From the second perspective we elaborate on our interpretations of emergent issues or themes that are less focused under the first perspective: this provides a basis of comparison between the interpretations of the various categories of participants across the two study sites, to provide a general understanding of ICT-led developmental impact at the micro level.

In summary, the first perspective is more abstract in nature, but is explained further through the second perspective. The discussions presented through these separate perspectives are central to the implementation of our conceptual framework.

The results summarised in Table 2 inspired us to revisit our field data to gain further understanding of the issues that had emerged, resulting in the presentation of the results according to the emergent themes of two sites, as shown in Table 3. Some of the elements in that table indicate that at least part of the discussions centred on development from the perspective of the five freedoms identified by Sen (2001), and mentioned at the end of Section 3. In the rest of this section, we elaborate on findings with

respect to these freedoms.

TABLE 3
Summary of development indicators at two study sites

Respondent	Site 1 (GPCIC)	Site 2 (Gonokendra)
Librarian/trainer	<ul style="list-style-type: none"> • Education • Social recognition • Health and sanitation 	<ul style="list-style-type: none"> • Education • Increase in decision making capacity
Trainees	<ul style="list-style-type: none"> • Education • Social independence • Economic independence 	<ul style="list-style-type: none"> • Use of learned knowledge
Officials	<ul style="list-style-type: none"> • Effective use of useful knowledge 	

Political Freedoms

Multimedia training sessions at Gonokendra provide information designed to increase legal awareness among the participants. The legal awareness issues include penalties associated with dowries, acid throwing and other outlawed activities. According to a participant: “I know the punishment for acid throwing is death. Not only that, I know dowry is a social crime.” Another participant shared his feelings:

In our village early marriage is a huge problem. This creates more problems for the family. The parents think that by giving early marriage, they get rid of one of their family members but they do not think how this decision can bring more problems. I’m well aware...

TABLE 2
Summary of key findings of field data from the two projects

Respondent	Site 1 (GPCIC)	Site 2 (Gonokendra)
Librarian/trainer	<ul style="list-style-type: none"> • Financial benefit • Chance to contribute towards society • Social acceptance 	<ul style="list-style-type: none"> • Gain independence • Opportunity for personal development • Increase social recognition and respect
Trainees/users	<ul style="list-style-type: none"> • Aware about the legal issues • Participate in establishing the local welfare agenda • Increase entrepreneurial skills • Access to resource increased • Knowledge about alternative credit sources • Increase management skills • Increase social status • Easy access to information • Try to help people in the time of disaster 	<ul style="list-style-type: none"> • Gonokendra is locally appropriated • Share information with family and friends • Increase leadership and management skills • Share knowledge between users and non-users • Increase social status • Friends and family appreciate the active role • Information is easily accessible and understandable • Knowledge about fertility • Try to inform others about disasters
Officials	<ul style="list-style-type: none"> • Motivation to provide information • Towards building a learning society • Greater community participation • Self sustained project • BRAC provides technical support 	

This notion was also discussed by another participant who directly came to the point by saying: “The marriage age of males is 21 years and for female it’s 18 years. If anyone marries under these ages, then the marriage is called early which is illegal.”

In addition to being aware of legal issues, participants expressed their opinions where applicable. For example, a young boy took the initiative to stop the marriage of his sister, after the bridegroom’s family demanded a dowry. In explaining how the programme enhances the power of expressing opinions, a female interviewee said smilingly:

Well... if you don’t know if a thing is good or bad how will you make any decision? You can’t make decisions unless or until you know about that thing. Expressing an opinion is also a thing where you have to know what you are talking about. If you know more you can express more. Not always everybody think rationally, but we have to put opinion with some logic.

The social arbitration systems in Bangladeshi villages are sometimes based on the misinterpretation of the holy verses of the Koran and legal awareness is required to overcome misconceptions. Gonokendra participants played an active role in this aspect and in the welfare of the society, showing sensitivity to the local political and legal systems. Users and trainers at Gonokendra conveyed a sense of urgency about learning and their intention to change the society, using their increased awareness and knowledge. The participants were active in formulating agendas for development and those who did not participate in this process were aware of its importance, as illustrated by a young participant:

When any important decision is taken in the family as well as in the community we are really curious about the outcome. Because we are too young for coming up with our ideas but always want good decisions which bring better outcomes for the society.

These thoughts and perceptions are interpreted as an emergent issue, consistent with political freedoms, one of the five freedoms articulated by Sen (2001).

Economic facilities

The head master of Bhoanipur High School emphasised the economic impact of the Gonokendra and GPCIC ICT programmes. In the context of Bangladesh, with 40% of the population (and even higher in rural areas) living below the poverty line, the economic aspects are of vital concern in the daily activities of villagers, who are always in search of opportunities to improve their livelihoods. But the irony is that access to economic assets and utilisation of available local resources were so deficient that the most disadvantaged did not benefit from these assets until they became more aware of how they could better utilise available resources, after learning about it at the ICT4D projects.

The benefits of computer training far exceeded the minimal course fees, as articulated by a teacher in a focus group discussion:

I must say that this ICT training must be mandatory for each and every one because it’s a requirement of the time. There’s no such training institute that gives such training with such minimal fees. So Government must come forward to launch area specific or union specific such types of computer programme.

The general course which focused on the educated youth helps the participants learn the basic Microsoft Office applications, which these days are a necessary complement to other educational qualifications in the formal labour market, as expressed by one official:

In our village one participant got a job in a branch of a private commercial bank and earns a handsome salary which would not have been possible for him with his qualifications alone. This is the case for most of the participants who take the general course.

Livelihood improvements are highly related to the enhancement of skills and abilities. The normal course curriculum has more emphasis on theoretical and rote learning approaches, than on practical, work related skills. There are only a few vocational training institutes serving the areas studied, but the demand was so high that a substantial proportion of willing students could not enrol. The ICT programme was helping the students and unemployed youth improve their skills and ability to learn and work. One participant expressed his gratitude towards the ICT programme:

I can’t take decision what business to start because I’ve little capital to invest. With the motivation of some successful friends I got a general training which helps me to understand the basics of computer. After the course I also take short time training and with my little capital I have decided to open a business to provide basic computer service. When I expressed my idea of opening business before the training, only a few people supported me. But this time they help and motivate me and with the mercy of the almighty I am now doing well.

Access to economic resources is also a vital factor in gaining economic freedom, especially in the rural areas where resource utilisation is hindered by challenges such as lack of education, power shortages, superstition and gender discrimination. Gonokendra and GPCIC ICT have helped communities achieve access to economic resources and more importantly assist them with agriculture and other small economic endeavours. The projects have also empowered women to join the workforce, as illustrated by female trainers at Gonokendra. In the focus group discussion in Bhoanipur village, one committee member said:

I want to add something about the former librarian/trainer of this Gonokendra, Ambia, who is now in a very good post in another organisation and earns a handsome salary. How is it possible? It's possible only because of the training and experience she gained from this Gonokendra programme. She's married and around 28 years of age and can contribute a lot towards her family.

Social opportunities

The two projects have helped the trainers particularly increase their management and leadership skills, as a result of them managing the operations of the programme. They have demonstrated leadership qualities by arranging cultural and sporting events. One of the participants started a social organisation that educates and mentors school age children. One of the officials said:

The participants are away from drug addiction and they can practice social values. In one of our adjacent villages some college and university students started a union and those are also ICT participants of our GPCIC. That organisation is free from drugs. So I feel if this programme is continued in every village then our young generation must benefit from skills and can also save themselves from the abuse of drugs.

Community members felt strong attachments to both the programmes, which were highly appreciated in the community. One official said,

... the programme is really a community programme and there is full, or I can say active participation of the community in this project. The local community is involved in the formation of GPCIC. The community contributes a certain amount of money and the operation is continuing, using the help and effort of local community members.

The GPCIC and Gonokendra programmes were well accepted by family members of the participants and one of the main reasons behind this is the equal learning opportunities provided by the non-discriminatory course composition and training curriculum. The female trainer supported this view:

If you go through the existing number of students you can easily find that the participation of girls is substantial. They also feel comfortable to learn computer use from me. My participation helps the girls convince their parents about them attending the ICT course and the parents sometimes visit the Gonokendra and express their willingness to continue their support. Another thing I need to add is that the schools for girls are starting the Gonokendra programme as well.

Transparency guarantees

The main objective of Gonokendra and GPCIC is to provide information to the community through their libraries and ICT resources, to help community members

gaining knowledge in diverse areas. Such an ICT programme can also help schools start a new lab-based education system, as suggested by a Committee member:

The success of this programme also helps us introduce newer types of education systems in the school which is a requirement of modern times. Lab based education is still not available in many big training centres, but we started a programme of that nature and operate it successfully to gather knowledge. The students are familiar with computer through this ICT training—that's why it's possible for us to make that computer lab based education a success. So I can say with confidence that the ICT programme is really a good move for us ...

Also the secretary of the managing organisation of Gonokendra expressed his feelings,

The participants can learn computer and can also read books and newspapers in addition to their normal curricular education. The teachers also got training from this centre. They know about the new system of teaching that's why the quality of education also increased. The computer lab based education in the school is the result of this initiative. Both the teachers and students are accustomed to the computer through ICT training which has made them fit for the digital world.

Each Gonokendra has a set of 15–20 compact disks (CDs), most of which have been produced in the local language with multimedia based information. The participants watch these CDs in a group organised by the librarian/trainer once a week. The CDs contain information related to different educational and social awareness issues, such as the following:

- General knowledge
- Health information: Dealing with diarrhoea, drinking safe water, using sanitary latrines in the household, child and pregnant mother healthcare, basic cleanliness issues, AIDS, etc.
- Legal information: Early marriage, dowry, women's rights, legal assistance, etc.
- Environmental issues, e.g. using organic fertilisers.

In response to a question whether the disseminated information is practiced by the households or not, one of the trainers answered by saying:

Well if you go to the households you can see that they really practice what they have learned, which is a very good sign. Every member of the family uses the sanitary latrine and they follow the health rules. They are aware of safe water and health issues. It's an obvious contribution of information dissemination by Gonokendra and other sources.

Protective security

Bangladesh is one of the most vulnerable countries in terms of the adverse effects of the global climate change. The country has suffered from numerous natural disasters

like cyclones, floods and droughts that are very damaging for the agricultural economy. Information about such disasters can be a new dimension of the programme. One official said:

The information about disasters is given, but in a small scale. If any calamity arises then we make it known to the participants. But this information is an untapped potential regarding the expansion of multimedia materials for information dissemination sessions.

The participants shared the information about natural disasters and intended to help community members with its dissemination in a timely manner in critical situations. A participant addressed this issue:

When I got the information of floods around the district I realised the flood was also coming to our village and the crops and lands were going to be inundated. Then I told my brother and neighbours to take action like cut the early ripened crops and preserve drinking water. These measures I know from GPCIC.

Another participant shared his experience:

In the time of Sidr¹ we didn't think it would hit our village. But when we heard the signal was 10 then we took steps to reduce the damage by telling others to be aware that the cyclone might hit the village and we told all to stay in a safe house where there was no risk of injury by falling trees.

Soil fertility is another issue of which the participants became more aware. The use of chemical fertilisers reduces the soil fertility while organic fertilisers preserve and increase the fertility. In some cases, the use of chemical fertiliser has caused big losses to the rural people.

The ICT programmes disseminate information relating to the importance and use of organic fertilisers instead of chemical fertilisers on cultivated land. The participants found information that was very helpful for their farming methods, learning how to make organic fertilisers using kitchen waste and other natural substances which cost them nothing. Participants obtained information about this from the project resources and also through interactions among themselves and tried to help others with that information.

REFLECTION OF THE FIELD RESULTS: BLENDING FIVE FREEDOMS

We now summarise the interpretation of the results, combining Sen's five freedoms. The results clearly indicate the close relationship between Sen's five freedoms in that the achievement of one freedom facilitated the achievement of other freedoms and capabilities. For example, those with low economic facilities tended to fall behind in other freedoms, such as social opportunities in terms of education for children and the capability of being healthy. One operator shared his experiences:

The financial condition of my family was too bad. It was impossible for me to feed three meals my children, education and proper treatment was like a day dream to me. But GPCIC changes my fate dramatically. Now, my monthly earnings offer me a happy life where I am able to feed my children, send them to school and provide them proper treatment. I said good bye to quacks.

Social awareness increased with improved education, which was facilitated by economic opportunities. Social opportunities were also enhanced from the large social networks established through the centres. As the training was available to and used by the more marginalised at low or now costs, they had the opportunity of enhancing their knowledge about a range of issues, including politics, society, economy and culture. As a result, social awareness increased among them. To support this argument, we refer to a statement by one female operator:

My husband bears my family expenses. Most of the time, demand exceeds income. I had a keen interest to send my children to school but financial barriers became a great problem. Suddenly, I got information about GPCIC. It was possible for me to start the business due to little investment. Now, my monthly income is around thirty five thousand taka and I can contribute to my family as well. My daughter is going to school as well as I am going to elder education centre because I realised that without education it is impossible to develop a human's fate. Every week I arrange a meeting in my shop where people discuss about the importance of education, health and social awareness. The most important achievement of my life is that my position is now established in the society and I can make decisions in my family and implement them as well. In addition, my husband also discusses with me before doing something which was unexpected before.

However, it is not possible for all people in rural areas to achieve all the freedoms and sometimes villagers are reluctant to achieve some freedoms. Therefore, economic facilities do not always bring social and political awareness. In this regard an operator's statements can be shown as an example. He said:

The financial condition of my family is well. In every matter my decision is final as I am the chief of my family. I don't care about my wife's decision.

We interpret this statement to mean that while the man has economic opportunity, he lacks political and social awareness and does not realise that women's contribution is essential for overall development.

As opposed to the previous argument, a GPCIC not only offers economic opportunities, but also helps to achieve other freedoms. According to a young operator said:

I started at GPCIC as a part time job besides study. I bear my own expenses as well as help my family.

I also try to get information on agriculture, health and education and try to reach them to general people. Therefore, it is possible for me to establish a unique position in the family and society. After completing studies, I have an intention to do something for my village.

SUMMARY, LIMITATION AND FUTURE RESEARCH

Adopting Sen's (2001) notion of "development as freedom" to understand our field results, we considered five basic freedoms and mapped the field results to these. Participants gained access to Gonokendra and GPCIC, where they participated in multi-media based information dissemination programmes and become aware of different social, economical, cultural and political issues. They applied their knowledge in their daily lives, and disseminated information to others. We found Sen's (2001) approach to socio-economic development to be very useful as a foundation for analysing ICT related development activities.

This research is an attempt to investigate the impact of ICT-led interventions in Bangladesh implemented by two organisations in two different villages, using a framework inspired by Sen's (2001) freedoms. The empirical work summarised here is of a qualitative, interpretive and exploratory nature, aimed at analysing the field data from the participants' perspective, rather than from the programme objectives. We found positive reactions and outcomes to the activities of Gonokendra and GPCIC. There are some limitations in the conduct of this research, the most important of which relates to data collection and attribution of impacts, as other development activities were taking place in the villages simultaneously. Much effort was devoted to motivate the respondents to provide relevant and concrete data.

The improved understanding of ICT4D impacts through the use of Sen's five freedoms would be useful in assisting international aid agencies to better plan, monitor and evaluate future project developments and implementations. This translates into national benefits by improving the delivery of aid to developing nations while improving the social benefits. Specifically, the results could be used by bi-lateral and multi-lateral agencies to better understand ICT4D's contribution to development. The approach could also be adopted by monitoring and evaluation consultants. Assuming it can be demonstrated that the application of CA's five freedoms is useful in different cultures, the results from this project can benefit other developed countries in various contexts by providing a new tool from assessing the impacts of ICT4D projects, encouraging governments and NGOs to improve the design of projects, taking into account wider impacts. This framework will be applicable to rural-remote areas where community level impacts of ICT are poorly understood. From our research in general and application of Sen's five freedoms' in particular, best practice can be developed with the potential to save time and costs through a framework with general applicability, thereby optimising

funding of future ICT projects. Using this approach to develop indicators, would encourage policymakers to pay more attention to the economic and social aspects of ICT4D interventions. By focusing on local values, capabilities and sustainability, participants are more likely to consider the longer-term environmental aspects of their development aspirations.

Further research would be required to refine the research approach to obtain more relevant data and to explore whether it is possible to better understand the role of ICT4D initiatives such as Gonokendra and GPCIC in the context of other developmental activities in a particular area.

NOTE

1. 2007 Cyclone Sidr.

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If You Build It, Will They Come?

Adoption of Online Counselling among Overseas Migrant Workers

This study presents a model integrating perspectives from migration, help-seeking behaviour and technology adoption in examining the adoption of online counselling for migrant workers. The model suggests that adoption of online counselling among overseas Filipino workers (OFWs) is driven by a felt need and nature of location. Expressed concerns typically related to marital and relationship issues, family and parenting, homesickness and loneliness, work-related, and cultural adjustment. Majority of site users were based in the Middle East. A second factor influencing online counselling adoption is technology acceptance and adoption. In particular, data from non-users reveal that access to technology and lack of skills are major barriers to use indicating technology. Finally, the interviews also highlight the cultural barriers and misconceptions that may hinder migrant workers from seeking online counselling. However, site users report positive feedback about the site in providing social support to OFWs.

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In the Philippines, an estimated 10% of the population, or around 11 million, have left the country to work in various parts of the globe (Philippine Overseas Employment Agency, 2008). These overseas Filipino workers (OFWs) have proven to be a boon on a macro and micro level, uplifting the Philippines' economy at the same time improving the lives of the families they left behind. Unfortunately, there are social costs associated with the migration of labour including depression, abuse and stress. The families left behind are affected as well. For example, children of migrant mothers reported higher levels of anxiety and loneliness compared with children non-migrant parents. Infidelity and deterioration of family bonds has also been attributed to family and spousal separation (Scalibrini Migration Centre, 2003). Given the psychological distress experienced by both OFWs and the families they left behind, the overarching goal of this paper is to aid in providing mental health interventions to these populations.

The transnational nature of migrant work makes it difficult to provide basic psychological services. Fortunately, counselling and psychotherapy can now be provided through various Internet-mediated modes of communication. Online counselling is the provision of mental health intervention using technology-mediated communications such as fax, telephone, and closed-circuit television (VandenBos & Williams, 2000). The

practice of online counselling is burgeoning and slowly gaining acceptance. Just in the last decade, the websites offering online counselling jumped from 12 in 1995, to 250 in 2000 (Ainsworth, 2002), and in 2006, one online counselling website reported having more than 1000 therapists in their roster (Lavallee, 2006).

Unfortunately, much of the literature on online counselling is from the West and there are concerns whether such intervention would work for citizens of developing countries particularly in Asia. There is also no existing model to explain adoption of online counselling among migrant workers. In this paper, we examine the viability of online counselling as a means of providing psychosocial support among Filipino migrant workers integrating perspective from migration, help-seeking behaviours and technology adoption.

REVIEW OF RELATED LITERATURE

Migration and sojourner adjustment

Any relocation requires some adjustment on the part of a sojourner. Researchers have examined the variables that predict the adjustment process such as those related to the host country. For example, there is evidence that culture novelty or the degree of difference between host and home countries or culture is negatively related to adjustment (Church, 1986). It also appears that certain locations may be more challenging than others. For example, the Asian Migrants Coordinating Body declared the Middle East as the "most distressing OFW destination" because of gross violation of human and labour rights (Olea, 2008).

Beyond location, family and spousal adjustment are likewise strong predictors of the adjustment of overseas workers (Hechanova et al., 2003). Not surprisingly, OFWs commonly report depression, loneliness, increased stress, and homesickness (Briones, 2008).

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Help-seeking behaviour

Given the difficulties of cross-cultural adjustment it would be understandable, and even expected that migrant workers would seek help in coping with their challenges. However, research on help-seeking behaviour reveals that not everyone actually seeks professional counselling. In particular, help-seeking behaviour appears to be a function of several factors.

People seek professional help when they experience great psychological discomfort. Beyond loneliness and stress OFWs, especially those illegally staying in the host country, also experience abuse and being persistently fearful of possible deportation (Briones, 2008; Lee, 2006).

In terms of gender, men report more negative attitudes towards help seeking, and are less inclined to seek help when they need it (Tudiver & Talbot, 1999). Consequently, men underutilise mental health services, and seek counselling and psychotherapy less often than women (Vessey & Howard, 1993). This reluctance to seek help, researchers argue, places men in greater physical and psychological risk, hence the need to link men with the available medical and psychological services (Good & Wood, 1995).

The propensity to seek help is also dependent on one's perception of the availability of social support. However, there appears to be cultural factors that may affect help-seeking behaviour. Asians, compared with their Western counterparts, have a stronger belief that one's problems should be solved independently; and are concerned about the possible stigma and negative relational consequences of seeking help from others (Kim et al., 2008; Zane & Yeh, 2002). Not surprisingly, Asians underutilise mental health services, and are less likely to reveal emotional and interpersonal problems and to seek help from mental health professionals (Matsuoka et al., 1997; Zhang et al., 1998).

When Asians do seek help, there is research that suggests that their expectations of counselling differ from that of Americans. Mau and Jepsen (1988) found the three primary roles as perceived by Chinese students were friend (75%), expert (61%) and listener (31%). In contrast, American students expected their counsellors to be listeners (77%), friends (53%) and expert (50%). Their study also revealed that compared to Americans,

Chinese students prefer older counsellors when seeking counselling for personal problems.

Adoption of online counselling

Preliminary data on adoption of online counselling suggest that most online counselling users are female, between ages 25 to 44, had an average of five sessions ($SD = 4$), and typically presented relationship and family issues, followed by mood and anxiety related problems (Chester & Glass, 2006).

Beyond gender, culture also appears to be a factor. Although it is logical to assume that Asians would prefer online counselling because of the anonymity that the platform provides, studies suggest that Asians and Asian Americans had less favourable attitude towards online counselling compared with face-to-face therapy (Chang & Chang, 2004; Rochlen et al., 2004).

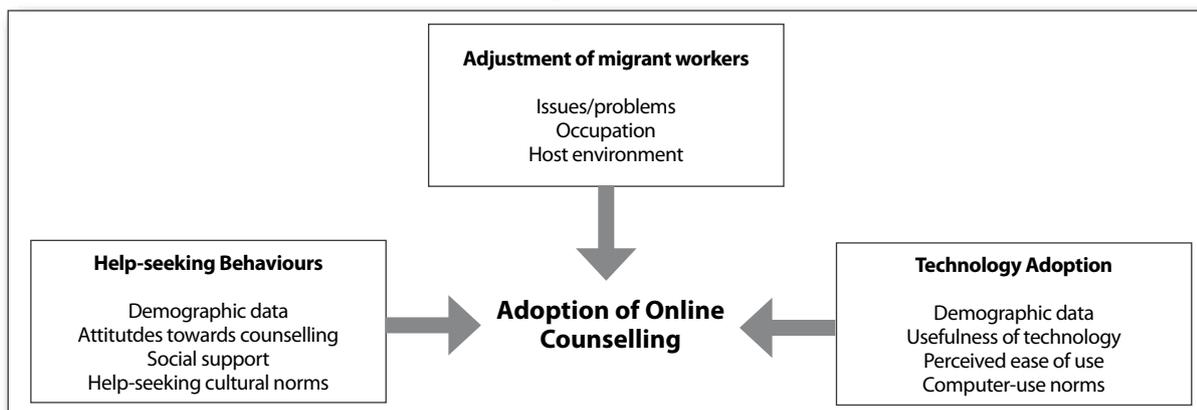
Technology adoption

Adoption of online counselling is premised on the assumption that users are actually techno-literate. Yet not everyone who may want to seek help will actually use technology to do so. The Unified Theory on the Use and Acceptance of Technology (UTAUT; Venkatesh et al., 2003), suggests four elements that influence the use of and intention to use technology: the belief that a system will increase job productivity and performance, the degree of ease associated with using the technology, the perception of an individual that significant others believe she or he should use the technology and individual's belief that an organisational and technical infrastructure exists to support technology use. The theory also suggests that gender influences technology-use. This is validated by studies showing that women perceive new technology to be more effortful and men are more likely to make use of novel technology compared to women.

STUDY FRAMEWORK

The proposed framework integrates data gathered from pilot of the project and literature on cross-cultural adjustment, help-seeking behaviour, and technology adoption. Although these various frameworks can be

FIGURE 1
Conceptual framework



Source: Authors

applied individually to the behaviour of online counselling adoption, they are incomplete by themselves. Thus, we developed an integrated framework that we wish to test. Figure 1 summarises these factors.

Research problem

Given the dearth of information on the migrant workers and online counselling, this study examines usage of OFW Online site in terms of the profile of users as well as the issues they raised. Such information is important to determine the reach and viability of technology-mediated counselling among migrant workers. Another limitation of the literature on online counselling is the lack of information about the perceptions and attitudes of non-users. Technology acceptance theories (e.g. Moore & Benbasat, 1996; Venkatesh, et al., 2003) have emphasised the predictive value of perceptions and attitudes in the adoption of new technology hence this study examines OFWs and their families who are non-users of the site. Such information is invaluable in reaching out and transitioning non-users to users of online counselling.

More specifically, this study seeks to answer the following questions:

1. How does the profile of OFW users in terms of issues raised, occupation and host country influence adoption of online counselling?
2. How do help-seeking factors influence the adoption of online counselling?
3. How do technology-related factors influence the adoption of online counselling?

METHOD

The platform

In order to reach a population that does not have access to traditional mental health services, the Centre for Organization Research and Development and Department of Psychology of the Ateneo de Manila University in 2009 launched OFW Online, an Internet site that provides free online counselling for OFWs and their families. Counselling in this website is conducted through synchronous chat and asynchronous email format. After registration, users can choose to schedule an appointment with a counsellor or chat with the counsellor-on-duty. All counsellors are either volunteers who hold a Masters Degree in Counselling Psychology, or graduate students pursuing the same degree. Additionally, all counsellors underwent training on online counselling, labour migration, and OFW issues, and are under supervision of the Clinical Psychology faculty of the university.

Participants

To provide a profile of OFWs that made use of the website, the demographic variables of 191 OFWs who registered in the site beginning July 2009 to October 2010. To obtain informed consent, OFWs who registered and availed of counselling services were asked to electronically sign a document stating that chat conversations and email correspondence will be used in a study, and that they have

the freedom to withdraw from the study anytime they wish. A total of 91 chat transcriptions and eight e-mail correspondences were content analysed.

To understand the perceptions and attitudes of non-users about online counselling, 30 individuals (10 OFWs, 10 spouses, 10 children) were invited to participate in the study using a stratified purposive sampling method and a number of selection criteria. First, OFWs were defined as migrant workers who left their country of domicile (i.e. Philippines) and whose sole purpose was to seek better occupational opportunities (as opposed to immigrant workers who left the country with the intent of changing nationality or remaining in the host country). Second, the OFWs should have immediate family members (i.e. spouse and/or offspring) left behind. Finally, OFWs should represent different occupation-types (e.g. white- and blue-collared workers, sea-based workers, household helpers, etc.) and location (refer to Table 1) to represent the variety of experiences and capture the heterogeneity of the OFWs' work and location. Potential participants were identified and invited through the individual and institutional contacts of the authors. After being presented the objectives of the study and signing an informed consent form, participants were asked: What are the difficulties you experience being an OFW/spouse or child of an OFW?, Who do you talk to about your problems?, When you hear the word counsellor what comes to mind?, Do you have access to the Internet?, and Would you consider using online counselling?. Interviewers probed and urged respondents to expound on their answers.

Data analysis

The counselling, email, and interview transcriptions were analysed using inductive content analysis (Elo & Kyngäs, 2008). Email correspondences and interview and counselling transcripts were given to two graduate students and the first and second author to read thoroughly. Coders were asked to read and re-read the transcripts and correspondences, conduct open coding, and generate preliminary categories. In generating categories, coders were asked to look for patterns in the answers, notice and group answers with similar themes, and constantly compare and contrast emerging themes with earlier data. Each coder then presented their categories to the group, were discussed, and the final categorisation was determined through discussion.

RESULTS

Profile of online counselling users

Beginning July 2009 to October 2010, a total of 191 OFWs registered in the online counselling website. A majority (65%) were males with a mean age of 40.69 (SD = 8.69). Most of those who registered had at least a Bachelor's Degree, were presently working in the Middle East, and engaged in Business or Engineering/Architecture-related occupations (refer to Table 2). On the other hand, 34 OFW family members registered, 26 of which were female (the website did not require other

TABLE 1
Online counselling non-user demographics

	OFW <i>n</i> = 10	Spouse <i>n</i> = 10	Child <i>n</i> = 10
Gender (female)	4	8	8
Mean age (SD)	42 (9.55)	35 (6.23)	21 (4.47)
Location of migrant worker			
Middle East	4	7	3
North America	1	0	3
Asia	1	2	1
Europe	0	1	3
Africa	1	0	0
Australia	1	0	0
Sea-based	2	0	0
Work industry/type of work			
Construction related	2	3	1
Health related (e.g. nurses, caregivers, geriatric care)	2	0	3
Business/office/secretarial work	0	1	2
Avionics industry (e.g. pilot, airplane mechanics)	1	2	0
Teaching	0	1	1
Manufacturing / factory work	0	1	1
Restaurant and food (e.g. cooks, valet parking attendants)	1	0	1
IT-related (e.g. computer programmers, web designers)	1	0	0
Domestic help/household help	0	1	0
Science and research (e.g. lab technicians)	0	1	0
Seamen / oil rig workers	3	0	0
Uses Internet / knows how to use the Internet	8	8	10
Location where Internet is usually used			
Home	4	8	10
Work / school	6	6	4
Other places (e.g. Internet cafés)	1	1	4
Typical uses for the Internet			
Chat	5	6	4
E-mail	4	5	7
Social networking (e.g. Facebook)	3	3	8
Games	2	0	4
Videoconferencing (e.g. Skype)	3	4	4
Work / school-related Functions	2	2	5
Other uses (e.g. banking, entertainment, downloading, etc.)	3	5	5

information from family members). However, out of the number of OFWs that registered, only 36 availed of the online counselling services and they shared similar demographic characteristics as the registered users (Table 2). Only three of the 34 registered family members sought counselling bringing the total to 39 individuals who availed of online counselling.

Of the number that availed of counselling, 36 conducted counselling through chat only, two made use of both chat and email, whereas only one client preferred to have counselling strictly through email. Chat counselling sessions typically ran an average of 60.73 minutes and counselees had an average of 2 sessions. The inclination towards chat may have been a reflection of a preference for a simulated conversation, as manifested in one comment:

... actually she gave me already (an assignment through email), but I didn't write it because I prefer the actual online conversation because it's spontaneous, right? Like there are no pretensions in feelings, right? If it's email, it's like it's scripted, right? (Interview, Dec 2009).

Issues presented in counselling

Family, marital and relationship issues

To uncover issues typically presented in online counselling, 91 chat transcriptions and eight email correspondences were content analysed by the authors, as well as with the assistance of three graduate students. The most salient category concerned interpersonal concerns in the context of a relationship or marriage. A total of 26 clients raised issues that pertain to conflict between

TABLE 2
Demographic variables of OFW registered users and counselees

	Registered OFW		OFW counselees	
	<i>n</i>	%	<i>n</i>	%
Educational attainment				
High school	3	1.57		
Some college	38	19.90	3	8.33
Bachelor's degree	118	61.78	25	69.44
Master's degree	7	3.66	2	5.56
Did not report	25	13.10	6	16.67
Current location				
Middle East	117	61.26	24	66.67
East/Southeast Asia	24	12.57	4	11.11
Europe	15	7.85	1	2.78
North America	10	5.24	2	5.56
Africa	7	3.66	1	2.78
Australia/Pacific Islands	3	1.57		
South America	2	1.05		
Did not report	13	6.81	4	11.11
Nature of work				
Business/office work/secretarial	75	39.27	18	50.00
Engineering and architecture	32	16.75	7	19.44
Health-related (e.g. doctors and nurses)	11	5.76	2	5.56
IT related	9	4.71	1	2.78
Domestic help	5	2.62		
Teaching	4	2.09	1	2.78
Science and research	4	2.09		
Seaman	3	1.57		
Tourism	2	1.05	1	2.78
Others (e.g. factory worker, gardener, butcher, etc.)	16	8.38	3	8.33
Did not report	30	15.71	3	8.33

partners, infidelity, power and decision-making, and lack of communication. This category also includes problems with the in-laws and concerns regarding raising children, in particular the stresses and difficulties of long-distance parenting, as well as guilt in missing out on important events in their family's lives. Sample comments include "That's the worst part of going abroad, you are not with them when they are enjoying their adolescence", "I feel guilty for not being there for my wife in dire times and important moments of my family".

Homesickness and loneliness issues

In contrast with the first category, the homesickness and loneliness category, presented by six counselees, subsumes feelings of longing and sadness, as well as negative thoughts and actions, primarily brought about by the physical distance from family, friends, and country of origin. As one counselee points out, "loneliness is always with us :) . . . (part of our reality here is) homesickness, how to fight it."

Work-related issues

Reported by nine of the 39 clients, this particular category deals with issues and difficulties encountered in the client's work environment. This includes

problems with co-workers and bosses, as well as issues with racial discrimination and prejudice at work. Exemplars for this category include: "I get irritated because there are a lot of . . . white supervisors who feel that their race is supreme."

Adjustment issues

Six clients identified difficulties in adjusting to customs, traditions, and social mores, and in interacting with people in their host country. Other issues include feeling restricted because of laws, as exemplified by a responses such as "life is limited here[...] there are a lot of restrictions". One client expressed frustration at being unable to go to religious services, and feeling discriminated by those who display intolerance for their religious practices: "Like one time I went to mass and he [referring to the roommate] kept criticising the practice in front of me."

Financial issues

Presenting problems coded under this category typically pertains to money, concerns about the dearth of their financial resources, the mismanagement of the OFW's hard-earned income, as well as issues related to taxation. As one counselee shares, "I do not want to see my child experiencing difficulties especially on the financial side."

Help-seeking factors

Attitudes towards counselling

The researchers discerned several kinds of expectations of counselees from the counselling sessions: obtaining advice from the counsellors; having someone to listen to their concerns; receiving validation; requesting for action; and getting a diagnosis on state of mental health. However, some OFWs expressed concerns and questions about the nature of counselling. Counselees typically ask questions such as “If one asks for counselling, does that mean he is crazy?” or “Are you the same as a psychiatrist?” Concerns also include confidentiality and the qualifications of the counsellor.

OFW site users generally had positive reactions to the counselling experience. Eight OFWs gave positive feedback about the programme, and six of the eight stated that they were grateful for the service and for the counsellor’s time. Most of them described the experience as relieving and commented that they were happy about the site. Some said that the site became an avenue for them to vent out and reveal their personal issues. One of the counselees said: “Thanks. It’s interesting. Because no one knows about this. Glad that I found this site.”

Among the non-users, 57% indicated that they would consider online counselling in the future whereas 43% categorically stated that they have no intention of using it.

For those that would consider using online counselling, three counselling-related subthemes emerged, first of which was provision of help and advice. Thirteen participants said they would consider using online counselling in the future because they perceive that counsellors could provide them with advice, “help cope with emotional problems” like depression and loneliness, and/or “help them solve their problems” that spans from marital, family, and relationship issues, and school or employment problems. Users perceived the counsellors’ role as providing solutions to problems. A second subtheme revolved around the perception that counsellors would be able to “give comfort” and consolation. Participants viewed counsellors as professionals who would simply listen and the counselling as a means to “vent” their problems. The third subtheme was psycho-education, where the users wanted to learn from the counsellor how to better perform their roles as spouses, parents etc.

Social support

OFW site users reported having social support mostly coming from their family. In particular, they mentioned people, like their wife and siblings, as sources of support when dealing with problems. Ironically, however, majority of the issues expressed during online counselling had to do with family and marital relationships which may explain the need to seek a third-party’s assistance in dealing with their problems.

Among non-site users what was notable was that they would consider seeking online counselling only when they are unable to talk to their family or friends. Thus, online counselling was perceived to be a source of support only when there was no immediate source of social support. Seven participants were disinclined to use

online counselling primarily because they preferred to talk to family members and/or friends rather than to a counsellor. The interviewees consider their family and friends as their “first and primary defence and coping” mechanism. One pointed out, “We are different. Unlike in America, right, where just a little (problem) they go straight to a psychiatrist, right? It’s like that. Here, for us, we don’t need that because we have friends . . . so counsellors, no.” (Interview, January 2010)

Others indicated a preference for spiritual support, as exemplified in answers such as “I prefer talking to God” was also subsumed under this subtheme because, as Kirkpatrick (1992) suggests, prayer, religious experience, and other private devotions are experienced as a kind of social support that provides the same benefits to human social support.

Socio-cultural norms on help-seeking

Among the OFW site users, the comments we received suggested an acceptance for help-seeking. Four counselees said that they endorsed the site to others. They tried to encourage their relatives to join so they can also take advantage of the free service. They also sent the link of the site to their friends and colleagues. One of the counselees shared: “Told my colleagues to register here. They’re doing it now!” and “[I have] been telling everyone I meet about your site”

However, this was quite different among non-users. Answers under this category typically express a general discomfort about either asking help or sharing one’s problem to another. Additionally, some participants were reluctant to seek counselling, anxious that their action would burden another. As one participant related: “Sometimes, *nakaka-hiya* (embarrassing) . . . because, I feel that if I tell my problems to a person I don’t know, I might be a burden to them.”

Technology-related factors

Ease of use and computer use norms

Site users found the online format advantageous because it is easily accessed and computer use is a norm at work. However, among non-users, interviewees expressed their lack of Internet know-how and access prevents them from accessing online counselling. For example, the OFW users from the Middle East report that Internet access is not an issue for them as computers are ubiquitous in their workplace and even in their dormitories. However, other OFWs such as the domestic helpers in Asia report no access to either computers or the Internet, have no day-off or their phones are confiscated by their employers. There are also those who report they cannot afford to pay for Internet access.

Perceived usefulness

Site users indicated the usefulness of the online medium in particular its anonymity. For example, some participants liked the impersonal nature of the medium because they felt they could have honest and upfront answers:

Probably it’s better, there’s a certain level of anonym-

ity . . . So probably, you'll get more honest answers compared to face-to-face, (unlike) if you know that person in a more of a personal level, if (you know them) from . . . before. At least there's anonymity. Because people who don't know you can give you more honest answers. And can give you a different perspective (Interview, December 2009).

Furthermore, online format is preferable because it does away with the embarrassment caused by *hiya* or shame:

Ah, for me . . . online is more advantageous because I don't have to face (the counsellor) . . . because I have this tendency to feel embarrassed (*mahiya*) during face-to-face conversation. Whereas, there's Internet so it's okay. (Interview, January 2010)

In contrast, some non-users expressed preference for face to face counselling because it was perceived as more personal compared with the virtual interaction of online counselling.

DISCUSSION

This study raises some issues that would help inform the practice of online counselling, particularly among the migrant worker population. The data suggests that adoption of online counselling may be viewed as an outcome of three factors: experience of need, acceptance and adoption of the Internet, followed by an acceptance and adoption of Internet-mediated communication as a means of receiving psychological treatment.

In terms of need, the data from counselees suggest that the concerns raised during online counselling sessions validated previous literature on OFWs (Scalibrini Migration Centre, 2003; Uy-Tioco, 2007). This congruence supports the findings of Cook and Doyle (2002) that clients experience a therapeutic alliance in online counselling similar to that established in face-to-face sessions and suggests that online counselling is a viable means to elicit migrant worker concerns.

One may ask, why are majority of users from the Middle East? One obvious reason may be difficulty of the location for OFWs. The Middle East has been described as the "most distressing OFW destination" because of gross violation of human and labour rights (Olea, 2008). This finding suggests that more attention may be required to OFWs in these locations. Still another explanation is that workers from the Middle East that have the access to the Internet compared to migrant workers in other locations.

The paucity of family members seeking counselling also provides another lens in which to view the issue of need. The findings suggest that lack of felt need for counselling among OFW families may be ascribed to the presence of social support. Conversely, it may be precisely the lack of social support among OFWs in the Middle East that may drive the need for online counselling.

Assuming the existence of the need for counselling, the second factor salient to adoption of online counselling would be the access and adoption to technology. The success of online counselling hinges on OFWs first adapting to the technology. In an era where the Internet

is ubiquitous and pervasive, it is easy to assume that everyone has access to and can use the technology. The profile of OFW online counselling users suggests that they tend to be college-educated professionals with access to technology. In contrast, the study of non-users reveal that there exists individuals who do not access online counselling, not because of a reluctance to do so, but because of the lack of competence and access.

According to Venkatesh et al. (2003), Internet use is very much influenced by education and occupations that require rudimentary working knowledge and access it. The data from the user profile shows that there is a substantive segment of the OFW population (blue collar workers, particularly in Asia) that the site does not reach. This is a serious consideration for those attempting to provide mental health intervention to OFWs and their families via the Internet. Interestingly, the data from interviews with OFW families suggest that they do have Internet access in the Philippines. Thus, the issue of access appears to be related to the host country and employment conditions. The lack of access of blue-collar workers is unfortunate because research suggests that workers in low-level occupations are especially at risk for abuse and illegal trafficking (Olea, 2008).

Given the presence of both need and technology-savvy, a final factor would be the acceptance and adoption of Internet-mediated communication as a means of receiving psychological treatment. The data from non-users suggest that the reluctance to use online counselling generally comes from the preference for obtaining social support from families and friends over counsellors. Such reluctance to seek professional help has parallels in other studies that find Asians underutilise mental health services (Matsuoka et al., 1997; Zhang et al., 1998). The results are not surprising as Filipinos are known to be family and small-group oriented (Church, 1986) hence these social groups are the primary source of social support.

The Filipino value of *hiya* also contributes to this general reluctance. *Hiya* in the Filipino language is a painful emotion, akin to embarrassment, which is felt in encounters with important others whose approval or disapproval can inflate or deflate one's ego (Bulatao, 1964). It is also an emotion that bars a person from certain behaviour when it is perceived that such action will have negative effects on one's dignity or will tarnish the family reputation (Nadal, 2000). Apart from the discomfort in talking to strangers about one's personal problems, there is a fear of being onerous to the counsellor. However, when this preference for friends and family members is juxtaposed with the salience of relationship issues presented in online counselling, it is safe to assume that the social network of the migrant worker is inadequate.

Interestingly, the results of this study indicated that men were the ones who sought counselling the most. This runs against the grain in the literature on men's help-seeking behaviour. Compared to women, men are more reluctant to seek help across varied problems or issues, have more negative attitudes towards help-seeking and counselling, online counselling included (Rochlen et al., 2004), and seek counselling and psychotherapy less often (Courtenay, 2003;

Addis & Mahalik, 2003). The number of males that sought counselling, could be an effect of the interaction of gender and technology use—men are more likely to make use of novel technology compared to women (Venkatesh, et al., 2003). However, it is also possible that the anonymous and impersonal nature of the online medium allows men to drop social convention. Furthermore, the nature of the online medium could appeal to populations that are uncomfortable with verbal expressions of emotions and those that underutilise or stigmatise counselling services like men (Rochlen et al., 2004).

Serendipitous findings

Beyond the provision of social support to OFWs, the existence of the online counselling appeared to have a number of advantages. To ensure quality of counselling, regular case conferences were conducted and counsellors utilised the actual counselling transcripts as material for discussion. The presence of the counselling transcription became very valuable in the training of counsellors. As Haberstroh (2009) explains, the presence of documentation affords counsellors the opportunity for self-reflection and allows them to pick up on themes they may have missed. In addition, the transcripts aid education of counselees as supervisors can review the exchange in detail.

A second serendipitous finding was the application of online counselling site to other uses. In September 26, 2009, the Philippines was hit by typhoon Ketsana that brought record rainfall and caused severe flooding in the metropolis. The typhoon also destroyed a number of cellular phone sites thus hampering communication. The Internet became the alternative venue for communication in both asking for and providing assistance. Building on the experience with the online counselling site, the Ateneo Department of Psychology tapped the online counsellors from the OFW Online site to provide online social support for those affected by the calamity.

CONCLUSION

In conclusion, our data reveal that users of the online counselling are generally male OFWs in the Middle East. On one hand, it is heartening that the site can reach a population that generally underutilise mental health services and who are in location where social support may not be immediately available. However, more research has to be done to increase our understanding on how to improve the delivery of technology-mediated counselling services. For example, the inability to reach other OFW populations suggests there is a need to perhaps explore other technologies that may be more appropriate such as mobile phones. Future research may seek to determine the efficacy of mobiles in reaching untapped populations.

It is likewise important to address the barriers that prevent migrant worker from seeking professional help would be important to increase adoption of online counselling. In particular, the lack of access to days-off and communication technology by women and blue-collar migrant workers is worrisome because they have the highest risk for abuse. Ideally, such rights could be

included in employment contracts. Battistela (1999) contends however, that the playing field is hardly level. The lack of alternatives and union representation to protect their interests confines migrant workers to an unequal relationship with their employers. He argues that even as the Philippines has sought to improve legislation and support for migrant workers, it has had limited success because migration benefits the Philippine economy. In addition, the lack of regional dialogues and desire to maintain good relations with receiving countries often results in little power in establishing bilateral agreements that will effectively protect the rights of workers. Thus, migrant workers have no choice but to rely on themselves and personal networks to cope and protect themselves.

However, beyond improving migration policy, the lack of Internet access presents potential for greater support from the government. Although the site is currently promoted through the employment agencies through a partnership with the Philippine Association of Service Exporters (PASEI), such partnership can be extended to the government agencies handling OFWs. Effort was made at the beginning of the project to obtain this but with little success. Some exceptions are progressive consulates such as the Philippine Embassy in Italy that provides computer training and access to Internet access to OFWs through its Community Technology Learning Centre (Rivero, 2007).

We began this study with the question, “If you build it, will they come?” Our data suggests that the answer depends on a confluence of migrant factors (location, nature of work, issues encountered), help-seeking attitudes and norms, and technology related factors. Our findings reveal that migrant workers who feel the need and have little social support, have both technological access and ability and those who are open to seeking professional help will adopt online counselling. Given that labour migration will likely always be fraught with difficulties, the challenge then for those who wish to assist migrant workers is to address issues of access, ability and openness to technology-mediated counselling.

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Evaluation of an M-Service for Farmers in a Developing Region

A Case Study from Rural Bangladesh

This paper addresses the issues relating to evaluating a mobile phone-based agricultural market information service designed for farmers in Bangladesh. The paper is grounded on a mixed methods research approach and case study supported by surveys and participant observations. The findings show and confirm that addressing the need assessment and “perceived ease of use” adequately, upholding management efficiency, adopting innovative strategies for sustainability, getting the involvement of local stakeholders, deploying appropriate technology to make the service fully accessible by targeted end-users, and processing and disseminating qualitative, and useful content are the major aspects of a good service. The lessons learned from the case study can be of special interest for academicians as well as for practitioners who are particularly concerned with the use of mobile technologies for rural development in emerging economies.

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The mobile phone has now become one of the greatest hopes for the spread of Information and Communication Technologies (ICTs) in developing countries, and in turn, for the geographical growth of the information society. Using mobile phones as the most dominant communication technology has great potential in the development agenda, especially in least developed countries (LDCs), which as a group represents 10% of the world population. In these countries, over 72% people live in rural areas and depend mainly on agricultural activities.

Recent research has shown that mobile phones can play a significant role in development if applied efficiently and appropriately. For example, mobiles can be used in education to facilitate distance learning (Andersson & Hatakka, 2010), and in farming and fishing activities, most notably to assist with agricultural market information services, improving rural livelihoods (Jensen, 2007; Shaibu & Powell, 2008; Bhavnani et al., 2008; Muto & Yamano, 2009; Mokotjo & Kalusopa, 2010), in health (Idowu et al., 2003; UN Foundation, 2009), in community development (Goggin & Clark, 2009), in small business development (micro-entrepreneurship), governance (Narayan, 2007), in disaster management and emergency situations (Monaresa et al., 2011; Ketabdar & Polzehl, 2009; Agar 2003), in environment and weather (Houghton, 2010), and in mass communication and entertainment (Wei, 2006).

Most of the studies, as mentioned, indicate that the role of the mobile phone as a technology for development is

more evident in the un-served communities and regions. In particular, the study of Duncombe and Boateng (2009) reveals that the mobile phone has proved more useful in the sub-Saharan region and in South Asia where existing fixed-line infrastructure is weak and underdeveloped. In this regard, Bangladesh is an LDC (UN-OHRLLS, 2010) where the total teledensity is around 40%, more than double from the rate of only four years back. Notably, only around 2% of this density is shared by fixed-line telephone subscriptions, while the rest is accounted for by mobile phones (BTRC, 2010). Presently, almost all of the country has cellular network coverage. Out of 156 million people, 76% live in rural areas, with about 18 million households affiliated with farming activities (BBS, 2010). An earlier study finds that access to mobile phones at the household level is around 90% in urban areas, and 70% in rural areas where most of the adult inhabitants are farmers (Rahman, 2007). According to the World Bank (2007), “poverty in Bangladesh is primarily a ‘rural phenomenon’, with 53 percent of its rural population classified as poor, comprising about 85 percent of the country’s poor”. One of the strategies of improving such a situation is by reducing information asymmetries and empowering entrepreneurship of the poor farmers by connecting them to markets with the help of ICTs (Cecchini & Scott, 2003; World Bank, 1999).

It is this development context and rural phenomena that are the main focus of this study. The mobile phone based service or ‘m-service’ under this study was locally known as PalliNet or RuralNet, and was in operation in parallel to the ongoing web-based e-government initiative of the Department of Agricultural Marketing (DAM), Ministry of Agriculture, Government of Bangladesh. The web-based programme was implemented with the

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objective to provide “improved marketing services to ensure fair returns to the growers for their produce and adequate supply to the consumers at reasonable prices” (www.dam.gov.bd). But considering that computer-based Internet penetration rates at the national level were only 6% while mobile phone penetration rates were around 40% (Government of Bangladesh, GoB, 2010), the Government’s web-based service was poorly constructed and irrational, especially in the rural context. In this regard, the study of Islam and Grönlund (2007) concludes that the current web-based initiative of DAM explores two important opportunities to make such an initiative effective: firstly, the use of commonly available mobile phone technology and the dissemination of quality information to farmers, and secondly, the integration of services at the local level by complementing technology with local actors.

PalliNet, as a test case, integrated these two opportunities by employing the easily and widely available mobile technology (i.e. mobile phones) throughout the service and by employing local level human resources in selected remote villages in Bangladesh in early 2009. But, did PalliNet use the right technology to reach the targeted users (i.e. farmers) in a given context? How useful was the information to the target group? How efficient was the service in general? Did it function as desired? What are the pros and cons of a mobile phone based service tailored especially for rural users? So far no mobile-service (m-service) evaluation framework has been developed to address these issues comprehensively. The focus of this paper is therefore on evaluating a mobile

phone-based market information service for farmers in Bangladesh. The evaluation is based on an m-service evaluation framework developed through the analysis of existing literature.

TOWARDS AN M-SERVICE EVALUATION FRAMEWORK

An m-service can be defined as the provision of a service over a wireless network that facilitates location-based as well as personalised communication. In this case, the network can be a cellular, Wi-Fi or future wireless technology that is accessible via portable media such as mobile phones, laptops, and personal digital assistants (PDAs).

A literature survey shows that there has been a significant lack of holistic evaluation frameworks for e-services in general, and m-services in particular, that covers both the aspects of supply (for example, management) and demand (for example, users). In fact, there is no evaluation framework for m-services so far which can be used to evaluate any type of m-services. Similarly, there are some evaluations on e-services, but these are mostly dominated by the study on service quality offered via websites. McNaughton et al. (2008) also find that most of evaluation frameworks are aimed at improving service quality and its functional requirements and benefits. Table 1 summarises some major studies relating to (mostly web-based) service evaluation frameworks which provide an important direction towards conceptualisation of an evaluation

TABLE 1
Key project perspectives and evaluation criteria

Perspectives	Criteria of evaluation
Users	Information needs (Heeks, 2001; McNaughton et al., 2008) Expectations: Perceived ease and usefulness (Pedersen et al., 2002; McNaughton et al., 2008; Alshawi & Alalwany, 2009)
Management	System (Heeks, 2001; Lu & Zhan, 2003; Papadomichelaki et al., 2006) Objectives (Heeks, 2001) Skills (Young et al., 1997; Heeks, 2001; McNaughton et al., 2008) Strategies (Lu & Zhan, 2003; Papadomichelaki et al., 2006; Parasuraman et al., 2006; Lee & Chib, 2008)
Cost	Time and money or Budget (Heeks, 2001; Alshawi & Alalwany, 2009; Carratta et al., 2006; Lu & Zhan, 2003; McNaughton et al., 2008) Sustainability (Young et al., 1997, Lee & Chib, 2008)
Technology	Appropriateness (Young et al., 1997; Heeks, 2001, Lee & Chib, 2008) Accessibility (Papadomichelaki et al., 2006; Alshawi & Alalwany, 2009) Ease of use (Santos, 2003; Parasuraman et al., 2005; Horan et al., 2006; Papadomichelaki et al., 2006;) Security and privacy (Santos, 2003; Papadomichelaki et al., 2006; Anastasios & Vasileios, 2008) Efficiency (Pedersen et al., 2002; Lu & Zhan, 2003; Parasuraman et al., 2005; Horan et al., 2006; Papadomichelaki et al., 2006; Anastasios & Vasileios, 2008; Alshawi & Alalwany, 2009)
Contents	Relevance (Young et al., 1997; Papadomichelaki et al., 2006) Accuracy and completeness (Horan et al., 2006; Papadomichelaki et al., 2006) Personalisation (Anastasios & Vasileios, 2008) Formats (Anastasios & Vasileios, 2008, Papadomichelaki et al., 2006; Santos, 2003) Timeliness (Horan et al., 2006; Papadomichelaki et al., 2006)

framework for an m-service. In this Table, the major issues of evaluation, as discussed in the respective literature, are grouped into five common perspectives, namely users, management, cost, technology, and content. Similarly, the issues of evaluation have been classified based on common evaluation criteria.

Based on the criteria with corresponding perspectives as shown in Table 1, a qualitative m-service evaluation framework or m-SEF (in short) is presented here (Table 2). This framework can be used holistically by taking consideration of all the five perspectives, or can be focused on any of these by addressing some strategic questions as listed. It is this framework that is used for evaluating the case study in Section 4 of this paper.

The ‘users’ perspective of this framework focuses on two issues—needs and expectations. Expectations are addressed by perceived ease of use and usefulness of the service, while needs are the physical (for example, more income) and psychological (for example, feeling good or secure to know something) functions of users discovered by thorough analysis. On the other hand, users’ expectations for the service can be known by direct enquiry about the

prospective or existing artefact (or service).

‘Management’ aspect deals with the nature of managerial decision making processes, efficiency level of personnel, and objectives with strategies related to the service being offered. Depending on the context, a certain managerial style is conducive for certain goals to be achieved. In this case, employing the right person or team in the right time and in the right place with the right strategies are crucial factors for the success of any initiative. The same person is not qualified for all missions; instead certain skills are required for certain segment of the operation, and these need to be evaluated in order to measure the efficiency of the management as a whole.

‘Cost’ includes both the short-term and long-term aspects of resources being invested and its expected returns or benefits within a budgeted timeframe. In this regard, adequate mobilisation of financial resources and focus on sustainability issues are important aspects for the decision to continue a service.

In addition to hardware and software, ‘technology’ also covers the infrastructure and system aspects in this framework. While it deals with both the realities of supply

TABLE 2
m-Service Evaluation Framework (m-SEF)

Perspectives	Major evaluation questions	Relative assessment with score (optional)
Users	Are the needs of the targeted users appropriately and adequately reflected on the service being offered?	(Demand side evaluation) Effective service (2);
	Are the perceived ease of use and usefulness of the targeted users closely associated with the offered service?	Somewhat effective (1) Ineffective service (0)
Management	How the management structure and decision making process congenial for the smooth operation of the service?	(Supply and demand side evaluation) Efficient management (2); Somewhat efficient (1)
	How efficient and skill (conceptual, technical and interpersonal) the personnel of the service operation are?	Inefficient management (0)
	Does the management have service objectives associated with appropriate strategies?	
Cost	Is the service affordable for majority of the targeted users?	(Supply and demand side evaluation) Sufficient fund and sustainable (2);
	Does the management have a budget or financial plan for the smooth operation of the services?	Sufficient fund, but unsustainable (1); Insufficient fund and sustainable (1);
	How sustainable the service in the long-run is?	Insufficient fund and unsustainable (0)
Technology	How appropriate the technology and its associated systems both for the supply and demand sides are?	(Supply and demand side evaluation) Appropriate technology (2)
	Is the service easily accessible with the given technology and process?	Partially appropriate technology (1) Inappropriate technology (0)
	Overall, how reliable the service is?	
Contents	How relevant the content of the service is for the targeted users?	(Supply and demand side evaluation) Qualitative and useful (2);
	Are the contents accurate, complete and available on time in a given place or situation?	Qualitative, but not-useful (1); Non-qualitative and not useful (0)
	Is the presentation of the contents accessible and understandable by the targeted users?	

Final relative assessment scale

Excellent (10), Very Good (9), Good (8), Very Prospective (7), Prospective (6), Average (5), Below average (4), Poor (3), Very poor (2), Grave (1), Failed (0)

and demand side appropriateness, more attention should be given to demand side accessibility. Deploying the right technology (or systems) in a given infrastructural and socio-economic context ensures the expected level of usability of a service. Furthermore, usability may turn into effectiveness if the service is made available efficiently. In this case, efficiency can be of many forms, such as appropriate addressing of security and privacy, compatibility and integrity, reliability, maintainability, interoperability, speed to connectivity and feedback issues.

Finally, 'content' or data is the blood for any ICT based service, while technology is considered as the vein. The quality of content is defined by its extent of relevance to the targeted users at a given time, which is also valued by its accuracy and completeness and the way it is presented in a chosen media or interface (such as mobile phone).

The assessment part of this framework, which can be used optionally, bears some scores that would help to relatively assess the merit of a service. Being influenced by Heeks' (2003) design-reality gap (or ITPOSMO) model, the framework as presented here is weighted by considering the subjective strengths of the supply (service initiator) and demand (end-users) sides. In this framework, the summations of all relative scores are ten (10), which is the maximum, and zero (0), which is the lowest. Therefore, an initiative scoring 10 implies excellent performance and sustainability of the service, while an initiative that scores '0' indicates that the service is a failure and needs to be discontinued immediately.

RESEARCH METHODS

This study is based on a mixed methods research on interpretive perspective which is "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham 1995: 76). Cronholm and Goldkuhl (2003) argue that the interpretive approach is suitable in a situation when an information technology (IT) system is viewed as a social

system and IT is attached to it. Here the information system is an m-service which is evaluated in a rural context. The mixed method, in this case, is dealt with the deductive qualitative analysis (DQA) approach (Gilgun, 2010), for developing an evaluation framework and a case study being evaluated by the criteria used in this framework. As for determining the criteria of evaluation (Cronholm & Goldkuhl, 2003), the soft-criteria approach has been followed since it is difficult to understand the human relationship with IT, as it is more open to interpret as a phenomena (Lewis et al., 2006). The case study is a useful method for an empirical inquiry when the boundaries between phenomenon and context are not clearly evident and when there is a need for understanding holistic characteristic of real-life events (Yin, 2003). On the other hand, the DQA is a 'better theory' driven scientific approach which begins with an initial conceptualisation based on a parsimonious model or theory. In this approach data can be generated through observations, interviews or through the examination of existing literature (Gilgun, 2010: 5). A theory-driven approach is particularly important in a research study as it, (i) helps to describe and explain the pattern of relationships and interactions better by grouping the data according to clearly defined codes derived from the research framework, and (ii) it brings to the surface themes which may not have emerged through an inductive mode of analysis (Altinay & Paraskevas, 2008)

Sample and data collection

As for interpretive research, a mixture of both qualitative and quantitative data has been used (Yin, 2003). The author was thoroughly involved in the process of collecting the data. The 'passionate participant' observation method (Andrade, 2009) with a 'sense of detachment' (Oates, 2006: 211), in order to avoid bias in the research process, provided the author with an in-depth understanding about the various contexts of the service and its stakeholders. In such method, all the relevant observations were preserved

TABLE 3
Demographic characteristics of the PalliNet farmers

Items	Scale	Levels (grouped later)	Responses (n = 100)
Age	Open-ended	18 and below	0%
		19-30	49%
		31-50	48%
		51 and plus	3%
Education	Open-ended	No formal education	23%
		Primary	19%
		Below secondary	31%
		Secondary school	14%
		Higher secondary	7%
		Graduate	6%
Monthly income (in Taka or TK. 1 USD = 70TK)	Open-ended	5,000 & below	49%
		6,000-10,000	46%
		11,000-15,000	4%
		15,000 & above	1%

through notes, photographs and videos.

Data from the farmers were collected from the site where PalliNet was tested. The site was located in a remote village in the northern district of Natore (<http://dcnatore.gov.bd>) in Bangladesh, where a total of 100 pre-registered farmers who had mobile phones of their own, were investigated. These farmers were connected to their neighbouring three agricultural markets—*Hoybotpur*, *Laximipur* and *Station Bazaar* (the central market of the district). Initially, some of the farmers were chosen randomly and the rest through the snowball approach (Oates, 2006: 99) with references from other farmers having mobile phones of their own. The farmers in the sample can be considered representative ethnically and in terms of the overall socio-economic profile of the country. Vanhanen (2004: 1) described Bangladesh as “ethnically the most homogeneous country”, because more than 90% of the population in Bangladesh share the same religion, language and most of other cultural parameters. According to Khan et al. (1986: 96), “except for the [small] tribal areas in the Chittagong Hill Tracts, Bangladesh is a homogeneous country in which all rural areas are generally similar”.

Table 3 shows the demographic characteristics of the farmers (sample) being concerned by the PalliNet. The ages of most of farmers were between 30 and 50, where half of them can be considered as young adults. Less than one-third of the sample had no formal education, while half of them had education below the secondary level. Furthermore, around half of the framers had monthly incomes of BDT 5,000 (US\$ 70) and below.

The study uses data from the three consecutive surveys carried out by the author. The first one was conducted between the period of November 2007 and February 2008 in order to understand the socio-economic, farming and communication practices of farmers in Bangladesh. However, this paper uses only the data that indicates the types of information the farmers were interested in for a prospective mobile phone based market information service designed for them. The other two surveys were conducted just before and after the implementation of PalliNet, and are described and analysed in Section 4.

Data analysis

Data analyses were carried out in two phases—(i) when developing the theoretical framework by means of literature review, and (ii) through the case analysis by means of surveys and observations. The literature review process followed the guidelines of Webster and Watson (2002) and Oates (2006) who stress the importance of coding the key points as gathered, generating the concepts, categorising the concepts to develop an evaluation framework. Data from the surveys and observations were sorted and grouped in accordance to the criteria of the framework and subsequently analysed following the narrative modes of analysis (Myers, 1997), which is mainly a textual description of the facts.

EVOLUTION OF AN M-SERVICE: RESULTS AND DISCUSSIONS

A brief introduction to PalliNet

PalliNet is a mobile-phone based electronic service which was in operation in Bangladesh during the period between 1 February and 15 July 2009. The service supported small farmers ($n = 100$), in rural villages in Natore connected with three wholesale markets, through the daily provisions of information about the price of crops for no charge. The price data were gathered by local price-collectors who sent the information every morning before 8am via SMS in a prescribed format. The data were stored on a server maintained in the capital city—Dhaka (around 250Km away from the project site), and disseminated via SMS to all registered farmers according to their predefined preferences. Before going to markets, the farmers had current and timely information on the maximum wholesale and retail prices of the products they were to sell.

The following discussions evaluate this service based on the framework as discussed above.

Users' perspective

Prior to the implementation of PalliNet, feedback from several field surveys were used to help to understand the situational aspects of the farmers. Information such as demographics, agricultural values and supply chains, economic conditions, social interactions, connectivity and infrastructure, and use of technologies in general and mobile phones in particular were gathered in these surveys. This understanding contributed towards designing and implementing the service in accordance with individual farmer preferences. The data collected during the registration process in January 2009 were particularly useful in order to determine which subscriber belonged to which market(s), what agricultural produce he was interested in and what types of mobile device and network he was subscribed to.

Table 4 shows whether the perceived ease of use and perceived usefulness of PalliNet subscribers was closely associated with the offered m-service. This further indicates the effectiveness of the service in the view of its users. The findings suggest that although all the farmers agreed on the usefulness of the offered service, around 70% stated that they had an accessibility problem because they had difficulty in reading the English SMSs. However, because of the strong need for information, such an access barrier had been overcome by getting the messages translated by family members, neighbours or friends who could read English.

Getting price information from PalliNet did not necessarily mean that farmers relocated their produce to other market(s) where prices were known to be higher than in their usual market(s). The main reason behind this was the unfamiliarity about the mechanism of the unknown market and transportation costs involved. In fact, the information helped many subscribers to reduce their transaction costs by minimising their risk and empowering them with a sense that “it just feels good to know, to be in

TABLE 4
Usages of the service

Surveyed questionnaires	Scale	Responses (final survey)
Which features of mobile phone seem uncomfortable to you?	5 close-ended and one open-ended	SMS: 70% English: 70% Internet: Never used
How do you access the <i>PalliNet</i> service?	4 close-ended	Myself: 32% Family members: 36% Neighbours: 24% Friends: 8%
Do you have electricity?	Dichotomous	<i>N</i> = 100 Yes: 51%, No: 49%
I am satisfied with the stability and availability of the network	Ordinal	Satisfied: 100 % (Strongly agree to agree)
Do the contents of <i>PalliNet</i> serve the purpose of seeking market information?	3 close-ended	Yes: 100%
If yes, have you <u>ever</u> been relocated from your usual market after knowing the price information from the <i>PalliNet</i> ?	Dichotomous	Yes: 34 % No: 66%
If yes, how your (% of) income has been affected for using this service?	3 close-ended	Improved, but didn't calculate about how much: 56% 10 to 20 % increased: 36 % 20 to 25% increased: 8%
Overall, how satisfied are you in using the <i>PalliNet</i> service?	4 close-ended	Highly satisfied: 72% Satisfied: 28%

control". As consequence of improved bargaining power with the middlemen, around half of the respondents opined that their income had increased within the range of 10% to 20% compared to their income prior to the launch of the m-service. This is evident in some of their statements too. According to a respondent (Anonymous, Age 37) who was a subscriber of *PalliNet*, "I used to bring in my produce in the market after receiving the price information from *PalliNet*. This saved my time and helped me to realise a reasonable return on selling". Another respondent (Anonymous, Age 55) also expressed that:

"previously we used to sell our produce to our usual market(s) at whatever the prices being offered by the middlemen (Bepari) especially in a case when the supply of produces was found to be higher than the earlier days. Such situation has been changed with the presence of *PalliNet*. We come to know the price information of our nearest markets staying at home via our mobile phones. This helps us to decide to sell our produce directly to the concerned market".

Relative assessment: Despite the satisfactory feedback from the end-users of *PalliNet*, the relative score under this perspective may be given '1' which is 'somewhat effective'. This is mainly due to the difficulties in accessing the text message written in English (non-native language) that somewhat affect the farmers' 'perceived ease of use'.

Management perspective

PalliNet was a small-scale test project which was operated as a flat organisation managed by a Project Manager who was responsible for overseeing all of the project

activities. Under such an environment, a Programmer was responsible for programming and maintaining the SMS sever; a Field Manager monitored and coordinated the three local Data Collectors, who were appointed to collate daily prices from their designated markets. They were all found to be efficient in performing their assigned jobs. As opposed to the centralised management structure of the Government of Bangladesh, this was in fact promoted as a decentralised decision making process as the decision making power was delegated among the project personnel with clearly assigned roles and responsibilities. Since its actual operation in February 2009, the service did not face any bureaucratic problems and hence had never been interrupted for any on-service changes. As such, it is evident that the management structure of the project was favourable for the smooth operation of the service.

The management of the m-service had a concrete roadmap with a timeframe for the project inception, planning, designing and implementation. Each phase of the project was guided by certain objectives and strategies. The implementation phase (1 February to 15 July 2009), especially, was associated with strategies for making the service effective, such as—the use of mobile phones as an appropriate technology, disseminating personalised contents free of charge, recruiting the data collectors locally living near the assigned markets, awareness-raising campaigns and creating the community participation for building a sense of ownership. All of these strategies were taken into consideration and addressed in due manner and in due time. Sense of community ownership was evident in the two 'Meet the farmers' programmes during the project period. In these meetings, not only were the registered participants present, but also the local elites

FIGURE 1
**'Meet the farmers programme': Do you want
 PalliNet to be continued? Voting for Yes!**



Source: Author

who positively hailed the project and requested for its continuation.

Relative assessment: Based on the above evaluation, the relative score for management perspective can be considered as '2' which interprets that the management was efficient enough to carry out their jobs successfully within a certain timeframe to meet certain objectives and implement certain strategies.

Cost perspective

PalliNet was offered free of charge to the registered farmers. There was a budget with sufficient funds for the smooth functioning of the service. Other than the registered group, anyone in Bangladesh can 'pull' the price information of the pre-defined three markets and crops anytime within the service period through their mobile phones without any additional service charge. In this regard, the service was financially affordable to all users. However it has been observed that, despite local level promotional campaigning, the SMS server did not receive a significant number of 'pull' requests from unregistered users of those markets. This behaviour signals that rural subscribers are susceptible to the unvigilant return on their expenses. This further indicates that the sustainability of a service like PalliNet does not depend on charging fees from poor farmers, instead there must be an innovative business model where, for example, the service initiators, network operators (for profit/cost sharing for each SMS request) and the local data collectors or entrepreneurs build-up a tripartite partnership for making such value added service financially feasible. Also, the Ministry of Agriculture of the Government of Bangladesh may link up their current web-based service with a mobile server of PalliNet for disseminating market price information efficiently and effectively.

Relative assessment: The relative score of the assessment on cost perspective is given as '1'. This is because even though the service had a budget with sufficient funds for running the service smoothly for a

certain time period, it was not found to be sustainable. It is imperative that the service is designed to survive through revenue generation from farmers and/or other users, by imposing service charges.

Technology perspective

The PalliNet system involves the use of SMS and cell phone technology for data collection, process and information dissemination. This technology is appropriate where the mobile phone is widely available and accessible to both the supply and demand sides. The SMS content was designed in such a way so that these could support the basic devices, including the most frequently used handsets (e.g. Nokia's ultra-basic 1000 series); the design also enabled the conversion of text messages into voice (Interactive Voice Response or IVR system) for application in the future. However, as discussed above, there was an accessibility problem with regards to reading the SMSs in English. The data collectors, whose phone identities were registered on the server, sent SMS on price information of each of the available produce from their respective markets in a prescribed format. They received an error message for each of the wrongly formatted information sent to the server. Subsequently, the processed data were disseminated to the registered users according to their needs as expressed during the service registration process, and also sent to all the project personnel including the data collectors for their concerns on content validity. This, therefore, made the system reliable to users as it was able to minimise the errors and was flexible enough to disseminate personalised contents.

As shown in Table 4, around half of the respondents had no access to electricity which is one of the major barriers for the growth of wireless as well as wired technologies and their associated applications. However, in this case, it had been observed that the farmers used to overcome such obstacles by charging their mobile phones at their neighbours or at shops located to the nearest rural markets for free or, in some cases, at a very nominal cost. It was also found that farmers had no complaints on the signal strength of their network operators and the availability of topping-up their talk-time from the retailers.

Relative assessment: Considering the above pros and cons of the technology and system, the relative score can be considered as '1' which implies that though the supply side had actual and potential capacity of deploying appropriate technology, the demand side (farmers) was partially incapable of accessing the textual message.

Content perspective

The contents of PalliNet were determined based on the feedback received in the February 2008 and January 2010 surveys, during the time of individual registration process. During the 2008 survey, farmers were asked about the types of information they would be interested, in which are shown in Table 5.

As Table 5 indicates, farmers were very interested to know the retail prices at their nearest markets including at the main district market. They were also interested

TABLE 5
Types of information farmers are interested in
(February 2008 survey)

Types of information	% responses (multiple preferences), n = 420
Prices at nearest market	44 %
Push when price changes	32 %
Price of main district market	26 %
Pull information	26 %
Multiple crops as preferred	21 %
Push information	20 %
Single crop as preferred	17 %
Prices in capital city	14 %
Other (open-ended answers)	1%

in multiple crops of their choice and wanted to receive information through the ‘pull’ system when the prices fluctuated from its previous level. However considering the limitation of fitting a maximum of 160 characters in a single SMS, the contents finally included maximum wholesale and retail prices of a single product available on a particular day at the nearest three markets including the main district one. Each registered farmer was eligible to automatically receive a maximum of three SMSs in a day containing the price information (irrespective of the types of changes from the earlier days) of three produce of their choice by 9:00 am which was their usual business hour. In addition, the system was capable of providing historical price information which was accessible through a ‘pull’ system by anyone (registered or unregistered) from anyplace during the project period. In an effort to make the text more understandable to farmers, all the texts were written in English by using Bangla (native) phonetics. For example, an SMS would read as, “*Simer projay Cromay Paikary O Kuchra Dor Station Basare 014.50 O 015.50, Hoybotpurer 011.00 O 012.50, Ahmedpure 009.50 O 011.50 Taka*”, the exact meaning is “the wholesale and retail prices of Beans respectively are 14.50 and 15.50 in

Station Bazar, 14.50 and 15.50 in Hoybotpur and 9.50 and 11.50 Taka in Ahmedpur”. Notably, in the middle of the project period, a voice call system was introduced in parallel to the SMS system. With such an arrangement, a person was appointed to call the farmers having low literacy levels to convey the desired information every day during their usual business hour.

Relative assessment: Under the content perspective, the score achieved could be a ‘2’, meaning that the disseminated contents were qualitative and useful in terms of process, time, relevance, and completeness within the limitation of the adopted technology and system. Overall, users were satisfied with the PalliNet service as described above and evident in Table 4.

As shown in Table 6, the summation of all the relative scores is seven which indicates that PalliNet is a ‘very prospective’ initiative. However, in order to consider it a better service in the rural development perspective, and to turn it into a project with no gap between design and reality (Heeks, 2003) some issues need to be taken care of appropriately. These are, but not limited to, addressing the needs assessment and ‘perceived ease of use’ adequately, upholding management efficiency with the targeted goals to achieve, adopting innovative strategies for sustainability and up-scaling, getting the involvement of local stakeholders, deploying appropriate technology to make the service fully accessible by most targeted end-users, and processing and disseminating qualitative, and useful contents.

In addition to the usability, availability and overall appropriateness of technology in a given socio-economic context and integration of local actors in the service; understanding the behavioural aspect of accessing and using of information by the targeted users is an important aspect for a service development strategy. It is evident from this study that perceived usefulness is much stronger than ‘perceived ease of use’ as the farmers were inclined to decipher the meaning of SMSs from others due to their low level of literacy. Even the absence of electricity did not

TABLE 6
Summary of the relative assessment of PalliNet

Dimensions/ perspectives	Score	Relative assessment	Remarks/things to do
Users	1	Somewhat effective	‘Perceived ease of use’ should be reflected adequately in the service in action.
Management	2	Efficient	Efficient management is always desirable for achieving the goals.
Cost	1	Sufficient fund, but unsustainable	Needs innovative strategies for long-term sustainability.
Technology	1	Partially appropriate	Voice based system (voice call, IVR, call centre) seems to be more appropriate than text-based. Ensure availability of Electricity (e.g. solar system)
Contents	2	Qualitative and useful	Quality of m-service largely depends on the quality of contents and usefulness.
Total	7	Very prospective	Addressing the above issues properly would turn it an excellent service in due course of time.

deter these poor farmers, living in remote villages, from using their mobile phones. Furthermore, the information disseminated from the service was not used as expected, which in this case was the relocation of agricultural produce to another more profitable market, or selling their produce at a reasonable price as a result of improved bargaining power over the middlemen. Rather, the findings indicate that 'getting to know something' would simply empower their perceived security by reducing the level of uncertainty which possibly emerges due to the lack of access to quality of information.

CONCLUSION

This paper focuses on the evaluation of a mobile-phone based service especially tailored for farmers in Bangladesh. The lessons learned from the case study, which is evaluated with the presented framework, can be of special interest to academicians as well as practitioners who are particularly concerned with the use of mobile communication media in rural development, especially in the context of emerging economies.

While the main contribution of this study is to bring out a holistic view of the crucial aspects for the effectiveness of a rural m-service, the framework as used here could be an important tool for the evaluation of mobile phone-based services. This framework is based on the major findings from existing literature that includes the five key perspectives which are weighted through qualitative assessments. The subjective nature of relative scoring the assessments in this framework can be regarded as a limitation of this study, although it would provide a valuable direction towards the worth and merits of any wireless electronic service. Furthermore, as the author, as part of his research intervention, actively participated in the designing, implementation and evaluation of the service under study, could have questioned the possible biasness of the evaluation. In this case, the author thinks that as the goal of interpretive research is "not only to conclude a study but to develop ideas for further study" (Yin, 2003: 120), there is a scope for future research to test the framework with multiple projects in various settings. Furthermore, the deductive qualitative analyses as used in this research elicits that the method "is based on the idea that 'final' theory is not final at all, but tentative and subject to revision when there is evidence to do so" (Gilgun, 2010). Therefore, future scholars may come up with stronger assessment criteria in order to get a better view of the effectiveness of rural electronic services especially tailored for the unserved communities in the developing world.

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Continued from page 2

NOTE

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Interacting with the State via Information and Communication Technologies

The Case of Nemmadi Kendras in Karnataka

This article explains how the introduction of information and communication technologies (ICTs) influences citizens' engagement with the state by analysing Nemmadi Kendras (NKs), which are computerised kiosks established in rural areas of Karnataka to provide revenue services and land records to citizens under a public-private partnership. The government argued that the introduction of digital technology as an interface between the State and citizens would contribute towards good governance by enhancing efficiency, transparency and accountability. Drawing on the social shaping of technology perspectives, the findings suggest that a thorough analysis of the impact of information technologies in governance necessitates paying attention to the larger political and social processes within which the technology is introduced and embedded. The article further argues that the introduction of information technologies in a fraught and contested context adds more layers (in terms of bureaucracy and middlemen), which rural citizens have to navigate before they can actually attain services. Concerns related to costs, scale and political dynamics in the design of databases are also discussed here. The article concludes by advocating the 'embedded' approach for studying the role of ICTs in governance.

BHUVANESWARI RAMAN
ZAINAB BAWA

Many governments have deployed Information and Communication Technologies (ICTs) in the administration of public organisations through “e-government” and “e-governance” policies to address the problems commonly perceived to plague governance (von Haldenwang, 2002; World Bank, 2001). The terms e-government and e-governance have leitmotif for efficiency, accountability and transparency (von Haldenwang, 2002). Unidirectional links and relationships are often presumed between the role of technology and good governance. A recent focus in this direction is the use of ICTs to improve the interface between government and citizens (Madon, 2006; Gil-Gracia & Martinez-Mayano, 2007; Gatty 2009). It is widely believed in policy circles that replacing human interactions with technological interfaces will automatically improve the ways in which the business of the state is conducted, specifically modes of interactions and relationships between government functionaries and citizens (Ahuja & Singh, 2005; Bhatnagar & Chawla, 2005; Singh & Gururaj, 2009). Policy makers often assume that

technology has an “inherent logic outside the influence of human agency” (William & Edge, 1996: 857) and that its outcomes can be predetermined. This article questions the underlying deterministic assumptions of e-governance agendas. It explores how technological interventions implemented to improve governance (re) shape government-citizen relationships in ways that open up and simultaneously foreclose possibilities of making and fulfilling claims. In this paper, governance is defined as connections and relationships among government bodies operating at different scales and between governments and citizens. These connections and relationships are part of processes and protocols within the wider political system (Stern 2002). E-Governance is defined as the way in which insertion of technology affects the workings of the government and its relationship with other agents in society.

This article further illustrates how a variety of political, bureaucratic and economic logics provide the impetus for introducing ICTs in governance, the domains in which they are introduced and the manner in which they are situated in institutions and contexts (Rossel & Finger, 2007). The choice of technology and its adaptation are influenced by the interests of the public and private organisations involved in conceiving and implementing e-governance programmes as well as factors such as costs of technology and prevailing regulatory environments (ibid). Introduction of ICTs in the administration of State organisations are also driven by the political logic of the State to discipline ‘front line workers,’ commonly

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referred to as ‘street bureaucrats’, (Lipsky, 1980: IX, 3) in many contexts (Bovens & Zouridis, 2002). Given this, introduction of technology in governance is not neutral and has political and social consequences for interactions between various levels of authority in the government and among citizens. In this respect, as Merritt Roe Smith (1985) succinctly argues, technological artefacts are simultaneously social products which embody power relationships, social goals and structures.

The approach adopted in this paper is informed by a range of perspectives broadly grouped under the rubric of “Social Shaping of Technology” (SST) (Bijker & Law, 1992; William & Edge, 1996: 856). According to this perspective,

Technology does not develop according to an inner technical logic but is instead a social product, patterned by the conditions of its creation and use. Every stage in the generation and implementation of new technologies involves a set of choices between different technical options. Alongside narrowly ‘technical’ considerations, a range of ‘social’ factors affect which options are selected, thus influencing the content of technologies and their social implications (William & Edge, 1996: 2).

This article demonstrates how society, technology and the realm of the political constituted by both these entities simultaneously act upon each other, thereby shaping the symbolism and uses of technologies, citizen-state relationships and state-society interactions.

Moreover, e-governance theories tend to overlook the differences between citizens in their relationship with the State and the complex ways in which the institutions and agents of the State are embedded in society. Several studies on the anthropology of the State, particularly in the Indian context, have illustrated its embeddedness in society (Corbridge et al. 2005; Fuller & Harris 2002; Gupta 1995). These studies describe how government functionaries, especially those working on the ground, are often faced with competing claims on resources and demands from different citizen groups which they have to negotiate in the course of fulfilling the state’s obligations towards citizens and in delivering services. Attending to the complexities of embeddedness reveals that ICT interventions have differential outcomes for different groups in society. This is because citizens’ access to and alliances with various functionaries in the bureaucratic and political hierarchies of State institutions differ vastly (Benjamin, 2000; Chatterjee, 2002), thereby impacting their ability to articulate and establish claims in different situations. When ICT interventions are introduced, they affect the capabilities and resources of different groups in society to mobilise state functionaries, as well as state functionaries’ own ability to respond to the claims of these different citizen groups. Besides being constrained by the new ICTs, citizens and state functionaries invariably adapt and/or appropriate technologies in ways that suit the realisation of their goals. This article therefore argues that when technology is situated within existing social relations and in a complex ambit marked by differing

interests and alliances between actors inside and outside the state, it becomes important to analyse how and where the technology is embedded, which institutional levers, nodes and processes are sought to be curbed/reformed, and what kinds of interactions between governments and citizens are tried to be straightened. It is also important to map how government functionaries and citizen groups appropriate such technologies. Appropriation, in this case, does not amount to negative consequences; rather, as explained above, appropriation can change the symbolisms, uses and meanings of technology, thereby shaping citizen-state and state-society relationships in complicated ways. This article explores these issues by drawing evidence from research conducted on an e-governance initiative called ‘Nemmadi Kendra’ (NKs) programme implemented in the state of Karnataka in South India.¹

The rest of the paper is organised into six sections. The next two sections describe the Nemmadi programme, the research questions and research methodology followed by a description of how the wider political economy context shaped the rationale for introducing Nemmadi. The subsequent sections explore the following aspects: effects of Nemmadi, ways in which Nemmadi has been appropriated by state functionaries and citizens, and the social factors that have contributed to the design of databases used in this programme. The article concludes by emphasising the need to focus on embeddedness of technology to understand its effects in governance along with themes for further research.

RESEARCH FOCUS: THE CASE OF NEMMADI

The Government of Karnataka (GOK) implemented the Nemmadi programme from 2006 onwards to improve government-citizen interface, mainly to enhance “transparency, accountability and responsiveness of the government to citizen needs” (Singh & Gururaj, 2009: 311). The programme was introduced to continue and extend the rationale of an earlier e-governance programme called ‘Bhoomi’, which was widely hailed as a success story and best practice in transparent management and delivery of land records (Chawla & Bhatnagar, 2004; World Bank, 2006). The studies on Bhoomi, which were largely authored by policy makers, technologists and bureaucrats who were involved with its implementation (Chawla & Bhatnagar, 2004; Meena et al., 2005), have focussed on the technical aspects of e-governance and administrative concerns with corruption between ground level functionaries and citizens. In their assessments, concepts such as transparency and accountability have been discussed from normative points of view, delinked from the institutional contexts in which land and rural administration are carried out. The few studies that have attempted to move beyond the official discourse explain how e-governance projects such as Bhoomi have impacted land markets in cities (Benjamin et al., 2005) and have had social consequences for particular citizen groups (De, 2005, 2009; Gatty, 2009). These studies also discuss how the roles of street bureaucrats and their relationships with

rural citizens were reconfigured through Bhoomi, which is developed further in this article. This article builds on the sparse research about Nemmadi and explores the role of ICTs in (re)configuring state-citizen relationship post-Bhoomi. It also discusses the interplay of technical, political and social dynamics on decisions relating to technology, which have not been addressed by earlier studies on Bhoomi.

Research questions

NKs deliver digitised land records also known as Record of Tenancy and Crops (RTCs) and 40 Rural Digital Services (RDS) in the rural districts of Karnataka. While RTCs are an important means to stake claims on land (Bhatnagar & Chawla, 2005), RDS documents are a means to strengthen one’s citizenship claims. The Karnataka state government has made it compulsory to produce and update documents such as caste, age, and income certificates² for admission of children in schools and colleges, to claim benefits under government schemes, and even to contest *Panchayat* elections. Further, registering births and deaths and acquiring the necessary certificates has become incumbent to prove the ownership lineage of the land parcel in case of property disputes. These documents must also be produced during surveys that the government is now conducting to update information about land.³ Given the criticality of RTCs and RDS, it is clear that the delivery of these services is highly political and involves resolution of multiple claims.

Prior to the introduction of Nemmadi, street bureaucrats of the Revenue Department, namely Village Accounts (VAs) and Revenue Inspectors (RIs), were the main interface between the hierarchy of officials in the

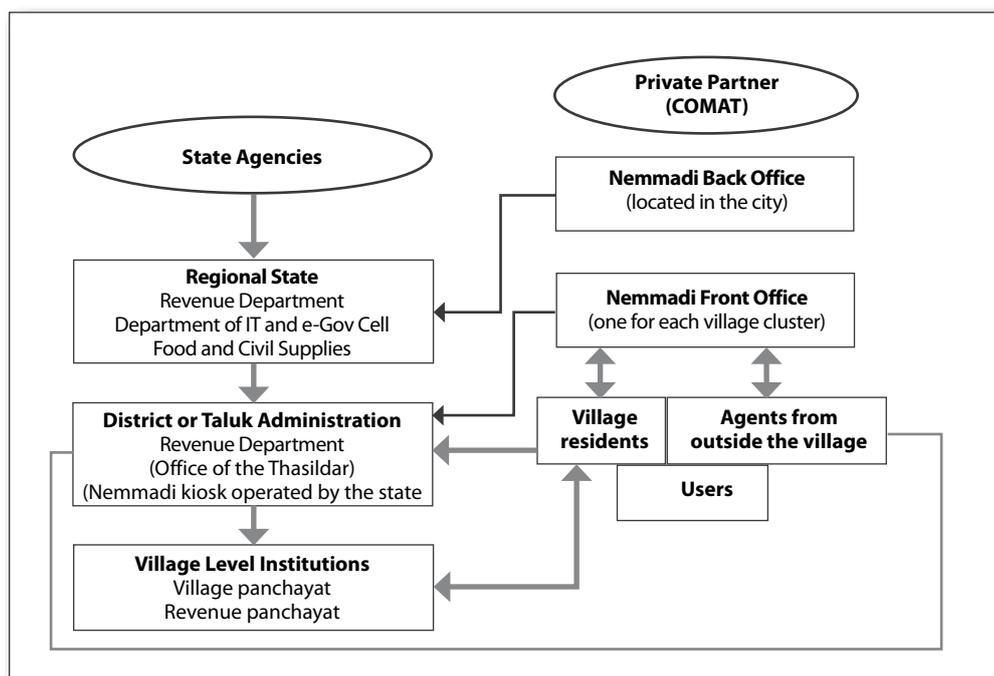
revenue department, rural citizens and political classes. They significantly influenced the process of creating and delivering RTC and RDS documents. Advocates of Bhoomi and Nemmadi programmes attributed the problems regarding RTC and RDS services to the absence of a centralised records management system and street bureaucrats’ “monopolistic” (Rao and Bhat, 2005: 80) control over the delivery of revenue services (Ahuja & Singh, 2005; Bhatnagar & Chawla, 2005; Singh & Gururaj, 2009). To resolve this problem of monopolistic control, NKs were made into a single window for receiving applications for RTC⁴ and RDS documents. Policy makers assume that the shift towards screen bureaucracy together with realignment of decision-making powers within revenue administration will reduce the influence that street bureaucrats have over the process of RTC and RDS services and also restrict their opportunities to interact directly with citizens, thereby curbing petty corruption.

Nemmadi was implemented under a public-private partnership model (PPP) between the GOK and a consortium of private Information Technology (IT) companies headed by Comat Technologies. Figure 1 illustrates the institutional architecture of the NK programme.

As shown in the Figure, there are three broad groups of stakeholders’ viz., users, Comat and the State. NK operations are executed by Comat through front-end kiosks at the village clusters (*hobli*) and back end offices in the sub-districts (*taluks*). Operators in these kiosks are employed by Comat. This article examines the following questions to infer the role of ICTs in reconfiguring the relationship between the State and Citizens:

- What are the effects of Nemmadi on users?

FIGURE 1
Nemmadi organisation



Source: Authors

TABLE 1
Summary of research themes, methods and informants (knowledge, attitude and practices)

Field research questions (topic guide)	Methods	Informants
<p>Background</p> <ul style="list-style-type: none"> • Social and occupational background of respondents • Land ownership • History of the village and recent developments <p>Users' experiences post Nemmadi</p> <ul style="list-style-type: none"> • Knowledge of Nemmadi kiosk • Practices of engagement with the kiosk (process of submitting applications and reasons) • Services procured through Nemmadi kiosks • If yes, what types? If not, why? • Experience with obtaining RTC and RDS services • Process description Time taken for submitting application; collecting supporting documents; obtaining the RTC and RDS documents • Views on Nemmadi • Frequency of errors in RTC or RDS • Experience with rectifying errors • Relationship with ground level functionaries of Revenue Department • Relationship in the village panchayat <p>Users experiences pre-Nemmadi</p> <ul style="list-style-type: none"> • Practices of obtaining RTC and documents currently issued via RDS • Experience of engaging with the officials of Revenue Administration 	<p>Semi-structured interviews at the following locations:</p> <ul style="list-style-type: none"> • Kiosks • Residence of users • Community spaces (savings and credit groups) • State <p>Non-participant observation at the kiosks, field office of Revenue Administration and village council</p>	<p>Users (68) and brokers (6)</p> <ul style="list-style-type: none"> • Farmers • Agricultural labourers • Non-agricultural labourers • Men, women • Youth and elderly persons • NGOs (social workers) • Brokers
<p>Kiosk operators (COMAT front office)</p> <ul style="list-style-type: none"> • Characteristics of clientele • Level of demand for different services • Issues faced in delivering service (conflicts with Nemmadi clientele) • Links between the back office and front office functions • Pattern of interaction between kiosk operators and field officials of Revenue Administration 	<p>Interviews and non-participant observation at COMAT front office (kiosks)</p>	<p>Private partner (COMAT) (11)</p> <ul style="list-style-type: none"> • Kiosks operators
<p>COMAT back office officials and technologists</p> <ul style="list-style-type: none"> • Reasons for recurrence of errors • Process of decision making relating to selection of technology and design databases • Financial sustainability of Nemmadi • Future plans / use of database • Work organisation between different private partners • Management of databases 	<p>Semi-structured interviews held at:</p> <ul style="list-style-type: none"> • COMAT back office • Other organisations involved in e-governance projects 	<ul style="list-style-type: none"> • Vice chairman of COMAT • General manager (COMAT) • Computer programmers
<p>Agents of the state</p> <ul style="list-style-type: none"> • RTC/RDS service delivery process before and after Nemmadi • View on Nemmadi process • Work flow in paper • Issues faced in everyday administration • Relationship with other functionaries of Revenue Department and kiosk operators • Coordination with kiosk operators • View about the quality of information 	<p>Semi-structured interviews held at:</p> <ul style="list-style-type: none"> • Village-level offices • Sub-districts offices 	<ul style="list-style-type: none"> • Revenue Administration officials (village assistants) • Land Tribunal members (state level) • Village council elected members (present and previous) • Village council officials • Women and Child Welfare Department officials

- How did Nemmadi programme influence citizens' interactions and relationships with street bureaucrats and screen bureaucrats?
- How were decisions on technical aspects such as database design and its maintenance made?

Research methods

The researchers adopted a qualitative research methodology to investigate the research questions. Fieldwork was undertaken in two sub-districts situated on the peripheries of the Bangalore Metropolitan Region, between May and August 2010. The two sub-districts were chosen to reflect differences in social and economic characteristics of the population and demand for land since these aspects influence the volume of RTC and RDS transactions. The villages visited in one district had relatively high land values since they are contiguous with the IT corridor in Bangalore. The second district is situated in a relatively less well-off part of the metropolitan region.

The choice of qualitative research methodology is influenced by the nature of research questions which seek to understand 'process', 'relationships' and 'practices' (Bauer & Gaskell, 2000; Denzin & Lincoln, 2000; Strauss & Corbin, 1998). The methodology draws on the constructivist paradigm, which regards theories and concepts as multiple constructions co-constructed by the researcher and research participants (Corbin & Strauss, 2008: 10). The paradigm is inductive in nature and draws upon local constructions of reality. In order to capture the multiple realities of Nemmadi programme, taking from Bijker (1995), the research followed three sets of stakeholders involved in the programme: users, service providers and decision makers.

Interviews and conversations with users focussed on their knowledge of Nemmadi and their experiences with securing RTC and RDS services before and after. Besides, service providers and intermediaries were interviewed to understand their roles and relationship with users. In addition, decision makers in the State and technologists connected to the e-governance programme were interviewed to understand the factors influencing the choice of technology. About 102 interviews were conducted with all the stakeholders listed in Table 1.

Information relating to the themes listed in the above table could not be easily elicited through a survey methodology. It required repeated interactions and intensive engagement with different stakeholders. Also, the decision-making processes connected with the choice of technology and design of the programme would have been difficult to understand through a survey approach. Such information is held by a closed group of individuals and bureaucrats connected with the implementation of the programme. Therefore, a combination of data collection methods was used including semi-structured interviews, conversations and participant observations. The researchers also referred to government orders, reports and other published material on Bhoomi and Nemmadi.

Interviews were conducted in English and the local language Kannada at different places including the back and front-end offices of Nemmadi, villages where users resided, offices of sub district administration and village level administration. Where possible, interviews were recorded, transcribed verbatim and translated. Translation of Kannada interviews was undertaken by authors along with the research assistant who is a native of Karnataka and is well versed in the local language. The researchers also observed the interactions between people and operators at the kiosk and in the field offices of the revenue department. Triangulation techniques were used to ensure the validity and reliability of the data.

The techniques of 'frame analysis' (Ritchie & Lewis, 2003) and 'laddering of data' (Miles & Huberman, 1994) were used to analyse qualitative data. Each interview was analysed for the themes that emerged which then provided the basis for the second round of data collection. Upon completion of data collection, the researchers revisited all the interviews to review crosscutting concepts and to build relationships between these concepts to generate a theory.

THE POLITICAL ECONOMY CONTEXT OF NEMMADI

NKs deliver services, which are closely linked with the complex domains of land and rural administration. The complexity of land administration stems from imperfect information regarding land claims, diversity of land types and tenure forms, and the underpinning institutional and legal regimes. RDS includes the provision of identification documents and administration of pension schemes. Rural administration is highly political because governance bodies, elected representatives and bureaucrats compete with each other to develop their own constituencies among people and to enforce loyalty. In the context of land and rural administration, three institutions are significant namely the Revenue Department, Village *Panchayat*⁵ and Rural Administration, and the Department of Surveys and Land Records. NKs have been implemented by and for the Revenue Department. Discussions in this paper are limited to the role of Revenue Department which is implementing the Nemmadi programme.

Historically, the Revenue Department has been a powerful agency. During the pre- and colonial times, it was responsible for collecting land taxes which constituted the main source of income for governments at that time. In the post-independence period, the Government of India (GoI) shifted its focus from land reforms to computerisation of land records when the Ministry of Rural Development of GoI announced the Computerisation of Land Records (CoLR) Scheme in 1980s to "streamline the maintenance and updating of land records" (Ahuja & Singh, 2006: 69).

ICTs were introduced in revenue administration at a time when there was a growing emphasis on land as source of economic development in India. There was a high demand for land from both state and non-state actors, particularly for corporate led development. The financial logic of IT corridors and mega infrastructure

projects is linked to realising real estate gains. These projects require large parcels of land, which the state often has to acquire either under public-private partnership arrangements or on demands made by big corporations or by the State's own developmental agencies. In this light, creating a unified database on land information and situating it in a centralised manner in the State was both timely and necessary. Even in villages, subdivisions and assimilations of land parcels were actively taking place in the 1990s as owners of land parcels and real estate brokers (who were often *Panchayat* members and local leaders) were capitalising on the boom around land. Advocates of computerisation also argued that maintaining land information was also critical for the state government and the revenue administration to ensure that people were registering their transactions and that there were no leakages in the income that ought to have accrued to the State through stamp duties and registration fees. It is in this complex sphere of heightened political and economic activity around land that some senior civil servants' calls for introducing ICT in land administration gained support. Their calls were supported by IT entrepreneurs (Meena et al., 2005).

While RTCs were digitised under Bhoomi, Nemmadi extended the e-government agenda through computerisation of RDS documents as a way to bring VAs and their seniors—the RIs—in line with due process in service delivery, thereby curbing the scope for exercise of discretion.⁶ RTCs are delivered immediately since they

require the operator at the front-end kiosk to simply query the database with the survey number⁷ and print the RTC on government stationery. The process involved in availing RDS services is shown in Figure 2.

The findings on Nemmadi's impact in terms of reconfiguring state-citizen relationship are discussed in the next section.

FINDINGS

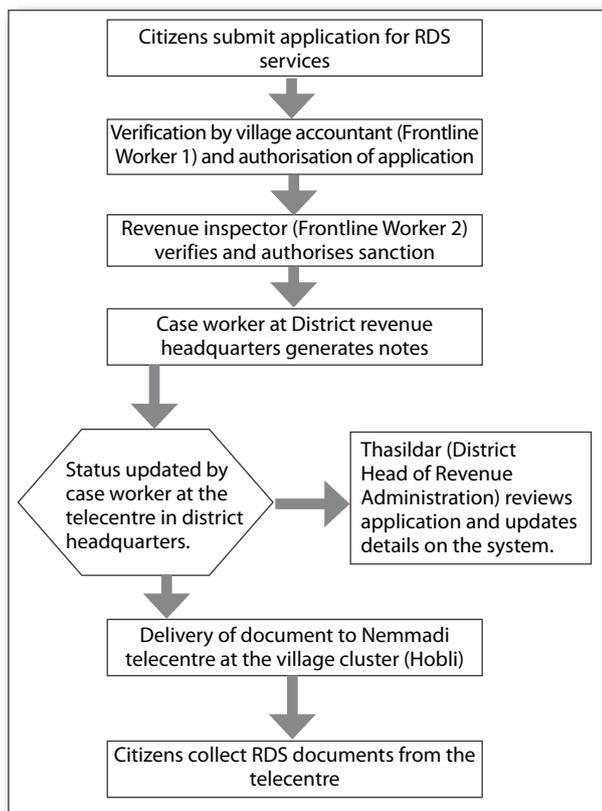
Effects of Nemmadi

It is difficult to categorise Nemmadi's effects in a linear frame of ills and benefits because users' experiences with NKs (and therefore their perceptions of ICTs) vary depending upon their social positioning, including the resources they have and can garner for applying documents at NKs and the social, political and economic networks they can mobilise for expediting the delivery of documents/services. For instance, daily wage labourers are positioned much lower down the socio-economic hierarchy. Not only do they have less time and money to visit government offices for obtaining official documents, they also have less access to resources and networks, which can provide them with information on how to procure government records and claim state welfare. It may be presumed that the introduction of Nemmadi would have made it easier for daily wage labourers to get income and caste certificates as well as avail pension schemes. However, interviews with government education officers, *panchayat* members and local leaders revealed that landless/daily wage labourers did not necessarily benefit from the introduction of Nemmadi and they were not aware that such a programme existed. Secondly, the process for obtaining documents, other than RTCs, through Nemmadi continued to be ridden with bureaucracy, which in turn required users to spend either more time or money or both to get the documents in the first place. These costs add to the overall expense involved in applying and obtaining RDS documents under Nemmadi. Moreover, the emphasis on providing proofs of domicile and identity with each application further marginalises users such as landless and migrant labourers whose citizenship status tends to be highly contentious.

On the other hand, economically affluent users and *panchayat* members who were also involved in the real estate economy mentioned that they found the Nemmadi system to be more convenient. They explained that after first time application, their records had been entered into the RDS database, which minimised the need for identity verification on subsequent applications for the same documents. These users recounted their experiences with Nemmadi as 'correct' and 'modern', suggesting that the introduction of ICTs was beneficial for them. It is important to note that these users do not represent the experiences of majority.

Users' perceptions also differ depending on which services they are seeking and which state institution they are interacting with via Nemmadi. For instance, *panchayat* members indicated that while Nemmadi has made it easier for users to procure RTCs i.e., RTCs are

FIGURE 2
RDS workflow process on paper



Source: Authors

delivered within a day's time; it is highly cumbersome and expensive to correct mistakes and record mutations in the digital RTCs. This is because following the introduction of Bhoomi and then Nemmadi, the authority for authorising corrections and mutations in digital RTCs has been removed from ground level functionaries and handed over to senior bureaucrats, whose offices are centrally located in Bangalore city. This change has increased the social and political distance between users and state agents, necessitating increased employment of brokers and payment of higher amounts of bribe for obtaining sanctions for changes in the digital RTCs. A farmer summarised other farmers' experiences with corrections and mutations through Nemmadi in these words:

The digital system is an unjust system ... for small farmers who do not have the money or influence to make changes in their RTCs and ... (they) lose lands because of errors in their names or extent of their lands.

Overall, although 40 services are provided through Nemmadi (Singh and Gururaj, 2009), most users visited NKs to obtain caste and income certificates, RTCs and to submit applications for pension schemes. Official reports on Nemmadi and Bhoomi cite the volume of RTC transactions as an indicator of the success of the programme. However, RTC services are as much sought by land brokers and real estate dealers as much as by small and marginal farmers. These real estate brokers and dealers viewed the opening up of land records data by making it available on the Internet and the digital delivery of RTCs as a positive move and associated the Nemmadi programme with transparency. Their sentiments are reflected in the following statements:

The advantage is that you can see the records on the Internet if you know the survey numbers. You can also see details such as the name of the owner of the land parcel, location of the plot, etc. It is a very open system. So from anywhere in India, if you know the survey numbers, you can see this information. There is no objection as to who can see this information. (Interview with *panchayat* members, 15 July 2010)

... Nemmadi is good. We can sit here and see the details of the land anywhere in Bangalore" (Interview with broker, 7 July 2010).

In contrast, below is the view expressed by a community member belonging to a socially disadvantaged caste group, which problematises transparency ushered by opening land data:

K gate has become developers paradise ... this whole thing of anybody going and getting a RTC is really problematic... even if a owner does not want to sell, (developers) can mobilise ... information, ... muscle power and money (to get the land). (Interview with Dalit Sangarsh Samithi, president, 29 June 2010)

From the above accounts, it is clear that the volume

of RTC transactions or its timely delivery does not necessarily reflect Nemmadi's success in terms of improving citizens' relationship with street bureaucrats and thereby with the state. Rather, the type of users seeking RTCs raises questions about who benefits from the reconfiguration of citizens' relationship with the State and realignment of decision-making powers and authority within the State. Similarly the effects of making land data open are not equal for every group in society. Moreover, not all users have the resources to avail of every service under Nemmadi. For example, to secure digitised maps, an applicant has to get 15 kinds of documentary proofs, which are maintained by different institutions at different places. Consequently, due to high costs involved, large farmers and developers predominantly used this facility.

Citizens' relationship with street and screen bureaucracies' post Nemmadi: The role of brokers

Another critical issue is the emerging relationship between users and street and screen bureaucrats. The rationale of Nemmadi programme is that the flow of information through computerised networks makes it easier for superiors to monitor the work of field bureaucrats (Meijer & Bovens, 2005). Computerisation, however, occupies a very minor role in the overall process of creating, verifying and delivering RTC and RDS services. The crucial functions of verification and authorisation of applications must still be done by VAs and RIs. The role of computerisation is simply to provide the status of the application and facilitate digital delivery of documents. During interviews, kiosk operators explained that they often encouraged applicants to personally follow-up with VAs and RIs to quicken the process. Further, owing to the large-scale rollout of the system, ambiguities regarding the first time process, procedure for subsequent applications in case of failure to update RDS documents at periodic intervals, and modifications in processes when new government policies and regulations are announced for different regions/districts in the state, continue to prevail across board.

A consequence of these complexities and confusions result in processes and rules being adapted and modified locally,⁸ thereby leading to appropriations and subversions of the technology by middlemen, users, government functionaries and kiosk operators alike. Earlier, villagers would pursue the VA in their own village to issue these documents. Following implementation of Nemmadi, VAs rarely visit and survey the villages. They have transferred the accountability in delivery of records and documents to the computerised system because institutionally as well as legally, they are no longer directly in charge of providing the service. Their non-availability makes it necessary for applicants to approach brokers and mediators such as *panchayat* members, local leaders and political activists to access VAs and RIs. The tediousness of the hierarchical process under Nemmadi is compounded during specific periods in the year, such as between April and July, when there is a flood of applications for caste and income certificates necessary for children's school and college admissions. During such times, the need for brokers to

follow-up and expedite the verification and signature process becomes even more crucial given the urgency of the situation. Middlemen are also important in such periods because they can either directly or through their networks approach revenue department officials to request for exceptions, favours and use of discretion in certain cases. In one instance, it was found during participation observation that a user wanted the RI to review his income certificate application in a way that would make it easier for his son to apply for a reserved category seat in medical colleges. Since as per the regulations and working of the NK system such requests are not legitimate, brokers assisted him in preparing a separate covering letter that explained his situation to the RI and they agreed to follow-up on his application. In this way, citizens have to access/approach officials through mediators and middlemen for bypassing the regulatory barriers introduced by technology interface.

Besides other intermediaries, front-end kiosk operators have emerged as another set of brokers. These operators are employed by Comat, but users perceive them to be government employees performing public service functions. Operators are either already part of the local political system by virtue of being members of political groups or by being related to landlords and local leaders. Or, they may get integrated into the dynamics over time as a result of their relationships with VAs and RIs, which they must cultivate and maintain as part of their executive responsibilities. They can therefore request these officials to quicken procedures for users who pay for hastening/bypassing the process. Sometimes, operators also perpetuate the belief that they have direct access to the network architecture and servers from which certificates and records are electronically transmitted to the front-end. It was found that the servers from where information is transmitted between *taluk* offices, NKs and the state data centres are usually inaccessible because of traffic and poor infrastructure.⁹ Therefore, operators often asked users to wait or to come back another day to collect their documents. Over time, inaccessibility of the server was cited as an excuse to extract extra payments from users for delivering certificates.

Through Nemmadi, an attempt was made to decentralise the delivery of RTCs and RDS by setting up kiosks in the headquarters of every *hobli* in the *taluk*. However, such decentralisation did not always guarantee efficient delivery of service because the location of the kiosks was not always convenient for residents of some villages. Villagers explained that in some instances, the *taluk* headquarter offices are geographically closer for them and that it is a more familiar institutional space where they have networks through which they can negotiate the RDS and RTC processes. It was also observed that the increased physical and social distance of Nemmadi front-end kiosks influenced the decisions of some villagers to employ the services of brokers to submit their applications and subsequently to follow-up on its progress. Further, women applicants, especially those who have to care for little children at home, rarely visited these kiosks because of the time involved in travelling

to the kiosks, difficulty of access owing to poor public transportation facilities and lack of knowledge regarding application and follow-up procedures. For other small and medium farmers, travel to the kiosk involved both time and cost.

Thus, the introduction of NKs has not removed the inequalities that prevail in the socio-economic structure of society. Instead, new layers of bureaucracy and regulation have been added in citizens' relationships and interactions with the revenue department officials. Interviews with users, *panchayat* members and brokers revealed that the process involved in applying for RDS documents and services is more bureaucratic now than it was prior to Nemmadi. The rationale for computerising workflows discounts the specificities and politics of the contexts in which documents are requested as well as the inequalities that prevail among different citizen groups in accessing services and the state.

Technical decisions and their consequences do not stem from an inherent logic of technology, but are influenced by differing interests of and relationships between actors embedded in the state and society. To illustrate the argument about the social shaping of technology, the next section explains how factors such as scale and costs of technologies, and social relations influenced technical decisions concerning databases supporting the Nemmadi programme.

Decisions on database: Questions of cost, scale and social relations

A recurring theme in the interviews with farmers, brokers and *panchayat* members pertained to the issue of rectifying mistakes in digitised titles. To understand the reasons for these errors, factors influencing design of Nemmadi and Bhoomi databases were investigated. Discussions with technologists and managers involved with e-governance programmes brought to fore the influence of bureaucratic and economic logics on database design and maintenance.

RTCs issued through Nemmadi kiosks rely on a database system created under the Bhoomi programme. Bhoomi database was designed to standardise land information across Karnataka state. Digitisation effectively means copying all the information on manual records and inputting it into the system. In reality, however, data entry from manual records into the digital system proved to be a cumbersome and contentious process. Technologists faced a challenge in developing a standardised format for digitising titles due to the diversity of land tenure regimes in Karnataka. The State of Karnataka was created by combining four different regions, each of which had its own administrative and political systems. The systems of recording and managing land information were therefore diverse, including the measurement systems used to record the extent of land parcels in each of these regions. The Bhoomi software, however, uniformly recorded land extent in *gunthas*.¹⁰ The columns and tables designed for the Bhoomi database tried to enforce a standard format for recording and managing land information, whereas there were considerable inter-

regional variations in the type of information contained in the manual records (Ahuja & Singh, 2005). Data entry operators therefore had to calculate and convert different measurement denominations into the metric system.¹¹ Consequently, errors have crept into the digital records. Secondly, errors in spellings of names of owners have been attributed to the poor record keeping practices and illegible handwriting of VAs. While this may have been the case, it also remains that data in land records were stored in multiple languages such as Kannada, Urdu, Tamil, Hindi, etc. Converting spellings from all these languages into a common language naturally results in errors because names spelt in one way in one language can be spelt in multiple ways in another language.¹² Construction of databases is therefore fundamentally linked to the choices that technologists and decision-makers in governments make regarding standardisation and customisation.

Nemmadi and Bhoomi databases were designed and constructed by software companies with sweeping directives from government officials and policy-makers. Technologists who work closely with e-governance programmes or the application of ICTs in governance assess government officials' understanding and capabilities of information technology to be poor in India.¹³ One of the technologists interviewed during this research opined that the state tends to rely on a select group of software companies and individuals to design, develop and maintain ICTs, which, in turn, gives these companies and individuals the power to influence both the design and the costs of technology. As a result, the quality of their work goes unchecked. This technologist explained,

... e-governance systems in general ... are all developed by software companies ... they are developed by external experts whose time is short and they cannot sit and address every issue that comes up with data management. There is a process by which the (database) design is developed ... is flawed to begin with ... (software developers) make a lot of choices simply in the interests of time.

According to another technologist associated with e-governance programmes, these technology lobbies are influential in bringing the agenda of e-governance to the table, the domains in which they must be introduced as well as in defining the terms of e-governance contracts.¹⁴ Further, technologists who develop databases in government and private companies are insulated from the ground situation. Field visits for assessing the local specificities are not mandated in consultants' contracts, which also make the design process fundamentally flawed. This was the case in Bhoomi where the digital database was developed without attending to the complexities that were prevailing in relation with management of land records, including recording mutations and corrections. This technologist opined that companies tend to continue with badly developed software systems and databases because it is cumbersome and expensive to develop a new system from scratch.

The process of data entry itself is cumbersome and expensive. To weed out errors as far as possible, entries have to be done at least twice and crosschecked independently by two different operators.¹⁵ The costs of data entry consistently concerned revenue department officials during the implementation of Bhoomi as a result of which services of VAs were eventually secured to enter data into the digital system. Moreover, technology gets outdated rather quickly but governments cannot afford to keep up because software and licenses are expensive to build and purchase. Besides, software companies prefer to abstract information so that the system they design can be generically applied to more than just land records, as reflected by the following narrative,

... software companies, generally, like to abstract things away. You make systems that generically you could apply as much to land records as to other things. For instance, Bhoomi—there is a lot of talk about repurposing Bhoomi for demographic data as well.

Interviews with technologists revealed that deciding between abstraction and customisation is not an easy choice.¹⁶ Heavy customisation is expensive in terms of development and maintenance. Software companies rarely highlight this dilemma when tendering/pitching for e-governance projects. Governments, on the other hand, plan and roll out e-governance programmes on a large scale, which also adds to the difficulty in customising the software. Thus economic and bureaucratic logics of the government perpetuate continuation of a badly designed system or an outdated one.

While issues of costs, scale and design are important, technologists' recommendations of robust data entry processes and tailoring technology to local contexts overlook the fact that land information is often incomplete. This incompleteness stems not simply from intent but also from which accounts and histories of land ownership gain precedence over other competing narratives. The contested nature of claims on land renders land information imperfect by nature (Haila, 2002; World Bank, 2007). Therefore, in practical terms, it is difficult to design a database co-relating one owner to a single land parcel, which runs counter to the logic of programmes such as Bhoomi and Nemmadi instituted to clear ambiguities in claims believed to stem from human errors, behaviour and design issues.

CONCLUSION

This article examined the role of technology in reconfiguring government-citizen interface following the implementation of Nemmadi and the factors which influenced the design of databases used under Nemmadi. It also described how the wider political and institutional dynamics provided the impetus for introducing Nemmadi. Further, the article illustrated the consequences of ICT interventions, particularly, for citizens with relatively weaker economic and social power and their responses in terms of adapting to, and

appropriating, the new technology. The article thus shows how ICTs introduced to improve government-citizen interactions get entrenched amidst prevailing complexities in society, and even introduce new layers of mediators and regulations which citizens have to navigate before they can access government institutions.

Findings reported in this paper reinforce the observations of earlier studies (Benjamin et al., 2005; De, 2005, 2009; Gatty, 2009) on Nemmadi's predecessor, Bhoomi, about the effects of reconfiguring citizens' relationship with street bureaucrats and those in the higher rungs of bureaucracy. The problems identified with Bhoomi programme by these researchers persist in Nemmadi. This research has added to these studies through a comprehensive exploration of the relationship between street bureaucrats, kiosk operators and rural citizens. While earlier studies have alluded to the potential adverse effects of reconfiguring relationships between rural citizens and street bureaucrats, they have not expanded on the specific ways in which e-governance programmes have sought to reconfigure state-citizen relations. Another contribution of this research is about the findings on social factors which influence technical decisions such as choice and design of technologies. Earlier studies by policy makers as well as academic researchers have not focussed on this aspect of e-governance.

The findings in this article illustrate the need to study technologies by embedding them in the institutional, political, societal and regulatory contexts in which they are introduced and situated. Such an approach moves away from normative assumptions about the impact of technology and allows for more nuanced understandings of how technology reconfigures institutions, processes and interactions between government functionaries and citizens. This understanding is crucial for re-conceptualising technology, governance and politics as intricately linked to material bases and practices. The embedded approach also challenges notions of technological determinism where technology is viewed as the final solution to problems of ambiguities, illegibility and inefficiency. Instead, the authors want to advocate an approach that focuses on how human actors are embedded in political and social systems and how technology transforms their stakes, interests and behaviour and in turn gets appropriated in highly complex ways. All these factors have an impact on the organisation of the state system and how the state will manifest before its citizens.

This study is limited in its analyses of the reflexive influences of social and technical factors on decisions relating to the forms and content of technology in e-governance programmes. It analyses one aspect of technology, viz., database design. Further research is needed on the reasons for selecting a particular technology and the choice of vendors. It is also useful to study the implementation of technology and e-governance in different domains and institutions in India. Finally, this research elaborates only on the role

of revenue administration under Nemmadi. It will be useful to study the effects of technology adoption among other organisations that are connected with rural and land administration.

NOTES

1. Fieldwork for this research was conducted under the aegis of the generous grant awarded by SIRCA/NTU to Servelots, Bangalore. We would also like to acknowledge the support of B. Manjunath who assisted with the field research and analyses of data.
2. RDS documents have acquired mandatory status under the laws of revenue administration and state government even though it is widely acknowledged that the information contained in most of these documents is not accurate despite having been verified by revenue department officials. For instance, incomes of applicants recorded in an income certificates, is known to be underestimated because people prefer to declare lower incomes in order to avail of government benefits and subsidies. Further, the process of verifying incomes is not foolproof. (Interview with officials of Agricultural Bank and Panchayat members, July 2010)
3. Interview conducted with a member of a village council on 2 July 2010.
4. RTCs are available from NKs and also from the registrar's office in the *taluk* headquarters. Additionally, private kiosks authorised by the government also deliver RTCs.
5. *Panchayats* are the basic unit of village administration. It is a form of rural local government.
6. Interview with a technologist who was involved with implementing e-governance projects in India. Interview conducted on 22 May 2010.
7. Survey numbers are unique numbers allotted to each parcel of land owned/occupied singly or jointly under one title. Source: <http://punjabrevenue.nic.in/lr6.htm>. Last accessed on 20 October 2010.
8. It was also found that Comat has modified the process of delivering RDS certificates to first-time applicants in some districts. Applications are verified by checking against the database which the company developed when redistributing ration cards in Karnataka state. This process helps the company and its operators to expedite the delivery of RDS by bypassing the mandatory verification and authorisation by VAs and RIs on first time applications. It was also mentioned to the authors that DCs and *Tahsildars* have the powers to modify processes/regulations and adapt these to local circumstances in the districts.
9. Interview with a technologist who was involved with implementing e-governance projects in India. Interview conducted on 22 May 2010.
10. Forty gunthas equal one acre.

11. Source: Circulars issued by Revenue Secretary dated 10 July 2003 available at stg2.kar.nic.in. Last accessed on 27 July 2010.
12. The authors are grateful to Gautam John, Project Manager at Akshara Foundation, Bangalore, for sharing this insight with them based on his experiences with maintaining digital databases. Interview conducted on 9 July 2010.
13. Interview with Alok Singh conducted on 9 July 2010.
14. Interview conducted on 22 May 2010.
15. Interview with Gautam John conducted on 9 July 2010.
16. Interview with Alok Singh conducted on 9 July 2010.

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BOOK REVIEW

ICT4D: Information Communication Technology for Development

Parveen Pannu & Yukti Azaad Tomar

K International Publishing House, New Delhi, 2010,
280 pages. US\$30 (paperback)

ISBN: 9780521712361.

The book *ICT4D – Information Communication Technology for Development*, by Parveen Pannu and Yuki Azad Tomar, provides a comprehensive overview of how Information and Communication Technologies (ICT) can be used effectively for development. In a country like India, where development is a stated priority for both the government and the private sector, and a great deal of interest is evinced by academics, businessmen and NGOs, this book takes a serious look at how ICT can actually become a useful tool to support the already existing and then new development activities that all these organisations take up. The book provides a broad overview of the range of ICTs available today and looks at the usefulness of these technologies in the context of development.

Divided into 25 chapters, the book looks at the various technologies that constitute ICT and how each one is used. It is, at the same time a wonderful 'to-do manual' for both students and practitioners and a book which provides a theoretical framework for ICT for development. The 25 chapters are framed within 12 parts, each part discussing one distinct area of study. Parts I, II and III locate the debate of ICT within the context of India and parts IV to XII discuss the various technologies, both old and new, that constitute ICT and how these technologies can be used in development activities.

Arrival of the internet in the late 1990s as a 'global' phenomenon has sparked many changes. One has been a change in terminology. Where before people talked of only Information Technology (IT), today we talk of ICT. This reflects the convergence of digital, computing and telecommunications. This reflects the convergence of the old and the new. And 'ICT4D' reflects precisely this convergence.

Changes in technology have also affected the way people view development as well as how governments, corporates and NGOs deal with development. The age of e-development – use of electronic ICTs like the internet to support development activity – has arrived. Donors attracted by the hype and hope generated by ICTs have altered their funding priorities and pushed ICT up the development agenda. Within that agenda has begun to appear the idea that ICT leads to the diminishing of distances, create a 'level playing-field' in which the small and the new can compete on equal terms with the large

and the well established and permit leapfrogging to an information economy.

The result of this movement has been an explosion of activity and writing, much of it poorly thought out and with little understanding of either history or of development realities. An enduring theme of such work has been an over emphasis on the technology itself, to the exclusion of other parameters. I believe that any writing on the subject of ICT for development today should go beyond the current enthusiasm for derivative description and technological determinism and discuss the social and cultural consequences of the use of such technologies, the appropriateness or otherwise of the new technologies within the context of our societies and so on. This is where the book has failed to make a mark.

Pannu and Tomar, in the first three parts have point out how the home has become a 'communications hub' and how new technologies such as the distributed networks of file-sharing applications, the possibilities of uploading and downloading of MP3 and MP4 files, transferring digital video and graphics from and to hand-held devices and mobile phones and synchronising these devices with the PC have dramatically changed the nature of the home and society at large. They have discussed the how these new technologies have begun to create new virtual communities and information heavy homes, but do not discuss the consequences of these. However, the authors go into some depth in looking at the phenomenon of ICT and spirituality. Their analysis of 'ICTs and Indian Culture and Spirituality' is broad ranging and astute. The discussion on the challenges India faces regarding uniform access to ICT technologies is partial at best. Although, it seems that the scope of the book is not to discuss in detail all social consequences of ICTs, it seems that any discussion on the subject cannot get away from approaching topics relating to universal access to technologies and their appropriateness and the transfer of technology debate.

However, the authors redeem themselves wonderfully in the next chapter on 'Development and Communications' wherein they discuss at length, the modernisation theories, dependency theories, basic needs model, and the constraints inherent in these models. Pannu and Tomar then go on to discuss new paradigms and the concept of sustainability and the use of Communications in development. The ensuing chapters deal, in great detail, with the various ICT technologies, both new and old. The book ends with a chapter critiquing the use of ICT for development based on the challenges faced by people using ICTs in the context of their capacity to receive, process, use and transmit information. The book ends with an optimistic note that ICTs are driving the new world order and impacting every aspect of today's life and we must learn to deal with it in order to survive. One

of the unique features of this book is the comprehension exercises given at the end of every chapter which would be very useful for students of communications and information technologies.

What the authors convey very clearly is the complexity of the contemporary situation. The ascendancy of global technologies in a developing world and the efforts of countries like India trying to deal with new technologies in the face of International pressures at the same time trying to work with the old technologies that are not entirely obsolete and useless. It would have, however been richer if there had been some more critical analysis

and some comparison with other countries facing similar situations. The authors successfully bring together a number of pieces that provide an overview of ICT for development. Its contribution to the body of literature in the field is valuable. This book should be particularly useful to students of communications and ICT.

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12. Do not use abbreviations, except author's initials, in references. Check the information against the original article for accuracy and ensure that each reference is cited in the text by author's surname and year of publication. Any reference not cited in the text will be deleted. Ensure that the spelling of the author's name and year of publication in the text matches the information provided in the full reference.

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