Taking e-Government to the Bottom of the Pyramid: dial-a-Gov?

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ABSTRACT
Much attention has been paid to the use of ICTs to improve the delivery of government services to citizens in developing countries. Government and donor funds have adopted two strategies in parallel: (i) the re-engineering and automating of government services, and (ii) the installation of telecenters (community Internet access centers) for citizens to access reengineered government "e-Gov" services.
The model of delivering e-Gov via the Internet has major drawbacks as shown by survey data representing 397 million people at the Bottom of the Pyramid (BOP) in India, Pakistan, Philippines, Sri Lanka and Thailand. First, only 49% have even heard of the Internet and only 2.6% have used it [15]. Second, it will take a lot more time and significant funds to roll-out enough telecenters to cover the BOP sufficiently. Third, most telecenters fail, while the successful ones are sustained by revenues from non-Internet services such as voice calls, fax and photocopying. But even these revenue streams may dwindle – according to our survey, over 40% of current BOP non-owners plan to purchase a phone within 2 years. They will spend their already-limited communications budgets on phones they own, not at a telecenter.

By viewing the telephone as the end-device for e-service delivery, implementers can automate those parts of a government process that can deliver value quickly, through "smaller" (less complicated, therefore less likely to fail) applications. By not seeking to re-engineer entire government departments, these projects face less resistance to change from public-sector employees. Given that over 90% of those at the BOP use phones already [15], significant use is more likely if the necessary attention is paid to language, design and publicity.

The Internet, accessed at a telecenter, and sophisticated e-Government systems will play a role in providing "higher-end" citizen services, for example submitting a passport application online with an uploaded digital photograph. But at a time when the Internet is barely reaching 10.3 million people at the BOP in these countries, the paper argues that phones are the cheaper, more immediate and ubiquitous tool for Asian governments to inform, transact and interact with almost 400 million of their most needy citizens.

The paper presents an alternative, telephone-centric model for electronic delivery of public services citizens. It draws on research conducted by LIRNE*asia* in 2006 and previously published as well as unpublished e-Gov case studies.

Categories and Subject Descriptors
K.4.0 Computers and Society, General

General Terms
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Keywords
Government, mobile, transactions, markets, poor, telecenter

1. INTRODUCTION
Much effort is being applied to the use of Information and Communication Technologies (ICTs) to improve the delivery of government services to citizens in developing countries. Government and donor funds are implementing two strategies in parallel: (i) the re-engineering and automating of government services, and (ii) the installation of telecenters (community Internet access centers) for citizens to access reengineered government "e-Gov" services.

The model of delivering e-Gov via the Internet has major drawbacks as shown by survey data representing 397 million people at the Bottom of the Pyramid (BOP[1]) in India, Pakistan, Philippines, Sri Lanka and Thailand. First, only 49% have even heard of the Internet and only 2.6% have used it [15]. Second, it will take a lot more time and significant funds to roll-out enough telecenters to cover the BOP sufficiently. Third, most telecenters fail, while the successful ones are sustained by revenues from non-Internet services such as voice calls, fax and photocopying. But even these revenue streams may dwindle – according to our survey, over 40% of current BOP non-owners plan to purchase a phone within 2 years. They will spend their already-limited communications budgets on phones they own, not at a telecenter.

The paper presents an alternative, telephone-centric model for electronic delivery of public services citizens, drawing on research conducted by LIRNE*asia* and previously published as well as unpublished e-Gov case studies. It first explicates the

[1] Socio Economic Classification (SEC) A, B, C, D & E classify people according education and employment, with a co-relation to income levels. The SEC classifications are used globally in market research. A is the highest ranking (richest, the top of the pyramid) and E is the lowest. The BOP is defined as SEC groups D and E. The data and calculations in the paper are for the BOP population between the ages of 18 – 60

stated objectives of e-Gov. Then it focuses on the delivery channel, currently dominating the thinking of decision makers. The strengths and weaknesses of telecenters and phones are assessed and compared, leading to the formulation of an alternative vision of e-Gov delivery, one that is centered on the increasingly sophisticated and multi-purpose capabilities of evolved mobile phones (and fixed phones that mimic them)

2. E-GOVERNMENT TO EMPOWER THE BOTTOM OF THE PYRAMID

2.1 Benefits of e-Gov

Electronic-Government (e-Gov) applications have the potential to facilitate good governance by increasing transparency, efficiency, and citizen-centric service delivery and to act as an effective medium to facilitate citizen consultation, policy discussion and other democratic inputs into the policymaking process [27]. According to Grimsley & Meehan [10], e-Government systems differ from commercial information systems and go beyond efficiency, effectiveness and economy in that they include political and social objectives such as trust in government, social inclusion, community regeneration, community well-being and sustainability.

2.2 Evolution of e-Gov

There are various models which measure the development or evolution of e-Government applications across a spectrum of service sophistication (see among others Santos and Heeks [22] and West [28]). Moon [16] has identified 5 stages:

1. Stage 1: e-Gov services Inform citizens, by allowing them to access government information on the Internet.
2. Stage 2: email and other data transfer technologies enable citizens to communicate (Interact) with the government, sending and receiving information
3. Stage 3: e-Gov application enables citizens to access a government service, and Transact with government (complete a financial transaction online)
4. Stage 4: the government introduces various government services are vertically and horizontally integrated, so citizens have a "one-stop shop" online to be informed, to interact and to transact (stages 1 – 3 above done with higher ease).
5. Stage 5: the government uses the Internet to promote Web-based political participation by including e-Governance tools such citizen polling

Stages 4 and 5 can be considered transformational stages in e-Gov, where the relationship between citizen and government is transformed into a new level of sophistication and citizen-centric service orientation.

It is Stages 1, 2 and 3 (inform, interact and transact) that are the primary focus of this paper.

2.3 Citizen-centric (G2C) e-Gov projects

Depending on focus and targeted constituents e-Gov initiatives can have provide 3 types of services: G2G (government to government), G2B (government to business) and G2C (government to citizen). G2C systems aim to take the benefits of e-Gov to citizens – to make their access easier and more efficient and to increase transparency so that all citizens have equal or easy access to the services. The delivery of G2C e-Gov services is the focus of this paper.

Taking the dividends of any government reform activity to all citizens is difficult. The benefits of reforms in infrastructure often first benefit the urban or middle-higher income groups of the populations disproportionately. For example, telecom infrastructure is often first implemented in urban areas (due to population density providing for economies scale), and generally consumed first by the higher income groups.

The challenge for G2C e-Government projects is to give the poorest citizens access to government services electronically in a manner that does not discriminate geographically or economically. Taking the dividends of e-Gov to the Bottom of the Pyramid (BOP), thereby decreasing existing disparities in access, is in fact the holy grail of e-Government projects. Using the standard Socio-Economic Classifications [9] of A – E, this paper focuses on delivery of G2C e-Gov services to citizens in the D and E socio-economic classifications, or those at the bottom of the pyramid (BOP), to use a popular term.

3. ROLE OF THE TELECENTER IN DELIVERING E-GOV TO THE BOP

G2C e-Gov projects aim to deliver services to citizens via specific "channels" - one is the Internet (accessing the service remotely through any computer connected to the Internet), and the other is counter services (where the citizen still walks to the government office, but is served faster/better due to e-Gov being implemented). Some countries list the mobile phone as another possible channel, though current examples of e-Government provision through the phone are rare in developing Asia.

Low incomes levels in developing Asia often do not allow even citizens of middle income households to access a computer or the Internet at home or at work. The access problem is compounded when the BOP segments of the population is considered. Not only does the BOP not have sufficient income, but they tend to live in rural areas – where commercial provision of Internet services is often less commercially viable. Figure 1 [15] shows not only the low Internet use but highlights the urban-rural divide within BOP in the five countries studied.

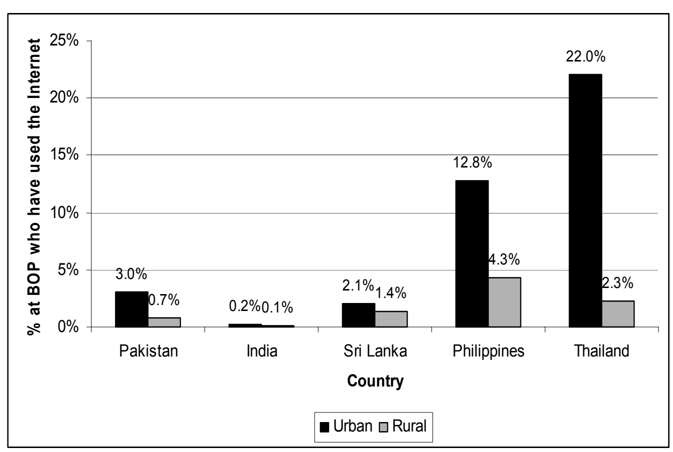

Figure 1: The urban-rural digital divide within the BOP

To bridge this divide and to enable the BOP citizens to access e-Government services, community access points, variously referred to as telecenters, kiosks, knowledge centers, community Internet centers and a host of other names are viewed and used as the primary channel.

Telecenters come in various forms: Colle [5] points out that telecenters can differ from each other on a number of different dimensions such as profit vs. service orientation, provision of narrowly-focused services (e.g. providing access technology only) vs. multipurpose services (e.g. providing access technology, training, development information), commercial (charging clients for services) vs. free, urban vs. rural and so on. Irrespective of the form, telecenters are designed to provide a combination of ICT services ranging from simple voice calls, to full broadband Internet based services.

Often e-Government applications provide the biggest opportunity for achieving the sustainability and development goals of telecenters [1]. Indeed, in many countries there is a mutual dependence of e-Gov services and telecenters: telecenter content is anchored on e-Gov applications and e-Gov applications use telecenters as the primary channel to take services to the BOP. For example:

- In Sri Lanka the telecenter is the dominant channel in delivering e-Government services to citizens at the BOP. With over USD 83 million in funding from various sources such as the World Bank, the Government of Korea and the Government of Sri Lanka, the e-Sri Lanka initiative has allocated about USD 35million towards projects that re-engineer government departments [31]. These projects range from the simple (developing web sites for government departments) to the complex (automating the process of issuing National Identification Cards to citizens). The channel for the BOP access to these re-engineered services is the network of 200 rural telecenters, implemented using USD 7.5 million of e-Sri Lanka projects funds [31]. The target has now risen to 1000 telecenters [12]. One of the outcome indicators for measuring the success of the telecenter network is that people use the telecenters regularly to access government services (among other services) [31].
- In India, the 1020 Drishtee Village Information Kiosks claim to have e-Government services as the most popular applications used by citizens. These include filing online grievances and other government services that citizens of rural areas would have previously had to spend a lot of time and money to access such as obtaining driving licenses and land records [7].

Numerous other similar strategies where the telecenter is the dominant delivery channel for e-Gov are found across Asia. Indeed the number of telecenters that have been funded in the recent past and are being planned for the near future in the developing world is impressive. Table 1 provides a snap shot of well-known telecenter programs in India, Sri Lanka and Pakistan

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Table 1. Telecenter Programs in Pakistan, Sri Lanka, India

Country	Organization	Telecenters to be deployed within next decade
Pakistan	Pakistan State Oil	3,500
	Pakistan Telecom Authority	400
	Post Office Telecenters	12,000
	Agha Khan Rural Support Pr.	200
	Karakoram Dev. Authority	100
	Allama Iqbal Open Uni.	2,000
	Telecard, Mobilink, Telenor	200
	Entrepreneurs	Several 100
Sri Lanka	USAID	500
	Sarvodaya	189
	E-Sri Lanka/ICTA	1,000
India	Swaminathan Foundation	95
	ITC (E-Choupal)	20,000
	Drishtee	1,020
	Tarahaat	196
	Gyandoot	21
	N-Logue	6,000
	Gramdoot	200

Sources: [2, 3, 8, 11, 12, 13, 19, 25, 26, M. S. Swaminathan Research Foundation, India & Sarvodaya, Sri Lanka, personal communication]

4. INTERNET USE AT THE BOP

Research by LIRNE*asia* [15] representing 397 million people at the BOP in five developing countries in South and South East Asia (India, Pakistan, Sri Lanka, the Philippines and Thailand) shows that Internet usage is minimal at the BOP in these countries – ranging from 0.3% of the BOP in India (the lowest) to 10.4% in Thailand (the highest) (Table 2).

Table 2. Internet Use at the BOP

	Pakistan	India	Sri Lanka	Philippines	Thailand
% at BOP who have accessed the Internet	1.9%	0.3%	1.5%	8.8%	10.4%

Source: [15]

Such low usage numbers call to question the availability of Internet facilities at the BOP in these countries. Even in countries like India and Sri Lanka which have embarked on large telecenter programs, the reach of the Internet is miniscule.

Usage (accessibility) is low. But awareness is also low. When asked if they had heard of the Internet, the percentage of the BOP population who said “no” ranged from a lowest of 14.3% in Philippines to a high of 71.9% in India (Figure 2 [15]). This equates to 227 million people at the BOP in these countries who have never heard of the Internet.

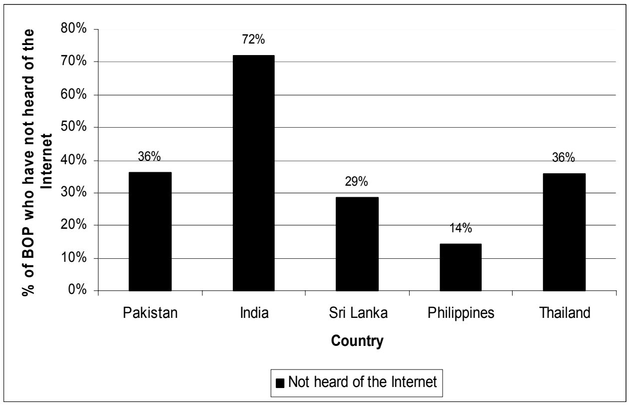

Figure 2. Awareness of the internet at the BOP

This does not bode well for the strategy of delivering government services to the BOP through telecenters. Telecenters are costly to implement, and to roll out a sufficient number to reach the BOP population takes time. But even if they were rolled out in sufficient numbers and in the appropriate (rural) locations, the awareness has to be built from scratch if they are to be used by citizens.

5. PHONE USE AT THE BOP

In contrast to usage and awareness of the Internet, usage of telephones is extremely high among the BOP. In all the countries surveyed in the LIRNE*asia* [15] study, over 92% of the population had used a phone in the last 3 months (Table 3). The sample consisted mainly of BOP respondents – therefore we can safely say that phone use among the BOP is also high, and certainly orders of magnitude higher than the Internet use.

Table 3. Telephone usage at the BOP

	Pakistan	India	Sri Lanka	Philippines	Thailand
% of those randomly approached who have used a phone in the preceding 3 months	98%	94%	92%	93%	95%

Source: [15]

Not only is awareness high (indeed people are not only aware, they have in fact used phones), but phones are relatively easily accessible - around 60% of the BOP in all the countries can get to a phone in less than 5 minutes (Figure 3 [15]).

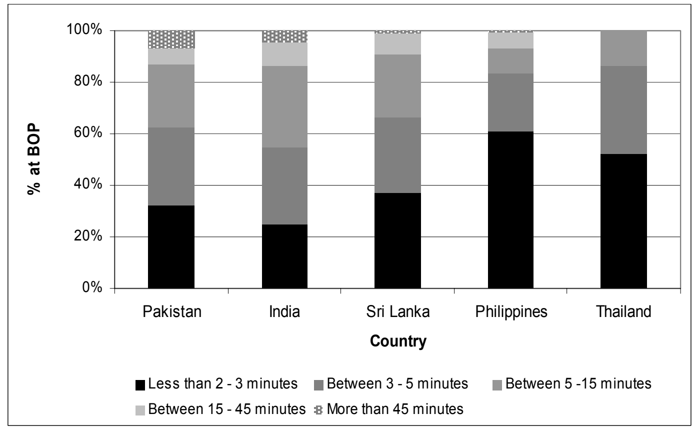

Figure 3. Time taken to reach the nearest phone

Breaking this down by urban and rural does not change the numbers significantly – even in rural areas, the people can get to a phone nearly as fast as they can in urban areas (Figure 4 [15]).

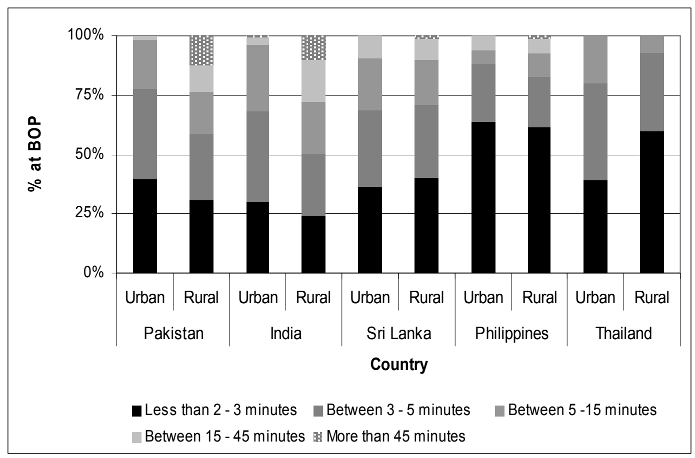

Figure 4. Urban vs. Rural access to a phone

Not only is the phone well accessible now, but access is likely to increase. Of those at the BOP who do not own any kind of a phone (fixed or mobile), the number of people who plan to buy a phone by 2008 is 115 million. This means the percentage of people at the BOP with a phone will be significant – ranging from a low of 50% (or 130 million people) in India to a high of 86% (or 12.9 million people) in Thailand. (Figure 5 [15]). The total number of people at the BOP with phones will then amount to over 232 million.

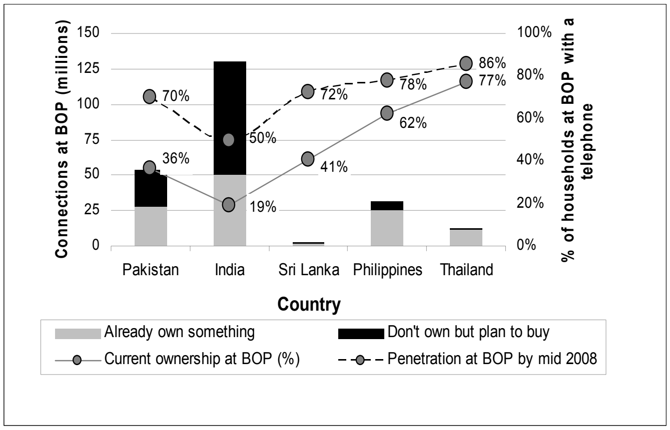

Figure 5. Current and Future ownership of Phones at the BOP

Of those who intend to buy a phone, the majority will purchase mobile phones (as opposed to fixed) (Figure 6 [15]). This is about 168 million at the BOP with sophisticated mobile devices, and the rest with fixed phones which are increasingly providing "mobile-like" functionality (e.g. fixed phone penetration in South Asia is increasing due to CDMA phones which provide limited mobility and SMS).

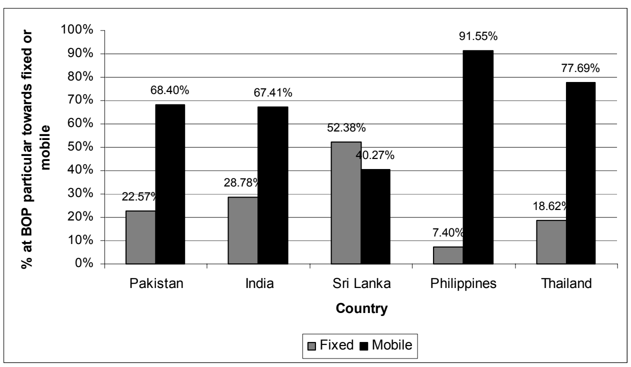

Figure 6. BOP preference for mobile phones

The same survey shows that those who intend to purchase phones are able to spend up to USD 5 per month on usage charges (Figure 7 [15]), which is in line with declining ARPUs (average revenue per user) reported by many Asian operators.

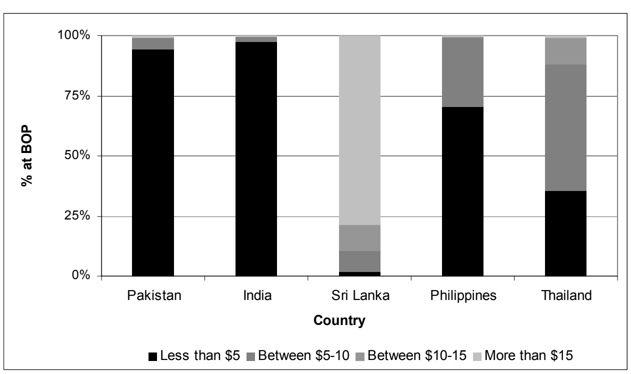

Figure 7. Expected monthly spend on the new phone service

What does all this mean for telecenters?

6. IMPLICATIONS OF TELEPHONE USE & OWNERSHIP ON TELECENTERS

Most telecenter models depend on non-Internet services to generate a steady revenue stream. Dominant among these are voice calls. Citizens who may never have used or heard of the Internet still walk into telecenters to make calls, and they pay for it. Indeed many telecenter models depend on voice-call revenues to ensure some level of financial sustainability. In some models, such as the one adopted by e-Sri Lanka, the dependence on voice calls is quite high - voice calls are expected to generate about 60% of the total revenue in the early stages [31].

But the high access and high (current and potential) ownership of phones among the BOP can pose a serious threat to this revenue stream. We showed that the majority of people at the BOP will own their own telephones soon, and use it to make calls. If they do not own one, they will use a relative's or neighbor's phone to make or receive phone calls, as they are doing now. What they will not do is visit telecenters to make these calls. Therefore, the roughly USD 5 that they expect to spend on communication will flow to mobile (or fixed) phone operators, and not to the telecenters. In this scenario, the telecenters stand to lose USD 5 per consumer per month from their revenue stream – this is significant in light of the fact that these calls are among the few solid revenue generating activities for many telecenters.

Citizens using phones at home also mean that they will not be walking in and out of the telecenter as they otherwise might have. This might mean a loss of other revenue as well, due to reduced traffic into the telecenter.

Individual case studies that list success factors for telecenters in the developed world exist in the literature, and a few of them address financial sustainability (see among others Wong et al. [30] and Murray and Cornford [18]). But comprehensive studies on the financial sustainability of telecenters in the developing world are rare. Amin [1] states that worldwide there are few truly self-sustaining business driven telecenter models, and that few have achieved financial sustainability. In one of the few comprehensive evaluations of telecenters in a country, Peter Benjamin observes that the government operated telecenters in South Africa are less successful when compared to the private entrepreneur operated ones [32].

We know that it is very difficult for a telecenter to achieve financial sustainability even under "ordinary" circumstances. Increased mobile/fixed phone penetration further threatens that sustainability. Indeed, the challenges of falling revenue faced by Bangladesh's village phone ladies [23]and the attrition of "telecenters" (in this case mostly phone resellers) in Senegal are providing early evidence that the space for community access points for telephone services is becoming narrower in light of increased cell phone penetration [14].

The negative implications of the above trend are for telecenter operators. But to a designer of e-Government systems, the high use and accessibility of phones is not a problem; it is an opportunity to get closer to the "holy grail" of disparity reducing service provision.

7. A MOBILE-CENTRIC ALTERNATIVE TO DELIVER E-GOV TO THE BOP

Examining the characteristics of mobile phone access, usage and functionality provide a different world view in service the BOP.

7.1 Widely available and used

To people at the BOP, the phone is already a familiar and accessible device – a majority can get to a phone in less than 5 minutes (Figure 3). Those who do not own a phone plan to buy one in the near future (Figure 4). The phone they buy is going to be a mobile phone or one with "mobile-like" capabilities – a device generally more sophisticated than fixed phones, enabling not just voice calls, but SMS, Internet and payment, among other things. In a few years, 168 million of the poorest people in Asia will be walking around with sophisticated devices capable of making/receiving voice calls, browsing the Internet, sending SMS and doing a host of other activities that are yet being conceptualized. If fixed phones are included, there will be a total of 232 million citizens at the BOP with a phone, fixed or mobile. Fixed phone growth is being driven mostly by CDMA technology, which enables the "fixed" phones to have features of a mobile phone such as SMS and limited mobility. Therefore the potential for 232 million people at the BOP to receive the dividends of e-Government is clear.

7.2 Available Immediately

The mobile is here now, providing an immediate channel for e-Gov delivery, unlike telecenters which are in the early stages of development and are likely to take years to reach a majority of the BOP. The delay, with respect to e-Gov, is in back-end automation of e-Gov systems, not in the delivery channel.

7.3 Unlikely to face financial sustainability issues

Mobile phone connectivity is a service provided by companies who are in the business of making a profit. People who want to consume phone services expect to, and are willing to, pay for it. The same cannot be said of telecenters that often start as a) pilots and allow free Internet use in order to attract people in the initial stages or b) start with and continue to provide free services in order to achieve higher social objectives at the expense of financial self-sufficiency. The mobile as a channel for e-Gov service delivery will not face the sustainability challenges that dog the telecenters. There is no need to worry about the e-Gov service delivery channel closing down.

7.4 Providing for a full range of e-Gov sophistication

Mobile phones are capable of providing e-Gov services to citizens at varying degrees of sophistication – that is, they can inform, interact and transact with citizens. Examples can already be found, as shown below:

7.4.1 Inform

Sri Lanka's government information center (GIC) enables citizens to dial 1919 from any phone and ask questions on how to obtain various government services (e.g., which forms must be completed to apply for a national identity card, what supporting documents must accompany the application, where to submit the application, phone number of relevant official at the government department, etc). Data from just 6 moths of operation show that citizens with phones did use the GIC's services – the provinces with the highest number of household phones originated the highest number of calls[2] [21]. At present, the GIC is arguably the most "used" citizen service in the e-Sri Lanka e-Gov portfolio. The other G2C projects depend on Internet access or on counter service.

7.4.2 Interact

The state of Gujarat in India, in partnership with mobile operator Hutch, offers an SMS based service to citizens who apply for an Indian passport. According to Mukherjee [17] previously over 900 citizens queued outside the Regional Passport office each day. About 300 of them are simply accompanying individuals. Of the remaining 600, about 250 come from different corners of the state to simply inquire about the state of their passport. Through the new SMS-based service, a citizen who sends an SMS containing the file number is kept informed about the progress (or lack thereof) of the passport application at each of the seven stages.

7.4.3 Transact

The g-Cash PayBIR service is supported by the Philippine government's Bureau of Internal Revenue (BIR) and enables the payment of taxes using mobile phones. Payments of up to P10,000 (approximately USD 180) towards a citizen's income tax, fines or penalties or regular documentary stamp taxes can be paid with a simple SMS. An SMS "receipt" sent by the BIR provides confirmation that the payment was recorded/received [6].

The vast numbers of commercial mobile-finance solutions from across the world targeting the un-banked and those at the BOP is well documented, and are predicted to be the next big shift in the mobile and financial services sectors. For example, Wizzit [29] in South Africa and SMARTmoney [24] in the Philippines are just two in a series of emerging product offerings combining financial transactions and the mobile phone. However, very few examples are found of government financial transactions involving mobile phones (the g-Cash PayBIR example above being a rare one). This is ironic, since phones can achieve many of the social objectives of e-Government easier and faster than the alternatives available to governments in developing Asia.

Telecenters and payments via the Internet have only been successful for e-Government initiatives in the developed world, where most people have bank accounts and credit cards. But the total number of credit card users in India is 45 million [20]. In Sri Lanka less than 830,000 credit cards have been issued [4], with the number of actual credit-card owners likely to be even less (due to multiple cards per person). In both countries, that is less than 4% of the population, none of them at the BOP. The relevant comparison is the 0% at the BOP with access to credit cards or other online payment mechanisms with the 85 million at the BOP who already have or will have a transaction-capable mobile phone

[2] The only exception is the war-tone Northern province which generated very few calls

by 2008 in these two countries, or the 168 million in the 5 countries studies.

7.5 Possibly Bridging the literacy gap and helping users migrate to the internet in the future

Kavanaugh et al [34] argue that users with low literacy who use a mobile phone can use that experience to learn how to use a personal computer. In developing countries where some citizens at the BOP may have low reading literacy, the use of mobiles phones can act as a "scaffolding technology" that helps users be less intimidated by the use of a computer.

The scaffolding effects of the phone may extend also to the use of mobile related payments. Many emerging mobile transaction models are offered in partnership by mobile operators and banks. At present, many at the BOP are un-banked. As a result of using mobile phone payments, BOP users are likely to, over time, build up traceable financial records which make them more bankable. It is possible therefore to imagine a situation where in the long term, current mobile-payment users at BOP migrate to using more traditional banking products, including credit cards or other credit based payment systems, thereby facilitating their use of such tools online.

The phone based e-Gov systems may also help bridge the literacy-gap in a different way. A phone-based system has the ability to offer Automated Voice Recognition systems and phone trees to be utilized to offer government services. By simply requiring the user to listen, press keys/buttons on the phone or speak clearly, the phone can provide information or certain interactive services that do not require reading literacy at all. For example, the Soochna Se Samadhan (lifeline India) system allows citizens to make a complaint through an integrated voice recognition system following the guidance of a voice menu. Once a complaint has been lodged and a solution has been identified by the relevant authority, the person who made the complaint can either retrieve an audio recording with the solution, or receive the same via a SMS [35]

7.6 The future: combination of phone and Internet

A model for e-Gov service delivery based solely on the phone is neither realistic nor desirable, for a number of reasons.

Current technology doesn't enable bandwidth-heavy tasks (e.g. uploading of a scanned birth certificate containing multiple pages) to be performed via mobile-broadband within a reasonably short time. This and certain other types of services will continue to be best suited for a high-bandwidth internet connection.

Furthermore, it has been pointed out that in certain countries/societies, the poor may not feel comfortable talking to senior level government officials even on the phone. In such situations, voice-based informational or complaint handling systems may not be used by the citizens. Of course if these citizens are literate they may be able to communicate with the officials via SMS.

Due to these and other reasons, we believe that the optimal evolution of e-Gov service delivery is a combination of the phone and the Internet (where the phone is a personal device owned by the BOP and the Internet is accessed at a telecenter when needed). Some parts of a government service are ideally suited for phone based delivery. Others are better suited for the Internet. But in order to do find the right mix, the current thinking around e-Gov and telecenters needs to evolve.

A more "low-tech" evolution (before the phone + Internet model reaches everyone) maybe the phone + fax machine: information requests are made via the phone, but the actual government forms are faxed to the citizen and the completed forms are faxed back to government. Once again, the fax machine is located at a telecenter/community access center.

8. CONCLUSIONS

The stated objectives of e-Gov in developing Asia cannot be achieved by relying solely on telecenters. Newly available data on tele-use at the BOP indicated that the Internet has made very little headway in penetrating these population groups. In contrast, the survey data shows telephones, especially the mobiles, making tremendous gains. It is therefore time for e-Gov strategists to think of the mobile as the dominant channel for taking e-Gov to the BOP. It is time that the mobile phone displaces the website from the central position it currently occupies in e-Gov thinking. Eventually, it will be a combination of the phone and the Internet (through telecenters or otherwise) that evolves. But for now, e-Gov implementers need to view phone-based service delivery as the immediate solution to the digital divide that keeps those at the BOP from reaping the benefits of e-Government.

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The paper uses data from a comprehensive survey conducted by LIRNE*asia* in 2006 in 5 countries (India, Pakistan, Philippines, Thailand and Sri Lanka). This Tele-use at the Bottom of the Pyramid (T@BOP) survey and research was led by Harsha de Silva and Ayesha Zainudeen of LIRNE*asia*. The authors gratefully acknowledge their contributions, as well as those of Dimuthu Ratnadiwakara of LIRNE*asia* and the ACNielsen team that conducted the survey. Any errors are the responsibility of the authors

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11. APENDIX: T@BOP survey methodology

This section provides a brief overview of the methodology of 2006 T@BOP survey undertaken by LIRNE*asia.* Data from this survey is used in this paper. A more detailed description of the sampling methodology is found in De Silva, Zainudeen [33]

Participants

Respondents were males and females aged between 18 and 60 years of age from urban and rural locations within the 5 countries.

A multi-stage stratified cluster sampling by probability proportionate to size (PPS) was used to select the target number of urban and rural centres. After determining the number of centres to be selected from each cell (strata in respective provinces), urban and rural areas were selected again using PPS on a constant population interval on geographically ordered centres within each cell. See Section 3.3 of De Silva, Zainudeen [33] for more details.

Research Design

Quantitative Module: Face to face interviews were conducted with randomly chosen respondents using a structured questionnaire at their respective homes. The sample was designed to represent the BOP in each country so that the findings would be representative of the respective segments in each country as seen in Table 4. Phone usage and behavior were also recorded through the placement of a diary among 50% of randomly selected respondents who were literate and trained as required. An incentive was provided for diary completion while random checks were conducted to ensure that recordings were being made.

Table 4: Quantitative sample overview

Country	**Population (millions)**	**Sample Size**		**Total**
		SEC A,B,C	**SEC D,E**	
Pakistan	166	731	1,081	**1,812**
India	1,000	652	3,348	**4,000**
Sri Lanka	16 (excl. 2 provinces)	596	481	**1,077**
Philippines	87	92	1,008	**1,100**
Thailand	65	348	352	**700**
Total sample size :				**8689**

Qualitative Module: Six Extended Focus Group Discussions (EGD) consisting of 8 individuals in each EGD, which lasted approximately 3 hours each were conducted in each country. Table 5 provides the sample overview. Respondents included telephone users as well as those who had not used a phone in the preceding 3 months. All groups were conducted in the local language(s).

Table 5: Sample country composition for the qualitative component

Country	**# of Focus groups (SEC D,E only)**		**Centers**
	Users	**Non-users**	
Pakistan	4	2	Peshawar, Karachi, Lahore
India	4	2	Lucknow, Teravalure
Sri Lanka	4	2	Kurunegala, Moneragala
Philippines	4	2	Metro Manila, Batangas
Thailand	4	2	Chiang Mai
Total sample size : 30 focus groups			