A Theoretical Framework for Government Information Service Delivery to Deep Rural Communities in South Africa

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Abstract

This paper reports on a study to determine the information requirements of communities in deep rural areas on government services and how this information can be made available to them. The study then proposes an e-government theoretical framework that utilizes deep rural Small, Medium and Micro Enterprises (SMMEs) to serve as access points to the government information on services available and needed by this rural community. Initially the study identifies current services provided by the government to the community and measures the levels of satisfaction of the community on the service provision. On the basis of the analysis of community satisfaction levels the gaps in the information needs of the deep rural community are identified. The study also identifies the challenges faced by the community in trying to access these services. A theoretical framework for government information service delivery is then proposed.

This research was conducted as a case study at KwaNongoma rural area in KwaZulu-Natal. To come up with the community needs, recreation needs of three communities of KwaKhangela, KwaMememe and KwaSomkhele were identified. The community needs determination covered electricity, water, education, housing, financing and health to name but a few.

Keywords: E-government, deep rural communities, SMMEs

1. INTRODUCTION

Deep rural communities in South Africa face the challenges of access to information on government services and access to ICTs that could otherwise deliver this service. Deep rural communities are those which have a local municipality that has small old "resettlement areas" with more than 50% of people living more than 5 kilometers from a tarred road, and more than 25% of the people using water from streams, rivers, dams or rainwater tanks and with very limited choice of services within that municipality [1]

The role of Small, Medium and Micro Enterprises (SMMEs) has not been exhaustively explored by the government in the delivery of information services to the deep rural communities. This research is about the development of a theoretical framework for e-government information service delivery to deep rural communities through SMMEs. E-government can be defined as "information technologies that have the ability to transform relations with citizens, businesses and other arms of government… and can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management" [2].

The project is focused on empowering rural communities and SMMEs to successfully sustain government information services through ICTs. Isolation, lack of adequate ICT infrastructure, and awareness of government services that are available for rural communities, limited opportunities for training, and the speed with which technology is changing all offer special challenges to the rural community and SMMEs. It follows that, for the government to deliver such services it is important to understand the needs of the particular community.

2. RELATED WORK

Traditionally, close rural areas have received significant attention from the government because of their strategic positioning – that of being close to a tarred road and hence experience higher economic growth and reduced illiteracy rates as compared to deep rural communities. On the other hand, deep rural communities are faced with severe problems and their lack of accessing government services exacerbates their condition [1].

According to South Africa's development framework, one of the goals for the ICT sector in the country is "to increase the use of ICT as an enabler for socio-economic development with equity" [6]. Various solutions ranging from portal technology to ICT-hubs for rural communities have been adopted to bridge the information gaps. Through portal technology, it is possible for communities to apply a collaborative approach that supports resource sharing; and through ICT-hubs it is possible to have sustainable physical centres with the necessary infrastructure to provide generic services like tele-centres, desktop publishing, business support, application development, training and information services to the community.

However, these technologies are suitable for rural communities and SMMEs who have the capabilities and the knowledge of what information technology capability can do to their livelihoods and businesses respectively. Little attention is paid to deep SMMEs who view e-commerce as being too complicated to implement and resource scarcity continues to threaten their adoption, thus leading to the digital divide which often prohibits residents of rural communities from accessing government services.

The slow diffusion of e-government in Africa can be attributed to factors of "e-readiness for e-government" [4]. The data systems infrastructure, legal infrastructure, institutional infrastructure, technological infrastructure, human infrastructure and leadership infrastructure should be in place for e-government to work.

There are many considerations and implications of implementing e-government. An e-government site that provides web access and support does not offer the potential to reach many users, particularly in remote areas [5]. Low English proficiency and poverty are some of the issues that are a hindrance. Much of the current discussions on the implementation of e-government focuses on the Internet. It is assumed that the Internet is the base medium in all phases and recommends governments to build Internet infrastructure. Issues of lack of an Internet infrastructure, high Internet costs, low Internet penetrations and citizens' Internet illiteracy are overlooked in all this [6].

It is also imperative for e-government projects to establish the services and information needs of the community that it is serving beforehand. This decreases the differences between the technology and the reality of the social context, that is, people culture and policies in which the system is expected to operate. Linked to this is the lack of skills and training which are required to effectively use an e-government system by both the communities and government officials [3].

3. METHODOLOGY

3.1 Aims and objectives

The study aims at understanding the information needs of deep rural communities and crafting a theoretical framework that utilizes deep rural SMMEs to serve as an access point to all the government services and information needed by the communities.

The research question is:

"What are the required features of a collaborative framework between government and SMMEs to ensure effective information service delivery to deep rural communities and how is this achieved?"

The objectives of the research therefore are:
- To identify current government services provided to deep rural communities.
- To analyse the services provided and deduce the gaps in the information needs relevant to deep rural communities
- To identify the role which SMMEs could play in government information service delivery

- To examine existing technologies which can be adapted to meet the acute infrastructural deficiency in the SMMEs
- To propose a collaborative framework between government and SMMEs to ensure effective information service delivery

3.2 Data collection

A background study on rural communities and e-government models was conducted. This study spoke into a questionnaire to gather the information from both the community and SMMEs on their needs. The questionnaire was administered to three communities in KwaNongoma rural. These were KwaKhangela, KwaMeme and KwaSomkhele. Respondents were asked to give their opinions on how far their needs were being met and comment on how the current situation could be improved. The survey covered several issues related to health, energy, water, education and transport, to name but a few. The questionnaires were arranged in sections to find out:

- The government services that were available in the deep rural area of KwaNongoma.
- How the community viewed these services.
- The levels of literacy and ICT literacy in the community.

3.3 Sample

In total, from the three KwaNongoma communities surveyed, 80 questionnaires were completed. Table 1 shows the exact number of responses received from the community.

Community	Number of responses
KwaKhangela	25
KwaMememe	38
KwaSomkhele	17
Total	80

Table 1: No of community responses received

The majority of study participants were female (62%) and 38% of the study participants were male. The age of study respondents reflected the younger population of the communities surveyed. Most participants were young adults from 18 to 25 years old (46%). Those between 25 and 35 years were 16% of the sample. The 35 to 45 age group were 17%, while those above 45 years were 21%. 98% of the participants indicated that Zulu was their preferred language of communication, while 2% preferred English. Only 16% of the respondents were computer literate although 77% were keen to learn the computer if given the opportunity. 35% of the participants had an education level of between Std. 6 and 8 while 24% had Matric, 3% had diplomas, 2% -postgraduate diplomas, 0% - bachelors' degrees and 36% were below Std 6.

4. FINDINGS OF SURVEY

Respondents were asked to evaluate the importance of community needs to their quality of life on a 4-point Likert-type scale, that is, very important, quite important, not very important, not important at all. Opinions of the respondents were sought on literacy support, housing assistance, pension plan, government student loans, health information and ICT literacy to promote a quality of life in the community. 94% of respondents rated these government services from "very important" to "important" in improving the quality of their lives.

All communities surveyed scored high on the importance of literacy support to the quality of life. 96% scored literacy support as very important, 2% as quite important, 0% as not very important and 2% as not important at all. 94% of the participants scored housing assistance as very important, 6% as quite important and 0% for both not very important and not important at all. 68% scored employment insurance as very important, while 11% scored it as quite important and 16% and 5% scored employment insurance as not very important and not important at all, respectively. 95% scored the pension plan as very important, 3% as quite important, 2% as not very important and 0% as not important at all. 100% of the respondents scored the government student loan as very important. 94%, 6%, 0% and 0% scored the health information as very important, quite important, not very important and not important at all, respectively. 50%, 21%, 16% and 13% scored laws and regulations as very important, quite important, not very important and not important at all, respectively. 81% scored access to sources of finance as very important, 11% as quite important, 3% as not very important and 5% as not important at all. 93% scored ICT literacy as very important, 2% each for quite important and not very important and 3% scored ICT illiteracy as not important at all. 63% scored community leadership as very important, 22% as quite important, 10% as not very important and 5% as not important at all.

The distances of the respondents from the various facilities are shown in Figure 2:

Facilities	% participants versus distance from facilities						
	0-5km	5-10km	10-15km	15-20km	20-40km	Not available	Total participants
Main road	58%	24%	8%	0%	10%	0%	100%
Nearest SMME	61%	11%	5%	0%	6%	17%	100%
Nearest preschool	22%	11%	0%	0%	0%	67%	100%
Nearest primary	68%	24%	0%	0%	0%	8%	100%
Nearest highest school	63%	27%	0%	0%	2%	8%	100%
Police Station	2%	96%	0%	0%	0%	2%	100%
Nearest clinic	22%	3%	2%	0%	70%	3%	100%

Table 2: Distances from facilities

82% of the participants live within a radius of 10 kilometres from the main road. 72% live within a 10km radius of the nearest SMME that provides Internet services. 33% of the participants live within a 10km radius of a preschool, while 67% live beyond a radius of 40km of a preschool. 92% of the participants live within a 10km radius of a primary school. 90% live within a 10km radius of a secondary school. 98% live within a 10km radius of a police station. 70% of the participants live between 20 and 40 kilometres of the nearest clinic.

In this rural area the response to the transport mode used to get to the nearest SMME that has Internet access was as follows: 37% used the bus, 47% walked and 16% used taxis. The percentage of the population that has access to government services currently is as follows: child grant – 29%, student loans – 14%, housing assistance – 3%, public pension plan – 27%, health information and grants – 12%, laws and regulation information – 5%, community leadership information – 3%, literacy support information – 6% and employment insurance -1%. 78% of the participants indicated it was difficult to access these services. 30% of the participants suggested that the said services should be provided near the population centres to make them more accessible. 70% indicated that the government should interact more with the communities frequently if they were to come up with ways of making the services accessible.

49% of the participants had never heard of the Internet before. 27% indicated they had heard about it but did not know what it was. Only 24% said they had heard of it and also know what it is.

On their opinions on the possibility of services being delivered via the Internet, the response was as follows: 61% indicated they would support it, 21% indicated it was a great idea, but was a bit far-fetched, 2% felt it would be a great idea but likely to face resistance from the populace, 2% said it would not be a great idea and 8% did not give an opinion The preferred language for Internet service delivery was given as English by 63% of the participants and Zulu by the remaining 37%. Only 3% of the whole lot of participants knew of an SMME that provided Internet facilities in the community.

58% of the population used mobile phones to call and receive calls only, 21% used it to send and receive calls and SMSs, 8% used it to send and receive calls and MMSs, 10% used it to send and receive calls , SMSs and MMSs and 3% did not use it at all. Only 22% of the participants indicated that they could afford mobile phones that allow Internet access. 8% of these participants are in employment. 88% of the participants indicated they could not afford phones with Internet access. 14% of these cited unemployment as the reason and 21% said they could not afford. 95% of the participants said they would prefer that the service were delivered via mobile phones because they were cheap to purchase and portable. 5% said they wouldn't prefer that because they are used to computers and computers offer more services than the cell phones. At 58% of the participants, the most common type of mobile phone among the populace is the Nokia 3310 followed by the Motorola V360 at 24% and the Samsung D3 at 5%, while the other types are at 13%. While Nokia 3310 does not support Internet access, the V360 and D3 do support Internet access.

5. DISCUSSION

Table 2 shows that preschools are scarce in the area. 67% of the participants indicated that they have no access to preschool facilities within a 24 km radius of their homes at least. Only 22% have a preschool within a 0-5km radius. Police stations are scattered all over the rural area as well. 96% of the participants have a police station within a 10 – 15 km radius. The demand for police stations is low because the crime rate is low in this rural area. A low crime rate can be explained as that the population is poor and hence there is nothing to get from them. Also, rural areas generally have closely knit communities. The nearest clinic for 70% of the population is 20 – 40 km away. The government has resorted to mobile clinics to resolve the issue of distance. This is because the homes are dispersed over a wide area. 90% of the participants live within a 10 km radius of a high school. 92% of the population lives within a 10km radius of a primary school. This is quite promising, but more can be done to bring the schools closer. The main road is within a 10 km radius for 72% of the participants. Very few people have their own transport. This is not surprising considering that this is a poor rural community. The government is providing public transport in the form of buses and taxis for them to go about their business. The indicators above prove that KwaNongoma is a really deep rural area.

94% of the participants indicated that health information is very important, but only 12% indicated that they have access to health information and grants currently. 95% scored the pension plan as very important, although only 27% of the participants has access to government service on pension plans. 94% of the participants scored high on the importance of housing assistance but only 3% have access to government services on housing assistance. The same goes for the other issues. This shows that there is a huge discrepancy in the importance accorded to these services by the participants versus the actual delivery of information and services by the government.

Although the research looks at the issue of Internet access to bring the government information services to the community, it would be difficult to make these services available. There is no electricity supply to the area. Alternate energy sources such as solar and generators should be exploited for energy supply. The truth is that the people in this rural area are poor, so very few of them can afford these technologies. Even if electricity were to be supplied to the community via the grid, very few community members would be able to afford that service.

97% of the participants use the cell phone. Cell phone coverage is only in areas where the signal can be detected. Where there is cell phone coverage, it is accompanied by the possibility of Internet access as well. But the amount of data that can be carried via cell phone is limited, unless the information that is carried is textual. Cell phones are also prohibitively expensive as tools of mass media communication.

The survey on the importance of community needs shows that law and order is not a priority among the participants, with only 50% scoring it as very important. The crime rate is low in this area because of its rural nature. Communities are closely knit, and there is still a level of respect for each other. The community is poor, and would not be attractive to thieves from outside as well. 93% scored ICT literacy as very important. This is probably because the benefits of ICT were explained to the

villagers before commencement of the project. There is a danger though of generally giving an impression that ICT can solve all problems in the communities. Improving ICT literacy in the community is an important factor if villagers are to avoid public access to information, in favour of customised access via a cell phone, for example. Access to sources of finance is rated very high by the participants. This is a fairly poor community; hence the sources of finance cannot be bank loans. The villagers must be looking forward to government grants instead. The government student loans system is rated very high. People cannot afford tuition to further their education. 24% of the participants hold Matriculation. It would have been interesting to find out how many of these qualify meet the university entry requirements. 94% indicate housing assistance as a high priority area. A lot of these people cannot afford to purchase houses. Therefore they need to be informed on how to acquire RDP houses, for instance. The deduction from this analysis is that this poor community would like to access funds and tools to improve their livelihood.

6. THE PROPOSED FRAMEWORK

The survey information spoke into the design of the framework for e-government information services delivery. The design of the framework is based on the following criteria:

- Ease of use
- Best available appropriate technology
- Ease of expansion and reconfiguration
- Security of data
- Effective use of available communication bandwidth
- Integration with existing national services

As shown in the framework (Figure 1), the rural community makes known its needs to the SMME. Working together, the SMME and the community define the information needs of the community and communicate this to the government. The government creates the required information services in their repository. The SMMEs can then access the government repository and download the services onto their systems. The community can then have access to these information services. The SMMEs are given the mandate to provide the ICT services because the community is predominantly ICT-illiterate.

6.1 Components of the framework

The components of the framework are as shown in Figure 1:

a) **The rural community:** The community's role is to identify services and information they wish to have access to from the government. Consulting the community members throughout the various phases of the cycle ensures that the team continues to address the community needs correctly and promptly.

b) **SMMEs:** The SMMEs act as agents of service delivery from the government to the community and needs delivery from the community to the government. The government supports the SMMEs financially for delivering on their mandate.

c) The government: The government's role is to ensure that the needs of the communities are defined and met. The government determines the practicality of the needs of the community and negotiates with the community to identify and outline the critical needs among the identified needs so that the service delivery is prioritised.
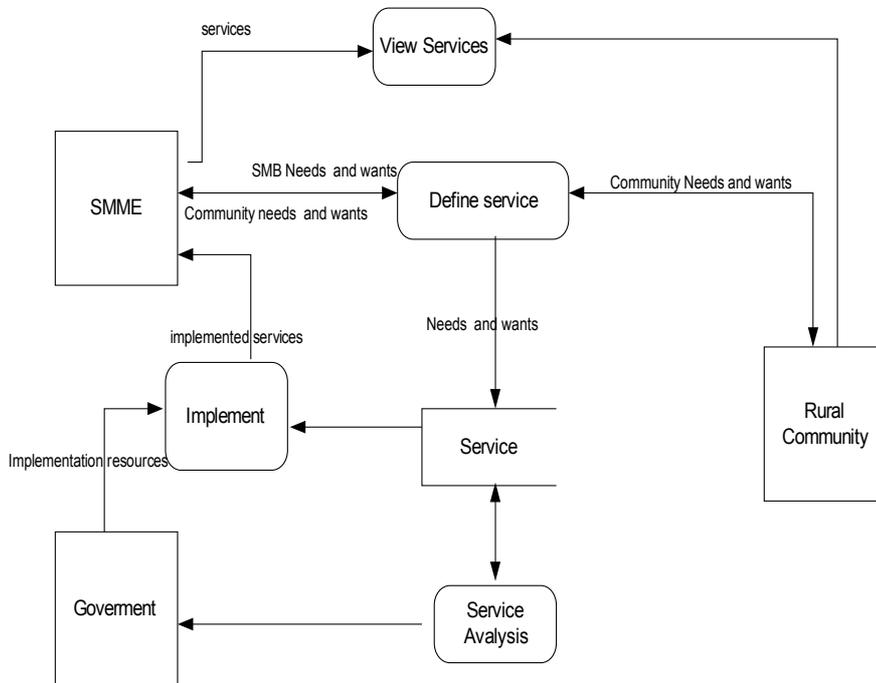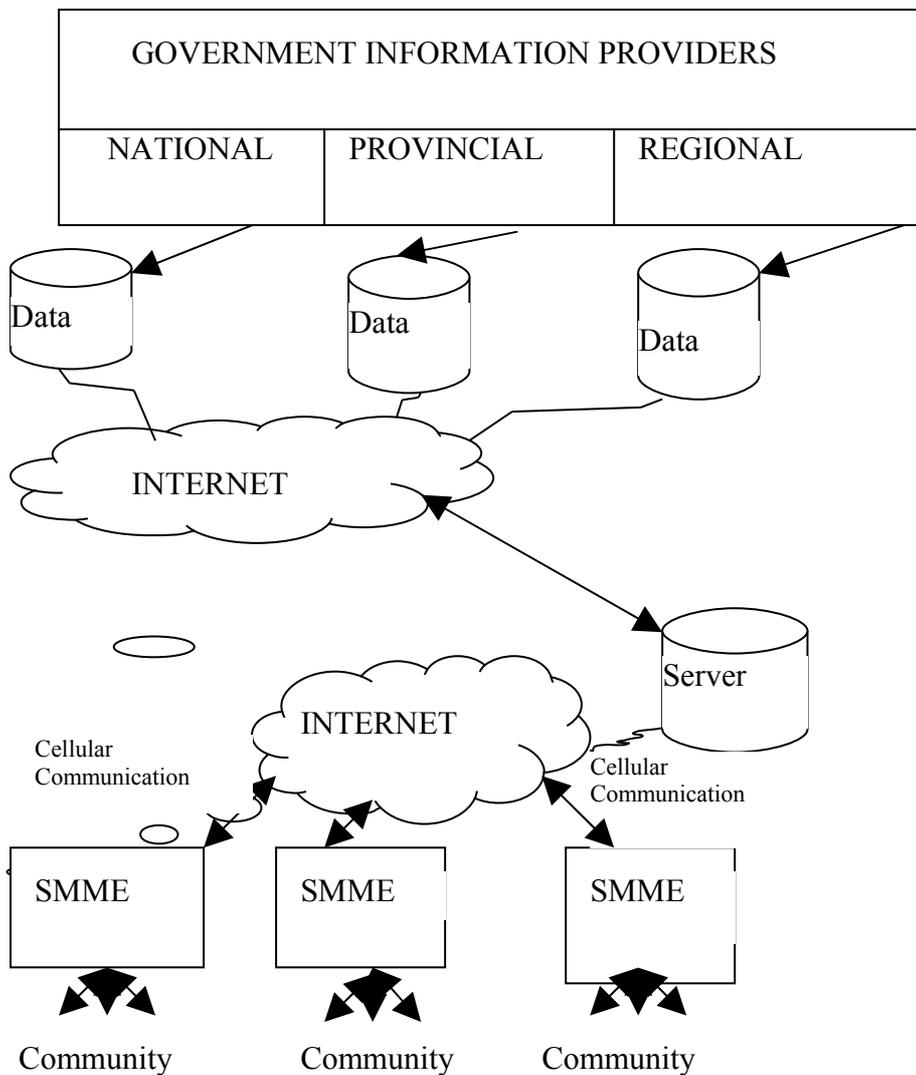

Figure 1: Framework

d) Service definition and analysis: This is a service repository. This software repository resides on the government back-end system. The SMMEs supply the information to the government system on the community needs and requirements. The government then crafts the services required by the community and uploads these services on their web site for access by the SMMEs.

e) Implementation: Implementation involves the SMMEs and community members. The services server is loaded on the SMMEs server for the community to view and use specific services relevant to their needs.

6.2 The SMME and government information service delivery

The set-up of the framework is centralised-decentralised as shown in Figure 2. The government departments both at national, provincial and local levels all deposit the required information services into a central repository. The government departments connect to this central repository via the Internet since they have access to a high bandwidth. Creation of this centralised repository is so that the various SMMEs that access it can avoid talking to each and every government department separately for information. The SMMEs then access the information from this central repository via cellular technology and download it to their servers. The choice of the cellular technology is due to the availability of this technology easily even in the rural areas.

Figure 2: Service Delivery Framework

Since the information requested by the communities sits on the SMME server, the community can access this information from the SMME server even when the link between the SMME and the central repository is down. The SMME only connects to the central repository occasionally to download information, cutting down on communications costs. The centralised repository, just like the databases on the SMME servers, can also be maintained by an SMME. The SMMEs therefore act as central access points for the information within the communities. User-friendly software is specifically developed for use in the SMMEs and the communications technology that is utilized by the SMME is based on low bandwidth connections.

The advantages of such a framework are that the government is made aware of the requirements of the community, and the community is empowered to communicate what they want to the government via the SMMEs. The services available are downloaded from the government repository to the SMMEs and the repository is occasionally updated. This cuts down on the bandwidth costs, should the SMMEs be accessing the services directly from the government server each time a service is required. Since the SMMEs are in deep rural areas which have cell phone coverage, mobile technology is preferred for communication between the government repository and the SMME.

The information that is in high demand by the communities and should be made available is health information, information on housing assistance, literacy support information, pension plans and information on student loans. The issue of confidentiality of information and security of the data though would mean that SMMEs have to be trained on these issues. Cell phone reception for transferring data should be encouraged since cell phones are owned by 97% of the population. Only 22% of the population indicated that they can afford mobile phones that allow Internet access, hence the SMMEs will have a vital role to play in centralizing access for the communities. Since the majority of the community members are poor and cannot access high-tech technologies in their homes, the SMMEs are enabled to afford technologies to render services to the people. The framework means that services will be made available at close range since 72% of the population lives within a 10km radius of an SMME. Because of the low-levels of ICT literacy help with access to technology can be available at the SMMEs, or the SMMEs can train staff to operate the technologies on behalf of the clients.

7. CONCLUSION

People in deep rural areas do not have an easy access to information on government services that is essential to improve their quality of life. This research proposes that the South African government take advantage of SMMEs to fulfill the role of government agents in information service delivery by acting as central access points to this information by communities. By supporting the SMMEs with setting up infrastructure, identifying the information requirements of the communities, empowering the community with ICT-literacy, e-government services can easily be set up. This research has come up with a model which says that the needs of the rural communities should be known first before a service is provided on the basis of the needs. This is a way of running away from a situation in which the government comes up with services that are not customised to the needs of the rural community. A strong relationship between the government and the community is fostered through this interaction. The paper has also come up with an e-government information service delivery framework to support the delivery of information to the rural communities, that is, how the SMMEs will be able to provide e-government services.

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