Market Creation and Poverty Alleviation through Telecenters

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ABSTRACT

In the recent past, two significant changes have taken place in efforts to address rural poor: Businesses have started recognizing potential of rural markets and governments have started providing G2C services to rural citizens through telecenters. Telecenters have emerged as the most popular mode of e-governance projects in many of the developing countries. In this paper we argue that these rural telecenters can facilitate market creation and improve governance in rural areas where the government machinery for service delivery is the weakest thereby addressing needs of people and the government in such areas.

Categories and Subject Descriptors

H.1.2 [**Models and Principles**]: User/Machine Systems – *Human factors.*

General Terms

Management, Measurement, Performance, Design, Reliability, Experimentation, Security, Human Factors.

Keywords

E-governance, Market Creation, Information, Policy Implementation, Telecenters.

1. INTRODUCTION

Recent discourse on development through markets and private sector with emphasis on a development-through-entrepreneurship model has been popularized by the phrase "Bottom of the pyramid" [8][11][12]. The core of the argument is that private sector should target the vast, growing and largely untapped rural markets in developing countries with low-cost services and appropriate business models. According to this school of thought, increasing the well-being of the poor while enlarging the opportunity for the private sector provides win–win opportunities for both. Last decade has also seen a marked increase in the number of projects in developing countries that use information and communication technologies (ICTs) for social, economic, and

political development [13]. A large number of these projects aim at bringing the benefits of ICTs to communities where individual ownership of computers is low and use of the Internet is infrequent [3]. This trend illustrates the high and ever-increasing expectations placed on ICT in terms of quality of life improvement, empowerment and economic development for the affected communities [6]. The prevalent method of reaching out to rural areas in these projects has been telecenters [5] which provide shared public access, often intermediated by an operator, to information and communication technologies and services via computers and the Internet. These telecenters or Common Service Centres (CSCs)[1] are based on various models ranging from fully public projects like Gyandoot by Government of Madhya Pradesh, India, to wholly private projects like ITC's E-Choupal. Out of these Public-Private Partnerships (PPPs)[2] are currently held in high expectation by those seeking ICT solutions to development challenges reflecting the efforts made by government to improve public service delivery in rural areas while recognizing its lack of capacity. Advantages of the PPP model for the governments are improvements in operational efficiency, greater access to financial resources, human capital, markets, technology as well as risk sharing and the ability to scale up projects [4]. Government functionaries at the implementation level generally lack a comprehensive understanding of the potential use of ICT for development due to excessive compartmentalization of functions, lack of adequate qualified manpower and inability to deliver technically complex solutions. The increased involvement of private sector in such projects has meant that financial sustainability has become a necessary condition for the success of these initiatives [13].

In this paper we explore two approaches that can substantially improve the well-being of the rural poor and enhance the financial sustainability of these telecenters. First, telecenters can facilitate creation of market for services like education, agricultural information, contract farming, health, etc. Second, these telecenters can provide G2G services[3] and strengthen last-mile governance by making it more effective and efficient. Both approaches require the private sector to think beyond the

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[1] The terms telecenter, rural kiosk and CSC have been used interchangeably from here onwards in the paper.

[2] PPP here refers to voluntary collaborations that build on the respective strengths of each partner, optimize the allocation of resources and achieve mutually beneficial results over a sustained period.

[3] G2G services are defined as the transactions between governments at various levels or various departments or agencies or bureaus of the government.

traditional business model of provision of G2C services coupled with certain B2C services. Experience of Karnataka state in India provides useful insights in this regard. Karnataka, centre for software industry in India, has many distinctions in using ICT for e-governance. *Bhoomi*, an online land record system, and more recently Bangalore-One, a project to provide G2C services in cities, are prime examples [10]. In 2007, Department of Revenue, Government of Karnataka (GoK) set up 764 *Nemmadi*[4] centres in rural areas throughout the state to provide G2C services via a PPP model at *Hobli*[5] level. The government provides access to its database and authenticates the certificates issued, whereas private partner provides the logistics for issuing certificates. Now, GoK has decided to establish CSCs at g*ram panchayat*[6] level in part to fulfil the requirement of National e-Governance Plan of Government of India to set-up 1, 00,000 CSCs across India. The findings in this paper are based on an action research project initiated to explore the financial sustainability of these CSCs at *gram panchayat* level [9].

2. MARKET CREATION BY TELECENTRES

Across the world, the percentage of poor that reside in rural areas is quite high and the rural poor frequently live in remote areas with sparse populations [7]. This implies that access to quality services for the rural poor is constrained by distance and high opportunity cost involved in travelling to urban centres to avail them. In this section we first explore the role information can play in poverty alleviation and then outline a conceptual model of how telecenters can help reduce these barriers to access to services.

2.1 Role of Information

Traditionally poverty has been looked at from an income-based perspective. A multi-dimensional definition of poverty would not just include lack of income but consider the well-being of individual and include qualitative factors like powerlessness, social exclusion, vulnerability etc [4]. Information can play a crucial role in improvement of all these parameters of poverty provided that poor people have "real access" to "quality information". "Real access" and "quality of information" depends upon following factors [2]

o **Affordability:** If the information is available at an unaffordable cost, the access is only in name and not in practice.

o **Connectivity/Availability:** A patient in a rural area may want information about nearest medical facility or a farmer may want some information about crop cultivation. If this information is available, it can reduce transaction cost substantially for availing these services.

o **Capacity:** Lack of technical skills to access some of the information can be an impediment to real access. In countries like India, low literacy levels especially e-literacy exacerbates this problem. Even if a person is literate, if the information is not in local language, he doesn't have real access to the information.

o **Adequate:** For example, for a job seeker in a village, is the information available over internet enough for him/her to be able to apply for it? Does the information available to a farmer enable him to plan his agricultural decisions? The information that is easily available may have to be supplemented to make it adequate for use by citizens.

o **Reliable:** Can the person trust the information he obtains? For example, the usage of a service providing advice on crop cultivation for a particular soil type would depend upon whether the farmer trusts the information he gets to be reliable. Is there a way by which reliability of the available information can be known?

o **Locally relevant information:** For information about employment, agriculture etc to be useful for a user it has to be relevant in the local context. If information is not apt for local uses, then it becomes useless.

Access to quality information to a citizen can lead to following improvements.

o **Better livelihood opportunities**: Apart from getting information related to employment opportunities, people in rural areas can improve their skills through educational packages, get information about markets for their produce and make decision about crop plantation leading to increase in income levels.

o **Reduce risk and vulnerabilities**: Poor people in rural areas are particularly vulnerable to external shocks. Provision of adequate and reliable information reduces risk perception about newer technologies as well as enables people to take sufficient and appropriate care to deal with the risk in livelihood support as well as other aspects like health. It can stimulate markets for several goods and services in rural areas.

o **Enriching living conditions**: Availability of content for the purposes of entertainment like music, movies, games etc can enrich the living conditions of the people in rural areas.

Thus above mentioned advantages can be realized if real access to information can be provided. Figure 1 summarizes the role of information for rural citizens
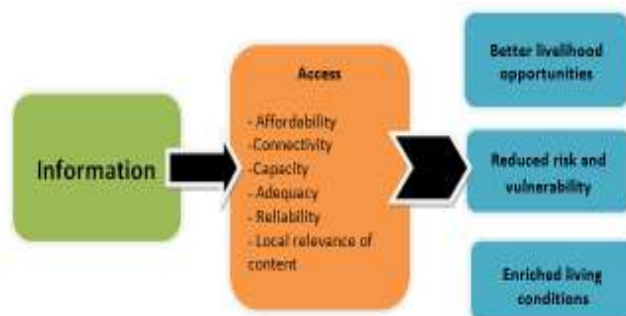

Figure 1. Role of Information for rural citizens

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[4] *Nemmadi* means 'deriving happiness by being hassle free' in the local language Kannada.

[5] *Hobli* is an administrative unit comprising of 15-20 villages with total population of 20000.

[6] Village *panchayat* or *gram panchayat* is the smallest local government unit in rural areas in India comprising of 3-5 villages with total population of approximately 5000.

2.2 Telecenters as Conduits for Market Creation: A Conceptual Model

CSCs are particularly well placed to stimulate demand for above services in rural areas and making them affordable. Demand can be created or increased by bringing following characteristic to service delivery by the CSCs

o **Role of distance and convenience**: Currently rural people are required to travel long distances to avail certain services like tuition, English language coaching etc. The provision of these services at village level would not only reduce cost for the rural people, but will also be more convenient. More importantly, the girl child can't avail these services if the place is far off and/or timings are late in the evening, whereas telecenters can provide access to these services to the girl child.

o **Reliability**: As the services and information are provided at the village/community level and not by a private company agent or salesman located elsewhere, people will trust the information and consider it reliable. The permanency of the centre would also instill confidence in people as they can follow up any problem with them. For instance, a contract farming agreement through the CSC would be preferred by farmers than a direct contract with the company located in a distant place.

o **Affordable cost**: Once information becomes available and the services are profitable, there will be more private players offering these services. For example, once the content for educational courses has been prepared, it will become easier and cheaper for other players offering educational services to enter the market in rural areas. Consequently, the cost of providing these services will also go down for the businesses.

o **Adequate information**: Certain services will encounter a fillip because of availability of greater information. For example, exporters can, through the CSCs, get information about crop sown by farmers in a particular area and might enter into a forward contract with them. CSCs would thus create market by acting as an interface.

As the demand increases, the model of PPP to provide such services would become viable and more and more private players will enter the market reducing the cost of provision of such services. Following examples illustrate how above characteristics brought to bear by the private sector through the CSC as vehicle can lead to market creation.

2.2.1 Market Creation in Insurance

Insurance has low penetration in rural India. One of the impediments in providing insurance to people in rural areas is the accentuated moral hazard problem and adverse selection problem because of lack of reliable information about people and their practices in these areas. The cost of obtaining this information like agricultural practices in case of crop insurance or living practices, medical history in case of life insurance, is very high. Now, consider the case when CSCs function as agents of the insurance company, the cost of obtaining this information is reduced considerably because the CSCs are much closer to the people being insured. At the same time, since these services are provided by CSCs which have a permanent presence in the village, people perceive them to be more reliable and can follow up easily for problems relating to insurance claims. The problems of moral hazard are reduced since insurance companies can now monitor the practices of farmers etc more closely and regularly by having a local person as the agent. The problem of adverse selection is mitigated because village communities being close-knit, information about risk in providing insurance to a person is known more accurately.

2.2.2 Market Creation in Health

People in rural areas, especially doing manual labour, do not get proper treatment for a lot of diseases like skin diseases, eye-related infections and disorders etc. because of absence of specialists in these areas and inconvenience in travelling to the nearest health centre which costly and time-consuming as well. Setting up of a telemedicine centre at the CSC would solve these problems of access by providing affordable care by saving time and making it convenient. Thus a market can successfully be created for certain health services.

2.2.3 Market Creation in Agriculture

The CSCs can also become the interface for farmers and business buying the produce. An exporter for example, would be able to gather from CSCs information about the crop sown by farmers in a particular area, the condition of the crop and the total produce from that region. Seed companies would be able to know which seed would be in demand in next season through CSCs. CSCs can also facilitate contract farming. Certain special crops are not grown by farmers because their demand is very limited and uncertain. Retail houses can get those items only by way of contract farming but because of the lack of trust among farmers and the uncertainty in prices of these crops, farmers are unwilling to grow such crops. CSCs can help bridge the deficit. Retail houses can interface with the CSCs to contract farmers for these special crops

2.2.4 Market Creation in Education

One of the reasons that a girl child drops out of school after primary level is that the secondary schools are very far from their residence. The girl child is often denied tuitions or English speaking courses because of the distance required to travel and the late timings of these services, which are inconvenient for her. If educational services like tuitions for board exams, English speaking courses etc are provided at the community level by CSCs via e-learning courses then they can attract enough students to make the service financially viable and in the process provide much needed help in educating girl child. These services would be helpful to all children pursuing secondary or higher education since quantity, availability and quality of teachers at these levels in public schools is often not even up to the minimum standards.

As above examples illustrate, CSCs by bridging the gap between businesses and rural people, can become the front-end facing the customers and can change the nature of service delivery. This will cause a rightward shift in the demand curve. As the business model becomes viable and cost to provide these services comes down, more and more private players will enter the market and the supply curve also shifts rightward. The shift in the supply and demand curve will lead to shift in the equilibrium point from A (virtually no market with quantity q_1) to a point B (where both businesses and consumers are better off with quantity q_2). Figure

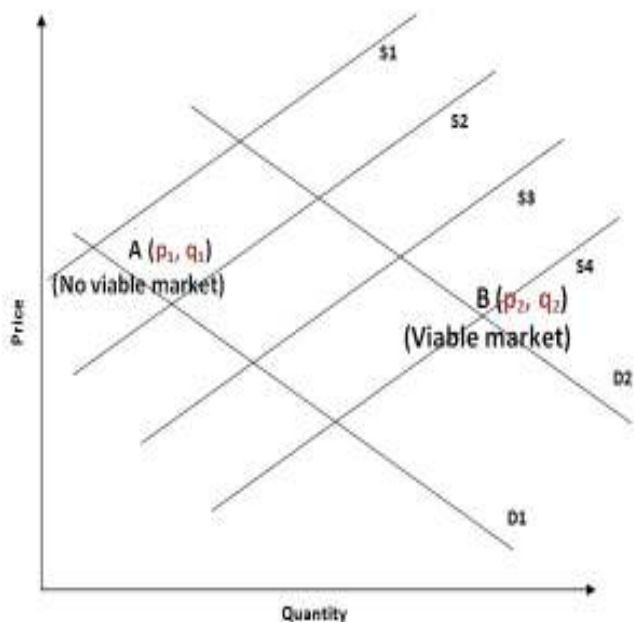2 demonstrates the shifts in supply and demand curve which lead to viable market creation.

Figure 2. Market statics with increased access to information

2.3 Demand in Rural Areas

Apart from information-based services many other services are also required by the rural poor like health, education, training material for skill upgradation etc. Following table provides a list of potential services demanded by the rural poor from which they can benefit.

Table 1. Services demanded by citizens

Educational services
o Primary school educational services (Computer training, English, Math, Science coaching, Remedial teaching/Tuitions)
o Online sessions from expert teachers
o Usage of interactive CDs and videos
o High school educational services
o Community developmental education services
o Information on universities and colleges
o Training and coaching for competitive exams
o Access results of examinations
o Online applications and registration etc. for education institutions
Tele-medicine services
o Primary health care consulting from a trustworthy doctor
o Secondary advice from experts at district/higher level
o Issue of medical certificate

o Information on facilities and service available
o Providing referrals
Agri-consulting services
Planning and preparation
o Financial linkages
o Seeds, fertilizers & other inputs linkages
o Identification of markets
Crop selection & management
o Training
o Pre-harvest advice and monitoring
Post-harvest support
o Market linkages
o Value-addition and income generation programmes
B2C services
o Utility payments
o Mobile recharges and new connections
o Ticketing (Railway, Bus, Air) etc
o DTH recharges and sale
o New insurance sale and premium collection: Life, live stock, crop insurance etc.
o Internet surfing, print-outs and photocopying facilities
G2C services
o RTC (Land certificates) and Rural Digital Service
Livelihood/ Finance
o Loans and microfinance
o Vocational trainings
o Insurance and banking operations
o Issue of employment certificate

3. TELECENTERS AND RURAL GOVERNANCE

Government needs to collect, collate and pass on information which is then used by various agencies of the government for purposes of planning, execution, monitoring and evaluation of government programmes. Examples from India include the information related to National Rural Employment Guarantee Scheme (NREGS)[7], the data on crop-updations kept by village accountants etc. The task of data collection, entry and maintenance is performed by local government employees and issues like same data collected by multiple officers, same data collected multiple times by the same officer leading to data redundancy are common place. Most of this information is maintained in hand-written form and not stored electronically and hence sharing data across multiple departments becomes very

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[7] NREGS is a Government of India programme which guarantees employment to one member of every household for minimum of 100 days in a year.

difficult and time consuming. Resultantly, these data related tasks consume most of the time of these personnel leaving little time for other important responsibility entrusted to them. In countries like India, sub-national government machinery to reach rural households has become weak due to shortage of manpower and lack of alternate effective mechanisms at lower levels of government. Most of the *ad hoc* alternative mechanisms tried so far have turned out to be cost centres. The cost of implementing ICT at these levels, if done by the government itself, would be huge not to mention the issues of non-availability of trained man power and inability of government to train personnel in usage of ICT. CSCs can be extended to provide G2G services by making them the front end of collection of information. In the proposed PPP, the data collected by the CSCs at the village level can be uploaded, directly as well as through different levels of government, to a central database. Following are some of the examples of G2G services that can be integrated with telecenters:-

o **National Rural Employment Guarantee Scheme (NREGS)**: In many village *panchayats,* village *panchayat* secretary spends 6 hrs a day in maintaining records. S(he) maintains 60 record books on a daily basis having enormous redundancies. This data can be collected at these kiosks and uploaded regularly.

o **Anganwadi Worker (AWW)**: The household health and nutrition data collected at the Anganwadi by Anganwadi workers can be collected at these kiosks.

o **Crop-updation**: This activity is being carried out by village accountants at present. The crop area as recorded are most of the times time inaccurate and often arbitrary.

o **Public Distribution System (PDS)**: Real time data regarding the allotment and disbursement of food items through PDS can be availed through these kiosks.

o **Sarva Shiksha Abhiyan (SSA)[8]:** As part of the programme, local government personnel need to collect data on attendance, mid-day meal provisions, students' performance, teacher availability. Telecenters provide efficient ways of collecting this data.

The transfer of responsibility of these services from government to telecenters would change the way information flows through government hierarchy as illustrated in next section.

3.1 Telecenters and Change in Flow of Information

The traditional flow of information from government to citizens follows a hierarchical approach flowing from state to the *gram panchayats*, which in-turn interface with the citizens for provision of services and vice-versa. The traditional process of service provision which uses hierarchical flow of information is time consuming and entails high administrative cost for the government. Information passes through too many levels of government before reaching the rural citizen. Also, over time the linkages at lower government levels have weakened because of lack of adequate manpower both quantitatively and qualitatively. Hence, while the linkages from the state to the district and district

to the *taluka[9]* level government are still strong, further linkages from *taluka* to *gram panchayat* and *gram panchayat* to the citizen are very weak leading to last mile problems in service delivery and governance in general. Figure 3 shows the traditional flow of information and services from government to citizens:-
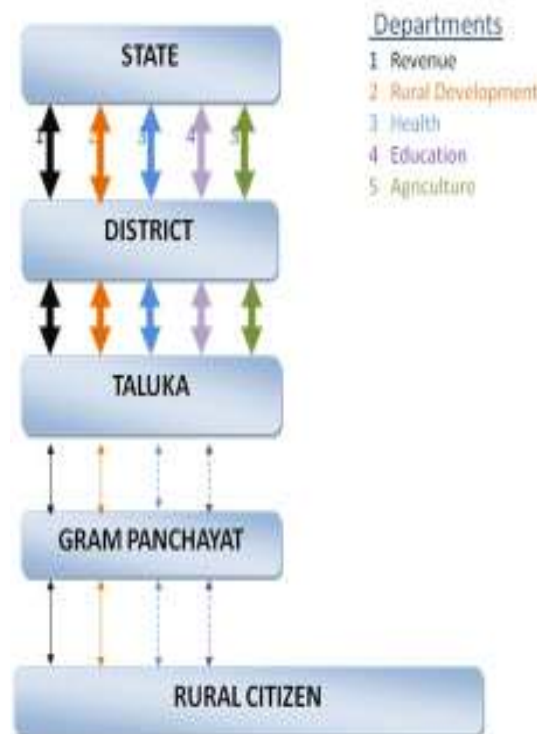
Figure 3. Traditional flow of information to a rural citizen

The dotted lines in Figure 3, depicting flow of information between rural citizens and *gram panchayats* and between *gram panchayats* and *taluka* represent the dithering of quality of government structures at the lower levels of governance.

In the presence of CSCs a large portion of the data can be collected, digitised and uploaded to a central database. This would change the nature of business processes involved in both service delivery and programme implementation mitigating future risk for functioning of telecenters [1]. The flow of information in the presence of rural kiosks or CSCs is illustrated in the figure 4.

The advantages in collection of information through telecenters based on PPP model are as follows.

o **Reduction in data redundancy:** Consider the example of Sarva Shiksha Abhiyan (SSA), where personnel spend a lot of time manually writing information regarding daily attendance, mid-day meal, student performance etc. Each time the personnel need to copy the name of all the students. If data is collected using electronic systems, such redundancies can be reduced.

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[8] *Sarva Shiksha Abhiyan* (SSA) is a government programme providing free education to children.

[9] A *taluka* is an administrative unit smaller than a district but larger than a village.
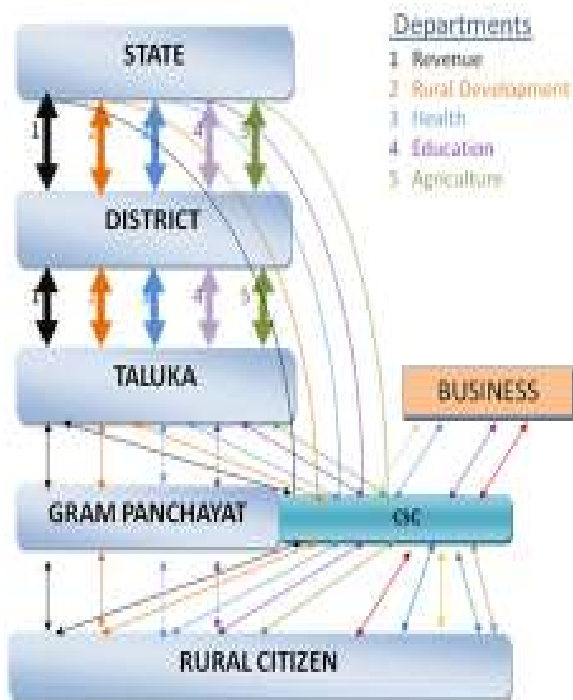
Figure 4. Flow of Information after the provision of Common service centres

o   **Faster**: In the above example, the attendance can be taken using biometric systems and uploaded to the information management system, which would make the process faster, accurate and reliable.

o   **Facilitate data aggregation:** Continuing with the above example, if such information is uploaded daily in the information system for every school, district-wise, state-wise and country-wide attendance figures for each week or month can be produced easily.

o   **Increase frequency of data collection:** If the process of data collection is electronic and thereby faster, data collection can be done more frequently giving a time series on say health numbers or attendance in primary numbers etc.

o   **Cost efficient:** The cost, if the government implements these systems and maintains them is very high. By involving private sector, overall cost for these processes can be reduced.

o   **Accurate and Reliable:** Data on crop area as well as programmes like NREGS used to calculate asset creation is inaccurate and unreliable. Better quality data can be obtained using GPS devices.

o   **Enhanced data sharing and inter-goverement co-ordination:** Once this data is available in electronic format, data sharing among various government departments, and agencies for policy implementation can be made possible, thereby enhancing co-ordination.

o   **Strong networks at grassroots level**: In addition government departments will be able to build a strong network at the grassroots level to obtain accurate, detailed and timely data from citizen on the programmes being implemented as well as develop a robust citizen database.

o   **Reduction of burden on government employees:** Once relived of these laborious manual data collection procedures, government personnel can focus on their principal administrative responsibilities.

The above model would address the last-mile problems of government programme implementation by improving following aspects.

o   **Planning**: With more accurate data at each delivery point, infrastructure can be planned better. For example, with accurate data about usage of health services, the stock of drugs required at a PHC can be inferred.

o   **Execution**: With more frequent data at the delivery points, services delivery can be executed better by reducing the time between realizing the need of action and taking the action itself. For example, with weekly data of stocks of drug at a PHC, the stock can replenished whenever it goes below a desired level.

o   **Monitoring**: Availability of accurate and frequent data can help in fine tuning or course correction required for government programmes. Detailed data about health and nutritional indicators of a village can help in evaluating the effectiveness of government interventions.

o   **Evaluation**: With more accurate and detailed data, the evaluation of a programme can be more appropriately conducted. For example, with more accurate information on the size of land holdings under NREGS, the total asset creation through the employment guarantee programme can be more accurately assessed and the return on money spent in the program would be more accurately known.

Figure 5 summarizes all the various role that information can play in improving governance:-
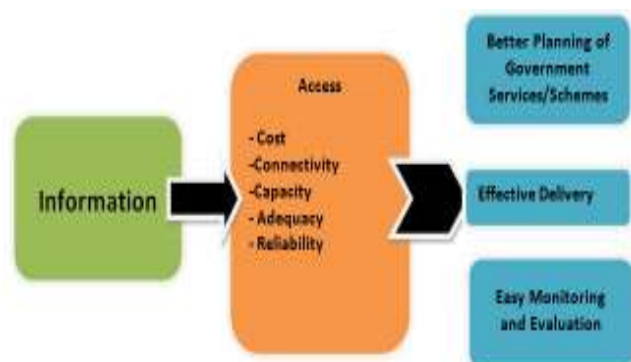
Figure 5. Role of Information for government

The data collected from the telecenters at the *gram panchayat* level would be added directly to a central database. All other data captured at the *taluka*, district or the state level would be integrated into the central database. This architecture will need to be fine tuned for each department depending on the nature of the programme and data requirement suiting the business processes involved. Figure 6 illustrates how the information can be collected, collated and transmitted to various levels for government departments.
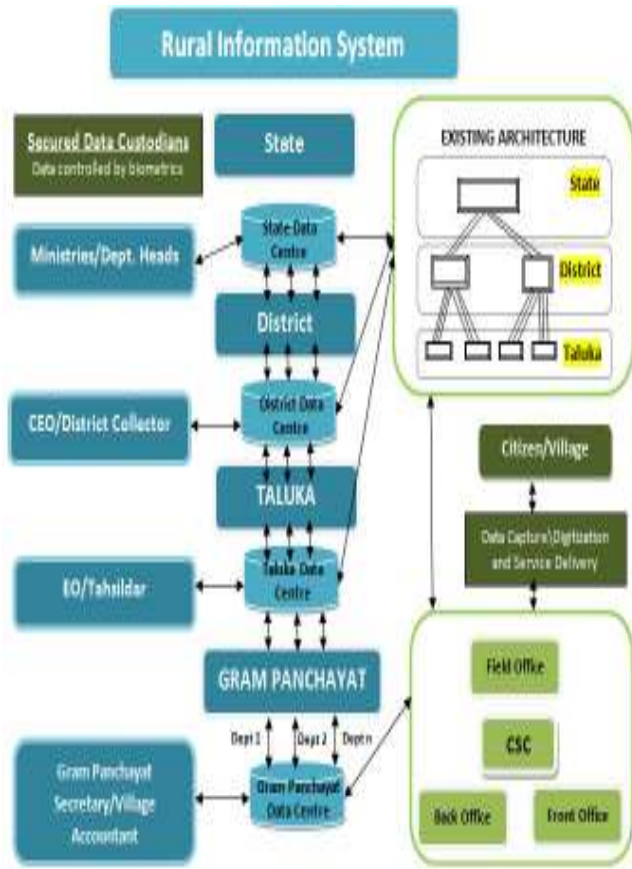
Figure 6. System Architecture and Information flow

Based on this analysis, a consortium of citizens, government departments, academic institutions and IT companies are initiating pilot projects in 15 *gram panchayats* in Gubbi *taluk* of Tumkur district in Karnataka state in India to demonstrate the creation of viable markets for many of the services illustrated in the paper.

4. CONCLUSION

In the developing world, the telecenters have become the preferred mode of providing e-governance to rural citizens. At the same time entrepreneurs have been testing various business models to provide services in rural areas. As we have shown, conceptually telecenters can create a viable market for provision of many of the services hitherto thought to be out-of-reach of the rural poor. These telecenters can also improve governance at the lowest levels of administration by substantially improving the process of collection and management of data related to various government programmes. The presence of telecenters can become a conduit in facilitating the provision of a wider range of services and can also improve planning, execution, monitoring and evaluation of programmes at the local levels in these areas.

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