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ICT for Rural Development: An Inclusive Framework for e-Governance

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ABSTRACT

Review of literature shows that intervention of information and communication technologies (ICT) in rural development initiatives are capable of development, but are not successful. Lack of community participation, absence of an integrated approach and non-inclusion of traditional knowledge systems (TKS) in the project designs are the major impediments. We therefore suggest a systems-based approach in the design of e-Governance projects, and brief some future directions. The proposed framework is based on participatory approach with inclusion of relevant TKS, has a bi-directional Citizen to Government (G2C2G) interface and a feedback mechanism. The prime goal is that rural e-Governance projects serve as means to attain good-governance for enhancing sustained rural development.

Keywords: *E-governance, Rural Development, Community Participation, Traditional Knowledge System (TKS), Systems Approach.*

Information and Communication technologies (ICT) have a potential for economic growth and social empowerment (Nandi, 2002). Direct or indirect application of ICT, in rural development sector has also been referred to as "Rural Informatics."Rural economies can be benefited from ICT by focusing on social production, social consumption and social services in the rural areas (Malhotra, 2001). Sustained development using rural informatics is possible, only if ICT interventions are able to respond to the local needs and re-adjust as per the prevailing knowledge (Traditional Knowledge Systems- TKS)* of the rural areas. To capture the needs and local knowledge prevalent at the grassroots, these interventions should preferably have an effective bi-directional link. The inculcation of a Citizen-to-Government (C2G) and Citizen-to-Citizen (C2C) interface would provide this link that would also lead to community participation in design and implementation of ICT interventions. This in return could promise better economic opportunities as well as social inclusion of rural people in the processes of governance. Such attributes in the social set up are essential prerequisites for good governance and rural development.

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The paper is divided in five sections. In the first section titled 'Rural Development and Governance', the authors discuss the processes of development that encompasses both economic growth and social empowerment of the beneficiaries. In the rural context, the development initiatives should strive to improve the quality of life of the poor. Rural development is the prime concern of governance in the global context that can be addressed by imbibing participatory approach. In the second section titled 'ICT and Governance', the authors review various studies on the application of emerging information and communication technologies (ICT) in governance and in ushering development. In the process the authors define and demarcate between the popular terms like 'e-government' and 'e-governance.' The next section titled 'e-Governance for Rural Development' further tapers to the use of emerging technologies in rural areas, wherein using the example of Indian rural e-governance cases, the authors highlight various issues confronting ICT implementation in rural governance. The review of literature brings in the importance of community participation and incorporation of indigenous knowledge that has been delineated in the subsequent section titled 'Alternative approaches'. On basis of this, in the final section labeled 'An Integrated Approach to e-Governance in Rural Context', the authors propose a systems based inclusive framework for e-governance systems, cite its key features and also present 'Future Directions' for its implementation.

Rural Development and Governance

In the rural context, development involves use of physical, financial and human resources for economic growth and social development of the rural economies (Burkey, 1993). The term rural development also represents improvement in quality of life of rural people in villages. As per Chambers (1983) "Rural Development is a strategy to enable a specific group of people, poor rural women and men, to gain for themselves and their children more of what they want and need." Singh (1999) defines Rural Development as "A process leading to sustainable improvement in the quality of life of rural people, especially the poor."The fact of the matter is that three quarters of the world's poor, about 900 million people are in rural areas, and the Millennium poverty target set by Millennium Development Goals (MDG)*, cannot be met unless the world addresses rural poverty. "Sustainable Rural Development can make a powerful contribution to four critical goals of: Poverty Reduction, Wider shared growth, Household, national, and global food security and Sustainable natural resource management" (World Bank, 1997). Hence, worldwide there is a growing emphasis on development of rural economy of the countries. Any improvement, in the social or economic status of rural areas would not just directly benefit rural poor but would also bring down the migration-pressures on cities and contribute by positive ripple effect in global stride towards development.

The process of development in a country is to be aided by its governance. The goal of governance "should be to develop capacities that are needed to realize development that gives priority to the poor … and creates needed opportunities for employment and other livelihoods" (The World Bank, 1992, UNDP, 1994). Increased number of poor, hungry, or marginalized

people in a country represents decrease in its quality of governance. To promote development, various studies have proposed governance in the contextual realities of each country, including veritable participation of citizens in the governmental decision-making process (Grindle, 2004; Evans and David, 2006). Several institutions and experts accept Governance as a reflexive process, wherein policies, institutions, outcomes, and analysis interact, to maximize the process of participatory development (UNDP, 1997; Ludden, 2005; Mehta, 2006).

ICT & Governance

ICT is an integral part of development strategies of both developing and developed countries. It has great potential to bring in the desired social transformations by enhancing access to people, services, information and other technologies (Dutton et al., 2004). ICT applications can enhance poor people's opportunities by improving their access to markets, health, and education. Furthermore, ICT can empower the poor by expanding the use of government services, and reduce risks by widening access to micro finance (Cecchini and Scott, 2003). The uses of ICT for development are actively promoted, for economic development, job-creation, rural development, and poverty-alleviation. By adopting ICT in mid 1990s, public sector underwent a major transformation (Bellamy and Taylor, 1998). Application of ICT in processes of governance can be considered in two categories viz. for improving government processes and secondly for building interaction with and within civil society. The examples of the former category are dissemination of public information grievance redresses mechanisms, utility payments and billing services (Mitra and Gupta, 2003). This intervention of ICT in public domain, managed by Government, is referred as e-Government. Secondly, ICT improves civil society participation in the governing process, which is also referred as e-Governance. E-Governance has a greater scope and connotation than e-Government, even though ordinarily the terms are used interchangeably (Andersen and Henriksen, 2006; Sahu, 2004). e-Governance permits new ways of participation of citizens and communities for debating (Taylor and Williams, 1994 ;Rogers and Shukla, 2001; Gupta et al., 2004; Heeks, 2004). Such interactions facilitate provision of accurate information about social problems and their possible solutions. It empowers communities to determine their own future by developing self-efficacy and collective efficacy. Indeed if Good Governance leading to Development is the goal of governance, then e-Governance serves as a means to attain this goal.

E-Governance for Rural Development

Rural e-Governance can provide timely information to the citizens and have the potential to spawn innovative means of wealth generation in rural context (Singh, 2004, Malhotra et al., 2006). ICT can improve living standards in remote and rural areas by providing important commercial, social, and educational benefits (Share, 1993; Madden et al., 1997). Electronic service centres have a pivotal role to play, especially in reaching out to the marginalized sections living in remote areas (Singh, 2000). A study by Wilson (2000) concludes that in a developing economy like India, ICT has development applications in education, governance, environmental

monitoring, health, human rights promotion, economic growth, and other areas. An earlier research confirms that transaction costs have substantially reduced by adopting automated supply chain management models for selling agriculture produce (Annamalai and Rao, 2003). Other studies show that e-government projects are successful in rural India as it acts as an intermediary between government and recipients, while pursuing commercially sustainable objectives (see for instance, Kaushik and Singh, 2004).

However, given the high incidence of poverty in rural India, e-Governance implementation to cover 135 million rural poor is an increasingly complex process. Jhunjhunwala, et al. (2006) states that success stories of e-Governance in rural India are isolated cases, and says that "sum total of the Indian experience in terms of two important parameters viz. villages connected and lives transformed are yet too minimal."Although there are more than fifty grassroots' projects currently using modern ICT for development in India, Keniston (2002) despairingly notes that since no systematic study or evaluation has been conducted on ICT based projects so "opportunities to learn the diverse creative Indian experience so far remain almost entirely wasted."Investigation undertaken by Cecchini (2004) of an e-Governance initiative Gyandoot*, shows that though it is supposedly popular, its usage is still low and that it is not effective for the poorest of poor in the rural regions. With reference to villages of south- India, Kanungo (2004a) points out issues like "how do we build effective Information Systems that are premised on emancipation in a rural setting (of southern villages of India)…" Existing e-Governance models are more technology centric, which have been aped from west (Jauhari, 2004) and thus do not completely assure rural development in context of developing countries like India (Bhatnagar and Schware, 2000).

Such observations for ICT interventions in the rural context are generally true for other developing countries too. Emerging studies show that many of the claims that are being made about the potential of ICT for development are not supported, and point to the possible counter-productive effects of the use of ICT (Gomez et al., 1999). The study by Wilson (2000) underscores that a purely technology centric approach widens the digital divide between developed and underdeveloped. Ray (2005) summarizes thatsome of the good governance initiatives for poverty alleviation have not translated into social good due to slack institutional mechanisms. Wolfram (2004) suggests that to resolve the rampant "institutional disequilibria" there is a need to supply globally competitive products emerging from traditional knowledge of the region. Annamalai and Rao (2003) bring out that there are several gaps associated with deployment of the information village projects where the larger goals of empowerment, dignity and "preservation of traditional technologies" are not considered. In view of such limitations, it is important to propose some alternative approaches to rural e-Governance projects.

Alternative approaches

Social processes in rural regions need to be integrated in a holistic manner with the prevalent governance model to ensure development (Kanungo, 2004b; Pande, 2003). Establishing linkages with local strengths and encouraging indigenous development of e-governance initiatives (Heeks, 2002) would positively contribute towards achievement of development objectives of a country. Instead of importing or aping existing e-Governance models, the interfaces of ICT interventions deployed in rural areas, should be customized and the content duly localized to deliver the intended benefits to the rural beneficiaries. Jhunjhunwala, et al. (2006) underline that the business model for rural development should be based on collective partnerships and must incorporate the traditional knowledge available within local community. Incorporation of traditional knowledge systems (TKS) would also ensure involvement and ownership of the rural beneficiaries themselves. The need to integrate inputs from indigenous systems is important not just because of their richness but also because these systems have evolved over millennia preserving the social balance in that area. In the Indian rural context, there are already several encouraging examples such as "Honey Bee Network" which is a database of grass root innovations and technologies and serves as an effective solution to problems of local development. International development circles too have adequately stressed incorporation of indigenous knowledge in prevailing models of governance.

Garai and Shadrach (2006), conclude that there is an urgent need to recognize the role of local knowledge in sustainable development. They also argue that interactions between communities based local bodies and development worker need to be enhanced to ensure success of the development process. Since communities are the closest to grassroots' problems, they are the best judge to evaluate technology alternatives and provide innovative solutions for the problems of their respective areas. This "from the inside out" and "bottom up" perspective to technology has been supported by several socialists (Lee, 2001). Such form of governance has always been preferred one and is referred as 'community governance' (Toole and Burdess, 2002). Community participation has been pointed out by Yerramsetti (2005) as a key component of success of telecentres in ushering development and social change in rural areas. Galperin (2005) examines the success of collective action by business owners in rural context of Scotland. Konstadakopulos (2005) points out through a case study of artisan development in Vietnam that formulation of clusters helped to avail benefits of technology for small-scale entrepreneurs in Vietnam. Misra and Vijayadita (2006) also bring out the importance of community-focused approach for ensuring success ICT initiatives for Rural Governance. Taking a cue from all such studies, we can presume that there is a necessity of a community driven approach for sustained and successful e-Governance systems. Review of literature points out that the majority of e-Governance systems have been developed only from the perspective of trends, institutions, or administrators. This kind of 'limited-perspective-approach', based on reductionism, tends to ignore the cascading nature of consequences on other stakeholders and subsystems. To design successful and sustained ICT based projects for rural governance with equal participation of the

stakeholders especially the community, it is important to consider the system as a "whole" rather than dismembering it in isolated units. This would require an interdisciplinary Systems approach where interests and inputs of all especially the citizens are considered in harmony with other stakeholders.

Theoretical support for systems approach comes from the General Systems Theory proposed by Bertalanffy (1968). It states that behavior of the system as a whole, and often of the individual parts, is a complex aggregation of the interactions of all the parts. The theory also puts forth: System must be adaptable, Have a purpose and Strive towards goal. Such systems are 'self-organizing' and self- evolving with formation of new (or 'emergent') properties, which cannot be predicted (Emmeche et al., 1997). Corning (2001) applies the concept of emergence in organizational context and insists on self-organizing organisational systems for growth. No matter how effectively an organisation meets the initial needs of its stakeholders, it must remain constantly alert and responsive to its citizens continuing wants else the environmental-changes will erode the early advantages of this organisation.

Thus, in a fast changing global environment, Governance also needs to develop competitiveness through innovative response mechanisms. This requires a thoughtful balance between global demands and local priorities as well as a balancing of needs of various stakeholders' that are embedded in the processes of the governance. By adoption of a holistic approach in design of ICT interventions for governance, using Systems theory, such conflicting priorities, and various needs may easily be resolved.

Analysis: Need for An Integrated Approach to e-Governance in Rural Context

As pointed out by study, Information and Communication Technologies (ICT) initiatives in rural areas are capable of enabling the governance to achieve rural development and their integration with the grassroots is critical for sustainability. An integrated framework for ICT interventions in rural areas is required that could amicably blend community needs, knowledge and inputs along with inputs of other stakeholders.

The aim of the proposed framework is therefore to evolve techniques/methodologies for designing sustained ICT initiatives for rural governance that result in economic and social empowerment of people at the grassroots. The proposed framework is termed as TKS based G2C2G framework (Traditional Knowledge System based Government to Citizen to Government framework). It is a bi-directional framework, which means that ICT initiatives not just deliver governance services and products but also accept and adapt as per community aspirations, practices, and structures. This framework intends to amalgamate ICT inputs with the existing Traditional Knowledge used by local communities in production techniques, resource allocation and conflict resolution in the processes of rural governance. The regulators of this framework are the constraints defined by national boundaries and available local resources.

Hypotheses Of The Framework

The main hypotheses, derived from review of literature, on which this framework is based, are as follows:

1. Rural e-governance projects would lead to rural development only if they are customized as per the needs of local communities.
2. Community participation is critical for customization of e-governance projects.
3. Community participation in design of ICT initiatives could be mobilized only if these initiatives are bi-directional.
4. Synergy between various stakeholders of rural governance is imperative for success of ICT initiatives.

Objectives Of The Framework

1. To involve communities in the design of rural e-Governance projects.
2. To ensure alignment and communication between various stakeholders of governance through rural e-governance projects.

ICT initiatives can benefit all the components of Rural Development (RD) directly or indirectly. Direct ICT initiatives for rural-development refer to the front-end use of computing, networking and Internet technologies for rural communities. Examples are database systems, web portals or community service centers (CSC) at block or village level to address rural concerns such as local governance issues, land records management, supply-chain management, augmenting processes of rural markets or agriculture, and so on. Indirect ICT initiatives for the rural sector would be using ICT in background as a tool for education, weather forecasting and so on. All ICT initiatives, direct or indirect, in rural context have to be designed using an integrated and self-evolving approach.

The ultimate beneficiaries (end-users) of ICT initiatives in rural areas are rural communities; consequently, ICT initiatives for rural areas ought to be people-centric. The design of ICT initiatives should reflect community needs, aspirations, prevalent resources, and knowledge. To capture the same, Community Participation is an important input to ICT initiatives for design of sustained rural e-governance projects. To make community participation as a meaningful design input, indigenous knowledge available with these communities needs to be integrated with ICT initiatives. Such indigenous or community knowledge is also referred as Traditional knowledge Systems (TKS) that represent the prevalent practices, systems, techniques, indigenous knowledge or components, existing at grassroots. Acceptance of TKS in ICT based initiatives would customize these initiatives as per the local needs. This framework has therefore a strong feedback loop and flexible boundaries.

Linkages in the Framework

All inputs in the framework are bi-directional, as ICT initiatives may be designed to provide support to local governance as well as should be able to react to queries generated by local needs of the communities/citizens. These inputs are collated in the processes of governance established by institutions, processes, policies, and information. Therefore e-Governance projects based on this framework are not just 'Government to Citizen' (G2C) but have a 'Citizen to Government' (C2G) component too and therefore are also referred as "G2C2G."The term G2C2G also echoes the importance of keeping the 'C', the Citizen, as the central focus in all technology-based initiatives. E-Governance projects based on the framework proposed in the paper would be referred as 'TKS based G2C2G' e-Governance projects for rural development. Such projects should not just deliver governance services or products to people but also 'listen' and change as per the people's expectations. This way, rural communities would develop a sense of ownership for TKS based ICT initiatives, which when integrated with the processes of governance would lead to design of customized, bi-directional, flexible rural e-Governance systems. Projects based on this TKS based G2C2G framework would guarantee equitable participation, transparency and accountability in local rural governance, which is a cornerstone of Good Governance.

Key Aspects of the Proposed Framework

a. An integrated e-Governance framework that assures stakeholders inputs and accepts indigenous inputs.
b. Collaborative tools to ensure participation of all the stakeholders in the processes of governance.
c. Key Action Areas in policy inputs to assure Good Governance in the rural context.
d. Critical Success Factors for benchmarking any e-Governance for rural development.

CONCLUDING REMARKS

This paper is a multidisciplinary study of ICT initiatives for rural development. It emphasises adoption of a more systematic approach for integrating Traditional Knowledge Systems (TKS) and ICT inputs to ensure sustainability of rural e-governance projects. The study of literature related to rural development and e-governance has indicated various issues impeding success of such initiatives. The main issues are lack of localization of content for rural communities and inadequate participation of rural communities in design of rural ICT initiatives. The study therefore suggests the use the systems-approach to integrate the relevant TKS along with ICT initiatives in the design of e-governance systems for rural development. This participatory approach can lead to creation of more acceptable and sustainable e-governance projects. The output of TKS based G2C2G framework would be to provide template for design of rural e-Governance projects that are self-sustaining and would lead to socio-economic empowerment of the rural poor. The paper provides future directions for researchers, critical policy inputs to

technocrats and innovative options for designers of e-governance projects. The impact of this inclusive framework could be studied by gauging important governance indicators before and after the implementation of the same. Some of these governance-indicators could be increase in per capita income, health indices, and status of education. Increase in economic production could be assessed by measuring increase in agricultural productivity or by increased market access of rural community groups (including farmers, artisans, forest dwellers and such other communities). The quality of governance in terms of its effectiveness could be gauged by the eight characteristics of good governance converted to four quantifiable variables viz. Citizen Participation Index, Government Orientation Index, Social Development Index and Economic Development Index (Huther and Shah, 1998). The variables to quantify success of an e-Governance initiative could be the popularity of the initiative measured by number of visitors to the e-Governance set-up in the rural area. The impact of an e-Governance initiative could also be measured by using afore mentioned indices, on a control group, before and after introduction of the e-Governance initiative or by comparing the economic-status between one cluster with the initiative and another one without the e-governance initiative. The relationship between the use of traditional knowledge and rural development can also be studied using a case-study approach.

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ANNEXURE 1: TERMS USED

• **ICT:** Information Communication Technologies (ICT) can be defined as "electronic means of capturing processing, storing, and communicating information. ICT may be computer Hardware, Software and Networks. They also include intermediate technologies like radio and television, literate technologies like books and newspapers and organic technologies based on human body like brain and sound waves" (Heeks, 1999). The term 'ICT' is popularly interchanged with the term 'Information Technology (IT).

• **TKS:** Traditional knowledge systems refer to the unique knowledge, values and technical capabilities existing within and developed around the specific conditions of communities indigenous to a particular geographic area. Terms like Traditional knowledge, systems (TKS), indigenous knowledge systems (IKS), Community Knowledge Systems (CKS), People's Knowledge Systems (PKS) or *lokvidya*, vernacular knowledge or local knowledge are the terms that are being used interchangeably in the literature.

• **Millenium Development Goals (MDG)** have set the target to halve the proportion of hungry and extremely poor people by 2015. Source: http://www.undp.org/mdg.

• **Gyandoot**is an e-government application implemented since January 2000, in poor and drought prone Dhar district of Madhya Pradesh; http://www.gyandoot.nic.in.

• **Digital divide:** It refers to the problem of the growing technology and/or knowledge gaps between and with countries, placing certain groups of people further in the shadow regions of global information flows. These gaps persist both at the level of access to ICT infrastructure, and in terms of the form of information conveyed and who is able to use, understand and produce the information and knowledge which it's potentially make accessible. (As quoted by several authors and referred by Wilson Merridy, 2000).

• **Reductionism** is defined as a procedure or theory that reduces complex data or phenomena to simple terms; Similar to the Cartesian approach -- take all the components apart and inspect them individually.

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