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EXAMINING THE SUSTAINABILITY OF RURAL IT INTERVENTIONS: LESSONS FROM THE FIELD

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Abstract
The idea that IT can be used to alleviate and fight poverty has been widely embraced. However, while most IT-based interventions in poor and rural communities and villages have tended to demonstrate initial success, their long-term viability still remains unclear. Based on field experiences in India, we present findings of a case study that highlights issues and concerns beyond initial success associated with IT intervention in rural settings. We analyze the primary concern of sustainability to extend far beyond simple economic viability in the longer run. Governance structures for the IT setup, value links associated with the IT setup, and the nature of IT linkages add up to influencing the sustainability of IT interventions in rural settings. We base our analysis on Habermas’ theory of communicative action (TCA) and conclude that sustaining the larger vision of empowerment and social change is more important than simply seeking economic viability for IT interventions. Our major implication from a policy perspective is to support IT interventions much longer than expected at present. The major implication for theory is the utility of TCA for assessing the value of IT investments.

Keywords: Rural, information system, sustainability, theory of communicative action

1 INTRODUCTION
Information technology (IT) can be used to address poverty in direct as well as indirect ways. The importance accorded to IT and IT-enabled approaches by organizations like the World Bank and United Nations (http://www.unesco.org/webworld/news/2001/011121_bridges.shtmligure) demonstrate the legitimacy and high potential of IT to alleviate poverty. Many IT initiatives in poor regions of the world are framed in the context of sustainable development. However, while IT-enabled benefits (Quibria and Tschang 2001) tend to be demonstrated, it is not yet clear whether these can be sustained in the longer term. This paper focuses on the notion of long-term viability of rural IT setups that are typified by the information kiosk.

This paper is based on field experiences of information systems (IS) deployment and use in extremely poor rural settings in South India. The IT intervention took the form of “village information shops” or “knowledge centers (KCs)” that enable villagers to...
access diverse information and communication services. The KCs are kept running by training selected volunteers in operating and maintaining the KCs and processing generic information into something that is locally relevant. The underlying premise is that knowledge and information are vital to the process of empowering the poor instead of just giving them "chemical and capital" (www.mssrf.org/information%20village/pobj.html). While this project has shown positive results, subsequent concerns have shifted to seeking resolutions to ensure how IT, as one of the developmental inputs, can be made independently viable. This appears to be a problem because, while the villagers are willing and able to pay for the upkeep and maintenance of the KC, there are areas where deficiencies remain. For instance, network functions (developing linkages with government agencies, markets, and other villages) are extremely challenging for a single village or a group of villagers. This concern assumes importance given the finite tenure that developmental projects have. While pulling the plug from a clearly beneficial intervention is inappropriate, indefinitely extending project support for such interventions is not possible either.

The results of this research are important because IT interventions in extremely poor contexts are increasing. Preliminary expectations tend to run high. Yet, subsequent results—in terms of structural changes and resilience of inhibitive governance or social structures associated with such IT initiatives—are not available. This research provides policy implications as well as a theoretical framework within which the sustainability issue can be addressed. We employ Habermas’ (1984) theory of communicative action (TCA), to frame our discussion of sustainability. First, we review the notion of sustainability from the TCA standpoint. We then subject the behavior and interactions of actors to critical analysis. This allows us to suggest practical steps to ensure that IT is indeed used to achieve the noble, but extremely challenging, goal of poverty alleviation.

2 CONCEPT DEVELOPMENT AND RESEARCH FRAMEWORK

While KCs are replicable (see Figure 1), the goal of sustainability is more challenging. While information exchange is an essential component of sustainable development because information access gives people greater control over their destinies (Nath 2001), there is a time lag between IT-enabled outcomes and the actual intervention owing to the development problem (Meadows et al. 1972). From an IT standpoint, the problem is captured by an ensemble view of IT (Orlikowski and Iacono 2000) where IT is one of the many interventions in a problem that has social, economic, and ecological dimensions. A requirement that women have to participate in the KC initiative exemplifies this. Empowering women and other disadvantaged groups has the effect of disturbing the social status quo within a village social system. Changes in power relationships lead to some dissent. Yet villagers recognize the emancipatory character of the information system from a collective good standpoint. This collective good is manifested in the demonstrated economic payoffs. However, such economic payoffs are not yet enough to support viable operations of the KC. In most occasions it is difficult to quantify value propositions for the KC.

So the question becomes, is a KC independently viable given that costs tend to be high and many benefits are indirect and hard to quantify? Stated differently, can a KC demonstrate sustainability in a poor and rural setting once external support is withdrawn?

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3This intervention, taken up by the Chennai-based M. S. Swaminathan Research Foundation (MSSRF), is atypical in that they helped implement the KCs only when approached by villagers who were willing to provide a building to house the KC, provide volunteers to manage the KCs, and were also willing to take responsibility to absorb part of the operational costs associated with the KCs.

4Ironically, it was the success of the Information Village project that brought the issue of sustainability to the fore. Currently, the hub-and-spoke model based at Villanur is under increased pressure to maintain its service levels to KCs in villages. As the number of KC-enabled benefits increased, the importance of KCs increased. Over time, KCs took on the role of a village utility and the attractiveness of having a KC increased. More villages wanted KCs and, as additional KCs were operationalized, the workload at the hub increased exponentially. Of particular interest is the comparison made by Quibria and Tschang (2001) between the centralized model (hub and spoke) and network models (those operating without any hub). While the network model is more prone to failure on account of inadequate upstream preparatory efforts typified by KC implementation stage, the centralized system’s main weakness tends to be the need for “continued subsidization” of the spokes by the hubs.

5A typical model to manage the KC is the formalization of a salary structure for individuals who manage the KCs. The salary is expected to be paid from contributions made by the villagers.

6For instance, the opportunity cost of the wave height data is difficult to compute. Fishermen now routinely use these data to decide whether to venture out to sea. Many lives have been saved. However, the payoff in economic terms is still elusive. One approach is to estimate the insurance payoff and multiply that by the expected number of lives saved.
Data were collected as part of the larger study that attempted to answer the following questions: Are overall goals of the Information Village project being met? What is the status of content creation? Is the rural community sufficiently convinced that the KC is a valuable asset?

The notion of sustainability has arisen from the debate on sustainable development. In this paper, sustainability of the KCs refers to the carrying capacity of the village. It is, essentially, the ability of the KCs to continue to operate on their own. In that sense, our treatment of sustainability is much closer to what is connoted by viability. Since sustainability requires the consideration of a triple bottom line of environmental (ecological) and social factors in addition to the economic, the implication is that sustainability, as a concept, is not limited to natural resources or capital. In the context of development, communities own different types of capital. These include natural, human, social, and built capital. IT represents the built-up capital.

A sustainable world “can never come into being if it cannot be envisioned. The vision must be built up from the contribution of many people before it is complete and compelling” (Meadows et al. 1992). Taken thus, we see sustainable development as a continuous stream of discursive actions. TCA’s ideas are relevant for studying IS practice in rural contexts because implementing such information systems has social and political consequences (Myers and Young 1997). Our choice for employing TCA was influenced by the central Habermasian concept of “communicative rationality,” which is posited as a discursive form of collective reasoning. In this paper, we view the collective as comprised of villagers, participants from MSSRF, and other participants in the information village project. For this study, the choice of TCA was also influenced by the work of Hirschheim and Klein (1994) who have formalized the linkage between emancipatory intent and a critical perspective.

We viewed the process for information system development and processes supported or enabled by the information system from the TCA perspective. Our data collection methodology included a brief historical reconstruction. The bulk of data for this study were based on a series of intensive interactions with three project staff and three KC volunteers. Two KC project staff also served as translators (during the interviews with KC volunteers) since the local language is Tamil. Limited direct interaction took place with users. While in-depth interviews formed the major source of data, additional documentary evidence was based on project plans and reports, interim studies, and related documents. We also benefitted from numerous articles from the popular press.

3 VIEWING KC OPERATIONS FROM THE TCA PERSPECTIVE

Habermas (1984) identifies four primary social action types that an agent or actor can play out as a part of organizational or social functioning. They are instrumental, strategic, communicative, and discursive. The objective of an instrumental action is to get

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the receiver to act according to the sender's wishes. Strategic action attempts to influence behavior to conform to the sender's wishes but realizes the receiver can behave differently. The objective in a communicative action is to achieve mutual understanding. Discursive action is intended to achieve agreement for collective action.

3.1 Instrumental Actions

Instrumental action types were absent in the implementation of this project. This is because the project was premised on the methodology of participatory rural appraisal (PRA). If villagers were to indeed support what they helped create, then instrumental actions, which depend on authority and status, would have been inappropriate. However, the information system itself was used to support and enable multiple instrumental actions. Receiving daily wave height data and translating those to locally meaningful messages to be broadcast over the public address system is an example of instrumental action. This action allows fishermen to optimally balance risk and reward in terms of deciding whether to venture out to sea or not. Traditional knowledge systems provide the fishermen fairly accurate representations of local weather conditions over which they seek to exercise more control.

3.2 Communicative Actions

Communicative action is concerned with achieving and maintaining mutual understanding among those who are involved in a coordinated organizational situation. The implementation cycle of the information village lends itself to this action type. The PRA is iterative and the project team generally goes through four or five iterations with the village seniors. During the interactions in the PRA, the rights and responsibilities of the villagers and the MSSRF are clarified. In addition, the roles of both sides are clearly explicated and the team strives hard to ensure that the communication is indeed successful. It is important to ensure that the communication takes place between the larger village community and the project team. A collective understanding is a key enabler of success in such projects. A high level of transparency and understanding resulting from these interactions lead to the support of the community. During such interactions, the eligibility criteria for deploying KC in a village are also explicated.

The project team has to consider the nature of the village leadership structure while designing such interactions. The PRA process is also sensitive to issues like the time constraints on villagers. Most of the villagers work long hours during the day either in the fields or in cities as daily-wage workers. Women are also busy throughout the day. Hence the most appropriate time for such interactions or meetings are evenings. Typically, the initial interactions are with the village heads. Village leadership tends to be collective. Members are either elected or nominated to this group. Interaction sessions that follow tend to engage the youth and women’s groups. The project team allows ample time for the villagers to meet among themselves and think through the issues for themselves. The positive outcome of such meetings is a formal application by the villagers to the MSSRF stating that they need the KC and the reasons thereof. Toward the end of these interactions, the norms for implementing a KC are also clarified. They include (1) villagers to provide space to house the KC equipment; (2) villagers to provide electricity; and (3) villagers to provide volunteers to run the KC.

KC operations have enabled new communicative acts. One of the KC volunteers captures the emerging sentiment of villagers toward government services when he says,

Suppose I want to obtain a birth certificate or a caste certificate from the Tehsildar’s office. I should be able to find out whether the officials responsible for processing such documentation are present in the office or not and whether they will be able to process this request in a timely manner. Secondly, I would like to see the government block development officer (BDO) visit this village more often and would like to be informed of these visits through the KC.

This points to the changing relationship between the village community and the government. Given the potential for information access and exchange, the status quo has changed and villagers feel more empowered as they become increasingly aware and informed of their entitlements. How the new relationship emerges between the government workers (who will now need to be far more responsive) and villagers will depend on the communicative acts in which both choose to engage.
3.3 Strategic Actions

Strategic action is concerned with an actor’s influencing and transforming the behaviors of others so as to conform to the actor’s desires or goals. The primary validity claim of contextuality determines the legitimacy of this action (Ngwenyama and Lee 1997). Strategic actions tend to emerge as a result of information use enabled by the KC. For instance, one of the conditions for providing a KC to villages was the opportunity for women to be volunteers in the KC. In general, the idea of women volunteers was not welcome to the village communities. However, when the village leadership invoked their position to justify the opportunity for women, the village community tended to go along, especially because the volunteers’ job also entailed a small stipend. This is a clear example of formal authority being invoked, within the framework of the village decision-making process, to elicit desired behavior.

In order to explore the value that villagers had come to associate with the knowledge center, we asked how much the incumbent would like to receive as a salary if his present volunteer assignment was converted into a salaried position. After significant deliberation and hesitation, he weakly suggested a value of Rs 3,000 per month. In coming to this figure he had also observed, “I am not sure whether the village panchayat would go along with this suggested change. Even if it did, this possibility would hold promise only if the panchayat saw a sum of Rs 2,000 coming its way. Moreover, I am not sure whether I am cut out for this role.” This conversation points to two things. First, village leadership takes decisions and they hold. Secondly, villagers have not been able to formulate a basis for them to impute value to the information village concept. It is certainly “useful.”

We continued by asking the KC volunteer to speculate about a scenario in which the KC is closed down. His prompt response was that, “life would go on as usual in the same way as it existed before the KC was instituted.” Once we explained that we were not associating him with the quality of KC services nor the viability of KC operations, he switched to a conversational mode and listed Internet access and typing jobs as the leading sources of revenue for the KC. Based on subsequent conversations, we estimated that an average of five surfing sessions, each lasting roughly 30 minutes, would yield a net inflow of Rs 100 per day. Typing jobs (in English and Tamil) had the potential to yield a net inflow of Rs 50 per day. We believe that Rs 4,500 per month of net cash inflow is a conservative estimate for this particular village.

In this scenario, both the KC volunteer and the project staff are seen engaging in strategic actions wherein the project staff want the KC operations to operate independently of them, while the KC volunteers are not yet ready to assume full operational responsibility. In this example, a set of strategic actions demonstrates continuity and shifting loci (between KC volunteers and the panchayat, between the panchayat and project staff, and between KC volunteers and project staff, etc.). Resolutions to impasses in strategic actions tend to be found by translating them to communicative or discursive acts. While we did find evidence of financial viability, the important issue here remains in finding ways preserve the spirit and the essence of the information village concept. It is the latter that lends itself well to communicative and discursive acts.

3.4 Discursive Actions

Discursive action is oriented toward achieving or restoring agreement and redeeming validity claims. Ngwenyama and Lee (1997) cite one application of discursive actions to be the restoration of agreement after breakdowns. An instance of such breakdown was when women volunteers decided for themselves that they would manage the KC when and if the project support was withdrawn over time. Weakness of the strategic action types surfaced in this case. As has been discussed before, the role of women is a critical variable in the overall development of the village community. However, the involvement of women in the information village program was, at best, propitious, in the sense that given a choice, women would have opted for direct revenue generating activities as opposed to becoming volunteers in a KC. Even where women self-help groups have taken on the sole responsibility for managing the KC, they have done so (at least in one village) under the assumptions made by the village panchayat (all males) that it would be easier to “control” the KC operations by proxy. What the panchayat did not anticipate was the ability of women to create “trouble” (i.e., exercise autonomy in matters related to operations and decisions regarding the KC).

8US $1 = Rs 49 (approximately).

9Elected body in a village.

10We realized that the individual we were talking with also felt overwhelmed by what seemed to be a question-answer session to him (however much we had tried to carry on a conversation). In order to keep the conversation alive, we disaggregated the discussion strands and continued.
Another example of a discursive act is that associated with IS-enabled actions that have entered the discourse. Regional level workers (RLWs) are government functionaries who are charged with ensuring that government programs are implemented at the village level. They form the last node in the Government network. Typically, the RLW has to set aside two days a week for each village. Every Friday, the RLW is provided with a manifest of activities for the next week for each of the villages for which he is responsible. When the village KCs, through the hub at Villanur, requested that this manifest of activities and the RLWs’ schedules be made available, so that it could be made available to all villagers, the RLWs did not cooperate. The lack of cooperation was traced to an activity that had been established over a long time. By not disclosing their schedule, the RLWs made unscheduled village rounds. Such unscheduled visits result in minimal interaction with villagers. For the record, they check off their tasks in the manifest and, invariably, take the remaining day, assigned to the same village, off. The presence of a KC at the village reframed the situation and converted what used to be a chance meeting into an entitlement. While the parley between the villagers and the government office will continue for long (often associated with critical debate and argumentation), resolution frameworks often require third parties.

4 DISCUSSION

The main point that emerges from the analysis in the previous section is that there is a pitfall in looking at sustainability in only one dimension. Economic sustainability is necessary but not sufficient for meeting the larger ends of the project, which include empowerment and ensuring information access. Economic sustainability has been demonstrated in a limited way by utilizing the KC as an Internet kiosk (using payments per browsing session) and by offering and vending basic document processing and telecom facilities. However, such attempts at privatization are often accompanied by the dilution of the original intent and spirit, especially when it comes to the concept of collective ownership. The necessity of the KC is exemplified in many ways by the value addition provided by the hub at Villanur, which addresses almost any validity concern that communicating actors may have. That investment needs to be protected since the opportunity cost of not doing so is high. The role of the hub and the staff needs to be replicated in order to sustain existing KCs because grassroots movements tend to spread laterally. The proliferation of the number of KCs is best explained as diffusion by cultural infusion (El Sawy 1989). While the idea of converting some of the KCs to function like hubs is conceptually attractive, the skills and commitment possessed by the project staff are difficult to replicate.

It is from this standpoint that the idea of IT use for sustainable development is crucial. The built up conceptual and social capital enables village community members to question and articulate many of their concerns and work to improve their interactions with external agencies like the market and the government. The role of the MSSRF has emerged to be that of a value-adding infomediary. From this perspective, it is easy to see the importance of keeping the discourse, enabled by IT, alive.

When looking for ways to overcome the barriers to sustainability that KCs face, the ability of villagers to relate the impact of IT to their way of life, value addition, and perceived value acquire importance. The ability of villagers to relate the impact of IT to their way of life has to do with internalizing value. Coupled with this, frameworks need to be in place to demonstrate value as well as to quantify value (continuous metrication that is operationalized at each KC and customized to each village).

From a practical standpoint, this implies improving the efficiency of converting opportunities into viable benefits. Allowing village residents to influence and experience the process of value-creation through IT and explicating the value chain and the role of IT in that process best accomplish this. In that sense, this becomes a process of collective learning. This requirement also calls for a renewed emphasis on the quality of leadership of the Information Village project and the project team. This is especially important when understood in terms of the influencers of conversion gaps. Project leadership and participation is crucial in ensuring different and innovative ideas with respect to narrowing the conversion gaps. Such leadership can be effectively practiced employing the process of critical facilitation (Gregory and Romm 2001). This approach borrows from the Habermasian concept of discourse by developing an orientation of openness to discourse and encouraging it in order to evaluate different validity claims. In the process, collective learning takes place and the insights are shared.

The second variable, or action point, is also important from a project leadership standpoint. In a way, quality of KC activities translates into the proposition of ensuring high quality of KC operations, regardless of the short- and medium-term KC related societal and individual payoffs. This means that the KC volunteer group and the project staff have to continually identify opportunities for improvement as well as new uses. Needless to say, many such opportunities will emanate from outside the village. To that extent, the role of project staff and leadership will require new forms of networking that are addressed to not only linking the established IT infrastructure to other agencies that can be viable partners, but also to ensure that the existing infrastructure remains operationally healthy. This implies that services that we take for granted (electricity and telecom services) need to be willfully generated in order to sustain the IT initiative. Until such time as the government provides reliable electricity
and telecom facilities, information villages need the presence of organizations like MSSRF, especially for help with services that they are willing to pay for and participate in managing. Mintzberg (1996) drives the point home when he writes in the context of governments to consider the myth of measurement, an ideology embraced with almost religious fervor by the management movement….Things have to be measured, to be sure, especially costs. But how many of the real benefits of … activities lend themselves to such measurement? Some rather simple and directly delivered ones do—especially at the municipal level—such as garbage collection….How many times do we have to come back to this one till we finally give it up? Many activities are in the public sector precisely because of measurement problems: if everything was so crystal clear and every benefit so easily attributable, those activities would have been in the private sector long ago (p. 79).

We believe that this point is well taken in the context of IT in developmental contexts also.

5 CONCLUSION

We have been able to demonstrate how TCA allows us to conceptualize IS deployment and IS use in terms of delineable action types. While IS deployment can be understood in terms of both strategic and instrumental actions, IS use in developmental contexts lends itself best when used as an enabler of discursive actions. In that form, the KC presents ample scope for opening up new discourses, which may result in revised assumptions about social structure, economic opportunities, farming practices, gender roles, and many other issues that tend to be endemic to a poor rural community. From that standpoint, it appears reasonable to conclude that even in the face of weak economic viability, it should prove to be good public policy to continue to support the KC initiative until the time that such IT services can be provided as a true and reliable utility. From a theoretical standpoint, this study has demonstrated how to look at IT use in a developmental framework from a critical lens.

By employing a critical view in addressing the social and economic dimensions of sustainability, we have attempted to address more than conceptual completeness or tidiness. Participants and decision makers in rural development contexts need to understand and, at times, make trade-offs between options, each of which offers a menu of possible costs and benefits. While it may be better for a village to take a piecemeal approach and attempt economic sustainability rather than not considering the KC-enabled triple bottom line at all, we have shown that social payoffs and their demonstrable benefits can help us appreciate the complexity of the sustainability challenge.

Based on the data collected in this paper, while some KCs can be weaned from resource-based subsidization, the desirable strengths of the hubs (in the hub and spoke model) can be leveraged by devising and implementing processes that enable technical inputs and expertise (on enabling village residents to think through and link IT to new ways of creating value) to continue.

More importantly, discourses can be more than just words and the elements they signify. A discourse is a practice that influences subjects and emerges as a result of interaction between subjects. So discourse can be considered as a kind of language, which forms our knowledge and shapes our understanding. From this viewpoint, knowledge specifies what can be said about objects and phenomena in a domain of knowledge, and the KC is rightly part of the “knowledge system for sustainable food security” (Balaji et al. 1999). If one examines the fact that knowledge specifies what can be enunciated, one will see that not only objects and phenomena are produced in and via discourses, the process also involves the definition of those who have rights of access to the discourse. This is because a discourse actively defines what can be said and who among the totality of individuals has the right to speak. This understanding forms the basis of empowerment. In the same way as objects and phenomena are produced in a discourse, users of a specific discourse are also defined by the discourse.

6 REFERENCES


