

EVALUATION OF INFORMATION COMMUNICATION TECHNOLOGY PROJECTS IN DEVELOPING WORLD: FORMULATING A PROSPECTIVE METHODOLOGY

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A new paradigm of agricultural development is emerging. The overall development of rural areas in the developing countries is taking new avenues of expansion. The old ways of doing business in terms of delivery of important services to citizens are being challenged in both the developing and developed countries. A complete transformation of traditional societies to knowledge societies has been increasingly felt all over the world. The report of the “Task Force on India as Knowledge Super Power (2001)” emphasizes the need for developing the capacity to generate, absorb, disseminate and protect knowledge and to exploit knowledge as a powerful tool to derive societal transformation. The background report of “working Group on Information Technology for the Masses” declares: “It is the firm view of the Government that if any technology can create new opportunities to bridge the gap between information haves and have-nots in the present times, it is Information Technology”. (Working Group of GOI, 2000). It is being increasingly felt that Information Communication Technology (ICT) can be a major vehicle for all round socio-economic development. ICT can play a spectacular role in societal transformation to realize the concept of “Knowledge Society” in the Indian context. Being an agriculturally rich country, India cannot overlook the field of agricultural development as the main domain of societal transformation. Here comes the enormous potential of ICT that has to be harnessed for overall agricultural development in particular and for societal transformation in general. The development of precision farming in countries of the North emphasizes knowledge – intensity and hence the new agricultural paradigm in India will have to be recast to take advantage of the knowledge

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availability to achieve multiple goals: of income, food, jobs, etc. The emerging Information Technologies have a significant role to perform in evolving such a paradigm, as was evident from the interdisciplinary dialogue on Information Technology: Reaching the Unreached (Swaminathan, 1993).

Agricultural Extension, in the current scenario of rapidly changing world has been recognized as an essential mechanism for delivering knowledge (information) and advises as an input into modern farming (Jones, 1997). There are many possibilities for potential application of Information Technology in Agricultural Extension (Zijp, 1994). In spite of the huge potential of the Information Technology that can be harnessed for agricultural development, only a few isolated projects have been initiated in India and a few in other parts of the world. Interestingly, many of these projects were initiated by non-government organisations (NGOs), private organisation, cooperative bodies and Governmental organizations other than agricultural departments. This shows the non-readiness of agricultural development departments to incorporate the ICTs in their day-to-day activities. It is time to reckon that “no longer does it hold good that what happens in the west today is only possible in India in a decade or two later”. We have to realize that being tentative and casual will not pay; instead we should be open to the possibilities of harnessing ICT in agricultural development in a systematic manner. For this, there is a need to develop a strategy at different levels. To formulate such a strategy, the isolated Information Communication Technology projects needs to be studied and the experiences generated there must be documented to draw lessons for the future.

Most of the ICT initiatives in India are location specific, isolated and confined to a small area, providing services for a specific aspect of agricultural development. The efforts have to be institutionalised in order to draw lessons and develop insights into these differential approaches of the projects. The process of churning these projects is important and a prerequisite aspect for developing a sound strategy.

The future investment on harnessing the ICT for agricultural development, should meet minimum criteria of social benefits as promised by the ICT. Hence, the strategy should directly benefit agricultural communities. Hitherto,

some sort of pressure has been felt in order to use ICT in agricultural development in the recent past. The question is, how to build a sound strategy? Unfortunately there have been no attempts made by the agricultural development specialists. It is easy to develop information / knowledge culture among the policy makers, but what is more important is to develop a strong methodology and 'modus operandi' of harnessing Information Communication Technology in agricultural development. To introduce a revitalized agricultural extension for effectively harnessing the Information Communication technology, some spadework has to be done on various aspects. These aspects will have to be thoroughly discussed individually, before integrating them in future strategy.

The ICT strategy in agricultural development comprises the following aspects which form the basis for defining some researchable issues, that have, hitherto remained unanswered. An analysis of various isolated ICT initiatives all over the country is the foremost aspect. This will enable us to draw lessons and develop insights so as to design the overall strategy of ICT in agricultural development. Evaluation of the process of implementation of these projects, in order to derive the general guidelines in formulating the plan of activities for future strategy is another important aspect. The projects have to be analysed thoroughly on efficiency variables and effectiveness parameters. Sustainability of existing ICT projects is to be observed. This will lead to a desirable strategy so as to enhance the efficiency and effectiveness of using the ICT in agricultural development.

There is a need to document and analyse various initiatives of Information Communication technology in Agricultural Development, to gain an understanding about their conception, implementation and impact. Such an attempt would provide a platform for developing an integrated strategy for harnessing the ICT. There is a need to evaluate the functioning of various ICT projects initiated in the country for agricultural development on different parameters, of efficiency, effectiveness and sustainability. For increasing the effectiveness of future integrated strategy, the process impact of present projects is an important researchable issue. The content analysis of enormous amount of project details of various national and international Information Communication technology projects is to be done. The content analysis can be done based

on the following parameters for each project. Focus, Purpose, Clientele, Description, Information Base, Sustainability, Partners, Inputs such as investment, ISPs etc, Outputs, Duration (if applicable).

Understanding the Process Impacts of ICT Projects

In the Indian context, perhaps for the last few years attempts have been made to publish the “case studies” of ICT projects working towards agricultural and rural development. The academicians and other development experts have prepared lot of literature. Most of the attempts simply described the details of functioning of ICT projects without much emphasis on the impact these projects make on the stakeholders community. The benefits of expanding ICT to major urban cities has been well documented, and the results of such urban investment can be seen in both expansion of ISPs and the increasing connectivity throughout the urban areas of the country. The impacts on rural stakeholder community however are less understood (Richardson, 1996; Sirimanne, 1996). Even today, this situation is predominant in rural ICT initiatives.

As Michael Menou correctly pointed out, information development support seeks a balance between the development of infrastructure and the satisfaction of the information needs of the poorest segments of the population. The latter, like rural populations, are mainly reached by indirect methods, usually through extension services. When resources are scarce, choices between infrastructure and serving the poor are often in favour of the former (Menou, 1993). In such cases, the benefits that an investment on ICT project provides will have to be carefully evaluated.

Unfortunately, no serious attempts can be found in the Indian conditions to develop an evaluation strategy for rural ICT projects. This is coupled with the fact that the evaluation of ICTs on communities is still an open issue in terms of methodologies. As it is evident from the proceedings of workshop held on “Telecentre Evaluation: A Global perspective” (1999), universally accepted norms/ methods for quantification impacts of ICTs are yet to be defined. Lack of evaluation of ICTs impacts implies the exclusion of rural stakeholder communities and the actual researches aimed at measuring the ICTs efficiency.

An early exception for the above mentioned discussion is Kingo Mchombu's 1996 report, "Impact of Information on Rural Development Background, Methodology and progress". In this, Mchombu outlined some of the mid-term results of IDRC project in South Africa. (Mchombu, 1996). Although the Mchombu report researches the origins and impact of information on rural communities, it does not specifically address the newest form of ICTs i.e. Internet.

Another ICT evaluation report emerged in 1997, "Use of ICT in IDRC Projects: Lessons Learned", is authored by Graham and is published by IDRC. The report raises questions to address the results only in terms of those shareholders who have connectivity. No mention is made about stakeholders who have no connectivity. Of the eight evaluation questions posed in IDRC's report, only one concerns ICT in relation to its use by all stakeholders. Moreover, this evaluation is not based on any field research being conducted.

In this background, it is essential to refocus the ICT research so that the communication processes occurring with the use of ICT are examined, rather than infrastructure facilities themselves. In the Indian context, there have been no academic researches carried out so far in this line. Agricultural research has not been oriented towards the ICT research, not to talk about the ICT evaluation researches. In the near future, based on the methodologies proposed in the present paper, the ICT researchers may be reoriented towards evaluation component.

Don Richardson, in his paper "the Internet and Rural Development: Recommendations for strategy and activity", makes the case for increasing the focus on those who live on the fringes of ICT expansion, and against focusing all research on those with direct access to connectivity. He further states, "Research on impacts cannot only focus on users and local applications, but also focus on people who do not participate directly in local ICT initiatives, and suggest mechanisms for enabling them to benefit directly or indirectly from these initiatives" (Richardson, 1996).

Hence to conclude, in the developed world, there is need to shift from technical evaluation to ICT impact evaluations. In India, a series of ICT

researches should be taken up by research organizations particularly those who are responsible for overall agricultural development.

In the evaluation of ICT projects on the stakeholder communities, equal emphasis should be given to results impacts, process impacts and the technical evaluation. In the Indian context, since the ICT for agricultural and rural development has emerged very recently, any attempt to evaluate only the end result impact would be premature and too early to take up. Hence, for measuring the impact of ICTs, the focus should be more on process impacts of ICTs rather than result impacts. In this paper, an attempt has been made to develop a prospective methodology to evaluate the impacts of ICT projects.

How to Evaluate the Impact?

The evaluation of impact of Information Communication technology on stakeholder community is still an open issue in terms of methodologies. As it was already mentioned, since the ICT for agricultural development has emerged recently, any attempt to evaluate only the “end result”, would be premature and it is too early to expect concrete and sound results from the Information Communication technology projects. Hence, for measuring the impact of such Information Communication technology projects, the evaluation needs to be focused more on process impact than on the result impact. It is equally important to include all the stakeholders in addition to the entrepreneurs themselves while assessing the impact. The methodologies for Impact Assessment should be based on the operational principles that would include the aspect of accountability to stakeholders. A high degree of involvement by all the stakeholders in the whole assessment process will change the perspective of the evaluation. Difference in methodologies, data collected, the importance of this data and measurement of achievement from the data will all provide a broader picture to the impact assessment process.

To measure both process impact and result impact in the Indian context, the model of Scott Mc Connell (2001) can be used, with slight modifications. Various efficiency variables, effectiveness variables and their various indicators could be studied. Besides, sustainability variable can also be studied. As far as the result impact of these projects are concerned, direct impacts and

indirect impacts could be studied as prescribed by the model. Technical evaluation and scalability of the projects also find a place under this.

Various variables and their indicators that could be studied in accordance with the Mc Connell Model (2001) are enlisted as follows:

Efficiency Variables Indicators

i) Capacity of the project: Number of individuals involved in the project. The number of individuals actually related in the kiosk operators, top-level coordinators are determined. The total number is considered as the number of persons involved. Time taken to reach the stakeholders (farming) community. Time taken to reach the stakeholder (farmers) community is measured in terms of the length of time required (in days) for the dissemination process. The time elapsed from the reception of internet acquired information at the organisational level, to information dissemination to the average member of the farming community. For this, direct questioning can be done among the top-level functionaries to determine the time taken to reach the farming community (in days).

ii) Economic costs of project: Total budget of the project. This component addresses both the real and actual costs of the Internet (or other Information Communication technology tools) for the project. Indicators for this component included assessing the infrastructure costs of computers, training and internet connectivity. Direct interviewing with the key functionaries and inspection of annual budgets is done to determine the economic costs of the projects. This is expressed in terms of Indian rupees.

iii) Efficiency in use of Information Communication Technology: Degree to which Information Communication technology is used as information gathering tool. This variable is assessed in terms of the frequency of use of Information Communication technology (in days) as an information-gathering tool. Since, the ICT could be used in increasing the efficiency of information collection from a variety of sources, it is imperative to determine the frequency of use of Information Communication technology as an information gathering tool. The top-level functionaries can be directly asked about this on four degrees of (levels of) frequency viz.,

Very frequently – once a day

Frequently – once a week (7 days)

Rarely – once a month (30 days)

Very rarely – less than once a month.

Perhaps the most important efficiency indicator is the “degree to which Information Communication technology is used as an information-sharing tool”. This is assessed in terms of the frequency of use of Information Communication technology (in days) as an information-sharing tool. The top-level functionaries can be directly questioned about this on four levels of frequency viz.

Very frequently – once a day

Frequently – once a week (7 days)

Rarely – once a month (30 days)

Very rarely – less than once a month.

iv) No. of hits per day(or) per week : Average number of times, an information capsule is accessed. This is determined by direct questioning as to how many times the concerned website/domain of the project is “hit” by the farmers. Expressed in terms of number of times per week.

Effectiveness variables Indicators

i) Appropriateness of information: Perception of the farmers in terms of usefulness of the information services provided by the project should be studied. This variable examines whether the information provided by the project is appropriate to the needs, and the usefulness of the information provided to them is the indicator of the degree of appropriateness.

ii) User equity : Equity of men and women accessing the technology. Equity of people Below Poverty Line (BPL) and Above Poverty Line (APL), Equity in the number of male and female functionaries, Equity in number of male and female functionaries trained.

Information Communication technology opens opportunities for women and men alike by increasing their access to information, providing a venues for the expression and sharing of knowledge, as well as providing training in

a variety of areas (Rostagno, 1997). User equity is considered to be one of the important effectiveness variables to measure the process impact of a particular project. Number of men and women accessing the Information Communication Technology services under these projects is determined using direct questioning to the functionaries and users. Numericals are attached to this component. Number of people Below Poverty Line and Above Poverty Line is also to be studied.

Number of male and female functionaries should be found out to determine the gender equity. In the same manner, the number of male and female functionaries who received computer training should be studied.

All the four above-mentioned indicators finally are expressed in terms of percentage of user equity.

Direct Impact of the projects

This component is used to assess the success with which the projects objectives for providing assistance, service, and information to farmers were being met as a result of its own Internet connectivity.

Direct and indirect impacts resulting from the projects are examined by non-participant observation and by direct questioning of the farmers in the project area.

Indicators of direct and indirect impacts of the Information Communication technology projects would be dependent on the specific objectives of those projects. Hence, such impacts are to be assessed using the open-ended schedule and the questions are posed to the farmers.

Technical evaluation

The process impact and the result impacts of any project would be incomplete without the technicalities within which it is operating. For technical evaluation of the projects, the following dimensions (variables) were considered. Data Base Management System (Application Server Type, Internet Server Type, Mail Server Type), Customised software of the project, Number of servers and the scalability, Number of terminals connected to each server, Network

connectivity- (Fibre optics connectivity, Wireless LAN system, Wired LAN system, and Others), Leased Line connectivity, Number of hub centres, Type of operating system.

Key Steps in Designing and Implementing Impact Evaluations

Due to the lack of information about ICT projects, and the real absence of impact assessment data, most ICT projects should start by collecting their own baseline data and completing needs assessments of all the stakeholders. This should ensure that ICT intervention is supported by other delivery mechanisms and that the important function of the first mile of connectivity for rural beneficiaries is not overlooked. Before designing and implementing the impact evaluations, there are some key points to be noted down. Although this is not the exhaustive list of aspects to be considered, they will give a better idea as to how to go about.

Determining whether or not to carry out an evaluation

Are there similar ICT projects and studies from which lessons can be learnt ? Are older forms of ICTs currently under or over utilised, or simply not available? (Radio, Telephone, Fax, Post, Newspapers)? What limits can be envisaged to the evaluation?

Clarifying objectives of evaluation (who is it for, who is it done by, why is the information being collected, what will be done with the information, and the evaluation etc.)

How will the evaluation fit into the project - is the project flexible enough to accommodate any changes in direction or emphasis? How comfortable are the stakeholders with issues regarding new technology and the impacts it can bring? Exploring data-availability, what is currently there to be evaluated regarding ICTs? And what effect does infrastructure have on the data-availability?

Designing the evaluation

How can all stakeholders be included in a participatory way? What indicators should be used? What is the expected rate of use of the intervention?

Forming the evaluation team

What knowledge of ICTs and their use by poor people does the team have? How confident is the team in gauging the understanding of ICTs and explaining in simple terms the technology options?

Sample design and selection

Are the pilot questionnaire respondents representative of the general level of ICT awareness in the project areas? Are there issues relating to literacy, language etc that may exclude some stakeholders, both in the evaluation and in the ICT intervention? Are the farmers respondents and functionaries representatives of different socio-economic conditions?

Data collection instrument development

Is the data collected by structured schedules coupled with personal observations of the evaluator? Can there be any automated way to collect data about ICT usage? Does this impact the evaluation or raise any privacy problems?

Staffing and training fieldwork personnel

What knowledge of ICT and their use by poor people do the team have? How confident is the team of gauging, understanding and explaining in simple terms the technology options and the limit of the project?

Pilot testing

Are the pilot audience representative of the general level of ICT awareness in the project areas? How will feedback be incorporated into further work and impact assessment?

Data collection

Is control data to be collected from those not using the ICT intervention? What level of participation is recorded? What are the reasons for non-participation?

Data management and access

Can the data be synthesized so that evaluation against other ICT projects can be made? Ongoing data collection- How does it feedback into the project and what are the benefits? Will trends in greater ICT use be picked up by the evaluation? How will the data from people who tried using the intervention a few times but found it of little benefit and so stopped, be captured?

Analysing the data

What will the project do with the evaluation data - where does it feedback into the project? How can the qualitative data about specific case studies (success and failure) be reported? Writing about the findings and discussing them with policy makers and other stakeholders what policy and infrastructure issues arise and how can the project influence these issues? What level of support in the project is there from policy makers and private telecom operator in country? Do the policy level stakeholders have any “buy-in” or control of the project goals? Incorporating the findings in the project design if changes are needed, is it the ICT intervention, the first mile of connectivity, the infrastructure, the policy or other issues that need addressing?

Conclusions

Any impact assessment will undoubtedly be a learning process, and this needs to be fed back into both the project as a whole, and into subsequent assessments and other ICT interventions. The scope for scaling up of successful ICT projects is largely due to the replicability of the technology options used if the infrastructure is in place. Impact assessment plays a crucial role in ensuring the positive benefits of ICT interventions if acknowledged and acted upon by policy makers, donors and the private sector. In this respect, impact assessment needs to discover what is effective and what is not and so provide options for adapting the activities of the project and the impact assessment process. Effectiveness, of the project with regard to the approaches set out need to be measured and distilled into the feedback. The findings regarding the thorough analysis of process and result impacts of ICT initiatives in India on different parameters such as the efficiencies, effectiveness of the projects, impact on rural stakeholder communities etc., will be helpful for designing the national, regional and state level action plan.

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