
Lessons from the ICT project implementation experiences

The Indian experience with ICT projects have been mixed. Some of the projects have done well. International experience also has been similar. According to a study done by Heeks, 35 percent of the e-governance projects were total failures [1]. According to Heeks the main reason for the failure has been the gap between reality and design. The five major gaps he had brought out are:

- Information gap
- Process gap
- Objectives gap
- Management systems gap and
- Values gap.

While designing and implementing ICT platforms one has to ensure that the reality – design gaps are addressed properly. This will require considering multiple perspectives at the conceptualization. The various perspectives that one has to consider are:

- technological perspective
- organizational perspective
- economic perspective and
- social perspective

The second stream of research that can provide insights into the implementation of ICT projects is diffusion of innovations. ICT projects could be considered as attempts at diffusion of new technology. Tarde was one of the first to look into diffusion of innovation. He reported that, out of one hundred different innovations conceived at the same time ten would spread abroad while ninety

will be forgotten [2]. He observed that the rate of adoption of a new idea usually followed an S-shaped curve over time. Diffusion of innovation occurs through learning. An individual learns about an innovation by copying someone else's adoption of the innovation, implying that diffusion is a social process of interpersonal communication processes. Thus, diffusion of innovation has a number of prerequisites, namely:

- motivation to learn
- demonstration of the process or knowledge about the potential benefits
- social process of communication and
- interpersonal communication networks

The twelve ICT projects are analyzed using these two paradigms, namely

- a gap paradigm and
- a diffusion paradigm.

The tenet of this is that social and technological changes are caused by both innovation and diffusion. Some of the major elements that drive diffusion of innovation are the following:

- earliness of knowing about an innovation by members of a social system
- rate of adoption of different innovations in a social system
- innovativeness of members of a social system
- role of opinion leadership in diffusing innovations
- pervasiveness of diffusion networks
- rate of adoption of innovations in different social systems
- use of communication channels for diffusion
- consequences or benefits of an innovation.

It has been reported that innovativeness of members of a social system have maximum influence of the rate of diffusion of an innovation. The twelve case studies are analyzed using these concepts. The cases provide for enormous learning. The main learning is that diffusion of ICT platforms is a social process involving social relationships, social interactions, social communication and social cohesion. In other words, the major determinants of diffusion of innovation are

- perception of economic benefits
- institutional readiness
- social interaction and
- appropriateness of technology.

The hypothesis given in the earlier chapter is tested. Almost in all the cases the information and resources are accessed and shared at all the levels. The rural poor are empowered in some of the cases such as GCOMMFL, Kancheepuram Saree Industry and Carpet Industry; also participative management is practiced in cases such as GCOMMFL, e-Choupal and EID Parry.

The major findings of the Case Studies are explained subsequently:

ICT application in a dairy industry:

The e-experience of Amul

India is the largest producer of milk in the world, it is also one of the highest consumers of milk and milk products; but the milk collection and the milk procurement practices in India are traditional. GCMMF operates in 70,000 villages. The most crucial activity in dairy industry is milk procurement. A system for improving the milk procurement was conceived and implemented. The IT platform is called: Automatic Milk Collection Unit Systems (AMCUS). The focus was on empowering the farmers by employing IT at village cooperatives. The second end of the platform is Dairy Information System Kiosk project. Both these together can change the dairy industry, AMCUS reduces the time for payment for milk. Prior to this the payment was taking 14 days, the new system has reduced it to zero time. The payment is made as soon as the milk is delivered. Understanding the baseline operations is the starting point for designing a customer oriented ICT platform. The main enabling factors of diffusion of this innovative platform are :

- commitment of the project leader
- training and educating the beneficiaries
- designing a system that can work reliably in a rural setting
- substantial and direct benefit to the users and
- prevalence of high levels of trust GCMMF and the among dairy milk supplying farmers

Indian Institute of Management acted as an interface management agency that ensured that the requirements gap is eliminated at the system design stage.

Developing a Rural Market e-hub:

The case study of e-choupal experience of ITC

The potential for the use of ICT platform to enhance transactional efficiency in the agro-sector is very high. ITC Ltd implemented a project on electronic market place for the soyabean farmers in the state of Madhya Pradesh. The project owes its success to the factors such as utilization of local leadership in the villages, a sustainable business model and collaboration between the local authorities and the corporate implementer. The technology embarked was easy to replicate and easily scalable, and it was customized according to the needs of the local farmers. The entire project thrived on the initiative and commitment of ITC and the resource mobilization done by it. The project has helped the farmers developing sustainable income levels, elimination of the middlemen, developing easy access to the market place and shared ownership of the project. The factors that contributed to the success of the project are the following:

- ease of replicability and scalability
- customization of the ICT platform to meet the specific local needs
- organizational commitment to succeed
- selecting and training a local community member as the coordinator and
- profit sharing between the platform holder and the beneficiaries leading to a high levels of trust.

E-governance in a fisherman's community:

A case study of Pondicherry

e-governance has become one of the more effective and efficient way of improving the governance. A novel example in e-governance was that set-up by an NGO in the fishermen colony in Pondicherry. The project started by MSSFR was successful since the entire project was implemented in the phased manner, it was customized according the needs of the rural users, and it helped in developing a systematic knowledge base for sharing within the community. The Rural knowledge centre concept envisages that governance has to have pro-poor, pro-women, pro-nature orientation for development and community ownership and encourages collective action for spread of technology. The Rural knowledge centre project envisages at empowering communities with information in the fields of environment, health, markets, sustainable agriculture etc. The community would own each knowledge centre and the volunteers selected by the community would run and manage these centres. The critical success factors that made this project work are:

- social readiness to accept innovations
- high economic benefits
- high levels of trust among the community
- gender sensitivity to make sure that women are empowered, and
- focus on low income beneficiaries to ensure equitable benefits to all concerned.

Developing ICT platform for enhancing agricultural productivity:

The case study of EID Parry

The scope for the use of ICT in the agriculture sector is high as India is an traditional agrarian economy. EID Parry has implemented the project "Parry's Corner" to help the farmers, provide them with value-added services, improve their income levels and the productivity of their farms. The self help groups in the vicinity are using the ICT platform for e-commerce. This has helped in the creation of social networks. Social networks facilitate the diffusion of ICT platforms. The major reason for the success of this project has been that the company has been in operation in that region for a long time. The high levels of trust existing between the company executives and farmers helped in the rapid diffusion of the utilization of the ICT platform for a variety of reasons. The technology selected was a low cost option and hence the overheads were not high for platform. EID Parry is a value based company, operating in an ethical manner over the years. Social networks driven by trust and the economic benefits obtained from the programme are the main reason for the adoption of the ICT platforms. The field level benefits have been high in this case.

ICT for the renewal of a Traditional Industry:

A Case Study of Kancheepuram Silk Saree

Many of the traditional industries has been losing competitive edge. Kancheepuram silk saree was a traditional industry that was losing competitive edge. By developing an ICT platform the saree weavers have been able to reduce the cycle time and enhance the design interactivity. The ICT platform has helped introduce new designs and improve the colour combinations. Customer acceptance of sarees increased considerably. The main driving force behind the innovation has been two entrepreneurs. The main reasons for the success of adoption of the ICT platform have been the following:

- entrepreneurial orientation of the innovators
- identification is a good window of opportunity
- incremental cost of introducing innovations have been marginal and
- understanding the user perspective and then blending traditional technology and computer aided design.

Internet Kiosks for rural communities:

Using ICT platforms for reducing digital divide

ICT has the potential to provide digital transaction platforms for rural communities. The Melur Project is one such ambitious project. The project implemented in the state of Tamil Nadu, shows us how the low cost technology which was incubated at IIT-Madras has been successfully passed on for the benefit of the rural people and helping them to generate sustainable income levels. The project idea was easily adopted by the masses, this project fostered creation of knowledge and sharing of the knowledge, helped in skill development of the local entrepreneurs and encouraging the local participation. The project was a well conceptualized one. The cost of the platform was low as they had selected a low cost option. Large scale platforms can be implemented only through public private partnership. The success of the program has been due to the following :

- robustness of design, considering all the customer needs
- entrepreneurial orientation leading to enthusiastic implementation and
- systematic training of people for skill development.

Evolving an ICT Platform for a Traditional Industry: Transforming Artisans into Entrepreneurs

Leather is one of the oldest traditional industries in India. This case study highlights the repositioning of a traditional leather industry. Kolhapuri footwear making was becoming uncompetitive. Using an ICT platform they were able to modernize the traditional industry to respond to the customer needs and access new markets. The ICT project was initiated by Central Leather Research Institute. Through the use of the innovation the leather footwear designers were able to increase the product variety, enhance manufacturing productivity and change the manufacturing process. The critical success factors for the rapid diffusion of this project were:

- intensive skill development efforts
- substantial benefits from the new technology and
- reputation of the implementing agency

Regaining Competitiveness using an ICT platform in a Traditional Industry:

Adoption of Computer Aided Design for Carpet Weaving

Many of the traditional industries had been losing their competitive edge. Rajasthan carpet industry is one such traditional industry, which was losing competitive edge because of competition from synthetics carpets. The carpet weavers have been able to enhance product variety and reduce the development cycle time and enhance the design interactivity through the use of an ICT platform. The ICT platform has helped the weavers introduce new designs improve the colour combinations. The customers acceptance of carpets has increased considerably since the product can be visualized before design. The entrepreneurial motivation of the software provider and his ability to provide a comprehensive platform were the main driving forces for the success of the project. There was close interaction between the software provider and exporters to analyze the latest trends in the export markets. Training was provided to the weavers to improve their skills. This project essentially showed that a traditional industry can be transformed using ICT. It also proved that through adoption of new technology our traditional industries can survive. ICT platforms will be accepted if there are social and organizational readiness and economic viability built into the project concept.

Providing Rural Connectivity Infrastructure: *ICT Diffusion through Private Sector Participation*

With the objective of taking the power of Internet and the benefits of telephony to the majority of country's population residing in rural India using a low cost and an affordable communication technology option. This technology was incubated at IIT, Madras. The technology was specifically customized to the local needs. The project was taken to the rural area through an entrepreneurs work. The diffusion was done by an entrepreneurial start-up. To disseminate the technology, the start-up used a franchisee based business model on the belief that delivery and management of the Internet service should devote to the level of the supply chain that comes closest to the user of the service. Factors responsible for the success are cost effectiveness of technology, provision of value added services and commitment from the government authorities and entrepreneurial orientation of the startup.

ICT Platform for Enhancing Agricultural Productivity:

The case study of Tata Kisan Kendra

The scope for the use and application of ICT in the agro-sector is high as India is an agrarian economy. Tata Chemicals Ltd embarked upon an ICT initiative to provide farmers with the value-added services and improving their productivity and income levels. It implemented its project Tata kisan Kendra to help the farmers with agro input suppliers, farm equipment leasing, bulk blending, training and skill development, insurance and credit facility. Tata Kisan Kendra also introduced the concept of 'precision farming' to the Indian farmers. This ICT platform thrives on the 'Geographical Information System' to provide the farmers with infrastructure support, operational support, co-ordination and control, and strategic support for farm management. The project was successful, since it had the support of Tata Group and goodwill which the group holds in the minds of the rural farmers. The farmers had high level of trust for Tata Chemicals since the company had been operating in the region for a very long time. The project was implemented in the phased manner so that the project grows in an evolutionary manner.

The critical success factors that made the project work are :

- the ICT platforms have been conceptualized after consulting the users
- the project evolved step by step after validation
- the contact persons helped in building trust between Tata Kisan Kendras and the farming community.

The corporation, TCL has been able to conceptualize and implement a new ICT platform that provides value added services to the farming community. Trust has been the glue that binds all the members of the community.

A Telemedicine Platform:

A Case Study of Apollo Hospitals Telemedicine Project

The idea of performing medical examinations and evaluations through the telecommunication network is not new. The Aaragonda Project of Apollo Telemedicine Enterprises Ltd, a non-profit organization was set-up for the purpose of implementing the telemedicine project. Telemedicine uses ICTs to provide specialized services to patients living in the different parts of the globe. Telemedicine has the potential to revolutionize the whole of the health care industry. In ICT platforms for medical consultation, behavioural issues such as the trust becomes along with the cost of transaction. High investment platforms such as can be implemented only through public-private partnerships. The critical success factors for sustaining the telemedicine network are:

- economic sustainability of the platform
- connectivity of the platform and
- behavioural acceptability of the transactions.

A Telemedicine Platform:

A case study of Care Hospitals Telemedicine Project

Telemedicine has the potential to provide quality and cost-effective healthcare to the rural people. The idea and evolution of telemedicine is not new. The 'Sanjeeva Project' of care foundation was setup for the purpose of implementing telemedicine project in the Mahboobnagar district of Andhra Pradesh. Telemedicine uses ICT to provide remote specialized services to patients who do not have access to them otherwise in the rural Andhra Pradesh. The entire project had the support of care foundation and APVVP, also the technical expertise was provided by Phillips, Siemens and Karishma Software. The project also showed that the investments costs of telemedicine services are high for low volume transactions. For telemedicine to be viable the transaction volumes have to go up. Platforms like telemedicine that require large investments, the ideal institutional form is public-private partnership. As the technology gets matured the technology will get diffused. The dedication and commitment of Care Foundation was one the critical success factors. The critical success factors for sustaining the telemedicine platform are:

- economic sustainability of the project
- connectivity of the platform to many potential users
- behavioral acceptability of the transaction and
- reputation of the service provider.

This project has attempted to test four hypothesis, namely:

1. New ICT platform provided increased access to information and resources
2. ICT platform supported empowerment of the poor community and skill development
3. ICT platform empower communities and helps them in making informed decisions.
4. ICT platforms help in generating incomes through new ways of carrying out business, reducing cycle times or increasing productivity.

It has been found that ICT platforms have increased access of information in all the 12 projects that were studied. The information will result in enhanced income only if there is proper business model. Linkages with the business and presence of self-help groups will lead to an increase in income. In 50 percentage of the projects the poorer sections had substantial economic benefits. The participative management enhanced the empowerment. Empowerment was there in all the projects in which the project authorities had planned empowerment. Empowerment is not a function of technology but of the organizational system.

Table 1: Findings of the study

Case Study	Access to Information and resources	Empowerment of poor people	Participative management practices	Accrue ment of Economic Benefits
Amul	ICT platform facilitated access to information on the best practices in Dairy Industry	Rural farmers were empowered through collaborative actions of village co-operatives	GCMMF encouraged participative management	Shared by the milk farmers community in Gujrat
e-Choupal	Information kiosks allowed information access and provided with resources for better farm practices	The empowerment of poor farmers was low	Participative management was encouraged by developing local leadership and shared ownership	The benefits were shared by the farmers and the company
e-Governance, Pondicherry	Access for information on health, markets, environment	Scope for empowerment is low	Scope for participative management is low	Direct economic benefits didn't accrue, but the community was managed in an effective and efficient manner
EID Parry	Access for information and resources on farming techniques and markets	Empowerment is low	Encouragement for participative management	The benefits were shared by the farmers and the company
Kancheepuram Silk Saree	Access for information on latest trends and designs	Empowerment of local weavers for generating better living standard	Scope for participative management is low	The weavers were benefited economically since the number of designs and the acceptability of the final increased
Internet Kiosks for rural communities	Access to information and resources through low cost technology	Scope for empowerment is low	Participative management through local community involvement	Direct economic benefits didn't accrue

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Case Study	Access to Information and resources	Empowerment of poor people	Participative management practices	Accrue ment of Economic Benefits
Leather Industry	Access to information and resources on latest trends and designs in footwear-sector	Local cobbler community is empowered	Participative management through local community involvement	The cobbler community derived economic benefits by implementation of the ICT platform
Rajasthan Carpet	Access to Information and resources on designs and trends in carpet weaving	Empowerment is low	Scope for participative management is low	The weavers were benefited economically since the number of designs and the acceptability of the final increased
Rural connectivity	Access to information is high through low cost technology	Scope for empowerment is low	Participative management through local community involvement	Direct economic benefits didn't accrue
Tata Kisan Kendra	Access to information and resources on latest innovations in agro-sector	Scope for empowerment is low	Scope for participative management is low	The farming community derived economic benefits
Apollo Hospital	Access to information and resources in health care through connectivity	Scope for empowerment is low	Participative management through involvement of local governmental agencies	The patients derived economic benefits since the cost were reduced substantially
Care Hospital	Access to information and resources in health care through connectivity	Scope for empowerment is low	Participative management through involvement of local governmental agencies	The patients derived economic benefits since the cost were reduced substantially

Lessons from the study:

ICT projects essentially provide linkages, enhance market access, improve business process, increase product diversity and reduce development cycle time. The 12 ICT projects that were discussed provide for the following learning:

- the sustainability of ICT platforms are high when the external component of the project funding is of a reasonable level and the activities are sustainable
- it is the social organization that determines the success or otherwise of an ICT project, as diffusion is a social phenomena
- in rural settings, trust is the basis of sustainable relationships and the use of existing channels of relationships are crucial for the success of ICT platforms.
- creating assets and training of the people enhances the sustainability of ICT platforms.
- presence and convergence of interests and expertise of existing corporate entities and beneficiaries enhance the chances of sustainability of ICT platforms as shown by the experience of CLRI, EID Parry, ITC, GCOMMFL etc
- the organization for the maintenance of technology is a critical success factor and in case the organizational arrangements for these are made the projects will succeed
- the scalability of the ICT projects depends on the levels transaction costs involved in of operations of the platform
- if the social distance between the beneficiaries are low, diffusion of innovations occur rapidly or social homogeneity makes communications processes effective
- ICT platforms work effectively when training is an inherent component of the project. Skill development ensures rapid diffusion of innovation through interactions and communication

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- in a number of ICT projects the success have been due to the entrepreneurial orientation of one of the ICT platform creators. in both Rajasthan Carpets and in Kancheepuram sarees the success has been due to the entrepreneurial orientation of the promoter.
 - systems for the participation of the beneficiary upfront enhances the effective functioning of the ICT platforms
 - a number of ICT have projects demonstrated the substantial benefits that they can accrue to the poor. This occurs only when the beneficiaries are identified and involved at the project conceptualization stage
 - successful projects are the ones that have regular review systems to assess the realization of the benefits across different beneficiary classes.
 - customization of the platforms can bring a higher degree of success to ict projects. This will depend on the involvement of experts with a variety of experiences and domain expertise in project conceptualization so that the customer needs are incorporated in the projects from the beginning
 - a clear vision at the project initiation stage is another critical success factor that can contribute to the success of ICT projects and
 - large investment projects will be sustained if they are taken up as private-public partnership projects.

To sum up the ICT platforms that we have studied have been successful in delivering a significant level of benefits to the rural communities. Three traditional technologies have been transformed by the application of ICT. Significant results have come about through the use of ICT in these, namely: Carpet Weaving, leather, Kancheepuram Saree making. Both in the case of soyabean marketing and dairy industry ICT platforms have completely transformed the structure of business providing for considerable benefits. The ICT platforms have enormous potential to transform businesses, create new forms of business delivery and create new interaction spaces. The case studies of leather footwear, soyabean marketing, Rajasthan Carpet Weaving and Kancheepuram silk saree weaving indicate that ICT platforms can change the economics of an industry significantly.