

Towards an Appropriate Software; Motivations and Case Studies

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Abstract:

We report on our experiences and understanding of community information management issues in the Indian context and the development of an appropriate software model. We study the software development scenario for government and non-government projects, and the various factors that pull the plug from potential ICT projects. We introduce the Pantoto Communities model, which is an attempt to be an appropriate software model for the current Indian context, and elaborate on our experiences in using that for the realization of small and medium scale ICT projects.

By creating an information management solution that a) can be enhanced as needs change b) is available at a low cost of ownership and c) removes the dependency on software professionals, will small organizations be able to adopt and implement IT solutions for information management quickly and cost effectively?

PANTOTO

Pantoto Communities software¹ [UD02] development project started with a mission to bring information architecture and information management tools to the level of the common man. Over time, while working in the Indian context to cost-effectively develop the software, a clear identification evolved of the difficulty faced by organizations in getting software developed for their intranet or Internet needs. The Pantoto model has been iteratively developed while working with small and medium user groups. The mission is to develop a toolset for small enterprises and organizations in the social development/NGO and Government sector that enables them to manage information without software development dependency.

An organization can configure and continually enhance an information management system using the PANTOTO Communities software. It has diverse applications that include websites, catalogues, surveys, reporting systems, intranets, event and document management.

The Environment in India

Organizations irrespective of their size and area of work are willing to experiment and work with information technology. Most organizations in the government sector and in the social development sector recognize the importance of managing information efficiently and how IT can help not just capture but also disseminate information in an effective manner. Many of them are using e-mail intensively and some have simple websites. Hardware is improving in quality and at the same time becoming a bit more affordable². As penetration of the PC into Indian market increases, the hardware-related bottlenecks for an organization to adopt IT are being partially resolved. In the current environment, an organization that uses and depends on IT for decision making and information management has invested heavily in licenses and software development and will also have employed or contracted people with IT skills to maintain and manage the systems that are being used.

A competent entry-level software developer can earn anywhere between 15,000 to 20,000 rupees a month. A competent person with expertise and experience (defined as 5+ years) in the area of IT can earn anywhere 50,000 to 70,000 rupees a month. It is apparent that small organizations and organizations in the NGO sector will not be able to sustain such IT human resources on their team, especially for extended periods. Salaries at a typical NGO average around Rs. 5000, while government employees and teachers at universities, with around 5 years of experience [UG02], get paid around Rs. 10,000 [BS04].

¹ See [PC01] for online information, community cases and source downloads.

² A basic PC with 64 MB Ram and 1.2 GB drive was worth approximately Rs 50,000 in 1998. Today a PC with a far better motherboard, 256 MB Ram and 20GB hard disk is available for just above 20,000 Rupees -- which is still about 4 man-months of salary for an NGO in India.

Training users in IT skills can be an expensive proposition. A basic course in MS Office costs Rs. 2,500 on an average. Registering for pure IT course such as JAVA or networking runs into several thousands. As explained through this paper, the software development lifecycle is expensive, intensive in terms of human interaction and requires a lot of organizational resources.

The readiness of an organization to adopt IT, the availability of Internet connections and the availability of personal computers are all influencing the way in which organizations are adopting and experimenting with IT. The Indian environment shows tremendous potential

Issues associated with building an ICT Solution

Information and communication technology (ICT) has opened up possibilities not only for accelerating the pace of economic progress but also for e-governance³. A number of projects have been initiated, in India⁴, to use ICT to facilitate better communication and management of information within government offices, for the development sector and for citizens to more efficiently deal with the government. The cost of the projects and context of piloting them in rural settings often tell of a scenario where hardly any of the implementers identify with the intended utility of the project.

On the other hand, the cost of custom software development and the length of the software development cycle have inhibited the adoption of IT in small organization and in the social development sector. The problems are similar in the Government sector.

For many of these projects, building of customized software for the project's need becomes a large activity that demands special attention and interaction with a team that is foreign to the context of the project itself. Most of these projects do not have the capability or the resources to interact with an ICT team. This interaction becomes crucial⁵ when custom software is being developed for a project's need. The introduction of ICT implies training of people with the basics of computer use -- which demands a few months of familiarity, requiring them to work with minimal infrastructure while expecting this change of process to be significantly more effective than the one before.

Demographics of the market segment and the demographics of the innovators and the market drivers vary in different geographic areas, cultures and their economies. Adding to this fragmented nature of the market base, particularly as seen in India, is the large segment of multi-lingual, semi-literate, traditionally oppressed, economically weak, culturally diverse middle class segments and the disenfranchised segments of the

³ "In its simplest sense, Electronic Governance (eGovernance) refers to the use of information and communication technologies (ICTs) for the processes of government and public administration." - <http://www.commonwealthdigitalopportunities.com/FAQ.htm>

⁴ <http://www.ICTforChange.net>

⁵ Most NGOs and government projects need custom software of some sort, as they cannot be classified into a vertical sector such as hotel or hospital-management and school-administration software.

developing world. From a governance perspective, India has a huge disenfranchised sector. Computer and natural language literacy (English to a large degree), understanding of the law, dealing with the system and procedures are out of reach for most. Using ICT in these specialized markets will necessitate investigations that assist adaptation of models to suit this unyielding terrain⁶. Adding to this is the demographics of the economics driven culture of the IT industry that makes it infeasible for an Indian organization to hire competent people for ICT projects.

Inhibitors in the Indian ICT Infrastructure

The true inhibitors for proper development and deployment of ICT projects and e-governance in general are not necessarily the hardware and the connectivity issue but innovations for the peculiarity of the Indian context. See also [AR02]. We consider e-governance in a broad sense to include departmental information and communication management in addition to government to citizen facilities. Factors⁷ that are significantly noticeable are:

Software developer unavailability.

There is a dearth of software, content and user interface developers in particular and IT savvy people in general for locally relevant projects⁸. Many of the local projects⁹ suffer as they are not able to pay the high salaries in par with what is paid by the multi-nationals and other IT organizations that service the foreign markets. Some of the projects find large international funding to be able to hire these resources for their projects, but face other problems that we discuss below. There are exceptions, like the Bhoomi project of the Karnataka government, which was designed, implemented and sustained by the coffers of State and the Center.

⁶ A question that comes to mind is: While there are various attempts to explore this Indian sector in terms of ICT project feasibility, why most of these projects are attempted in rural areas but not realized in a large cities where some ICT infrastructure can already be found.

⁷ We have not discussed the typical problems of software development in general, such as need for standards, inter-operability, and such; or the hardware infrastructure deficiency in India.

⁸ In karnataka alone, there are around 200 engineering colleges providing degrees in Computer and Information Engineering Sciences. These colleges are run mostly by junior faculty who are graduates from the same college until they get hired by the high-paying corporations. This causes a pattern where graduates of these colleges are not competent IT people until they are inducted into an on-the-job training program in a corporation. Hence, the unavailability of competent IT savvy people for local needs.

⁹ Pro-vision Asia came to us after several attempts at developing a patient management system using a resource pool of IT volunteers. Despite being in Bangalore, the IT capital India, they were unable to develop a solution despite having the information needs clearly specified.

Software user peculiarities.

Many users within the government sector and the social development sector are first time computer users¹⁰. They have worked in an environment that has been exposed to corruption, lacks resources and nurtures complex processes that are not always result/beneficiary oriented. Ensuring the participation of such users requires not only creating a change in mind-sets but also developing training programs and both positive and negative incentives to encourage¹¹ participation.

See Appendix I for a case study on the DMA project

Requirement specification and custom development.

Every software goes through a software development lifecycle. In the area of governance this cycle may take from anywhere between several months to well over a year. Developing the specification for the software, identifying the needs of the users, defining processes all require participation from both the ICT experts as well as the organization that is going to use the software. The process of accurately specifying the functionality and user requirements is not just lengthy process but can get derailed because of a lack of understanding between the ICT experts and the domain experts. It is often the case that by the time the software is ready for deployment the project needs have changed¹².

The Social Forestry Unity of the Karnataka Forest Department hired IT firms to develop¹³ reporting software for information management. The contract with CMC for this project is worth approximately 30 Lakhs. After 18 months, all that the forest department has to date are exhaustive manuals. The software however has not yet been commissioned for use.

See Appendix I and II for a case study on DMA (Directorate of Municipal Administration) and the Second Karnataka Rural Water Supply and Sanitation Project. The DMA software was ready for deployment in a matter of weeks because people at the DMA office did the design and software used was configurable. As project needs changed, enhancements were made by authorized users reducing the development lifecycle.

¹⁰ NGO Sakti had a domain expert with a Ph.D. who had never handled a computer mouse. DMA training sessions have consumed more sessions than anticipated and caused problems when they typed ";" instead of ":" in an URL or not hitting the "enter" key after typing in the user-id and password.

¹¹ In the DMA project disbursement of salary is linked to the submission of monthly reports. Please see Appendix I for more on the DMA project.

¹² In the Second Karnataka Rural Water Supply and Sanitation Project, the custom software that was developed was never used because the project had not just expanded but the needs had also changed. Please see Appendix II for more on this project.

¹³ This information was given to us in discussions with Mr. I.B. Srivatsava, the then conservator of forests. Mr. Shivanna Gowda (Chief Conservator of Forests – Social Forestry) showed our team the manuals that had been delivered during the software development work.

Bureaucracy and politics.

Bureaucracy and politics inhibit the adaptation of models that are replicable and scalable. In the Second Karnataka Rural Water Supply and Sanitation Project, after several rounds of software prototyping for their needs, the file which contained the proposal was mysteriously lost at the desk of the reviewing officer. The officer had approved the use of PANTOTO as low cost IT alternative until the custom software was ready, but had to leave town for some training. This was further complicated by one decision-maker being transferred by the time the officer was back from training after three months and the file was found.

The decision-making process because it is IT related has to be out-sourced invariably. There are no resources available internally to decide on the technology and the credentials of the service provider. The Directorate of Municipal Administration for example sends technical proposals to NIC. This also creates a delay in sanctioning the project. Such delays¹⁴ lead to a vicious cycle where the project design is always one step behind the project needs. The empanelment norms¹⁵ of the Government of Karnataka for software vendors ensure that only large IT service providers, software vendors and hardware vendors can participate in government contracts. This reduces the basket of options open to the government to develop (low-cost) sustainable and replicable solutions.

The Karnataka Forest Department example above is a case where a large organization had to be used. See Appendix I for a case study on DMA and the Second Karnataka Rural Water Supply and Sanitation Project

Project abandonment

Several ICT projects have been abandoned because of the above mentioned reasons. The Karnataka Forest Department had not commissioned the use of a reporting software for the branch offices after 18 months of development and after many manuals on software, and on training, had been prepared. The Small Scale Industries Development Commission (KSSIDC) of the Government of Karnataka after investing approximately 10 lakhs has abandoned a software project after 18 months of development¹⁶. They said they were unable to communicate their needs

¹⁴ In a recent tender called by KSIC, the deployment time for a custom built software was stated as 12 weeks. Over two months have passed since the tenders have been opened and the organization has not completed the short-listing process.

¹⁵ E-governance empanelment norms of the GOK available online at :
<<http://bangaloreit.com/html/egovern/egovernkar.htm>>

¹⁶ Mr. Shivakumar, the IAS officer, who was then the project director, accepted the need for the PANTOTO concept. He put us in touch with the IT department to investigate the state of MIS development there and for us to get an understanding of their needs. We discovered this information while investigating the possibilities of deploying the software at KSSIDC. In the year 2001, the IT department was willing to consider PANTOTO and that we felt it was stable and mature.

to the outsourced development team, which happen to continuously morph due to attrition in their group and the development team's inability to evolve the software to the changing requirements.

As governments change and officers get transferred, priorities of projects also change. Commitment to a project needs to be sustained irrespective of changes in the political scenario.

PANTOTO was used to prototype an online community for networking amongst social scientists, social science projects and academic institutions involved in social science research. The project was being funded by the Indo-Dutch Program on Alternatives in Development (IDPAD) and the Indian Council of Social Sciences Research (ICSSR). Despite an investment in the prototyping phase and a positive review of the work completed, the project was shelved. ICSSR was unable to take a decision on the next phase of deployment. Deployment would imply that there is at least one person from their team would be in charge of documentation management, to oversee the process. They were unable to find or hire that person. The team involved in the prototyping was unable to force a decision because they needed to wait for an annual meeting where decision-makers would come together. A change in the management of the institution following a change of government at the center further complicated the scenario. Investments made both by the project team and by the inter-governmental institutions funding the project have not shown a return. This, despite the fact that one of the significant activities of institutions involved in this project, is that they actively seek and support knowledge management activity for their project grantees -- an activity they find it very hard to realize in today's context. If a little more attention was shown to the project, we believe that a replicable model could have been developed for various networking and scientific bodies in the country.

In the case of an NGO village baseline survey, despite successful implementation, we were forced to abandon the project because they/we were unable to convey to their board that the information put on the system they used was not accessible from outside their office, if they did not desire that. They were concerned about the security of the information on their intranet and not convinced of user authentication preventing a breach into the outside world.

Policy and economic incentives.

The excessive focus on export oriented software development and software service providers ensures that talent and resources remain unavailable for local projects, as discussed earlier. This issue needs to be redressed at a policy level. As long as the IT industry is encouraged to generate huge profits through international clients, servicing the Indian market will remain a second priority due to the resulting great disparities in income. There is little incentive for IT

companies to develop products and solutions for the Indian markets. Examples such as Tally¹⁷ that cater to the needs of the Indian market are few.

Open source, piracy and prejudices.

Economic disparity is most striking in India. A software developer in India identifies with upper economic class, hence aims to earn in par with multi-national paychecks. An open source developer¹⁸ stands apart again, as they have to work out a business model that compares to the income earned with multi-national paychecks. There by, much of the "independent" projects and developer activity does not relate to local contexts and local business models. Open source software does not have noticeable contribution by the Indian software developers. There is a general need among the developers to identify themselves with world class programming¹⁹, and to do world class projects which often manifests as selling software developed or services to the West. The selling out invariably makes software unavailable to the Indian market.

There are open source advocacy groups who are bringing awareness of open source software to the Indian market. However, we have observed that many computer department faculties at the universities do not have an understanding of open source software or its utility for their student projects. There are now a small but growing number of developers and users moving towards open source software.

Software products sold in the West are too expensive for an Indian computer user. Pervasive piracy of software products is the only reason for any cost-effectiveness in using IT at the individual level. It is easy to crack down, for over 90% of a random sample of IT users may lead to discovery of pirated software, however it does not justify the cost of cracking it down. For one, the indirect utility is akin to giving software free to universities as it assists in producing a band of users who help market it to contexts out side the university environments. Thus, most government and other offices in India use licensed versions of the software, in spite of the unjustifiable cost of the software.

Prejudice that larger the cost, and produced in the West, being of higher quality results in expensive and very expensive software purchases by government and other organizations. Delegation of responsibility of software choice is another reason why expensive software is chosen by organizations in India. External funding available to many projects encourages buying relatively more expensive

¹⁷ And PANTOTO?

¹⁸ Full-time open source developers are more common in India. This is probably because most companies are against the spirit of open source, which estranges a typical open source enthusiast; while the societal structures support a feeling that one does not need to earn much to make a living in India.

¹⁹ Even though Tally is used by a large number of people in India, it is not considered "world-class" for it does not support non-Indian accounting needs. Open source software, on the other hand, is "world class" by this definition as most of them are developed outside India.

non open-source software, while a sense of aspiration to have "the best" lead others to imitate the "infra-structure" at these organizations.

Learning webs, small and large

Peoples of the world, with their deep-rooted traditions along with an enormous disparity in income, are a civilization of cultures. A vast collection of tools, techniques and economies of practice are going to assist with the necessary adaptations to create a culture of commitment, by possibly creating "Learning Webs". A *Learning Web* shall provide what one wants to learn, make it possible to share knowledge and to create opportunities for those who want to present an issue. Sharing, communicating and reinforcing their indigenous knowledge shall distinguish them as knowledge enclaves. A significant part of a learning web is about bringing about a culture of participatoriness and conversations. When it comes to ICT, this should manifest as tools that can assist in training and appreciating this process.

Current state of infrastructure for utilizing ICT to aid the process of learning webs is encouraging us to think of innovative models to facilitate the development of such webs. Variety of ways in which ICT has enabled such models are: 1. Connector concepts like the Web, Intranet, Extranet, Emails and list services; 2. Infrastructure like the Internet, an Ethernet, WLL, Bluetooth, mobile networks; 3. Connection devices such as personal computers, laptops, palms, mobile phones and multimedia devices; and 4. Enabling software tools for browsing, publishing, chatting, collaborating, messaging and conferencing.

Assuming certain basic ICT facilities and infrastructure, enabling an organic process of continuous evolution of information structures and purpose based sub-community formation could be the basis for learning webs. If such a model uses a Web-community approach to a closed or existing community (e.g. organizations, enterprises or school environments), it thins the line between small versus large scale learning webs.

Conceptually it would be a model that sustains as information and community needs evolve, while encouraging participation

- to create a closed world semantic web,
- by sharing of meta-information between (sub) communities, while naturally creating an ontology,
- in building simple Web applications,
- in community communication and by facilitating rudimentary workflow, and
- in an individual/sub-community Web presence

Addressing the inhibitors: The PANTOTO Approach

Pantoto: meeting a *pan* community need of information management *in toto*. Research and development of Pantoto Communities software development project started with a mission to bring information architecture and community management tools to the level of common man.

Dependency on technical professionals to build community knowledge systems causes delays. The cost of hiring such resources also makes the effort unsustainable. Equitability can arise when organizations can create, maintain and manage information management systems by themselves. Organizations in the social development sector work directly with beneficiaries, capture, create and work intensively with data, information and knowledge. Based on the above, if IT is to be used by organizations in the social development sector, they have to be empowered to:

- Take the design of an information management system for granted (and not depend on IT professionals to create these)
- Redesign or evolve the system based on changing information needs
- Build solutions that are easy-to-use, affordable and quick to deploy
- Use the same process across projects and in different areas, and
- Manage the participatory creation of locally relevant and locally created content.

The research based on the Pantoto concept can further lead not only to conducting research and development that assists the middle, but also to a network of knowledge communities. Pantoto is also an indication that commonly available technologies can be put together to provide for a large group of community enablers. There by, an attempt to enable a not-very computer savvy person to create communities and manage information systems as a way of addressing some of the inhibitors discussed earlier.

Conclusion

Many of the problems that affect the development of a custom software solution also affect the development of the PANTOTO Communities Software, and this has resulted in a delay of many years in making it deployable. In the cases where the PANTOTO software has been deployed, problems related to bureaucracy and delays by decision makers affects the project and the net outcome of the deployment.

Despite these setbacks, the cases prove that it is possible for end users to create working ICT solutions in a cost effective manner and a relatively short span of time.

By increasing the number and variety of small projects that use the PANTOTO Communities software we create a network of users²⁰ who will themselves be able to deploy similar projects for others. Such a variety will contribute not just towards the

²⁰ Not restricted to software developers or IT experts.

enhancement of the software product but also towards developing scalable and replicable models. Experience with such projects could result in users who can contribute to the proliferation of ICTs in governance and NGO projects -- itself a learning web. Only by documenting the best practices and making it available will we be able to address the more sticky issues related to ICT infrastructure.

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We would like to thank Subramanya Sastry and Susan Uskudarli for their feedback on this article.

Appendix: Project Case Studies

I: Village Baseline Survey.

<http://openrun.com/toto/servlet/WMSearch?&urlid=rfvr2>

The scenario:

Working with a Social Scientist to develop a baseline survey for villages around Bangalore. The survey capture socio-economic data, health related data and information related to women's issues. The social scientist was not computer savvy.

The Objective:

To allow users to download information collected through the survey for analysis or to search across basic criteria.

The time frame

- One week to train the social scientist.
- She then took an additional week to build the system
- The next two weeks were spent in doing the data entry.

Technical issues along the way

- We came across problems related to displaying large search results. This issue was tackled by a larger amount of virtual memory on the server.
- Enhancements were made to the user navigation based on the observations that we made during the training sessions.

Training related issues

- The fact the social scientist that we were working with and her colleagues were not computer savvy, forced us to conduct a basic training module on using a mouse, and using a browser.
- The vocabulary during training was an issue. Our understanding of information management was difficult to explain. The phrases that we used such as "categories", "forms", "users" were difficult for the trainees to understand. It took us also some time to understand their phrases and terms.

Issues related to analysis of information

- Much of the complex analysis such as averages and prevalence of diseases etc needed to be done using advanced features of a spreadsheet software like excel. This requires additional training.
- The length of the form, over 50 fields, was becoming difficult to handle for a not very computer savvy user and editing the form required our intervention.

The status of the project

- Once the initial analysis was completed and the excel reports were generated the project expanded to include:
 - o The records/histories of students in the day schools that they run
 - o Managing HR records within the organization

- o Capturing the profiles and experiences of participants in the training programs that the organization conducted.

The speed with which the enhancements to the system took place surprised us, the early adopters had gone to create systems in their own areas of responsibility.

- However, the client insisted the managing committee within the organization felt that they would be unable to use the software because it compromises the security of their information. We explained that all the information is controlled by access levels and access to information is done only when a user is authenticated. The mere fact that the software could also work on the Internet was interpreted as a security issue. We were forced to withdraw from the project and were also asked to uninstall the software from the Intranet.
- The project has been shelved.

II: MIS for the Directorate of Municipal Administration (DMA)

Case of MIS for SJSRY

Who or what is the DMA?

The Directorate of Municipal Administration (DMA) is a department of the Government of Karnataka and is a nodal agency for the urban local bodies (ULB) spread across the state. There are approximately 217 ULBs spread across the 21 district of Karnataka.

How are we helping the DMA?

The DMA is responsible for monitoring the implementation of government schemes in urban local bodies. PANTOTO Communities is being used by the DMA to monitor

- * the funds that are being allocated and spent for the SJSRY scheme
- * the number and type of beneficiaries that are covered under SJSRY

Why does the DMA need an MIS?

When we were first approached by the Joint Director, he explained their immediate need to monitor the expenditure of the ULBs under the SJSRY scheme. Enough data needs to be collected and organized for the DMA to plan for allocations and to design interventions.

How was the MIS system built?

Based on the existing reporting structures and information needs, the Joint Director (Development)²¹ developed the reporting format. This format consists of approximately 93 different pieces of information relating to 8 different components of the SJSRY scheme.

A Project Officer translated the format into an online reporting system²². An assessment of the participants and their roles helped us arrive at how much a

²¹ Mr. N.S. Chanappa Gowda

²² Yashodha Rani

stakeholder in the system based on his/her or her role is entitled to see. This phase or the design phase lasted approximately two weeks there were three independent sittings with the DMA team and we spent about one week training the project officer on how to use the software and design the online system.

How does the system work?

Project officers working in the 217 ULBs spread across the state visit a website from where they login and submit a report once a month. These reports are viewed by the DMA office based in Bangalore. Anybody with the authority to read the reports can send a message to the author of the report for clarifications. An author has up to the tenth of the following month to edit or change the report.

How is the system an MIS?

An authorized user can download the reports in a tabulated form onto a spreadsheet. Using predetermined formulas, reporting formats are automatically generated giving the user a clear indication of the balance, allocation, expenditure and other details about every component under the scheme. Reports can be generated for a particular ULB, for a particular district or for a particular scheme.

How was the MIS launched?

In four individual batches, approximately 65 project officers from various districts were trained in Bangalore on how to use the online system. This followed by a three program at the Administrative Training Institute in Mysore for selected Project Officers. The MIS website is now fully functional.

Is Internet connectivity an issue?

Yes and no! Most ULBs have at least one cyber cafe in their town. Many ULBs have an internet connection at the nearest Taluk Headquarters. Hence access to an Internet connection is not an issue. However busy lines and the cost of telephony still remain minor bottlenecks.

How has the DMA benefited?

1. It took six weeks to deploy the system.
2. Authorized users at DMA are trained to make changes to the format as and when they require to do so.
3. Total cost of ownership was less than Rupees One lakh (Rs. 100,000^α) and includes hosting, training and help with formulating results on Microsoft's Excel sheets -- the office is already familiar and comfortable with Excel.
4. "MIS experts" or people with technical expertise are not required to run, manage or maintain the system. Authorized users at the DMA can do this for themselves. Everything from backing up the system to creating new formats and trouble shooting can be handled with the assistance of training.

What were the issues along the way?

^α The cost can be reduced further if the office people spent more time with Pantoto training. Typically NGOs spend more time in training and are less dependent on our resources.

Length of the form:

Once the form building capability became obvious, the length of the form was changed from 6 fields to over 90 fields. It was well after deployment that we realized that not all project officers were comfortable with such a lengthy form. In hindsight, it would have been better to start with the same form that was used before the ICT version and then enhance the system in phases. The length of the form implied that the initial training programs revolved around explaining the form and not helping the project officers understand the functionality.

Developer Time:

As expected there was very little work done by developers throughout the course of the project. Most issues were sorted out by analysts both at DMA and at Servalots by changing the functionality through the user interface. Each change though, did result in some confusion amongst the project officers.

Auditing and Process Maturity:

The fact the project officers might not have the data was never considered. This led to several delays in the submission of data. When the DMA decided to withhold salaries until the submission of data, we started receiving *junk* data. Auditing the monthly reports and correcting data led to delays in report generation. Double entries, incorrect entries and missing reports all needed to be corrected not from the back-end but from the front-end.

Training:

Training facilities were inadequate because of a lack of internet connectivity and local area network at the training venue (ATI-Mysore). This forced us to conduct not one but two rounds of training spread over one month each. Each training session would last for three days and would have between 10 and 25 project officers. The first two days would be basic computer training which was conducted by ATI-Mysore. We would conduct a training session on the MIS on the third day.

Spreadsheet Based Reports:

Advanced features of Excel were used to generate the reports as per the requirements of DMA. The excel files that are used to generate the reports, however need constant maintenance. This is because of the quantity of data and the number of formulas. A typical desktop PC, will not be able to save any changes made to the files because of inadequate memory. Added to this was the problem that the quantum of data that was being used to generate the reports was growing by the week. In month six the size of the raw data in a MS-Excel format was below 1MB. Today the raw data has crossed 3MB. This increase in size has resulted in an increase in the download time for users at the DMA.

Although none of these issues are beyond resolution had to be within the financial limits set by our contract with the DMA. Hence, the solutions, not only take time in coming, but sometimes are not implemented because of a lack of resources with the

DMA. We have for example, born the cost of maintaining and managing the excel reports although they are outside our contractual agreement.

Bureaucracy:

Although the agreement with DMA expired in June this year (2004), we still (October 2004) are awaiting an extension on the contract. We are continuing to provide the hosting service at our cost despite these problems, so that the collection of reports is not hindered. Any change to the contract needs to go through a process at DMA. While we respect this process and feel it is necessary for transparent decision making, we do not agree with the amount of time that these processes take. In fact, the second training program began after our first contract expired.

III: The Second Karnataka Water Supply and Sanitation Project

“The Second Karnataka Rural Water Supply and Sanitation Project will assist the Government of Karnataka in increasing rural communities' access to improved and sustainable drinking water and sanitation services; and institutionalizing decentralization of Rural Water Supply and Sanitation service delivery to Gram Panchayats (GP) and user groups.”²³

Monitoring and Evaluation (M&E)

Monitoring and evaluation is a critical component of the project. . According to the project appraisal report²⁴ prepared by the World Bank the monitoring and evaluation systems are critical to:

1. Monitoring the progress of the project
2. Monitoring the processes that are in place
3. Evaluating the overall impact of the project

Through a selection criteria outlined by the World Bank a consultant was appointed to develop a Management Information System that was to be used for the M&E of the project. The value of the MIS system is USD 225,000²⁵.

In the period running up to the introduction of the new MIS system, the project team analyzed data that was being entered into an MS Access database with help of crystal reports and program written database queries. The new software used an Oracle® back-end and was running on a Microsoft ® operating system.

The MIS however was never completely implemented²⁶ and a fresh call for consultants had been invited. Information about this contract is not available at the World Bank website. However there are two reasons²⁷ why the MIS did not work:

²³<http://web.worldbank.org>

²⁴ Report No: 23204-IN, "PROJECT APPRAISAL DOCUMENT" ON A PROPOSED CREDIT IN THE AMOUNT OF SDR 119 million (US\$151.6 million equivalent), TO THE REPUBLIC OF INDIA FOR A SECOND KARNATAKA RURAL WATER SUPPLY AND SANITATION PROJECT, November 16, 2001- Prepared by World Bank.

²⁵<<http://web.worldbank.org/external/projects/main?pagePK=104542&piPK=95914&theSitePK=40941&menuPK=228443&contractid=1240164>> [World Bank contract ID: 1240164]

- a) The project team was dependent on the software company for day-to-day use of the software,
- b) By the time the software was ready for deployment the project needs had changed.

These reasons are probably why a fresh tender was called for the development of a new MIS system, despite the fact that substantial investments had already been made in the first MIS.

Our Intervention:

We were aware of the project because of the publicity generated because of its objectives and the quantum of funds involved (193.44 million USD).

We approached the then project director to use our software to capture information during the planning phase (at the village level). This particular phase is critical to designing the intervention and identifying the sanitation needs and available water resources. It also helps us understand what is the best mode for community participation. Considering that the project hinges on community participation and financial involvement, the phase is critical.

We suggested an alternative to their prevailing MIS processes. The PANTOTO software could be deployed at a low cost with minimal software customizations. The deployment would be phased and would begin with one district and would then expand.

Following our initial discussions, a system was prototyped and an export/import feature built into software to allow them to continue use the tools that had been developed for analysis.

Unfortunately, bureaucratic issues such as transfers and decisions-makers being away at training programs ensured that our initial prototypes never progressed. We had invested over three months in pursuing the relationship with the project team. Our objective was to prove that it was possible to develop the complex MIS and enhance it based on changing project needs without having to invest in the range of a quarter of a million USD.

²⁶ We received this information through the interactions that we had with the project Director Mr. Raj Kamal and the ADO Mr. Prasannakumar.

²⁷ Based on our interactions with the staff programmer involved using the software and a conversation we had with a programmer who was deputed by the software development firm start the server everyday.

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