

Association for Information Systems AIS Electronic Library (AISeL)

PACIS 2007 Proceedings

Pacific Asia Conference on Information Systems
(PACIS)

2007

E-government for Improving Performance of Power Sector in India

Geetika

M N National Institute of Technology, geetika@mnnit.ac.in

Neeraj Pandey

Thapar University, npandey@tiet.ac.in

Follow this and additional works at: <http://aisel.aisnet.org/pacis2007>

Recommended Citation

Geetika and Pandey, Neeraj, "E-government for Improving Performance of Power Sector in India" (2007). *PACIS 2007 Proceedings*. 57.
<http://aisel.aisnet.org/pacis2007/57>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2007 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

103. E-government for Improving Performance of Power Sector in India

Geetika
M N National Institute of Technology
Geetika@mnit.ac.in

Neeraj Pandey
Thapar University
npandey@tiet.ac.in

Abstract

The present paper endeavors to evaluate the impact of e-government applications in basic infrastructure and public utilities for which a model is developed to show that e-government has its roots in democratic values where the two reinforce each other. The model is then tested in the power sector in India using qualitative analysis. A comparative analysis of two players in the power sector, one from public sector and other from private has been made to derive conclusions and draw recommendations. Combination of research tools such as, structured survey, unstructured interviews, observations and secondary source study have been used. A major finding is that the public sector player should speed up the implementation of e-government in its operations especially to improve user-interface and to ensure competitiveness.

Key Words: e-government, democracy, efficiency, customer orientation, privatization

Introduction.

The term e-government was introduced by a joint report – Access America: Reengineering through Information Technology – of the National Performance Review and the Government Information Technology Services Board in 1997 (Relyea, 2002). At that time, however, e-government was little more than a general recognition of a confluence of information technology (IT) developments and use of these technologies by government entities. E-government has now been conceptualized as the intensive or generalized use of technologies in government for the provision of public services, the improvement of information managerial effectiveness, and the promotion of democratic values and mechanisms (Garcia and Pardo, 2005).

Government of India has planned to invest heavily in e-government initiatives in various public utilities (India, 2006). Power sector has not remained unaffected by overpowering influence of Information Technology in operations as well as marketing (Ellis, et al., 1993). Hence, it is relevant to study the role of e-government in increasing efficiency and competitiveness of state-owned power utilities in the country.

Power sector in India and e-government.

As an aftermath of reform process, public sector enterprises (PSEs) in India are losing their monopoly status and entering into oligopoly and monopolistic markets (Gupta, 2005). The power sector is witnessing massive transformation vis-à-vis restructuring, regulation and private sector participation (India, 2006). The State Electricity Boards are being unbundled in almost every state and the erstwhile purely government department / Board set up is now being given a corporate identity. As on March, 2005, a total of eighteen state electricity boards have been restructured (<http://www.powermin.nic.in>). In the changing scenario use of technology will become the main source of competitive advantage.

However on basis of analysis of more than 40 reports on e-government cases from developing and transitional countries, Heeks (2003) concludes that the success rate of e-government project implementation in developing countries is as low as 15%. He further emphasizes that these failures cause various tangible and intangible costs to the countries. The developing countries with large power consumer base and large illiterate population are skeptical about the kind of impact the e-government will bring in the power sector (Alam et al, 2004).

In power sector the applications are limited to several standalone applications with limited ability to effectively interface and integrate either with other applications or with potential applications to be deployed in the future (Arun and Nixon, 1998). The operation and distribution activity in the state power utilities in India is traditionally characterized by manual and cumbersome processes. The computerized system is expected to revolutionize the way state power utilities conduct their business by reducing operating cost, improving customer service and increasing employee efficiency (Ellis, et al., 1993). The e-government increases operational efficiency by reducing costs and increasing productivity and better quality of services provided by the government (Garcia and Pardo, 2005).

Study design.

The present study aims at two basic objectives, first to trace the linkages between e-government and democracy and second objective is to see the link between application of e-government and performance of organizations within special context of power sector in India.

We hypothesize that the implementation of e-government processes in the power sector has high potential of improving reliability and quality of supply, customer satisfaction, reducing technical and commercial losses (Paul, 2003; Alam et al, 2004).

Firstly, a model is developed (Figure-1) to show the reinforcing synergy between democratic values and electronic governance. In the model basic features of democracy are converged into four broad variables, i.e. People Centric, transparency, quality and accountability, which also constitute the key elements of e-government.

Secondly, to test the proposed model two cases are selected; one from among the public sector players (Uttar Pradesh Power Corporation Limited (UPPCL) and other from the private sector (REL). The case study from private sector is taken to find the difference in technological initiatives of the two organizations and their impact on performance. Case study research involves in-depth study of a few people, an organization or an event, and the case study can be used to research information systems in their organizational setting so that researchers can build theory from practice (Myers 1997). The objective of study being e-government applications, the case study method becomes very useful to present a holistic picture.

The case organizations were studied in two stages, firstly Top executives and select consumer groups of these organizations were approached to give their response through semi-structured interviews on significance of e-governance in organizational performance and to indicate the level of IT applications in their organization. Semi-structured interviews allow participants to speak with their own voices and control their responses and yet have the space to introduce and reflect on issues that they perceive as relevant (Mishler, 1986). The websites of the two organizations were also reviewed over a period of three months to check updates.

To further clarify the findings of interviews and observations, a survey of employees of UPPCL including top level officials as well as frontline employees was conducted. A total of

1540 employees were contacted. The respondents were asked to identify one of the most important technological factors responsible for poor performance of the organization and the impact of entry of private players. The survey tool was structured questionnaire with close-ended questions. Similar survey for REL was not conducted because during first phase of research, it was found that REL was a well performing organization whereas UPPCL was making losses. The main objective of the survey was to see the link between IT applications and organizational performance in terms of productivity, customer satisfaction, technical and commercial losses.

Finally the conclusions are drawn on basis of information obtained from all the sources to find the validity of the proposed model and to test the research question.

E-government and fundamentals of democracy

The premise here is that the process of e-government has to be seen as an essential corollary of democratic setup of governance especially in a state like India who is committed to the cause of social integration and growth with equity. E-government can truly help in living the ideology of democracy where people are sovereign, where the government agencies are meant to serve the people. According to Backus (2001), *e-democracy* refers to the processes and structures that encompass all forms of electronic interaction between the Government and the citizens, whereas *e-government* is a form of e-business in governance and refers to the processes and structures needed to deliver electronic services to the public, collaborate with business partners and to conduct electronic transactions within an organizational entity. According to Garcia and Pardo, (2005) E-government ensures maximum transparency, right to information, people empowerment, stake holder’s participation and better and timely services besides reducing ambiguity, corruption and delays in the day-to-day working of the government.

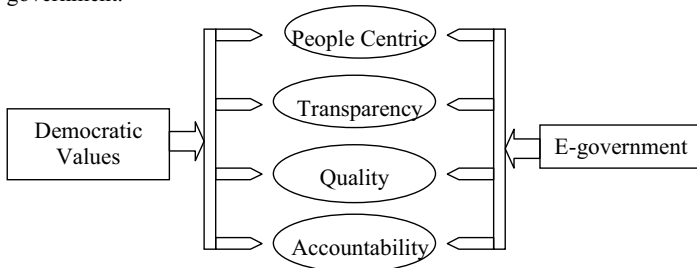


Figure-1: E-government Reinforcing Democracy

As part of research an analogy is drawn between the characteristics of e-government and the fundamentally essential ingredients of a successful democracy. A model is proposed here to depict the relationship between dimensions of e-government emerging from and strengthening the basics of democracy as illustrated in the Figure-1. The model suggests that E-government can provide new ways to increase citizen participation in the democratic process. The variables taken in the model are those common to both democratic set up and e-government.

People-centric: Studies on e-government interfaces in developing countries suggest that unless the e-government intervention is people oriented its adoption and diffusion may not be sustainable in the long run (Paul, 2003, Alam et al, 2004, Shrestha et al,2004).

Transparency: Transparency through e-government is all about providing accessibility and availability of information on decisions, services and action implemented by the government of the country. (Lanvine, 2004).

Quality: The people expect quality service from the service provider (Parasuraman, Zeithaml and Berry, 1985). This is reason that now consumers are talking about quality of power, besides quantity of power (Gupta, 2005).

Accountability: Accountability to citizens combines ultimate political accountability, since public institutions are supposed to get their ultimate legitimacy from the citizens, and client accountability, since citizens are normally the intended recipients of the services the public sector provides (Heeks, 2003; Wong and Welch, 2004).

Overall, e-government is a reform process in the way governments work, share information and deliver services. E-government is an opportunity to take advantage of the increased productivity at low costs by using information technology (Kannabiran, 2005).

Case Studies

Case One: Uttar Pradesh Power Corporation Limited (UPPCL) has been created after trifurcation of Uttar Pradesh State Electricity Board (UPSEB) on January 14, 2000. UPPCL is a government owned monopoly responsible for planning and managing the power supply in the State of Uttar Pradesh in India. A large organization, with a workforce of more than 30,000 people, over 25 millions power connections UPPCL is catering to power requirements of an area of 2,38,566 sq. km and 166 million people; which is more than many European countries combined together, both in terms of consumer base and serviced area. UPPCL has inherited the losses of its parent UPSEB which had never been able to come out of red since its inception. The management itself is conscious of its weaknesses on part of governance when it says through the official website (www.uppcl.org), “Corporate Governance is poor and there is instability in the corporate setup. We do not have an information system to aid decision-making and our hierarchical structure makes information flow difficult.”

Case Two: Formerly known as Bombay Suburban Electricity Supply Limited (BSES) incorporated on 1st October 1929, Reliance Energy Limited (REL) is the largest integrated power utility company in private sector in India, engaged in generation, transmission, distribution and trading of electricity. REL is on an expansion spree and through international competitive bidding it has acquired an equity stake of 51% in three of the four Distribution Companies of Orissa and two of the three distribution companies of Delhi after unbundling and privatization of the erstwhile Delhi Vidyut Board. Reliance Energy (REL) and its affiliate companies power 2 out of 3 homes in Mumbai, 1 out of 2 in Delhi and have a consumer base of 5 million in an area covering about 1,23,000 sq. km. with an estimated population of 34 million. (www.rel.co.in). BSES was among the first few utilities in India to adopt computerization in 1967 to meet the increasing workload and to improve services to its customers.

Results and Discussions

The composite of information gathered from the research study participants have been used to illustrate important interpretations in the broad framework of the model (Figure-1) and presented in Table 1. Findings of the survey of employees of UPPCL are summarized in Table-2 and Table-3, which show the consciousness of employees toward an imminent need for technology modernization including emphasis on information technology.

Comparative Analysis of Case Studies

Information collected from interviews and observations have been categorized under the variables identified in the model and the areas of application are taken as demonstrated effort by the organizations and a comparison is drawn between the two cases (Table1). The data regarding transmission and distribution losses and profit volumes are used to project a relation between e-government and organizational performance. Some of the issues which emerged from various rounds of interviews, especially with customer groups were communication patterns between customers and service provider, documentation standards, accessibility to officials, and measures to build trust in relationships.

Table 1: Empirical Observation of Case Data Variables (2005-06)

Variables	Applications	Case One (UPPCL)	Case Two (REL)
People - centric	On-line Billing and payment	No	Yes
Transparency	General Consumer Information	Only manual enquiry	On-line and manual enquiry
Quality	New Connections	Only manual enquiry	On-line and manual enquiry.
	Automatic Meter Reading	Partially	Yes
Accountability	Consumer Grievance	Only manual recording	Both on-line and manual
	Access to Officials	Difficult and discouraging	Contact no. available on website
Performance	Transmission and Distribution Losses	40%	12%
	Net Profit	Loss (Rs. 8500 million)	Rs. 9700 million

Table 1 reveals that REL is able to make more effective use of IT whereas UPPCL is lagging behind in all the categories and is largely dependent on manual processes with low transparency and poor quality. Further, REL has a Transmission and Distribution (T&D) loss of just 12% which is close to international standards of 10%. On the other hand UPPCL is incurring a heavy loss in T & D i.e. 40%. The net profit situation is unfavourable for UPPCL, although it may not be directly attributed to IT applications yet it can be definitely related to T&D losses. And IT has significant role in controlling T&D losses. Hence profitability of operations can also be seen to be affected by IT applications.

Survey Results

The interpretations shown in Table 1 regarding link between e-government and performance are further tested through the findings of the survey of employees of UPPCL, as summarized in Table 2 and 3.

Table2. Technology-Related Reasons for Poor Performance of UPPCL

Factors	Employees
Transmission & Distribution (T&D) Losses	22%
Lesser use of Information Technology	20%
Non-implementation of Energy Audit Technologies	58%

As given in Table 2, 20% of the respondents find lower application of Information Technology as the most important cause of poor performance of the organization. While energy audit dominates the responses as about 58% respondents find it to be the most important factor. It is needless to say that use of Information Technology will be a significant booster to proper implementation of Energy Audit therefore it can be concluded that as many as 78% employees realize the emergent need of application of e-government in UPPCL.

Table 3. Impact of Private Companies and MNCs on Customer Service

Variables	Employees
Better Service at same price	11.5%
Better Service at Higher price	43%
Better Service at lower price	6.5%
Same Service at higher price	39%

Regarding probable impact of entry of private and MNC players on power sector the results are very interesting (Table 3). Majority (61%) of the respondents believe that the private players will provide better service including a small (6.5%) suggesting that MNCs and domestic private players will begin an era of better service at lower price and another 11.5% saying that they will provide better service at same price. Although an equally high percentage believes that they will charge high price for the same service. This is important information since price and quality of service may ultimately decide the wave of competition in the power sector.

On basis of these analyses few recommendations are made that the government controlled power sector utilities should expedite the application of e-government initiatives to remain competitive in the wake of impending privatization. To begin the process UPPCL may extend electronic billing to cover all customer types and develop a comprehensive customer information system (CIS). Service connections and maintenance processes could be systemized and integrated with this CIS.

Conclusions

The present research is a pointer in the direction that e-government interfaces in power sector inter alia with power consumers and state power utilities are relevant and have link with the organizational performance. The scope for quantitative analysis to exactly enumerate the degree of performance linkage with e-government initiatives may be possible after few years when we implement e-government in the power sector at larger scale covering all functional areas i.e. distribution, generation and transmission.

We have discussed how e-government and democratic values are intertwined to enhance performance. India being the largest democracy of the world this analogy is significant for policy makers. The control variables taken in the model showing interlocking of democratic and e-government values, namely People-centric, transparency, accountability and quality are tested in light of findings of the two case studies, which have clearly shown that there is vast acceptance among all major stakeholders for technology enhancement; which is indicated by the difference in profitability and operational efficiency. It is also to conclude that the public sector player is aware of the imperatives of e-government and also of the fall-outs of not being able to do so which is clearly indicated by the interviews and survey results. Therefore

it is concluded that integrated and well planned application of e-government will significantly enhance the performance level of the power sector in India.

References

- Alam, M.S., Kabir, E., Rahman, M.M. and Choudhary, M.A.K. (2004), "Power Sector Reforms in Bangladesh: Electricity Distribution System", *Energy* Vol 29 No. II.
- Arun, T.G. and Nixon, F.I. (1998) "The reform of the power sector in India: 1991-1997". *Journal of International Development*. June, Vol. 10 Issue 4, p417-426, *John Wiley & Sons*
- Backus Michiel (2001), "E-Governance and Developing Countries" Research Report, IICD Publication.
- Ellis, D., Barker, S., Potter, S. & Pridgeon, C. (1993). "Information audits, communication audits and information mapping: A review and survey". *International Journal of Information Management*, 13(2): 134-151.
- Gil-Garcia, J. R. and Pardo, Theresa A. (2005) "E-government success factors: Mapping practical tools to theoretical foundations", *Government Information Quarterly* 22 187-216
- Gupta, V.K. (2005); "Power Scenario in Punjab -a bird's eye view", *Indian Journal of Power and River Valley Development* Page 179, Vol. XXV, July, 2005
- Heeks, R. (2003), "Most eGovernment-for-Development Projects Fail: How Can Risks be Reduced?" *Institute for Development Policy and Management*, University of Manchester, UK.
- <http://www.power-technology.com>
- <http://www.powermin.nic.in>
- <http://www.mit.gov.in>
- <http://www.rel.co.in>
- <http://www.uppcl.org.in>
- Jaegar, Paul T. and Thompson, Kim M. (2003), "E-Government around the world: Lessons, Challenges and Future Directions", *Government Information Quarterly* 20 (329-394).
- Kannabiran, G., Xavier, M.J. and Anantharaaj, Ammu (2005). "Enabling E-government through Citizen Relationship Management-Concept, Model and Applications" *Journal of Services Research* (Oct2004-Mar2005, Vol. 4 Issue 2), New Delhi.
- Lanvigne, Bruno D. (2004) , Government for Development Information Exchange project, [Training Guide: Using ICT's for Government Transparency](#) , CDT Publication.**
- Myers, M. D. (1997). "Critical Ethnography in Information Systems" in A. S. Lee (Ed.), *Information Systems and Qualitative Research* (pp. 276-300). London: Chapman and Hall.
- Mishler, E. G. (1986). *Research Interviewing: Context and narrative*. Cambridge: University Press MA.
- Parasuraman, A; Zeithaml, Valerie A and Berry, Leonard L A (1985) "Conceptual Model of Service Quality and Its Implications for Future Research", *Journal of Marketing*, Vol. 49
- Shrestha, Ram, Kumar, S., Sharma, Sudhir and Todici, Monaliza (2004), "Institutional reforms and electricity access: Lessons from Bangladesh and Thailand" *Energy for Sustainable Development*, Vol.VIII.
- Wong, Wilson and Welch, Eric (2004), *Does E-Government Promote Accountability? A Comparative Analysis of Website Openness and Government Accountability*, Governance: An International Journal of Policy, Administration and Institution, Vol 17, No.2, Blackwell Publishing.