ABSTRACT OF THE THESIS ON

Study of Citizen Centric E-governance Projects in Maharashtra

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M Sc ( Physics )

For the degree of Doctor of Philosophy ( Ph. D)
In the Faculty of Management
submitted to The University of Pune

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August 2008
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Study of Citizen Centric E-governance, Projects in Maharashtra  
(Subject: Computer Management  
Faculty: Management)

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1.0 Introduction:
We as citizens, especially those from the urban area, are aware of the penetration of ICT (Information and Communication Technology) in our daily life. Whether it is withdrawal of cash from bank, purchases, travel, education, medical, pension, insurance, event management, real estate deals, purchase of sharers, marriages or entertainment, use of IT has become a necessity. The private sector firms have made rapid strides in the user-centric applications of the ICT. Through a gradual and compulsory involvement in the ICT based systems; the citizens, as users, are increasingly able to avail better and more efficient services. Increasing use of ATM’s for withdrawal of cash can be cited as one example.

The same cannot be said about the Government sector, especially when it comes to citizen-centric services. Governing with the assistance of ICT is called e-governance. A comprehensive definition of electronic governance, given by the Council of Europe covers the use of electronic technologies in three areas of public action – relations between the public authorities and civil society, functioning of the public authorities at all stages of the democratic process (electronic democracy) and the provision of public services (electronic public service).

Looking at all the three areas stated, it is commonly believed that the government sector in India has not delivered in terms of e-governance, despite huge budgetary allocation. Registration of property, railway reservation, electricity and water billing, examinations results, birth / death certificates, educational admissions, land records, taxation, domicile certificate, and driving license are some of the e-governance projects which have been initiated in the recent past. Some of these are useful to citizens but their impact is low in terms of transparency, ease of use, availability, information dissemination and integration. If we compare similar applications in advanced countries, our CCEG (Citizen
Centric E-Governance projects seem to lag in terms of their impact on the society.

Spread of ICT in the rural area is meager as compared to urban area. There have been stray success stories, such as students using internet to plan their higher education or searching for job opportunities, farmers planning transportation of agriculture products to the most lucrative markets based on rates obtained from the internet, and use of a mobile van with computer and communication facilities, to issue 7/12 (Land ownership document) certificate to the farmers at a reasonable cost. However, these are a mere drop in the ocean considering the need.

Several reasons for the under-performance of CCEG applications are mentioned. It is believed that the impact of citizen centric e-governance applications is poor since the main objective is to gain political advantage rather than offer better service to the citizens. Integration across government departments is often not planned properly. The famed single window concept does not work. The citizens still have to visit different citizen centers spread within cities or towns.

The complaints related to bills such as water meter bill, electricity bill, telephone bill can be registered online, but tracking of the rectification process is still manual. This is mainly due to the fact that while the front-end interface is computerized, the back office is not automated properly and not linked to front-end services.

By and large, citizens from all segments of the society are confused as to whom to approach for solving their problems. Number of independent web-sites exist but, still can not be used as a reliable source for government level information. Since services are not integrated (for instance, registration of property and maintenance of land records), citizens have to face problems arising out of data inconsistency.
As stated earlier, the scope of e-governance is not merely restricted to public services. The citizens expect a lot more from e-governance projects than only improvement in service delivery in terms of time saving and sophistication. They look for an improvement in the functioning of the government so that the quality of life of citizens can be improved. Huge funds are planned to be disbursed every year to citizens under a number of different schemes. Agriculture is one of the largest sectors in India, in the case of which huge funds are provided as subsidies, loans or grants to assist farmers for enhancement in the production of food grain. However, transparency is not experienced in the implementation of a majority of schemes. As per news report and views expressed by the government authorities, high level of corruption exists in release of funds. If the list of village level beneficiaries is made available to the public on the web, resulting transparency will help in reducing corruption. Political decisions for launching new schemes, if based on correct data, will genuinely benefit the citizens. E-governance services such as driving licenses still require hiring of middleman. Citizens expect that they themselves should be able to interact with government for all their needs.

The research problem identified by the researcher therefore is that the current status of e-governance will require lot more enhancements to satisfy the citizens.

In a nutshell, the research theme is important due to the following reasons:

1. CCEG ICT projects are developed only during last five years.
2. Impact analysis will help to improve the citizens’ satisfaction level.
3. Citizens’ expectations are not fulfilled currently.
4. Good governance can be achieved using e-governance.
5. There is scope to enhance Transparency and reduce corruption with effective use of ICT.
6. Re-engineering requirements need to be identified.
7. Enormous amount of duplications of efforts are noticed.
8. This type of research projects will require cooperation from GOM authorities, hence are rarely pursued.

The main objective of the research is to derive a set of parameters to ensure e-governance ICT projects are successful, implementable, usable, transparent, time effective, affordable and accurate from citizens’ point of view.

2.0 Review of Literature:
E-governance has evoked interest, both as an area of research and as a field of practice, due to its apparent promise to improve the quality of life. The researcher in this case has carried out a comprehensive review of publications on this subject.

1. Study of E-governance evaluation framework
E-governance evaluation frameworks were studies at the International and the National level.

**International Frameworks**
- Gartner Assessment framework
- Gartner four phase model for Benchmarking of e-governance Applications

**National Level Frameworks:**
- E-governance evaluation framework – by DIT
- E-governance framework – IIT, Delhi

2. E-governance concepts and definitions
3. IT policies and National E-governance plan by Government of India
4. Experience survey of about 10 e-governance projects in India

Important highlights of literature review are as follows.

**International level**
E-government Assessment Framework: Completeness of vision, Ability to execute

(Gartner, Industry Research, Id number G00147284, Published on 28 March 2007, by Dr Andrea Di Maio, Dr David McClure, Dr Richard G. Haris)

Gartner Inc is the world's leading Information Technology research and advisory company. Founded in 1979, Gartner is headquartered in Stamford, Connecticut, USA. and has 4,000 associates, including 1,200 research analysts and consultants in 80 countries.

The likelihood of success for an e-government initiative depends on both the completeness of the vision and the sustainability of vision execution.

Formulating e-governance strategies is a balancing act among maximizing constituency services, realizing operational efficiency and achieving political returns. The framework should help to formulate core questions about whether government organization involved in implementing the e-strategy have the right tools, resources, processes and political support required for future state vision to be realized. This leads to assessing both the completeness of vision and the ability to execute.

Gartner's Four Phases of E-government Model

- Phase 1: Presence
- Phase 2: Interaction
- Phase 3: Transaction
- Phase 4: Transformation

(Gartner Research, Published on 21 Nov 2000, ID number TU-12-6113, Dr Christopher H Baum, Dr Andrea Di Maio)

Phase 1: Presence:
This phase of e-government development is characterized by creation of simple web-sites. The primary goal is to post information such as agency mission, addresses, opening hours and possibly some official documents of relevance to public.

Phase 2: Interaction:
This phase is characterized by web-sites that provide basic search capabilities, host forms to download, and linkages with other relevant sites as well as e-mail addresses of offices or officials.

Phase 3: Transaction:
This phase is characterized by allowing constituents to connect and complete entire tasks online. The focus of this stage is to build self-service applications for the public to access online, but also to use the web as a complement to other delivery channels.

Phase 4: Transformation:
This phase is the long term goal of almost all national and local e-government initiatives. It is characterized by redefining the delivery of government services by providing a single point of contact to constituents that makes government organization totally transparent to citizens.

Requirement of cost, time and complexities increases from phase 1 to 4. Also constituent value enhances from phase 1 to 4.

World bank
- The E-Government handbook for Developing countries
- Framework for the assessment of ICT pilot projects

Impact Assessment of ICT for Development Projects: ICTD and NISG

National Level:
- Evaluation Framework 2.0 – Department of Information Technology, Government of India,
  (www.mit.gov.in/download/NISG_EAF_18-05-04.pdf, prepared by
Objectives of an Assessment Framework:

This framework is designed with following specific objectives.

- To assess whether and to what extent a given e-governance project has the characteristics of a good e-governance project delivering value to stakeholders.
- To guide in funding of a e-governance projects at various stages of their life-cycle (newly started, roll-out, scaling up, replication)
- To provide guidelines for mid-term assessment of ongoing initiatives, so that mid course corrections, if any, can be applied.
- To provide guidelines for shaping future e-governance projects
- To provide material for e-governance training programs
- To enhance the trust and confidence of stakeholders by enabling creation of a knowledgebase of all e-governance projects rated as per trusted framework

Summary assessment:
The summary assessment should be conducted on a small sample. It should start with collection of data on the project (and similar projects) from secondary sources to facilitate development of a broad framework for evaluation.

Detailed assessment:
The detailed study should be based on scientific sampling plan, which is refined by the exploratory study. The sampling plan should be detail out the location wise and type wise number of stakeholders to be surveyed.

Evaluation Framework - IIT, Delhi

(Book: Evaluating e-governance: Dr M P Gupta and Dr Jaijit Bhattacharya
Department of Management studies, IIT, Delhi and Dr Ashok Agarwal ,CSI Evaluating E-government)
Experience survey:
International and national level ten Citizen Centric e-governance applications were studied which are outstanding, fully operational and created impact on the society. Each application was studied for project description, scope, services, outcomes, earlier problems, features, time-frame, Software platform, cost and drawbacks.

Citizen centric e-governance Applications within Maharashtra
1  District courts Computerization in Maharshastra
2  SETU : The Integrated Citizen Facilitation Centers (SETU ) at Collector office and Thashildar offices for offering services using ICT

Citizen centric e-governance Applications within India
1  VOICE: Vijaywada, ( Versatile Online Information Centre) by CMC Ltd, Andra Pradeash
2  CARD computer-aided Registration of deeds Andha Pradesh
3  Government School Teachers transfers, Karnataka
4  SWAGAT: State Wide Attention on Grievances by application of Technology
5  Akshaya : Government of Kerala, integrated web-site for Gateway to opportunities, towards knowledge society
6  MCA21: e-governance project of Ministry of Company Affairs to offer all services electronically using almost paperless procedures

Citizen centric e-governance Application world wide
1  Directgov the official government web-site for Citizens of UK
2  Citizen Service Centers in Bahia, Brazil

3.0 Research methodology:
( 1. Business Research Methods by Donald R Cooper, Pamela S Schindler
2. Research Methodology, methods and techniques by C R Kothari )
Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In the case of this project, **case study method** has been adopted.

Researcher Robert K. Yin defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used. ([http://www.gslis.utexas.edu/~ssoy/usesusers/l391d1b.htm](http://www.gslis.utexas.edu/~ssoy/usesusers/l391d1b.htm))

Steps to use Case Study Research Methodology are as follows.

1. Determine and define the research questions
2. Select the cases and determine data gathering and analysis techniques
3. Prepare to collect the data
4. Collect data in the field
5. Evaluate and analyze the data

A key strength of the case study method involves use of multiple sources and techniques in the data gathering process. The researcher can determine in advance what evidence to gather and what analysis techniques to use with the data to answer the research questions. Data gathered is normally largely qualitative, but it may also be quantitative. Tools to collect data can include surveys, interviews, documentation review, observation, and even the collection of physical artifacts.

In the case of this project, three different case studies related to citizens of different sections of the society were studied which have been acknowledged as successful e-governance projects in Maharashtra. It may be mentioned that e-governance projects involve access to confidential and sensitive information and
procedures. It is not easy to obtain information. The researcher has been fortunate to have been able to study three different projects, viz.
1. Citizen Facilitation Centers (CFC) of Kalyan Dombivli Municipal Corporation (KDMC)
2. Land Records Computerization in Maharashtra (LRC)
3. Online examination for 12th class students of Information Technology subject for SSC Board

Above three e-governance applications have different success factors, stakeholders are from different social sectors, used different technologies and used different method for implementation.

Case study methodology is used at apex level but within each case following research methodology has been used.

a. Exploratory Study was conducted by visiting the state level office and field level offices. The purpose of exploratory study was to get a reasonable understanding of the system and to identify stakeholders with their roles in the system. Project objectives were short-listed separately for Citizens and organization or government department.

b. Detailed study was carried out using separate questionnaires for each of the stakeholders. Prolonged interviews were conducted of Head of organizations and project leaders.

c. Document study covering available project documents, websites, published literature, project manuals, project presentations etc was carried out.

**Hypotheses:**
Considering the research methodology used, hypotheses are not strictly necessary; however the following three working hypotheses have been formed to guide the research.

- Majority of CCEG ICT projects require improvements to satisfy citizens.
- Re-engineering of government procedures increases acceptance of CCEG ICT projects.
• Effective implementation of CCEG ICT projects reduces corruption.

4.0 Analysis of Primary data – Case Studies:
The research is based substantially on 3 major CCEG projects implemented in Maharashtra. The details of these cases follow.

4.1 Briefing of the Case study: Citizen Facilitation Centers (CFC) of Kalyan Dombivli Municipal Corporation (KDMC):

*Municipalities ICT projects are undertaken by number of corporations with the objective of enhancing their capacity to deliver services and minimize public grievances with improved living conditions.*

Citizen Facilitation Center, (CFC) at KDMC is one of the successful e-governance, G2C, service oriented application. CFC is single touch point for citizens to interact with KDMC for availing majority of services such as payment of taxes, making an application for services (eg: birth certificate), seeking information for applying to a service, checking the status of application, lodge a complaint, and review the status of complaint. CFC’s are established at six different locations covering area under KDMC. WAN is set up to connect all CFC’s to central database at Kalyan. Oracle 9i is used as RDBMS and D2K as development tool. All CFC’s are operational on a regular basis after the application is released. (Jan 2002).

CFC project was introduced aiming at creating system driven corporation with highest level of transparency, accountability and with highest level of Citizen serving standards.

One of the objectives is to maximize revenue of corporation.

The project was executed under the guidance of expert committee set up with members from IIT, Mumbai, VJTI, and NCST.

**Exploratory study:** GOM authorities had suggested to undertake CFC of KDMC case study. Exploratory study was conducted by making visits to KDMC office. Initial meeting with commissioner gave over all idea of the project. System
manager, HOD of Computer Section coordinated further study. Visits were made to two CFC’s to get feel of actual operations. Visit to CFC at Kalayan demonstrated actual working of the e-governance application. Windows at CFC are arranged in such a way that Citizens get full benefit of CFC and need to wait minimum time. HELP desk, Bill collection windows, Birth/death certificate, Civil window, Application receipt window, Tapal window and print out windows are arranged to provide service. It was noticed that all operations were smooth and Citizens visiting CFC were able to complete their work and returns with satisfaction. Back-office working was studied by visiting almost all departments. Meeting with HOD’s was arranged to share their experiences. Separate team behind CFC windows operates to analyze software, operations or data problems. All operations are managed by KDMC staff. Meeting with software vendor was arranged. All project documents, presentations and sample documents were collected.

Stakeholders identified are,

- Citizens who visit to CFC centers of KDMC and are residents of KDMC area.
- Employees of KDMC
- Departmental heads, System Manager, Departmental staff
- CFC In charge, CFC operators
- S/w team members from ABM, S/w vendor
- Senior government officials–commissioner, ex-commissioner

**Detailed study:**

Questionnaires were prepared for each stakeholder to conduct the survey. Interview with ex-commissioner was conducted to get his perspective of the application.

Internal documents and registers were studied. Decision making reports and summary reports generated by CFC application, were analyzed.
Major finding are as follows.
Departmental staff is able to work with workflow based application. Due to smooth, clear and time bound operations, revenue of KDMC is maximized. Citizens’ applications are answered within time limits.
Citizens gave their feedback as method of service delivery being improved drastically. Interaction with KDMC is made simple due to CFC. Information for making any application is made easily available hence number of visits and waiting time is reduced to submit an application. Some of the services such as birth/death certificates, permit issues, payment of bills are made easy and transparent. But, services which improve quality of life of Citizens such as, complaints solving procedure, civil department’s services, issue of water connections permits etc are not improved noticeably. This may be due the fact that, Functioning of the corporators of KDMC is not included in the workflow application of CFC and senior staff at KDMC is not using decision making features of the system.
This study was conducted from Jan 2006 to Aug 2006. This report was refereed to plan replication of KDMC application across corporations in Maharashtra.

4.2 Briefing of the Case study: Land Records Computerization in Maharashtra (LRC)

Importance of Land Records in India:
Land records define ownership of land in a village. It shows details such as area and boundaries of each plot, owners’/khatedar’s name with their proportionate areas, cultivators name, crop details, irrigation methods, other rights, loans taken details and amount of land revenue to be paid to government. Land Records is basic legal document which is used by majority of rural population for various purposes such as, Seeking crop Loan, Security for bail in criminal cases, to obtain a certified income statement, Avail benefits from government scheme that are mainly agriculture related, Sale or purchase of land etc.
For significant transactions as per above cases, entries are made in the land records registers. For example, bank loan amount is written on land ownership records. Hence land records become essential document for all most all activities of farmers in the rural areas. Land records are equally important in Urban areas, mainly for sell or purchase of property.

Land Records are maintained at village level by staff of Revenue department, designated as Talathi or village assistant who takes care of four to five villages. Generally there is one village level staff taking care of three – four villages. Land records are maintained as per the procedure defined in Land Revenue Manual using various registers.

**Formation of 100 % Centrally sponsored scheme By MoRD:**
To remove inherent flaws in the existing Land Records maintenance and to bring about efficiency, transparency and easy accessibility of Land Records, Ministry of Rural Development (MORD), Government of India initiated a Centrally sponsored scheme in 1988-89 which is still supported. Computerization of Land records aims at offering all services of Land records, mainly issue of land documents ownership, mutation, crop details, (7/12) at citizen centers.

Village level data for land records and property card are entered to create basic databases at Taluka level. Citizen centers are set up at Taluka revenue offices by BOT vendors. BOT vendor is responsible for data entry, updations, and to provide service for 7/12 land records. But property card citizen centers are operated by revenue staff.

**Exploratory study:**
Researcher approached GOM authorities for allowing conduct of study for Land Records Computerization. Research work was initiated in Aug 2006. Initial few meetings were conducted with settlement commissioner to decide study outline and understand the project scope. His views were important since, major LRC
project activities were executed during his tenure. LRC project covers Land records from all villages in Maharashtra. Numbers of field visits were made to understand ground realities.

Computerization of Land records in Maharashtra consists with two major e-governance applications. Issue of 7/12 extracts (mainly for rural areas) with related services and issue of property card and related services (mainly for urban areas). Separate taluka computers are set up for these services. Following table gives comparison between the two projects.

<table>
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<th>Sr</th>
<th>7/12 services (Rural)</th>
<th>Property card services (Urban)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manual services are still continued</td>
<td>No separate manual procedure in operations But printed documents are kept</td>
</tr>
<tr>
<td>2</td>
<td>Updates are not online</td>
<td>Updates are online</td>
</tr>
<tr>
<td>3</td>
<td>Services are provided by BOT vendor</td>
<td>Services are provided by revenue staff</td>
</tr>
<tr>
<td>4</td>
<td>Citizens have to travel upto Taluka to get the service</td>
<td>Computer centers are set up at all City Survey Offices hence no extra travel</td>
</tr>
<tr>
<td>5</td>
<td>Data errors are high</td>
<td>Almost nil data errors</td>
</tr>
<tr>
<td>6</td>
<td>Back end 7/12 updates are manual</td>
<td>All back end operations are computerized</td>
</tr>
</tbody>
</table>

**Detailed study:** Even through LRC centers are at Taluka places, majority of Citizens stay in village area. Since farmers are 90% users of 7/12 services, it was decided to conduct survey at village level. Department of agriculture regularly conducts various activities for farmers at village level. Also farmers visit agriculture offices regularly at village level for availing scheme benefits. Hence, separate simple and short questionnaire in Marathi was prepared. The survey was conducted in Solapur and Nagar taluka’s in 557 villages covering 1525 farmers. The survey for all stakeholders as per following table was conducted.
with permission and assistance from Department of agriculture, settlement commissioner and revenue department.

Group discussions with group of Talathi’s and agriculture village level staff were arranged.

**Major Findings:**

98% Citizens availing facilities at Property card citizen centers are extremely happy in terms service quality, correctness of data, time required and payments to be made. Property card e-governance application is satisfying almost all demands of Citizens.

As regards to 7/12 extract computerization, Data entry, validation, correction and making them certified are most crucial steps which required about four years consistent efforts at multiple locations are complete in all respect. Due to the appointment of BOT vendors at taluka places and effective monitoring it was possible to sustain this activity to create basic databases. This activity was mainly performed during 2002 to 2005. However, similar efforts were taken at least as pilot project earlier during from 1990 to 2002 but it was not possible to create statewide database using which services can be offered. Successful Completion of data preparation stage of 211 lakhs land records is a great achievement in LRC computerization.

Authorities made efforts to provide legal status to computerized 7/12 extracts after amendment of law since May 2005.

However, since manual records are not discontinued and online mutations are not in use, citizens gave following opinion.

Citizens have expressed their deep concern about Land records (7/12 issue) services offered at Taluka computer centers. Citizens have to travel till taluka to get service, computerized 12 document (crop records) does not have latest crop entries, manual land records system is also in operations, mutation entries are not updated on time, online mutation module is not implemented, BOT vendor some times demands additional money, computerized land records are not accepted for majority of official transactions since they are not updated, these are some of the major concerns of the Citizens.
Land records data is basis for majority of policy decisions for almost all departments but procedure is not established to share the data.

4.3 Briefing of the case study: Online Examination for 12th class students of Information Technology subject, SSC Board

Introduction:
Information Technology subject is now part of the curriculum even for undergraduate courses in Maharashtra. Practical experience and actual use of computers is essential to get basic knowledge of the subject. Hence, colleges offering Information Technology as subject for 12th class are required to set up computer lab as per guidelines released by State Secondary and higher secondary certificate board, Maharashtra state, (SSC board).

Only limited number of students’ enrollment is permitted based on infra-structure availability.

Online Examination method is introduced since March 2004 examination. It is used for 12th standard for March and October examinations.

There are about 627 centers with 41,000 students who have appeared for March 2008 online Examination. Online Examination time table is spread over one week in two slots per day. Each center is expected to set up additional (stand by) machines to overcome hardware problems. Also, internet connectivity is ensured during examination period. Lot of security measures such as registration of IP and machine numbers and encryption methods are used. Web based application is in place to interact with teachers and administrative staff. Fully automatic methods are introduced for interactions across centers.

Question bank is developed with lot of features to set up question papers. Question bank is enhanced with teachers’ contribution on continuous basis. Workshops of IT teachers are arranged every year to enhance the question bank.

Mock / trial examination is conducted before each March examination for students to get know how of the Online Examination procedure.

ICT hardware set up is ensured to be in place with automatic checking.
Answers are stored at multiple locations (three) with time stamp in encrypted format.

The objectives of the study are,
1. Compare manual and Online Examination procedures to derive its merits
To learn effective use of ICT to implement statewide web application
2. To find out limitations of Internet connectivity to implement state wide web application
3. To examine use of web application to interact with state wide spread over of centers and teachers

Exploratory study was connected during Oct 2007. Visits were made to two centers to get feel of online conduct of examination, based on which detailed study was planned during mock/trial examination of March 2008 and also during actual conduct of the examination. Since web questionnaire was prepared and students have to submit feedback forms before completing the mock trail, 15,091 feedback from students were received.

Students and teachers (center in-charge) were selected as stakeholders. Web-based questionnaire was added after the mock examination paper to collect students’ views. Also 44 teachers’ feedback was collected using web-questionnaire.

15,091 students gave feedback during mock/trial Online Examination. They are able to use the online examination without any problems.

Online Examination e-governance application is fully successful application, satisfying all requirements. Online examination demonstrates use of automated procedures for hardware and connectivity checking which helps to reduce excuses and ensures use of web application across 627 centers.

Students have rated Online Examination much higher with respect to manual examination method, which has been supported by a chi-square test.

5.0 Hypotheses testing:
The working hypotheses have been tested as below.

Majority of CCEG ICT projects require improvements to satisfy citizens.
On the basis of analysis and tables prepared for Citizens feedback in case of all the three case studies, one can conclude that Citizens require lot more improvements in these e-governance applications to satisfy them in terms of improved services. Service application can be submitted easily with CFC but, service delivery is manual, 7/12 issued does not contain latest crop details and computerized 7/12 is not completed correct, Hence, this hypothesis is true.

Re-engineering of government procedures increases acceptance of CCEG ICT projects.
Massive re-engineering was done in CFC of KDMC e-governance application to set up workflow based working within KDMC corporation hence this application has high level of acceptance as compared to computerization in other corporations in which only bill preparation is planned.
Online Examination procedure is defined entirely on the basis of usage of computerized systems. Issues as storing copies of answer-sheets electronically, preparing results which are paperless indicates high level of re-engineering which is one of the factors to make the application successful. Even, in the court cases these methods are accepted.
Hence, this hypothesis “Re-engineering of government procedures increases acceptance of CCEG ICT projects” is proved.

Effective implementation of CCEG ICT projects reduces corruption.
Services which are instantly made available reduce corruption due to transparency in services. Example is issue of birth/death certificates. Same is not true for sanctioning water connection.
Issue of property card system in Land records computerization is effectively implemented by discontinuing manual procedures and making it transparent has reduced corruption. But, in case of land ownership documents (7/12) corruption is marginally removed since mutations are still made manually. Also involvement of BOT has not reduced the corruption.
Online Examination application uses updated question bank. This helps to set up multiple set of question papers reducing corruption in paper setting procedure. Hence, the hypothesis “Effective implementation of CCEG ICT projects reduces corruption” is proved indirectly since it does not have direct evidence.

**Benchmarking of three case studies with Gartner Four Phase model:**
The 3 projects studied have been benchmarked with reference to the 4 stage model suggested by Gartner. CFC of KDMC and Land Records Computerization projects are using client / server technology hence major characteristics of Gartner model for Transaction (phase 3) and Transformations (Phase 4) are not implemented which are based on web-based transactional applications. BPR at high level is observed in CFC of KDMC. Some of characteristics of Presence (phase 1) and Integration ( phase 2) are incorporated in these applications. Online Examination being paperless and fully web-based, incorporates major features of all four phases. However none of the projects are ideal; they leave much to be desired.

**6.0 Research Outcomes**

**6.1 Inferences from the CCEG Cases**

1. E-governance projects are sustained if funds allocation is planned yearly with appropriate enhancements depending upon project status.

2. Objectives of the citizen centric e-governance projects are mainly defined from organization’s point of view hence citizens are not fully satisfied. Reduction in Corruption and transparency is expected by Citizens which is mostly missing form e-governance applications.

3. Since data in e-governance application has high rate of errors on which citizens services are offered, citizens face lot of harassment in rectification of data.

4. Discontinuation of manual system is not planned on time hence two systems running in parallel create confusion and additional problems.
5. Hiring services of BOT vendors without proper monitoring and terms and conditions creates additional issues due to computerization.
6. Part implementation of e-governance applications does not offer all benefits to Citizens.
7. Sharing of databases / interaction across departments are not noticed due to which integrated services are not a reality. Citizens still have to visit at number of locations for different services.
8. Regular enhancements in e-governance application are not planned after It’s rollout.
9. Transfer of project leader / departmental head if happens in between, before release, project gets discontinued.
10. Delays at government level to amend laws make important projects ineffective.
11. Committees are functional only till release of the package hence, issues in implementation remain unattended.
12. Integrated approach is planned but not implemented.
13. Decision makers / political members’ involvement is negligible.
14. Documentations are not updated.

6.2 **Success factors for Citizen Centric e-governance projects:**
1. Appropriate re-engineering as basic step for successful e-governance
2. Defining of Interaction in terms data exchange across departments
3. Setting up separate Citizen facilitation Centers to offer e-governance services
4. Defining of the project objectives separately for Citizens and departments
5. Involvement of Project leader and his abilities build e-governance application
6. Involvement of Staff at all level in all stages of the application
7. Streamlining of manual and computerized operations
8. Finalization of Maintenance contracts for ICT vendors on time
9. Setting up of separate Computer section
10. Project Management by head of organization
11. Setting up of Expert committee to finalize technological issues
12. Timely availability of funds
13. Planning of Initial Database creation for huge data
14. Appointment of BOT vendors for Data entry and managing operations at Citizen centers
15. Setting up of Coordination committee for defining interaction across departments and executes actions to amend rules and regulations
16. Issue of guidelines for written communication across organization
17. Appointment of domain experts for defining user requirements and coordinate with software team
18. Careful Selection of software vendor by technical committee
19. Training to all staff covering ICT and operations of e-governance
20. Use of web-enabled tools to monitor infrastructure of field offices
21. Use of US based servers to get high band width and availability
22. Use of web-enabled software to set up for effective electronic communication and automatic monitoring of implementation
23. Use of security levels as per role of e-governance applications
24. Minimizing network connectivity requirements ensures high level of usage

6.3 Model for Citizen Centric E-governance projects:
An important research outcome is a model developed by the researcher to guide CCEG projects. This is derived based on success factors noticed in the case studies and keeping objective to reach upto Gartner’s fourth stage of Transformation.
Success Model for Citizen Centric E-governance projects is a reference framework, which defines essential factors contributing to the success of the e-governance project, which should be addressed during entire life-cycle of the e-governance project.
Diagram for success factor model for citizen centric e-governance projects:

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<td>Level of integration</td>
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<td>Project monitoring parameters</td>
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6.4 Contributions / Recommendations:

1. Large scale continuous campaigning efforts are required to make citizens aware about e-governance services.
2. Lots of features are required to be added in the web-sites useful to citizens to make them usable.
3. Citizens complaints lodged on web-sites should be sorted out within specific period.
4. Services demanded by Citizens should be added.
5. Manual services should be discontinued within few months after release of e-governance services.

6. Government staff involved in manual service providing also should be associated in e-governance service delivery to take advantage of their domain knowledge.

7. Power problems are serious at village level. UPS solution is a must to offer services on time and reducing citizens’ repetitive visits for the same work.

8. Monitoring and evaluation reports should be automatically generated.

9. PMP’s (Project Measuring Parameters) should be derived automatically. Periodical review of projects should be undertaken to define enhancements.

10. E-governance projects should be monitored till it is discontinued.

11. Committees set up should be functional till project is phased out.

12. Regular training of senior staff is essential to make use of full benefits of ICT applications. MIS, decision support and BI features are required to be explained and demonstrated to senior staff.

13. Project champions should visit to other states and study similar projects to increase their awareness.

14. Project leader should not be transferred during development of the project.

15. Efforts are required to be taken to add features in the e-governance applications to build transparency in the e-governance applications to reduce corruption.

16. Product should be tested from certified bodies for its testing to ensure bug free software product.

17. Software product should be developed in stages. Each stage can be considered as new project to ensure its completion.

18. Software team sizes should be defined till project is in use for development and maintenance separately.

19. Amendments in laws are required to be made on time.

20. All modules implementations is to planned for providing complete service.

21. There should be only one Citizen center at field level offices covering services of all departments after integration across departments.
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