

## **E-GOVERNANCE AND DATA MINING: A METHODOLOGY FOR E-VOTING**

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E-governance comprises the use of information and communication technologies (ICTs) to support public services, government administration, democratic processes, and relationships among citizens, civil society, the private sector, and the state. There are very few successful e-government projects in developing countries because most of e-government projects within developing countries employ advance technology intervention whereas citizens are not ready for this. The research concludes the use of data mining tool in e-governance helps in improving existing electoral process in different states in India by e-voting. In this way e-governance integration with data mining improves the efficiency and also saves money and time.

**Keywords:** Data Mining, E-Governance, E-Democracy, E-Voting, G2G, G2C, G2B, Knowledge Discovery, EBM.

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### **1. INTRODUCTION**

#### **1.1 E-Governance**

The benefits of the information revolution can be fully realised only if governments play a central role in this transformation. Till now developing countries have focused on the relatively easy phase of e-Government, developing websites, piloting a few applications, and putting these services online. E-Governance stands for the Electronic Governance which is the collaboration of e-democracy and e-business [1]. It refers to the process of using information technology to computerize the internal and external operations of government so that citizen and the other business should interact with government policies easily and the interaction between citizen and government increases via e-governance. The advent of Information and Communication Technology (ICT) in the recent years has presented an opportunity for the IT managers and the senior officials in the government to change the way organizations leverage and value their information assets. With the ability to easy access of information mission delivery, resource management and data dissemination can be raised to levels which were previously not at all possible. Government departments might have come across shortages or resources in one department and excess of resources in the other. This could be due to non-availability of proper data and facilities to disseminate information. Even if government departments are computerized and networked more for the purpose of Internet usage and mail transfer, the information available

in one department, which possess the data could not be utilized in other department. This is because the information is stored in different formats, in different platforms and in heterogeneous different data base systems. Computerization of internal operations reduces the cost and improves the response time and automation in interaction with citizen reduces the overhead of both parties and increases the value of economy. If we call it by 24/7 approach then it'll not be wrong because in this interface communication can take place 24 hours a day and 7 days a week without any wait.

Electronic voting is an interdisciplinary field of research based on the collaboration of a number of well-established scientific fields. Computing experts need to cooperate with sociologists, political scientists and media communication experts. Moreover, e-voting research particularly requires the contribution of legal and public administration experts. E-elections, similar to traditional elections, are government owned and initiated processes, and as such, many of the activities involved in their undertaking are closely related to public administration, in this case electoral administration in particular. In the past, process reengineering in the public administration sector has been widely used to reorganize other administrative processes that had to be redesigned due to the introduction of ICT in some or all of their stages.

In India currently we are using E-governance in the following fields:

- (1) To deliver Govt. services
- (2) In Defense System
- (3) Educational Sector
- (4) Health and Social Science
- (5) Public Certification
- (6) Transportation System

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- (7) Environment Sector
- (8) Revenue Sector

### 1.2 Data Mining

Data mining is a technique in which broad category of applications and technologies for gathering, storing, analyzing and providing access to data to help the decision makers in making decisions. It is also known as analytical tool because it helps the user to analyze the data from different fields, integrate them and identify the relationship between them. In layman language it is the technique of drawing out the information related to the concept from the large database. User collects the data from surveys, stores that data and then analyzes that data to take any decision [7]. So, it also helps in taking decisions. That's why it is also known as Knowledge Discovery (KD). In the recent years private sector is employing it to solve the problems related to customer support, marketing strategy product development and financial decisions.

Five major elements of data mining are:

- Haul out, alter and load transaction data onto the data warehouse system.
- Hoard and handle the data in multidimensional database system.
- Present data access to business analysts and information technology professionals.
- Study the data by application software.
- Present the data in useful format, e.g. graph, tree, table, etc.

In the recent years, not only the private sector but also the public sector and the government are taking advantage of Information and Communication Technology. Government is using e-governance to govern the processes in which ICT plays the significant role. Framework of data mining can be depicted in the figure as given below in Fig1.

The Fig. 1 shown above tells us about the working of data mining. The raw data is collected from surveys, internet browsing, institutes etc. and then that data is fed into the

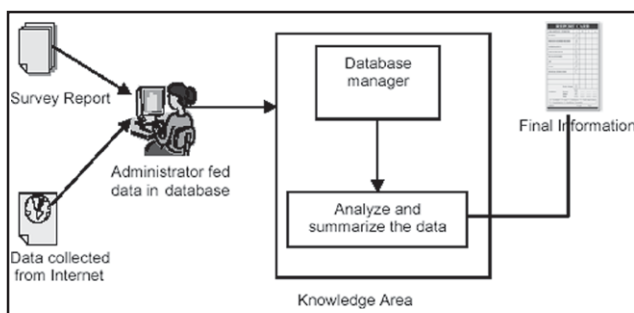


Figure 1: Framework of Data Mining

database. Here database means to say any software supporting data handling e.g. MS-Access and Oracle etc. After the data fed into the database, Data Manager manages the data using some Data Mining Tools and Algorithms. And finally the user gets the required information that is data mining results.

*Data Mining Tools Include:* Excel, Microsoft SQL Server, Oracle, SAS etc[6].

*Data Mining Algorithms include:* Linear Regression Using Least Square Method, Non Linear Regression, Association mining and Hash Tree[5].

### 1.3 Integrate E-Governance with Data Mining

In this research, we are talking about the applications of data mining [8] in e-governance. In this section we are going to discuss data mining and e-governance in collaboration. The framework of data mining and e-governance is shown in Fig. 2

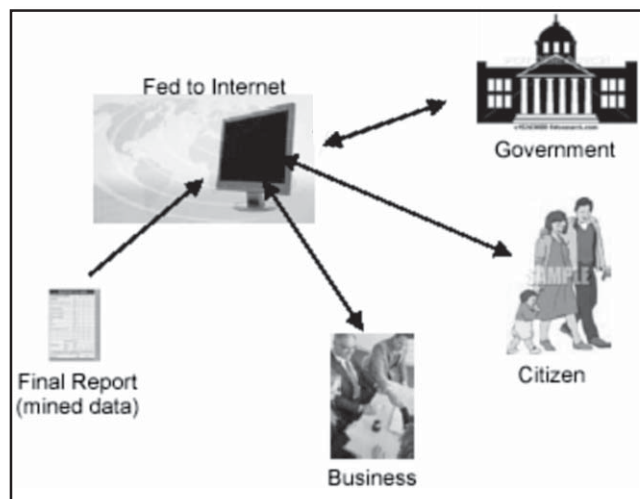


Figure 2: E-governance with Data Mining

Fig. 2 depicts that the final report which is mined data, administrator feds that data onto the Internet. Government, Business and Citizens communicate with that Knowledge storage area.

If we talk about the Indian Government, there are number of departments e.g. Railways, Telecom, Water Supply, Electricity board etc. and each department recruits new employees according to requirement. And this information is related to the citizen and government. If a particular site is developed for the purpose of government recruitments then it will become easy for the citizen to download the forms related to the job or department. All the information can be mined in a single database for the ease of citizen and government too. Another advantage of data mining [7] in e-governance is that the resources and the information can be shared in one another department with no time wastage of posting. Since there is distributed

system, data is scattered, no one department can take advantage of another department in information sharing. But if the concept of data mining comes in use then it can add application to the e-governance.

## 2. RESEARCH WORK

The objective of this research is to maximize the use of Internet in government services. Since we know that in India the level of corruption and crisis is very high so if we introduce this concept in democratic India, it will be distant to large extent. E-Voting refers to the concept of electronic voting system. Elections using computerize system is called *e-voting*.

A particular site can be developed which will carry all the information of citizens of the country.

- During the period of elections voting lines will be opened and that particular site will provide a particular username Id and password to the citizens. The unique username and password will help to provide the security to the personal rights of election.
- The username ID and password will be confidential which will be provided by some media like mobile phone system or by the particular organization (e.g. Govt. Banks) on the paper to those citizens who do not have the facility of mobile phone. This type of security can be seen in ATM cards.
- We know that during the period of elections, disputes occur at the election booths which lead to the loss of many lives which is the most crucial part of elections. This research is based upon the removal of all these crimes.
- Another crime which can be removed with this research is that we know fake voting take place mostly in India. Fake voting will be totally removed by this technique. The developers of the site will provide constraint over double entry i.e. one entry for one voter, it will lock or in other words we can say that it discard the another entry if in any case it happens.
- There will be full freedom to everyone to vote for the candidate whom they desire.
- Another benefit which we find is that the institutes, government offices which remain busy during the election period will become free. It means that they can continue to their work. There will not be any disturbance due to elections. Mostly we see that study centers remain close during the elections leading loss to the studies. This loss will come to an end.
- It is seen that during elections, the persons who get duty are govt. employees and when the election

period comes near they can not concentrate on the work for which they are employed. Offices remain evacuate. This will be finished if we use e-voting system.

## 3. SYSTEM MODEL

The system model of e-governance consists of different levels in Government: Central Government and Local Government. In this way interaction can be between government to government which is depicted in the Fig. 3 [1][2][3]. E-Governance is divided into two parts:

- External Level
- Internal Level

External Level of E-Governance includes:

**G2C:** G2C is the one of three categories of e-governance. G2C stands for the Government to Citizen. Under this category the communication comes under governments and citizens. It is basically serving the customers on the Web. The documents submitted at any of the facility center is made available across the departments so that carrying of volumes of documents and feeding them into computers is totally eliminated or minimized to a maximum extent. Each citizen will have a unique identification number and all the facilities and services rendered to a particular citizen can be tracked easily. Once implemented, this will drastically reduce the workload of the government departments. For example, as the government units are functioning in silos, it requires issuing various certificates to the general public for availing some facilities. Instead if common general-purpose citizen identification is given to each citizen, there won't be any further need for issuing the same set of certificates again and again. The concerned departments can verify the details from the central database.

**G2B:** G2B is another category of external e-governance which stands for Government to Business. Communication takes place between governments and businesses/interest groups. In order to implement the government's various plans and projects it needs the business communities' services. Services like e-procurement, e-payment, and project monitoring and implementation forms part of this model. E-Procurement is an application to transform the existing manual system of government procurement into an efficient electronic based one.

Internal Level of E-Governance includes:

**G2G:** G2G is the internal e-governance stands for Government to Government. Interaction takes place between governments (central to local or local to central). All the G2G interactions and dealings are required for planning, decision support and implementation of its action plans. The goal of the Government-to-Government (G2G) system is to

forge new partnerships among various levels of government. These partnerships facilitate collaboration between levels of government, and empower state and local governments to deliver citizen services more effectively. The time gap can be greatly reduced once the E-governance system is in place. It requires a single interface to government offices and staff, to effectively carry out functions like human resource management and financial resource planning in an integrated environment. Further, all government agencies to be linked through a modern computerized network that allows secure communications and interaction. Existing government systems are either replaced or integrated into the new technology, depending on the functionality and adaptability of legacy systems. Fig. 3 is given below to show the system model of e-governance. In this model it is shown that the both levels of government (G2G) central and local are put into one box, which are connected to citizens and businesses for the purpose of e-democracy and e-business as defined earlier in the definition of e-governance.

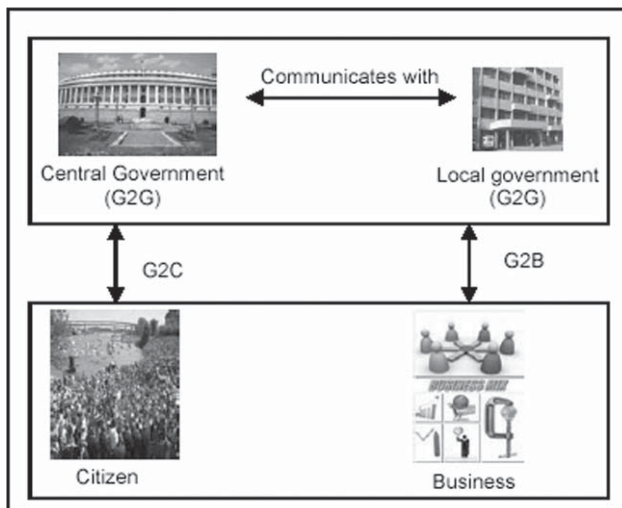


Figure 3: System Model of E-Governance

The system model of developed countries like USA according to Gartner[4] works on four stages. These stages include:

- (1) Information
- (2) Interaction
- (3) Transaction
- (4) Transformation

If we talk about our nation India, it is under developed country and we can step it towards developing by following the approach of this research. Because how much we think we gain some part of that. So plan for long then we'll achieve some instead of nothing. The present state of India tells us that in e-governance we are at the first step of information. The Internet in India just provides us the information related to government policies and strategies but we can not interact

with the government. If we use this concept of data mining and e-governance in collaboration, then we can achieve the two more stages interaction and transaction in Indian e-governance.

#### 4. IMPLEMENTATION

Initially, in electoral process the concepts such as relationships, obligations and resulting dependencies are used to consider the design of election process to an e-voting process and analyze the resulting effects on the validity of the process, the effectiveness of its administration and the social acceptance of its results. Electronic voting system is in use since 1960's in developed countries like United Kingdom, Estonia and Switzerland etc. but in India it was implemented for the purpose of casting voting only [2]. The technique of voting presently in use in India is ballot system. This is known as Paper based electronic voting system, which is partially electronic because the counting of votes is done manually.

The electronic device which is used in India for polling is known as Electronic Ballot Marker (EBM). This electronic device is only used for polling but on the other hand the counting is done by hand (manually).

The challenge was to identify the different sub processes (stages) that take place within an e-election. The purpose of the following section is to present the concepts used to depict the redesign of the electoral process to an e-voting process through the use of ICTs and analyze its resulting effects. The research on e-voting can be implemented by the following strategy:

- (a) Keep high objectives
- (b) Do efforts
- (c) Get some achievement
- (d) Unite the small achievements and get the big one

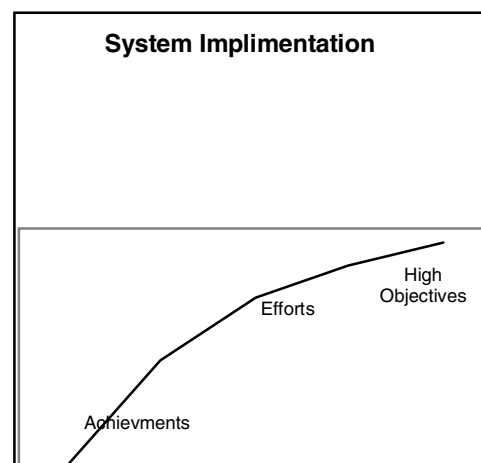


Figure 4: Implementation Strategy of E-voting

In our implementation we concentrate on the concepts that

- (a) What is the purpose?
- (b) For whom we are creating?
- (c) What are the requirements to create?
- (d) What benefits will it provide to us?

The answers to all these questions are given above in our discussion of research work i.e. is we wish to create a site for e-voting. Creating purpose is for the ease of government and citizens. Also to increase the interaction between governments and citizen. In our discussion we are taking central point as government and citizen.

Increasing evils in society is the requirement to create this site. Wish to reduce these evils like fake voting, disputes during voting at voting booths, corruption etc. Time will save. This is an economic phenomenon. Offices never remain idle due to the duty of employees in elections and the works of government offices remain continue. Details of stages of e-voting system are described below in Fig 5.

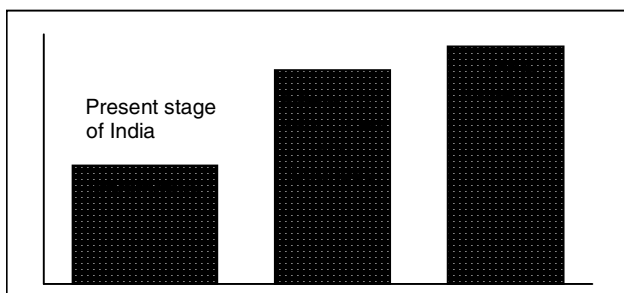


Figure 5: Stages of Developing E-Voting System

### Stage 1: Information

India is on the first stage that is acquiring information only. To implement our research first of all we will collect all the data about the citizens who are eligible for vote. And then this data will be mined through software.

### Stage 2: Interaction

In the second stage of our research, we are interacting with the public by providing them a username and password in the place of voting Identity cards. For the proof of authorization, in e-voting system we are providing Username and password to the public instead of Identity cards which is the recent process in use.

### Stage 3: Transformation

Third stage of implementation is concerned with the process when in actual e-voting starts. Citizens vote on the particular website and they also get the information about winner via this electronic system. In this website a block can be created

in which voters can add their comments or suggestions, which will help the government to know what they want from government. In this way a whole democratic country will develop.

## 5. CONCLUSION AND FUTURE WORK

E-voting costs nevertheless should be measured against the expected added value that their deployment will incur in the wider democratic process. Usually, the prospective benefits from the introduction of e-voting technologies are related to the hypothesis that the convenience offered can be used as a counterbalance against voter apathy and therefore increase voter turnout, which in turn legitimises the outcome of the electoral process. A further hypothesis is based on the assumption that young voters who are familiarized to the use of technology in general, are more inclined to participate in the electoral process if presented with the opportunity to use technological means to cast a ballot. However, both of the above assumptions remain to be proven. The main argument of this research is that data remains collected and this data is analytical which is hidden too and helps in decision makings. Data mining provide us the better knowledge to understand the citizen's needs. It helps us to provide the better service and increase the value of information. It is the technology which has the ability to develop project implementation plans for state and national government. It provides fast service than manual system. Requires less storage space than manual paper system and also is provides better security system than manual. Chances of loss of data are very rare. Data mining is a concept in which knowledge discovery presents a great and important role. Data mining is successful if it has the capability to define the problem. Thus knowledge discovery management is the management of data, information, skill, experience and finding hidden aspects of knowledge using machine smartness.

Eventually, if no apparent relationship between e-voting and increased voter turnout is achieved, then the future of e-voting will lay solely upon the cost factor as far as the state is concerned and the trust factor from the voters' point of view. In future, we will work on how to provide security in E-Voting.

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