



# Integrated Smart System to Maintain Citizens Database with Biometric Online Voting

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**Abstract---**The paper is based on linking the various information of a citizen spread over in different departments and aggregated into the single integrated database (DB) to provide interoperability between various departments and thereby making the update by concerned departments to purify the information of people. The information is integrated in database with the help of unique identity. Complete data including basic details, photo and fingerprint is uploaded and various government department details are linked along with the above database. Further updates can be done by the concerned departments. The updates can be done by administrator side and updates are viewed by user side in respected website. Image processing technique is used to simplify monitoring and controlling of human activities. By maintaining the centralized database, we are providing another benefit called online voting. It is achieved using the centralized database which consist electoral details. Voting is authenticated using fingerprint based biometric security.

**Index Terms---**Centralized Database, Integration of Systems, E-Government and Online Voting.

## I. INTRODUCTION

In the recent years, governments of various countries are moving onto “e-government” programs to enhance the activities taken by a government. By going online, reforms of a government will reach faster to the people and 24/7 services are provided to make work easy based on their time and convenience. Efficient

result will be yielded to achieve the target fixed. This is ensured by bringing all the services into a single platform. By providing the online services, manpower and cost of consumption is reduced for the work proceeded and it can be utilized for other services of a government. This is achieved by integrating the several department databases into a single centralized database.

Voting is the most powerful way for citizens to have a voice in the leadership and development of their nation. Even though voting is the fundamental rights of an Indian citizen, Indian citizen living in abroad is not having an option to vote in general elections. So, one person is not able to cast his vote due to the above reason. When a person living in abroad is allowed to vote in fair and open elections, members will feel a greater sense of value, ownership, and responsibility. With the surge of technology, online voting is a convenient option for many members. It will allow them to access ballots anytime, anywhere. Online voting is secured by fingerprint based biometric authentication.

## II. OBJECTIVES

The integrated smart system is a linking of several departments such as bank, asset, tax, employment, education, scholarship, security and online voting. By linking the clustered details of citizens related to above departments are integrated into a centralized database. The collected details from a centralized database are

aggregated in an order. Right from the birth of a person, the details are maintained in a database and updated automatically based on the information updated time-to-time by the several departments mentioned above.

Online voting facility is provided at the time of general elections. This facility is provided by collecting the voter identity details and location details such as area and place of living which is required for elections. These details are taken automatically from a centralized database and loaded into a polling system, which recognizes the constituency of a person where he is supposed to cast his/her vote. Online polling system brings the advantage of casting a vote from where he/she reside. i.e., anywhere from the world. The online voting is made secured by providing fingerprint based biometric authentication for logging into a voting system during the time of general elections.

### III. LITERATURE SURVEY

For efficient development of research, several existing researches done so far have been analyzed. Some of them are discussed below:

The research work done by Pino.C, Ravida.S and Scibilia.S<sup>[5]</sup> has proposed a enormous growth of citizen's data in a public administration requires an adequate use of technologies in order to retrieve the information quickly. Various separated links or scenarios of government are combined into federated database. Various links such as Government to Government (G2G), Government to Business (G2B), Government to Citizens (G2C) and Government to Enterprise (G2E). Those scenarios are combined into a centralized database.

The research work done by Ioannis Katakis, Nicolas Tsapatsoulis, Vasiliki Triga and Constantinos Tziouvas<sup>[8]</sup> has proposed a voting advice applications (VAA) are essentially vote recommendation systems and usually exploited during elections. VAA's are of vital importance since they promote rational reasoning

for voting and to fill information gaps and have positive impact on voter turnout.

The research work done by Marijn Janssen, Yannis Charalabidis and Helmut Krcmar<sup>[3]</sup> has proposed that public systems are more and more interconnected, decisions concerning interoperability, quality, sharing and sourcing.

The research work done by K.Lavanya and Dr.M.Krishnamoorthi<sup>[6]</sup> has proposed that fingerprint is the replication of a fingertip epidermis, produced when a finger is pressured against a plain surface. The most apparent structural characteristic of a fingerprint is a pattern of ridges and valleys. In a fingerprint pattern, ridges are dark, though valleys are bright. Ridges and valleys are frequently run in parallel and they will bifurcate as well as terminate.

The research work done by Parag Chatterjee and Asoke Nath<sup>[2]</sup> has proposed biometrics refers to the metrics related to human characteristics and traits. Biometric identifiers are discrete and distinctive measurable characteristics used to identify an individual. Biometric authentication is a popular technique now-a-days in authenticating a user or implementing access control mechanisms. However in the case of authentication, the physiological characteristics like fingerprint, iris, and face recognition are mostly used compared to the behavioral characteristics in the recent times.

### IV. EXISTING SYSTEM

The system which is followed now in India such as linking of Aadhaar number with various systems handled by the several government departments for the purification of schemes and other problems. The details of the citizen's such as name, address, photo, eye iris, fingerprint etc., are collected for aadhaar card generation. The aadhaar card is used to link various departments. But in this system, aadhaar needs to be linked with every individual department. This has been

done to attain some benefit which has been mentioned above. But in reality, it is very difficult in comparing the Aadhaar number with one to another system. Because, the process of collecting the data is not achieved to aggregate the clustered data. For instance, a passport verification form needs to be verified in banking and

police/security department. While verifying, form needs to be passed in each and every department for inspection. So it takes more man power, time and cost. Though it may be verified using aadhaar identity number for fast retrieval and inspection but it needs individual verification in every department.

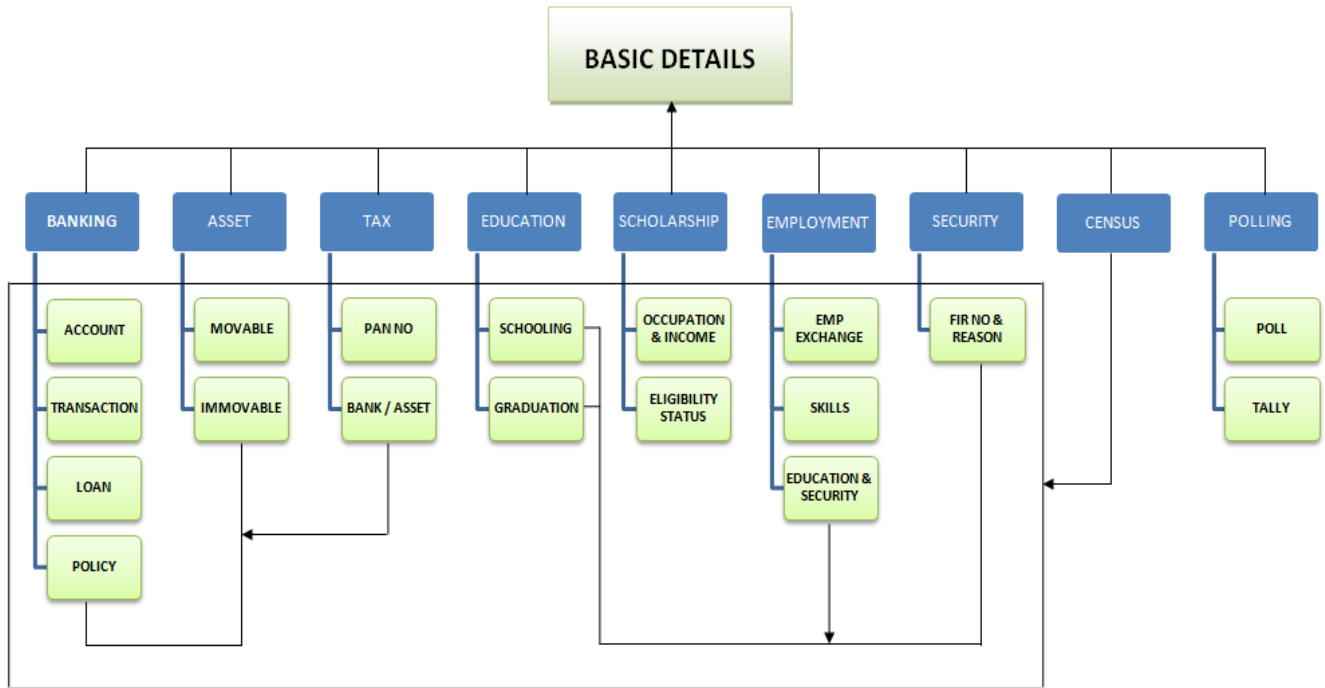


Fig.1 : Hierarchy of integrated smart system or centralized database

### V. PROPOSED SYSTEM

The integrated smart system or centralized system clears the difficulty in comparing and monitoring the various systems of several departments by integrating the database in single system through our proposed project. Thereby, the updates of the government departments are made easier. There won't be in need of searching the documents to verify the citizen's information for any schemes and reforms provided by the government. Therefore, monitoring and controlling of citizens database will be simplified through this project. An application moving from one department to

another department is fully omitted in this proposed system. Because, the related departments are inter-linked to provide interoperability between the different department systems for a required data. Other benefits provided by this system are purification of citizen fake details, aggregating the clustered data, monitoring the money exchange, reduction of double benefits, reduce paper work, literacy of citizen is monitored, employment providing, criminal details detection, passport verification and automatic generation of census report. Using centralized database, online voting is achieved. The centralized database consist electoral details such as voter identity number and residential

address. Voting is authenticated using fingerprint based biometric detection. Benefits provided by this system are, automatic tallying, archived election results, ballot scrubbing, ballot shuffling, comprehensive reporting, email reminders, email validation, reduced costs and saved ballot templates.

## VI. MODULE DESCRIPTION

As shown in fig.1, basic details are taken as a super class for all the departments. The basic details are inherited, which is achieved by interoperability between the departments. Those data are not needed to be entered in every department. Fields which are required for a particular department is entered newly by the concerned administrator only. There are four entities are present in integrated smart system. The entities are listed below:

### A. Entity 1

This entity consists of some departments such as banking, asset and income tax. Detailed description of each department is explained below:

1) *Banking department:* Linking bank account with the primary database will reduce the work of investigation in getting loans and policies etc.,

2) *Asset department:* Linking revenue details of individuals with the primary database will reduce the work of filling several basic details often. And it consist the details of movable and immovable assets.

3) *Income tax department:* By linking bank and asset details with income tax department in the integrated database, money exchanges are monitored easily. So that, Tax is calculated directly for the exact income which avoids black money storages.

### B. Entity 2

This entity consists of some departments such as education, scholarship, employment and security. Detailed description of each department is explained below:

1) *Education department:* The literacy of citizens can be monitored for improving further educational reforms and plans. This is achieved by updating the educational information of citizens by the education department.

2) *Scholarship department:* The integration of several scholarships into a single portal will lead to the reduction of double benefits enjoyed by the beneficiaries. This can be achieved by identifying it on registration time itself. Suppose if they attempt to register twice, the system will detect and doesn't allow the beneficiary to register more than one scholarship.

3) *Employment department:* Employment information can be updated for easy identification of citizen's employment status. Security department module is linked with this employment module to show the disciplinary status of the job seekers in government or private organization.

4) *Security department:* If there is any first information report (FIR) has been registered on a particular person. It is useful in selecting the candidates for government jobs and passport verification process is also reduced. It is updated by respected police/security department. In this module, image processing using finger print is done for finding the criminals database.

### C. Entity 3

This entity consist census department. Description of census report generation is explained below:

1) *Census report generation:* It is easier to take census report from linked information. By integrating all the basic details of the citizens, census report is automatically generated and statistics can be taken.

### D. Entity 4

This entity consist online voting system. Detailed description of online voting is explained below:

1) *Online voting system:* The details required for an election such as voter identity and location details with area/place of living permanently are retrieved from the centralized database. These details are taken and loaded into a polling system, which recognizes the constituency of a person where he is supposed to cast his/her vote. The online voting is made secured by providing fingerprint based biometric authentication for a logging in to a voting system during the time of general elections.

### VII. METHODOLOGY

There are two actors present in this system. They are, user and administrator. User can only view a data respected to him by authenticating. The authentication needs unique identity and password for verification before viewing a data. Administrator can add, view, edit, update and delete the details. These changes can only be done by the respective department after verification.

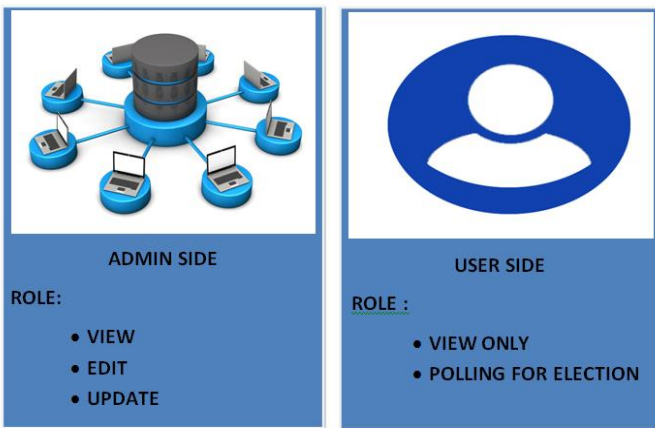


Fig. 2 : Roles of actors in the system

Online polling portal is opened at the date of election to cast his/her vote by accessing the ballot from

home. Fingerprint based biometric authentication is provided to make polling more secure.

### VIII. FUTURE ENHANCEMENT

In future, some functionality can be added to this project for increasing the efficiency and to create maximum benefit to the citizen's. Smart Documentary Machine can be installed in every government department to access and take print out of any document at anytime, anywhere. The documents can be such as birth certificate, income certificate, asset certificate, etc., Mobile OTP's can be provided to authenticate those

machines. Online voting can also be provided with OTP to make more authenticated. Private sectors can also be added to this system to make it more efficient.

### IX. CONCLUSION

Integration of several departments in to a single database or a centralized system with the help of unique identity. Unique identity should be used national wide to maintain the data of whole population in a single platform. By maintaining this system, the monitoring and controlling of the human activities are made easier and efficient. The funds can be saved by filtering double beneficiaries and monitoring of bank transaction and asset details which lead to a corruption free nation. So, the economy of a nation will also be developed.

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