

ELECTRONIC VOTING SYSTEM ON AZURE HYPERLEDGER

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INTRODUCTION

Election is considered as a festival of democracy. We face many hurdles to organize this festival . We can see every year people name get missing from the voting list due to error of election official or malpractice. We need to make our voting list error free from these manual intervention. We also see problem like accusation of EVM hacking and booth capturing .Our current voting system also not allow distant voting. So, people staying or working in different location face problem in voting. Creating Voter ID card also a cumbersome process. We should make this process simple ,secure,robust , tamper proof and transparent so that people can enjoy their festival.

PROPOSED SOLUTION

We are proposing a Azura Hyperledger based solution to all current problems as follow-

- **Apply Voter Card-** If a person already have Adhar card then voter Id will be automatically created when he/she turned eighteen. If anyone do not have Adhar card then they need to apply in the system by uploading their birth certificate and address proof. User can schedule document verification and bio-metric(finger print) registration request.
- **Missing Name-**We will remove idea of manual voting list. We will store the voting list in blockchain. The list will be automatically updated when person age reach 18 based on given details while applying for Voter ID.
- **Live in a Different Location-** We will keep a drop box to select voter location as current and different. If polling officer choose different location,candidate details will be loaded from the location of voter ID.
- **Fake Voter and Booth Capturing-** There has many cases where people use other person voting card to vote in their name and

some people capture booth for false voting. So, user need to give their finger print at the voting for verification before vote so no one can make false voting.

- **Expedite Vote Counting-** We do not need to count the data manually, so we will keep the hyperledger query to count the vote constituency and candidate wise. Result can be out just after voting without any inconsistency.

SYSTEM ARCHITECTURE

We will use Hyperledger composer to build our blockchain back end. Our web application (client side) will interact with the blockchain system with the help of REST APIs. Client side will be build using HTML, CSS, JavaScript, Ajax etc. We will use the database which is implicitly provided by Hyperledger. Currently, we have decided to run all the nodes on a single machine using docker container. Our future goal is to run it on multiple machines on the same network. Our model file will contain following- participant, asset, transaction.

- **PARTICIPANTS**

- Voter
 - ID Registration Officer
 - Election Officer
 - Polling Officer
- **ASSET**
 - Candidate
 - Constituency
 - Voter
 - Ballot
 - Voting Status
 - **TRANSACTIONS**
 - cast Vote
 - Create voter card
 - Update voter information
 - Delete voter information

- Register candidate
- Delete candidate
- Generate voting list (add voter details from Adhar)
- Add constituency
- Delete constituency
- Count vote
- Start Voting
- End Voting
- ENDORSER
 - Poling Officer
 - Election Officer

IMPLEMENTATION

we have build four portal as a part of our project as follow-

- Voter Portal- This portal can be used by voter to register voter card,view voter list,view candidate list and view voter card registration status.



The screenshot displays the 'ELECTION PORTAL' website. At the top, there is a navigation bar with links: HOME, VOTER REGISTRATION (highlighted in red), CANDIDATES, VOTER LIST, and REGISTRATION STATUS. Below the navigation bar, the main heading is 'Register For Voter Card'. The form contains the following fields:

- Name**: Enter Your Name
- Father/Husband Name**: Enter Your Father Name
- Date Of Birth**: dd/mm/yyyy
- State**: Enter Your State Name
- Constituency**: Enter Your constituency Name
- Mobile No**: Enter your constituency Name
- Email**: (field is partially visible)

The background of the form features a faint map of India and a hand with a pink ink mark on the index finger, symbolizing the voter registration process.

- Registration Officer Portal – This portal will be used by registration officer to update voter information.

REGISTRATION OFFICER PORTAL

HOME
REGISTER VOTER
UPDATE VOTER INFORMATION

Registration Status

Registration Number

Enter Your Registration Number

SEARCH NOW

- Election Officer Portal – Election officer can do Register new candidate ,delete a candidate and register new party with the help of this portal.

ELECTION OFFICER PORTAL

HOME
REGISTER CANDIDATE
UPDATE CANDIDATES
REGISTER PARTY

Register Candidate

Name

Enter Your Name

Father/Husband Name

Enter Your Father Name

Date Of Birth

dd/mm/yyyy

State

Enter Your State Name

Constituency

Enter Your constituency Name

Party Name

Enter Party Name

Mobile No

- Polling Officer Portal – This portal will be used for voting purposes where polling officer will start, co-ordinate and end the voting process.

REGISTRATION OFFICER PORTAL

Uttar pradesh

Kanpur

View Candidates

Enter Voter ID:

Serial No	Candidate Name	Party Name	Choose
1	Narendra modi	BJP	Click to Vote
2	Rahul Gandhi	Congress	Click to Vote

TESTING

We are using Hyperledger composer which has inbuilt testing tool which supports three types of testing: interactive testing, automated unit testing and automated system testing. It has a command-line interface that provides commands allowing you to easily run interactive “smoke tests” to ensure the deployment was successful. This also makes it easy to execute tests in a CI/CD system.

System tests can also be created using Docker Compose and Mocha/Chai. You can start a run time and deploy your business network definition, then programmatically create assets, submit transactions and inspect the state of asset registries.