BLOCKCHAIN PROOF-OF-CONCEPT PROPOSAL

Blockchain Development individual assignment.

Voting

Prepared by: Luka Lazarashvili

Due date: 25 December, 18:00 Tbilisi time.

SUMMARY

A voting dapp application that runs on a blockchain and allows users to participate in voting or decision-making processes. Some possible features of a voting dapp might include:

- Secure and transparent voting: Because the dapp runs on a blockchain, all votes are recorded in an immutable ledger, making it difficult for anyone to tamper with the results. This can help to ensure the integrity of the voting process.
- Anonymity: We can encrypt users and they can vote anonymously, which can help to protect their privacy and prevent vote-buying or other forms of coercion.
- Accessibility: A voting dapp can be accessed from any device with an internet connection, making it easier for people to participate in the voting process regardless of their location.
- Efficient decision-making: Because the dapp is decentralized, it can be used to facilitate decision-making processes in a variety of contexts, including corporate governance, community voting, and even political elections.
- Customization: A voting dapp can be customized to fit the specific needs and requirements of a particular organization or community. For example, it could be configured to allow only certain groups of users to vote, or to require a certain percentage of votes to pass a particular measure.

```
contract Voting { // voting contract for register as voters and vote
    address public owner; // owner address
    mapping(address => Voter) voters; // all registered voters
    Voter[] votersArr ; // all registered voters (array for get length)
    bool votingStatus; // to check if voter vote
```

```
    Candidates candidatesContract; //


     event ChangeVotingStatus(); //event on votinng status change

     event SCFeedback(); //event on scfeedback


    modifier isOwner() // to check owner

    modifier is18() // to check if voter is 18+

    modifier isZeroBalance() // to check user balance to prevent fake accaunts spam

    modifier isVoterNew() // to check if user is registered

    modifier hasVote() // to check if voter has left vote

    modifier isVotingTrue // to check if voting is on

    modifier isVotingFalse // ti check if voting is of


    constructor() {

        owner = msg.sender; // find owner address

    }


  function addCandidatesContract(Candidates _candidatesContract) public
isOwner // add candidate contract by owner

  function viewAllVoters() public view returns (uint, Voter[] memory) //
returns all voter

  function checkVotingProcess() public view returns (bool) // returns
voting status

  function startVotingProcess() external isOwner isVotingFalse // owner
starts voting process and emit voting status event

  function stopVotingProcess() external isOwner isVotingTrue // owner
stops voting process and emit voting status event

  function vote(uint8 _participantNumber) external isVoterRegistered(
msg.sender) isVotingTrue hasVote(msg.sender)  // check voter vote and voting status
if success voter can vot

  function registerAsVoter(string calldata _fullname,string calldata
_identicalNumber,uint8 _age) external isVoterNew(msg.sender) is18(_age)
isZeroBalance  // if user is 18+, don't have vote account and have balance
can register as voter
```

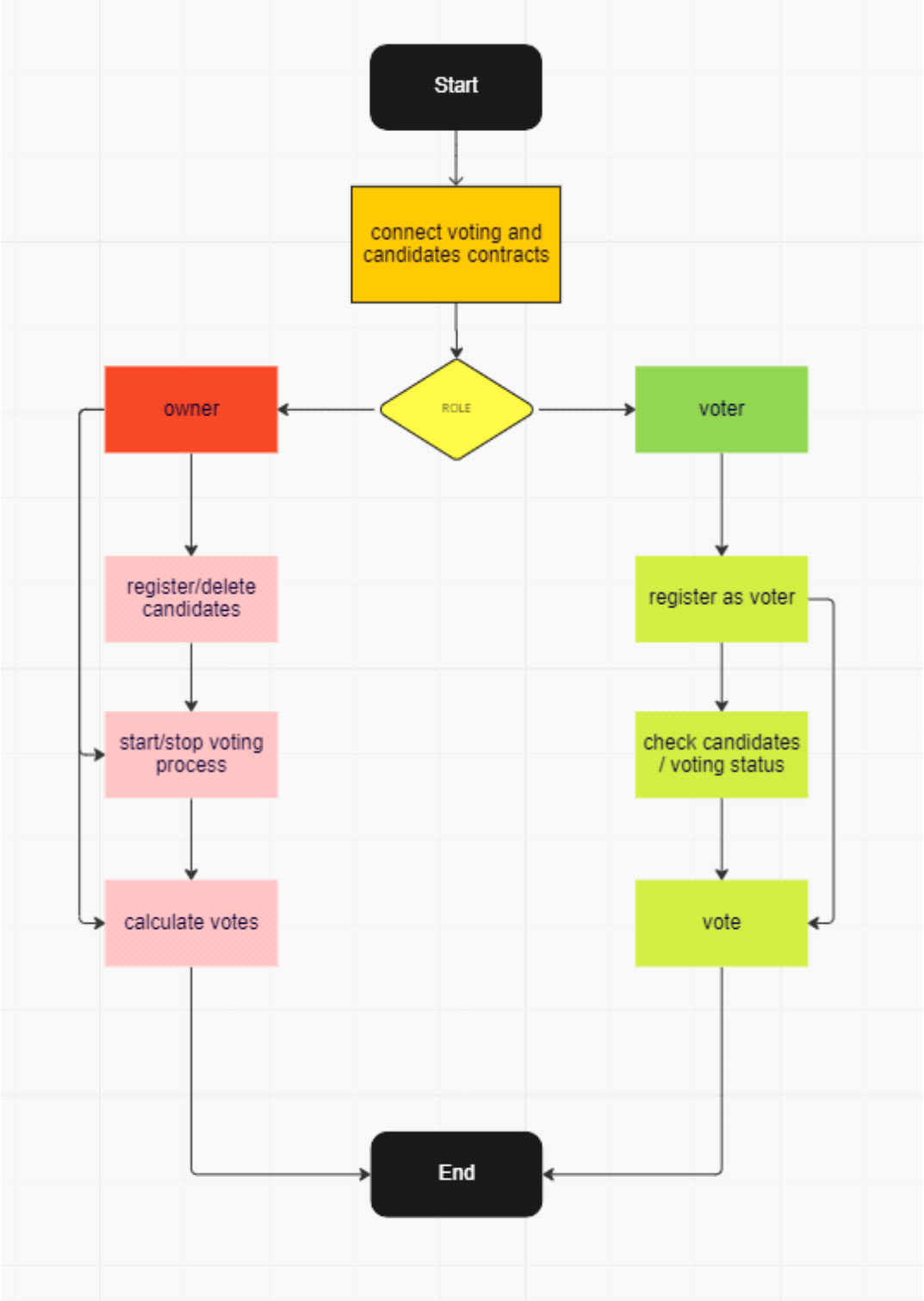
```
 function donateToContractOwner() public payable   // function to donate owner some eths


 receive() external payable() // to catch unespected ethereums

}


contract Candidates{ // Candidates contract to manage candidates by owner

    address public owner; // owner address

    mapping(uint8=> Candidate) candidates; // all registered candidates

     Candidate[] candidatesArr; // all registered candidates (array for get length)

    uint8 maxCandidates = 10; // max candidate number to prevent lots of gas usage from array iterations

     address votingAddress; // address from voting contract


    event CalculateVotes(Candidate[]); // emit when calculate votes

    event WinnerCandidate(Candidate); // emit when find winnner


    modifier checkMaxCandidates() // to check maximum candidates from array length

    modifier isOwner() // to check owner

    modifier isSCSafe() // to add securite level, check votins address



    function addVotingContract(address _votingAddress) public isOwner // owner must add voting contract address when deploy contract to check if votes is validate

     function showAllCanidates() public view returns (uint, Candidate[] memory)  // everyone can see all candidates

    function updateCandidateVote(uint8 _participantNumber) external isSCSafe // +1 vote on candidate if vote is from known contract

    function addCandidate(uint8 _participantNumber, uint256 _identicalNumber, string calldata _fullname, string calldata _slogan) external isOwner checkMaxCandidates // only owner can add candidate

    function deleteCandidate(uint8 index) external isOwner // only owner can delete candidate

    function calculateVotes() external isOwner // owner can invoke function that calculating all vote
```

```
and finding winner

    receive() external payable() // to catch unespected ethereums

}
```

Smart contracts explanation

- Voting contract is used to register users as voters and vote candidate when owner starts votinc process
- Candidates contract is used to add or delete candidates from owner, to calculate votes and find winner, all can check candidates list.

Smart contracts process flow



owner deploy voting and candidates contracts and connect to each other

adding or deleting candidates in candidates contract (max 10 candidate), and start voting process in voting contract

users can register as voter in voting contract

after owner start voting process, voters(users) can vote to only one candidate

owner can stop and calculate result any time

EXPECTED BUSINESS RESULTS

Overall, a voting dapp has the potential to revolutionize the way decisions are made in a variety of contexts, by providing a secure, transparent, and efficient platform for voting and decision-making.

Luka Lazarashvili