Meeting Minutes #1 (Kickoff Meeting)

Date: 01/04/2024 Time start: 6:00pm Time end: 7:00pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Project Group Member Introduction

Agenda

1. Coding

- Discussion of possible coding language to be used (python, C++).

2. Documentation

- Find out what are the necessary documents to be prepared for the next submission.

3. Research

- Research what are the current implementations of RingCT and in what areas they are used for.

Things to Do before Next Meeting

- 1. Understand project requirements.
- 2. Research and understand what ring signatures and ringCT are and how do they work.

Date: 05/04/2024 Time start: 3:00pm Time end: 4:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Discuss Submission Requirements

- 1. How to submit the reflection diary (weekly? End of project?)
- 2. When is the next submission date?
- 3. PRD submission date
- 4. Are wireframes required in the PRD? (wireframes are inside the TDM based on presentation slides)
- 5. What should be included in the PRD

Creation of Platforms to Share Materials

- 1. Google Drive
- 2. Discord
- 3. Telegram
- 4. Taiga

Discussion of Linkable Ring Signatures, RingCT and Their Applications

- 1. Overview of ring signatures
- 2. Overview of RingCT
- 3. What are the real world applications of RingCT? (Monero)
- 4. Are there any other ways to implement RingCT? (E voting, healthcare data exchange, whistleblower)

Things to Do before Next Meeting

- 1. Research the problems and potential solutions related to ringCT.
- 2. Research similar competitors' features.

Date: 10/04/2024 Time start: 3:00pm Time end: 4:00pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Discuss Potential Implementation Problems

- 1. Discuss overview of how RingCT works (hide sender's identity using ring signature, hide transaction data and allow verification using commitments, range proofs, etc).
- 2. Problems in hiding medical records
 - Medical records can be in many forms (pdf, jpeg, txt, etc..).
 - Medical records can include various data (blood pressure, glucose level, etc..).
 - Recognition of patient's photo in PDF (may have to use machine learning).
- 3. Problems with whistleblower app
 - File size may be too big.
 - How do we know the data is authentic?
- 4. Problems in e voting system
 - We might need to use blockchain (i.e.decentralized).

Things to Do before Next Meeting

- 1. Research more about use cases and solutions.
- 2. Try to understand more in detail about RingCT.

Date: 15/04/2024 Time start: 3:00pm Time end: 4:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Discuss RingCT and Ring Signature Implementation

- 1. How does ring signature works (both in rsa and elliptic curve cryptography).
- 2. How does Pedersen commitment works.

Discuss More about Use Cases

- 1. Discuss implementation ideas regards to problems that are raised during last meeting.
- 2. Set up an in-person meeting with project supervisor to present researched use cases and their implementation concerns.

Things to Do before Next Meeting

1. Research more about RingCT and ring signature.

Date: 17/04/2024 Time start: 7:00pm Time end: 8:00pm

Participants: Jun Ji, Phyo, Nann, Nigel

Agenda

Discuss about e voting system

- 1. What kind of e voting system do we want to implement?
 - Singapore election
 - Election and voting related to organizations
- 2. Potential kinds of users for e voting system
 - a. System admin
 - Control access levels of each user profile?
 - b. Board of directors (for organizations)
 - Approve or deny request of election
 - E.g. Directors will discuss if the request is approved.
 - c. Election manager
 - Create request of election for approval
 - E.g Once company decides on election topic, request is sent to directors for approval
 - If the voting topic is not high profile, approval is not needed(?)
 - Able to create different confidentiality elections e.g.()
 - d. Voter
 - Registration of the Voter
 - Register using ID number/organizational email address
 - Login of the user
 - Using of the voting system
 - Able to view the number of votes after the voting procedure ends
 - e. Candidate
 - How will the candidate register?

Potential Difficulties Regarding to SG Election

- 1. For registration or verification of voters' accounts, we need to have access to a specific service or database to verify singpass.
- 2. It is not possible for system admin to manually create an account for each citizen.
- 3. Which kind of people will take which role in sg election (besides from voters and candidates, there must be people who all agree to create or start an election process, who oversees the entirety of the election etc).
- 4. Research the detailed process of SG election and roles and access levels of each person who is involved in the election.

Things to Do before Next Meeting

1. Research about e voting process in detail for both sg election and organizational related elections.

Date: 19/04/2024 Time Start: 3:00pm Time End: 7:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Discuss about E-Voting System

- 1. Discussed our findings on multiple e-voting platforms, highlighting their advantages and disadvantages.
- 2. Finalized idea for implementation of RingCT: an E-Voting system for the Singapore General Election.
- 3. There will be 5 distinct roles in our e-voting system: System Admin, Candidate, Voter, General User, Returning Officer.

Discuss Work Flow of SG Election

1. Once the roles have been finalized, we will begin plotting the flow of how the election process is carried out with figma. What are the designated roles of each user, how will they interact with one another etc.

Next Meeting

- 22nd April 2024

Date: 22/04/2024 Time start: 3:00pm Time end: 4:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Discussion about Tech Stack

- 1. Containerize the application/service into a docker container?
 - Allows for debugging and development in the same environment.
 - Helps streamline tests and deployment efforts.
- 2. Gitlab vs Github
 - a. Gitlab provides a solid base for CI/CD.
 - b. Github requires you to set up the CI/CD pipeline yourself.

To Do

 Arrange meeting with project supervisor to receive feedback on current implementation of our product.

Next Meeting

- 24th April 2024

Date: 24/04/2024 Time start: 3:00pm Time end: 4:00pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Meeting with Project Supervisor

- 1. Met with our project supervisor to receive feedback on current implementation of our idea, his feedback included:
 - a. The Singapore General Election has a returning officer role to process the candidates prior to the election. As the main focus is the implementation of RIngCT, we should focus on that instead of the administrative duties of an election (removal of Returning Officer role).
 - b. We must convince the assessor on the complication of our problem and provide a solution on how we intend to solve it.
 - c. Explain the core RingCT infrastructure and how it works, as well as how it is applicable to our E-Voting system.
 - d. Develop something workable and useful, something that one is able to easily relate to.

To Do

1. Divide tasks amongst members for the PRD document, update on progress made in the next meeting.

Next Meeting

- 26th April 2024

Date: 26/04/2024 Time start: 9:00pm Time end: 11:00pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Update on PRD

- 1. Tasks left pending are:
 - a. Business model
 - b. Development tools and methodologies
 - c. Regulations
 - d. Stretch goals
 - e. Gantt chart
- 2. Non functional requirements portion is missing the scalability and compatibility portion, to be added in later.

To Do

- 1. Methodologies and stretch goals are to be completed and will update once it is finished.
- 1. Gantt chart to plot the entire flow of the project, not just the prototyping phase.

Next Meeting

- 29th April 2024

Date: 29/04/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Update

- 1. Methodologies and stretch goals are completed and to be combined into the PRD draft.
- 2. Regulations still pending, to be completed by next meeting.
- 3. Overview of competitor has been completed and to be added into the PRD draft.
- 4. Use Case Descriptions for System Admin, Candidate, Voter and General User have been completed, pending peer review from all members before including it into the PRD.

Planning of Wireframe/Use Case Description

- 1. Begin planning of wireframes to showcase E-voting platform design and how it will look like.
- 2. Creation of use case description to highlight the steps each user will take to navigate through our E-Voting system.

Next Meeting

- 2nd May 2024

Date: 02/05/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Meeting with Project Supervisor

- 1. Second meeting with project supervisor
 - a. Don't over engineer, the main purpose is to be able to use RingCT to implement an E-Voting system.
 - b. Don't think of a perfect solution, quickly test out the idea to see if it is viable.
 - c. Start on a smaller scale, illustrate that we are able to conduct voting for a small group (e.g 5 people) Once proven successful, scale up accordingly.

Update

- 1. Complied our updated changes into our PRD, it includes:
 - a. Updated the project description to highlight the key role RingCT plays in our project.
- 2. Performed final quality check before submission.

Date: 08/05/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. The docker containerization setup is almost completed, which will enable us to run our applications reliably and in any environment, given how our members are using different operating systems.
- 2. Set up of gitlab was completed, added members into the repo.

To Do

- 1. Discuss plans on how to proceed with URS/TDM
 - What are the necessary documents required?
 - When is the next deadline?
 - Allocate the division of tasks (Database diagram, ERD, activity diagrams).
- 2. Based on previous design discussion, begin drawing up the wireframes for the E-Voting system.

Next Meeting

14th May 2024

Date: 14/05/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Changed the backend server to postgres instead of djongo due to:
 - The inconsistency in djongo.
 - Python libraries needing to be downgraded in order to accommodate djongo.
 - Postgres supports the JSON file type and Django's ORM (Object Relational Mapper) has native support for postgres, meaning it is well tested and reliable when paired with postgres databases.
- 2. Testing with postgres was successful, merged postgres into the main branch.
- 3. Successfully pushed the branch feat/2-systemadmin, which handles the CRUDs of the user account, district and election status.

To Do

1. Use Case Descriptions have been allocated to the respective members and to be completed by the next meeting.

Next Meeting

- 21st May 2024

Date: 21/05/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Added a new branch that includes borromean ring signature for rangeproof.
- 2. Added compute mask function for output commitments.

To Do

- 1. Discussion of the candidate workflow, use figma to illustrate.
- 2. Meet with supervisor to clarify doubt about division of tasks between the users.

Next Meeting

- 27th May 2024

Date: 27/05/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Grpc setup is completed, allowing the django server to communicate with the RingCT microservice.
- 2. Pushed a new branch feat/4-systemadmin which includes the CRUDs of announcements and election party.

To Do

1. Begin working on the backend logic for the Candidate, as well as the front-end logic.

Next Meeting

- 4th June 2024

Date: 04/06/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Voter frontend has been completed.
- 2. Still working on the candidate front-end and back-end, the delete function for the candidate is still pending.
- 3. Preliminary User Manual and User Requirements Specification is close to completion.

To Do

- 1. Tentatively, use wix to construct the marketing website for prototyping purposes. May shift to using react.js for more customizability.
- 1. Construction of the database diagram, ERD, class diagrams, activity diagrams, state diagrams etc.

Next Meeting

- 10th June 2024

Date: 10/06/2024 Time start: 2:00pm Time end: 6:30pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Rebased the feat/1-evoting to feat/2-evoting to complete gprc integration.
- 2. Completed a script for table initialization and django mock data insertion, this will help assist in the drawing of the database and ERD diagrams.
- 3. CPP class diagram has been completed and has been added to the TDM draft.

To Do

- 1. Creation of presentation slides for pending presentation on the week of 16th June.
- 2. Completion of the activity and use state diagrams.

Next Meeting

- 14th June 2024

Date: 14/06/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. There was an error in how the database and ERD diagrams were drawn so they were quickly rectified.
- 2. Updated the database to be used in the "Tech Stack" section from MongoDB to PostgreSQL in the PRD documentation.
- 3. Updated the functional requirements, work breakdown structure and gantt chart in the PRD documentation.
- 4. Addition of mock Singpass Login service in the System Features section in the PRD documentation.
- 5. Addition of new features comparison with competitors to highlight our product's unique selling point.
- 6. Presentation slides are completed and to include with the other relevant documents.

To Do

- 1. Perform final quality check on all relevant documentation before final submission.
 - Check that the Preliminary User Manual, Project Progress Report,
 Technical Design Manual, User Requirements Specification are present.
 - Check for grammatical errors, formatting inconsistencies.

Next Meeting

- 18th June 2024

Meeting Minutes #19

Date: 18/06/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Pushed the branch feat/8-evoting to be used during demo.
- 2. Created a script to show how voter anonymity is present when the voter casts a vote, in the event the assessor asks for clarification. The script will grab all the info related to the voter and print it out for easy viewing.

To Do

- 1. Continue practicing the respective parts of the presentation.
- 2. Conduct an initial dry run to figure out total time taken for the presentation.
- 3. Schedule meeting with project supervisor to demo the presentation to ask for feedback/critique on the slides and the content of the presentation.

Next Meeting

- 26th June 2024

Date: 26/06/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Pushed the branch feat/8-models-urls-testing, which conducts unit tests for all the models and urls used to ensure they are functioning as intended.
- 2. Pushed the branch feat/9-evoting which provides the General User functionality.
- 3. Pushed the branch feat/10-evoting, which modified views to use updated functions for the general user and removed the functions that are no longer in use.
- 4. A logout function was added to properly end a user's session.

To Do

1. Plans to implement invalid and edge cases for test_models.

Next Meeting

- 3rd July 2024

Date: 03/07/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Runner will run the gitlab yml file, this will simulate how the tests are run in the local machine. After docker images are built, it will be stored in the container registry.
- 2. For the views unit tests, currently fixing gRPC error. Recorded the errors in taiga to be amended later.
- 3. Added validation for models for the candidate election poster, disable upload of large file sizes.
- 4. Added validation so that votes computed cannot be a negative value.
- 5. Tested django models for invalid and edge cases.
- 6. General User page can display the announcements, election status and districts in the election.

To Do

- 1. Complete the compute_total_vote function.
- 2. Need to add validation for passwords (e.g at least 8 characters).
- 3. Enable candidate to change their password(?), change "forget password" to "change password".
- Conduct first level of system testing to track errors.

Next Meeting

- 8th July 2024

Meeting Minutes #22

Date: 08/07/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. AWS hosting, comparison of pricing for hosting of the e-voting site.
- 2. Fixed some of the errors for the django_views.test and grpc calls.

To Do

- 1. Optimization of sql query for pagination
- 2. Further research needed on deployment of the e-voting website
- 3. Study webauth for implementation of biometrics verification for candidate
- 4. Finish integration testing

Next Meeting

- 13th July 2024

Date: 13/07/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Django server is on the cloud, it is now live. RingCT server has not been set up so login with Singpass is disabled for the moment.
- 2. AWS Config has been changed as not much testing to be done yet, so there is no need to allocate more CPU/RAM.
- 3. URL restriction based on role (e.g System Admin cannot use voter function).
- 4. Error handling for the frontend has been implemented.
- 5. Search function has been enabled, as well Candidate delete posters, statement and profile picture.
- 6. Integration testing is yet to be tested as view functions have not handled all errors.
- 7. Marketing website mostly completed, video player and download button for relevant documents added.

To Do

- 1. Deploy RingCT server, so it can be deployed on AWS.
- 2. Error handling at the model level.
- 3. Finish up integration tests.

- 4. Setting up of mock database.
- 5. Align System Admin components in the e-voting website.

Next Meeting

1. 18th July 2024

Meeting Minutes #24

Date: 18/07/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Singass has been enabled on the live site, allowing voters to successfully login.
- 2. Persistent storage to store media files for candidate's profile picture and candidate poster.
- 3. Webauth has been successfully implemented.
- 4. Finished remainder of integration testing.
 - a. Users login/logout
 - b. System admin

To Do

- 1. Work on the mock singpass data.
- 2. Combine webauth process with the user login.
- 3. Work on mobile view for the candidate/voter pages.
- 4. Work on fixing the alignment of the charts in the voter page .

Next Meeting

- 22nd July 2024

Date: 22/07/2024 Time Start: 6pm Time End: 7pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Uploading of csv file for district and user.
- 2. Ongoing results feature has been included to keep track of election results.
- 3. Pie chart added to general user page.

To Do

- 1. When registration fails, do not log in the user.
- 2. Fix alignment in the final results page for the general user.
- 3. Add CSS to the new webauth features added.

Next Meeting

- 24th July 2024

Date: 24/07/2024 Time Start: 9pm Time End: 10pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Added pagination and grab decoy, integrated range proof into the codebase.
- 2. Implemented health check for the ringct, checks if service is alive or dead.
- 3. Deploy ringCT in the live service.
- 4. Added message during successful login, added more validations (no more than 2 election phases can be active at the same time etc).
- 5. Test models and test urls, all tests run successfully.
- 6. Cleaned the urls page for make naming more consistent.
- 7. Set max limit for webauth to 2 devices.

To Do

- 1. Cpp testing yet to be completed.
- 2. Figure out what tools to be used for stress testing.
- 3. Container scanning yet to be implemented.

Next Meeting

- 26th July 2024

Date: 26/07/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Did container scanning and stress test, demo part of stress test (create 500 mock users to access live site).
- 2. Integration testing has been completed.
- 3. Web-auth has been finalized.

To Do

- 1. Create district, compute total vote and ... (asynchronous code).
- 2. Improvement of the sql query on the cpp side.
- 3. Testing of views to be done.
- 4. Finish stress testing.

Next Meeting

- 28th July 2024

Date: 28/07/2024 Time Start: 2pm Time End: 3pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Test_views has many test cases, so will take some time to complete.
- 2. Still working on cpp testing, 2-3 tests have passed so far.
- 3. Alignment for the charts in the general user charts, added additional animations.
- 4. Mobile view for general user has been added.

To Do

- 1. Fix announcement font family for consistency and system admin update user profile page.
- 2. Disable create buttons during the different election phases.

Next Meeting

- 30th July 2024

Date: 30/07/2024 Time Start: 3pm Time End: 4pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Shared findings of the stress test, try to find which parts of the code is bottlenecking the system.
- 2. 150 users are the current maximum users.
- 3. Added salt to the voter model in the singpass backend.
- 4. Performance testing for sql query.
- 5. View tests is almost completed, disable creation buttons have been done.
- 6. Cpp testing almost finished.
- 7. Fixed alignment in the voter homepage.

To Do

- 1. Create 2 accounts for admin, in the event one admin is unavailable during the election.
- 2. Restrict ip address during polling day.
- 3. If the voter does not cast a vote, generate a list of voters who did not participate in the election.
- 4. System testing to conducted once changes have been pushed to main.

Next Meeting

- 1st August 2024

Date: 01/08/2024 Time Start: 2pm Time End: 3pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Upload csv button completed, find the voters who have never logged, logged in but never voted and print out the results.
- 2. Added some url tests and url restrictions.
- 3. User manual is still worked on.
- 4. All djanjo test integration.

To Do

- Finalize what functions we will demo to project supervisor.

Next Meeting

- 2nd August 2024

Date: 02/08/2024 Time Start: 10pm Time End: 11pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Held a meeting with our project supervisor to update him on our current progress with our project.
 - a. Showcase biometric authentication as requested by assessor (biometrics).
 - b. Csv feature for creating districts.
 - c. Csv feature for creating user accounts.
 - d. Showcase master device feature, in the form of a usb key.
 - e. Perform stress test to simulate live voting and showcase live vote count feature.
 - f. Showcase feature of tracking non-voters during polling day.

To Do

- 1. Automate certain steps of the testing process?
- 2. Discuss how to showcase all the new features within the live demo.
- 3. Implement second admin account.

Next Meeting

7th August 2024

Date: 07/08/2024 Time Start: 9pm Time End: 10pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Updated system design and combined it with deployment diagram.
- 2. Redid system design as it has been updated.
- 3. Ci/cd pipeline document has been created.
- 4. Sequence diagrams have been updated, adding them into the final document.
- 5. Finished user manual document.

To Do

- 1. Combine sql performance test with stress test.
- 2. Testing range proof function.

Next Meeting

9th August 2024

Date: 09/08/2024 Time Start: 3pm

Time End:

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda

Updates

- 1. Stress test was combined with sql dealing.
- 2. Fixing ci/cd pipeline.
- 3. Integration test is still being worked on.
- 4. WebAuthn to be updated to allow deletion of single user's credentials.
- 5. Risk management plan is being worked on.

To Do

- 1. Mobile view for marketing website to be fixed.
- 2. Continue working on risk management plan.
- 3. Complete last bit of integration testing.

Next Meeting

- 12th August 2024

Date: 12/08/2024 Time Start: 8pm Time End: 9pm

Participants: Phyo, Chin Yee, Nann, Nigel, Jun Ji

Agenda Updates 1. Ring-CT (user manual). 2. WebAuthn for voter has been implemented. 3. Delete my credentials button has been included for system admin, candidate and voter. 4. Penetration Testing document has been completed. To Do 1. Finish writing ring-ct component for user manual. 2. Flnish up integration test for cpp. Next Meeting