OrgTracks: A Real-Time Interview Activities Tracker for the Membership Application Process of UPLB Student Organizations

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***Abstract*— Tracking the interview activities within the membership application process of student organizations using general-purpose tools adds unnecessary complexity to the overall process. The burden from the slow and inefficient process is usually carried by organization members and officers. OrgTracks aims to solve this by providing a dedicated system for tracking the interview activities for the membership application process of UPLB student organizations. The system was successfully developed using MongoDB, Express, Next.js, Node.js, and Socket.IO; and was deployed in the cloud for user testing and evaluation. Thirteen (13) user testers evaluated OrgTracks using the System Usability Scale (SUS), where the system obtained an average score of 79.23 concluding its usability for the target users.**

***Index Terms*— real-time, web application, student organization, membership application process**

I. Introduction

A. Background of the Study

Member recruitment is a vital process in a student organization's continuity. It is a complex and time-consuming process that requires the involvement of its members. A part of it is the membership application where interested students take the initiative to participate in the process in hopes of becoming a member of their desired student organization. Then, the student organization interviews the applicants and collates their observations about them, tracks their progress, and later on deliberates whether or not they will be accepted to the organization. The process of tracking the progress in the interview activities of many applicants in the perspective of the student organization, specifically the officers-in-charge of the process, can get cumbersome and tedious.

Since a student organization is composed of members from several departments, using web applications with real-time features for information sharing is typical due to their collaborative benefits such as increase in productivity, organized workflows, and improvement in workplace user experience [1]. Student organizations at the University of the Philippines Los Baños (UPLB) use web applications such as Google Docs and Google Sheets to track the progress of the membership applicants. The officer-in-charge sets up all the necessary documents – such as time availability matrix, reporting documents, and feedback sheets – which are to be filled out by the participating organization members. The time availability matrix is set up with Google Sheets, while the reporting and feedback documents are created using Google Docs. These documents are edited by the concerned organization members to track the progress of the applicants during the interview process (also called as the reporting process). When the membership application process concludes, it is necessary for the point person [2] of the student organization to update its membership roster in the Office of Student Affairs Management (OSAM) System – a modernization project of the Office of Student Activities (OSA) under the university's Office of the Vice Chancellor for Student Affairs (OVCSA) [3] – which is another step to formalize the membership of the newly-accepted members of the student organization. While the current solution gets the job done, the setup is time-consuming and tracking all separate documents gets cumbersome as the number of applicant increases. Furthermore, the tedious nature and jagged user experience of the current solution ultimately burdens the organization officers and members because such tools were created for general document creation that were not tailored to the processes of student organizations such as the interview activities.

B. Significance of the Study

As of the 2nd semester of the academic year 2022-2023, UPLB has over 180 student organizations registered at OSA [4]. Integrating software programs in organizational processes is beneficial as appropriate tools can increase organization within teams and allow them scale their processes if necessary. [5]. In the case of student organizations, a system tailored to the tracking of interview activities for their membership application process will reduce the hassle of setting up relevant documents, eliminate the friction in tracking multiple documents, and automate the updating of membership roster in OSAM System, which make the process more efficient and scalable.

C. Objectives of the Study

This study aimed to create a real-time interview activities tracker for the membership application process of student organizations at UPLB. Specifically, it aimed to:

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1) Create a secure web application for the proper management and scheduling of interview activities within the membership application process of UPLB student organizations.
2) Implement a real-time update feature for displaying the reporting progress of the applicants during the membership application process.
3) Design and develop a module that will update the membership roster of an organization with the details of the successful applicants via an upload feature to the OSAM System of OVCSA.

D. Scope and Limitation

The system was developed during the 1st semester of the academic year 2023-2024. Its target users are the students part of student organizations at UPLB. The activities that will be tracked by the system under the membership application process of a student organization will be the interview assignments, appointments, statuses, feedback, and membership acceptance of organization applicants.

In terms of the system's operation, it will be a web-based system to be deployed into the Internet to enable remote access for users through their devices' web browsers. Furthermore, it will support real-time updating of data within the web application so that the users do not have to frequently reload the application to get the latest data.

II. Review of Related Literature

A. Google Workspace Applications

A study by Chomiak-Orsa and Klus [6] showed that social organizations such as student government use online tools like Google Workspace applications to improve their operations and make information collection, storage, and exchange efficient across its stakeholders. At UPLB, students also utilize Google Workspace through the UP Mail account provided by the university for academic and organizational purposes.

Two applications that is commonly used by UPLB students are Google Docs and Google Sheets. Google Docs is a free online document editor that allows real-time collaboration for users using any device. [7] Google Sheets is a free online spreadsheet editor that – similar to Google Docs – allows users to collaborate using any device. [8] Both apps are part of the suite of tools under Google Workspace, which is oriented towards productivity and collaboration. While these apps integrate well with each other, the workflow that the student organizations intend these apps to during the interview activities within the membership application process introduces some issues. In the part of the officer-in-charge of the student organization, it is tedious to create and organize numerous documents that contain the applicants' relevant information about the interview progress because it involves working on a template document and later on duplicating then customizing the information for each individual applicant. This also makes it unnecessarily time consuming to track the summary of the applicants' progress because the officer-in-charge needs to open each document to see the latest progress of the applicants. It consequently makes the process hard to scale if the number of applicants in the succeeding batch of membership application process increases. Furthermore, the issue of data security is present because there is no proper restriction on who can edit only the specific parts of the shared documents. If a document is shared to a set of users, they have the ability to edit any part of the document even if they should only be editing a specific part of it.

B. OVCSA, OSA, and RECOMMIT

The Office of the Vice Chancellor for Student Affairs (OVCSA) is an office under the university's Office of the Chancellor, which supports the diverse needs of the growing student community at UPLB. [9] Formerly known as the Office of Student Affairs, OVCSA takes on a greater role at making an impact by addressing the needs of UPLB students when it was elevated by the UP Board of Regents in 2020. [10] One of its sub-office is the Office of Student Activities (OSA), which caters to the activities involving students and organizations in the university. It aims to develop skillful students and organizations through utilizing students' organizational resources and intends to be a proactive unit taking the modern knowledge management practices through the efficient and effective use of interpersonal communication and information technology. [11]

Another unit under OVCSA is the Research, Communication, and Information Technology (RECOMMIT). It supports all the other units and offices of OVCSA by providing various information and communications technology resources. These include the design, development, and maintenance of information systems tailored to UPLB constituents; crafting of strategies, procedures, plans, and policies to ensure the efficient operation of the OSAM System; managing the ICT resources of OVCSA; and dissemination of information and conducting IT training to students and staff. [12]

C. OSAM System

One of OVCSA's initiative is called OrgsUP, a system created to facilitate records management, automation and digitization of organization recognition forms, creation of activity permits, and online submission of activity reports, among other features. [13] The system has evolved to become the OSAM System that now has an advanced suite of mobile, desktop, and web applications that help OSA in providing efficient student services. [3] The OSAM System is continuously being developed by OSA with the help of RECOMMIT.

D. WebSocket Protocol

The WebSocket Protocol is a proposed standard that allows full-duplex communication between a client and server [14] without the need to initiate multiple HTTP requests that is performed in the older HTTP polling protocol [15]. It has been widely utilized in different applications including productivity, business, and complex-scale applications. [16] [17] [18] It has been adopted by web applications and developers due to the significant bandwidth savings and decrease in network overhead. [19] The real-time features can be implemented

using the native WebSocket implementation in browsers and a Node.js server using a module called "ws." However, the WebSocket protocol evolves which means browser-specific implementation might be different and support for older browsers must be considered. Thus, an abstraction on top of WebSocket that takes care of cross-browser and backward compatibility is preferred by developers through the use of library called Socket.IO. [20]

III. Materials and Methods

A. Development Tools

The system was developed using a laptop with the following specifications:

- Operating System: MacOS Ventura 13.3.1
- Chip: Apple M1 (8-core CPU, 7-core GPU)
- Memory: 8GB
- Storage: 256GB SSD

The system used the following technologies to implement its features:

- Next.js - a React framework that allows the creation of full-stack web applications
- Express.js - a back-end framework for developing web applications and APIs
- MongoDB - a non-relational database management system that uses a simple document model while maintaining scalability and flexibility
- Socket.IO - a library that enables a full-duplex, low-latency, and event-driven communication between client and server.

B. System Features

1) *User Accounts:* The users can create an account and log in to the web application with their UP Google Mail accounts.
2) *Organization Information Management:* A user that has an administrator role in an organization can manage the information of their organization, which includes the list of departments, members, roles, applicants, and interview assignments.
3) *Interview Assignments:* The users can monitor their interview assignment progress, which includes the number of accomplished interviews and notes to an organization applicant.
4) *Appointment Scheduling:* The organization applicants can create appointment requests through a calendar interface to the organization members, and the latter can either accept or decline appointment requests.
5) *Applicant Evaluation:* An organization officer can conclude the application process, which will prompt them to evaluate the membership acceptance of the applicants.
6) *Reporting to OSAM System:* An administrator can send the details of the successful applicants to the OSAM System through a dedicated button inside OrgTracks.

C. System Architecture

Figure 1 shows the system architecture of OrgTracks. The client serves the user interface where users can interact with the web application. Then, it communicates with the back-end server via HTTP requests to process user data and update the database. Moreover, the client initiates bidirectional communication with the server through Socket.IO to enable real-time update features and notifications. Finally, OrgTracks's server communicates with the OSAM System through an API that receives and saves the membership details of the successful applicants to a dedicated database in the OSAM System.

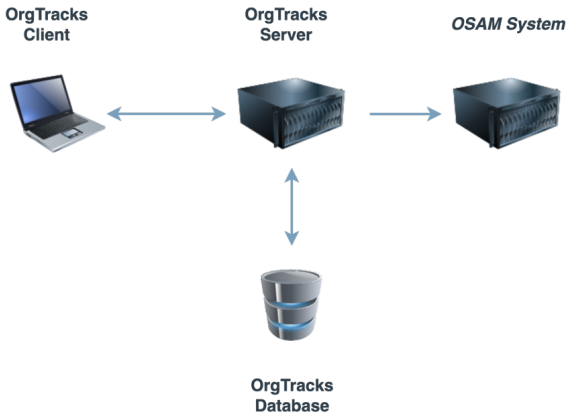

Fig. 1. System Architecture

D. Process Models

The system has the following user classifications to achieve the objectives of this study:

1) *Organization Applicant:* The system will allow an applicant to view the list of organizations they have applied to. They will also be able to view their interview assignments and request for an interview appointment with the organization members through the system. Finally, they will be able to view their progress, which includes their application status and their interview quota with the organization members. Figure 3 shows the user flow for an organization applicant within OrgTracks.
2) *Organization Member:* The system will allow an organization member to view the list of organizations they are a part of. Inside it, they will be able to view their interview assignments with the applicants and can accept or decline an appointment request. Finally, they will be able to mark the interview as completed and put their feedback to the applicant which will be only visible to the applicant and optionally to the members of the organization. Figure 3 shows the user flow for an organization member within the system.
3) *Organization Officer:* An organization officer inherits the privileges of an organization member. Additionally, they will be able to monitor the progress and evaluate the membership acceptance of the applicants. Figure 4

shows the user flow for an organization officer within the system.

4) *Organization Administrator:* An organization administrator inherits the privileges of an organization officer. Furthermore, they will be able to manage the settings of their organization. This includes the department list, membership roster and role management, applicants list and interview assignments, and reporting the list of successful applicants to the OSAM system. Figure 4 shows the user flow for an organization admin within the system.

E. Entity Relationship Diagram

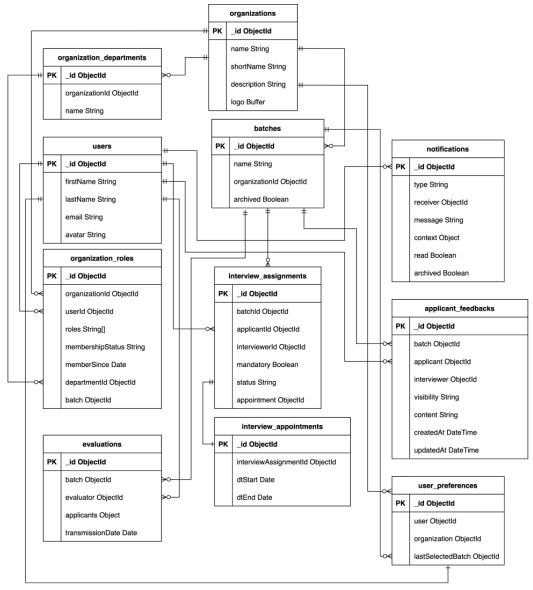

Fig. 2. Entity Relationship Diagram

F. User Flow

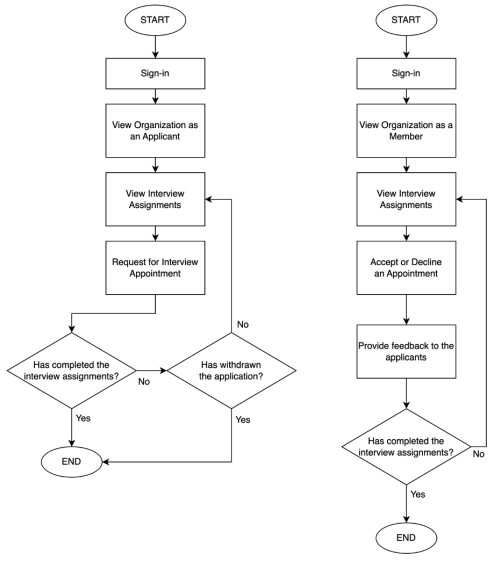

Fig. 3. User flow of an Organization Applicant (left) and Member (right)

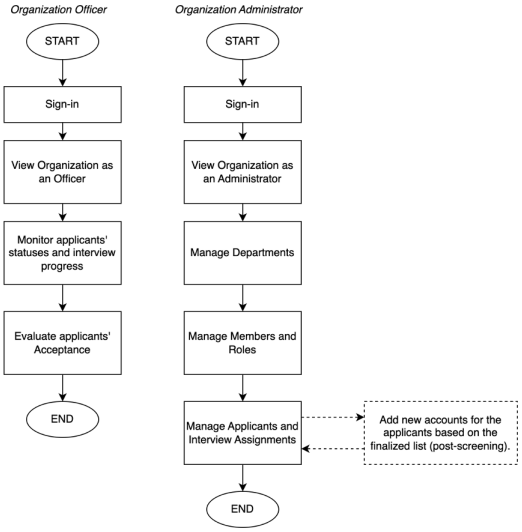

Fig. 4. User flow of an Organization Officer (left) and Administrator (right)

G. Authentication System

To ensure the security of the system, the following authentication measures has been implemented:

1) User Registration and Login: A user can create an account by clicking the Google One Tap button in the registration page, which requires them to authorize OrgTracks to access account information and obtain a secure token. The back-end server decodes this token and uses the name, email address, and picture associated with the user's Google Account to locally register the user in OrgTracks' database.

Once the user has successfully registered for an OrgTracks account, they will be able to log in using also Google One Tap in the login page. If the user authorizes the log in, the service returns a similar token that is also decoded in the back-end server and uses the email address to find an existing account in OrgTracks database. If the user has a matching record, the server generates a secure JSON Web Token (JWT) that contains the user object. This token is saved on the client side, which will be used for future requests to OrgTracks API endpoints.

2) API Endpoints Protection: OrgTracks' API endpoints use an authentication middleware to protect the routes that modify or gives access to sensitive user information. To access the protected routes, the JWT generated upon log in must be included in the header of every HTTP request. The server authorizes the request if it was able to verify the token validity and serves the requested resource accordingly.

H. Testing and Evaluation

Students who are members of any student organizations at UPLB were invited to participate on the testing of OrgTracks. Using the system, they were asked to simulate a part of their membership application process by taking on different roles as outlined in the Process Models and Figures 3 and 4. Afterwards, a two-part survey were given to the participants to evaluate the usability and usefulness of the system with regards to their respective organizations' membership application process. The first part contained the System Usability Scale (SUS)

[21] to assess OrgTracks' usability. The second part contained an open-ended form for feedback, suggestions, and thoughts on how useful the system will be in the membership application process of the participants' respective organizations.

IV. Results and Discussion

OrgTracks has been developed as a real-time interview activities tracker for the membership application process of student organizations at the University of the Philippines Los Baños. The system was deployed in the following cloud platforms for user testing: Vercel (front-end), Render (API servers), and MongoDB Atlas (databases).

A. System Features

1) *User Accounts*
Fig. 5 shows the registration page of OrgTracks. A user can create an account with the application through Google One Tap with their UP Mail account (Fig. 6). The application saves the name, email address, and picture associated with the UP Mail account to the database to keep track of the registered users in the application.

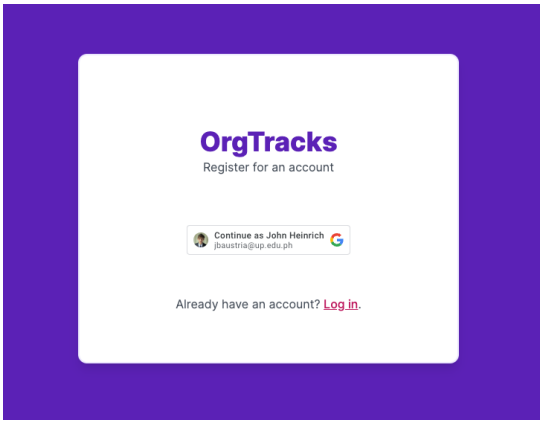

Fig. 5. Registration Page

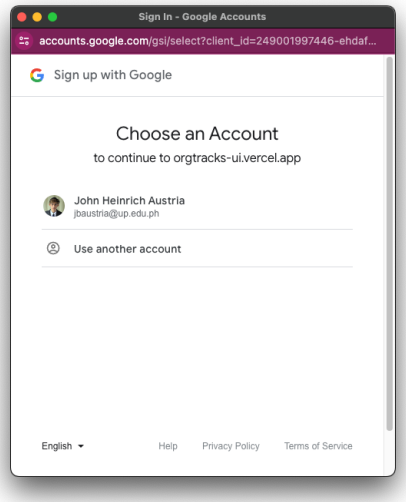

Fig. 6. Google One-Tap Sign-in

The user will be redirected to OrgTrack's home page (Fig. 7) after successful registration, or they can log in to the application through the same Google One Tap provided that they have already registered within the application.

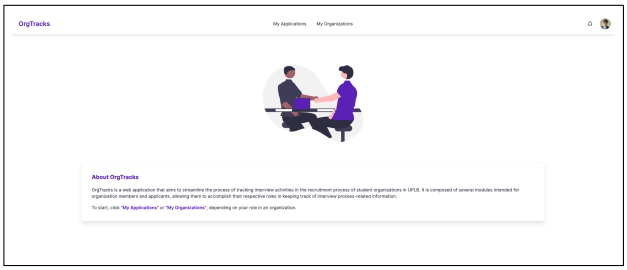

Fig. 7. OrgTracks Homepage

2) *Organization Information Management*
In My Organizations page (Fig. 8), the user has the ability to create a new organization. In Fig. 9, it shows the required information to create an organization such as the organization's proper name, short name, and description. Optionally, the user can add a photo that represents the organization being created. The user who created the organization is automatically assigned the administrator role for that organization, who has the ability to manage organization data including departments, members, and applicants.

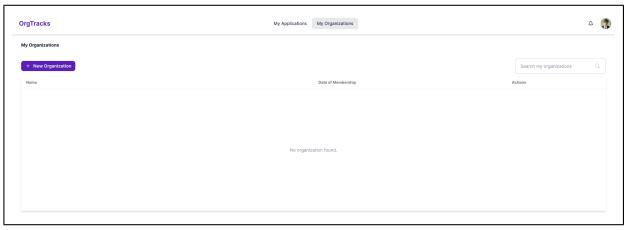

Fig. 8. My Organizations Page

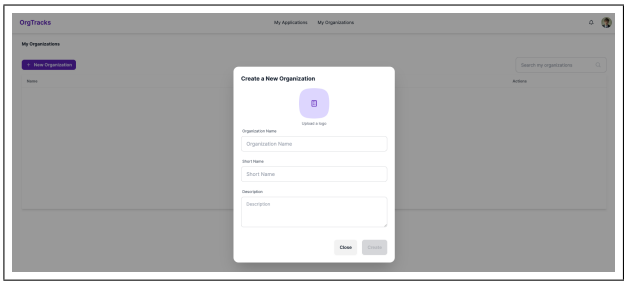

Fig. 9. Create Organization

After the successful creation of an organization, the user will be redirected to the organization settings area. The settings area consists of the following pages:

- General - organization's name, description, and photo can be updated (Fig. 10)
- Departments - manage departments (Fig. 11)
- Members - manage members (Fig. 14)

- Applicants - manage applicants and corresponding batches (Fig. 19)

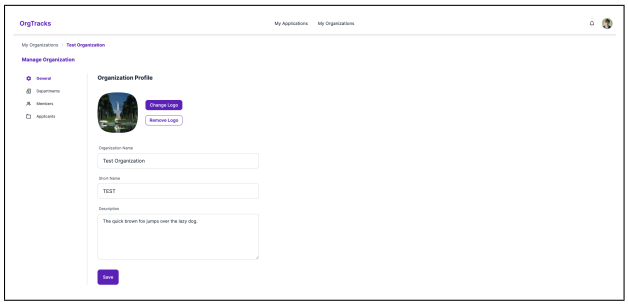

Fig. 10. Organization Settings - General

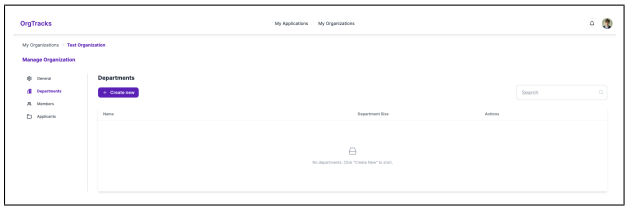

Fig. 11. Organization Settings - Departments

Fig. 12. Organization Settings - Add Department

Fig. 13. Organization Settings - List of Departments

In the Members page, the organization administrator can invite a new member by entering the invitee's registered email address, assigning the member's designation, and department within the organization as shown in Fig. 15. When the invitation is sent, the recipient user receives a notification in which the user can choose to accept or decline the invitation (Fig. 17). The administrator is notified by the action taken by the invited user and the list of members in OrgTracks is updated accordingly (Fig. 18).

Fig. 14. Organization Settings - Members

Fig. 15. Organization Settings - Invite Member

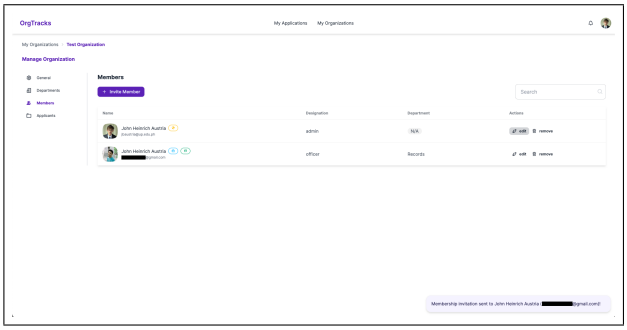

Fig. 16. Organization Settings - Member Invited

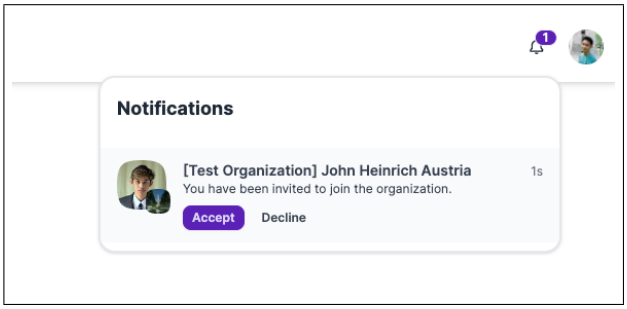

Fig. 17. Member Invitation Notification

Fig. 18. Member Invitation Accepted Notification

In the Applicants page shown in Fig. 19, the organization administrator needs to create and select a Batch (Fig. 20) where the information of the applicants to be added will be associated. Afterwards, the organization administrator can invite the applicants by entering their registered UP Mail address and clicking the Invite button (Fig.

21). The applicant will receive a notification where they can accept or decline the invitation (Fig. 23), and the organization administrator is also notified by the invitee's action (Fig. 24).

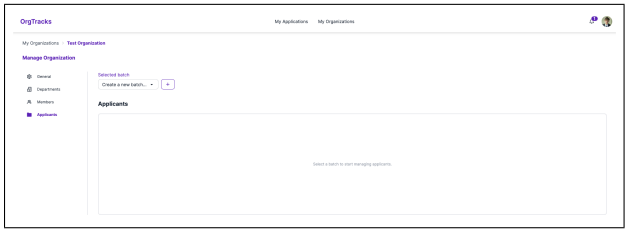

Fig. 19. Organization Settings - Applicants

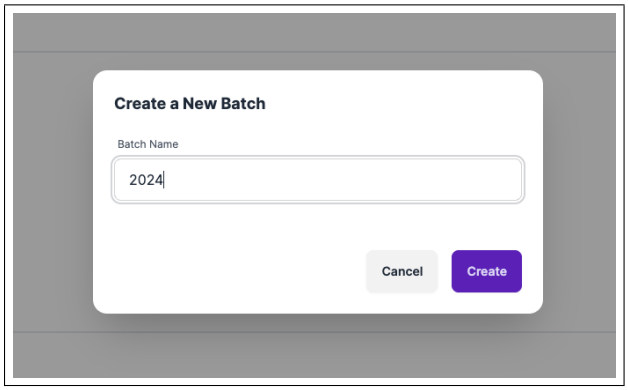

Fig. 20. Applicants - Create Batch

Fig. 21. Invite Applicant

Fig. 22. Applicant Invited

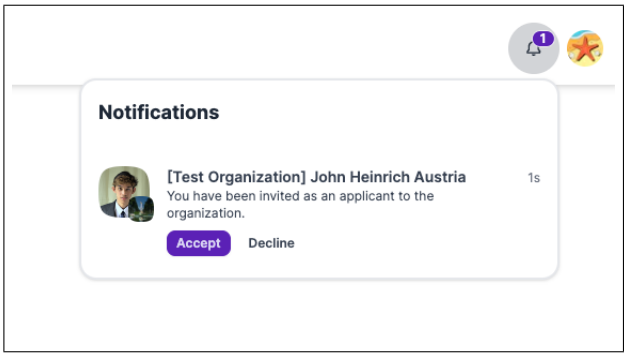

Fig. 23. Applicant Invitation Notification

Fig. 24. Applicant Accepted Invitation Notification

During the development and testing of OrgTracks, non-UP Mail addresses were allowed to create an account and use the system. However, Google Identity Service, which is utilized in the authentication system of OrgTracks, can be configured to restrict access to users with UP Mail accounts only.

3) *Interview Assignments*
The organization administrator can manage the interview assignments to an applicant by selecting the Assign Interview action (Fig. 24). It will pop up a modal that shows the details of an applicant and a button to edit the interview assignments (Fig. 25). As shown in Fig. 26, the organization administrator can use the checkbox to select the members that will be assigned to the applicant for the interview. Additionally, a filter by department and search by member's name or email address functionality is present to easily find a specific member to be assigned to an applicant.

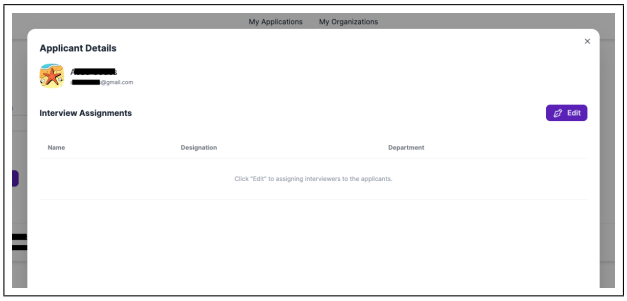

Fig. 25. Applicant Details

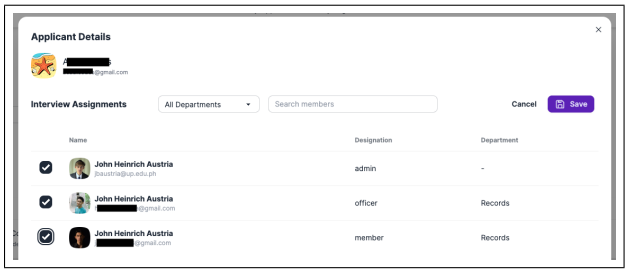

Fig. 26. Assign Interview - Edit

Fig. 27. Assign Interview - Saved

4) *Appointment Scheduling*

A user (organization admin, officer, or member) who is assigned to an applicant has the ability to block a portion of their calendar to indicate their unavailability for appointments on the indicated time blocks. It can be done by clicking "View My Appointments" (Fig. 28), clicking the "Block Time" button (Fig. 29), then clicking and dragging on a time slot in the calendar view, and finally clicking the "Save" button (Fig. 30). Booking an appointment on a blocked time slot is not allowed in the system, but the user can unblock a time slot by clicking on it on the calendar view and clicking the "Unblock" button as shown in Fig. 32.

Fig. 28. Interview Assignment - Member

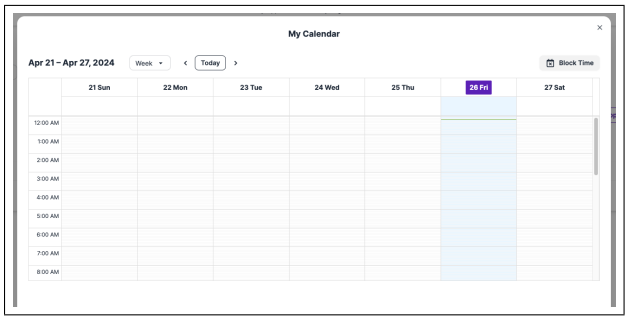

Fig. 29. Calendar View - Member

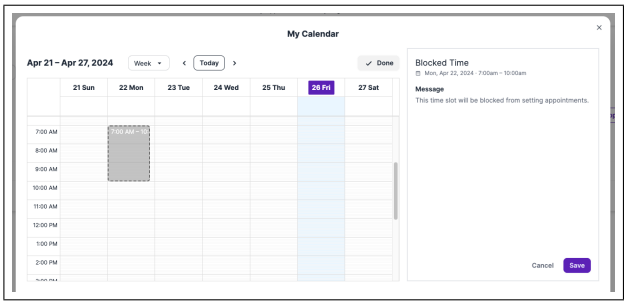

Fig. 30. Calendar View - Block Time Slot

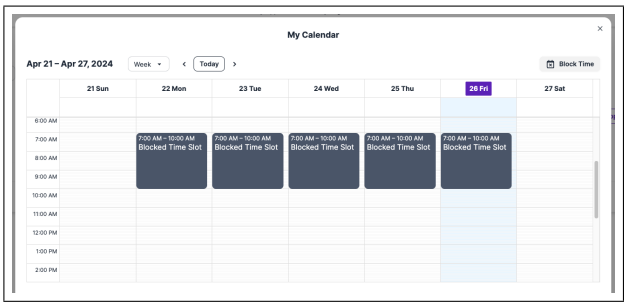

Fig. 31. Calendar View - Blocked Time Slot

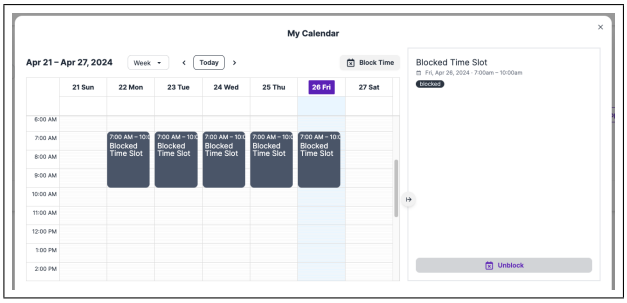

Fig. 32. Calendar View - Unblock Time Slot

During the appointment scheduling process, the applicant initiates the action by going to My Applications, selecting the name of the organization, and viewing the list of interview assignments (Fig. 33). The applicant can select an organization member to see their calendar where the applicant can click the "Request for an appointment" button. This enables the applicant to click and drag a time slot and save the appointment request (Fig. 34), to which the organization member will be notified of such request where they can either accept or decline.

Fig. 33. Interview Assignment - Applicant

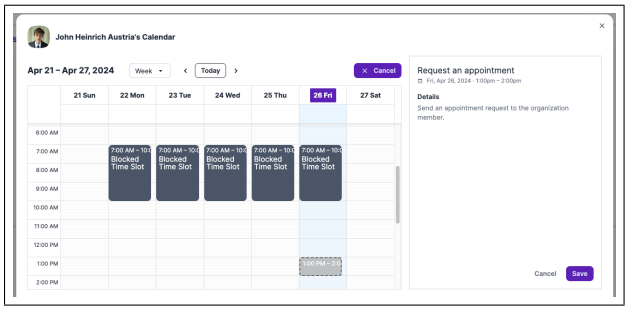

Fig. 34. Request an Appointment - Applicant

The interviewer can update the status of the interview with an applicant by selecting the applicant, hovering over the "Reporting Status" button, then clicking on an appropriate status for the interview such as "Mark as Done" (Fig. 35). Choosing "Mark as Done" updates the interview progress of the applicant as well as the interviewer in real time, which can be seen by the applicant, interviewer, and organization officers and administrators (Fig. 36, 37, and 38).

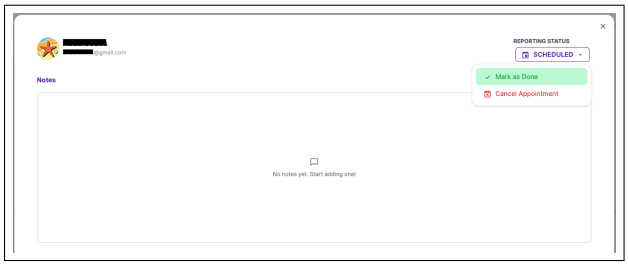

Fig. 35. Reporting Status Actions

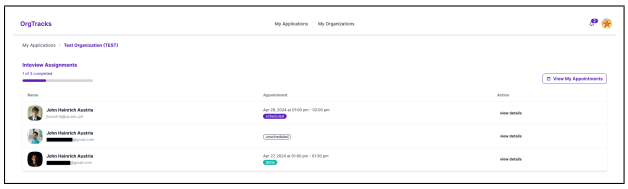

Fig. 36. Interview Progress - Applicant

Fig. 37. Interview Progress - Member

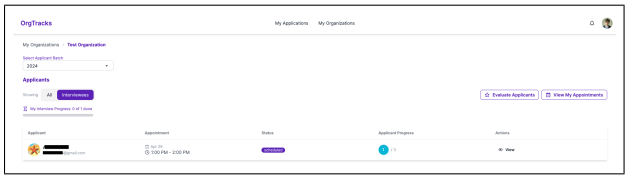

Fig. 38. Applicant Progress Monitoring - Admin and Officer

An interviewer may leave feedback or notes on the applicant, which can be a helpful reference for both the applicant and organization members. These notes can be set to be visible to both applicant and organization members (Fig. 39) or organization members only (Fig. 40).

Fig. 39. Interview Notes - Visible to Organization Members and Applicant

Fig. 40. Interview Notes - Visible to Organization Members Only

5) *Applicant Evaluation*
The organization administrator has the ability to start concluding the application process through the "Evaluate Applicants" functionality shown in Fig. 41. The summary shows the list of applicants, the number of completed interviews, and a selection whether to accept or reject the respective applicant (Fig. 42).

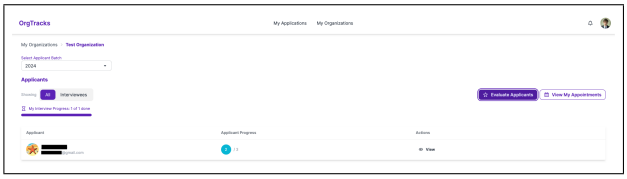

Fig. 41. Evaluate Applicants Feature

Fig. 42. Evaluating Applicants

6) *Reporting to OSAM System*
After confirming the evaluation, there is a button that allows the organization administrator to transmit the data of the successful applicants to the OSAM System (Fig. 43). In this study, a mock server was created to receive

the data from OrgTracks. The office can then process the transmitted data to update the membership roster within their system to reflect the new members of the organization.

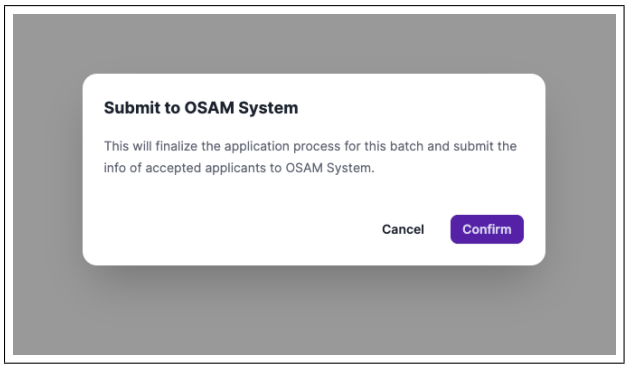

Fig. 43. Transmit Applicant Data to OSAM System

B. Testing and Evaluation

Fifteen (15) participants from three (3) different student organizations at the University of the Philippines Los Baños (five from each) were sought to participate in the user testing of OrgTracks. To simulate the process of an organization membership application, participants took on different roles within the organization where for each organization, one (1) participant acted as the organization administrator, one (1) as the organization officer, one (1) as an organization member, and (2) as organization applicants. In actuality, only thirteen (13) participants made it to the testing session (five, five, and three from each organization) where the last organization did not have actors for applicants due to schedule conflicts. Hence, for the summary of roles, there were three (3) organization administrators, three (3) for organization officers, three (3) organization members, and four (4) organization applicants who took part in the user testing of OrgTracks.

In three separate testing sessions for each organization, the participants were guided and asked to perform activities within OrgTracks that represent part of the membership application process in a student organization. The activities are outlined as follows:

- Register and login using a Google Account (all users)
- Create and update organization information (organization admin)
- Manage departments, members, roles, and applicants (organization admin)
- Monitor interview assignment progress (organization admin and officer)
- Monitor interview feedback and notes to applicants (all users)
- Request an appointment (applicant)
- Respond to appointment requests (organization member)
- Update reporting status (organization member)
- Evaluate the acceptance of applicants (organization admin)
- Transmit finalized applicants' data to the mock server (organization admin)

P#	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	SUS Score
1	3	3	3	1	3	3	2	3	3	3	67.5
2	3	3	2	2	3	4	3	3	2	3	70
3	3	2	3	3	3	2	4	3	3	3	72.5
4	3	3	3	3	4	2	4	3	4	2	77.5
5	4	4	4	3	1	2	3	4	3	4	80
6	4	0	4	3	4	4	4	0	4	3	75
7	4	0	4	4	4	4	4	4	4	4	90
8	4	4	4	3	4	4	4	4	3	4	95
9	3	4	4	4	3	3	4	4	4	0	82.5
10	4	4	4	3	3	4	4	3	4	4	92.5
11	3	3	4	3	3	3	4	3	4	4	85
12	3	2	3	3	3	1	2	3	3	1	60
13	3	3	4	3	2	4	3	4	3	4	82.5

TABLE I
SUS QUESTIONNAIRE RESULT

After each testing session, the participants were asked to answer a two-part survey. The first part contained the System Usability Scale (SUS) questionnaire to measure the overall usability of OrgTracks. Then, the second part contained the general feedback form for qualitative responses.

The SUS questionnaire consisted of the following ten (10) statements that the respondents would rate on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree):

1) I think that I would like to use this system frequently.
2) I found the system unnecessarily complex.
3) I thought the system was easy to use.
4) I think that I would need the support of a technical person to be able to use this system.
5) I found the various functions in this system were well integrated.
6) I thought there was too much inconsistency in this system.
7) I would imagine that most people would learn to use this system very quickly.
8) I found the system very cumbersome to use.
9) I felt very confident using the system.
10) I needed to learn a lot of things before I could get going with this system.

A SUS score can have a range of 0 to 100, which can be obtained by the following computation. First, the score contribution from each item is added. For odd-numbered items, the score contribution is the number on the scale subtracted by 1; while for even-numbered items, the score contribution is 5 minus the number on the scale. The total of the score contribution is then multiplied by 2.5 to get the overall SUS score. [21] A SUS score exceeding 70 is rated as Good, while a score of at least 85 is deemed Excellent, with a perfect score of 100 representing the Best Imaginable. [22]

Table I shows the score contributions to each statement in the SUS questionnaire and the computed SUS scores based on the participants' responses. Overall, OrgTracks obtained an average SUS score of 79.23.

In the second part of the survey, the participants were asked to share their thoughts regarding their experience with OrgTracks in relation to the membership application process of their organization. The following outlines the summary of

their responses:

- The testers have recognized OrgTrack's utility in managing membership application process-related activities within student organizations. They emphasized its clean and intuitive user interface, ease of use, and efficiency in terms of appointment scheduling.
- The testers have pointed out weak points and flaws within OrgTracks. These include the system's speed to reflect changes, inaccurate error messages in some modules, and multiple website crashes. However, it was also noted that these bugs were usually resolved after a page refresh.
- The testers have also mentioned several points for improvement in user interface and experience within OrgTracks. They have noted tweaks to simplify batch actions such as supporting CSV import and one-click select all for checkboxes. Additionally, minor tweaks in layout on certain pages and components were suggested to better align with user intentions.

V. Conclusion

In this study, OrgTracks was developed, a system that provides student organizations and applicants a web application for scheduling and tracking interview activities in real-time. It also features a module that can transmit applicant data to another server for administrative purposes such as the OSAM System of OVCSA. The target users have tested and evaluated the system's usability, where the system got an average SUS score of 79.23, which translates to a Good adjective rating. Therefore, the study has achieved its objectives and OrgTracks has been deemed usable by its users.

VI. Recommendation

To polish the core features of OrgTracks, it is recommended to consider the users' feedback regarding the user experience within the system. Having the ability to invite multiple users at once may be implemented via CSV import or a custom user interface. Moreover, a more detailed display of appointments in the calendar view may be done to avoid unintentional conflicts in appointment requests. Lastly, minor UI tweaks such as page and notification indicators are suggested to enhance the clarity of contexts within the application.

To further improve the real-time utility of the system, email notifications may be implemented to allow users to still receive updates from the application even if they are not actively using it. In terms of accessibility, enhancing the UI's responsiveness on smaller screens such as mobile devices is recommended, because the system was initially designed for bigger screens such as tablets, laptops, and desktops. Finally, if the system will be launched for production, it is recommended to deploy its servers to a dedicated hosting for better performance.

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I would like to express my sincerest gratitude to the **Office of the Vice Chancellor for Student Affairs** of the University of the Philippines Los Baños for their commitment to addressing the evolving needs of students through digital modernization efforts. I am especially thankful for their recognition of the significance of this study and their openness to integrating OrgTracks with their existing system. Their support and collaboration have been invaluable to the success of this research.

References

[1] L. Salo. (2021, May) Why real-time collaboration is essential in web apps for work in 2021. [Online]. Available: https://vaadin.com/blog/why-real-time-collaboration-is-essential-in-web-apps-for-work-in-2021
[2] O. of Student Activities. (2021, Feb.) Guidelines governing the registration of student organizations in uplb. [Online]. Available: https://uplbosa.org/ui/images/osaguidelines2021.pdf
[3] What is osam? [Online]. Available: https://uplbosa.org/page-osam
[4] (2023) List of registered organizations - second semester, ay 2022-2023. [Online]. Available: https://uplbosa.org/orgs
[5] I. E. Team. (2022, Oct.) What is a software program? definition, types and benefits. [Online]. Available: https://www.indeed.com/career-advice/career-development/what-is-software-program
[6] I. Chomiak-Orsa and R. Kłus, "The use of modern remote communication tools in improving processes of a non-profit organization based on the example of the student government of the wroclaw university of economics and business," *Informatyka Ekonomiczna*, no. 3, p. 1–14, 2021.
[7] Google docs: Online document editor. [Online]. Available: https://www.google.com/docs/about/
[8] Google sheets: Online spreadsheet editor. [Online]. Available: https://www.google.com/sheets/about/
[9] Uplb - office of the vice chancellor. [Online]. Available: https://uplb.edu.ph/vice-chancellors/
[10] (2020, Feb.) Osa is now ovcsa. [Online]. Available: https://uplb.edu.ph/all-news/osa-is-now-ovcsa/
[11] Office of student activities. [Online]. Available: https://uplbosa.org/offices-units/OSA
[12] Recommit - office of the vice chancellor for student affairs. [Online]. Available: https://uplbosa.org/offices-units/RECOMMIT
[13] O. of Student Affairs. (2014, Feb.) Office of student affairs annual report november 2012 - december 2013. [Online]. Available: https://uplbosa.org/download/report
[14] A. Melnikov and I. Fette, "The WebSocket Protocol," RFC 6455, Dec. 2011. [Online]. Available: https://www.rfc-editor.org/info/rfc6455
[15] P. Saint-Andre, S. Loreto, S. Salsano, and G. Wilkins, "Known Issues and Best Practices for the Use of Long Polling and Streaming in Bidirectional HTTP," RFC 6202, Apr. 2011. [Online]. Available: https://www.rfc-editor.org/info/rfc6202
[16] Y. V. Singh, H. Singh, and J. K. Chauhan, "Online collaborative text editor using socket.io," in *2021 3rd International Conference on Advances in Computing, Communication Control and Networking (ICAC3N)*, 2021, pp. 1251–1253.
[17] C. Yinka-Banjo and O. Esther, "Financial stock application using websocket in real time application," *International Journal of Informatics and Communication Technology (IJ-ICT)*, vol. 8, p. 139, 11 2019.
[18] L. Zhang and X. Shen, "Research and development of real-time monitoring system based on websocket technology," in *Proceedings 2013 International Conference on Mechatronic Sciences, Electric Engineering and Computer (MEC)*, 2013, pp. 1955–1958.
[19] P. Murley, Z. Ma, J. Mason, M. Bailey, and A. Kharraz, "Websocket adoption and the landscape of the real-time web," in *Proceedings of the Web Conference 2021*, ser. WWW '21. New York, NY, USA: Association for Computing Machinery, 2021, p. 1192–1203. [Online]. Available: https://doi.org/10.1145/3442381.3450063
[20] A. Mardan, *Real-Time Apps with WebSocket, Socket.IO, and DerbyJS*. Berkeley, CA: Apress, 2018, pp. 307–330. [Online]. Available: https://doi.org/10.1007/978-1-4842-3039-8_9
[21] J. Brooke, "Sus: A quick and dirty usability scale," *Usability Eval. Ind.*, vol. 189, 11 1995.
[22] A. Bangor, P. Kortum, and J. Miller, "Determining what individual sus scores mean: adding an adjective rating scale," *J. Usability Studies*, vol. 4, no. 3, p. 114–123, may 2009.