

INTEGRATIVE PROJECT - (420-610-LE)

VALCOURT 2030 COMPREHENSIVE ASSESMENT REPORT
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PRESENTED TO GABRIEL GASTUDILLO
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COMPUTER SCIENCE TECHNOLOGY
CHAMPLAIN COLLEGE LENNOXVILLE

Table of Contents

Final Report: Valcourt2030 Community Engagement App	3
Introduction	3
Background information	3
Objectives	3
Project Description.....	4
Overview	4
Team Structure	5
Methodology	7
Approach.....	7
Challenges and Solutions	8
Difficulties Encountered and Solutions Found to Overcome them.....	8
Project Completion and Results	9
Completion Level.....	9
<i>Reasons for Incomplete Feature.</i>	10
<i>Importance of Incomplete Features:</i>	11
<i>Lessons Learned:</i>	11
Achievements.....	11
Self-Evaluation.....	13
Reflection:.....	13
Improvement:	14
Conclusion	14
Summary.....	14
Future Directions	14
Staying Current with Technology	15
Appendices	15
User Flow	16
Navigation Structure.	17
Application Architecture.....	18
Mock ups.....	19
Trello	22

Final Report: Valcourt2030 Community Engagement App

Introduction

Background information

Globalization and Community Engagement

In an era of globalization, fostering social cohesion and engagement among residents from diverse backgrounds is essential for a community's growth and vitality. The Valcourt region is no exception. While welcoming newcomers and foreign workers, particularly those with specialized skills, these individuals often face challenges integrating into the existing community due to language barriers and a lack of awareness about local activities. This limited social interaction can hinder their sense of belonging and overall well-being.

The Client: Valcourt2030

Valcourt2030 is a non-profit organization established in 2014 to foster community development in the Valcourt region of Quebec. They identified a need to improve communication and engagement, particularly for newcomers and foreign workers attracted to the area for high-demand jobs. Currently, communication relies on Facebook and WhatsApp, which can be exclusionary for those unfamiliar with these platforms.

Client and Problem Statement

This project is for Valcourt2030, a non-profit organization dedicated to fostering a vibrant and inclusive community. The project aims to address the following challenges faced by newcomers and foreign workers:

- Difficulty accessing information about local events due to language barriers or lack of established networks.
- Challenges connecting with others and participating in social activities.
- Disorganized information about community events scattered across various platforms.

Objectives

The goals of this integrative project are to develop a web application that bridges the gap between newcomers and the existing Valcourt community. The application's key objectives are:

- Enhance community engagement: Foster a sense of belonging and connection among all residents by offering a platform for social activities and events which is related to the current Valcourt2030 website.
- Improve communication: Facilitate communication between newcomers and local residents.
- Centralize information: Create a central hub for users to discover and register for various community activities.
- Personalize user experience: Allow users to receive notifications about events relevant to their interests through tag-based customization.
- Enable user registration for activities: This functionality allows users to express their commitment to attending specific events, fostering a sense of accountability and promoting active participation.
- Enhance Event Attendance: The application will provide timely reminders by sending email notifications three days before registered events. This ensures users don't miss out on the activities they've signed up for.

Project Description

Overview

This project proposes the development of a web application named Valcourt2030. The application aims to improve community engagement and information dissemination for Valcourt2030 by providing a user-friendly platform for newcomers, foreign workers, and existing residents.

Scope and Deliverables

The core functionalities of the application include:

- User registration: Collects essential user information and allows them to select interest tags for personalized notifications.
- Tag-based notification system: Delivers notifications about upcoming events matching user-selected tags.
- API/Webhook integration: Enables communication between the application and the existing Valcourt2030 WordPress website.

- User account management: Provides standard features like password reset and profile editing.
- Tag and date-based sorting: Users can filter, and sort activities based on their interests and date when the activity takes place.
- User Registration: Users can register for specific events that interest them and they will be able to keep track of them on their own activities page
- Automated Reminders: The application sends automated email notifications three days before registered events, ensuring users don't miss out on the activities they've signed up for.

The project will also explore potential future functionalities like:

- User input section: Allows users to propose ideas for new events or activities.
- Feedback mechanism: Integrates a system for gathering user feedback to assess the effectiveness of community initiatives.
- Admin section: The admin should be able to update the database where we store the tags and municipalities, modify events, users and be able to make other users admins.

Team Structure

Our project was developed by a team of four students with complementary skillsets:

- Munir Khaliqyar and Vladimir Estevez collaborated on the application's foundation, including database design and front-end and back-end development.
- Guillaume Blais led the front-end development, ensuring a user-friendly and responsive interface.
- Jeremy Blackburn provided crucial support in front-end development, collaborating with Guillaume to achieve the desired visual elements.

Vladimir emerged as a technical leader, playing a pivotal role in the project's success. He architected the core application structure, encompassing both the user interface and server-side logic. His expertise bridged the gap between the existing Valcourt2030 WordPress website and our custom application, ensuring seamless communication and data exchange. Furthermore, Vladimir devised and implemented a robust notification system. Users registering for activities receive timely reminders, and event creators are alerted about potential participants based on user-selected tags.

Beyond technical prowess, Vladimir fostered a collaborative and productive team environment. He facilitated weekly meetings, ensuring clear task allocation and providing crucial support to team members facing challenges. His commitment extended to finalizing the project before presentation, guaranteeing a polished and professional deliverable. In collaboration with Munir, Vladimir spearheaded the creation of a deployment-ready application on Elastic Beanstalk. This included rigorous testing across various environments and assisting Jeremy in crafting a functional build script. Vladimir's dedication culminated in the creation of comprehensive deployment documentation, empowering the client to replicate the process if needed.

Munir Khaliqyar, alongside Vladimir Estevez, played a pivotal role in shaping the foundational aspects of our project, focusing on database design, and both front-end and back-end development. Munir's expertise ensured the structural integrity of our platform, while his proactive engagement in problem-solving and collaborative team efforts facilitated a cohesive development environment. Additionally, within our web application project, I spearheaded the implementation of key features such as password modification functionality, code formatting, backend route creation, and activity display based on the date. These enhancements not only improved user security and usability but also streamlined development processes and enriched the overall user experience, contributing significantly to the project's success.

Guillaume held accountability for the entirety of the website's front-end, ensuring user-friendliness through a minimalist design approach. His efforts extended to optimizing the website's compatibility across various devices, seamlessly integrating with both mobile and desktop interfaces while adhering to the color scheme of Valcourt 2030. Additionally, Guillaume meticulously crafted email templates for forthcoming activity notifications and subscription confirmations. Collaborating with Jeremy, he adeptly addressed CSS and React component-related formatting issues, ensuring accurate rendering of activity descriptions within the application.

Jeremy has taken accountability for the of the website's front-end. Working alongside Guillaume, Jeremy implemented a proper display calibration in the front end, ensuring compatibility with mobile phones and resolving major front-end bugs. Together, they addressed CSS and React component-related formatting issues, ensuring accurate rendering of activity descriptions within the application. Additionally, Jeremy and Guillaume collaborated to implement Bootstrap into the front end, enhancing the website's design and responsiveness. Furthermore, Jeremy worked with Vlad to implement a Node.js build script for the backend.

Methodology

Approach

Our project execution revolved around structured methodologies and collaborative tools. Weekly meetings with our teacher provided invaluable guidance and ensured alignment with project objectives. Task assignment was streamlined through Trello, where responsibilities were clearly delineated, facilitating focused progress. Git served as our primary tool for tracking work and facilitating seamless collaboration. Leveraging the Git feature branch workflow, each team member could work independently on assigned tasks, creating pull requests upon task completion. These pull requests underwent thorough review by a teammate before integration into the main branch, ensuring code quality and consistency across the project. This systematic approach fostered efficient development and enabled effective cross-validation of our work, contributing to the project's success.

To further empower our team and streamline communication, we utilized Microsoft Teams effectively. We conducted regular group calls within Teams, allowing us to discuss project specifics, delegate tasks amongst ourselves, and brainstorm solutions collaboratively. This fostered a sense of ownership and increased our team's autonomy. We also established a dedicated Teams chat specifically for the project. This platform facilitated clear communication, real-time discussions, and quick task updates. We could share relevant resources, ask questions, and provide feedback within the chat, ensuring everyone stayed on the same page. By combining these Teams features with Trello's task management and Git's version control, we achieved streamlined task delegation through clear communication within the Teams chat. This transparency kept everyone informed and ensured focused progress. The Teams chat also served as a central hub for all project communication, further improving communication and fostering a collaborative work environment. This multi-faceted approach, leveraging both teacher guidance and our own team communication through Teams, contributed significantly to the project's success.

Challenges and Solutions

Difficulties Encountered and Solutions Found to Overcome them.

Throughout this project, our team encountered several challenges that required us to adapt and refine our approach. Here, we'll discuss these hurdles and the solutions we implemented to overcome them:

- **Task Division and Workload Distribution:** Initially, ensuring an even distribution of tasks amongst team members proved challenging. To address this, we held regular meetings in Microsoft Teams to collaboratively define task scopes and ownership. Trello boards further enhanced transparency, allowing everyone to visualize assigned tasks and track progress.
- **Progress Tracking:** Keeping track of individual and collective progress can be difficult in a fast-paced development environment. We implemented a multi-pronged approach. Weekly meetings with our instructor provided a platform for progress checks and course correction. Additionally, we utilized Trello for task visualization and completion tracking.
- **Collaboration and Communication:** Maintaining clear and consistent communication is vital for any project's success. We established a dedicated Microsoft Teams chat for real-time discussions, quick updates, and resource sharing. This fostered team spirit, ownership, and efficient task delegation.
- **Technical Hurdles:**
 - **Webhooks:** Integrating webhooks for data exchange between our application and the Valcourt2030 website presented a technical hurdle. We leveraged online resources, developer forums, and our instructor's guidance to troubleshoot and successfully implement this functionality.
 - **Frontend Development:** Challenges arose during frontend development, particularly with CSS and React component formatting. Effective communication between Guillaume and Jeremy, along with their collaborative efforts, ensured accurate rendering of activity descriptions within the application.
 - **AWS Deployment:** Deploying the application on AWS (specifically Elastic Beanstalk) involved unfamiliar territory since we only had worked in a local host environment. Having to deploy the app on a real server was something new we did not have the chance to work on. By meticulously testing across various

environments and collaborating with Munir, Vladimir was able to create comprehensive deployment documentation, empowering the client to replicate the process if needed.

Git Workflow: Merging Git branches effectively can be tricky. To avoid overwriting remote branches, we adopted a rigorous workflow. Each team member worked on separate feature branches, creating pull requests upon completion. These pull requests underwent thorough review by a teammate before integration into the main branch, ensuring code quality and consistency.

Meeting Scheduling and Team Dynamics: Scheduling meetings and ensuring active participation from all members can be challenging. We established a recurring meeting schedule within Microsoft Teams, fostering team accountability and open communication. However, we also acknowledge that **[GA1]** knowledge level and seriousness on some members of the team **[GA1]** presented occasional hurdles. Moving forward, we would emphasize clear expectations and open communication to ensure all team members contribute effectively.

Project Deadline: Meeting all project deadlines can be stressful. Our team adopted a proactive approach, breaking down larger tasks into smaller, manageable milestones. This allowed us to consistently track progress and course correct as needed.

By acknowledging these challenges and implementing effective solutions, we were able to navigate the complexities of project development and deliver a successful final product.

Project Completion and Results

Completion Level

Our project achieved a significant level of completion, delivering a functional web application that fulfills most of the objectives outlined for the Valcourt2030 community engagement app. Here's a breakdown of the completed features:

- **User registration:** Users can create accounts and provide essential information.
- **Tag-based notification system:** Users can select interests and receive notifications about relevant events.
- **API/Webhook integration:** The application successfully connects with the existing Valcourt2030 WordPress website.

- **User account management:** Users can manage their accounts, including password resets and profile editing.
- **Tag and date-based sorting:** Users can filter and sort activities based on their preferences.
- **User Registration for Events:** Users can register for events that interest them and track them on a dedicated page.
- **Automated Reminders:** The application sends automated email notifications three days before registered events.

However, we were unable to complete one key functionality due to time constraints:

- **Admin Section:** The planned admin section, which would allow the client to manage activities, update the database, and create new admin users, is not currently implemented.
- **Comprehensive Error Handling:** While the core functionalities of the application are functional, we were unable to implement a robust try-catch testing mechanism for comprehensive error handling.

Reasons for Incomplete Feature.

There were two primary reasons why the admin and the comprehensive error handling section wasn't completed:

- **Time Constraints:** The project timeline presented challenges in implementing all functionalities. Focusing on core user-facing features and ensuring core application logic functioned correctly took priority to deliver a usable application within the given timeframe. This prioritization also limited the time available for implementing the admin section and comprehensive error handling mechanisms.
- **Team Capacity/Engagement:** While some team members grasped the project's requirements well, others had competing commitments like work schedules or faced challenges understanding specific tasks. This uneven distribution of workload and knowledge limited the team's ability to complete all aspects of the project, including the development of the admin section and the implementation of a robust error handling strategy.

Importance of Incomplete Features:

- **Admin Section:** The admin section is crucial for ongoing application maintenance and management by the client.
- **Comprehensive Error Handling:** Thorough error handling is a critical aspect of web application development. It allows for graceful handling of unexpected situations that might arise during user interaction or system processes. This can prevent application crashes, improve user experience by providing informative error messages, and aid in debugging efforts.
-

Lessons Learned:

This project experience highlights the importance of several factors for successful development:

- **Realistic project scoping:** Balancing the desired feature set with available time and resources is crucial. This includes prioritizing core functionalities and being transparent about features that may need to be completed in a later phase.
- **Effective team communication:** Ensuring clear understanding of tasks and open communication about challenges is essential for efficient collaboration. This is particularly important for projects with varying member skillsets.
- **Comprehensive development practices:** Incorporating robust error handling mechanisms (like try-catch statements) from the outset is crucial for application stability and user experience.
- **Focus on maintainability:** Planning for ongoing maintenance and future development is important. This includes considering the need for features like an admin section to empower client management of the application.

By considering these lessons learned, future projects can benefit from improved planning, communication, and development practices, leading to more robust and maintainable applications.

Achievements

Based on the information in our report, here are some of the key achievements of our project:

1. **Developed a Functional Community Engagement App:** This is the core achievement of our project. We successfully built a web application that meets the needs of Valcourt2030 and the community they serve.
2. **Implemented Core User Functionalities:** We delivered key functionalities like user registration, tag-based notifications, user account management, event registration, and automated reminders. These features directly address the objectives of improving communication, information dissemination, and community engagement.
3. **Integrated with Existing Website:** Through successful API/Webhook integration, we connected our new application to the existing Valcourt2030 website. This creates a seamless user experience and avoids data silos.
4. **Established Strong Team Communication:** We implemented effective communication practices using Microsoft Teams, Trello boards, and a code review process. This ensured clear communication, task management, and version control, which are crucial for successful team collaboration in a software development project.
5. **Demonstrated Adaptability:** We tackled new challenges like AWS deployment and overcame complex front-end formatting issues. This showcases our ability to learn new skills and adapt to unforeseen hurdles during project development.

How My Key Achievements Contributed to Course Competencies

Developing a Functional Community Engagement App: This achievement addresses several course competencies:

- **Conceptual Skills (Objectives 1 & 4):** This achievement demonstrates my proficiency in core computer technician skills (web development, database design, application functionality) and my critical thinking ability to identify user needs and translate them into technical solutions embodied in the app's functionalities (e.g., user registration, notifications). Building a complex application showcases my diverse technical knowledge.
- **Technical Skills (Objective 5):** Developing the app itself signifies my programming, testing, and implementation skills.

Integrating the App with the Existing Website: This achievement contributes to the following competency:

- **Technical Skills (Objective 5):** The integration involved various technical skills like working with APIs and web services, further expanding on my programming expertise.

Implementing Core User Functionalities: This achievement contributes to the following competency:

- **Technical Skills (Objective 5):** Building these features like user registration and notification systems demonstrates my programming and implementation skills.

Establishing strong team communication highlights these aspects:

- **Conceptual Skills (Objective 3):** Effective communication demonstrates my understanding of communication best practices, a crucial skill for any technical role.
- **Section 3: Personal Skills (Objectives 11 & 12):** This achievement highlights my teamwork abilities, communication skills, and ability to foster trust and openness within the team.

Finally, **demonstrating adaptability** contributes to these areas:

- **Conceptual Skills (Objective 2):** Adapting to new challenges like AWS deployment showcases my ability to stay up to date with technological changes.
- **Conceptual Skills (Objective 4):** This achievement demonstrates my critical thinking and problem-solving skills as I tackled unforeseen technical hurdles.
- **Section 3: Personal Skills (Objective 13):** Successfully overcoming challenges highlights my adaptability and ability to learn new skills.

Self-Evaluation

Reflection:

Looking back on the project execution, I can identify several areas where I excelled and areas where I could have contributed more. Here are some key takeaways:

- **Strengths:** I played a pivotal role in the project's success in a few key areas. My technical skills were instrumental in developing core functionalities like the notification system and user registration. My leadership abilities were evident in facilitating team meetings, ensuring clear task allocation, and providing support to teammates. Additionally, I championed the creation of comprehensive deployment documentation, empowering the client for future maintenance.

- **Learning:** This project presented valuable learning opportunities. I gained experience with AWS deployment, a new territory for our team. I further honed my communication skills by fostering collaboration via Microsoft Teams and Trello. Additionally, the project highlighted the importance of realistic project scoping and comprehensive error handling practices – lessons I'll carry forward into future projects.

Improvement:

While I am proud of my contributions, there's always room for improvement. Here are some aspects I could have focused on more:

- **Technical Depth:** While I actively participated in development, I could have delved deeper into specific areas like front-end development challenges faced by Guillaume and Jeremy. Offering more technical support in those areas could have streamlined the process.
- **Task Delegation:** While I delegated tasks, I could have been more proactive in assessing individual workloads and knowledge levels. This might have helped mitigate some of the challenges arising from uneven team member engagement.

Conclusion

Summary

This project culminated in the successful development of a functional web application, the Valcourt2030 Community Engagement App. The application addresses the key needs of Valcourt2030, fostering communication, information dissemination, and community engagement. Core functionalities like user registration, notification systems, event management, and integration with the existing Valcourt2030 website were successfully implemented. Importantly, this project provided me with invaluable hands-on experience and reinforced my understanding of critical development concepts.

Future Directions

While the core functionalities are operational, there's room for further development:

- **Admin Section:** Implementing an admin section would empower Valcourt2030 to manage events, update the database, and create new admin users. This functionality is crucial for ongoing application maintenance and content management.

- **Enhanced Error Handling:** Integrating a robust error handling mechanism would improve application stability and user experience. By gracefully handling unexpected situations, the application can prevent crashes and provide informative feedback to users.
- **Advanced Features:** Future iterations could explore functionalities like user-generated content sections for proposing new events or feedback mechanisms to gauge user experience and community needs.

Staying Current with Technology

Throughout this project, the importance of staying up-to-date with best practices and technological advancements became evident. Here's how I'll continue to cultivate this essential skill:

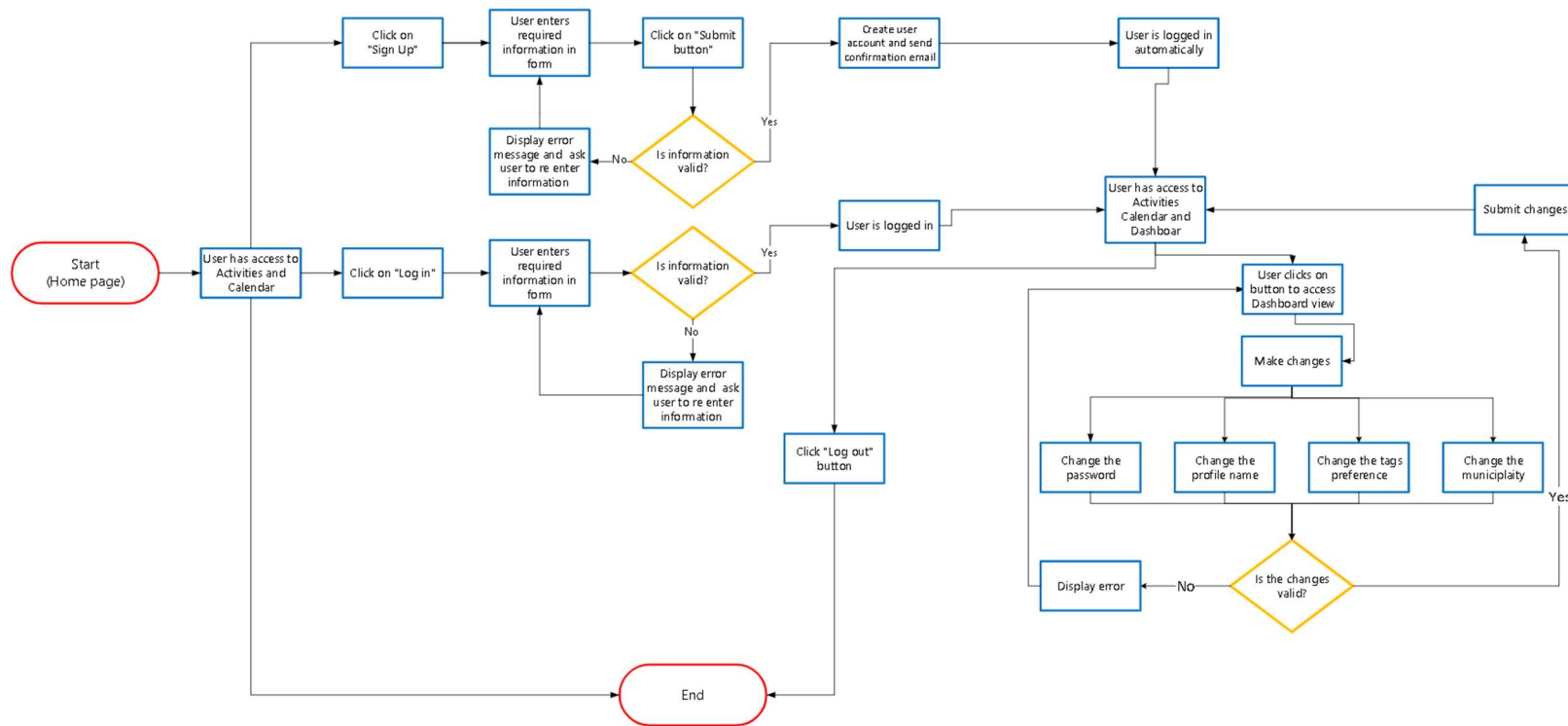
- **Continuous Learning:** I'll actively seek out new learning opportunities through online resources, tutorials, and industry publications to stay abreast of emerging technologies and development trends.
- **Collaboration with Experts:** Engaging with experienced developers and participating in developer communities will provide valuable insights and keep me informed about the latest practices.
- **Project Selection:** Prioritizing projects that involve novel technologies will push my boundaries and broaden my skillset.

By actively engaging in these practices, I aim to ensure my technical expertise remains current and allows me to tackle future projects with confidence and a commitment to excellence.

Appendices

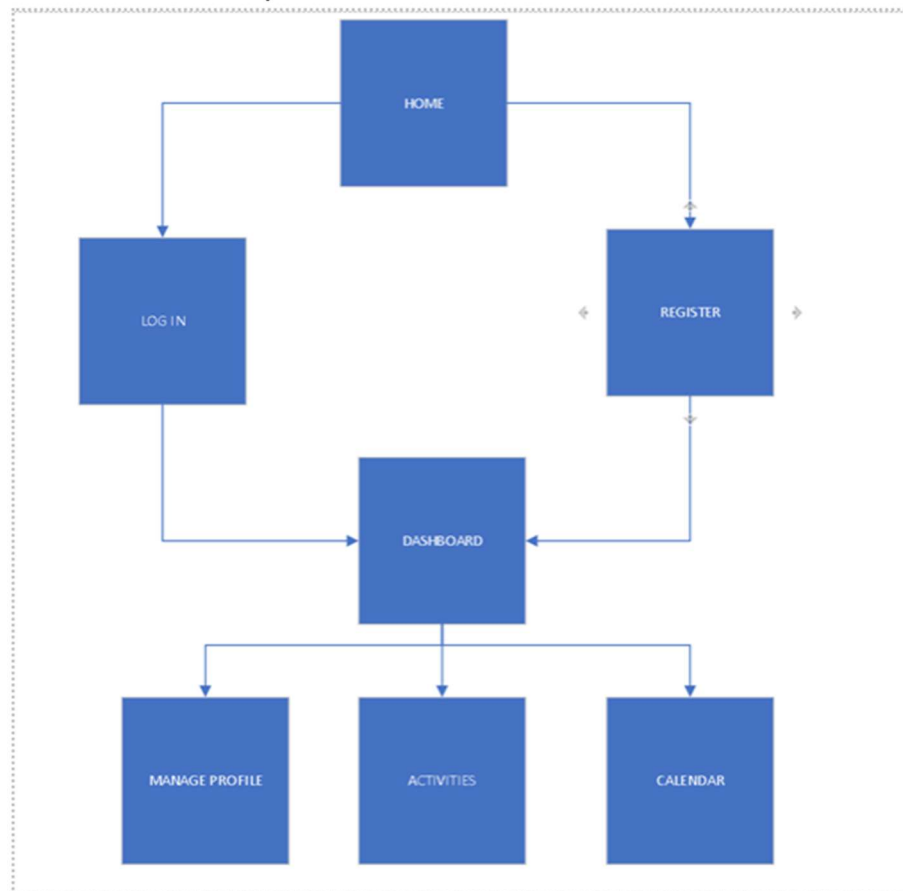
Include any additional material like charts, graphs, or data that supports your report (if applicable).

User Flow



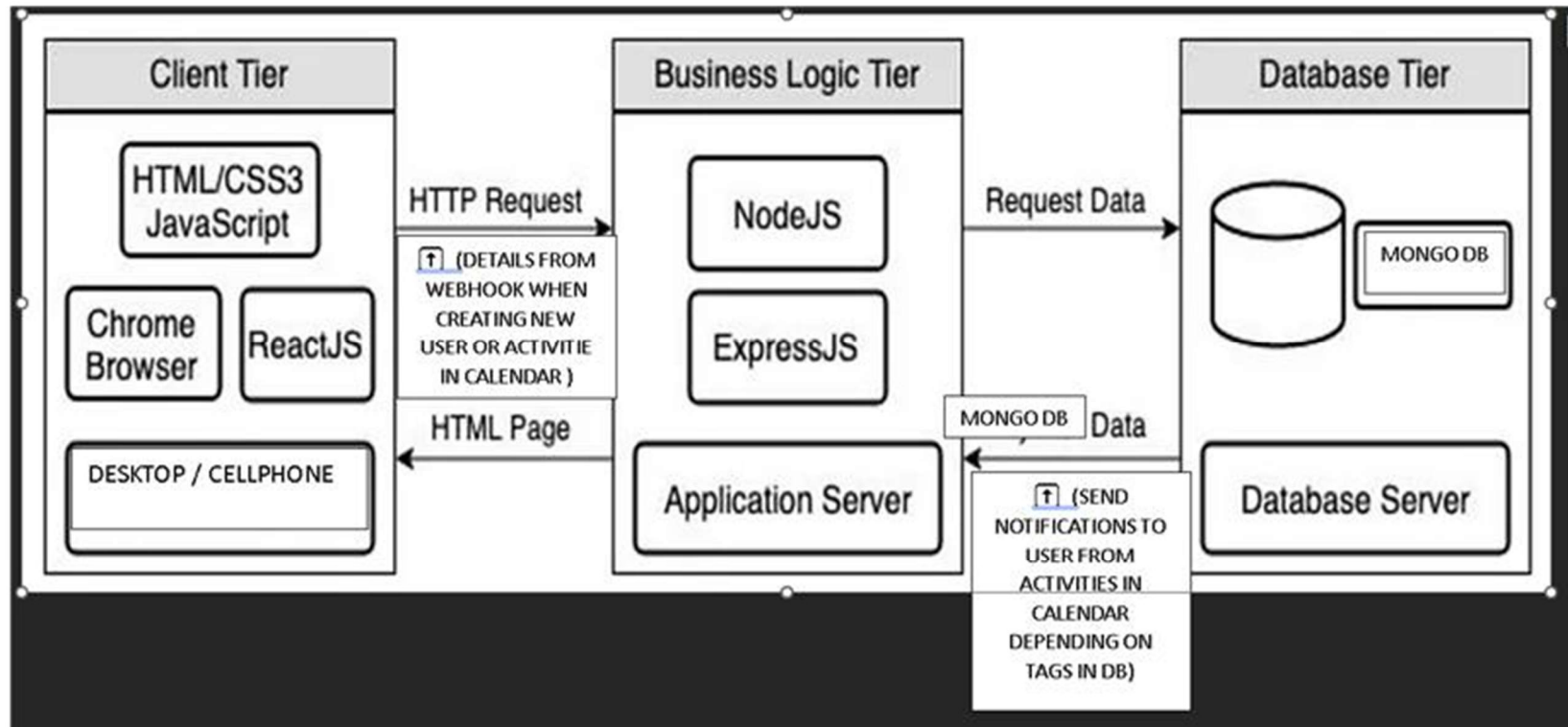
Navigation Structure.

- Navigation Structure. (For User Flow see attached PDF):



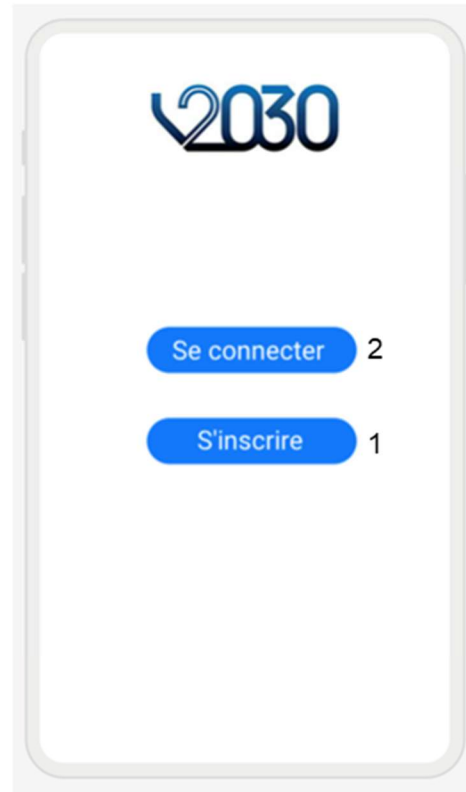
Application Architecture

Application's Architecture / API



Mock ups

MAIN PAGE:
VIEW = 0



REGISTRATION PAGE:

VIEW = 1

LOGIN VIEW = 2

ACTIVITIES PAGE:

VIEW = 3

Inscription

Prénom:

Nom de famille:

Courriel:

Mot de passe:

Confirmer:

Municipalité:

Intérêts:

☐ Intérêt 1 ☐ Intérêt 6

☐ Intérêt 2 ☐ Intérêt 7

0 4

Connection

Adresse courriel:

Mot de passe:

4

0

4


**Bienvenue
Guillaume**

Vos activités:

MAIN PAGE VIEW = 4
MODIFICATION VIEW = 5
SELECTED ACTIVITY VIEW = 6

3

Bonjour Guillaume



Voir mes activités3

Modifier mon profil5

Retour au menu0

Modifier

Prénom:

Nom de famille:

Mot de passe:

Confirmer:

Municipalité:

Dropdown

Intérêts:

☐ Intérêt 1

☐ Intérêt 2

☐ Intérêt 6

☐ Intérêt 7

4

Annuler

Modifier

3

Patinage

Date: 28/01/2024

Heure: 14h à 17h

Emplacement: Aréna de Valcourt

Intérêts: Familiale, intergénérationnel, etc.

S'inscrire à l'activité

Annuler

Trello

