C4GT's Dedicated Mentoring Program (DMP) 2024-Proposal

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Current Occupation:	Undergraduate Student
Education Details:	**Rajiv Gandhi Institute of Petroleum Technology**-Bachelors of Technology: Computer Science and Design Engineering (2023-2027)
Technical Skills:	• **Languages:** Python, Java, C, C++, Dart, JavaScript, MATLAB • **Tech Stacks**: Flutter, OpenCV, HTML5, CSS3, Figma, AutoCAD, Computer Vision, Docker, MongoDB • **Level**: Intermediate

Title: “AquaRevive: An App for The Wave of Hydration Innovation”

Summary:

Water footprint assessment (WFA) is a powerful tool that quantifies and maps water footprints, assessing the sustainability, efficiency, and equitability of water use. Water is life, and its responsible management is critical for our planet’s survival.

AquaRevive, a groundbreaking app, seamlessly integrates water footprinting and health tracking, creating a powerful synergy.

Here’s why this matters and how AquaRevive benefits users:

1. **Understanding Water Impact:**
    - Water footprinting quantifies our water usage—both direct (drinking, bathing) and indirect (food, products).
    - AquaRevive combines this data with health metrics, offering a comprehensive snapshot of well-being.
2. **Promoting Sustainable Practices:**
    - Awareness drives change. By tracking water consumption, users recognize their impact on water resources.
    - AquaRevive encourages mindful water use, reducing waste and promoting sustainable habits.
3. **Health-Environment Nexus:**
    - Proper hydration is fundamental for health. AquaRevive ensures users meet daily water needs.
    - Simultaneously, it emphasizes responsible water use, safeguarding ecosystems and future generations.
4. **Smart Alerts and Insights:**
    - AquaRevive nudges users to stay hydrated, considering factors like weather and activity level.
    - Insights into water usage patterns empower informed decisions for health and conservation.

5. **Behavioral Change:**
    - Integrated health and water tracking create positive feedback loops.
    - Users prioritize hydration, aligning personal well-being with global water stewardship.
6. **Global Impact:**
    - AquaRevive's collective user base becomes a force for change.
    - By fostering awareness and responsible habits, it contributes to a sustainable future.

Project Details:

#.	Organization	Product	Project	Mentors
65	**Arghyam**	**India Water Portal**	**What's your Ripple Effect?**	**Sreechand (sreechand), Simran Nigam (simran142002)**

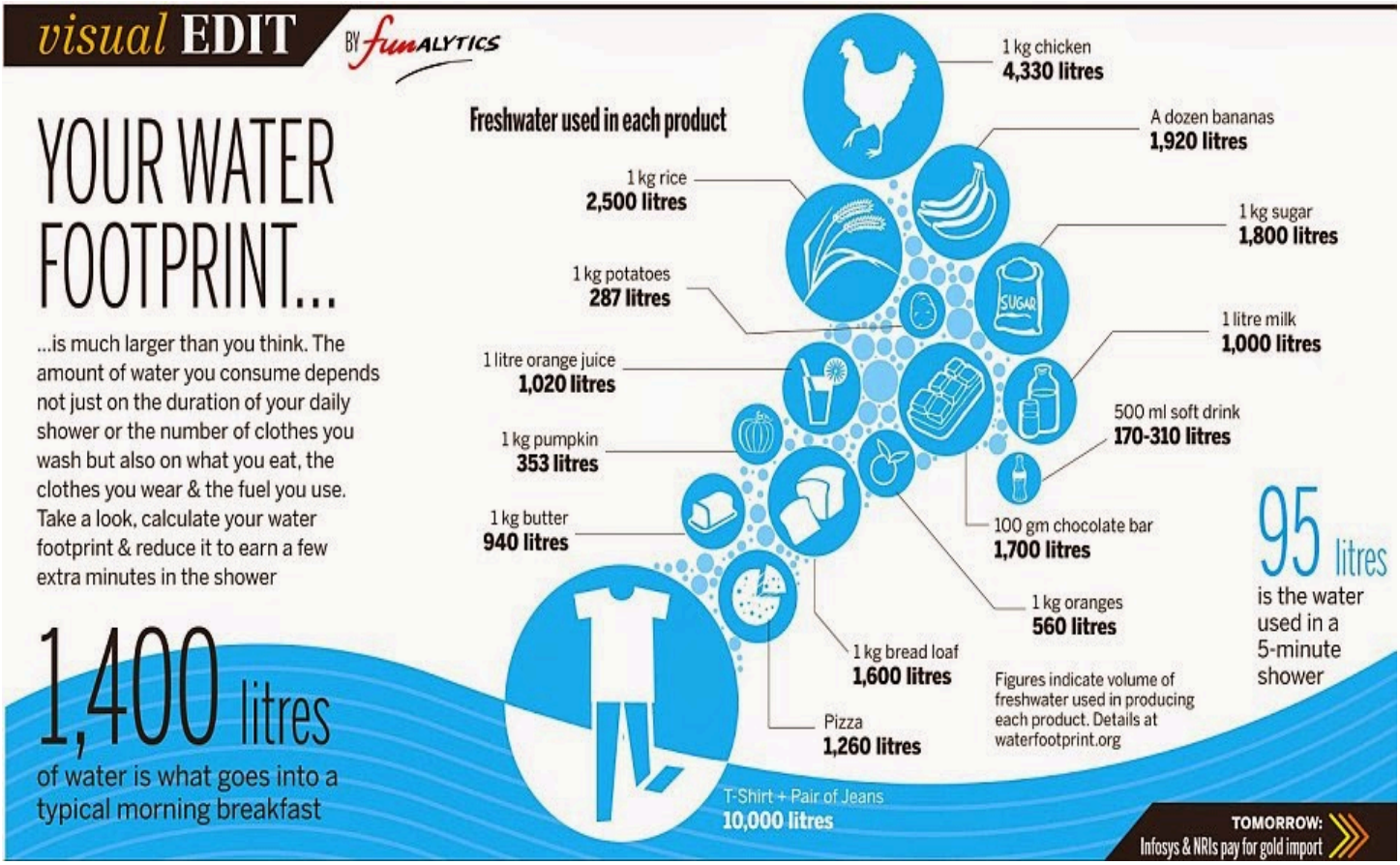
Project Overview:

In the digital age, apps are becoming a crucial tool in combating water wastage at the ground level. Here's how they make a difference:

1. **Real-Time Monitoring:** It will utilize IoT sensors to provide real-time data on water usage, enabling users to detect leaks and overuse immediately.
2. **Smart Irrigation:** Plans irrigation schedules based on precise water needs, reducing excess usage, and promoting efficient farming.
3. **Educational Tools:** It will raise awareness about water conservation through interactive quizzes and information.
4. **Water Footprint Tracking:** Users can track their water footprint with apps that calculate consumption based on daily activities, helping to identify areas for reduction.

5. **Leak Detection:** It will be connected with utilities to alert users to potential leaks, which can save significant amounts of water if addressed promptly.
6. **Automated Solutions**: Pump automation and tanker monitoring ensure that water is used optimally, avoiding wastage in residential and commercial settings.

We should fuse water tracking and health apps, which will empower users to optimize their well-being. It's not just about drinking water, it's about embracing a holistic approach to health, one drop at a time.



A diagrammatic visualization of a water-footprint calculator

Understanding of this project:

“Hydration and Health: The Synergy of Integrating Water Tracking and Health Apps”

In the quest for overall well-being, the integration of water-tracking apps with health apps yields remarkable benefits. It will not be healthy for the user but ultimately save water.

Here’s how this synergy empowers users:

1. **Hydration Optimization:**
    i. Water tracking apps remind users to stay hydrated throughout the day.
    ii. When integrated with health apps, these reminders align with individual needs, considering factors like weather, weight, and activity level.
2. **Preventing Dehydration**:
    i. Dehydration affects energy levels, cognitive function, and overall performance.
    ii. Integrated apps ensure timely water consumption, preventing dehydration during workouts and daily routines.
3. **Efficient Fitness Goals**:
    i. Hydration directly impacts exercise performance. Integrated apps help users maintain optimal hydration levels for better workouts.
    ii. Proper hydration supports muscle function, endurance, and recovery.
4. **Weight Management**:
    i. Water tracking apps encourage mindful drinking, aiding weight loss or maintenance.
    ii. Health apps complement this by tracking nutrition, physical activity, and overall progress.
5. **Health Alerts:**

i. Real-time data from integrated apps can detect deviations from normal health patterns.
ii. Alerts prompt users to address issues promptly, whether related to hydration, sleep quality, or stress.

6. **Behavioral Reinforcement:**
    i. Consistent reminders foster healthy habits. Users log water intake, reinforcing positive behavior.
    ii. Integrated apps create a feedback loop, motivating users to prioritize hydration and overall health.
7. **Holistic Wellness Monitoring**:
    - By combining water intake data with health metrics (such as exercise, sleep, and nutrition), users gain a comprehensive view of their well-being.
    - Health apps analyze patterns, identify correlations, and offer personalized insights for optimal health management.

- ## Problems:

Not conducting proper water footprinting can lead to several problems, including:

1. **Unsustainable Water Use:**
    - Without accurate data, it's difficult to manage water resources sustainably, leading to overexploitation and depletion.
2. **Inefficient Agriculture:**
    - Agriculture consumes a significant amount of water. Inefficient practices can result in wastage and reduced productivity.
3. **Economic Impacts:**
    - Industries and economies that rely on water can suffer if water scarcity is not anticipated and managed effectively.
4. **Environmental Degradation:**
    - Overuse and pollution of water resources can harm ecosystems, biodiversity, and the natural balance.
5. **Social Challenges:**
    - Communities may face water shortages, health issues, and conflicts over water access due to poor management.
6. **Lack of Awareness**:
    - Without footprinting, individuals and organizations may not be aware of their impact on water resources.
7. **Policy and Planning Setbacks:**
    - Policymakers need accurate water use data to create effective regulations and infrastructure plans.
8. **Global Water Insecurity:**
    - On a larger scale, improper water footprinting contributes to global water insecurity and potential crises

- ## Solutions:

Here's how AquaRevive can be utilized for effective water footprinting:

- **Personal Water Audit:**
    - Users can conduct a personal water audit, tracking daily water usage against sustainable benchmarks.

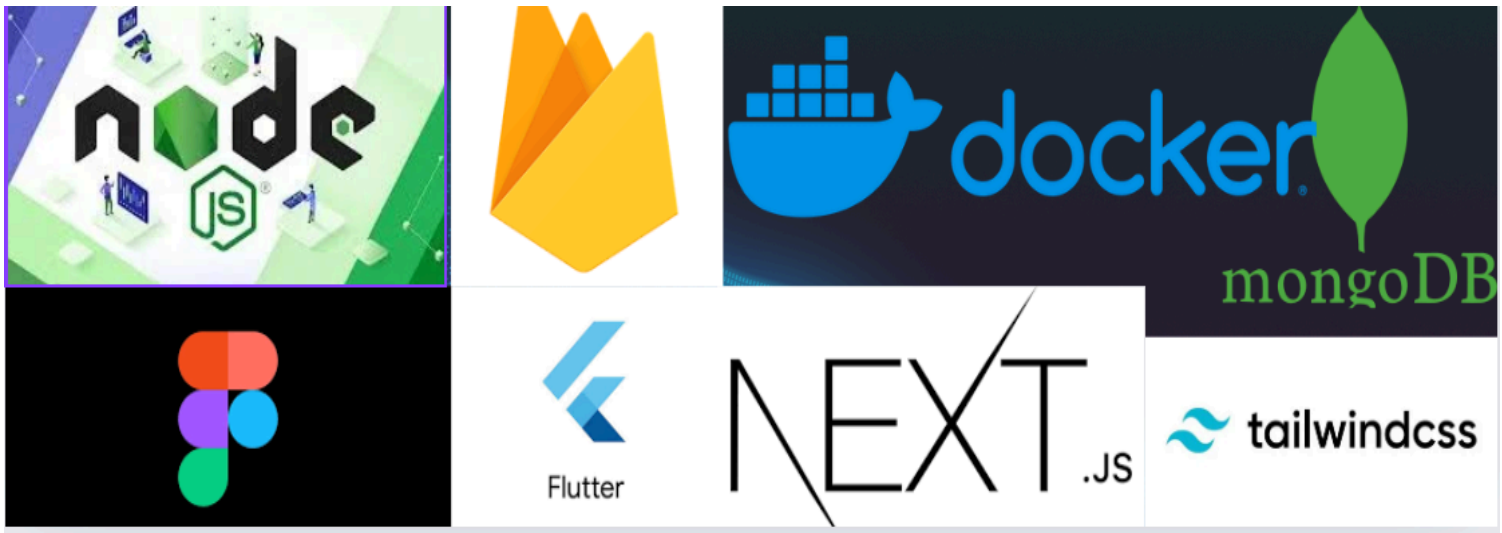
- **Smart Alerts:**
    - Receive alerts for potential overuse or when nearing daily water budget limits.
- **Eco-Friendly Challenges:**
    - Engage in challenges to reduce water footprints and earn rewards for sustainable habits.
- **Community Leaderboards:**
    - Compare water usage with peers, fostering a community-driven approach to conservation.
- **Educational Insights:**
    - Learn about the water footprint of various activities and make informed decisions to reduce it.
- **Integration with Smart Home Devices:**
    - Sync with smart home devices to monitor and control water usage in real time.
- **Goal Setting and Tracking:**
    - Set personal water usage goals and track progress over time.
- **Reporting and Analytics:**
    - Access detailed reports and analytics to understand water usage patterns and make adjustments

Technology Stacks in Use:

- **MongoDB:** An Open Source NoSQL Database for storing data in CSV format (Comma Separated Values)
- **MySQL:** An Open Source SQL (Database Management System) for storing data
- **Docker:** For System Containerization.
- **NodeJS**: For Backend Server-Side Service using npm
- **NextJS:** A React framework that gives building blocks to create web applications and pages.
- **Tailwind CSS:** For designing web pages.
- **Figma:** For Designing and wireframing the user interface of the app

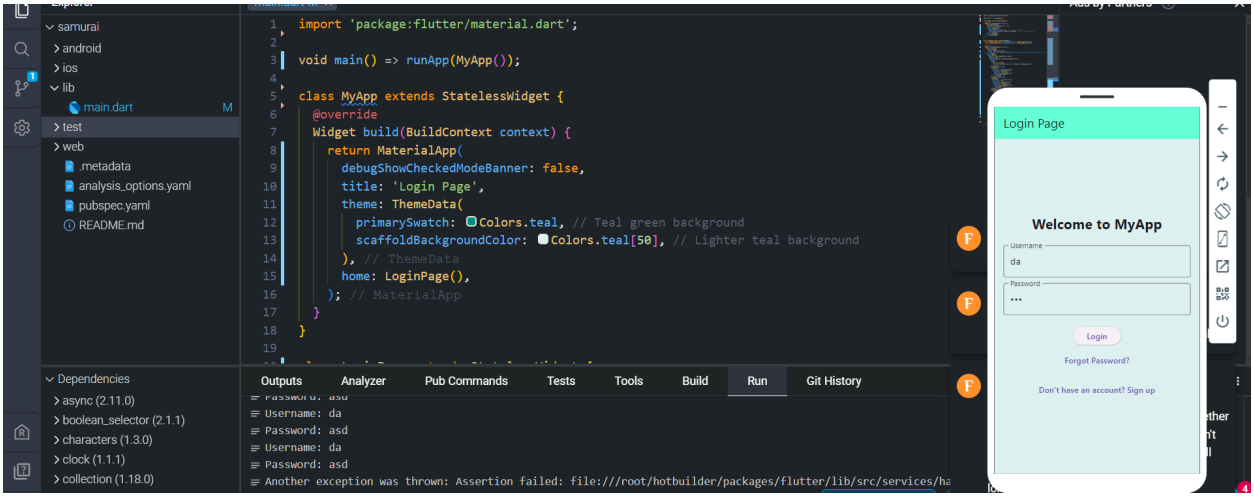
- **Flutter:** For Building the Cross-Platform Application (iOS, Android, Windows Web App)
- **Firebase:** For maintaining the Backend authentication and authorization of the user.
- **Encrypt biometric data during storage and transmission:** Implement access controls and regular security audits. Comply with data protection regulations and prioritize data security.
- **Programming languages used:** JavaScript, Dart, HTML, and, CSS (Cascading Style Sheets)

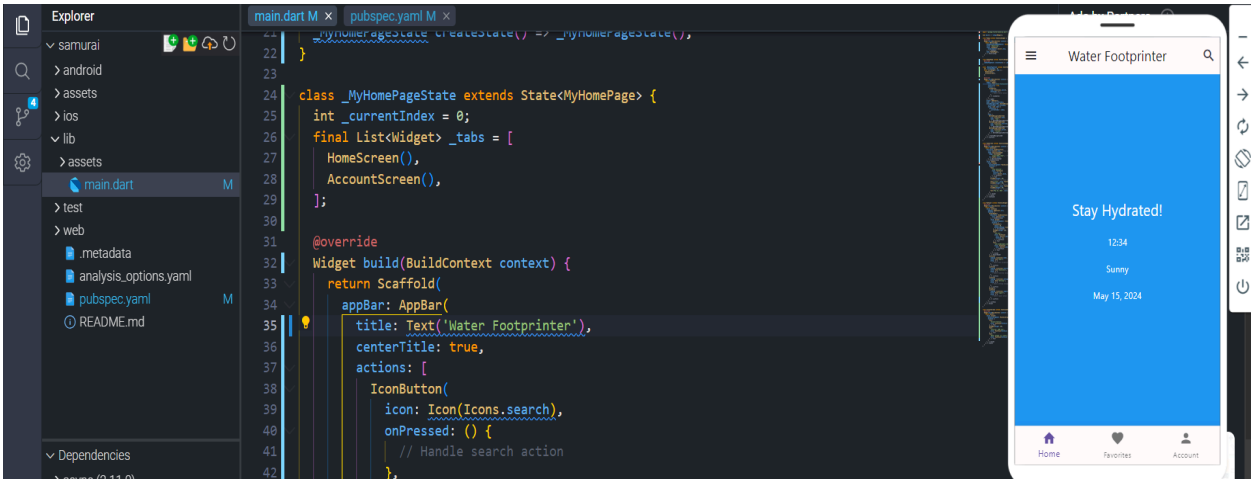
  By proactively addressing these aspects, we can create a robust and ethical water-tracking system that will benefit both users and the environment.

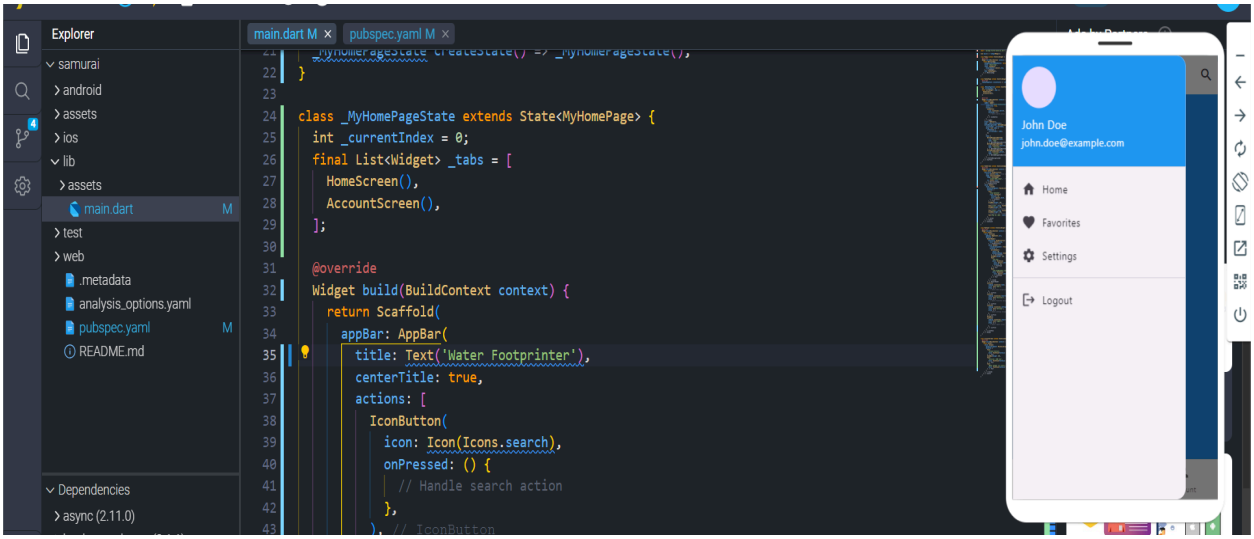


“ Tech Stacks involved in the development “

“Some sample screenshots of the pseudo-code for the Application along with Testing on the Android Emulator”







Key Shifts Needed

People's attitude towards water needs to change

People's attitude towards their food choices needs to change

More transparency is needed regarding data about water

Government bodies must address the water crisis through regulation

Aligning Impact Goals

Raising awareness about the **severity** of the water crisis

Educating people about the **Water Footprint** of the food they eat

Giving access to info about indirect water use in **agriculture**

Making people **actively choose** water-conscious foods

Achieving water sufficiency through **people's participation**

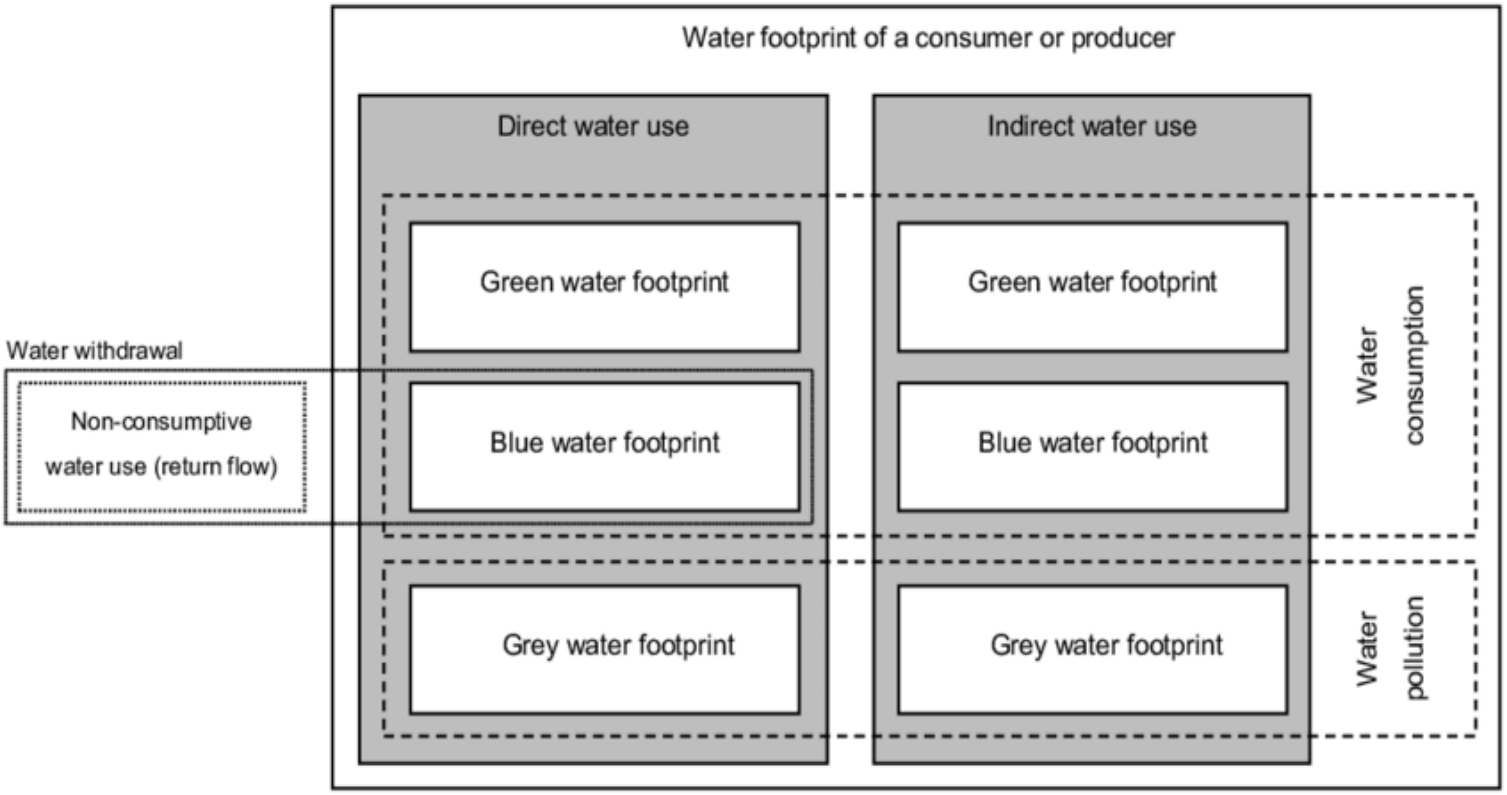
Potential Features

Learn	Calculate	Plan	Discover	Track
Increase awareness about the concept of virtual water and water footprint	Water footprint calculator for diet	Make your 5 day meal plan Check out water conscious recipes	Resources from experts Facts, figures, news about water	Track your water footprint Set goals, earn rewards, leaderboard

Implementation Details with Timelines:

Tentative timelines for the foreseen project:

- **Milestone 1**: Designing and Developing the User-Interface/Experience (starting June 2, 2024 -June 16, 2024 [2 weeks]):
    1. Wireframing the Algorithm
    2. Constructing the User-Interface
    3. Designing the Application on Figma

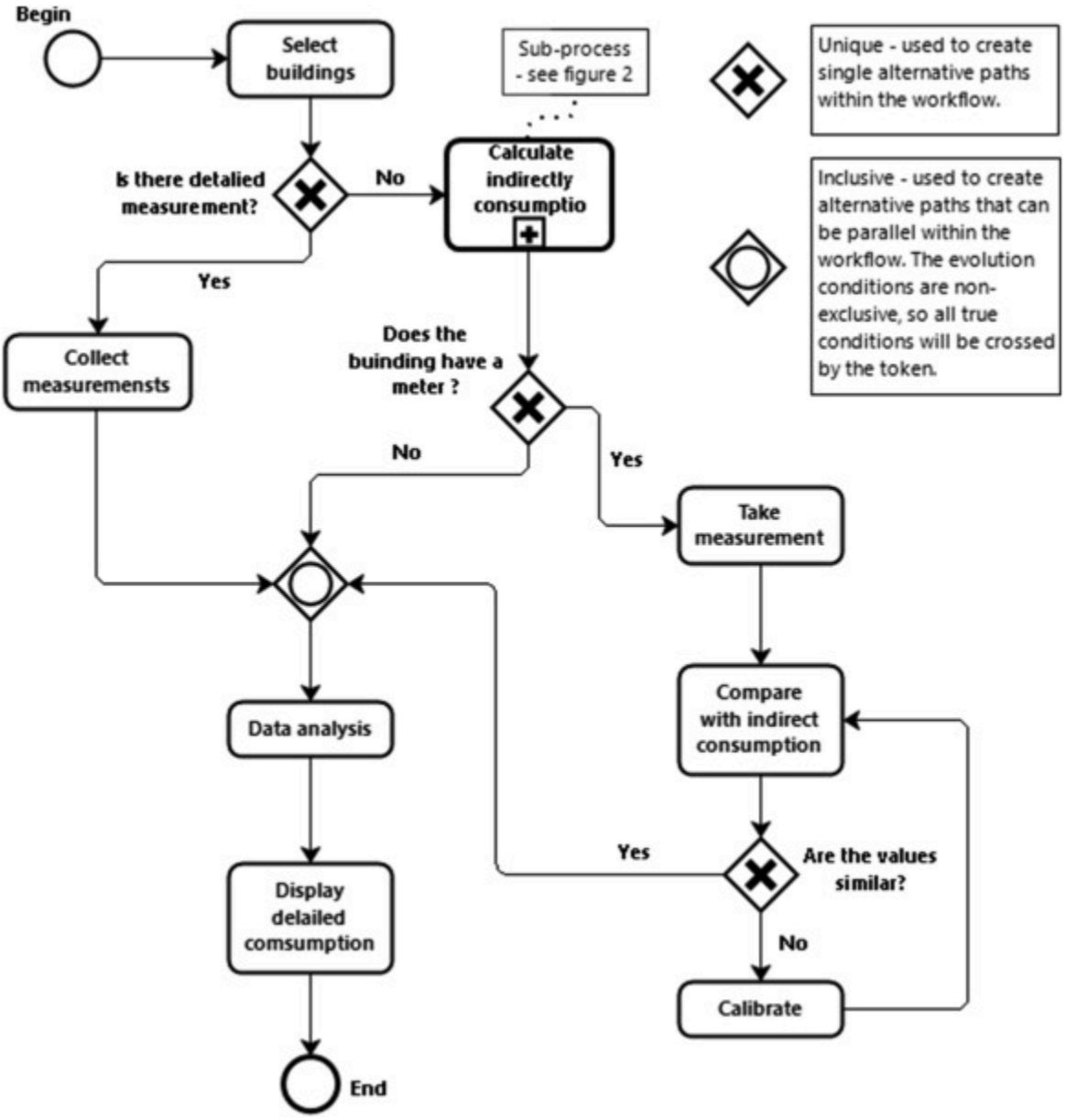


- **Milestone 2:** Prototyping (June 17, 2024 - July 2, 2024 [2 weeks]):
    1. Creating the Application on Flutter
    2. Redefining the Algorithm

- **Milestone 3:** Creating and Developing the User Backend Services (July 3, 2024 - July 24, 2024 [3 weeks]):

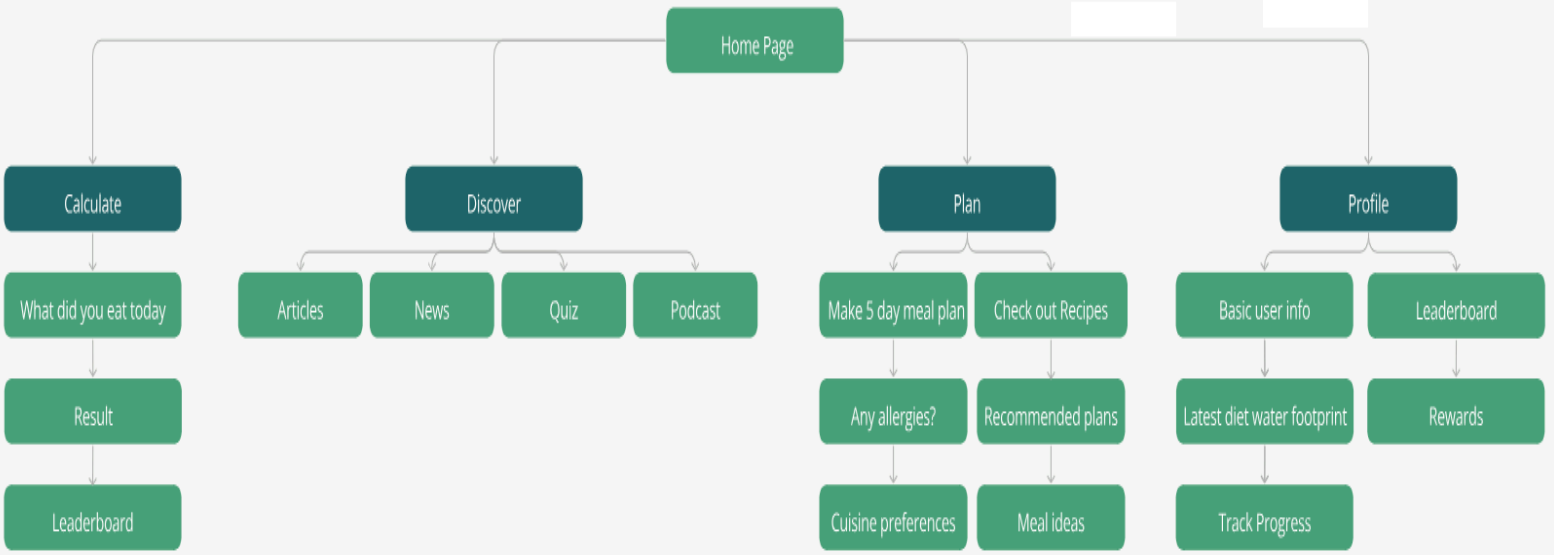
    Creating the database management system for user data and their credentials.

- **Milestone 4:** Documentation
  (July 25, 2024 - August 8, 2024 [2 weeks]):
    - Creating and managing the documentation process



Information Architecture

credit:Puddle



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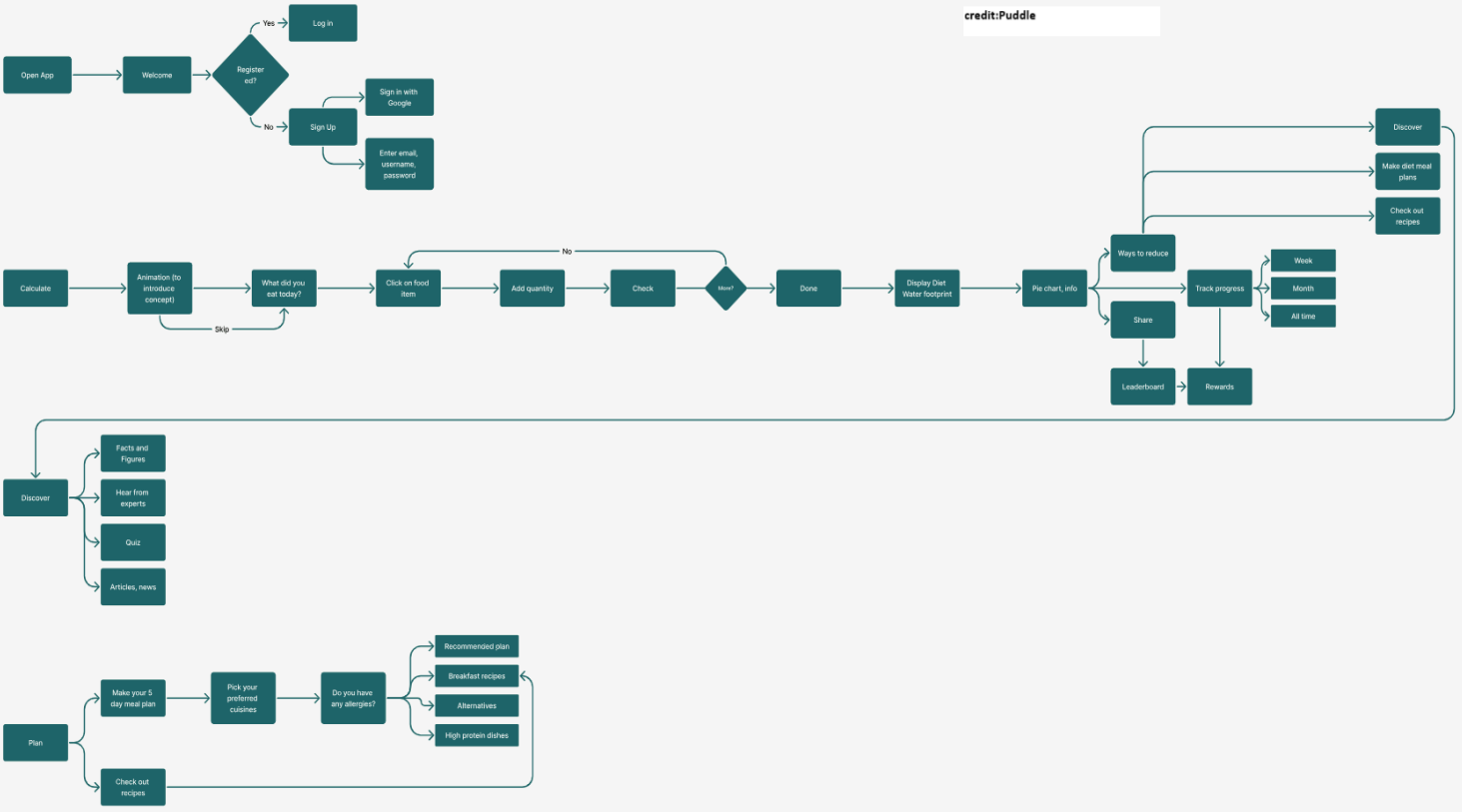

Availability:

Number of hours available to dedicate to this project (per week)	**60 hours**
Do you have any other engagements during this period? (projects/internships)	**None**

Personal Information:

I am Aditya Bhattacharya, a first-year undergraduate pursuing a Bachelor of Technology in Computer Science and Design Engineering at Rajiv Gandhi Institute of Petroleum Technology. Driven by curiosity, I thrive on exploring emerging technologies and aspire to contribute to the Open Source Community while honing my skills. Ready to share my burgeoning skills and, in turn, absorb the wisdom of the digital cosmos.

What is your motivation to apply for this project:

The Motivation behind applying for the project "**The Ripple Effect"**, is that the impact of AquaRevive is envisioned to ripple outward, influencing policies and practices on a larger scale.
It serves as a catalyst for change, to prioritize water conservation in our daily life and future. Being a programmer, I wanted to do something for society, and in doing so, my only resources are my skills, which I will leverage in this project.
In essence, the motivation for building AquaRevive is a blend of environmental stewardship, technological innovation, and social responsibility. It's about creating a tool that not only saves water but also enriches lives and nurtures the environment. This project is a testament to the belief that every individual effort, no matter how small, contributes to the monumental task of safeguarding water for our shared future.

- **Previous Experience:**

Though I have my repositories on GitHub, here are my notable achievement projects:

S.no	Project Name	Description
1.	G.R.I.T- A student-friendly app for mental health	● An app for the Smart India Hackathon 2023 that provides real-time health status updates for students during their psychological mid-journey. ● Our unique selling point (USP) included collaboration with nearby doctors and physicians, a 911-like emergency service, and a robust user-controlled data privacy system. ● The app was built using Flutter and Firebase for the full-stack implementation. Additionally. ● It was integrated with an OpenAI API 3.5-powered chatbot. ● Utilized MongoDB for data storage, and conducted server-side API testing with Postman
2.	**Cognitive Face Recognition System with Data Tracking**	● Developed a face detection system that records a person's presence along with date and time. ● The system features a user-friendly interface. OpenCV was used for the environment, and Microsoft Excel was employed for data tabulation.

Contribution to C4GT's open community:

Have you contributed to tickets in C4GT's open community?	**No**
Have you successfully completed C4GT's GitHub Classroom Assignment?	**No**
DPG Points	**0**
Screenshot of leaderboard	**0**