H2HOME PROJECT PROPOSAL   
 *"* *Hassle-Free Hydration at Your Doorstep"*

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY.**

**BCT 2315: COMPUTER SYSTEMS PROJECT**

**COMPUTER TECHNOLOGY**

**3.2**

**TEAM MEMBERS**

1. VANESSA WAMBUI – SCT212-0108/2022

2. MARK OGARI - SCT212-0715/2022

3. EZEKIEL GIKUHI - SCT212-0112/2022

4.SALEM MAINA - SCT212-0167/2022

5. EVE MAINA - SCT212-0109/2022

6. BRIDGET WANJIRU – SCT212-0466/2022

1. **PROBLEM STATEMENT**

Highlighting Juja located in Kiambu county as our primary case study, most apartment buildings do not provide fresh water for drinking to their tenants making the sight of water vendors along the various streets a common sight where these tenants often visit to refill their water bottles which is usually two or more times a week.

To address this challenge, **H2 HOME** is a software solution that automates and tracks the delivery of drinking water from the local vendors to consumers as well as monitoring the customers water consumption.

The platform ensures customers have easy access to clean drinking water at their convenience.

1. **COMMERCIAL VIABILITY**
2. **REVENUE GENERATION**

* The project will have two revenue generation models:

1. ***Monthly subscription****-* The consumers will be required to pay a subscription fee based on the amount of water to be delivered per refill such as 50Ksh – 5 liters, 95Ksh – 10 liters and 190Ksh -20liters. An automated algorithm will also be used to calculate a customer's subscription amount based on their desired water quantity and number of refills per month.
2. ***Pay-As-You-Go (PAYG) Option***

For customers who don’t want a subscription, they can **pay per refill** at a slightly higher rate:

**Example:** Ksh 100 per refill

This ensures revenue from occasional users while encouraging frequent customers to subscribe.

1. **COMPETITOR ANALYSIS**

* While no direct competitors currently offer a solution aimed at delivering clean drinking water to customers, some indirect competitors include:
* **Physical purchase from local vendors:** This is the current method being implemented where the customers visit these vendors to pay and refill their water bottles.

Our target market includes urban residents, apartment dwellers, university students, and busy professionals in Juja who need a convenient and reliable solution for accessing clean drinking water.

1. **GO-TO-MARKET STRATEGY**

To ensure the successful launch of ***H 2 HOME***, the team will implement a well-structured approach that includes digital marketing, partnerships, user acquisition tactics, pilot testing, and customer support mechanisms.

1. **Marketing Approach**

Our marketing strategy will focus on creating brand awareness and driving user engagement through:

*Digital Marketing:*

* Social media campaigns on Facebook, Instagram, Twitter, and LinkedIn to reach potential customers.

*Partnerships:*

* Collaborate with local water vendors to onboard them onto the platform and promote the service to their customers.
* Engage residential property managers to introduce the service to apartment dwellers.
* Work with student organizations and universities to target campus residents who frequently need water refills.

*Word-of-Mouth & Referral Program:*

* Offer a discount or free refill for every new user a customer refers to the platform.
* Encourage existing customers to share their experience on social media through incentives.

1. **User Acquisition Strategy**

To attract early users and retain them, we will:

* Offer a Free Trial: First-time users get one free refill to experience the service.
* Subscription Discounts: Limited-time offers (e.g., 20% off for the first 3 months) to encourage sign-ups.
* Push Notifications & Reminders: Timely alerts for water consumption tracking and refill reminders.

1. **Pilot Testing Plan**

Before the full launch, we will conduct a pilot phase in Juja, targeting select apartment buildings and student hostels.

Steps for Pilot Testing:

1. Recruit Early Adopters: Identify 100+ users (students, apartment dwellers, vendors).
2. Collect Real-Time Feedback: Use in-app surveys and direct user interviews.
3. Refine Based on Feedback: Adjust pricing, features, and delivery process as needed.
4. Expand Gradually: Roll out to more areas based on demand and operational capacity.
5. **Customer Support & Feedback Mechanisms**

To ensure a seamless experience and continuous improvement, we will implement:

*Multi-Channel Support:*

* 24/7 in-app chat support for real-time issue resolution.
* Dedicated WhatsApp helpline for quick inquiries.
* Email & Social Media Support for non-urgent queries.

*Feedback Collection:*

* Post-Delivery Ratings & Reviews to evaluate vendor performance.
* User Suggestion Box within the app for feature requests.
* Monthly Surveys to track customer satisfaction and areas for improvement.

1. **RESOURCES**
   1. **HUMAN RESOURCES**

The project involves the following team members:

* 4 Developers: Responsible for both frontend and backend development
* 3 Designers: In charge of UI/UX design and brand identity.
* 2 Security Analyst: Responsible for the systems Security & Performance Optimization
* 1 Group Lead: Will focus on team coordination, ensuring collaboration and smooth workflow
* 1 Project manager/Researcher: oversees development and ensures that timelines are met   
  1. **HARDWARE AND SOFTWARE REQUIREMENTS**

*Frontend:*

* Framework: Flutter
* Language/Styling: Dart

*Backend:*

* Framework: Django/Rust- managing the backend logic and APIs
* Database: MySQL

*Authentication:*

* Django authentication backend

*Development Environments*

* Android Studio (FrontEnd)
* Arduino IDE (BackEnd)
  1. **BUDGET CONSIDERATIONS**

*IoT Components:*

* ESP 32 – microcontroller
* Load Cell (20-50 Kg)
* HX711 (amplifier load cell)
* 5V Lipo battery
* T.P4056 module
* LED indicator

The above are estimated to cost about 4500 Ksh.

1. **METHODOLOGY**
2. ***Development Methodology***

**Agile Development:**

* Work in short, manageable sprints (2 weeks each).
* Gather continuous feedback from vendors and potential users.
* Prioritize flexibility, allowing for modifications based on testing results.

1. ***Step-by-Step Development Plan***

**Phase 1: Planning & Requirements Gathering (Week 1-2)**

**Objectives:** Define core functionalities and technical needs.

* Conduct research on user needs through surveys and interviews.
* Identify key requirements such as automated water delivery tracking, a vendor listing system, water consumption tracking, and secure payment processing.
* Select the tech stack:
* **Frontend:** Flutter (Dart)
* **Backend:** Django/Rust
* **Database:** MySQL
* **Authentication:** Django authentication
* **Hosting:** Cloud-based solution
* Define software architecture, API endpoints, and database schema.

**Success Measurement:**

* Completion of requirement document

**Phase 2: UI/UX Design (Week 3-4)**

**Objectives:** Create user-friendly interfaces and interactive prototypes.

* Design wireframes and mockups using Figma
* Develop a prototype for the mobile app’s user flow.
* Validate designs through user testing and refine based on feedback.

**Success Measurement:**

* Approval of final UI/UX designs.

**Phase 3: Frontend Development (Week 5-8)**

**Objectives:** Build the user interface and integrate APIs.

* Set up Flutter environment and project structure.
* Develop key screens:
* User authentication (login, registration).
* Dashboard displaying vendors and consumption tracking.
* Payment and order management screens.
* Implement state management using Provider or Riverpod.
* Integrate API calls for backend communication.

**Success Measurement:**

* Successful implementation of core UI components.
* User interactions are smooth with minimal bugs.

**Phase 4: Backend Development (Week 5-8, Concurrently with Frontend)**

**Objectives:** Implement server-side logic, database, and APIs.

* Set up Django/Rust backend and MySQL database.
* Develop core functionalities:
* Vendor and user management.
* Order processing and tracking.
* Secure authentication system.
* Build RESTful APIs to connect with the frontend.
* Optimize database queries for performance.

**Success Measurement:**

* All backend endpoints function correctly in Postman testing.
* User and order data are stored and retrieved efficiently.

**Phase 5: Payment Gateway Integration (Week 9)**

**Objectives:** Enable secure online transactions.

* Select payment providers (M-Pesa, credit/debit cards).
* Implement payment processing API.
* Ensure encrypted transactions and security compliance.
* Test payment flows under different scenarios.

**Success Measurement:**

* Successful completion of test transactions.

**Phase 6: Testing & Debugging (Week 10)**

**Objectives:** Ensure system stability and reliability.

* Perform unit testing on individual components.
* Conduct integration testing between frontend and backend.
* Optimize performance and fix reported bugs.

**Success Measurement:**

* 90% of reported bugs are fixed.

**Phase 7: Deployment & Launch (Week 11-12)**

**Objectives:** Deploy the system and onboard initial users.

* Deploy backend on a cloud service (AWS, GCP, or Azure).
* Publish the app on the Google Play Store.
* Run a **pilot test** with selected users before a full-scale launch.

**Success Measurement:**

* Successful launch with at least 100 active users.

1. **CONCLUSION**

***H 2 HOME*** aims to revolutionize water delivery by providing an efficient, automated system that connects consumers with local vendors, ensuring convenient access to clean drinking water.

With features such as real-time vendor listing, water consumption tracking, and secure payment integration, ***H 2 HOME*** will streamline water delivery services while supporting local businesses.

This project not only addresses a critical urban challenge but also paves the way for future innovations in smart water distribution systems.