[1 pt] Project Description

Our project, HydroLink, is a redesigned digital platform aimed at transforming the way Davao City Water District (DCWD) customers interact with their water service. Through our earlier research and analysis, we identified that the current DCWD system struggles to deliver a smooth user experience. Users commonly face issues such as missed billing notifications, lack of timely service interruption updates, and difficulty in reporting problems or accessing customer support. HydroLink addresses these issues by providing a mobile-friendly, user-centered interface that empowers users to manage their water accounts with ease. It supports essential tasks such as viewing and paying bills, receiving proactive notifications, reporting issues, accessing service zone maps, and chatting with a support agent or bot. HydroLink is designed to be accessible for a wide demographic, including senior citizens, working adults, students, and those with varying levels of technical literacy.

[4 pts] Requirements Summary

HydroLink is intended to run on both Android and iOS devices. To accommodate the varying capabilities of users' smartphones, we propose the following minimum and recommended system requirements.

Table 1. System Requirements for HydroLink (Android and iOS)

Category	**Minimum Requirements**	**Recommended Requirements**
OS	Android 5.0 (Lollipop), iOS 11	Android 9.0 (Pie), iOS 13 or higher
RAM	2 GB	4 GB
Processor	Dual-core	Quad-core
Screen Size	4.5” or higher	5.5” or higher
Connectivity	3G/Wi-Fi	4G LTE/ Wi-Fi
Permissions Required	Notifications, Storage, Location (for zone map)	Notifications, Storage, Location, Background Data

The system is intentionally lightweight and front-end oriented to cater to lower-end smartphones, while still providing a richer experience for modern devices. Features such as push notifications,

chat support, and service maps are designed to work effectively under minimal hardware and network conditions.

[75 pts] Prototype Description

Overview of the Prototype

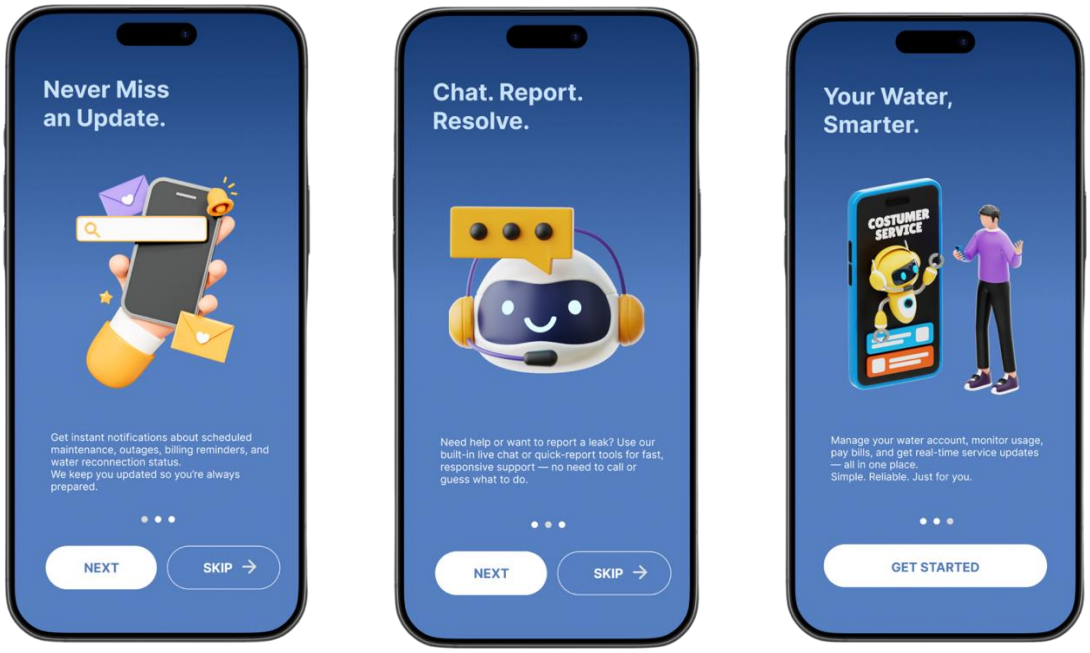
The HydroLink prototype was developed using Figma to simulate the interface experience for users. The prototype is interactive, enabling testers to perform key actions such as:

- Viewing billing history and payment status
- Checking for service interruptions by zone
- Reporting issues (e.g., leaks, disconnections)
- Receiving billing alerts and maintenance notifications
- Interacting with a chatbot for support

Though backend functionalities like live outage tracking and real-time database queries are not yet implemented, the prototype reflects realistic interaction flows to demonstrate core functionality.

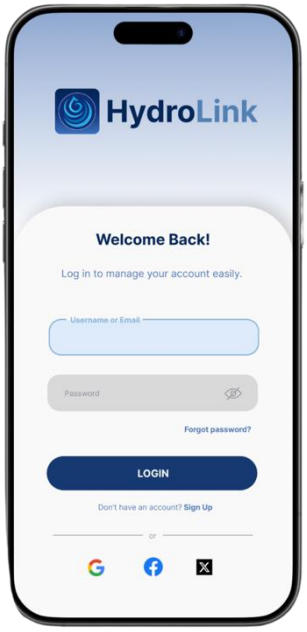
Description of Each Screen

Welcome / Get Started Screen



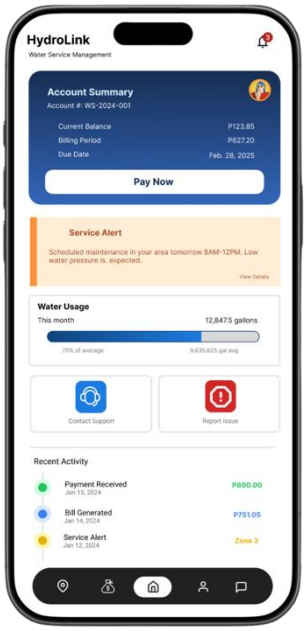
The following screens acts as the user's entry point into the HydroLink app. It features the app's logo at the center with soft wave graphics in the background to establish visual connection with water. Below the logo, users see two buttons: "Get Started" and "Login." This separation allows new and returning users to immediately identify where they should go. The visual hierarchy is clear, and text is legible even on smaller devices. The colors are soft blue and white to evoke calmness and trust.

Login / Sign-Up Page



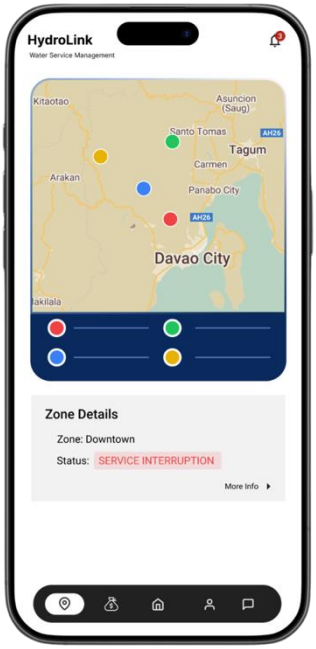
The login page uses a card-style layout, with a rounded input form floating over a blue-toned background. The app logo is placed at the top to build brand consistency. The input fields are large and clearly labeled, reducing chances of user errors. Links for password recovery and account creation are placed just below the login form, supporting user control and flexibility. The page uses icons to represent email and password input fields to aid recognition over recall.

Dashboard / Home



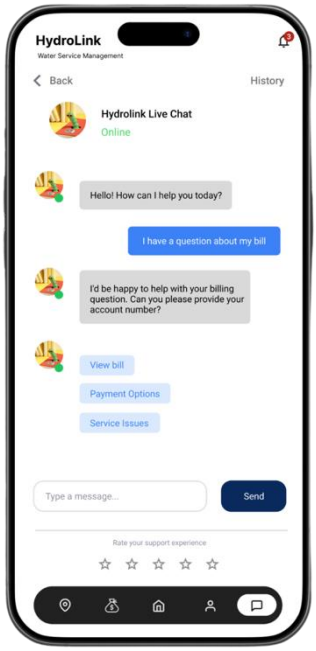
The main dashboard provides users with a clean, consolidated view of their water account. It prominently displays their current balance, next due date, and quick buttons for actions like "Pay Now," "Report Issue," and "Check Status." The visual layout uses color-coded cards and large icons to aid quick recognition. At the top, users can see any active service alerts or messages relevant to their zone. This screen is designed to reduce navigation time and give users a one-glance understanding of their status — aligning with the HCI principle of "visibility of system status."

Interactive Zone Map



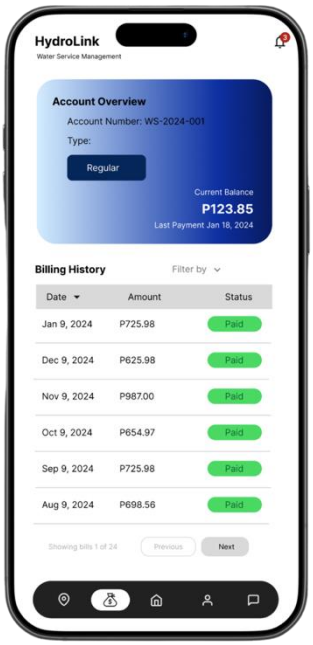
This feature allows users to search their area or use their address to view the status of water service in their zone. Zones are color-coded: green for active service, yellow for upcoming maintenance, and red for current interruptions. Tapping a zone brings up a detailed notice, including the cause of the interruption, estimated time of resolution, and DCWD advisories. This screen addresses the problem of users being caught off guard by interruptions and brings transparency to local service updates.

Chat Support Interface



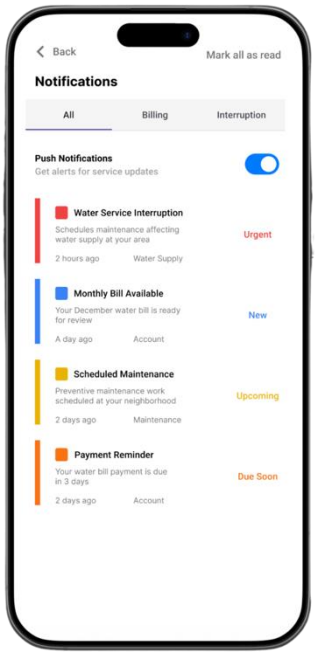
The chat screen is designed to be as intuitive and conversational as possible. It features a chatbot that handles frequently asked questions, bill inquiries, and outage queries using smart replies and pre-defined buttons. For more complex issues, users can escalate the conversation to a live agent or submit a help ticket with attached photos or descriptions. The interface also includes a history log so users can revisit past conversations. This blends immediate assistance with user-friendly support access.

Billing History & Payment Screen



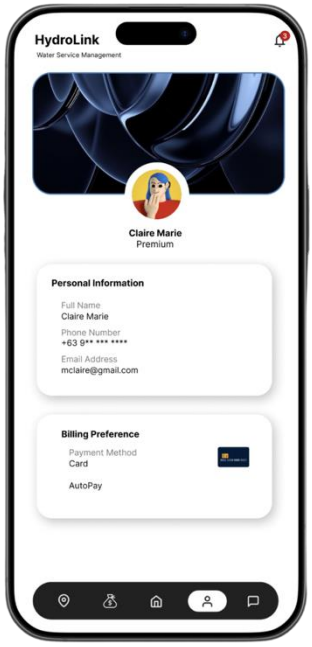
This section allows users to view a timeline of their previous payments and outstanding balances. Bills are listed by month, with the option to download a PDF receipt. Users can filter results, view payment status (paid/unpaid/overdue), and tap a prominent "Pay Now" button that initiates a mock payment flow for testing. This screen emphasizes transparency and record-keeping, addressing a common frustration with unclear billing.

Notification Center



Here, users can view all system notifications in one place. Notifications are sorted by category (billing, interruptions, maintenance, tips) and timestamped for clarity. Users can also enable or disable push notifications by type. This ensures users aren’t overwhelmed while still staying informed about what matters to them.

Account Settings Page



This page allows users to update their personal information, set billing reminders, opt into autopay, and manage zone preferences for service alerts. The design is form-based but optimized for mobile screens, using dropdowns, sliders, and toggles. Accessibility settings like text size and language preferences are also included.

Scenario from User's Perspective

At 7:00 AM, Maria opens her faucet and discovers there's no water. She quickly checks the HydroLink app and sees a red alert on her dashboard: "Zone 4: Scheduled Maintenance from 6 AM to 2 PM." Relieved to know it's not just her, she checks her bill status and sees she also has a pending payment. Within seconds, she taps "Pay Now" and completes her transaction. Curious about the alert, she uses the chatbot to ask about future interruptions and sets an alert for 1-day advance notifications. All this takes under three minutes.

Rationale: Why This Prototype?

For the Concept:

We chose to focus our project on redesigning the user interface of the Davao City Water District (DCWD) system because it reflects a real-world problem that directly impacts the community. Many users in Davao, including students, professionals, and families, have expressed frustration over delayed billing notifications, unclear service interruption schedules, and inaccessible customer support. By developing HydroLink, we aim to modernize and simplify the way users interact with DCWD. Our proposed interface addresses these concerns through a user-centered approach that includes real-time alerts, a smart dashboard, zone-based service maps, and integrated chat support. We chose this project because the impact is immediate and measurable, even minor improvements in billing reminders or outage visibility can significantly enhance daily life for users across Davao. This project allowed us to apply Human-Computer Interaction (HCI) principles in a way that is practical, community-driven, and scalable.

For the Design:

We selected this prototype because it encapsulates the most impactful and practical features derived from our design explorations in Part 2. Among all concepts, this version best balances user needs, technical feasibility, and system usability. It combines a comprehensive dashboard, real-time notifications, smart support mechanisms, and location-aware service status to give users both control and clarity in managing their water service.

Our decision was also influenced by the feedback from potential users who emphasized the value of being able to receive advance billing alerts, know service status without having to call or guess, and access customer support through an intuitive chat system. These needs guided us in prioritizing ease of access, minimal task steps, and consistent feedback across all features.

Advantages:

- Offers an all-in-one, centralized view of everything a user needs to know or do.
- Mobile-first, intuitive design supports broad demographics from students to senior citizens.
- Incorporates HCI best practices such as recognition over recall, consistency, feedback, and error prevention.
- Allows seamless user flows such as receiving an alert, paying a bill, and confirming the transaction within 1–2 taps.

Disadvantages:

- Some features such as live zone tracking and chatbot escalation depend on backend systems or staffing, which may not be fully ready.
- Users new to mobile applications may initially require onboarding or visual aids to navigate all available tools.

Despite these limitations, this prototype is optimal for usability evaluation. It allows realistic task simulation and provides a strong foundation for iterative improvement.

For the prototyping tool:

We chose **Figma** as the prototyping platform for HydroLink because it allows us to create realistic, interactive screens and collaborate efficiently as a team. Its real-time editing features enabled each member to contribute to the prototype simultaneously, while its easy sharing and commenting tools made remote testing and feedback collection seamless. Figma helped us simulate user experiences such as bill payments, checking service interruptions, and chatting with support, without needing to code backend logic. The platform's web-based nature meant quick updates and rapid iteration during class discussions and poster feedback. However, Figma does

require an internet connection to save changes and can be less responsive on smaller screens, which may affect usability during mobile previews. Still, for this stage of the project, the ability to build an interactive, test-ready prototype outweighs these drawbacks. It allowed us to focus fully on designing a user-friendly interface based on our identified problems and design goals.

Changes to Requirements

During the design and prototyping phase, we identified areas where our initial requirements were either too broad or missed practical details. These are the changes we made:

Table 2. Revised Requirements and Justifications

Original Requirement	Revised Requirement	Reason for Change
Chat Support	Live Chat + FAQ Bot with Escalation Option	Initial plans called for a fully live chat experience. However, feedback showed users preferred a chatbot to answer common queries and only escalate to human agents if needed. This hybrid model improved perceived availability and efficiency.
Offline Access	Cached Billing & Notifications (View-Only)	Users noted they often check balances or past bills in low or no-connectivity areas. Full offline access isn't feasible, but allowing cached content ensures critical info is still available.
Zone Alerts	Searchable, Interactive Zone Map with Filters	A static zone list proved hard to navigate during early tests, especially in emergencies. Adding search functionality and visual indicators (green/yellow/red) on a map allows faster recognition and location-based relevance.
Form for Reporting Issues	Step-by-Step Guided Report Wizard	Users found traditional long forms overwhelming. A multi-step form that asks one question per screen was

		preferred, reducing abandonment and helping users feel less intimidated.
(Not initially listed)	Dark Mode Support	Participants consistently mentioned eye strain when using white backgrounds at night. While not originally prioritized, it was added based on strong user feedback for accessibility.

[20 pts] Initial Evaluation Plan

In this phase, our group aims to evaluate how effective, usable, and intuitive the HydroLink system prototype is for real users. We plan to simulate realistic interactions with our prototype using modern platforms that are accessible for both evaluators and participants. We will be combining **face-to-face sessions** and **remote usability testing** using **Figma prototypes**, screen recordings (e.g., via Zoom or Google Meet), and digital forms (e.g., Google Forms or Microsoft Forms) to gather comprehensive insights.

Our evaluation will be divided into **three core parts**:

- **Usability Specifications**
- **Heuristic Evaluation**
- **Participant Survey and Feedback**

Usability Specifications

To evaluate HydroLink in terms of its real-world use, we will focus on these five usability goals derived from HCI best practices:

Table 3. Usability Criteria and Evaluation Methods

Criteria	How We Will Evaluate It
Effectiveness	Users should be able to successfully complete key tasks such as checking bills, reporting issues, or navigating to the water interruption map without errors.
Efficiency	We will measure how quickly users complete tasks and how many steps are needed. Fewer steps and time mean a more efficient system.
Learnability	New users should be able to understand how to use the app with minimal guidance. We will check if they can complete tasks on their first attempt.
Memorability	After a short break, users should remember how to use core features without needing to relearn.
Satisfaction	Through survey results and observation, we'll determine if users enjoy using the interface and feel confident using it in the future.

Test Participants (Target Population)

We will invite **5-10 participants** that reflect our app's target users:

- Residential users (students, parents, workers)
- Senior citizens or less tech-savvy users
- Tech-savvy mobile-first users (young adults)

These participants will interact with our **clickable prototype via Figma**, either in person or virtually, and will be guided to complete benchmark tasks.

Prototype Tasks (Benchmark Tasks)

Participants will be asked to complete the following tasks during the test session. Each task is designed to test specific parts of the interface and ensure real-life relevance.

Table 4. Benchmark Tasks and Corresponding Evaluation Goals

Task	Goal
1. Open the app and navigate to the billing overview	Test ease of accessing main data
2. Check water interruption status for a zone	Test use of interactive map
3. Report a pipe leak with photo	Test the reporting form's usability
4. Use live chat to ask about reconnection	Test chatbot/live support interface
5. Download the latest billing statement as PDF	Test accessibility and utility

Each task will be timed and observed. If tasks take too long or cause confusion, it will indicate a usability issue.

Roles of Team Members

Table 5. Team Member Roles During Testing

Team Member	Role
Member A	Facilitator – guides participant, explains task
Member B	Notetaker – observes participant behavior, logs errors
Member C	Survey & Debrief – assists with feedback forms and final comments

Success Time Benchmarks (Time-Based Interpretation)

Table 6. Success Time Benchmarks (Task Time Thresholds)

Task Type	Target Time	Interpretation
Navigation tasks (e.g., Billing overview)	≤ 30 seconds	Successful
Interactive tasks (e.g., report issue)	≤ 1 minute	Acceptable
Complex tasks (e.g., map + report + submit)	≤ 2 minutes	Acceptable
If > target time or errors occur	—	Review for redesign

Heuristic Evaluation (Nielsen's 10 Principles)

Our team will also conduct an internal heuristic evaluation, using Nielsen's 10 Usability Heuristics. Here's how HydroLink addresses them:

- **Visibility of System Status**

Real-time updates for billing, confirmation prompts, and outage alerts help users feel informed.

- **Match Between System and Real World**

We use everyday language like "Pay Bill," "Report Issue," and zone names instead of technical terms.

- **User Control and Freedom**

Navigation menus, back buttons, and cancel options allow users to reverse or exit unwanted actions easily.

- **Consistency and Standards**

Colors, fonts, icons, and layouts are consistent throughout the app. Primary actions always appear at the bottom.

- **Error Prevention**

Input fields include validation and confirmation modals to avoid mistakes like duplicate reports.

- **Help Users Recognize and Recover from Errors**

Error messages are user-friendly, descriptive, and include suggestions like “Try again later” or “Check your connection.”

- **Recognition Rather Than Recall**

Navigation is icon-based and uses labels, reducing the need to remember steps.

- **Flexibility and Efficiency of Use**

Users can jump between tasks using a fixed bottom nav bar and shortcut icons for power users.

- **Aesthetic and Minimalist Design**

Design avoids clutter. White space is balanced, and key actions are prominent and simple.

- **Help and Documentation**

FAQs and a chatbot/live support system are available to provide help in real time.

Participant Survey and Feedback

After testing, participants will complete a brief **post-test survey** to gather both quantitative and qualitative feedback. This will help us understand their overall impression of the app.

Table 7. Participant Survey Methods

Method	Description
Survey (Quantitative)	5-point Likert scale to measure ease of use, satisfaction, clarity, and interface appeal.
Open Feedback (Qualitative)	Short written answers on what they liked, found confusing, or would improve.

Survey Sample Questions

- On a scale of 1–5, how easy was it to navigate the app?
- How would you rate the clarity of the billing information?
- Was it easy to find and use the report feature?
- Did the map and chatbot features feel helpful?
- Any part of the app that confused you?

Evaluation Rubric (Success Thresholds)

Table 8. 5-Point Likert Scale Interpretation Guide

Scale	Interpretation
5	Highly Acceptable (Effortless experience)
4	Acceptable (Few minor issues)
3	Neutral (Some difficulties)
2	Needs Improvement
1	Not Acceptable (Confusing, error-prone)

If a feature scores below **3.5**, we will flag it for redesign or enhancement in part 3.2.