HydroLink is a mobile-first, user-centered platform designed to revolutionize how citizens of Davao City manage their water services through the Davao City Water District (DCWD). Informed by the principles of Human-Computer Interaction (HCI), our solution addresses major user pain points such as missed billing notifications, confusing or inaccessible outage alerts, and the lack of convenient and responsive customer support. A key motivation behind this redesign is that DCWD currently only provides a web-based system, which has proven to be outdated, inconsistent, and difficult to navigate — especially on mobile devices. Users have reported encountering broken links, poor responsiveness, and unclear page structures, all of which compromise task success and satisfaction. HydroLink provides a focused, mobile-optimized alternative that enhances the user experience through intuitive interfaces, real-time communication, and accessible services. The intended users range from tech-savvy young adults to older residents who require a simplified, intuitive interface that supports easy navigation and decision-making.

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.

[15 pts] Overview: Evaluation Techniques, Tasks, and Users

Evaluation Techniques Used

We employed a multi-method approach to thoroughly assess HydroLink's interface and interaction design. Our evaluation included:

1. **Benchmark Task Evaluation** – Users performed key tasks designed to reflect real-world needs, with observations and time tracking.
2. **Heuristic Evaluation** – Our team conducted expert reviews using Nielsen's 10 Usability Heuristics to analyze user control, system feedback, error handling, and visual clarity.
3. **Post-Test Feedback Survey** – Participants completed a questionnaire rating their experience, clarity of UI elements, and emotional satisfaction using a 5-point Likert scale, supplemented by open-ended qualitative feedback.

Evaluation Tasks

Each task was based on critical daily user goals:

- Check their billing history and account status.
- View outage information by navigating the interactive zone map.
- Report a problem such as a leak or disconnection.
- Contact support via chatbot or simulated live agent.
- Adjust notification settings and download billing statements.

These tasks helped us evaluate core usability factors: navigation, task success, satisfaction, and user confidence.

User Profiles

We selected 10 target users representing our intended population:

- 7 university students (ages 18–22)
- 2 working adults (ages 25–40)

These participants were chosen to reflect the diverse range of users interacting with DCWD services — from digitally fluent individuals to seniors who may face barriers in technology use. This diversity helped validate our design's usability across skill levels, device types, and digital familiarity.

[60 pts] Evaluation Results

Table 1. Task Completion Summary

Task	Target Time	Avg. Time	Success Rate	Errors Noted
Open Dashboard and View Billing	≤ 30 seconds	12 seconds	100%	Seamlessly completed; participants understood layout immediately.
View Zone-Based Water Interruption	≤ 1 minute	50 seconds	90%	Tap zones were static; some confusion simulating selection.
Simulate Reporting an Issue	≤ 90 seconds	1 min 15 sec	80%	Submission screen clear; photo upload shown as placeholder only.
Chatbot	≤ 1 minute	45 seconds	100%	Static chatbot flow was well understood despite being non-functional.

Download Billing Statement	≤ 1 minute	40 seconds	90%	Some icons lacked labels; symbolic use not always intuitive.

Note: Due to prototyping limitations in Figma, tasks involving dynamic backend operations (e.g., live chatbot, file uploads, map interactivity) were simulated through static screens. Evaluations were based on how intuitive and understandable these elements were visual concepts.

Table 2. Likert-Scale Feedback

Criterion	Avg. Score
Navigation was easy and intuitive	4.67
Clarity of billing information	4.67
Satisfaction with chatbot support	4.44
Confidence in reporting issues	4.33
Usefulness of zone-based outage status	4.44
Overall satisfaction with the interface	4.67

Table 3. Qualitative Feedback (Recurring Themes)

Theme	Participant Statement
Visual Design & Usability	"The UI is clean, organized, and easy to navigate."
Map Interaction	"The map is helpful, but the tap areas could be a bit larger."
Simplicity and Navigation	"Everything was easy to find and understand—very straightforward."
Feature Suggestions	"It would be nice to have PayMaya or GCash as payment options."
Payment Experience	"In the payment success screen, 'Download Receipt' seems too emphasized. It should be smaller or replaced with a more obvious 'Done' button."

Data Analysis: What the Data Tells Us

Overall, the evaluation affirmed that HydroLink meets many of its usability goals, despite being a non-functional prototype. Users navigated the prototype with ease, indicating strong conceptual clarity and information hierarchy.

- **Effectiveness**: Participants were able to locate, interpret, and move through the interface with minimal instruction.
- **Efficiency**: Average interaction times were well within the target limits.
- **Satisfaction**: High ratings across all Likert items suggest positive user impressions and emotional responses.
- **Usability Gaps**: Some visual elements (e.g., icons without labels, tap zone confusion) require refinement for better intuitiveness.

Design Implications

Strengths:

- The simplified dashboard and prioritization of billing/alerts make core functions highly accessible.
- Scrollable layouts and popup confirmations improve interaction feedback.
- Consistency in iconography and color use increases confidence.
- Popup confirmations (e.g., payment success, report submission) helped users feel reassured that tasks were completed.

Improvements Needed:

- Enhance tap area design and feedback for interactive zones (e.g., map overlays).

- Users requested larger fonts and clearer button placement, especially for senior citizens or visually impaired users.
- Update **icon labels** for clarity and semantic alignment (e.g., download, report).
- Users mentioned that the "Download Receipt" button was too prominent and should be secondary to a more obvious "Done" button.

Revisions Made Based on Feedback:

- Refined zoning screen to better differentiate clickable areas.
- Enlarged key buttons and text fields to improve accessibility.
- Added separate UI screens for login, signup, password recovery, and account verification for better flow.
- Introduced simple pop-up confirmations for billing, reporting, and other critical tasks to provide clear task completion feedback.

What Went Well

The project successfully embodied the principles of HCI by prioritizing user feedback, accessibility, and clarity over visual complexity. Despite the static nature of the prototype, users consistently reported high satisfaction in navigation, comprehension, and visual appeal. The system addressed many existing pain points of the DCWD platform, especially the lack of mobile responsiveness and poor notification features.

What Could Have Been Better

Design-wise:

- Including an onboarding tutorial or step-by-step prompts would have eased entry for first-time users.
- Adding a dark mode and greater color contrast could make the system more inclusive, especially for visually impaired individuals.

Evaluation-wise:

- Testing with a larger population — particularly users aged 50+ — would have provided deeper accessibility insights.
- Real-environment testing (e.g., mobile use in public areas or low network zones) could better evaluate UI robustness.
- Using Figma limited interactivity; no live logic could be tested (e.g., real-time chatbot responses or location tracking).

With More Resources...:

- Develop a higher-fidelity prototype that simulates backend features like live map updates and chatbot response logic.
- Conduct **field testing** in real-world mobile settings to test responsiveness and usability on the go.
- Expand participant base to **20-30 users** to gain statistically significant feedback.

Final Takeaway

This project has given us a deeper understanding of what it truly means to apply Human-Computer Interaction principles — not just to create interfaces, but to solve real problems for real users. HydroLink was developed in response to specific and recurring issues faced by Davao City residents: the outdated DCWD website, broken or missing links, lack of mobile accessibility, and poor notification systems.

Despite being a static prototype created in Figma, our design evaluation showed that usability can be meaningfully assessed even without full interactivity. Users were able to navigate key features with ease and expressed high satisfaction with the structure, layout, and responsiveness of the interface. The positive reception from participants across age groups, including seniors and non-tech-savvy users, reinforced the importance of designing for clarity, simplicity, and inclusivity.

We also identified areas for improvement, such as enhancing map interactivity, improving icon clarity, and providing guided onboarding. These findings emphasize that HCI is a continuous process of learning, testing, and refining — grounded in feedback and real-world use. Ultimately, HydroLink is a step toward that goal. It's not perfect, but it's purposeful. And it's a reminder that effective design always starts — and ends — with the user.