## PART 1: UNDERSTANDING THE PROBLEM

### Overview [5 pts]

Having a reliable water service is essential to daily life. Yet, in Davao City, we've observed how limited-service accessibility from the Davao City Water District (DCWD) leads to avoidable inconveniences, confusion, and frustration for users, especially ordinary citizens. Despite having an online billing system, problems persist such as delayed bill notifications, unclear payment deadlines, lack of real-time updates, and poor access to customer support beyond social media. We've personally witnessed a neighbor experience water disconnection simply because they didn't receive any billing reminders. Their paper-based bill either arrived late or not at all, as it relies on physical delivery — a method prone to delays and human error.

Currently, DCWD relies heavily on **Facebook and its website** to provide updates such as **scheduled water interruptions**, **billing notices**, or **emergency announcements**. However, these platforms are **not consistently reliable, accessible, or inclusive**, especially for users who are **not digitally active or don't use social media** regularly. There is also **no official mobile application** or **centralized digital platform** where users can view bills or check disconnection schedules, report pipe leaks or service issues, directly ask support agents about water concerns, receive real-time notifications, and track when water service will be restored in their area.

Instead, users must manually **call or text hotlines**, which are often **slow to respond, unclear, or ignored**. Many users don't even know the proper numbers or platforms to use in urgent situations. These create confusion, stress, and even **missed payments that lead to unnotified disconnections**. As water is an essential utility and a basic necessity, it is crucial that consumers receive accurate, timely, and accessible information regarding their usage, billing, and service interruptions. We believe that there is a strong need to improve the current system or design a more efficient one to ensure better user experience.

### Characteristics of the Users [10 pts]

The primary users of the system are everyday residents of Davao City who depend on water for their daily routines. This includes a wide variety of people with different lifestyles, roles, and levels of digital experience. Among them are residential customers who manage household water consumption and bills, senior citizens and less tech-savvy individuals who may have difficulty navigating online platforms or do not frequently use email or social media, and working individuals with busy schedules who need quick, reliable access to billing updates and service alerts. Additionally, small business owners require accurate and timely billing information to manage operational costs, while parents and homemakers rely on water availability to maintain routines such as cooking, cleaning, and childcare. A growing number of mobile-first users, especially younger adults, prefer accessing services via mobile apps rather than desktop websites.

Despite their diversity, these users share several common traits:

- Most of them prefer mobile-based solutions because smartphones are their primary device for internet access.
- They exhibit varying degrees of digital literacy.

- They favor push notifications or SMS alerts over email, especially for urgent updates like water interruptions or bill reminders.
- Many seek quick, straightforward access to billing information, payment methods, and customer support.
- Some users feel anxious about missing due dates or being unaware of upcoming disconnections.
- Others are left in the dark about service interruptions, unsure when or why their water was cut off.
- When problems arise, they want real-time support and clearer communication channels for reporting and resolving issues.

**Task Analysis [30 pts]**

**a. Characteristics of Tasks Performed by the Users**

Users of the DCWD system engage in a variety of essential tasks that directly relate to water service access and maintenance. These tasks are typically **routine, reactive, and time-sensitive**, especially when related to payments or disruptions in service.
Common tasks include:

- **Checking water bills and due dates** to ensure timely payment and avoid disconnection.
- **Paying bills** either through online banking platforms, over-the-counter services, or mobile wallets.
- **Receiving alerts** for scheduled disconnections, maintenance activities, or emergency interruptions.
- **Reporting issues** such as pipe leaks, low water pressure, unclear billing, or complete service outages.
- **Inquiring about service interruptions, billing discrepancies, or account-related concerns** through available communication channels.
- **Reaching out to customer support** when problems arise or when existing information is unclear or inaccessible.

**b. Characteristics of Task Environment**

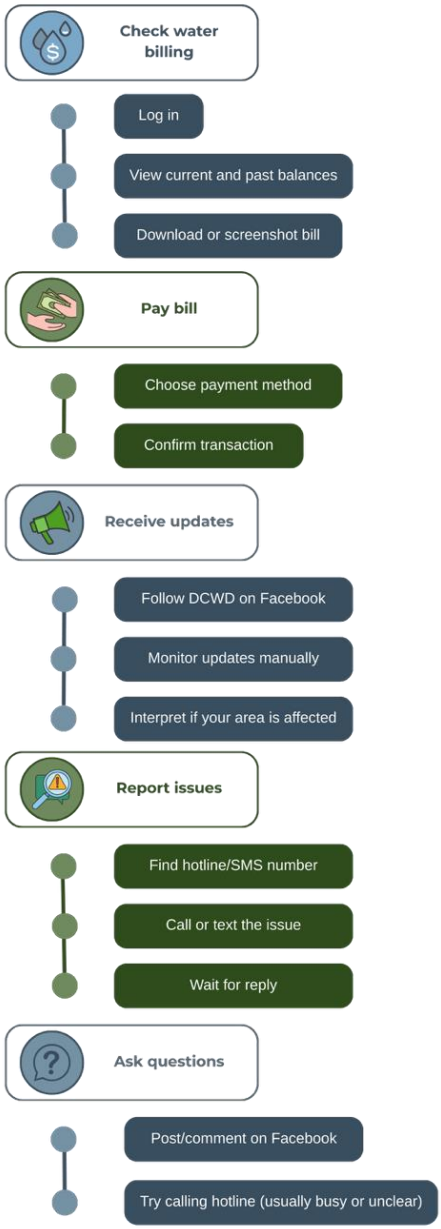
Most of the tasks users perform in relation to DCWD services happen in less-than-ideal conditions. In real life, people often check bills or report water issues while they're busy at home, at work, or even in transit. Many of them rely heavily on their mobile phones to access the system, but poor internet connectivity or lack of signal can make this difficult. Despite the need for quick and reliable service, users are left navigating through different channels just to get simple information. They switch between the DCWD Facebook page, SMS hotlines, and the website—hoping one of them provides the answer they need. However, the fragmentation of these communication methods makes it hard for people to know where to look, especially in urgent situations like unannounced disconnections or pipe leaks.

What makes things worse is the current state of DCWD's digital platforms. The official website (https://web.davao-water.gov.ph/home) feels outdated and cluttered, with a design that doesn't adapt well to mobile devices. Important information is hard to locate, and the layout lacks the intuitiveness that users expect in 2025. Even though DCWD has website, it is poorly promoted and offers limited features, making it ineffective for most users. This kind of system design fails to support the users' task environment, which is already full of stress, urgency, and limited access. These issues emphasize the urgent need to improve the system, not just for convenience but to make essential water services accessible to everyone especially

the elderly, less tech-savvy users, and busy individuals who simply want fast, reliable, and clear information.

### c. Structured Task Analysis

**Main Task:** Manage water service access and issues



## Analysis of the Existing System [15 pts]

Currently, the Davao City Water District (DCWD) offers a web-based platform accessible through https://web.davao-water.gov.ph/home. While this online portal serves as a foundational access point for basic services and information, our evaluation reveals critical gaps in functionality, usability, and communication that hinder user satisfaction and overall service efficiency.

**Strengths of the Existing System**

1. **Online Accessibility:** The platform is publicly available and can be accessed through any web browser, making it useful for desktop users and those with internet access.
2. **Basic Billing Services:** It includes a Customer Inquiry section where users can check billing and payment records, providing basic financial transparency.
3. **Public Notices:** There is a section dedicated to News and Advisories, such as scheduled water service interruptions, which shows some effort to inform users.
4. **Availability of Contact Information:** The site lists hotlines, emails, and office locations, allowing users to find contact options when needed.

Despite the above strengths, **the system falls short in multiple critical areas**, especially when evaluated through the lens of **Human-Computer Interaction (HCI)** principles such as accessibility, efficiency, error recovery, user control, and feedback.

1. **Web-Only Interface, No Mobile Application**: The current platform is **not mobile-responsive** in an optimal way, and **no dedicated mobile app** is available. This excludes users who primarily use smartphones — especially common in the Philippines, where many access the internet via mobile rather than desktop.
2. **No Real-Time Notifications or Alerts**: There is **no in-app or push notification system** for urgent advisories like scheduled water interruptions, emergency leaks, or disconnection warnings.
3. **Limited Customer Service Interaction**: Contact options are **static (phone numbers, emails)** and **not integrated within the site itself**. There is **no live chat, chatbot, or automated ticketing system**.
4. **Poor Localization and Area-Based Updates**: Advisories are **not hyper-localized** — updates are usually posted as plain text announcements without a search or filter tool to check if **a specific barangay or street** is affected.
5. **Confusing Navigation and Unintuitive UI**: The overall interface is **outdated and cluttered**, with poorly labeled links and inconsistent page layouts. The visual hierarchy lacks clarity, and there is **no site-wide search functionality**.
6. **No Reporting Tools for Service Issues**
7. There is **no built-in reporting tool** for leaks, illegal connections, or billing errors. Customers must resort to calling or emailing, which may not always be available or responded to.

## Description of the Larger Social and Technical System [15 pts]

This project intersects with both social systems (public utility use, daily life routines, consumer trust) and technical systems (DCWD infrastructure, payment gateways, notification systems).

- **Social System:** Users often experience stress due to lack of information, failed communication, and unclear processes. The digital divide (especially among the elderly or low-income households) creates inequality in access.
- **Technical System:** Current infrastructure is fragmented — web platform, SMS hotlines, Facebook page — but these do not sync or offer a seamless experience. There's no centralized system where all actions (checking bills, paying, reporting, chatting) can be done in one place.

A good design must bridge these two systems by improving inclusivity, reducing uncertainty, and allowing clear, real-time interactions across user types.

## Initial Usability Criteria [15 pts]

To make sure our design is not only functional but also genuinely helpful to users, we will follow key usability principles throughout the development process. These principles will guide how we design, test, and evaluate the system, ensuring that it addresses real user needs and works well in everyday situations.

### Visibility of System Status

Users should always know where they stand, whether it's their current billing amount, payment due dates, or if there's a risk of disconnection. They should also be able to see water service status like scheduled interruptions or ongoing repairs. To measure this, we will observe whether users can easily find this information through a real-time dashboard during usability testing.

### Ease of Navigation

The design should allow users to complete important tasks like checking their bill, making a payment, or reporting an issue without getting lost or confused. Ideally, these tasks should be completed in just a few steps. We'll evaluate this by checking task completion rates and observing how easily users can perform these actions during test sessions.

### Error Prevention

We aim to reduce the chances of mistakes like missed payments or incorrect reports by providing clear confirmation messages and timely reminders. We can measure this by tracking whether reports of missed payments or unexpected disconnections decrease over time as the system is used.

### Accessibility

The interface should be user-friendly even for those who aren't tech-savvy, such as elderly users or people who don't regularly use smartphones or apps. We plan to gather feedback directly from users in these groups and adjust our design based on their experience.

### Feedback and Responsiveness

When users report a problem or ask a question, they should receive immediate confirmation and a clear timeline for when they can expect a response or resolution. We'll measure this through customer satisfaction ratings and how quickly and effectively support requests are resolved.

### Implications of What we Learned [10 pts]

Through this process, we realized that designing a system is not just about making something functional, but about creating something meaningful, inclusive, and responsive to real-life situations. We've seen how deeply water service impacts daily routines, and how the lack of clear, timely, and accessible information can lead to unnecessary stress and disconnection. Exploring different design directions helped us understand that while some problems may be more manageable, they do not always reflect the depth and urgency of what truly matters to people. By focusing on the needs of a wider and more diverse group of users, including those with limited digital skills or unreliable access, we've learned that human-centered design must prioritize clarity, empathy, and accessibility. Every choice we make, from how information is displayed to how users are notified, must reflect the urgency and sensitivity of the tasks involved. This deeper understanding will guide us to design a system that is not only functional, but truly helpful and reliable for everyone who depends on it.