**MIDTERM**

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**Title: “A Web-Based Smart Ordering and Delivery Scheduling System for Water**

**Stations”**

**Review Related Literature**

1. **Introduction**

**Purpose:** This Literature find some related studies and systems in scheduling, delivering and high operational costs. To determine the water delivery business than, often face challenges like inefficient scheduling and delayed deliveries. Aqua Flow ,web-based system designed to optimize water delivery services by automating order processing and intelligently scheduling deliveries. Instead of traditional manual routing.

**Scope:** The review includes studies published from 2020 forward that are directly related to system for scheduling, delivering and high operational costs for water station and the people’s of subdivision in Tamara Tanza Cavite. specifically if the system is a type web- based, with a responsive user interface that can be use in any type of device.

**Thesis Statement:** This study aim for the development of the Aqua flow , A responsive web-based that can schedule the water delivery in subdivision, people in those area can use any device to access this application to communicate water station in that located inside the subdivision. Furthermore, it will send a notification and confirmation to the customers that ordered water in in the water station. Aqua Flow aim water stations improve efficiency, reduce costs, and enhance customer satisfaction**.**

1. **Body Of Literature**

**|."Smart Delivery Scheduling with route Development “**

This section to discuss the ways of using the technology and smart delivery of where and who the product will be sent. Instead of manual way of organizing the schedule of the delivery, there are some algorithms that helps the flow of the process to be more efficient.

* The continuous development of the smart city making the transportation more high-tech. Using of the intelligent transportation system is important to make the logistic fine and more secure to prevent the congestion in any places like city. In this process, it’s important to identify the delivery personnel to certain the quick and fine service of the operation. The importance of the Hungarian algorithm in the assignments. In there research, they use it to compare the delivery personnel base in the order cost efficiency, and the outcome is positive, it makes the company more productive. (Vásconez et al., 2024)
* The urban logistics is focus in making a detailed and complex study in the logistic of development of the city, it is important in the field of the modern city. Urban logistics is focus in the transportation of the product and quick services. They integrate the smart urban logistic and the technology like (AI) Artificial Intelligence in city to make the operation more smooth. Furthered more it make the routing and scheduling more efficient.(Büyüközkan & Ilıcak, 2022)
* The integration of routing decisions and loading schedules grow as area or city of interest in warehouse and delivery logistics (VRP) Vehicle routing Problem focus in optimizing path and time, without accounting for internal warehouse. This approach leads in inefficiencies in real world. Proposed an integrated approach to the Vehicle Routing Problem with Time Windows and Loading Scheduling (VRPTW-LS). This study determine the schedule of loading and minimize the overall travel distance. Furthermore researchers introduced an adaptive large neighborhood search (ALNS) algorithm, the algorithm is validated through extensive computation experiments. So the result are high quality and efficient .(Y. Liang et al., 2023)
* Increasing demand for last-mile delivery efficiency in urban areas, the use of Heterogeneous Robotic Delivery Systems (HRDS) , the system provide flexibility in navigating terrains while balancing the delivery cost and customer satisfaction. But still there’s a challenge due of difference between UAVs and UGVs. The researchers introduced a hybrid method that integrates the Improved Artificial Bee Colony (ABC) Algorithm with the Non-dominated Sorting Genetic Algorithm II (NSGA-II). To create a optimal delivery routes. It will minimize the cost but it will maximize the customers satisfaction. (Chen et al., 2024)

**Synthesis:** The studies show that smart delivery scheduling powered by web-based platforms and intelligent algorithms can significantly improve logistics operations, livery efficiency, and customer satisfaction. But some of existing systems are focused in specific areas. This web-based smart ordering and delivery scheduling system for water stations enhances coordination, reduces manual workload and reduces route seamless.

**||. Automated order reminders and confirmations**

A system that automatically give a reminder or confirmations to the customers that have ordered without manual follow-up. Such as SMS, email, or app notifications.

* The use of automated alerts and reminders in healthcare has become increasingly prominent as a tool to enhance patient adherence and self-management. Automated alerts reminds the patient in clinic. This helps the patients to prevent skip analysis to the clinic. This show that the both patient and digital literacy both continue to develop in effective way. heir utility spans several areas of healthcare, including increased appointment attendance, enhanced adherence to treatment regimens, support for post-discharge instructions, and reduced hospital readmission rates. This helps the clinic to lower the clinic operation, prevent the client that did not show during operation and improving patient-provider coordination.(Labrie & Schulz, 2016)
* With digital transformation of healthcare services, automated reminders is essential tools to prevent patients absence. the impact of behavioral economics-based messaging on patient appointment scheduling and completion through digital patient portals. This study emphasize the importance of the automated system and it’s a critical role in patient responsive.(S.-Y. Liang et al., 2022)
* Automated reminder systems have become an integral component in healthcare service delivery, this system in importance specially to the patients that is diagnostic. Imaging, That patient missed the slots, it can be result increased cost and delayed care for other patient. he effectiveness of an automated reminder system designed to reduce no-shows for magnetic resonance imaging (MRI) appointments. Findings, potential to address healthcare disparities when applied thoughtfully.(Kenniff & Ginat, 2023)

**Synthesis:** These research show that automated reminders and confirmations is important for improving service efficiency and client responsiveness, particularly in sectors like healthcare. They help reduce missed appointments, improve coordination between service providers and clients. But, most of these systems are designed for medical settings and focus primarily on patient attendance or treatment adherence. In response, the proposed smart ordering system for water stations integrates automated SMS, email, or app notifications to confirm orders and remind customers about scheduled deliveries addressing a gap in logistics and utility services. This study aims to reduce manual follow-ups, improve customer satisfaction, and ensure a more seamless, and lessen the missed absence.

**III, Responsive web- based interface for mobile and desktop**

Web – based interface , type of website or app that automatically adapts its size or layout and design depend on the device. Whether it’s mobile, desktop or table.

* .​ explored the influence of responsive interface design on user experience by evaluating 40 responsive websites through eye-tracking and user surveys. Their study focus in visual representation of responsive user interface. This research contributes valuable insights into the optimization of responsive web-based interfaces, making the foundation of innovations in centered designing.(Li et al., 2022)
* Responsive web design in the context with emerging devices such as smart TVs and wearables. This study is ensuring the compatibility of the wide screen and experience in other interaction types. They elaborate the more adaptability and flexible design that go behind the traditional. (Kaur, 2024)
* This study focused in the impact of the responsive design. The researchers highlighted the importance of the flexible web-based that can be access in different device and platform. Iincluding smartphones, tablets, desktops and laptops. The study concluded that well-implemented responsive design not only enhances accessibility but also promotes inclusive digital learning experiences. The researchers are aiming to improve the earner engagement and usability in web-based learning platforms. (El Shamy, 2023)

**Synthesis:** These studies elaborate the importance of responsive web-based interfaces in enhancing accessibility, user experience, and adaptability across various devices. Responsive design proves importance in today’s digital landscape. However, many systems remain limited to specific sectors such as education or media. The proposed system for water stations features a fully responsive web-based interface designed for both mobile and desktop use, ensuring users can place orders, receive updates, and track deliveries seamlessly regardless of their device. This design helps the people to access the application whatever the device that they will use.

**Synthesis And Discussion**

The literature surveyed provides that the web-based smart ordering enhance the flow of operation, user can schedule and order to the water station using any type of device because of it’s responsive user interface. Studies show that smart technologies like automated reminders, responsive design, and intelligent scheduling significantly reduce manual operation and convert into high-tech scheduling and ordering also manual workload. research supports the use of algorithms such as the Hungarian Algorithm, ALNS, and hybrid optimization methods to improve scheduling, route efficiency, and overall coordination. These innovations help reduce delivery time, minimize operational costs, and ensure timely service a need particularly relevant for utility-based businesses such as water stations. Automated notifications through SMS, email, or apps have also proven effective in industries like healthcare, where they enhance attendance, reduce no-shows or absences.

**IV. Review Of Related Systems**

1. Grab Mart/ Grab Express - Platform that, users can order water and food, including bottled water from nearby stores. It uses smart delivery and real-time tracking. This is web-based but responsive so it can be access using another device.
2. Aqua link, Philippines-based water delivery app - Connect customers in nearby water stations. Also they can choice the type of container. Focused directly on water refilling station.
3. Water Wala - Web-based platform for ordering 20 liters water. Real- time order tracking and scheduled delivery slot.
4. Amazon fresh / Big Basket – These app, let the user schedule the delivery and manage repeat orders. Also it has a smart ordering features.
5. Gcash Water Delivery Integration – local delivery integrate into Gcash allowing the ordering water scheduling. Demonstrates how fintech platforms are integrating ordering and scheduling systems.

**Contradictions and Debates**

Though intelligent delivery utilities and automation bear evident advantages, not every customer is equipped for very technical platforms. Local water stations or small businesses can have trouble dealing with sophisticated algorithms or platforms requiring specialized digital know-how. And, although automated reminders eliminate tedious effort, they presuppose that the customers are digitally enabled, which is not necessarily true. Interactive interfaces are fantastic for accessibility but ensuring they remain just as efficient across all platforms is still challenging.

**Identified Gaps**

* All but one system tend to address only a single feature such as routing or notifications without presenting an entire package.
* Local delivery services continue to lack reminders and order confirmations automation.
* Certain platforms fail to be adequately mobile-friendly, making it more difficult for mobile customers and on-the-move staff.
* Current solutions tend to aim at major cities rather than smaller, community-based businesses.
* The system to be proposed combines all the pieces smart scheduling, auto updates, and mobile-friendly design into one easy-to-use platform designed for water stations. It's designed to be user-friendly, even for those without tech skills, making it easier to enhance service without making things overly complicated

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