

**EQUIPMENT DELIVERY OPTIMIZATION FOR TRAVIS GENERAL SERVICES INC.
THROUGH TRANSPORTATION MANAGEMENT SYSTEM**

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Chapter I

THE PROBLEM AND ITS SETTINGS

This chapter encompasses and highlights the background of the study that focuses on the objective of the research, theoretical and conceptual framework; scope, limits, and delimitations; statement of the problem and definition of terms.

Introduction

The global transportation of equipment involves moving specialized items like machinery, medical devices, and IT hardware across continents using air, sea, road, and rail freight, depending on cost, urgency, and equipment type. Air freight is fast but costly, while ocean freight is ideal for bulky shipments. Road and rail freight support regional and long-distance needs, respectively. Challenges include regulatory variations, infrastructure limitations, environmental pressures, and technological demands like safe handling and real-time tracking. Industries such as construction, healthcare, and IT have diverse logistics requirements, from multimodal transport to temperature-controlled conditions. Best practices include proper packaging, partnerships with specialized carriers, insurance, and regulatory compliance. Transportation of equipment in logistics in the Philippines faces challenges due to the country's geography, infrastructure, and weather conditions. Key modes of transportation include land (trucks, vans, motorcycles), sea (RORO vessels for inter-island transport), and air (for urgent deliveries). Challenges such as poor

infrastructure in some areas, traffic congestion in urban centers, and frequent disruptions from weather conditions, particularly during typhoons, complicate logistics operations. Best practices include route optimization, multi-modal transportation, and preventive maintenance. Opportunities exist in the growing e-commerce sector, government infrastructure improvements, digitalization, and sustainability trends. These factors are shaping the future of logistics in the country.

Travis General Services Inc., founded in 2021 and located on Sarmiento Road, San Pascual, Batangas, Philippines, operates as a subsidiary of CGI, a construction company. As a specialized division of CGI, Travis focuses on calibration and inspection services, particularly in the oil and gas industry. The primary service offered by Travis is calibration, where they utilize flow meters to measure and ensure the accurate volume of oil being processed in the system. Their operations span across the Philippines, with Chevron being their main client. In addition to calibration, Travis also provides inspection services, ensuring the quality and compliance of materials and workmanship through thorough quality checks. Travis General Services Inc. aims to provide high-quality calibration and inspection services to the oil and gas industry, ensuring the accuracy, reliability, and safety of systems through precision calibration and thorough quality checks. The company strives to meet the needs of its clients, particularly Chevron, by delivering excellence nationwide. Their vision is to become the leading provider of calibration and inspection services in the Philippines, recognized for their commitment to innovation, reliability, and safety in the oil and gas industry. Travis seeks to expand its footprint, fostering long-term partnerships while advancing capabilities and contributing to the growth of the sectors they serve. The company's objectives include

ensuring precision through continuous improvement in calibration techniques, maintaining high standards of quality control, strengthening and diversifying its client base, expanding operations nationwide, and embracing sustainability and technological advancements to drive continuous improvement in their services. As a relatively new player in the industry, Travis General Services Inc. faces several challenges, particularly in logistics. One of the primary issues the company encounters is transportation, which has become a significant hurdle due to the diverse and varying demands of clients across the Philippines. The logistics system must be adaptable to meet the different requirements of each project and client, leading to complexities in planning and coordination. With operations spanning nationwide, managing transportation efficiently to deliver services on time and within budget is a constant struggle, especially considering the varying geographic conditions, infrastructure limitations, and the unpredictable nature of logistical operations in the country.

To address the transportation challenges faced by Travis General Services Inc., the researchers identified that implementing a Transportation Management System (TMS) would provide an effective solution. A TMS can optimize route planning by identifying the most efficient paths based on factors such as distance, traffic, and delivery schedules, thus minimizing delays and reducing fuel costs. Real-time tracking features would allow the company to monitor transportation vehicles, providing visibility into delivery statuses and enabling quick corrective actions when issues arise. The system could also forecast demand patterns using data analytics, allowing for better resource allocation and reducing the risk of bottlenecks. Additionally, a TMS can optimize load management by ensuring that vehicles are used to their full capacity,

reducing the number of trips required and lowering transportation costs. Fleet management features would help schedule preventive maintenance, ensuring vehicles are in good condition and reducing unexpected breakdowns. By integrating the TMS with supply chain and client management systems, communication would be streamlined, and client-specific demands could be met more efficiently. The system would also provide detailed cost reports, helping the company identify areas for savings and implement more cost-effective strategies. Overall, the implementation of a TMS would help Travis improve transportation efficiency, reduce costs, enhance service delivery, and better manage the varied demands of clients nationwide.

This research aims to address the logistical challenges the company faces in transporting equipment across the Philippines. Due to the country's geographical and infrastructure constraints, along with varying client demands, Travis encounters difficulties in ensuring timely and efficient deliveries. The introduction of a Transportation Management System (TMS) offers a solution by optimizing route planning, real-time tracking, and fleet utilization. This research will explore how implementing a TMS can improve delivery efficiency, reduce operational challenges, and enhance customer satisfaction, providing insights that could benefit other companies in similar industries.

Conceptual Framework

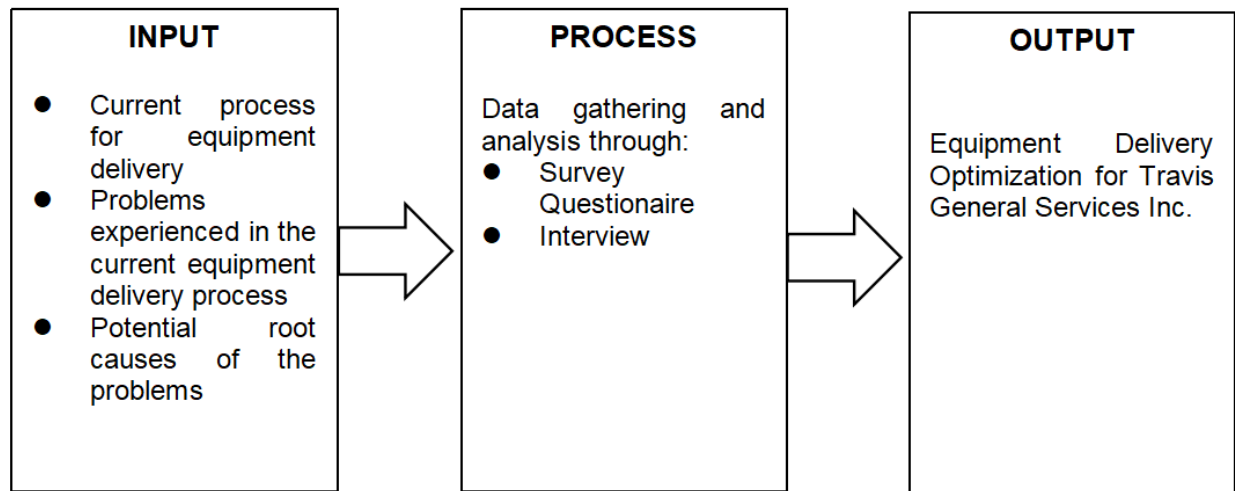


Figure 1.1 Research Paradigm

The diagram illustrates the research framework for "Equipment Delivery Optimization for Travis General Services Inc." using the Input-Process-Output (IPO) model. The Input stage involves identifying key elements necessary for the study, such as the current process for equipment delivery, the problems encountered in the process, and the potential root causes of these issues. The Process stage outlines the methods for data collection and analysis, including surveys to gather quantitative insights, questionnaires for detailed feedback, and interviews to gain qualitative perspectives from stakeholders. Finally, the Output represents the expected outcome of the research: the development of an optimized equipment delivery system for Travis General Services Inc., potentially through the implementation of a Transportation Management System (TMS). This framework ensures a systematic approach to diagnosing problems and proposing actionable solutions to enhance the company's logistics operations.

Statement of the Problem

The study aimed to optimize the delivery of equipment of Travis General Services Inc. Specifically, the study sought to answer the following questions:

1. What is the current process for equipment delivery at Travis General Services Inc.?
2. What problems are associated with the current equipment delivery process?
3. What is the potential root cause of the problem?
4. What are the proposed solutions and improvements for Travis General Services Inc.?
5. What are the improvements made by the proposed solution?

Scope and Limitation

This research focuses on optimizing the equipment delivery process for Travis General Services Inc. by proposing the implementation of a Transportation Management System (TMS). The scope of the study includes analyzing the company's current equipment delivery process, identifying logistical inefficiencies, and diagnosing the root causes of delays, rising costs, and other challenges. The study will also explore how a TMS can improve route planning, fleet utilization, real-time tracking, and overall delivery efficiency. Data collection will involve surveys, questionnaires, and interviews with key stakeholders, including logistics personnel, drivers, and management. The study will focus on Travis's operations nationwide, considering the unique geographical and infrastructural challenges of the Philippines.

However, the research has limitations. It is limited to the logistics operations of Travis General Services Inc. and does not include other aspects of the company's business, such as calibration or inspection services. The study is also constrained by

the availability and accuracy of data provided by the company, such as historical delivery records and feedback from stakeholders. Furthermore, the implementation of a TMS is explored as a conceptual solution, and the actual deployment, testing, and real-time evaluation of the system fall outside the scope of this research. External factors, such as sudden changes in infrastructure, regulatory policies, or natural disasters, are not fully addressed within this study.

Significance of the Study

The results and recommendations from this study held great importance in uncovering the underlying problem, offering valuable insights to those who engage with its findings.

For Travis General Services Inc. This research will help the company optimize its logistics operations, reducing delays, minimizing costs, and improving the efficiency of equipment deliveries. It will also enhance client satisfaction by ensuring timely and reliable service.

For the logistics industry. The study serves as a practical example of how a Transportation Management System (TMS) can address logistical challenges, particularly in regions with geographical and infrastructure limitations like the Philippines.

For other companies. The findings provide a framework for businesses facing similar issues to improve their transportation processes and adopt innovative, technology-driven solutions.

For the academic and industrial engineering community. This research contributes to the growing body of knowledge on logistics optimization, emphasizing the importance of route planning, fleet management, and data-driven decision-making. It also provides a case study for future research and technological advancements in transportation management.

For sustainable logistics practices. The study supports the development of more efficient, cost-effective, and environmentally sustainable practices in the logistics and transportation industry.

Definition of Terms

Researchers defined the following terms conceptually to provide readers with better knowledge and a clearer picture of the terms that are used in the study.

Calibration: The process of adjusting and standardizing equipment to ensure accuracy and precision in measurement. Travis specializes in calibrating oil flow meters to measure the volume accurately. (BIPM. (2008). International Vocabulary of Metrology.)

Fleet Utilization: The measurement of how effectively a company's fleet of vehicles is being used to meet logistical demands, ensuring maximum productivity and

minimal downtime. (Coyle, J.J., Novack, R.A., Gibson, B.J., & Bardi, E.J. (2016). Supply Chain Management: A Logistics Perspective. Cengage Learning.)

Inspection: A systematic process of evaluating and ensuring the quality, safety, and compliance of materials, equipment, or systems. (ISO 9000:2015 – Quality Management Systems – Fundamentals and Vocabulary.)

Logistics Optimization: The process of improving logistics operations to achieve greater efficiency, reduced costs, and improved customer satisfaction by streamlining delivery routes, load management, and fleet utilization. (Christopher, M. (2016). Logistics and Supply Chain Management. Pearson Education.)

Oil and Gas Industry: A sector that involves the exploration, extraction, refining, and transportation of oil and natural gas, serving as a primary focus area for Travis General Services Inc. ("Oil and Gas Industry Overview," U.S. Energy Information Administration, 2024.)

Route Optimization: The process of determining the most efficient routes for deliveries based on factors such as distance, traffic, and delivery timeframes, to reduce operational costs and improve delivery performance. (Ghani, G., Laporte, G., & Musmanno, R. (2013). Introduction to Logistics Systems Management. Wiley.)

Transportation Management System (TMS): A software platform designed to help organizations manage and optimize the physical movement of goods. It assists in route planning, fleet management, and real-time tracking to enhance efficiency and reduce costs. ("What is a Transportation Management System?" Oracle, 2024.)

Chapter II

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents various related literature and studies that are relevant to the conduct of this study. The review of related literature and studies is a crucial component of research, as it offers a concise summary of existing knowledge and investigations relevant to the topic at hand. By examining prior literature and studies, researchers can identify key findings, methodologies, and gaps in knowledge that inform their own study. This chapter sets the stage for a comprehensive review, enabling readers to understand the context and significance of the upcoming analysis of related literature and studies.

Review of Related Literature

Existing Equipment Delivery Processes

According to EfficiencyLab (2022), to improve the efficiency of large equipment deliveries, the client needed a streamlined process that reduced the time and effort required from both delivery personnel and customers. The existing method, which relied on a detailed checklist, was costly and lacked integration with enterprise systems, leading to redundant data entry. To address this, a responsive web application was developed to simplify the inspection process and facilitate seamless customer approvals. Integrations with multiple enterprise systems eliminated manual data entry, while enhanced search and reporting functionalities optimized workflow efficiency. As a result, the new system reduced delivery inspection time, eliminated unnecessary

manual work, and lowered overall costs, allowing for continuous refinements to further enhance the process.

According to Mecalux (n.d.), there are the five most common logistics processes: procurement, storage, inventory management, order picking and dispatch and transport and delivery of goods. As summarized, procurement ensures the supply of raw materials or goods to support business operations. Storage involves selecting the right system to protect and preserve goods based on logistics needs. Inventory control manages stock levels and supply timing to prevent overstocking or shortages. Order processing focuses on efficient packaging and dispatch to minimize costs and delivery time. Along with transportation, it directly impacts customer satisfaction. E-commerce businesses often collaborate with transport agencies, requiring careful coordination of packaging and labeling to prevent delays and ensure smooth deliveries.

Mecalux (n.d.) added, coordinated logistics enhance customer service while optimizing costs and resources. In today's complex logistics environment, automation and logistics software streamline decision-making, improving overall efficiency.

Transportation Management System

As of Schwarz (2024), Transportation Management Systems (TMS) is developed to oversee and enhance the movement of goods, products, and supplies between locations. As an essential part of supply chain management, it helps businesses optimize logistics operations, minimize transportation expenses, and enhance delivery speed. A TMS typically offers functionalities such as route planning, freight coordination, real-time shipment tracking, and data analytics, enabling companies to make informed decisions and improve overall supply chain performance.

Schwarz (2024) added that TMS is integrated into an organization's structure as a centralized platform for handling various transportation operations, including route optimization, carrier selection, shipment monitoring, and invoice processing. Different TMS solutions provide features like supplier portals, automated workflows, and seamless system integrations, enhancing supply chain visibility and operational control.

Supported by Manhattan Associates (2024), that a transport management system is essential for logistics and supply chain professionals working for manufacturers, and distributors who must manage their inbound and outbound shipments. And added, transportation management software can streamline numerous tasks, including carrier selection, route optimization, and shipment tracking, leading to significant time and cost savings. Additionally, it offers valuable data and insights that enable businesses to make informed decisions regarding transportation and logistics. Effective logistics management plays a key role in minimizing complexity and supporting administrative functions within the supply chain.

Route Planning for Logistics

According to Shipy (2023), route planning establishes the optimal delivery sequence and paths for fulfilling orders. It involves calculating the most cost-efficient route, enabling drivers to complete the maximum number of stops in the shortest possible time. Without route planning, delivery costs would rise due to the need for more vehicles, drivers, and time spent organizing orders and routes. Effective route planning optimizes deliveries by reducing fuel consumption, maximizing vehicle capacity, lowering expenses, and enhancing customer experience.

Shipsy (2023) formulates six types of route planning mainly as Multi-stop route planning ensures efficient scheduling for routes with multiple stops, while dynamic route planning adapts in real time to changes, such as order cancellations, to save time and costs. Open path routing allows drivers to cover the maximum number of stops without returning to the depot, making it ideal for third-party logistics (3PL). In contrast, closed path routing starts and ends at the same depot, commonly used in distribution centers. Reverse open path routing begins at the farthest delivery point and optimizes the return trip, whereas depot-to-depot routing focuses on efficient transportation between two depots. These strategies enhance logistics efficiency, reduce fuel consumption, and improve delivery accuracy.

Common Problem in Equipment Delivery

According to Gupta (2024), For any delivery business, its success in the logistics process is basically hinged on on-time, safe, and proactive deliveries. Common equipment delivery issues include delays from traffic or poor planning, damaged or incorrect shipments due to mishandling, and lack of real-time tracking, causing miscommunication. Inefficient scheduling leads to missed deadlines, while regulatory hurdles slow deliveries. Optimizing logistics and using automation can help overcome these challenges.

As of Chaurasiya (2024), logistical issues can cause major delays and problems for a company. Logistical challenges in the construction industry can lead to delays, higher costs, and potential risks. Having proper insurance coverage is crucial to safeguarding contractors and project owners from financial losses. Policies covering supply chain disruptions, transportation risks, equipment failures, worker injuries, and

site security help minimize these risks. By addressing these challenges with the right insurance, construction stakeholders can manage setbacks effectively and ensure project success.

In the construction industry according to Punam (2025), logistic management is an integral part of a construction site. The challenges construction industries face majorly related to poor logistic management affecting the project differently. He added, high transportation costs arise from vehicle shortages, driver unavailability, and remote site locations. Delays in vehicle sourcing and lack of in-transit visibility cause confusion, approval delays, and inefficiencies. Poor collaboration between vendors and stakeholders further disrupts project timelines and communication.

Review of Related Studies

The transportation system can be efficiently observed, analyzed, and managed using a widespread network of sensors and actuators integrated within an Internet of Things (IoT) framework. This integration provides numerous benefits for smart city transportation management, as it enables real-time data collection and system optimization. The paper discusses a hierarchical approach to comprehensive transportation management, detailing the necessary sub-model developments that address system optimization issues. These developments include car-following models, formation motion, and obstacle avoidance, all of which are essential for improving the transportation system's efficiency (Nguyen, 2020).

Moreover, the paper explores potential systems and methodologies for implementing total transportation management, illustrating how these approaches can

be applied to existing systems. It provides examples to demonstrate the sub-models required for effective management, alongside a preliminary evaluation of the proposed concept in comparison to current systems. This evaluation highlights the advantages of the IoT-based approach for transportation management in smart cities (Nguyen, 2020).

Improving last-mile logistics and reducing externalities are crucial challenges for researchers. Advances in technology, transportation modes, innovative techniques, and organizational strategies offer more effective solutions for managing last-mile deliveries in urban areas. The innovations introduced are categorized into areas such as optimization of transport management and routing, as well as improvements in public policies and infrastructure. The new paradigm of smart logistics is built on the combination of these concepts, along with the proposed innovations, to enhance the efficiency of urban delivery systems (Ranieri et al., 2018).

The digitalized model of delivery process seems to be well-suited for illustrating the current state of digitization efforts in outbound logistics, helping to shape a corporate vision for delivery logistics excellence. It also offers valuable guidance on the path for further development in this area. (Asdecker & Felch, 2018)

Synthesis

The integration of transportation systems is transforming the way smart cities manage logistics. Through a network of sensors and actuators embedded within the IoT framework, transportation systems can be observed, analyzed, and optimized in real time. This capability allows for enhanced coordination and management, addressing critical challenges such as inefficiencies in route planning, vehicle coordination, and system delays. The hierarchical approach to transportation management, which

incorporates key sub-models like car-following, formation motion, and obstacle avoidance, is essential for improving system efficiency and reducing transportation-related issues (Nguyen, 2020).

The focus on last-mile logistics, a critical aspect of urban delivery systems, further highlights the role of innovation in solving transportation inefficiencies.. To address these challenges, new technologies, transportation modes, and organizational strategies have emerged, offering more effective ways to manage last-mile deliveries. Innovations in transport management and routing, as well as improvements in public policies and infrastructure, play a significant role in tackling these challenges. These innovations contribute to a new paradigm of smart logistics that is focused on efficiency, sustainability, and responsiveness to the needs of modern cities (Ranieri et al., 2018).

A key element of this evolving landscape is the digitalization of logistics processes, which provides valuable insight into the current state of outbound logistics systems. The development of digital models to map and analyze delivery processes helps shape corporate visions for achieving excellence in logistics management. By focusing on the optimization of workflows, enhancing system integration, and implementing strategic improvements, companies can adapt to the demands of an increasingly digitalized marketplace. These efforts are essential for creating scalable and efficient systems that can handle the growing complexities of urban logistics (Asdecker & Felch, 2018).

The combination of IoT-based transportation management, last-mile logistics optimization, and the digitalization of logistics processes is setting the stage for a more integrated and efficient urban transportation system. As cities continue to grow and

evolve, leveraging these technologies and innovations will be crucial in addressing the increasing demand for efficient, sustainable, and cost-effective logistics solutions. The integration of these advancements offers substantial potential not only for improving delivery systems but also for reducing environmental impacts and enhancing overall urban mobility. Together, they represent a forward-thinking approach to transforming logistics and transportation in the context of smart cities.

CHAPTER III

METHODOLOGY

This chapter presents the dissertation's research methods. The researchers provide a clear and concise overview of the methods employed to collect and analyze data. This chapter includes the research strategy and design, the research methodology, the approach taken to find a solution to the problem that has been put forth, the data collection techniques, the sample selection procedure, the process, the tools used to gather data, and assistance in the data analysis and interpretation.

Research Design

This study employed an action research design to develop practical solutions for improving the equipment delivery process at Travis General Services Inc. by proposing the implementation of a Transportation Management System (TMS). Action research is a structured, iterative approach to problem-solving that involves identifying challenges, formulating solutions, implementing changes, and evaluating their impact. It emphasizes collaboration between the researcher and stakeholders who are directly affected by the problem, ensuring that proposed solutions are both practical and effective. This method is particularly useful in addressing operational inefficiencies, as it allows for continuous improvement through data-driven decision-making and iterative refinements.

The study focused on analyzing the inefficiencies in the company's current delivery process, particularly the lack of a standardized system for managing deliveries. Key issues identified included inconsistent scheduling, inefficient routing, and delays in transportation, all of which contributed to increased operational costs and longer delivery times. To address these challenges, the researchers developed a structured

plan to improve the delivery process and optimize the existing delivery plan. This included designing a more efficient delivery framework, streamlining scheduling, reducing transit times, and optimizing routes to minimize fuel consumption and unnecessary detours.

To support these improvements, data was collected on critical factors such as pick-up and drop-off locations, loading and unloading times, estimated arrival schedules, and delivery route constraints. By analyzing these parameters, the study identified bottlenecks in the current system and provided evidence-based recommendations for enhancing efficiency. The implementation of the proposed TMS is expected to improve coordination, reduce delays, and create a more cost-effective and reliable delivery system for Travis General Services Inc. Through continuous assessment and adaptation, the study aims to ensure that the proposed solutions remain effective in meeting the company's evolving logistical needs.

Research Locale

This study was conducted at Travis General Services Inc., located on Sarmiento Road, San Pascual, Batangas. The researchers identified this as the ideal location for the study, as it serves as the central hub for the company's logistics and delivery operations. Most activities, including the scheduling, dispatch, and transportation of equipment, take place in this facility. Additionally, the necessary data for this study, including insights from logistics personnel, drivers, and administrative staff, were gathered in this location. Their firsthand experience in managing and executing delivery

processes provided valuable information for assessing the company's logistics efficiency and identifying areas for improvement.

Respondents of the Study

The respondents of this study were key personnel involved in the logistics operations of Travis General Services Inc., including logistics personnel, drivers, and administrative staff. The logistics personnel were responsible for planning, coordinating, and monitoring deliveries, providing insights into scheduling, route management, and dispatch efficiency. The drivers, who directly handled the transportation of equipment, shared firsthand experiences regarding road conditions, loading and unloading challenges, and route optimization. Meanwhile, the administrative staff oversaw logistics operations, set company policies, and managed resources, offering perspectives on the feasibility and implementation of a Transportation Management System (TMS). By gathering insights from these three groups, the study aimed to assess the existing delivery process, identify inefficiencies, and propose practical solutions to enhance logistics performance.

Data Gathering Procedure

Data-gathering instruments play a crucial role in research, ensuring the collection of accurate, relevant, and reliable information that forms the foundation of the study's findings. By exploring these instruments, researchers gain deeper insights into various data collection techniques, allowing them to determine the most effective methods for obtaining meaningful and credible results. A well-structured approach to data gathering enhances the transparency, validity, and reliability of the research, ensuring that

conclusions are based on verifiable and accurate data. Moreover, understanding the strengths and limitations of these instruments allows both researchers and readers to critically assess the effectiveness of the study's data collection process. Careful selection and application of appropriate data-gathering tools contribute to the overall success of the research by providing a comprehensive and in-depth understanding of the subject matter.

The researcher conducted one-on-one interviews with logistics personnel, drivers, and administrative staff to obtain firsthand insights into the company's delivery operations. These interviews focused on key aspects of the logistics process, including scheduling efficiency, route management, transportation challenges, and potential improvements through the implementation of a Transportation Management System (TMS). The logistics personnel provided valuable information regarding operational planning and coordination, while the drivers shared practical experiences and challenges encountered during deliveries. Additionally, the administrative staff offered strategic perspectives on how a TMS could enhance overall efficiency. The information gathered from these interviews played a critical role in identifying key problem areas, helping the researchers analyze existing inefficiencies and develop targeted solutions to optimize the company's delivery process.

To analyze and utilize the collected data effectively, the researchers developed a system designed to address the challenges faced by the company. This system aims to provide practical and data-driven solutions that improve the efficiency of logistics operations, optimize delivery routes, and enhance overall workflow. By integrating insights gathered from interviews, the proposed system seeks to streamline scheduling,

reduce delays, and minimize transportation inefficiencies. Additionally, it will help in better resource allocation, tracking, and coordination among logistics personnel, drivers, and administrators. Through this approach, the company can achieve a more structured and cost-effective delivery process, ensuring smooth operations and improved service reliability.

System Design

In developing a web-based application that optimizes the equipment delivery process for Travis General Services Inc. It streamlines customer inquiries, order processing and transformation management different languages and technologies are used:

Language and Technologies

PHP. PHP is a widely-used server-side scripting language designed specifically for web development. It plays a crucial role in handling backend development by processing client requests, executing business logic, and interacting with databases to retrieve and store data. PHP dynamically generates HTML content, ensuring seamless user experiences. Due to its flexibility, scalability, and extensive support for various frameworks and libraries, PHP remains a preferred choice for building robust web applications. It is compatible with different operating systems and integrates well with MySQL, making it a powerful tool for developing efficient and secure web-based solutions.

MySQL. MySQL is an open-source relational database management system (RDBMS) used for storing, retrieving, and managing structured data efficiently. It works seamlessly with PHP, enabling web applications to perform database operations such as inserting, updating, deleting, and querying records. MySQL supports complex transactions, indexing, and high-speed performance, making it ideal for large-scale applications. Its reliability, security features, and ease of use make it a widely adopted solution for managing data in web applications, enterprise systems, and cloud-based platforms.

HTML (HyperText Markup Language). HTML is the standard markup language used to structure and present content on the web. It defines the layout and organization of a webpage using a variety of elements, such as headings, paragraphs, lists, images, tables, links, and forms. HTML provides the fundamental structure that allows web browsers to display content properly. When combined with CSS for styling and JavaScript for interactivity, HTML forms the backbone of modern web development, ensuring accessible and well-structured webpages. As a foundational technology, HTML continues to evolve with new elements and attributes to support responsive and multimedia-rich web experiences.

CSS (Cascading Style Sheets). CSS is a stylesheet language used to design and enhance the visual presentation of web pages. It allows developers to control the layout, colors, typography, spacing, and animations of a website, ensuring a polished and visually engaging experience for users. CSS enables responsive design techniques, making web pages adaptable to various screen sizes and devices. By leveraging advanced features such as Flexbox, Grid, and media queries, CSS enhances user

interfaces and improves usability. Additionally, CSS frameworks like Bootstrap simplify styling by providing pre-defined classes and components that speed up development.

Bootstrap. Bootstrap is a popular open-source front-end framework that simplifies the development of responsive and mobile-friendly websites. It offers a comprehensive collection of pre-designed CSS and JavaScript components, including a flexible grid system, typography styles, buttons, navigation bars, modals, and form controls. By using Bootstrap, developers can create visually appealing and functionally rich web applications with minimal effort. Its mobile-first approach ensures that web pages automatically adjust to different screen sizes, providing an optimal viewing experience. The framework also promotes consistency across web applications, making it an essential tool for efficient UI/UX design.

JavaScript. JavaScript is a powerful client-side programming language that enhances web applications by enabling interactivity, animations, and dynamic content updates. It allows developers to build engaging user interfaces by responding to user actions in real time. JavaScript works alongside HTML and CSS to create seamless experiences across different devices and browsers. With the advent of modern JavaScript frameworks and libraries such as React, Vue.js, and Angular, developers can build complex, scalable, and feature-rich web applications. JavaScript also plays a key role in asynchronous communication, enabling web applications to fetch and send data without requiring page reloads.

Development Tools

Visual Studio Code (VS Code). VS Code is a lightweight yet powerful source code editor developed by Microsoft. It is widely used by developers due to its flexibility, extensive extension library, and support for multiple programming languages. VS Code offers features such as syntax highlighting, intelligent code completion, debugging tools, Git integration, and a customizable interface, enhancing productivity and efficiency. The editor's built-in terminal, extensions marketplace, and real-time collaboration capabilities make it a preferred choice for web and software development. With regular updates and an active developer community, VS Code continues to be a top choice for coding, debugging, and project management.

XAMPP. XAMPP is an open-source, cross-platform web server solution that provides a local development environment for building and testing PHP-based web applications. It includes Apache (a web server), MySQL (a database management system), and PHP, along with additional tools like phpMyAdmin for database administration. XAMPP simplifies the setup process, allowing developers to create and test applications on their local machines without needing an internet connection. This makes it an essential tool for debugging, experimenting with new features, and ensuring applications run smoothly before deployment. Its user-friendly interface and pre-configured settings make it a go-to solution for PHP development.

Hosting and Services

Hostinger. Hostinger is a reliable and affordable web hosting provider that offers a range of hosting solutions, including shared hosting, VPS hosting, and cloud hosting. It

supports various web technologies, including PHP, MySQL, JavaScript, HTML, and CSS, making it an excellent choice for deploying web applications. Hostinger provides user-friendly tools such as cPanel/hPanel, a built-in website builder, and one-click installations for content management systems like WordPress. With high-speed servers, strong security features, and 24/7 customer support, Hostinger ensures smooth website performance. It also includes domain registration and free SSL certificates, enhancing website security and credibility.

Google SMTP (Simple Mail Transfer Protocol). Google SMTP is a secure email-sending service that allows web applications to send automated email notifications using Gmail's SMTP server. It is commonly used for critical functions such as contact forms, account verifications, password reset links, and system-generated alerts. Google SMTP ensures encrypted email transmission through SSL/TLS, preventing unauthorized access. It also enhances email deliverability, reducing the chances of messages being marked as spam. By integrating Google SMTP into a web application, developers can ensure reliable and professional email communication while leveraging Google's infrastructure for security and stability.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents the results obtained from this study and engages in a comprehensive discussion to interpret their implications. Researchers then delve into a thorough discussion of the findings, examining their significance in the context of existing literature and addressing problems from gathered data. The presentation of the results and the discussion were patterned from the statement of the problem which was presented in chapter one.

Existing Delivery Process

Using a step-by-step procedure Travis General Services Inc. accomplishes deliveries through this process:

- 1. Identify the Need for the Project/Department.** The process begins with identifying the need for specific materials within a department or project.
- 2. Fill-up Material Request Form.** A formal document, often a requisition form, is used to document the material request.

Details must include the following:

- Purpose of the request.
- Item description and quantity.
- Requested delivery date.

- Requester's information.
- Any specific requirements or specifications.

3. Canvassing

- Request for quotation
- Abstract of quotation
- Evaluation of criteria
- Selection of supplier

4. Approval. The form will be sent for approval of COO and/or managers. The approval process ensures that the request aligns with budget and project requirements.

5. Requesting and Releasing of Funds. Once approved, funds will be requested. Funds will be released by the Finance department.

6. Procurement and Delivery. The purchasing department or designated personnel then procures the materials based on the PO. The materials are then delivered to the designated location.

7. Release to Requesting Personnel. Upon receipt, the materials will be released to the requesting department.

8. Inventory Management

Logistics and Delivery

. The researcher conducted an interview with the logistics personnel and the driver of Travis General Services Inc. to evaluate their concerns about the company's delivery process.

Logistic Personnel

0.00-1.0 **Strongly Agree**

1.01-2.0 **Agree**

2.01-3.0 **Maybe**

3.01-4.0 **Disagree**

4.01-5.0 **Strongly Disagree**

Statements	Response	Verbal Interpretation
The process of picking up and delivering equipment is well-organized.	1.67	Agree
The loading and unloading process is efficient and does not cause delays.	2.33	Maybe
My delivery schedule is well-planned and allows for timely arrivals.	2.00	Agree

Traffic and road conditions often impact my ability to deliver on time.	1.00	Strongly Agree
I believe my delivery routes are optimized for the fastest and most cost-effective travel.	2.00	Agree
The current delivery system allows me to complete my trips without excessive stress or difficulty.	2.33	Maybe

Table 4.1 Logistics Personnel Response

The responses indicate that the delivery system is generally well-organized, with an agreement on the efficiency of picking up and delivering equipment. However, there is some uncertainty regarding the loading and unloading process, as it may occasionally cause delays. The delivery schedule is considered well-planned, but traffic and road conditions are a major concern, strongly impacting the ability to deliver on time. While the routes are perceived as optimized for efficiency, there is some doubt about whether the overall system allows for stress-free deliveries. These findings suggest that while the system is functional, improvements in loading/unloading efficiency and strategies to mitigate traffic-related delays could enhance delivery operations.

Driver

0.00-1.0 **Strongly Agree**

1.01-2.0 **Agree**

2.01-3.0 **Maybe**

3.01-4.0 **Disagree**

4.01-5.0 **Strongly Disagree**

Statements	Response	Verbal Interpretation
The process of picking up and delivering equipment is well-organized.	1	Strongly Agree
The loading and unloading process is efficient and does not cause delays.	2	Agree
My delivery schedule is well-planned and allows for timely arrivals.	2	Agree
Traffic and road conditions often impact my ability to deliver on time.	3	Maybe
I believe my delivery routes are optimized for the fastest and most cost-effective travel.	1	Strongly Agree
The current delivery system allows me to complete my trips without excessive stress or	1	Strongly Agree

difficulty.		
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Table 4.2 Driver's Response

From the driver's perspective, the interview responses suggest that the driver feels the process of picking up and delivering equipment is highly organized and efficient, which helps in ensuring smooth operations. The driver agrees that the loading and unloading process is generally efficient and does not cause significant delays, though there may be occasional minor setbacks. The delivery schedule is considered well-planned, and the driver feels it usually allows for timely arrivals. However, traffic and road conditions are a concern, with the driver acknowledging that they sometimes impact the ability to deliver on time, which may cause delays. The driver strongly believes that the delivery routes are optimized for the fastest and most cost-effective travel, suggesting confidence in the route planning.

Each question is answered depending on the response of the interviewee.

Interview Question	Response
Can you describe the step-by-step process of picking up and delivering equipment?	"As the funds are released, warehouse personnel contact the supplier for the purchase to be made. And Goto the supplier pick up"
Can you describe any recurring issues that slow down deliveries?	"Heavy items that needs 2-3 people to unload" "Traffic"
Are there any specific routes to cause delays?	N/A

What are the most frequent causes of delays in equipment deliveries?	"Traffic"
What procedures do you follow when loading and unloading equipment?	"Uses equipments such as forklift and trolly for heavy equipment"

Table 4.3 Driver's Interview Response

In addition , Based on the interview responses, the step-by-step process of picking up and delivering equipment involves warehouse personnel contacting the supplier once funds are released, followed by going to the supplier to pick up the equipment. Recurring issues that slow down deliveries include heavy items requiring 2-3 people to unload and traffic-related delays. The interviewee did not mention any specific routes causing delays. The most frequent cause of delays is traffic, as confirmed by the driver. For loading and unloading equipment, the procedures involve using equipment like forklifts and trolleys for handling heavy items.

Existing Delivery Route

According to the administration of Travis General Services Inc., the company operates without a fixed delivery route while continuing to offer nationwide service. However, this lack of a structured routing system presents significant challenges in maintaining efficiency. Without a proper tracking system, deliveries may overlap, leading to unnecessary fuel consumption, increased operational costs, and potential delays.

Additionally, the absence of route optimization makes it difficult to identify opportunities for consolidating shipments, which could otherwise improve overall productivity.

To address these issues, the administration recognizes the need for a route-tracking system that can monitor and optimize delivery schedules. By implementing such a system, the company can enhance coordination, reduce redundancies, and ensure that deliveries on similar routes are strategically planned. This would not only improve service efficiency but also contribute to cost savings and better customer satisfaction.

Potential Root Cause of the Existing Problem

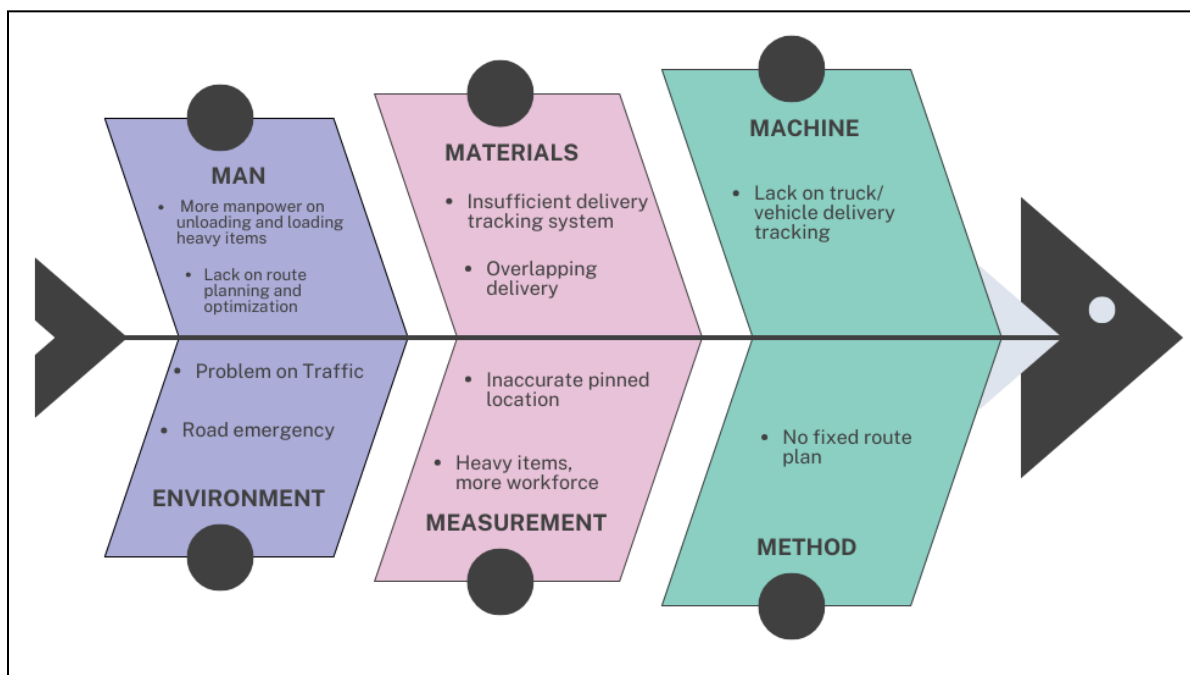


Figure4.1 Fishbone Diagram of the Problems in Delivery Process

The fishbone diagram highlights the key factors contributing to the inefficiencies in the delivery system of Travis General Services Inc. The primary issue stems from the

lack of an optimized delivery process, leading to delays, overlapping routes, and operational challenges. These problems are categorized into six main areas: Man, Materials, Machine, Method, Measurement, and Environment, each playing a crucial role in the overall inefficiency of the system.

Man category focuses on workforce-related challenges. The company lacks sufficient manpower for unloading and loading heavy items, which slows down the delivery process. Additionally, poor route planning and optimization further contribute to inefficiencies, making it difficult to meet delivery schedules. Similarly, the *Materials* category highlights issues such as an insufficient delivery tracking system and overlapping deliveries. Without an efficient tracking mechanism, multiple deliveries may take place along the same route unnecessarily, increasing costs and wasting resources.

Machine and Method categories emphasize structural inefficiencies in the company's operations. The lack of truck and vehicle tracking makes it difficult to monitor deliveries in real time, leading to delays and ineffective route planning. Furthermore, the absence of a fixed route plan results in inconsistent delivery paths, increasing travel time and fuel consumption. Addressing these concerns through GPS tracking and structured route planning would significantly enhance efficiency and reduce operational costs.

Measurement and Environment categories reveal additional challenges. Inaccurate pinned locations can lead to misdeliveries and further delays, while the need for more workforce to handle heavy items adds to inefficiencies. External factors such as traffic congestion and road emergencies also disrupt delivery schedules, causing

unpredictable delays. While some of these challenges are beyond the company's control, adopting real-time traffic monitoring, improving address accuracy, and allocating sufficient workforce would help mitigate these issues. By addressing these factors, Travis General Services Inc. can improve its delivery system, reduce costs, and enhance overall efficiency.

Why why of the Potential Root Cause of the Existing problem

Problem:Companies lack an on-route delivery plan and a service tracking system.

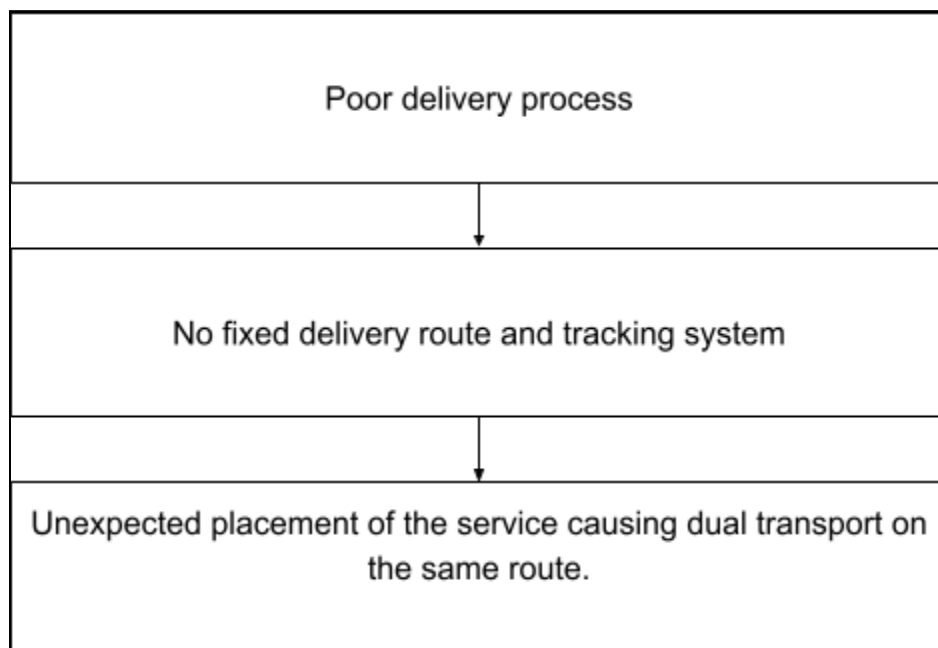


Figure 4.2 Root Cause Analysis

Proposed Improvement: A system that will fix a delivery system and enable an efficient tracking system for both clients and the company's administration.

Proposed Web-based Application

The researchers have developed a web-based application designed to enhance the efficiency of logistics operations by providing data-driven solutions tailored to the company's needs. This system leverages insights from interviews and operational analysis to optimize delivery routes, streamline scheduling, and minimize transportation inefficiencies. By integrating real-time tracking, automated scheduling, and intelligent resource allocation, the application aims to reduce delays and improve overall workflow. The platform allows logistics personnel, drivers, and administrators to coordinate seamlessly, ensuring a structured and well-managed delivery process.

Furthermore, the system enhances communication and transparency within the logistics network, enabling stakeholders to monitor deliveries and make informed decisions based on live data. With an intuitive interface and robust analytics, the application empowers the company to improve service reliability while reducing operational costs. By addressing key logistical challenges, the system promotes a more cost-effective and efficient supply chain, ultimately improving customer satisfaction and business performance.

Assumption

The researcher presents the following scenario to demonstrate how the developed system will facilitate communication between Travis General Services Inc. and a potential client using their web-based application:

1. User A registers on the system.
2. After completing the registration, User A places a delivery request to Lipa City.
3. The staff reviews and approves the request, confirming the delivery schedule.
4. Another user signed up and placed a transaction heading to Calamba, Laguna.
5. User A tracks the order in real-time through the system. As well as User B.
6. Upon successful delivery, User A and B provides feedback on the services

Account Registration

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Figure 4.3 Account Registration

The figure shows the registration process begins when a new user accesses the web application and fills out a registration form. The form, built using HTML and styled with Bootstrap and CSS, collects essential details such as the user's full name, email, contact number, and password. JavaScript is used for client-side validation, ensuring that the user enters the required fields correctly before submission.

If the registration is successful, PHP generates an email confirmation message and sends it to the user via Google SMTP. This email contains an activation link, which, when clicked, updates the user's status in the MySQL database to indicate a successful registration. Once activated, users can log in to access the system.

Company System: After a Client Registers

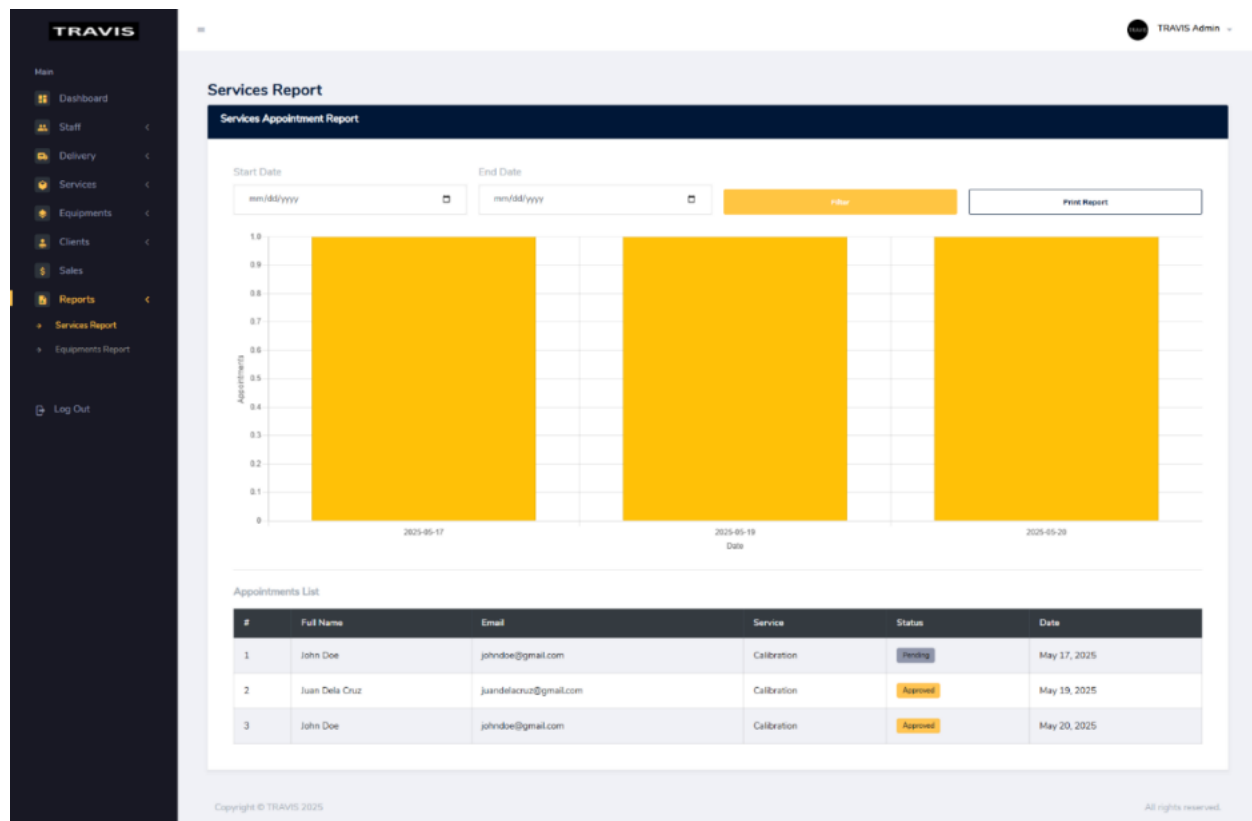


Figure 4.4 Admin Panel

This figure provides a view of an admin panel where the system owner can access data related to registered clients and their service requests. This dashboard is built using HTML, Bootstrap, and JavaScript to present data dynamically in tables with

filtering, sorting, and search functionality. Upon login, PHP verifies the admin's credentials and retrieves client data from the MySQL database.

The admin panel allows the owner to view customer profiles, including their contact information, order history, and current requests. JavaScript enhances the user experience by enabling dynamic updates without requiring a full page reload. Additionally, the backend PHP scripts ensure secure access to client data by implementing authentication and authorization measures, ensuring that only authorized users can view or modify customer records.

Request for Service

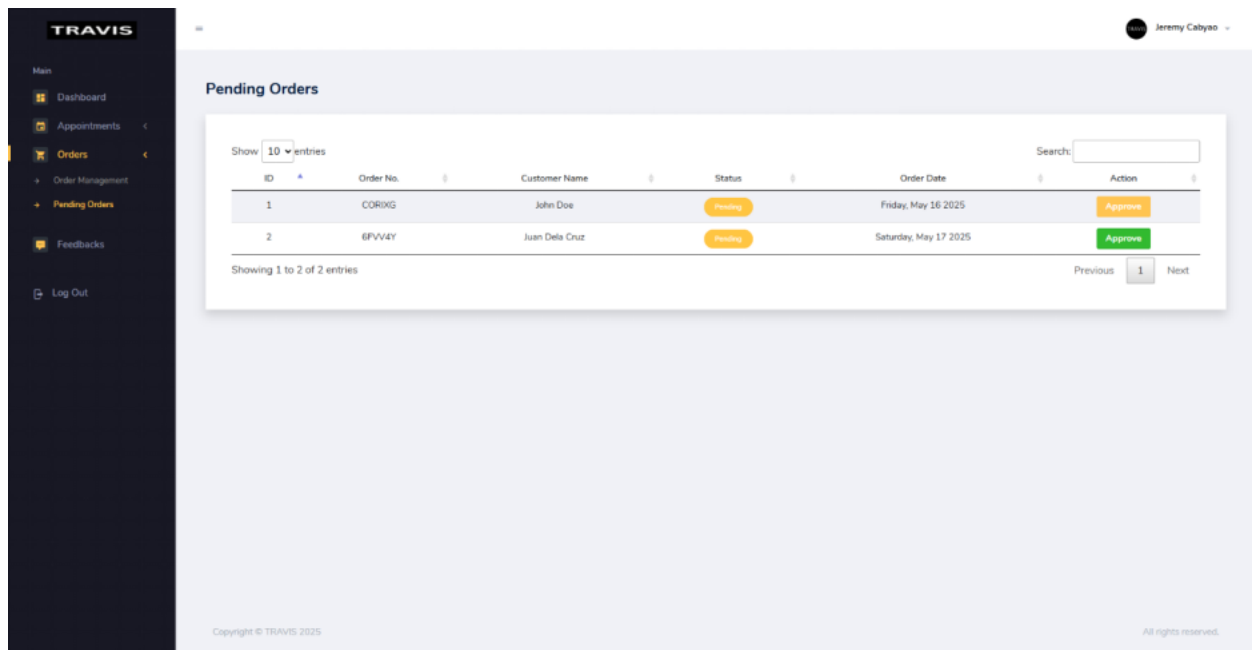
The screenshot displays the 'Appointments' section of the TRAVIS website. The header includes the TRAVIS logo and navigation links: Home, About, Services, Equipments, Team, Contact, Appointments (highlighted), and Carts & Orders. A 'Profile' button is also present. The main heading is 'Appointments' with the subtitle 'Manage your appointments and stay updated with Travis General Services Inc.' Below this is a breadcrumb trail: Home / Appointments. The section is titled 'APPOINTMENTS MAKE AN APPOINTMENTS'. The form contains four input fields: 'Email' (pre-filled with 'johndoe@gmail.com'), 'Contact Number' (pre-filled with '09059788849'), 'Select Service' (a dropdown menu showing '- Choose a service -'), and 'Appointment Date' (a date picker showing 'mm/dd/yyyy'). A 'Book Appointment' button is located below the form. The footer section is divided into four columns: 'TRAVIS' with contact information (Sarmiento Rd., Brgy. Danglayan, 4104 San Pascual, Philippines; Phone: +63 900 0000 000; Email: info@travisgsi.com) and social media icons; 'Useful Links' with links to Home, About us, Services, Equipments, Terms of service, and Privacy policy; 'Our Services' with links to Calibration and Inspection; and 'Our Newsletter' with a subscription form and a 'Subscribe' button. The footer also includes a copyright notice: '© Copyright TRAVIS All Rights Reserved.' and a small upward arrow icon.

Figure 4.5 Client's Request for Service

Clients can request a delivery service through an intuitive web interface. The frontend form, designed with HTML, CSS, and Bootstrap, allows users to input package details such as sender and recipient addresses, and delivery priority. JavaScript ensures proper validation, checking for missing or incorrect inputs before submission.

Once the client submits a request, the PHP backend processes it, generates a unique order ID, and stores the information in the MySQL database. The system then updates the admin dashboard in real-time, adding the new request to the list of pending orders. Clients receive an automated email via Google SMTP confirming that their request has been received and is awaiting approval.

Approval of Delivery Service



ID	Order No.	Customer Name	Status	Order Date	Action
1	CORXG	John Doe	Pending	Friday, May 16 2025	Approve
2	6FVV4Y	Juan Dela Cruz	Pending	Saturday, May 17 2025	Approve

Showing 1 to 2 of 2 entries

Previous 1 Next

Figure 4.6 Approval of Order

When a new order is placed, the system ensures that the owner is notified promptly. The PHP backend listens for new requests in the database and, upon detecting one, triggers an automated email notification to the admin using Google SMTP.

Additionally, JavaScript is used to refresh the admin dashboard dynamically. Instead of requiring a manual page reload, This ensures that the admin is immediately aware of new orders and can take action without delay.

After reviewing an order, the admin can approve or decline the request through the dashboard. When the owner approves an order, a PHP script updates the request status in the MySQL database from "Pending" to "Approved." This change triggers an automatic email notification sent via Google SMTP to inform the client of the approval.

The approved request now enters the processing phase, where logistics personnel are assigned to handle the delivery. The frontend UI is updated using JavaScript, ensuring that the client sees real-time status updates without needing to refresh the page.

Tracking of Order

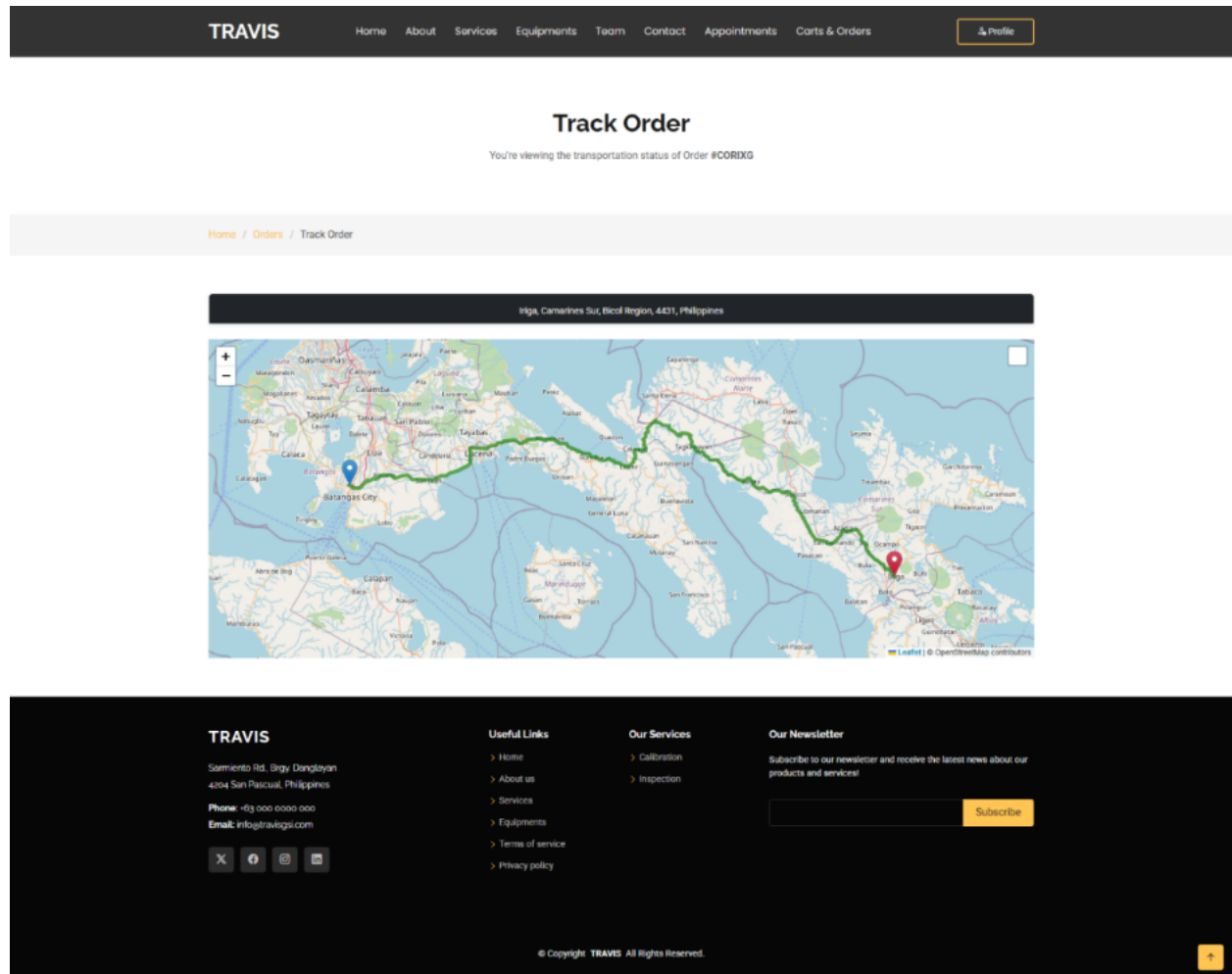


Figure 4.7 Tracking Order

Once an order is dispatched, both the client and the admin need to track its progress. The tracking system uses Google Maps API integrated with JavaScript to display the real-time location of the delivery vehicle. The delivery personnel's device periodically sends GPS coordinates to the PHP backend, which stores them in the MySQL database.

Clients can check their order status on a tracking page, which fetches the latest coordinates from the database and displays them on an interactive map. JavaScript updates the location dynamically, ensuring a smooth and real-time tracking experience. This feature enhances transparency and allows users to estimate delivery times accurately.

Pinned Location (For Delivery Driver/ Personnel)

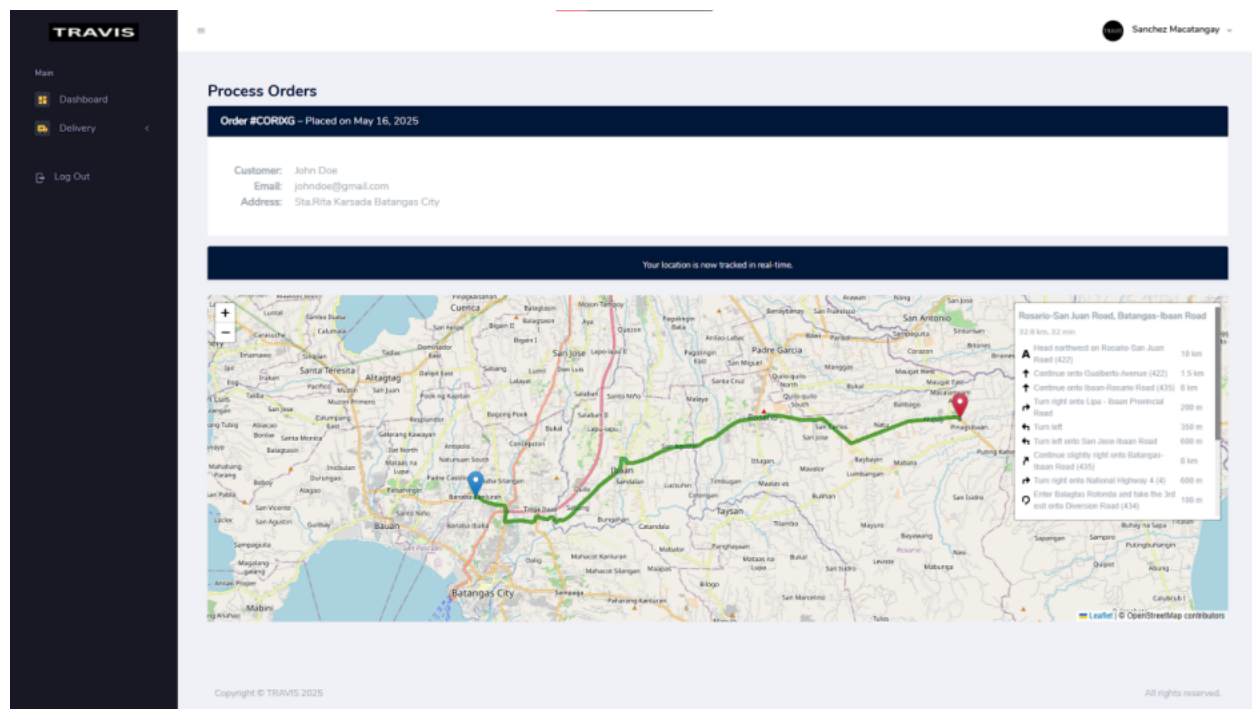


Figure 4.9 Pinned Location

This shows the exact location of the client's pinned location, using GPS the driver can easily track if he is near the delivery drop point.

Complete Delivery

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Carts

Orders

ORDERS

YOUR ORDER

Order #2JIS5A - Placed on May 21, 2025

Pending

Approved

In Transit

Out for Delivery

Delivered

TRAVIS	[21REF01] - 2" Master Meter Flow Meter	1	P45,000.00	P45,000.00
TRAVIS	[22REF03] - 2000L Prover Tank Prover Tank	1	P130,000.00	P130,000.00
			Total	P175,000.00

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Figure 5.0 Successful Delivery

Once a delivery is successfully completed, the system finalizes the transaction by updating the order status in the database. The delivery personnel confirms completion using the mobile-friendly interface, which triggers a PHP script to mark the request as "Delivered."

Immediately, an automated email is sent to both the client and the admin via Google SMTP, providing details such as the delivery completion time and recipient confirmation. Additionally, the system updates the order tracking page, displaying a “Delivered” status alongside the final delivery timestamp. The customer can also leave feedback or rate the service through a built-in review system powered by PHP and MySQL.

For Admin Dashboard and Reporting

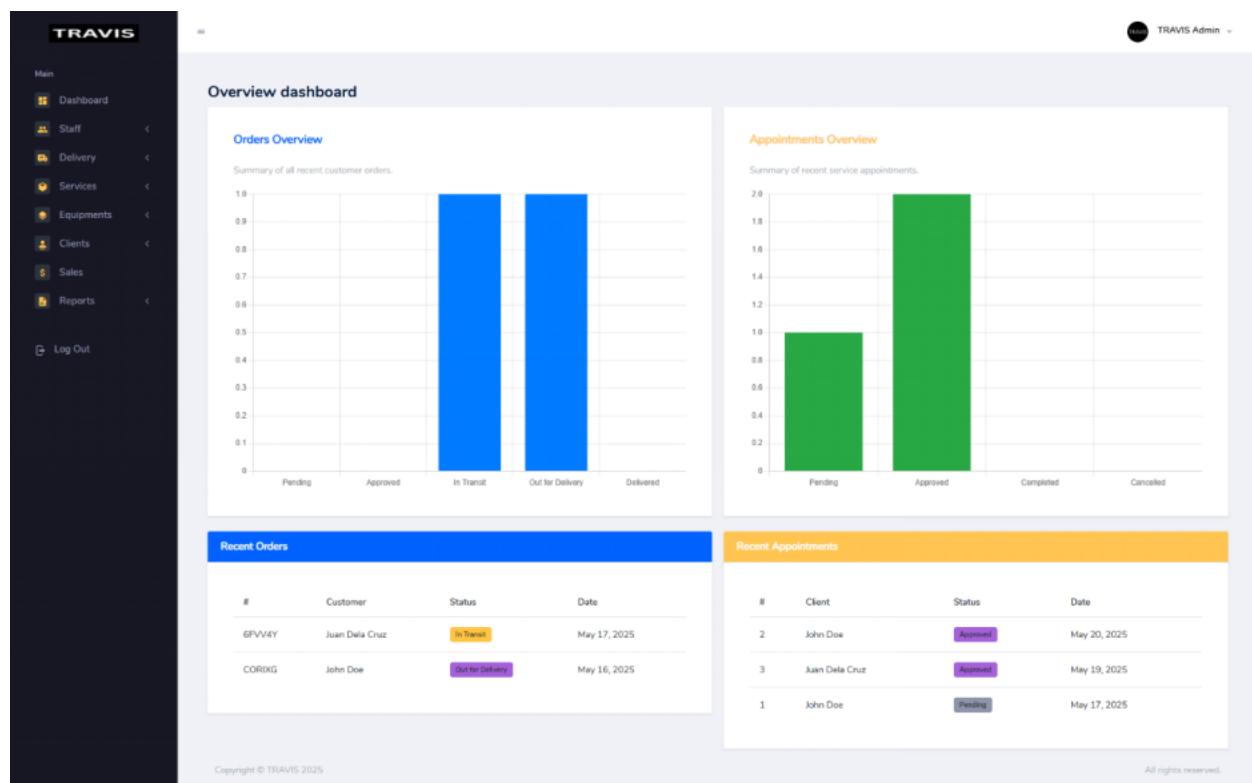


Figure 5.1 Admin Dashboard

The system will display orders and inquiries in a well-organized, searchable table, allowing the admin to filter, sort, and search through records efficiently. PHP will retrieve order details from the MySQL database, while JavaScript will ensure that new orders and inquiries appear in real-time without requiring a full page reload. Customers submitting inquiries through an HTML form will have their messages stored in the database, and the admin will receive email notifications via Google SMTP. The system will also include a response feature, enabling the admin to reply to inquiries directly through the platform, ensuring smooth communication with customers.

The admin dashboard will utilize PHP to retrieve financial data from MySQL, and JavaScript charting libraries. This feature will present revenue trends through interactive bar graphs, line charts, and pie charts, helping the admin monitor financial performance. PHP will also generate automated sales reports that can be downloaded in PDF or Excel formats, allowing for easy financial analysis. Additionally, weekly or monthly revenue summaries will be sent to the admin via Google SMTP, ensuring they stay informed of business performance. Bootstrap-powered cards and tables will highlight crucial insights such as total revenue, profit margins, and sales growth percentages, providing a comprehensive financial overview.

The Equipment Demand Analysis module will help the admin track and predict the usage of delivery trucks, storage units, and other logistics equipment. PHP will handle data collection, storing usage records in MySQL, while JavaScript will enable real-time filtering to analyze equipment demand trends over different time periods. By studying historical order data, PHP will generate predictive analytics, showing future demand for essential resources. A JavaScript-powered forecast chart will help the

admin anticipate peak periods when additional equipment may be needed. To prevent shortages, the system will trigger automated Google SMTP email alerts whenever inventory levels drop below a critical threshold. Additionally, Bootstrap alerts will provide on-screen notifications, ensuring that the admin can take immediate action to optimize logistics operations.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The current delivery system at Travis General Services Inc. lacks a standardized and centralized framework, resulting in numerous operational inefficiencies. One of the most significant issues identified is the absence of a consistent and optimized delivery route planning mechanism. Without a structured system in place, the scheduling of deliveries is often done manually and reactively, which leads to confusion and overlapping routes. This lack of standardization also contributes to poor coordination among logistics personnel and drivers, making it difficult to track deliveries in real-time and respond to unforeseen issues such as traffic congestion, weather delays, or vehicle breakdowns. Consequently, the company experiences longer delivery times, increased fuel consumption, and higher operational costs. Addressing these challenges requires the implementation of a systematic approach, such as a Transportation Management System (TMS), to streamline delivery operations and introduce consistency in route planning, scheduling, and tracking.
2. The interviews conducted with logistics personnel, drivers, and administrative staff provided a wealth of comprehensive and practical insights into the root causes of the scheduling and routing inefficiencies

experienced at Travis General Services Inc. These firsthand accounts offered a multi-dimensional perspective on the day-to-day challenges encountered across various levels of the delivery process. Logistics personnel highlighted the difficulties they faced in coordinating multiple deliveries without a centralized system. Drivers shared detailed experiences related to lack of route optimization, and insufficient communication regarding delivery priorities or changes. They also pointed out how unclear schedules often led to unnecessary delays, longer travel times, and even delivery overlaps. Meanwhile, administrative staff discussed the limitations of existing protocols and how the absence of real-time data tracking and reporting hindered their ability to effectively monitor performance or allocate resources. Collectively, these interviews underscored the urgent need for a more integrated and automated solution, such as a Transportation Management System (TMS), that can enhance scheduling accuracy, streamline routing, and improve overall logistical coordination within the company.

3. The developed Transportation Management System (TMS) has proven to be an efficient and reliable solution in addressing the key challenges of Travis General Services Inc.'s delivery operations. Specifically, the system significantly enhanced route planning by automating the scheduling and optimization of delivery paths, minimizing travel time and reducing the likelihood of delivery overlaps or delays. Through its real-time order tracking feature, the TMS provided both logistics personnel and customers

with up-to-date delivery statuses, allowing for proactive monitoring, better coordination, and timely decision-making. This transparency not only improved internal workflow but also boosted customer confidence by keeping them informed throughout the entire delivery process. Furthermore, the system served as an effective communication platform between the company and its clients, offering automated notifications, updates, and support features that facilitated a smoother and more responsive customer experience. Overall, the implementation of the TMS has greatly improved the efficiency, reliability, and professionalism of the company's delivery operations, laying a strong foundation for continued growth and operational excellence.

Recommendations

Based on the findings of this research, the following recommendations were developed to enhance the company's delivery process.

1. Travis General Services Inc. should fully adopt the proposed Transportation Management System (TMS) to establish a standardized and efficient delivery process. By doing so, the company can improve coordination among staff, reduce scheduling errors, and minimize delivery delays. The TMS will also help optimize routes, lower fuel costs, and enhance overall service reliability, making operations more consistent and customer-focused.
2. The system should also be developed as a mobile application to provide users with easier and more convenient access. A mobile version of the Transportation

Management System (TMS) would allow drivers, logistics personnel, and administrators to monitor deliveries, track orders in real time, and communicate more effectively while on the go. This added mobility would further improve responsiveness, streamline coordination, and enhance the overall efficiency of the delivery process.

3. The system should be regularly updated not only to maintain performance and security but also to adapt to the evolving needs of users and advancements in technology. Continuous improvements should include enhancing system features, optimizing the user interface, and addressing any technical issues that arise. In addition, reliable hosting services like Hostinger and secure email platforms such as Google SMTP should be utilized to ensure stable uptime, fast loading speeds, and secure communication. Beyond these, efforts should also be made to improve data backup protocols, integrate analytics for performance tracking, and ensure mobile responsiveness to provide users with a seamless and efficient experience across all devices.