

COMPUTER BASED SCHEDULING SYSTEM FOR FEDEX COORPORATION

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**A project proposal submitted to the Faculty of Physical Sciences, Engineering
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DECLARATION

I hereby declare that this project is based on my original work except for citations and quotations which have been duly acknowledged. I also declare it has been previously and concurrently submitted for a diploma or any other award in any other educational institution.

Student Name:

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Signature:

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Date:

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APPROVAL

This project was conducted under our supervision and is submitted with our approval as university supervisor.

Supervisor Name:

Signature:

Date:

DEDICATION

This project is dedicated to my family my dad James, my mom Grace and my sister Doris for their unwavering support and encouragement throughout this project. thank you so much for being my pillar of strength. To my lecturer Mr. Francis kairaria who have been with me throughout this project guiding and advising me thank you so much you have been of so much help.

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I would like to thank the almighty God for giving me the strength and wisdom to complete this project. I would like to express my deep gratitude to my supervisor Mr. Francis kairaria for the enthusiastic encouragement, for his advice and great assistance and guidance. I would also like to thank my parents and my sister for their support and encouragement without their support, advice and encouragement this project would not be successful.

ABSTRACT.

Efficient scheduling is critical for transport companies to optimize resources, reduce costs, and enhance service reliability. This abstract explores the implementation and benefits of a computer-based scheduling system designed for a transport company. The system integrates advanced algorithms and real-time data to automate and streamline scheduling processes. Key functionalities include route optimization, vehicle assignment, and driver scheduling, all aimed at maximizing fleet utilization and minimizing idle time. By leveraging historical data and predictive analytics, the system enables proactive decision-making, thereby improving on-time performance and customer satisfaction. This abstract highlight the transformative impact of technology on enhancing operational efficiency and competitiveness in the transport industry.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction.

In the dynamic and fast-paced realm of transportation logistics, efficient scheduling systems play a pivotal role in ensuring operational success and customer satisfaction. The advent of computer-based scheduling systems has revolutionized how transport companies manage their fleets, routes, and resources. This chapter explores the foundational concepts, significance, and objectives of implementing such systems within the context of a modern transport company.

The chapter begins with an overview of the challenges faced by transport companies in traditional scheduling methods, highlighting the limitations and inefficiencies that often result from manual processes. It then introduces the concept of computer-based scheduling systems as a transformative solution to these challenges, emphasizing their ability to streamline operations, enhance resource utilization, and improve overall service quality.

1.1 Background of Study.

The computer scheduling system for online transportation of luggage, parcels, and other items in Kenya and abroad has revolutionized logistics and delivery services. These systems utilize advanced technology to streamline operations, enhance efficiency, and provide real-time tracking capabilities for both senders and recipients. In Kenya, the concept of online transportation scheduling gained traction particularly with the growth of e-commerce and the need for reliable parcel delivery services. Companies like Sendy, based in Nairobi, have implemented sophisticated scheduling systems that allow users to book deliveries online, track their parcels, and receive timely updates on delivery status via mobile apps or websites. These systems typically employ algorithms to optimize routes and schedules, ensuring prompt delivery while minimizing costs and environmental impact. Abroad, similar system has been adopted in development and developing countries alike, catering to the increasing demand for efficient logistics solutions in a globalized economy.

1.2 Problem Statement.

Design and develop a computerized scheduling system for efficient and reliable transportation of luggage and parcels through an online platform. The system should facilitate seamless booking, real-time tracking, and optimized routing to ensure timely delivery while maximizing resource utilization and customer satisfaction. Key objectives include: Creating a user-friendly interface for customers to book transportation services, specifying pickup and delivery locations, parcel dimensions, and preferred delivery times. Implementing a tracking mechanism that allows both customers and service providers to monitor the status and location of parcels in real-time, ensuring transparency and accountability.

By managing fleet resources efficiently by assigning vehicles based on availability, proximity to pick up points, and capacity requirements, aiming to reduce idle time and operational costs. Provide automated notifications and alerts to customers regarding booking confirmation, estimated arrival times, delays (if any), and successful deliveries to enhance communication and customer experience.

1.3 Objectives.

1.3.1 General Objective

General Objective is to develop and implement a computer scheduling system that efficiently manages the online transportation of luggage and parcels, ensuring timely delivery and customer satisfaction.

1.3.2 Specific Objectives

- i. **To** enable customers to book transportation services online.
- ii. To minimize delivery times and transportation costs while maximizing delivery efficiency.
- iii. To provide a tracking mechanism that allows customers to monitor the status of their parcels in real-time. Develop a user-friendly interface for customers to manage their bookings, view transaction history, and provide feedback.

- iv. To Implement security measures to protect customer data and ensure the safe transportation of parcels.
- v. To Develop contingency plans and backup systems to maintain service reliability during peak times or system failures.

1.4 Research Questions

- i. How to monitor system performance through metrics
- ii. How to continuously improve the system based on feedback and data analysis
- iii. How to enable customers to book transportation online in real time
- iv. How to minimize delivery times and transportation costs

1.5 Significance of Study

The significance of a study on computer scheduling systems for online transportation of luggage and parcels lies in several key areas

Implementing a computer scheduling system can significantly enhance the efficiency of operations. It allows for better coordination of pickup and delivery schedules, optimizing routes, and reducing idle time. This efficiency translates into faster delivery times and improved customer satisfaction.

By optimizing routes and schedules, the system can help reduce operational costs associated with fuel, labor, and vehicle maintenance. This cost-effectiveness is crucial for businesses looking to maximize profitability while offering competitive pricing to customers.

Customers expect real-time updates on the status and location of their shipments. A computer scheduling system can provide accurate tracking information, enhancing transparency and trust between the service provider and customers.

As the demand for transportation services grows, scalability becomes critical. A robust scheduling system can handle increased volumes of orders efficiently, ensuring that service levels are maintained even during peak periods.

The system generates valuable data on delivery performance, customer preferences, and operational bottlenecks. This data can be analyzed to make informed decisions about resource allocation, service improvements, and strategic planning.

In a crowded marketplace, efficient logistics operations can be a significant competitive advantage. A well-implemented scheduling system sets a service provider apart by offering reliable and timely delivery services, attracting and retaining customers.

The flexibility of a computer scheduling system allows it to adapt to changing customer demands, regulatory requirements, and market conditions. This adaptability ensures that the service remains responsive and resilient in a dynamic environment.

1.7 Project Scope

The system should enable customers to track the status and location of their shipments accurately, possibly through GPS integration or similar technologies.

CHAPTER TWO: LITERATURE REVIEW.

2.0 Introduction.

The chapter begins by examining the fundamental principles of scheduling in the transport industry, emphasizing the intricate balance required between operational efficiency and meeting dynamic customer demands. It then proceeds to discuss the shortcomings associated with manual and semi-automated scheduling processes, such as human error, suboptimal route planning, and difficulty in responding to real-time changes. Furthermore, the chapter explores case studies and industry insights that illustrate the repercussions of inadequate scheduling on operational costs, service reliability, and overall business competitiveness.

2.1 Review of Related Work

[1] researched heuristic and metaheuristic algorithms such as genetic algorithms, tabu search, and simulated annealing for solving vehicle routing and scheduling problems. Their work emphasizes practical applications in transportation logistics, aiming to optimize fleet management and route planning. [2] did extensive work on optimization algorithms for vehicle routing and scheduling, including exact methods and heuristic approaches. Their research often incorporates real-world constraints and dynamic environments to improve operational efficiency and cost-effectiveness in transport logistics.

[3] Renowned for his contributions to transportation logistics, focusing on both theoretical studies and practical applications. His research spans various vehicle routing and scheduling problems, addressing complexities such as multiple depots, time windows, and heterogeneous fleet management. [4] contributions to transportation systems engineering include scheduling and operations research aspects. They have explored scheduling models that integrate real-time data and optimize fleet utilization for transport companies. [5] Known for developing optimization models and algorithms tailored to transportation and logistics systems. Their research includes innovative approaches to solve complex routing and scheduling problems, considering environmental sustainability and operational efficiency. David Passenger: Specializes in exact and heuristic algorithms for vehicle routing and related combinatorial optimization problems. His research often addresses practical challenges in fleet management, integrating advanced algorithms to achieve near-optimal solutions. Paolo Toth and Daniele Vigo: Their research focuses on both theoretical advancements and practical implementations in vehicle routing and scheduling. They have developed algorithmic frameworks that integrate decision support systems to enhance decision-making capabilities in transport logistics. [6] Their work emphasizes metaheuristics and exact algorithms for solving large-scale vehicle routing and scheduling problems. They have contributed to the development of optimization techniques that improve routing efficiency and reduce operational costs for transport companies. [7] defined three characteristics of m-commerce which are ubiquity, convenience, localization and

personalization. mobile aspects, [8] developed another measurement model specifically for mobile services.

2.2 Conclusions.

Through an in-depth analysis of the current manual processes and their limitations, it has become evident that adopting a computer-based system offers numerous advantages, including improved efficiency, reduced costs, and enhanced decision-making capabilities. The discussion highlighted the complexities involved in manual scheduling, such as human error, suboptimal route planning, and difficulty in accommodating last-minute changes. These inefficiencies not only impact operational performance but also customer satisfaction and overall profitability. By leveraging technology, the transport company can streamline scheduling processes, optimize resource utilization, and respond more effectively to dynamic market demands.

The review identified gaps in system integration, therefore there is a need to ensure seamless integration of the new scheduling software with the company's existing IT infrastructure and operational processes. Compatibility issues or data transfer problems could hinder the implementation process. also Training and Adoption: Adequate training programs must be developed to familiarize staff with the new system. Resistance to change among employees could slow down the adoption process and impact overall efficiency gains. Data Accuracy and Reliability was also identified, the reliability of data inputs is crucial for the effectiveness of the scheduling system. Ensuring accurate real-time data, such as traffic conditions or vehicle availability, is essential to avoid scheduling error. Scalability: The system should be designed to accommodate future growth and expansion of the transport company. Scalability concerns include handling an increasing number of vehicles, routes, and customer demands without compromising performance.

2.3 Conceptual Frame Work

Operations Research and Optimization Models: Utilization of mathematical models such as linear programming, integer programming, and simulation to optimize resource allocation, route planning, and scheduling in complex transport networks 1963; Topis,

1956 **Information Systems and Decision Support Systems:** Integration of information technology with decision support systems to enhance decision-making capabilities through data analytics, forecasting, and real-time monitoring 2002; 2007 **Transportation and Logistics Management:** Principles of transportation management including fleet management, logistics, and supply chain optimization to ensure timely delivery, reduce transit times, and improve overall operational efficiency 2016). the conceptual framework presented outlines the foundational elements necessary for the development and implementation of a computer-based scheduling system tailored for a transport company. By leveraging advanced technologies and theoretical insights from operations research and information systems, such a system promises to enhance operational efficiency, reduce costs, and improve service quality.

CHAPTER THREE: METHODOLOGY

3.0 Introduction.

The system development of computer-based scheduling system for a transport company leverages a combination of methodologies and tool to facilitate the design, implementation and testing. Under the system methodology, the researchers use iterative methodology but the development tools. The researcher will use HTML and database management systems (MySQL), while in the system design, the researcher will use qualitative and quantitative system design. Under data collection method, the researcher will use questionnaire, observation and interview. In addition, the researcher will analyze the data that was collected.

3.1 System Design

The researcher design is to help in the collection and gathering of information that is necessary and useful for the formation of the system. The qualitative and quantitative research design will be specifically used in this project. This is due to the fact that, by use of both the researcher will get better results other than used one had loop holes at the end.

Qualitative research design will help the researcher in the distinction between the study designs and methods of data collection. This is extremely important, for the researcher will be able to understand, explain and clarify situations.

Quantitative research design also helps in the researcher perfectly, for they were able to get specific and well-structured results at the end and also to clarify the research done and the information gathered was super good for the purpose of accuracy.

3.2 System Methodology and Development Tools

The iterative process model is the performance of the System Development Life Cycle (SDLC) in which the initial development is started based on the concern condition demand needed. There are features that are added to the base of the software product with the ongoing iterative until the final system is created. This breaks down the system development process of much -related flaws as early as possible. The benefit of this model is that it is employed during the earlier stages of SDLC that permits the project developer and tester to find practical or design.

3.3 Target Population

Identifying the target population is crucial for the successful design, development and implementation of a computer-based scheduling system. Dispatchers and operations managers are responsible for planning, scheduling and coordinating the transportation of goods or passengers. They ensure that vehicles and drivers allocated efficiently, routes are optimized and schedules are adhered to.

Drivers are responsible for transporting goods or passenger's according to the schedule provided by the dispatchers. They need to manage their routes adhere to schedules and communicating issues or delays. Administrative staffs handle the overall administration of the transport company including managing bookings, maintaining records and ensuring compliance with regulations.

3.4 Methods of Collecting Data

Interviews

Interviews involves face-to-face or virtual conversations between the researcher and the respondent to gather detailed information.

If a driver mentions unexpected delays due to specific traffic patterns, the interviewer can probe further to understand the issue better and gather actionable insights

Observation

Observation involves watching users in their natural work environment to understand their tasks, workflow and challenges.

Questionnaire

Questionnaires involves asking questions to acquire information from a large group of respondents.

3.5 Data Analysis

The data analysis for implementing a computer based scheduling system in a transport company reveals significant ,inefficiencies in the current manual process including frequent errors inconsistent schedules ,underutilized resources and high operational cost .By automating scheduling and employing optimization algorithms, the proposed aims to enhance resource allocation ,reduce idle times and improve service reliability .This will lead to fewer errors, lower operational costs and increased customer satisfaction, ultimately driving the company's operational efficiency and overall performance.

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APPENDICES.

APPENDIX A. QUESTIONNARE SAMPLE

Company name:

Position:

Contact information:

What type of scheduling system are you currently using?

Manual:

Spreadsheet:

APPENDIX II. GANTT CHART

ACTIVITY	1week	2weeks	3days	1week	3weeks
Planning					
Requirement analysis					
System design					
Testing					
Final approval					

APPENDIX III: BUDGET

Project management software	50000
Test servers	10000
Backup and storage solution	20000
Training session for staff	10000
totals	90000

