DEVELOPING A WEB-BASED RENTAL CAR MANAGEMENT SYSTEM FOR SAMMY'S HIRE CARS USING TOGAF FRAMEWORK

THESIS

DONALD SINOGEREL SAMSON

20200050100

INFORMATION SYSTEMS STUDY PROGRAM

FACULTY OF COMPUTER ENGINEERING AND DESIGN

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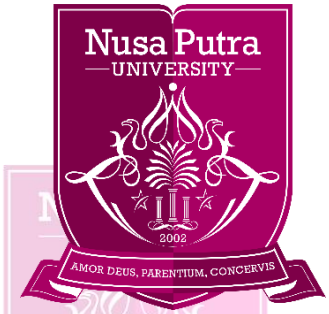
Donald Sinogerel Samson

20200050100



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AUTHOR'S STATEMENT

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NAME : Donald Sinogerel Samson

NIM 20200050100

AUTHOR'S STATEMENT

TITLE : DEVELOPING A WEB-BASED RENTAL CAR MANAGEMENT SYSTEM FOR SAMMY'S HIRE CARS USING TOGAF FRAMEWORK

NAME : Donald Sinogerel Samson

NIM : 20200050100

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Sukabumi, August 2024

Donald Sinogerel Samson

Writer

THESIS VALIDATION

TITLE : DEVELOPING A WEB-BASED RENTAL CAR MANAGEMENT SYSTEM FOR SAMMY'S HIRE CARS USING TOGAF FRAMEWORK

NAME : Donald Sinogerel Samson

NIM : 20200050100

This thesis has been tested and defended in front of the Board of Examiners at the Thesis Session on 25th June. In our view, this thesis is adequate in terms of quality for the purpose of awarding a Bachelor of Computers degree.

Sukabumi, August 2024

Supervisor I

Arny Lattu, S.Pd.Kom., M.Kom
NIDN. 042408926

Supervisor II

Falentino Sembiring, S.T., M.Kom
NIDN. 0408029102

Chief Examiner

Adithia Erfina, S.T., M.Kom
NIDN. 0417049102

Head of the Information Systems Study Program

Adithia Erfina, S.T., M.Kom
NIDN. 0417049102

Dean of the Faculty of Computer Engineering and Design

Ir. Paikun, S.T., M.T., IPM., ASEAN Eng
NIDN. 0402037401

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ABSTRACT

The automotive rental industry is undergoing a significant transformation driven by digital technologies, necessitating the development of efficient and user-friendly management systems. This thesis focuses on the creation of a web-based rental car management system for Sammy's Hire Cars, utilizing the TOGAF framework to streamline the development process. The system is built with HTML, CSS, PHP, and JavaScript, offering a robust, interactive, and accessible platform.The TOGAF framework plays a critical role in guiding the project from inception to completion, ensuring a systematic approach to meet operational and customer service enhancement goals. The project began with a comprehensive needs analysis to identify operational bottlenecks within Sammy's Hire Cars. The system is designed to improve inventory management, customer bookings, service customization, and financial accounting, thereby enhancing operational efficiency and customer engagement. The development features an intuitive user interface using HTML and CSS for front-end design, PHP for server-side scripting, and JavaScript for dynamic content management. These technologies were selected for their flexibility, compatibility, and extensive support, ensuring scalability and maintainability.

Keywords: Rental Car Management System, TOGAF Framework, HTML, CSS, PHP, JavaScript, Web Development, Operational Efficiency

FOREWORD

In the rapidly advancing digital era, the intersection of technology and traditional business operations has become a fertile ground for innovation and efficiency. The automotive rental industry, with its complex operations and customer service demands, stands at the forefront of this transformation. It is within this context that the development of a web-based rental car management system for Sammy's Hire Cars emerges not just as a project but as a testament to the potential of digital technologies to redefine industry standards and enhance customer experiences. This thesis represents a confluence of theoretical knowledge and practical application, underpinned by the rigorous TOGAF project management framework. The choice of this framework is reflective of a commitment to excellence, ensuring that every phase of the project from planning to execution adheres to the highest standards of quality and efficiency. The technologies chosen for this project—HTML, CSS, PHP, and JavaScript—are the bedrock upon which the system is built. These languages were selected for their robustness, flexibility, and widespread use in the development of web-based applications. Together, they provide a comprehensive toolkit for creating a system that is not only functional and reliable but also user-friendly and accessible. The journey of developing this rental car management system has been both challenging and rewarding. It has required a deep dive into the operational needs of Sammy's Hire Cars, an understanding of the technical capabilities of the chosen technologies, and an unwavering dedication to the project management principles outlined by the TOGAF Framework. This thesis documents this journey, offering insights into the decision-making processes, the challenges encountered, and the innovative solutions devised to overcome them. As the author of this thesis, I have had the privilege of bridging the gap between theoretical concepts and their practical application. This project has been an opportunity to apply the skills and knowledge acquired through my studies in a real-world context, contributing to the digital transformation of Sammy's Hire Cars. It is my hope that this thesis will serve as a valuable resource for future students, academics, and professionals interested in the intersection of information systems, project management, and the automotive rental industry.

FINAL PROJECT PUBLICATION APPROVAL STATEMENT PAGE FOR ACADEMIC INTERESTS

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CHAPTER I

INTRODUCTION

1.1. Background

The advent of the digital age has revolutionized various sectors, and the car rental industry is no exception. The demand for efficient, user-friendly rental services has escalated, driven by a global increase in travel for both business and leisure. This shift necessitates the adoption of advanced technology solutions to manage the complexities of car rental operations effectively. A web-based rental car management system epitomizes this technological leap, offering a platform that not only simplifies the booking process for customers but also streamlines inventory management, pricing strategies, and customer service for businesses. Sammy's Hire Cars, a player in this competitive industry, faces the challenge of adapting to these digital demands. Traditionally, car rental businesses like Sammy's relied on manual or semi-automated systems for managing reservations, vehicle maintenance, and customer inquiries. However, these methods are becoming increasingly inefficient in the face of growing customer expectations for instant booking confirmations, transparent pricing, and comprehensive service offerings. The transition to a web-based management system represents a critical step towards enhancing operational efficiency and customer satisfaction.

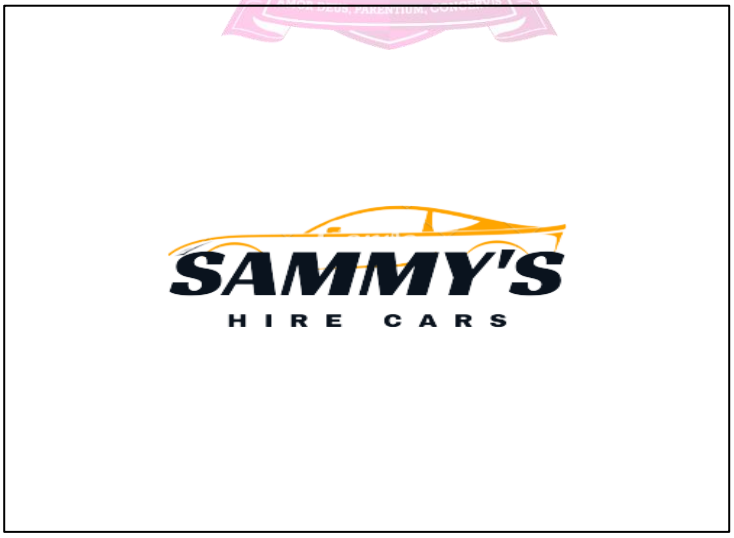

Figure 1: Sammy's Hire Cars Logo

The development of such a system requires a strategic approach, where the choice of technology and project management framework plays a pivotal role. The selection of HTML, CSS, PHP, and JavaScript as the development stack for this project is informed by their widespread use and flexibility in creating dynamic, responsive web applications. These technologies provide the foundation for building a robust system capable of handling the intricate requirements of rental car management, from real-time inventory updates to user authentication and data security. This system will be using TOGAF Framework to plan, design, create and implement the rental car system of “Sammy’s Hire Car”. TOGAF Architectural framework is efficient when it comes to plan and create such project and magnitude. This strategic alignment of using TOGAF ensures that the project progresses smoothly from conception to deployment, mitigating risks and maximizing efficiency.

The significance of this project extends beyond the operational improvements for Sammy's Hire Cars. It contributes to the broader discourse on digital transformation in the car rental industry, offering insights into the application of web technologies and project management methodologies in a sector poised for innovation. As such, this thesis not only documents the development of a web-based rental car management system but also explores its implications for business practices, customer engagement, and competitive strategy in the digital era. This background sets the stage for a comprehensive exploration of the project's development process, from the initial needs assessment to the final implementation and evaluation. It highlights the importance of technology and project management in adapting to the digital demands of the modern car rental industry, underscoring the potential of such systems to drive business success and enhance customer experiences.

1.2 Problem Formulation

The digital transformation sweeping across industries has set new benchmarks for operational efficiency and customer service, presenting both challenges and opportunities for businesses. In the car rental sector, companies are grappling with the need to modernize their systems to meet these evolving demands. Sammy's Hire

Cars, despite its success, finds itself at a crossroads, facing the imperative to transition from traditional, labor-intensive management practices to a more streamlined, technology-driven approach. The absence of a web-based rental car management system has led to inefficiencies in booking processes, inventory management, and customer engagement, ultimately impacting the company's bottom line and growth prospects. Some of the problems are as follows:

A) The car rental sector faces challenges in adapting to digital demands.
B) Sammy's Hire Cars needs to transition from traditional methods to technology-driven solutions.
C) Existing manual systems lack real-time updates and struggle with pricing adjustments.
D) Customer expectations for online bookings and transparent pricing are not met.
E) Management of the rental fleet lacks insight and efficiency.

1.3 Problem Limitations

While the development of a web-based rental car management system for Sammy's Hire Cars presents a significant opportunity for operational improvement and customer service enhancement, several limitations and challenges are inherent to the problem. These limitations can influence the project's scope, its implementation, and the potential outcomes, necessitating careful consideration and strategic planning to mitigate their impact. Some of the limitations are:

A) Technological integration with existing infrastructure poses challenges.
B) Data security and compliance with regulations are critical considerations.
C) User adoption and change management may face resistance.
D) Resource constraints in terms of budget, expertise, and time may arise.
E) Future-proofing the system against industry changes and advancements is necessary.

1.4 Research Objectives and Research Benefits

The primary objective of this research is to design and implement a web-based rental car management system for Sammy's Hire Cars, leveraging a chosen project management TOGAF Framework and utilizing technologies such as HTML, CSS, PHP, and JavaScript. However, some of the other main objectives of this project include:

A) Design and implement a web-based rental car management system for Sammy's Hire Cars.
B) Streamline booking processes and optimize fleet management.
C) Improve customer service and increase market competitiveness.
D) Enhance customer satisfaction, operational efficiency, and revenue opportunities.
E) Contribute insights to the broader discourse on digital transformation in the car rental industry.

1.5 Writing Systematics

This thesis will be prepared according to the following systematics:

A) Chapter I Introduction:

This chapter provides a general overview of the research background, problem formulation, research objectives, and the overall structure of the writing. The introduction explains why the research is being conducted, what it hopes to achieve, and why the topic is important to research.

B) CHAPTER II Literature Review:

This chapter contains a review of relevant literature related to the research topic. The literature review describes previous research, supporting theories, and approaches that have been taken by other researchers in understanding the same or similar problems.

C) CHAPTER III Research Methodology:

This chapter explains the methods used in conducting research, including the research approach, data collection techniques, and data analysis used. Research methodology provides a strong basis for readers to understand how the research was conducted and the validity of the results.

D) CHAPTER IV Results and Discussion:

This chapter presents the results of the research that has been carried out and its analysis. The results and discussion detail the research findings as well as the interpretation and implications of these findings for the research topic. The discussion can also include comparisons with previous research and consider the weaknesses and strengths of the research results.

E) CHAPTER V Conclusions and Suggestions:

This chapter contains a summary of the entire research, including conclusions drawn from the research results and answers to the problem formulation. In addition, this chapter also includes suggestions for further research or practical implications of research findings.

F) Bibliography:

This section lists all library sources used in research, whether in the form of journals, books, articles, or other sources of information. A bibliography ensures the accuracy and credibility of the research by providing the reader with the necessary references.

With this systematic writing, it is hoped that this thesis will be structured and well organized, so that readers can clearly understand the contributions and findings of this research in the context of the game development industry in Indonesia.

CHAPTER VI
CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The development of a web-based rental car management system for Sammy's Hire Cars has demonstrated significant improvements in operational efficiency, customer satisfaction, and overall business management. The application of the TOGAF framework throughout the development process ensured a structured and comprehensive approach, addressing both business and technical requirements effectively. The system's key functionalities, including online booking, real-time inventory management, customer profile management, and automated payment processing, have streamlined operations and enhanced the user experience. The integration of a reliable payment gateway has facilitated secure and efficient online transactions, further improving customer convenience.

The architectural design, incorporating cloud architecture, sequence diagrams, workflow diagrams, and a well-structured database schema, has provided a robust foundation for the system. The frontend and backend designs have ensured a user-friendly interface and efficient data processing, respectively. Blackbox testing validated the system's functionality, confirming that it meets all specified requirements and handles various inputs and interactions as expected. The system's ability to support user registration, car search and booking, and admin functions has been thoroughly tested and verified. Overall, the web-based rental car management system has achieved its objectives of improving operational efficiency, enhancing customer service, and providing a reliable and user-friendly platform for both customers and administrators.

5.2 Recommendations

A) Continuous Improvement and Maintenance:

   a. Regularly update the system to incorporate new features and address any emerging issues.
   b. Conduct periodic system audits and performance assessments to ensure optimal functionality and security.

c. Gather user feedback to identify areas for improvement and enhance the user experience.

B) Enhanced Security Measures:

a. Implement advanced security protocols to protect user data and transaction information.
b. Regularly update security software and perform vulnerability assessments to prevent potential cyber threats.
c. Ensure compliance with the latest data protection regulations and industry standards.

A) Mobile Application Development:

a. Develop mobile applications for both iOS and Android platforms to provide customers with greater accessibility and convenience.
b. Ensure the mobile apps include key functionalities such as booking, payment processing, and customer profile management.
c. Optimize the mobile user interface for a seamless and intuitive user experience.

B) Driver Management and Integration:

a. Incorporate driver management functionalities to track and manage drivers associated with rental services.
b. Provide a platform for drivers to update their availability, manage bookings, and communicate with customers.
c. Ensure drivers have access to a dedicated mobile application to streamline their tasks and improve efficiency.

C) Promotional Tokens and Loyalty Programs:

a. Introduce promotional tokens and discounts to attract new customers and retain existing ones.
b. Develop a loyalty program that rewards customers for repeated rentals, encouraging long-term engagement.
c. Integrate promotional offers and loyalty rewards seamlessly into the booking and payment processes.

D) Enhanced User Experience:

a. Continuously refine the user interface to ensure it is intuitive, user-friendly, and responsive across various devices.
b. Implement features such as real-time customer support chat, personalized recommendations, and easy navigation to enhance the overall user experience.
c. Conduct usability testing and gather user feedback regularly to identify areas for improvement.

E) Scalability and Future Enhancements:

a. Plan for future scalability to accommodate a growing customer base and expanding business operations.
b. Integrate additional functionalities such as advanced analytics, predictive maintenance, and automated customer service to further optimize operations and enhance user experience.
c. Explore the integration of emerging technologies such as artificial intelligence and machine learning to personalize customer interactions and improve operational efficiency.

F) User Training and Support:

a. Provide comprehensive training programs for staff to ensure they are proficient in using the system.
b. 2. Offer customer support services to assist users with any issues or queries they may encounter.
c. Develop user guides and tutorials to help customers navigate the system easily.

G) Marketing and Promotion:

a. Implement targeted marketing campaigns to promote the new system and attract more customers.
b. Utilize social media platforms and digital marketing strategies to increase visibility and reach a wider audience.

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