**ONLINE CAR SALE MANAGEMENT SYSTEM**

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# STUDENT’S DECLARATION

I the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university than the Pan Africa University in Nairobi for academic credit.

Signed …………………………… Date …………………………………

Mahlon Neyole Emmanuel Kanyi (ID No. DICT/23942/0/22)

This project proposal has been presented for examination with my approval as the appointed supervisor

Signed …………………………… Date …………………………………

Peter Obiria

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# ABSTRACT

This research aims to develop a robust online car sales management system to address inefficiencies within the automotive industry. By prioritizing user-centric design and agile development methodologies, the system seeks to optimize the car listing process, enhance user management, and facilitate secure transactions. The goal is to create a platform that significantly improves the overall car buying and selling experience for both dealers and customers. The online car sales management system is designed to streamline the car buying and selling process. The system aims to provide a user-friendly platform for customers to search, compare, and purchase vehicles, while offering dealers efficient tools for inventory management, sales tracking, and customer relationship management. By leveraging technology, the system seeks to enhance transparency, speed up transactions, and improve overall customer satisfaction in the automotive industry.

Keywords: Online Car Sale, Management System, User Authentication, Payment Integration.

# ACKNOWLEDGEMENT

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# DEDICATION

This project is dedicated to my beloved parents, whose unwavering support and encouragement have been the cornerstone of my academic journey. Their faith in my abilities has propelled me forward, and I am eternally grateful for their love and guidance.

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# Definition of Terms

* **User:** An individual who interacts with the online car sales management system, fulfilling the roles of either a buyer or seller.
* **Listing:** An advertisement for a vehicle available for sale on the platform, adhering to the platform's standardized format and content guidelines.
* **Admin:** An authorized personnel responsible for platform management, including user and content moderation, system maintenance, and data security.

**Chapter One: Introduction**

**Background Study**

The automobile market has seen a significant shift towards online platforms for buying and selling vehicles. Traditional methods involve physical showrooms and classified ads, which are often time-consuming and limited in reach.

**Problem Statement**

**Current System**

The current system relies heavily on manual processes and fragmented platforms, resulting in inefficiencies such as:

Limited accessibility and visibility for listings.

Lack of secure payment options.

Poor user experience and fragmented communication channels.

**Weaknesses**

Inconsistent listing information.

High risk of fraud and lack of trust.

Inefficient transaction processing.

**Proposed Solution**

The proposed online car sell management system will:

Provide a centralized platform for car listings.

Integrate secure payment gateways.

Offer robust user authentication and profile management.

Enable efficient communication between buyers and sellers.

**Justification**

This system will enhance user experience by providing a secure, reliable, and comprehensive platform for buying and selling cars. It will reduce the risk of fraud, streamline the transaction process, and increase market reach.

**Objectives**

**Specific**

Develop a user-friendly interface for listing and browsing cars.

Implement secure user authentication and authorization.

Integrate payment gateways for safe transactions.

**Measurable**

Achieve 100% functionality for core features by the end of the project.

Ensure the platform supports at least 1,000 concurrent users.

Reduce transaction processing time by 50%.

**Achievable**

Leverage existing technologies and frameworks to build the system.

Collaborate with industry experts for insights and feedback.

**Relevant**

Addresses the key pain points of the current system.

Aligns with the growing trend of online transactions in the automobile market.

**Time-bound**

Complete the development within 3 months.

Conduct user testing in the 4th month.

Launch the platform in the 8th month.

# Chapter Two: Related Work (Literature Review)

**Review of Similar Systems and Their Weaknesses**

**1. Cars.com**

**Overview:** Cars.com is a leading online marketplace for buying and selling new and used cars. It offers a wide range of services including car listings, dealer reviews, and financing options.

**Weaknesses:**

**Limited User Interaction:** The platform lacks robust communication tools between buyers and sellers, often requiring users to rely on external communication methods.

**Payment Integration:** There is no integrated payment system, which necessitates buyers and sellers to manage payments separately, increasing the risk of fraud.

**User Authentication:** User verification processes are not stringent, which can lead to fraudulent listings and transactions.

**2. Autotrader**

**Overview:** Autotrader is another prominent online marketplace that connects buyers with car dealers and private sellers. It offers a variety of search and filter options to find specific cars.

**Weaknesses:**

**Complex Interface:** The user interface can be overwhelming for first-time users, with numerous options and information cluttering the platform.

**Customer Support:** Limited support options are available for resolving disputes or handling fraudulent activities.

**Listing Verification:** Listings are not always verified promptly, leading to outdated or inaccurate information being displayed.

**3. eBay Motors**

**Overview:** eBay Motors is a part of eBay, specializing in vehicles and parts. It leverages eBay’s auction system and buyer protection programs.

**Weaknesses:**

**Auction System Complexity:** The auction system can be confusing and intimidating for users unfamiliar with bidding processes.

**Limited Local Options:** It is heavily reliant on shipping, which can be a deterrent for buyers looking for local purchases.

**Scam Risk:** Despite buyer protection programs, scams are still prevalent, affecting user trust.

**How Proposed System Objectives Intend to Address the Weakness Gap**

**1. Enhanced User Interaction**

The proposed system will integrate robust communication tools such as in-app messaging and notifications, allowing buyers and sellers to communicate seamlessly within the platform. This will address the limited interaction issues seen in Cars.com.

**2. Integrated Payment System**

To tackle the payment integration problem, the system will feature secure payment gateways (e.g., PayPal, Stripe) directly within the platform. This reduces the risk of fraud and simplifies the transaction process, overcoming the payment issues noted in Cars.com and eBay Motors.

**3. User Authentication and Verification**

A multi-factor authentication process and stringent user verification protocols will be implemented to ensure the authenticity of users. This addresses the user verification weaknesses of Cars.com and Autotrader, reducing fraudulent activities.

**4. User-Friendly Interface**

The interface will be designed with simplicity and usability in mind, providing an intuitive experience even for first-time users. This aims to resolve the complex interface issues found in Autotrader.

**5. Comprehensive Customer Support**

The system will offer 24/7 customer support through chatbots and live agents to handle disputes and provide assistance. This addresses the limited support options of Autotrader.

**6. Verified Listings**

All car listings will be verified for accuracy and authenticity before being published. This ensures up-to-date and accurate information, addressing the outdated listing issues of Autotrader.

**In-Text Referencing (APA Format)**

According to a study by Smith (2020), integrated communication tools significantly enhance user satisfaction on online marketplaces.

Johnson (2019) highlights that secure payment systems reduce fraud incidents by up to 60%.

User verification processes are crucial in maintaining platform trust, as evidenced by the findings of Brown (2018).

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# Chapter Three: Methodology

**3.1 Requirement Gathering Methods**

Effective requirement gathering is crucial for the successful development of the Online Car Sell Management System. The following methods were used to gather requirements:

**3.1.1 Surveys and Questionnaires**

Surveys and questionnaires were distributed to potential users, including car buyers, sellers, and dealerships. This method provided quantitative data on user preferences, challenges faced in existing systems, and desired features.

**3.1.2 Interviews**

Interviews with stakeholders, including car dealers, private sellers, and buyers, were conducted to gather qualitative insights. This helped understand the specific pain points and expectations from the system.

**3.1.3 Observation**

Observing current processes in car dealerships and online platforms helped identify inefficiencies and areas for improvement. This method provided practical insights into how users interact with existing systems.

**3.1.4 Document Analysis**

Analyzing existing documents, such as transaction records and customer feedback from current platforms, provided additional context and helped identify recurring issues and common requirements.

**3.2 Software Development Model Selected**

The Agile Development Model was selected for this project due to its flexibility and iterative approach.

Strengths of Agile Model:

Flexibility: Agile allows for changes and refinements at any stage of the development process.

User Feedback: Regular iterations and reviews involve continuous user feedback, ensuring the final product meets user needs.

Risk Management: Potential issues are identified and addressed early in the development cycle.

Improved Quality: Continuous testing and integration enhance the overall quality of the system.

Weaknesses of Agile Model:

Scope Creep: Without proper management, there is a risk of scope creep due to frequent changes and additions.

Resource Intensive: Agile requires a high level of user involvement and continuous collaboration, which can be resource-intensive.

Documentation: Agile often focuses less on comprehensive documentation, which may lead to gaps in knowledge transfer.

# Chapter Four: System Analysis and Design

**4.1 Requirement Analysis**

The requirement analysis phase involved identifying and documenting the functional and non-functional requirements of the system.

**Functional Requirements:**

User registration and login

Car listing creation, editing, and deletion

Advanced search and filter options

Secure payment processing

User communication (messaging system)

Review and rating system

**Non-Functional Requirements:**

Security: Ensure data protection and secure transactions

Usability: Provide an intuitive and user-friendly interface

Performance: Handle a large number of concurrent users and transactions

Scalability: Easily accommodate future growth and feature additions

**4.2 System Architectural Design**

The system follows a multi-tier architecture, consisting of the presentation layer, business logic layer, and data layer.

**Presentation Layer:** User interfaces for web and mobile platforms.

**Business Logic Layer:** Handles all business rules and processes.

**Data Layer:** Manages data storage and retrieval using a database management system

# 4.3 System Analysis

**Context Diagram**

**Online Car Sell**

**Management System**

**User Admin External Services**

*Figure 1: Context Diagram of the Online Car Sell Management System*

**Domain Analysis**

**Entities Identified:**

User

Car Listing

Transaction

Review

Message

# 4.4 Use Case Diagrams

System

Online Car Sell Mgmt.

System

Buyer Admin Seller

Register Manage Users Register

Login Manage Listings Login

Browse Generate Reports Create

Contact Listings

Figure 2: Use Case Diagram for Online Car Sell Management System

4.5 System Design

Class Diagrams

User

- UserID

- Name

- Email

- Password User

- Phone

- Address

+register()

+ login()

+ browseListings()

+ contactSeller()

Car Listing |

ListingID

UserID

CarMake

CarModel

Year

Price

Description |

Photos

+ createListing()|

+ updateListing()

+ deleteListing()

+ viewListing()

Transaction |

| - TransactionID |

| - ListingID |

| - BuyerID |

| - SellerID |

| - Date |

| - Amount |

| - Status |

+------------------+

| + initiateTransaction()|

| + updateTransaction() |

| + completeTransaction()|

| Review |

+------------------+

| - ReviewID |

| - UserID |

| - ListingID |

| - Rating |

| - Comment |

| - Date |

+ addReview()

+ editReview()

+ deleteReview()

| Message |

+------------------+

| - MessageID |

| - SenderID |

| - ReceiverID |

| - Content |

| - Date |

| - Status |

| + sendMessage() |

| + readMessage() |

| + deleteMessage()|

Figure 3: Class Diagram

Data Flow Diagrams (DFDs)

User

Online Car Sell Mgmt.

System

register() z

login()

browseListings()

contactSeller()

Admin

manageUsers()

manageListings()

generateReports()

Seller

createListing()

updateListing()

deleteListing()

viewListing()

|

Figure 4: Data Flow Diagram (Level 0)

Sequence Diagrams

|  |  |  |  |
| --- | --- | --- | --- |
| User | System | Seller | |
| register()    |--login() | | browseListings  contactSeller()  createListing|  viewListing--| |  |

Figure 5: Sequence Diagram

Collaboration Diagrams

1: register()

2: login()

3: browseListings()

4: contactSeller()

5: createListing()

6: viewListing()

|  |  |  |
| --- | --- | --- |
| User | System | Seller |
| |1: register() |  | 3: browseListings() |
| |2: login() |
| 4: contactSeller() |
| 5: createListing() |
|  |  |
| |6: viewListing |

*Figure 6: Collaboration Diagram*

**4.6 Database Design**

The database schema includes tables for Users, Car Listings, Transactions, Reviews, and Messages.

# Chapter Five: System Implementation and Testing

**5.1 Proposed Technology to Implement System**

**Frontend:**

React.js: For building a dynamic and responsive user interface.

Bootstrap: For styling and layout.

**Backend:**

Node.js with Express.js: For handling server-side logic and APIs.

**Database:**

MongoDB: For flexible and scalable data storage.

**Reason for Selecting Technologies:**

**React.js:** Offers component-based architecture, making it easier to manage and scale the frontend.

**Node.js:** Ensures fast and scalable server-side operations, with a large ecosystem of libraries.

**MongoDB:** Provides a flexible schema design, which is beneficial for handling diverse data types.

**5.2 Summary of Modules**

**User Module:**

**Features:**

User registration

User login

Profile management (update personal details, change password)

**Listing Module:**

**Features:**

Create car listings

Edit car listings

Delete car listings

View car listings with detailed information

**Search Module:**

**Features:**

Advanced search options (by make, model, year, price, etc.)

Filter listings based on various criteria (location, price range, year, etc.)

**Transaction Module:**

**Features:**

Secure payment processing

Transaction history for users

Manage transaction status (pending, completed, cancelled)

**Communication Module:**

**Features:**

Messaging system for buyer-seller interaction

Notification system for new messages

History of conversations

**Review Module:**

**Features:**

Add reviews for cars and sellers

Edit reviews

Delete reviews

Rating system (1 to 5 stars)

**5.3 Testing**

**Test Regime**

| **Test Case** | **Description** | **Expected Outcome** | **Actual Outcome** | **Status** |
| --- | --- | --- | --- | --- |
| User Registration | Test user sign-up process | User account created | User account created | Pass |
| Create Listing | Test car listing creation | Listing appears in search | Listing appears in search | Pass |
| Payment Processing | Test payment gateway | Transaction successful | Transaction successful | Pass |

**Screenshots of Test Cases**

*Screenshots showing user registration, listing creation, and payment processing test cases.*

**5.4 Conclusion and Recommendations**

The Online Car Sell Management System successfully addresses the weaknesses of existing platforms by providing a user-friendly interface, affordable listing options, robust communication features, standardized listings, enhanced security, and comprehensive customer support. Future work could involve integrating AI for personalized recommendations and expanding the platform to include additional services like car maintenance and insurance.

# End Matter

**Full Reference List (APA)**

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**Appendices**

**Test Data**

*Sample test data used for validating the system functionalities.*

**Code**

*Relevant code snippets for key functionalities.*

**Sample Requirement Gathering Tools**

*Surveys, interview questions, and observation notes used during the requirement gathering phase.*

# APPENDICES

**Appendix 1: Project Schedule**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Duration** | **Start Date** | **End Date** |
| Requirement Analysis | 2 weeks | 01/01/2024 | 14/04/2024 |
| System Design | 4 weeks | 15/01/2024 | 11/05/2024 |
| Development | 12 weeks | 12/02/2024 | 05/06/2024 |
| Testing | 4 weeks | 06/05/2024 | 02/07/2024 |
| Deployment | 2 weeks | 03/06/2024 | 16/07/2024 |

|  |  |
| --- | --- |
| **Item** | **Cost in Kenya Shillings** |
| Development Tools | 5,000.00 |
| Hosting Services | 3,000.00 |
| Marketing | 2,000.00 |
| Miscellaneous | 1,000.00 |
| **Total** | **11,000.00** |

**Appendix 2: Project Budget**