



# AUTO CONNECT – CAR RENTAL AND SALES

## **Final Year Project**

**A project submitted in partial fulfillment**

**Of the**

**Bachelor of Degree in Computer Science**

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## DECLARATION

We, the undersigned members of the project team for Auto Connect: A Web-Based Platform for Car Rental and Sales in Ethiopia," declare that this project proposal is the result of our collaborative efforts and independent research. We further affirm that all external sources and references cited within this proposal have been duly acknowledged and attributed.

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## **ABSTRACT**

Auto Connect represents a groundbreaking solution designed to revolutionize Ethiopia's car selling and rental industry. In a country comprised of ten regional states, our platform offers a unique opportunity for individuals and organizations to transcend geographical boundaries and tap into a diverse and expansive market. "Auto Connect" simplifies the process of selling or renting cars, making it an accessible and efficient endeavor.

This project aims to transcend the limitations of traditional methods by providing a multifaceted approach. It not only expands market reach, enabling users to connect with potential buyers or renters across Ethiopia's various regions, but also fosters transparency and efficiency. Through "Auto Connect," users gain easy access to vital information about available cars, their specifications, and pricing, thereby enhancing trust between all parties involved. Moreover, our initiative contributes to the economic growth of Ethiopia by empowering more individuals to participate in the car selling and rental market. As reported by the Ethiopian Investment Commission, the automotive sector has seen an average growth rate of 20% annually. The evident rise in vehicle imports into Ethiopia, exceeding 98,000 in 2019 as per the Ethiopian Revenues and Customs Authority adding to (James, p. 1), underscores the immense potential for economic expansion through this project. "Auto Connect" is set to redefine the automotive landscape in Ethiopia

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# **1. Introduction**

In the dynamic context of Ethiopia's car selling and rental industry, the "Auto Connect" project stands as a transformative endeavor. Ethiopia's diverse landscape, comprised of ten regional states, presents both opportunities and challenges in the automotive market. Conventional methods of car selling and rental have been historically limited by geographical constraints, curtailing market reach and constraining economic potential.

## **1.1 Background**

Our project operates within the broader landscape of an automotive industry that is pivotal to the economic growth of Ethiopia. The sector has shown exceptional growth, with the Ethiopian Investment Commission reporting a consistent annual growth rate of 20%. The region has witnessed a steady increase in the number of vehicles imported, exceeding 98,000 in 2019, as reported by the Ethiopian Revenues and Customs Authority. These figures underscore the sector's potential for significant economic expansion. In the context of Ethiopia's regional diversity, "Auto Connect" aspires to unlock the potential of every state, offering an accessible, efficient, and transparent platform to cater to the automotive needs of a diverse audience.

## **1.2 Problem Statement**

The project's mission is firmly grounded in addressing a critical issue within the car selling and rental industry. Traditional methods have long confined users to localized markets, limiting market reach and stifling opportunities for economic growth. The problem statement at the core of "Auto Connect" is rooted in the necessity to break free from these constraints. The issue is further compounded by the absence of transparent, efficient, and accessible platforms, hampering the trust and transaction efficiency between buyers and sellers. "Auto Connect" aims to solve this by promoting transparency, trust, and efficiency in the car selling and rental process.

The challenges that "Auto Connect" aims to address in the car selling and rental industry include:

- Limitations in geographical market reach, constraining economic growth.
- Lack of transparency and efficiency in traditional methods.
- Trust issues in transactions between buyers and sellers.
- The absence of a platform that connects users seamlessly.
- The need for a secure authentication process for used cars.

These issues collectively underscore the urgency and significance of the "Auto Connect" project in reshaping the industry by offering transparency, efficiency, and accessibility to a wide-ranging audience.

### **1.3 Proposed Solution**

At a high level, the proposed solution offered by "Auto Connect" is a comprehensive platform that addresses the major challenges in the industry. The system is designed to break geographical boundaries, expanding market reach for users across Ethiopia's diverse regions. By providing features like digital marketing, database tools, and user-friendly interfaces, the project promises to create a platform that enhances transparency, trust, and accessibility. Through streamlined processes, secure transactions, and user engagement strategies, "Auto Connect" envisions a more efficient and effective car selling and rental experience. This high-level description showcases the system's core functionality and features, which will be elaborated upon in subsequent sections.

As the project progresses, we will delve deeper into the specific aims, techniques, sub-tasks, procedures, and criteria for determining objectives, all of which contribute to the ultimate goal of reshaping Ethiopia's automotive industry through the "Auto Connect" platform. The evidence for these objectives will be carefully documented and presented in the final report, providing a comprehensive overview of the project's impact and potential for the future.

## **2. Project Rationale**

The choice of the "Auto Connect" project is underpinned by a multitude of compelling reasons. Foremost, we embarked on this endeavor with a primary objective is to contribute to the advancement of the automotive market sector in our country. The car selling and rental industry in Ethiopia has the potential to foster economic growth, and our project aims to be an integral part of this transformation. Moreover, we recognize that "Auto Connect" holds the promise of expanding into various facets, offering opportunities for future business growth. As computer science students, our intent extends beyond the academic sphere; we view this project as a springboard for honing our entrepreneurial skills. By undertaking "Auto Connect," we aspire to not only fulfill our final year project requirements but also leverage it as a platform for cultivating our entrepreneurial acumen.

This project aligns seamlessly with the broader objectives of addressing critical challenges in the car selling and rental industry. We intend to achieve this by providing essential information to potential buyers, enhancing trust through a testimonial and rating platform, and extending our reach to a vast audience spanning the entire country. The significance of "Auto Connect" is underscored by its potential to revolutionize how car transactions occur, promoting efficiency, transparency, and accessibility. In essence, our project is motivated by a dual commitment to contribute to economic growth and enrich our entrepreneurial expertise, while simultaneously addressing the pressing issues in the automotive sector.

## **3. Aim and objective**

The "Auto Connect" project is driven by a clear goal and a set of precise, concise, and SMART (Specific, Measurable, Achievable, Relevant, Time-bound) objectives. These aims and objectives not only guide the project but also address the issues highlighted in the preceding section on problem statements, ensuring a comprehensive approach to project success.

## **Aim:**

The primary aim of the "Auto Connect" project is to transform the car rental and sales industry in Ethiopia by establishing an innovative and accessible online platform for individuals and organizations. This platform seeks to enhance market accessibility, promote transparency, facilitate economic participation, support industry growth, ensure user-friendly experiences, and promote sustainable expansion.

## **Objectives**

- ✓ Market Accessibility
- ✓ Transparency and Trust
- ✓ Economic Participation
- ✓ Economic Growth.
- ✓ User-Friendly Experience
- ✓ Sustainable Expansion

## **4. Scope of the Project**

The scope of the "Auto Connect" project clearly delineates the objectives, responsibilities, and boundaries necessary for its successful completion. It defines specific project objectives, deliverables, features, functions, tasks, deadlines, and, ultimately, the associated expenses.

## **What Can Be Covered**

- Platform Development: The project encompasses the design and development of a comprehensive online platform for car rental and sales in Ethiopia.
- User Registration and Authentication: The platform will feature user registration and authentication mechanisms for both sellers and buyers.
- Listing and Searching Vehicles: Users can list their cars for rent or sale, and potential customers can search and view vehicle listings.



- **User Communication:** A secure communication system will be implemented, allowing users to interact and exchange information.
- **Rating and Testimonials:** The platform will support a rating and testimonial system to build trust and transparency.
- **Geographical Accessibility:** Users from various regions in Ethiopia will have access to the platform.

### **What Won't Be Covered**

- **Transaction Processes for Cars:** The project will not handle the actual transaction processes for used cars due to legal requirements and the inherent complexity associated with financial transactions and legal agreements. The platform will focus on connecting users but will not be involved in the financial aspects of car sales.

### **Rationale**

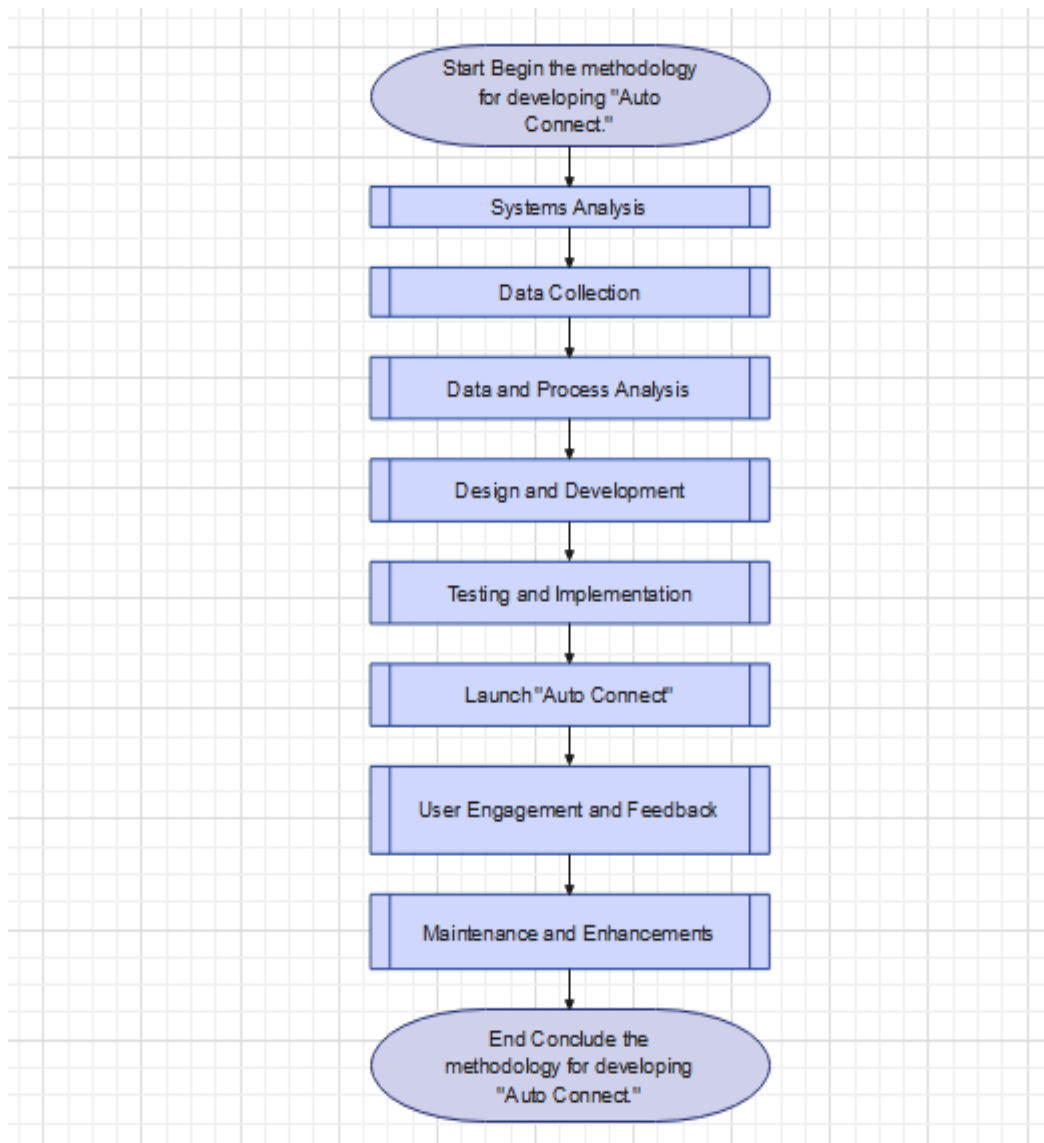
The decision to exclude transaction processes for cars from the project is driven by several factors, including the intricate legal requirements and the potential complexities involved in financial transactions and legal agreements related to vehicle sales. Ensuring legal compliance and financial security in such transactions requires a level of expertise and regulatory adherence that extends beyond the scope of this project, which primarily focuses on providing a user-friendly online platform for connecting buyers and sellers.

By refraining from directly handling transactions, the project minimizes risks and complexities, while still serving as a valuable tool for connecting individuals and organizations within the car rental and sales industry. This approach allows us to maintain a manageable scope, align with legal guidelines, and focus on achieving the project's core goals effectively.

## **5. Proposed Methodology and Architecture/ Tools and Technologies**

In the development of the "Auto Connect" platform, we are committed to employing a structured and systematic methodology to ensure the successful creation of a robust system. Our methodology encompasses several key steps, including systems analysis, data collection, data and process

analysis, system design and development, and system testing and implementation. This structured approach will allow us to navigate the intricacies of the project efficiently.



**Systems Analysis:** At the outset, we will delve into thorough systems analysis to understand the requirements of the "Auto Connect" platform. This phase will involve defining user needs, system functionalities, and performance expectations.

**Data Collection:** An essential part of our methodology is the collection of comprehensive data related to the automotive market in Ethiopia. We will gather critical information about car listings,

user profiles, testimonials, and ratings, which will serve as the foundation for the platform's operation. Our data collection approach encompasses several key methods:

- **Observation:** We employ observational techniques to gain an in-depth understanding of the current automotive market dynamics, including car rental and sales processes.
- **Interviews:** Through structured interviews with various stakeholders, including car owners, potential buyers, and users of the existing system, we aim to identify feature requirements and challenges in the current market. This direct engagement helps us gain valuable insights.
- **Document Analysis:** We conduct a comprehensive analysis of documents, such as market reports and sales data, to understand the current landscape. These documents serve as foundational knowledge for addressing existing issues.
- **Questionnaires:** To further gather valuable insights and information, questionnaires are utilized. We engage with car owners, managers, and employees to collect data on market preferences, pain points, and expectations.

**Data and Process Analysis:** Through meticulous data and process analysis, we will dissect the information collected to identify patterns, trends, and insights. This analysis will inform decision-making in system design and implementation.

To comprehend the existing data landscape, we undertake the following:

- **Data Profiling:** A comprehensive assessment of existing datasets related to car listings, user profiles, testimonials, ratings, and relevant data points.
- **Data Quality Checks:** Rigorous checks are conducted to ensure data accuracy, completeness, and consistency. Data cleaning and transformation techniques are applied to maintain data integrity.
- **Data Visualization:** Through techniques such as statistical analysis and data visualization, we extract insights and patterns from the data. These insights are critical for informed decision-making and system optimization.

Understanding the operational processes within the automotive market is also vital. This phase in process analysis includes:

- **Process Mapping:** We utilize visual tools like flowcharts and activity diagrams to map out current processes related to car renting and sales, customer interactions. This visual representation aids in identifying areas for improvement.

**Design and Development:** Utilizing state-of-the-art programming languages and database tools, the design and development phase will transform our analysis into a user-friendly platform. We plan to use PHP as the primary programming language, ensuring flexibility and scalability for future enhancements.

The design and development phase of "Auto Connect" encompasses several key aspects:

- **Requirements Gathering:** By conducting interviews, surveys, and workshops with stakeholders, we gather requirements specific to passenger needs, car operators' preferences, and station authorities' expectations.
- **System Architecture Design:** Based on the gathered requirements, we design the system architecture. This includes defining the overall system structure, identifying necessary components, and ensuring scalability and modularity for future enhancements.
- **User Interface Design:** The user interface design prioritizes user-friendliness, ensuring that features such as real-time car tracking, online transactions, and information access are presented with clarity and ease of use.

**Testing and Implementation:** Rigorous testing of the platform's functionalities will precede its implementation. We aim to ensure that "Auto Connect" functions seamlessly, with a focus on security, usability, and performance.

Our chosen tools and technologies include advanced database tools and programming languages that are well-suited to our project's requirements. These decisions have been made based on considerations of scalability, user-friendliness, and the capacity to accommodate future feature enhancements.

The testing and implementation phase of "Auto Connect" is a pivotal step, ensuring the system's readiness for deployment. This phase consists of the following steps:

- **Test Planning:** A comprehensive test plan is developed, outlining testing objectives, test cases, and scenarios. Functional, performance, security, and usability testing are conducted to ensure the system's reliability.
- **Unit Testing:** Unit testing verifies individual system components to identify and rectify any defects or errors, ensuring seamless integration.
- **Integration Testing:** Integration testing validates system component interactions, ensuring that data exchange is accurate and functionalities work cohesively.
- **System Testing:** System testing evaluates the entire system's functionality, ensuring it meets specified requirements and performs as intended. Validation encompasses features like real-time car tracking, ticketing, schedule management, and passenger information displays.

This structured approach to methodology and technology choices is fundamental to the successful development of "Auto Connect," ensuring that the platform is not only functional but also adaptable and capable of addressing the dynamic demands of Ethiopia's diverse automotive market.

## 6. Proposed Project Budget

The proposed project budget for Children Learning Ground includes the envisaged resources required to successfully develop and implement the system. The key items to be considered are hardware, software, human resources, and any other costs that will be incurred including ongoing maintenance and updates, as well as future enhancements.

## 7. Project Schedule

Project Schedule for Children Learning Ground:

Task 1: Project Initiation and Planning

- Define project objectives and scope
- Develop project plan and schedule

- Allocate of roles and responsibilities

#### Task 2: Systems Analysis and Requirements Gathering

- Conduct user surveys and interviews
- Identify key features and functionalities
- Gather requirements for website design and content

#### Task 3: Front-end Design and Development

- Design the user interface (UI) of the website
- Create wireframes and mockups for user feedback
- Develop the front-end code using HTML, CSS, and JavaScript
- Implement user-friendly navigation and interactivity
- Test the front-end for usability and visual appeal

#### Task 4: Back-end Design and Development

- Architect the server and database structure
- Develop the back-end logic and functionality
- Implement data storage and retrieval mechanisms
- Ensure data security and user authentication
- Optimize performance and scalability of the back-end
- Conduct extensive testing for functionality and reliability

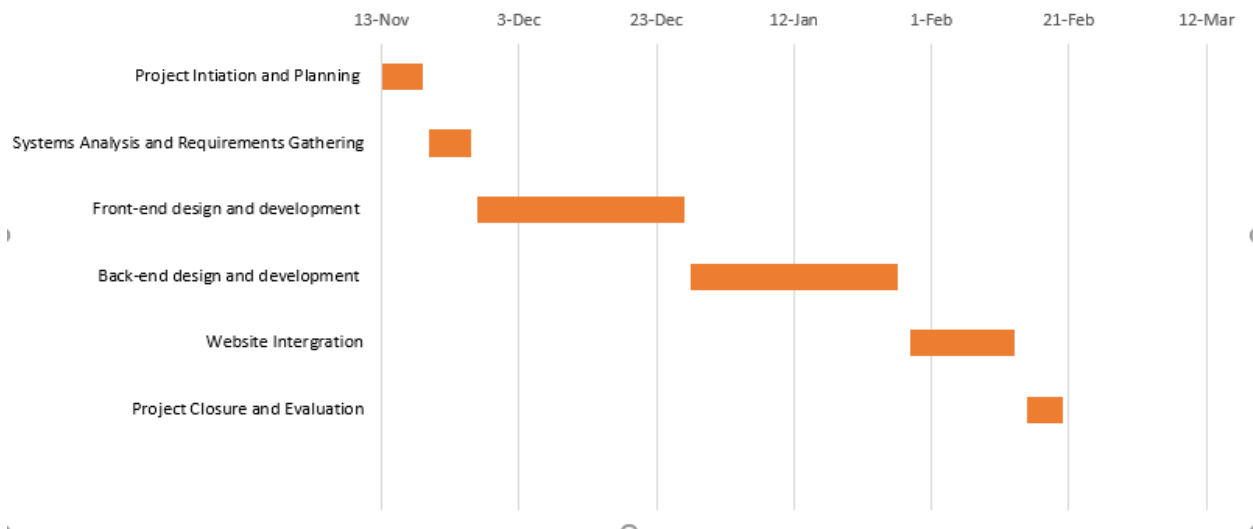
#### Task 5: Website Integration

- Integrate the front-end and back-end systems
- Ensure seamless data flow between client and server
- Implement communication protocols and APIs
- Test end-to-end functionality and data transfer
- Address any integration challenges or compatibility issues
- Conduct user acceptance testing (UAT) to validate the website's overall functionality plan.

## Task 6: Project Closure and Evaluation

- Conduct a final project review and evaluation
- Document lessons learned and best practices
- Prepare final project report and handover documentation

Gantt chart representation



## 8. References

- (james)Source: <https://www.mordorintelligence.com/industry-reports/ethiopia-used-car-market>
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