Software Requirement Specifications

AutoConnect

Version: [1.0]

Project Code	
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Submission Date	December 10,2023

Document History

Version	Name of Person	Date	Description of change
1.0	Ishaqullah Siddiqui	22 Sep,2023	Document Created
1.0	Ishaqullah Siddiqui	30 Sep,2023	Added Introduction and overall description
1.0	Sarim Latif Khan	1 Oct,2023	Added external interface requirements
1.0	Muhib Ahmed	2 Oct, 2023	Identified Functional Requirement
1.0	Sarim Latif Khan	2 Oct, 2023	Added all use cases
1.0	Muhib Ahmed	5 Oct ,2023	Added all non-functional requirements

Distribution List

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Document Sign-Off

Version	Sign-off Authority	Project Role	Signature	Sign-off Date

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1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document serves as a comprehensive guide for defining the functional and non-functional requirements of the initial release, Version 1.0, of the web-based application Autoconnect. Autoconnect is strategically designed to revolutionize online vehicle transactions within the dynamic and unpredictable Pakistani market, acting as a bridge between buyers and sellers.

The scope of this SRS document encompasses the essential aspects of Autoconnect, Version 1.0, providing a comprehensive view of the necessary components for the platform's development. The document meticulously outlines the requirements to ensure a thorough understanding of the project's fundamental structure.

It is essential to highlight that this SRS document focuses on the initial release and does not detail requirements for potential future enhancements or additional features. Autoconnect, Version 1.0, will be developed in strict adherence to the guidelines specified in this SRS, ensuring alignment with the project's overarching vision and objectives. This document will serve as the primary reference for the development team responsible for implementing Autoconnect, providing clear and authoritative requirements for the project.

1.2 Document Conventions

Font: Calibri Light

Font size:

Heading: 16px

Subheading: 13px

Description: 11px

1.3 Intended Audience and Reading Suggestions

1.3.1 Intended Audience

The Autoconnect Software Requirements Specification (SRS) document is tailored for a diverse group of stakeholders who play vital roles in the development and deployment of the Autoconnect platform. This includes the development team, who will use this document as a primary reference to understand and implement the project's requirements. Project managers will rely on it for planning and overseeing the development process, ensuring alignment with the defined objectives. The quality assurance team will utilize the SRS to create test cases and verify that the final product meets the specified requirements. Designers will find valuable insights to create a user-friendly interface, while system architects can use it as a foundation for the technical architecture. Additionally, stakeholders and investors will refer to this document to ensure the project aligns with their expectations.

1.3.1.1 Stake Holder Classification

1. Buyers (Favoured Class):
- Role: Individuals looking to purchase vehicles through the e-commerce platform.
- Priority: High, as they are the primary users and their requirements must be prioritized for a seamless buying experience.

2. Sellers (Favoured Class):
- Role: Individuals or dealers selling vehicles on the platform.
- Priority: High, as their satisfaction and ease of listing are essential for the success of the platform.

3. Mechanics (Favoured Class):
- Role: Professionals providing vehicle inspection and maintenance services.
- Priority: High, as they contribute to the platform's credibility and user satisfaction.

4. Negotiation Chat Bot (Favoured Class):
- Role: AI-driven chat bot facilitating negotiation between buyers and sellers.
- Priority: High, as it plays a crucial role in simplifying transactions and enhancing user experience.

5. University (Ignored Class):
- Role: The university for which the project is being developed.
- Reason for Ignoring: While the university's final requirements are considered, the university itself is not the direct user of the automotive e-commerce platform.

6. Regulatory Authorities (Ignored Class):
- Role: Government bodies overseeing regulations related to e-commerce and automotive sales.
- Reason for Ignoring: While compliance with regulations is crucial, these entities are not direct users but have an indirect impact on the platform.

7. Potential Advertisers (Non-Human User Class):
- Role: Automated advertising platforms or systems.
- Reason for Non-Human User Classification: Advertisers interact with the system through automated processes, and their requirements are different from human users.

8. Live Video Calling System (Non-Human User Class):
- Role: The technology or system supporting live video calling.
- Reason for Non-Human User Classification: It's a technical component that interacts with the system but is not a human user.

9. Market Research Tools (Non-Human User Class):
- Role: Tools used for market research and surveys.
- Reason for Non-Human User Classification: These tools provide insights but are not direct human users of the platform.

10. Competing E-commerce Platforms (Disfavoured Class):

- Role: Other e-commerce platforms in the automotive industry.
- Reason for Disfavoured Classification: While their presence is acknowledged, the focus is on making the system distinct and superior, not aligning with direct competitor preferences.

1.3.2 Reading Suggestions

To maximize the utility of the Autoconnect SRS document, readers are encouraged to adopt specific reading strategies. Begin by reviewing the product vision and scope to gain a comprehensive understanding of the project's goals and objectives. Focus your attention on sections that directly pertain to your role and responsibilities within the Autoconnect project, allowing you to align your work with the specified requirements effectively. For those seeking more technical details, refer to the appendices, where supplementary information, diagrams, and technical specifications can be found. Foster open communication and discussions with team members and stakeholders to clarify any questions or ambiguities that may arise during the reading process. Lastly, make it a practice to regularly reference the SRS as the project advances to ensure that development and implementation consistently align with the specified requirements. By following these reading suggestions, the intended audience can effectively use the Autoconnect SRS to guide the development process and contribute to the platform's successful realization.

1.4 Product Scope

1. Project Justification:

- Need: The project is needed to address the challenges in the Pakistani automotive market characterized by market fluctuations, complex transactions, and the absence of a user-centric platform. Buyers and sellers require a secure, efficient, and transparent solution to trade vehicles seamlessly.

2. Brief Description of Project Products/Services:

- Products/Services: The project will produce an innovative e-commerce platform, "AutoConnect" tailored to the Pakistani automotive market. It will offer features such as live video calling, a Smart Negotiation Bot, and a vibrant community for vehicle enthusiasts.

3. Summary of Project Deliverables:

- Deliverables: The project will deliver a fully functional web-based application, inclusive of user accounts, live video calling, negotiation chatbot, user reviews, and a robust database of vehicles. Additionally, the project will provide comprehensive documentation and a user support system.

4. Statement of Project Success Criteria:

- Success Criteria: The project will be deemed successful if it results in increased user satisfaction, secure and efficient vehicle transactions, high user engagement in the community, and a positive impact on the Pakistani automotive market. It should also comply with all relevant legal and regulatory standards.

5. Project Exclusion:

- Exclusions: The project will not involve the development of a mobile application, the creation of the entire e-commerce ecosystem (e.g., payment processing systems), or the handling of data quality and access related to third-party data providers. The project will not be cross platform however it can be accessed on mobile devices through browsers.

6. Constraints:

- Constraints: Constraints include budget limitations, time constraints for project completion, available technology infrastructure, and compliance with changing legal and regulatory requirements in the automotive industry.

7. Assumptions:

- Assumptions: It is assumed that users will actively engage in the community, that the provided third-party data sources will be reliable, and that market conditions will continue to experience fluctuations. If these assumptions are false, the project may need to adapt its strategies accordingly.

8. Dependencies:

- Dependencies: The project is dependent on external agents such as third-party data providers for vehicle history information and may require user access to devices with cameras for live video calls. Furthermore, the project may depend on stable internet connections for live video calls to function effectively.

1.5 Product Vision

For individual car buyers and sellers in the Pakistani automotive market **who** seek a convenient, transparent, and efficient way to trade vehicles, **the** "Automotive E-commerce" platform **is** an innovative e-commerce solution. It belongs to the product category of automotive e-commerce platforms. **Unlike** existing apps or the current system**, our** product offers live video calling for comprehensive vehicle inspections, a Smart Negotiation Bot for efficient transactions, and a vibrant community of enthusiasts. The **key benefit** is revolutionizing vehicle commerce, providing a safe and user-centric platform in an otherwise fluctuating market.

2. Overall Description

2.1 Product Perspective

2.1.1 Product Origins and Purpose

The "Autoconnect" platform originates from the need to address challenges within the Pakistani automotive market. The purpose of the product is to revolutionize the vehicle buying and selling experience by introducing an innovative e-commerce platform tailored specifically to the unique demands of the Pakistani automotive sector.

2.1.2 Challenges in the Pakistani Automotive Market

The Pakistani automotive market faces significant challenges due to market fluctuations and uncertainties. These challenges affect both buyers and sellers, making it difficult to secure the best deals. Existing Autoconnect platforms may not fully cater to the specific demands of the Pakistani market. The platform aims to address these challenges by providing a dynamic and adaptive solution.

2.1.3 Revolutionizing the Vehicle Trading Experience

"Autoconnect" seeks to revolutionize the vehicle trading experience by introducing cutting-edge features that facilitate seamless transactions for both buyers and sellers. The platform will incorporate a Negotiation Chat Bot and Video Calling functionality to enhance communication and simplify the buying and selling process.

2.1.4 Adaptive Online Platform

The platform will be an adaptive online solution designed to dynamically adjust to the ever-changing market conditions. This adaptability empowers users to secure the best possible deals for their vehicles, mitigating the impact of market fluctuations. The adaptability of the platform is a key feature that sets it apart in the Automotive E-commerce landscape.

2.1.5 Inception and Market Research

The project's inception is rooted in the recognition of challenges posed by the volatile nature of Pakistan's automotive sector. Extensive market research and surveys have been conducted to gain insights into user preferences, firmly establishing the viability of the concept. This research-driven approach ensures that the platform is aligned with the specific needs of the Pakistani market.

2.1.6 User-Centric Approach and Advanced Technology

"Autoconnect" is guided by a user-centric approach, acknowledging the importance of advanced technology features. The platform's design is informed by meticulous consideration of user preferences and behaviors. The incorporation of features like live video calling and a Negotiation Chat Bot reflects a commitment to leveraging advanced technology to enhance user experience.

2.1.7 Transformational Potential

The project has the potential to transform the Autoconnect landscape in Pakistan. By offering a platform that not only adapts to market challenges but also provides a seamless and empowering experience, "Autoconnect" aims to set new standards in the industry. The transformational potential is supported by the integration of innovative features and a focus on creating a vibrant online community.

2.2 Product Functions

2.2.1 Vehicle Buying and Selling

Description: The platform facilitates the buying and selling of vehicles in the Pakistani automotive market.

Functionality:
Users can list their vehicles for sale, providing detailed information and images.
Buyers can browse a diverse range of vehicles based on their preferences.
The platform ensures secure and transparent transactions between buyers and sellers.

2.2.2 Adaptive Online Platform

Description: The platform adapts to market fluctuations and uncertainties to empower users to secure the best possible deals.
Functionality:
The platform employs adaptive algorithms to dynamically adjust to changing market conditions.
Users are provided with real-time information and insights on market trends.
Adaptive features optimize the platform for both buyers and sellers, ensuring a competitive and fair environment.

2.2.3 Live Video Calling for Vehicle Inspection

Description: Users can conduct live video calls to inspect vehicles thoroughly before making a purchase.
Functionality:
Buyers and sellers can initiate live video calls to view the vehicle from every angle.
Real-time communication allows for interactive discussions and negotiations during the inspection.
Video calling ensures transparency and builds trust in the buying process.

2.2.4 Mechanic Portal

Description: A specialized portal for mechanics to register and offer their services to potential buyers.
Functionality:
Mechanics can register and create profiles showcasing their expertise and qualifications.
Buyers can access mechanic ratings and reviews to make informed decisions.
The portal facilitates direct communication between buyers and mechanics for pre-purchase inspections or post-purchase services.

2.2.5 Negotiation Chatbot

Description: A chatbot designed to assist buyers and sellers in negotiations when direct communication is not possible.
Functionality:
The chatbot engages with users to understand their needs and concerns.
It provides real-time responses and assistance during negotiations.
The chatbot ensures a seamless and responsive experience, even when the seller is unavailable.

These outlined product functions offer a comprehensive overview of the major features and capabilities of the "Automotive E-commerce" platform. Detailed specifications for each function will be provided in Section 4 of the SRS document.

2.3 User Classes and Characteristics

The Autoconnect platform will have four primary user classes: buyers, sellers, admin, and mechanics.

2.3.1 Buyers

Characteristics:

- Individuals seeking to purchase vehicles in Pakistan.
- May be new or experienced car buyers.
- May be interested in a variety of vehicle types, including new, used, and certified pre-owned.
- May be looking for the best possible deal on a vehicle.
- May appreciate the convenience of buying a vehicle online.

Needs:

- To be able to browse and search for vehicles based on their criteria.
- To be able to view detailed information about vehicles, including photos, descriptions, and specifications.
- To be able to compare different vehicles and get pricing information.
- To be able to negotiate with sellers and purchase vehicles online.
- To be able to schedule appointments with mechanics for inspections and repairs.
- To have access to customer support in case they need assistance.

2.3.2 Sellers

Characteristics:

- Individuals or businesses selling vehicles in Pakistan.
- May be selling new or used vehicles.
- May be looking to reach a wider audience of potential buyers.

Needs:

- To be able to list their vehicles on the platform.
- To be able to manage their listings and receive notifications of interest from buyers.
- To be able to negotiate with buyers and sell vehicles online.
- To be able to schedule appointments with buyers for inspections and test drives.
- To have access to customer support in case they need assistance.

2.3.3 Mechanics

Characteristics:

- Individuals or businesses that provide automotive repair and maintenance services in Pakistan.

- May be interested in attracting new customers from the platform.
- May appreciate the convenience of scheduling appointments online.

Needs:

- To be able to create a profile on the platform and list their services.
- To be able to receive appointment requests from buyers.
- To be able to manage their appointments and schedule time to complete repairs and maintenance.
- To have access to customer support in case they need assistance.

2.3.4 Admin

Characteristics:

- Platform administrators responsible for overseeing and maintaining the Automotive E-commerce platform.

Needs:

- Manage user accounts, ensuring compliance with platform policies.
- Monitor and moderate platform activities to ensure a safe and secure environment..
- Resolve disputes between buyers and sellers.
- Implement updates and improvements to the platform.
- Provide customer support and address any technical issues.

2.4 Operating Environment

2.4.1 Hardware Platform

The software will operate on standard computing hardware commonly used by individuals and businesses. This includes personal computers, laptops, and mobile devices (smartphones and tablets) with moderate processing power, memory, and storage capacity. The software should be compatible with both Windows-based PCs (desktops and laptops) and macOS devices. Additionally, it should be optimized for various screen sizes, including desktop monitors and mobile device screens.

2.4.2 Operating System and Versions

The software will be compatible with the following operating systems and their respective versions:

- Microsoft Windows: Windows 10 and above

- macOS: macOS 10.14 (Mojave) and above

2.4.3 Web Browsers

The software will be accessible via standard web browsers to ensure compatibility with a wide range of devices. It should work seamlessly with popular web browsers, including but not limited to:

- Google Chrome
- Mozilla Firefox
- Safari
- Microsoft Edge

2.4.4 Other Software Components or Applications

The software will need to peacefully coexist with other software components and applications that users may have installed on their devices, such as:

- Antivirus software
- Firewall software
- Ad blocking software
- Productivity software (e.g., Microsoft Office, Google Workspace)
- Social media applications (e.g., Facebook, Twitter, Instagram)
- Messaging applications (e.g., WhatsApp, Telegram, Signal)

The software will be designed to be compatible with a wide range of hardware platforms and operating systems, and it will be tested to ensure that it can coexist peacefully with other software components and applications.

2.4.5 Networking Requirements

The software will require a stable internet connection to enable real-time features such as live video calling and instant messaging. It should be designed to handle typical network conditions, including both wired and wireless connections. The software should also ensure data security and privacy by employing encryption protocols when transmitting sensitive information over the internet.

2.4.6 Integration with Third-Party Services

The software will integrate with third-party services for specific functionalities, such as accessing vehicle history data. It should be designed to seamlessly interact with these APIs (Application Programming Interfaces) to retrieve accurate and up-to-date information. Compatibility with these external services is crucial for providing users with reliable data during their interactions on the platform.

In summary, the software will operate on standard computing hardware and major operating systems. It will be accessible through popular web browsers and should peacefully coexist with other software applications. The software will also integrate with third-party services, ensuring smooth interaction and data exchange to provide users with a seamless and reliable experience.

2.5 Design and Implementation Constraints

1. **Regulatory Compliance:**

The software must adhere to specific legal and regulatory standards in the Pakistani automotive industry. This might include data protection laws, consumer rights regulations, and financial transaction standards. Developers must ensure the software complies with all applicable laws and regulations.

2. **Corporate Policies:**

Developers must work within the corporate policies of the organization funding the project. These policies might dictate development methodologies, data handling practices, and security protocols. Adhering to these policies is essential for alignment with the organization's overall strategies and goals.

3. **Hardware Limitations:**

The software must operate smoothly on a range of devices, including computers and mobile devices with varying processing power and memory. Developers need to optimize the software to ensure it runs efficiently on standard hardware configurations commonly used by the target audience.

4. **Interfaces and Integrations:**

Seamless integration with third-party applications, such as APIs providing vehicle history data, is vital. Developers need to ensure compatibility and effective data exchange between the software and these external systems. Any changes or updates to these interfaces must be accommodated in the software.

5. **Technology and Tools:**

The project might have constraints regarding the use of specific technologies, frameworks, or programming languages. These restrictions could be due to licensing agreements, existing infrastructure compatibility, or organizational preferences. Developers must select tools and technologies that align with these constraints.

6. **Database Requirements:**

The choice of database management system (DBMS) might be limited due to existing infrastructure or corporate preferences. Developers must design the software's database schema and queries based on the capabilities and limitations of the chosen DBMS.

7. **Communication Protocols:**

The software must employ secure communication protocols to safeguard data during transmission. Compliance with HTTPS and other encryption standards is essential for protecting user information and maintaining the integrity of transactions.

In summary, developers must navigate these limiting factors, such as regulatory compliance, hardware constraints, interface requirements, and technology limitations, to create a robust and compliant software solution aligned with the project's objectives and organizational policies.

2.6 User Documentation

2.6.1 User Documentation Components

- **User Manual:** A comprehensive user manual that provides detailed instructions on how to use the software, including all of its features and functionality.
- **Online Help:** Context-sensitive online help that provides users with assistance when they need it, in the context of the task they are trying to perform.
- **Tutorials:** A series of step-by-step tutorials that guide users through the most common tasks and features of the software.
- **FAQ Section**: A Frequently Asked Questions (FAQ) section will be included, addressing common queries and concerns users might have. It will serve as a quick reference for users seeking immediate answers to their questions.
- **Video Guides:** Video guides and demonstrations will be created to visually showcase complex procedures or features. These videos can be accessed online and will provide users with a visual understanding of various aspects of the software.
- **Release Notes:** Detailed release notes will accompany software updates, outlining new features, improvements, bug fixes, and any other relevant information. Users can refer to these notes to stay informed about the latest changes and enhancements.

2.6.2 User Documentation Delivery Formats or Standards

- **PDF Format**: The user manual and other textual documentation will be provided in PDF format. PDFs are universally accessible and can be easily viewed and printed by users on various devices.
- **HTML/Online Format**: Online help, tutorials, FAQs, and the knowledge base will be available in HTML format, accessible through web browsers. This format allows for interactive content, hyperlinks, and multimedia elements, enhancing the user learning experience.

- **Video Formats**: Video guides and demonstrations will be available on popular platforms such as YouTube. These videos will be in standard formats like MP4, ensuring compatibility across different devices and platforms.
- **Structured Content**: All documentation will adhere to structured writing standards, ensuring consistency, clarity, and ease of navigation. Clear headings, bullet points, and tables will be used to present information in an organized manner.
- **Responsive Design**: Online documentation will be designed with a responsive layout, ensuring optimal viewing and usability across various devices, including desktops, tablets, and smartphones.

2.7 Assumptions and Dependencies

2.7.1 Assumed Factors Affecting Requirements

1. **Third Party APIs:** The project assumes the availability and reliability of third-party APIs providing essential data, such as vehicle history information. If these APIs are discontinued, unreliable, or do not meet the project's requirements, it could affect the functionality and features related to vehicle data.
2. **Network Stability:** The software relies on a stable internet connection, especially for real-time features like live video calling. Assumptions about users' internet reliability might impact the feasibility and performance of these features. Unstable networks could lead to degraded user experience.
3. **User Participation**: The success of community-driven features, such as user-generated reviews and knowledge sharing, assumes active participation from users. If user engagement is low, these features might not fulfill their intended purpose, affecting the richness of user interactions and content.
4. **Regulatory Compliance**: Assumptions regarding the stability of legal and regulatory requirements might impact the software's design. Changes in regulations related to online transactions, data privacy, or user rights could necessitate significant modifications to the system.
5. **Security Assumptions**: The software assumes the effectiveness of implemented security measures. If new vulnerabilities are discovered or security standards change, adjustments will be required to maintain a secure environment for users and their data.
6. **Scalability Assumptions:** The software assumes a certain level of user base and transaction volume. If the user base grows significantly beyond the assumed scale, the system's scalability might need enhancements to handle increased traffic and data processing demands.

2.7.2 Dependencies on External Factor

1. **Third-Party Software:** The project might rely on specific third-party software components, such as libraries or frameworks, for certain functionalities. Any changes or discontinuation of these components could affect the development and operation of the software.

2. **Data Providers:** Dependencies exist on external data providers, especially for real-time data like market prices and vehicle specifications. Changes in these external databases or data structures might require adjustments in the software to maintain compatibility.

3. **Browser Compatibility**: The software relies on web browsers to deliver its services. Assumptions about the stability and compatibility of major web browsers (Chrome, Firefox, Safari and Edge) are inherent. Changes in browser technologies could impact the software's user interface and functionality.

4. **Mobile Device Features**: If the software intends to utilize specific features of mobile devices (such as cameras for scanning documents), assumptions about the availability and functionality of these features across different devices and operating systems must be accurate.

3. External interface requirements

3.1 User Interfaces

The "AutoConnect" platform offers user interfaces that ensure an intuitive and user-friendly experience. These user interfaces are designed to provide logical characteristics, standard functions, and a cohesive visual style. While specific details of the user interface design will be documented in a separate User Interface Specification, the following provides an overview of the key aspects:

1. Web Browser Interface:

- Characteristics: The primary interface for users, featuring a responsive design for both desktop and mobile devices.
- Visual Style: A clean and modern user interface design with an automotive-themed color scheme.
- Layout Constraints: Adaptive layout for various screen sizes and resolutions.
- Standard Buttons: Common navigation elements, such as "Search," "Browse," "My Account," "Sell Your Vehicle," and "Sign In/Sign Up."
- Functions: Access to user accounts, vehicle listings, search filters, and communication tools (Chat Bot and Video Calling).
- Keyboard Shortcuts: Standard keyboard shortcuts for navigation (e.g., Ctrl+F for searching).

2. User Account Dashboard:

- Characteristics: A personalized dashboard for users to manage their profiles, saved searches, and favorite vehicles.
- Visual Style: Consistent with the overall platform design, featuring user-specific data and options.
- Standard Buttons: "Edit Profile," "Change Password," "Saved Searches," "My Vehicles," and "Logout."
- Functions: Profile management, password changes, and access to saved information.

3. Vehicle Listing Interface:

- Characteristics: Displaying detailed vehicle information, images, and seller contact options.
- Visual Style: Clear and organized layout for easy vehicle comparison.
- Layout Constraints: Multimedia display for images and videos of the listed vehicles.
- Standard Buttons: "Contact Seller," "Save for Later," "Report Listing," and "Back to Search."

- Functions: Viewing vehicle details, contacting sellers, and saving listings for later reference.

4. Negotiation Chat Interface:
- Characteristics: Real-time chat interface for buyers and sellers during negotiations.
- Visual Style: Chat-style display with user avatars and message timestamps.
- Standard Buttons: "Send Message," "End Negotiation," and "Close Chat."
- Functions: Real-time text-based communication for price negotiation.

5. Live Video Calling Interface:
- Characteristics: Interface for initiating and participating in live video calls with sellers.
- Visual Style: Video calling overlay with options for camera and microphone controls.
- Standard Buttons: "Start Video Call," "End Call," "Mute/Unmute," and "Camera On/Off."
- Functions: Video and audio communication between buyers and sellers for vehicle inspection.

6. Mechanic Portal Interface:
- Characteristics: Registration and dashboard for mechanics offering services.
- Visual Style: Mechanic-themed interface with options for service listings and ratings.
- Layout Constraints: Mechanic profiles, service offerings, and ratings and reviews.
- Standard Buttons: "Register as Mechanic," "Edit Profile," and "View Services."
- Functions: Registration, service management, and interaction with potential customers.

7. Administrator Dashboard:
- Characteristics: Interface for platform administrators to manage users, listings, and resolve issues.
- Visual Style: A functional and data-centric dashboard for administrative tasks.
- Standard Buttons: "Manage Users," "Review Listings," and "Resolve Issues."
- Functions: User management, listing moderation, and issue resolution.

The user interfaces follow a cohesive visual style, emphasizing user-friendliness, clear navigation, and adherence to platform-wide standards. Specific design details, layout constraints, and visual elements will be outlined in the separate User Interface Specification document.

3.2 Hardware Interfaces

The "AutoConnect" platform interfaces with various hardware components to ensure seamless operation. These hardware interfaces include both logical and physical characteristics that enable the software to interact with the underlying hardware infrastructure. The following outlines the key hardware interfaces:

1. Web Servers:
- Logical Characteristics: The platform runs on web servers to host the web application.
- Physical Characteristics: Hardware servers, possibly distributed in a cloud environment.
- Supported Device Types: Servers equipped with adequate processing power, memory, and network connectivity.

- Data and Control Interactions: The servers receive user requests via HTTP/HTTPS, process them, and send responses.
- Communication Protocols: Standard web communication protocols (HTTP/HTTPS).

2. Database Server:

- Logical Characteristics: The platform relies on a database server to store and manage data.
- Physical Characteristics: Dedicated database servers, possibly distributed in a cloud or on-premises environment.
- Supported Device Types: Database servers equipped with storage capacity and processing capabilities.
- Data and Control Interactions: The software interacts with the database through structured queries to retrieve and store data.
- Communication Protocols: SQL-based communication for database operations.

3. User Devices (Desktop and Mobile):

- Logical Characteristics: The platform is accessed by users through web browsers on their devices.
- Physical Characteristics: Desktop computers, laptops, tablets, and smartphones.
- Supported Device Types: Devices with web browsers (e.g., Chrome, Firefox, Safari) compatible with HTML5 and JavaScript.
- Data and Control Interactions: User devices send HTTP/HTTPS requests to the platform's web servers.
- Communication Protocols: HTTP/HTTPS for web page retrieval and user interaction.

4. Video Calling Service Provider:

- Logical Characteristics: Integration with a video calling service for live video calls.
- Physical Characteristics: Video calling service provider's infrastructure.
- Supported Device Types: Devices equipped with cameras and microphones for video calls.
- Data and Control Interactions: Video and audio data exchanged during live calls.
- Communication Protocols: Proprietary video calling service protocols (to be specified).

5. User Devices for Video Calls:

- Logical Characteristics: Devices used by users to initiate and participate in live video calls.
- Physical Characteristics: User-owned devices, including smartphones, tablets, and computers.
- Supported Device Types: Devices with camera and microphone capabilities.
- Data and Control Interactions: User devices transmit and receive video and audio data during calls.
- Communication Protocols: Video call-specific protocols for data exchange.

The "AutoConnect" platform interacts with various hardware components, ensuring compatibility with different device types and communication protocols. These hardware interfaces enable the software to provide a robust and responsive user experience.

3.3 Software Interfaces

The "AutoConnect" platform will interact with various software components and services to deliver its functionality. These software interfaces include:

1. User Web Browsers:

- Purpose**:** Users will access the platform via web browsers on their desktop or mobile devices.
- Nature of Communication**:** HTTP/HTTPS protocols for web page retrieval and interaction.
-

2. Database System:

- Name and Version: MySQL 8.0
- Purpose: To store and manage user accounts, vehicle listings, transaction history, and other platform-related data.
- Nature of Communication: SQL queries and data retrieval through database connectors.

3. External APIs for Vehicle Data:

- Purpose: To access real-time vehicle information, including vehicle history, specifications, and market values.
- Nature of Communication: Integration with third-party APIs providing vehicle data (e.g., Carfax API).

4. Web Server:

- Name and Version: Apache HTTP Server 2.4
- Purpose: To serve web pages and handle user requests.
- Nature of Communication: HTTP/HTTPS requests and responses.

5. Third-Party Authentication Services:

- Purpose: To enable secure user authentication and authorization.
- Nature of Communication: OAuth 2.0 and OpenID Connect for user authentication and authorization.

6. Live Video Calling Service:

- Name and Version: Integrated Video Calling API (To be specified)
- Purpose: To facilitate live video calls for users to inspect vehicles before purchase.
- Nature of Communication: Integration with the video calling service's API.

7. Negotiation Chat Bot:

- Name and Version: Custom-developed Chat Bot (To be specified)
- Purpose: To assist users in negotiations when dealing with sellers.
- Nature of Communication: Real-time chat interface integrated into the platform.

8. AI-Driven Recommendation Engine:

- Name and Version: Proprietary recommendation engine (To be specified)
- Purpose: To provide personalized vehicle recommendations based on user preferences and behavior.
- Nature of Communication: Internal API calls within the platform for data analysis and recommendations.

9. Mechanic Portal:
- Name and Version: Custom-developed portal (To be specified)
- Purpose: To allow mechanics to register, offer services, and interact with buyers based on their ratings.
- Nature of Communication: Internal API for mechanic registration and service inquiries.

10. Operating System:
- Name and Version: Linux CentOS 7.0 (Server-side)
- Purpose: To host and run the web server, database, and other backend services.
- Nature of Communication: Interaction with the OS for system-level operations.

11. Web Application Framework:
- Name and Version: Ruby on Rails (Backend)
- Purpose: To develop and manage the backend services of the platform.
- Nature of Communication: Application-specific API endpoints for handling user requests and responses.

12. Frontend Framework:
- Name and Version: React.js (Frontend)
- Purpose: To create an interactive and dynamic user interface.
- Nature of Communication: Client-side rendering and API calls to the backend.

13. Integrated Analytics Service:
- Name and Version: Google Analytics (or an equivalent service)
- Purpose: To collect and analyze user behavior and platform usage.
- Nature of Communication: Integration via JavaScript tracking code for user data collection.

14. Data Sharing Mechanism:
- Shared Data: User account information, vehicle listings, transaction data.
- Implementation Constraint: Data sharing among components will occur through secure APIs and data encryption. The platform will implement role-based access control to ensure data privacy and security

3.4 Communications Interfaces

The "AutoConnect" platform incorporates various communication functions and interfaces to ensure effective interaction with users, external services, and components. These communication interfaces are crucial to the platform's functionality, and they adhere to established standards and best practices.

1. Web Browser Interface:

- Communication Function: User access via web browsers (HTTP/HTTPS).
- Message Formatting: Web pages rendered in HTML, CSS, and JavaScript.
- Communication Standard: HTTP/HTTPS for secure and reliable data exchange.
- Security and Encryption: Utilizes HTTPS for data encryption to protect user information during transmission.
- Data Transfer Rate: Depends on the user's internet connection speed.
- Synchronization Mechanisms: Real-time updates and synchronization of user interactions with the platform.

2. Live Video Calling Interface:

- Communication Function: Facilitating live video calls between buyers and sellers.
- Message Formatting: Video and audio data streams.
- Communication Standard: Proprietary video calling service protocol (To be specified).
- Security and Encryption: Video calls are encrypted to ensure privacy.
- Data Transfer Rate: Variable based on video quality and network bandwidth.
- Synchronization Mechanisms: Real-time video and audio synchronization during calls.

3. Chat Bot Communication:

- Communication Function: Real-time chat for negotiation assistance.
- Message Formatting: Text-based chat messages.
- Communication Standard: WebSocket or HTTP for chat message exchange.
- Security and Encryption: Messages are transmitted securely over WebSocket/HTTP.
- Data Transfer Rate: Low to moderate, depending on chat activity.
- Synchronization Mechanisms: Real-time chat interaction and updates.

4. API Calls for Data Retrieval:

- Communication Function: Retrieving data from external APIs (e.g., vehicle data, payment processing).
- Message Formatting: Data requests and responses in JSON format.
- Communication Standard: RESTful APIs over HTTP/HTTPS.
- Security and Encryption: API calls to external services are secured using HTTPS.
- Data Transfer Rate: Variable, depending on the nature and volume of data being retrieved.
- Synchronization Mechanisms: Asynchronous API calls for data exchange.

5. Internal API Calls:

- Communication Function: Interaction between internal platform components.
- Message Formatting: Data requests and responses in JSON format.

- Communication Standard: RESTful APIs over HTTP/HTTPS.
- Security and Encryption: Internal API calls are secured using HTTPS.
- Data Transfer Rate: Variable, depending on the internal data exchange.
- Synchronization Mechanisms: Real-time or asynchronous interactions, depending on component dependencies.

6. Integrated Analytics Service:

- Communication Function: Data collection and analysis of user behavior.
- Message Formatting: Data tracking and analytics events.
- Communication Standard: Proprietary tracking codes or JavaScript for data collection.
- Security and Encryption: Data is collected securely via HTTPS.
- Data Transfer Rate: Continuous data collection based on user interactions.
- Synchronization Mechanisms: Real-time or batch data transfer for analysis.

These communication interfaces and functions are designed to ensure seamless and secure interactions within the "AutoConnect" platform, meeting industry standards and maintaining data security and privacy.

4. Functional Requirements

4.1 Functional Hierarchy

4.1.1 System Features

4.1.1.1 Smart Negotiation Bot

Description and Priority

The Smart Negotiation Bot feature is of High priority. It aims to eliminate the need for haggling during transactions by ensuring fair and transparent deals. This feature is essential for creating a user-friendly and efficient experience.

Stimulus/Response Sequences

- User initiates the negotiation process by engaging with the Negotiation Bot.
- The Smart Negotiation Bot analyzes the offer and counteroffers.
- The system provides real-time notifications and responses to the user.

Functional Requirements

- FR-1: The Smart Negotiation Bot must analyze and evaluate offers and counteroffers from users.
- FR-2: The Bot should provide automated, fair, and reasonable counteroffers based on predefined criteria.
- FR-3: The system must maintain a log of negotiation interactions for user reference and dispute resolution.
- FR-4: The Smart Negotiation Bot should be responsive to user inputs and provide clear communication during the negotiation process.
- FR-5: The system should allow users to accept or decline counteroffers and finalize deals.
- FR-6: In case of user disputes or complex negotiations, the system should facilitate human intervention or resolution.

4.1.1.2 Live Video Calling

Description and Priority

Live Video Calling is of High priority as it enables real-time expert-guided vehicle inspections, enhancing user confidence and trust in the platform.

Stimulus/Response Sequences

- User initiates a live video call to inspect a vehicle.
- The system establishes a secure and real-time video connection.
- Experts guide the users during the vehicle inspection process.
- Users and experts can communicate effectively through video and audio.

Functional Requirements

- **FR-7:** The system must support real-time video calling, allowing users to inspect vehicles remotely.
- **FR-8:** Users should be able to schedule and join video calls with vehicle sellers.
- **FR-9:** The system should ensure the privacy and security of video calls.
- **FR-10:** Users must have access to a list of available experts for vehicle inspections.
- **FR-11:** The platform should enable smooth video and audio communication during calls.
- **FR-12:** The system must provide a user-friendly interface for initiating and managing video calls.

4.1.1.3 Comprehensive Listings

Description and Priority

Personalized User Accounts is of High priority, as it enables users to tailor their experience on the platform to their preferences and requirements.

Stimulus/Response Sequences

- Users create and personalize their accounts.
- The system saves user preferences and settings.
- Users access and modify their account information.

Functional Requirements

- **FR-13:** The platform should allow users to create and manage personal accounts.
- **FR-14:** Users must be able to set preferences, such as notification settings and saved searches.
- **FR-15:** The system should enable users to update their personal information, including contact details and profile pictures.
- **FR-16:** Users should have the option to link their accounts with social media profiles for ease of use.

4.1.1.4 Personalized User Accounts

Description and Priority

Personalized User Accounts is of High priority, as it enables users to tailor their experience on the platform to their preferences and requirements.

Stimulus/Response Sequences

- Users create and personalize their accounts.

- The system saves user preferences and settings.
- Users access and modify their account information.

Functional Requirements
- FR-17: The platform should allow users to create and manage personal accounts.
- FR-18: Users must be able to set preferences, such as notification settings and saved searches.
- FR-19: The system should enable users to update their personal information, including contact details and profile pictures.
- FR-20: Users should have the option to link their accounts with social media profiles for ease of use.

4.1.1.5 Diverse Portals

Description and Priority
Diverse Portals is of High priority, as it connects users, mechanics, and enthusiasts, fostering a robust and engaging community.

Stimulus/Response Sequences
- Users access specialized portals for mechanics, enthusiasts, and standard users.
- The system provides relevant content, services, and information to each group.
- Users can interact and share knowledge within their respective portals.

Functional Requirements
- FR-21: The platform must offer distinct portals for mechanics, vehicle enthusiasts, and regular users.
- FR-22: Each portal should provide relevant content and services tailored to the needs of the specific user group.
- FR-23: Users should be able to interact, ask questions, and share information within their designated portals.

4.1.1.6 Effortless Vehicle Comparison

Description and Priority
Effortless Vehicle Comparison is of High priority, enabling users to make informed decisions effortlessly by comparing multiple vehicles.

Stimulus/Response Sequences
- Users select multiple vehicles for comparison.
- The system generates a side-by-side comparison of selected vehicles.
- Users can view specifications, features, and pricing for easy decision-making.

Functional Requirements
- FR-24: The platform must allow users to select and compare multiple vehicles side by side.
- FR-25: Users should be able to view detailed specifications, features, and pricing for each vehicle in the comparison.
- FR-26: The system should provide an intuitive and easy-to-use vehicle comparison tool.

4.1.1.7 Advanced Search and Filters

Description and Priority

Advanced Search and Filters is of High priority, enabling users to find the exact vehicle they desire through a range of search and filter options.

Stimulus/Response Sequences

- Users access the advanced search and filter options.
- The system displays various search criteria, including make, model, year, and price.
- Users input their preferences and receive refined search results.

Functional Requirements

- FR-27: The platform should offer advanced search and filtering options to help users refine their vehicle searches.
- FR-28: Users must be able to input specific criteria, such as make, model, year, price range, and location.
- FR-29: The system should provide real-time search results based on user input.

4.1.1.8 Empowering User Reviews

Description and Priority

Empowering User Reviews is of "Medium" priority, enabling users to post and read reviews for vehicles, enhancing community engagement and information sharing.

Stimulus/Response Sequences

- Users access vehicle listings and their details.
- The system allows users to read and post reviews and ratings.
Users can provide feedback and share their experiences with the community.

Functional Requirements

- FR-30: The platform must enable users to read and post reviews and ratings for vehicles.
- FR-31: Users should be able to provide detailed feedback and descriptions of their experiences.
- FR-32: The system should include a rating and review system that helps users make informed decisions.

4.1.1.9 Real-time Communication

Description and Priority

Real-time Communication is of High priority, facilitating swift and effective interactions between users, mechanics, and enthusiasts.

Stimulus/Response Sequences

- Users initiate real-time chats or communication with other users.
- The system establishes secure and responsive communication channels.
- Users can exchange messages, information, and support in real-time.

Functional Requirements

- FR-33: The platform must support real-time communication between users, mechanics, and enthusiasts.
- FR-34: Users should be able to initiate chats, exchange messages, and engage in real-time discussions.
- FR-35: The system should ensure secure and private communication channels for user interactions.

4.1.1.10 Insightful Vehicle History

Description and Priority
Insightful Vehicle History is of "Medium" priority, providing users with comprehensive vehicle history information to build trust and transparency in transactions.

Stimulus/Response Sequences
- Users access a vehicle's history section.
- The system displays a detailed vehicle history report.
- Users can view information such as accident history, service records, and ownership details.

Functional Requirements
- FR-36: The platform must offer users access to comprehensive vehicle history reports.
- FR-37: Users should be able to view information regarding accident history, service records, and previous ownership details.
- FR-38: The system should ensure that the provided vehicle history information is accurate and verified.

4.1.1.11 Expert Customer Support

Description and Priority
Expert Customer Support is of High priority, providing users with instant resolution and assistance for a smooth experience on the platform.

Stimulus/Response Sequences
- Users encounter issues or require assistance.
- The system allows users to initiate live chats or support requests.
- Support representatives provide prompt and expert assistance.

Functional Requirements
- FR-39: The platform must offer users the ability to initiate live chats or support requests.
- FR-40: Support representatives should be available to provide expert assistance in real-time.
- FR-41: The system should ensure that support inquiries are addressed promptly and effectively.

4.1.1.12 AI-Driven Recommendations

Description and Priority
AI-Driven Recommendations is of "Medium" priority and offers personalized vehicle suggestions based on user behavior, continuously refining recommendations for an improved user experience.

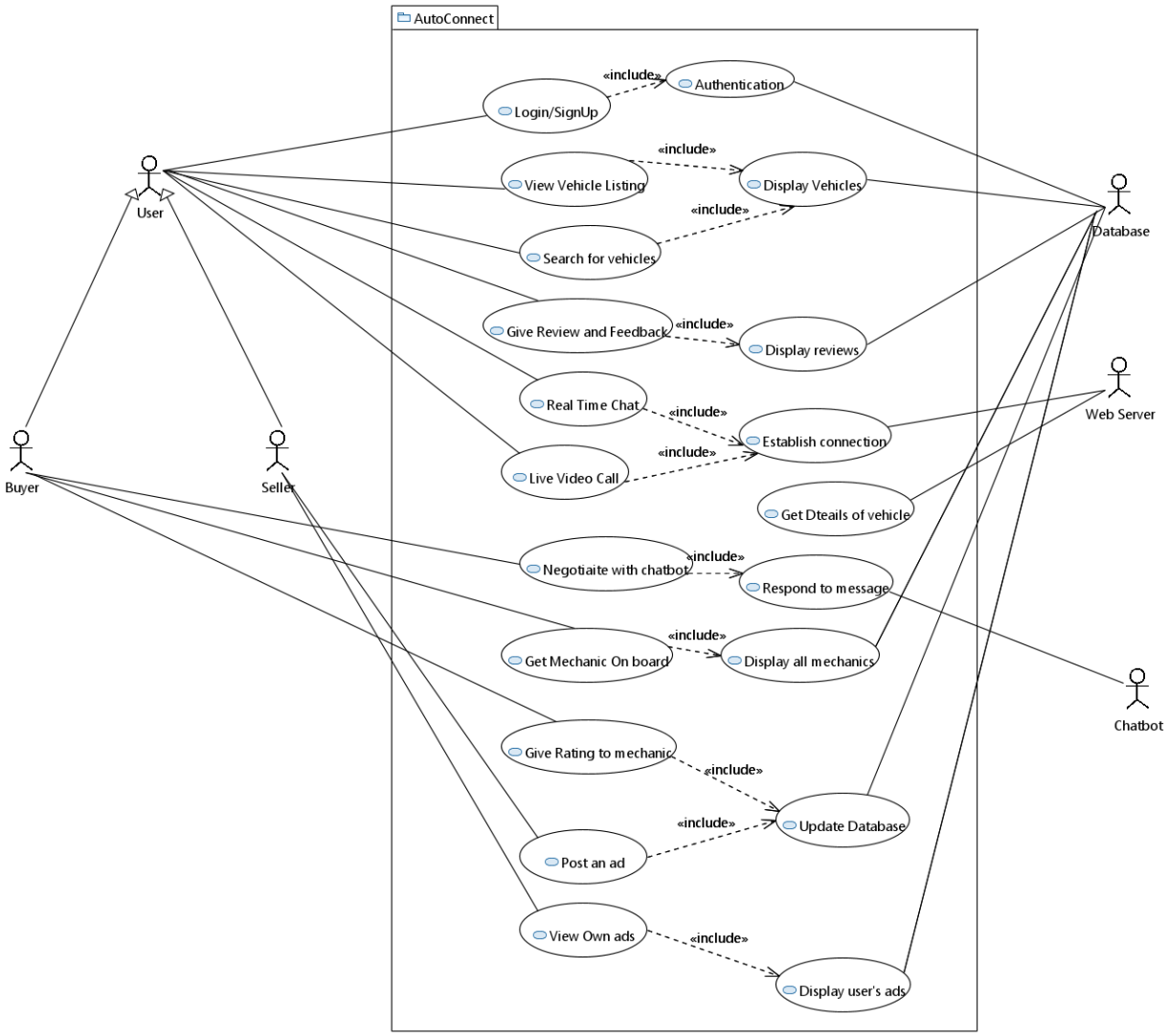
Stimulus/Response Sequences
- Users navigate the platform and search for vehicles.
- The system analyzes user behavior and preferences.
- Users receive personalized vehicle recommendations.

Functional Requirements

- **FR-42:** The platform must utilize AI to analyze user behavior and preferences.
- **FR-43:** Users should receive personalized vehicle suggestions based on their activity and preferences.
- **FR-44**: The system should continuously refine recommendations to enhance the user experience.

4.2 Use Case Description

4.2.1 User



Login/SignUp		
Use case Id:	UC-001	
Actors:	User, Database	
Feature:	Login/SignUp	
Pre-condition:	The Buyer is logged in	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	User clicks on the "Login" button.	System prompts for credentials.
2.	User enters valid credentials and clicks "Submit."	System validates credentials and logs in the buyer.
Alternate Scenarios:		
Action		***Software Reaction***
1a: *User clicks on "Signup" to create a new account.* ***2a****: User enters the information and clicks "Submit."*		*System prompts for required information.* *System validates information and creates a new account for the user.*
Post Conditions		
Step#	***Description***	
1	The user is logged in, gaining access to personalized features.	
Use Case Cross referenced	None	

View Vehicle Listings		
Use case Id:	UC-002	
Actors:	User, Database	
Feature:	View Vehicle Listings	
Pre-condition:	Just to open web app	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	User navigates to the "View Listings" section.	System fetches and displays available vehicle listings..
Alternate Scenarios:		
None		
Post Conditions		
Step#	***Description***	
1	The buyer can see available vehicle listings.	
Use Case Cross referenced	None	

Search for Vehicles		
Use case Id:	UC-003	
Actors:	User, Database	
Feature:	Search for Vehicles	
Pre-condition:	The user is logged in.	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	User enters search criteria in the search bar.	System filters and displays relevant vehicle listings.
Alternate Scenarios:		
Post Conditions		
Step#	***Description***	
1	The user can see search results based on entered criteria.	
Use Case Cross referenced	None	

Give Review and Feedback		
Use case Id:	UC-004	
Actors:	User, Database	
Feature:	Give Review and Feedback	
Pre-condition:	The User is logged in	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	User selects a completed transaction.	System prompts the user to leave a review and feedback.
2.	User enters the review and feedback and clicks "Submit."	
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The user's review and feedback are submitted.	
Use Case Cross referenced	None	

Real time Chat		
Use case Id:	UC-005	
Actors:	User, Web Server	
Feature:	Real Time Chat	
Pre-condition:	The user is logged in.	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	User selects a vehicle and clicks on the "Chat" button.	System connects the buyer and seller for real-time chat.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	

1	The buyer successfully communicates with the seller.
Use Case Cross referenced	None

Live Video Call		
Use case Id:	UC-006	
Actors:	User, Web Server	
Feature:	Live Video Call	
Pre-condition:	The user is logged in	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	User selects a vehicle and clicks on the "Video Call" button.	System initiates a live video call between the buyer and seller.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The buyer has a live video call with the seller.	
Use Case Cross referenced	None	

4.2.1.1 Buyer

Negotiate with Chatbot		
Use case Id:	UC-007	
Actors:	Buyer, Chatbot Server, Database	
Feature:	Login/SignUp	
Pre-condition:	The Buyer is logged in	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Buyer selects a vehicle and initiates negotiation.	System activates the chatbot for negotiation.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The negotiation process is completed.	
Use Case Cross referenced	None	

Get Mechanic On Board	
Use case Id:	UC-008
Actors:	Buyer, Database
Feature:	Get Mechanic On Board
Pre-condition:	The Buyer is logged in
Scenarios	

Step#	***Action***	***Software Reaction***
1.	Buyer navigates to the "Mechanic Services" section..	System displays available mechanics.
2.	Buyer selects a mechanic and sends a request.	System notifies the mechanic.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The mechanic receives the request from the buyer.	
Use Case Cross referenced	None	

Give Rating to Mechanic		
Use case Id:	UC-009	
Actors: Buyer, Database, Mechanic		
Feature: Get Mechanic On Board		
Pre-condition:	Buyer has subscribed for that particular mechanic	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Buyer selects a completed service by a mechanic.	System prompts the buyer to leave a rating.
2.	Buyer enters the rating and clicks "Submit."	System notifies the mechanic.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The buyer's rating for the mechanic is submitted.	
Use Case Cross referenced	None	

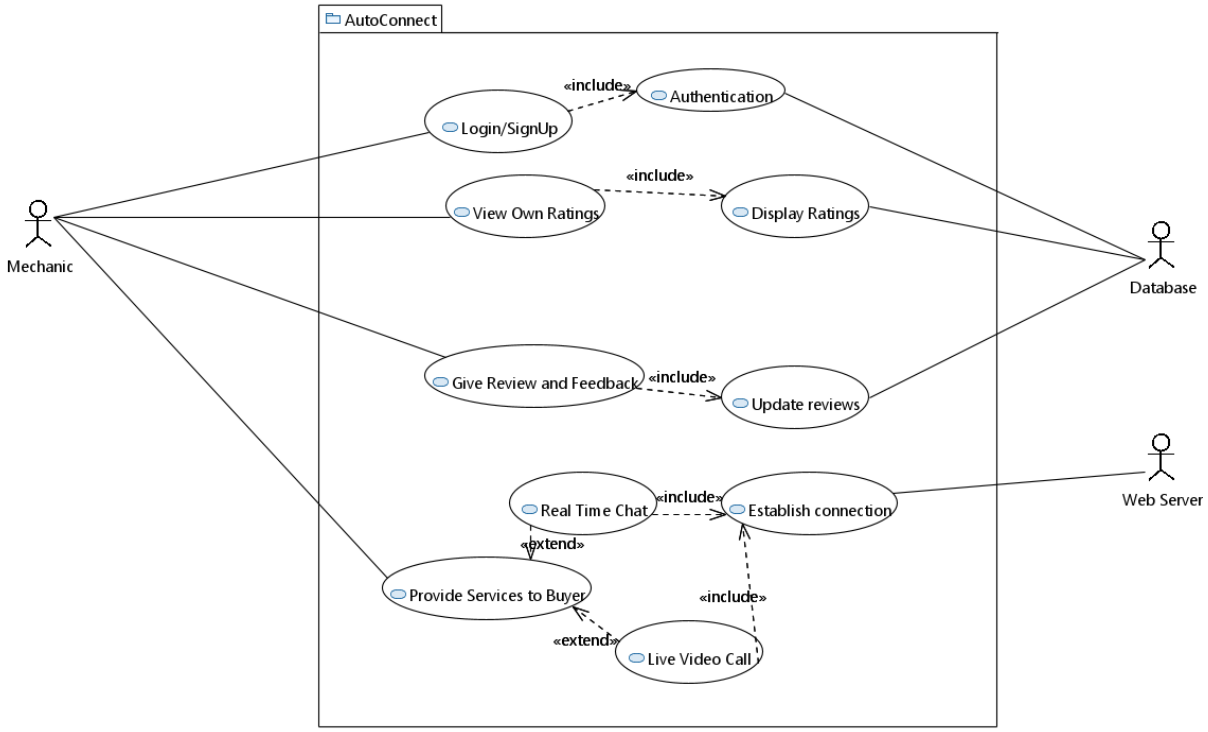
4.2.1.2 Seller

View own ads		
Use case Id:	UC-010	
Actors: Seller, Database		
Feature: View own ads		
Pre-condition:	Ads should be posted by seller	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Seller navigates to the "My Ads" section.	System fetches and displays both general vehicle listings and the seller's own ads.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	

1	The seller will have view of his ads posted.
Use Case Cross referenced	None

Post an ad		
Use case Id:	UC-011	
Actors:	Seller, Database	
Feature:	View own ads	
Pre-condition:	Seller should be logged in	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Seller clicks on sell car button	System asks the necessary details of vehicles
2.	Seller adds all the details	System adds the ad to the used cars listings
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The ad is posted to the web app	
Use Case Cross referenced	None	

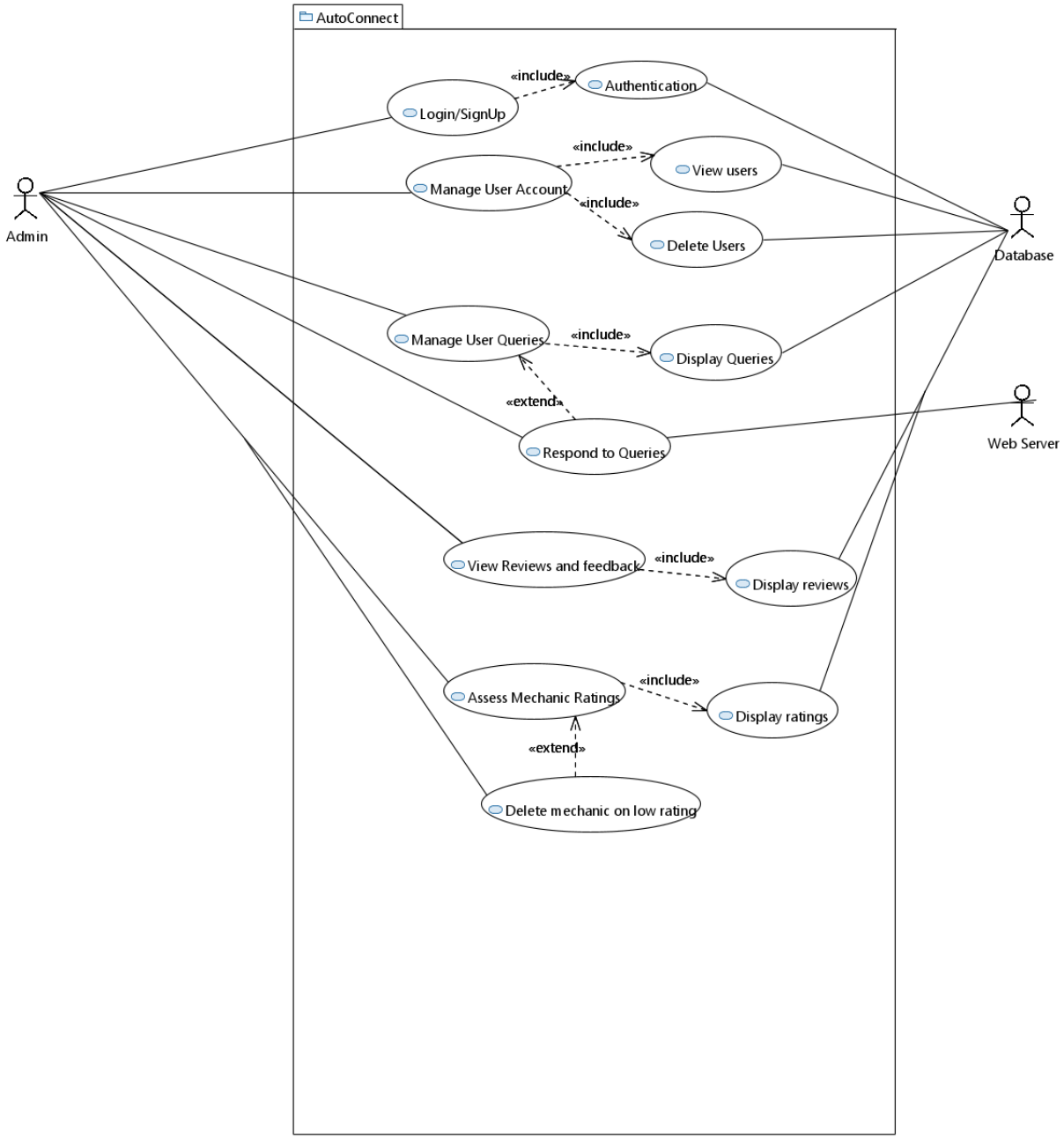
4.2.2 Mechanic



View Own Ratings		
Use case Id:	UC-012	
Actors:	Mechanic, Database	
Feature:	View own ratings	
Pre-condition:	Mechanic should be logged in	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Mechanic navigates to the "View Ratings" section.	System fetches and displays the mechanic's own ratings.
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The mechanics can see their own ratings.	
Use Case Cross referenced	None	

Provide Services to Buyer		
Use case Id:	UC-013	
Actors:	Mechanic, Database, Web Server	
Feature:	Provide Services to the Buyer	
Pre-condition:	- Mechanic should be logged in - Buyer should have requested for services	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Mechanic receives accepts request from a buyer.	System prompts buyer “Request Accepted”
2.	Mechanic start providing services to buyer	System update the customer status of mechanic
Alternate Scenarios:		
Action		***Software Reaction***
1a: *Mechanic declines the service request.*		*System prompts buyer “Request Declined”.*
Post Conditions		
Step#	***Description***	
1	The mechanic successfully provides services to the buyer.	
Use Case Cross referenced	None	

4.2.3 Admin



Manage User Accounts		
Use case Id:	UC-014	
Actors: Admin, Database		
Feature: Manage User Accounts		
Pre-condition:	The admin is logged in.	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Admin navigates to the "User Management"	System displays all users

	section.	
2.	Admin searches for a specific user account.	System gives details for the account
3.	Admin may deactivate or delete user accounts if necessary.	System updates the database
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The admin successfully manages user accounts.	
Use Case Cross referenced	None	

Manage User Queries		
Use case Id:	UC-015	
Actors: Admin, Database ,Buyer		
Feature: Manage User Queries		
Pre-condition:	- The admin is logged in. - User did a query	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Admin navigates to the "User Queries" section.	System displays all queries
2.	Admin views and responds to user queries.	System convey the response to buyer
3.	Admin may escalate or mark queries as resolved.	System updates the database
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The admin successfully manages user queries.	
Use Case Cross referenced	None	

Access Reviews and Feedback		
Use case Id:	UC-016	
Actors: Admin, Database		
Feature: Manage User Queries		
Pre-condition:	- The admin is logged in.	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Admin views reviews and feedback from buyers, sellers, and mechanics.	System displays all reviews

2.	Admin may take action based on feedback, such as addressing issues or escalating matters	
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The admin successfully accesses and manages reviews and feedback.	
Use Case Cross referenced	None	

Assess Mechanic Ratings		
Use case Id:	UC-017	
Actors: Admin, Database		
Feature: Manage User Queries		
Pre-condition:	- The admin is logged in. - Ratings should be given by buyers	
Scenarios		
Step#	***Action***	***Software Reaction***
1.	Admin views ratings and feedback for mechanics.	System displays all ratings of mechanics
2.	Admin may take action based on mechanic performance.	
Alternate Scenarios: *None*		
Post Conditions		
Step#	***Description***	
1	The admin successfully assesses mechanic ratings.	
Use Case Cross referenced	None	

5. Non-Functional Requirements

5.1 Performance Requirements

5.1.1 Performance Efficiency of Smart Negotiating Bot:

- **Initiation Response Time:**
  Performance Requirement: The system should respond to user initiation within 1 second.
  Rationale: Quick response to user initiation ensures an immediate engagement, contributing to a seamless and user-friendly experience.
- **Analysis Time for Offers and Counteroffers:**

Performance Requirement: The Smart Negotiation Bot must analyze offers and generate counteroffers within 2 seconds.
Rationale: Swift analysis is crucial for maintaining the flow of negotiations, preventing delays, and enhancing user satisfaction.

- **Real-Time Notification Delivery:**
  Performance Requirement: The system should deliver real-time notifications and responses to the user within 1 second.
  Rationale: Real-time notifications contribute to a dynamic and interactive negotiation process, providing users with immediate feedback.

5.1.2 Performance Optimization for Live Video Calling:

- **Initiation Response Time:**
  Performance Requirement: The system should respond to the user's initiation of a live video call within 1 second.
  Rationale: Quick response ensures a prompt initiation of the video call, providing users with an efficient and reliable experience.
- **Connection Establishment Time:**
  Performance Requirement: The system must establish a secure and real-time video connection within 5 seconds.
  Rationale: Swift connection establishment is crucial for users to begin their vehicle inspection promptly, contributing to a seamless and effective process.
- **Real-Time Communication Responsiveness:**
  Performance Requirement: Users and experts should experience minimal latency in video and audio communication, with a delay of less than 1 second.
  Rationale: Low latency in communication enhances the real-time interaction between users and experts, creating a more immersive and effective inspection experience.

5.1.3 Expansive Vehicle Exploration: Elevating User Journeys with Comprehensive Listings

- **Search Response Time:**
  Performance Requirement: The system should respond to user searches for vehicles within 3 seconds, providing quick access to relevant listings.
  Rationale: Fast search response time ensures users can promptly find vehicles matching their criteria, contributing to an efficient browsing experience.
- **Listing Retrieval and Display Speed**:
  Performance Requirement: The system must retrieve and display comprehensive listings within 5 seconds of user request.
  Rationale: Quick retrieval and display enhance user engagement, allowing them to efficiently browse through a wide variety of available vehicles.
- **Filtering and Sorting Responsiveness:**
  Performance Requirement: Users should be able to filter and sort listings based on preferences with a response time of under 4 seconds.
  Rationale: Swift filtering and sorting enable users to customize their search results, improving the overall user experience.
- **Saving and Comparing Listings Efficiency:**

Performance Requirement: The system should allow users to save and compare listings with an efficient response time of under 3 seconds.
Rationale: Quick saving and comparing functionality contribute to user convenience and informed decision-making.

- **Media and Information Loading Speed:**
  Performance Requirement: The platform should load high-quality images, specifications, and seller details for each listed vehicle within 6 seconds.
  Rationale: Fast loading of media and information enhances the visual appeal and comprehensiveness of vehicle listings, improving user satisfaction.

5.1.4 Optimizing User Account Personalization and Interaction

- **Account Creation Response Time:**
  Performance Requirement: The system should respond to user requests to create and personalize accounts within 3 seconds.
  Rationale: Quick response ensures a smooth onboarding process, allowing users to swiftly create and customize their accounts.
- **Preference Saving Time:**
  Performance Requirement: The platform must save user preferences and settings within 1 second.
  Rationale: Immediate saving of preferences ensures that users' personalized settings are applied instantly, contributing to a user-friendly experience.
- **Personal Information Update Responsiveness:**
  Performance Requirement: The system should enable users to update their personal information with a response time of under 2 seconds.
  Rationale: Swift updates to personal information enhance the platform's responsiveness, allowing users to manage their profiles efficiently.
- **Social Media Account Linking Time:**
  Performance Requirement: Users should be able to link their accounts with social media profiles within 5 seconds.
  Rationale: Quick linking to social media profiles enhances the platform's ease of use, providing users with efficient account management options.

5.1.5 Enhancing User Engagement Through Diverse Portals

- **Portal Access Response Time:**
  Performance Requirement: The system should respond to user requests to access specialized portals within 3 seconds.
  Rationale: Quick response ensures users can swiftly navigate to their desired portal, enhancing the overall user experience.
- **Relevant Content Delivery Time:**
  Performance Requirement: Each portal must deliver relevant content and services tailored to the specific user group within 2 seconds.
  Rationale: Swift delivery of personalized content ensures user engagement and satisfaction within their designated portals.

- **Interactivity and Knowledge Sharing Responsiveness:**
  Performance Requirement: Users should be able to interact, ask questions, and share information within their designated portals with a response time of under 3 seconds.
  Rationale: Immediate responsiveness in interactivity encourages active participation, fostering a dynamic and engaging community.

5.1.6 Streamlining Decision-Making through Effortless Vehicle Comparison

- **Vehicle Selection and Comparison Response Time:**
  Performance Requirement: The system should respond to user requests to select and compare multiple vehicles side by side within 3 seconds.
  Rationale: Quick response ensures users can swiftly initiate the comparison process, contributing to a seamless and efficient experience.
- **Generation of Side-by-Side Comparison Time:**
  Performance Requirement: The system must generate a side-by-side comparison of selected vehicles within 5 seconds.
  Rationale: Swift generation of the comparison view enhances the user's ability to quickly assess and analyze key details for informed decision-making.
- **Viewing Detailed Information Responsiveness:**
  Performance Requirement: Users should be able to view detailed specifications, features, and pricing for each vehicle in the comparison with a response time of under 2 seconds.
  Rationale: Immediate access to detailed information ensures users can effortlessly gather insights, aiding in their decision-making process.
- **Intuitive Comparison Tool Responsiveness:**
  Performance Requirement: The system should provide an intuitive and easy-to-use vehicle comparison tool with a response time of under 3 seconds.
  Rationale: Quick responsiveness of the comparison tool enhances user satisfaction and usability, making the vehicle comparison process effortless.

5.1.7 Facilitating Precision with Advanced Search and Filters

- **Access to Advanced Search and Filters Response Time:**
  Performance Requirement: The system should respond to user requests to access advanced search and filter options within 2 seconds.
  Rationale: Quick response ensures users can promptly initiate the search process and access refined filtering options.
- **Display of Search Criteria Response Time:**
  Performance Requirement: The system must display various search criteria, including make, model, year, and price, within 3 seconds.
  Rationale: Swift display of search criteria enhances the user's ability to understand and utilize the available filtering options effectively.
- **Input of Preferences and Real-Time Results Responsiveness:**
  Performance Requirement: Users must be able to input specific criteria and receive real-time search results within 5 seconds.
  Rationale: Immediate responsiveness in inputting preferences and receiving results contributes to a seamless and efficient search experience.

5.1.8 Fostering Informed Decisions through Empowering User Reviews

- **Access to Reviews and Ratings Response Time:**
  Performance Requirement: The system should respond to user requests to access vehicle reviews and ratings within 3 seconds.
  Rationale: Quick response ensures users can promptly access valuable information and engage with user reviews efficiently.
- **Posting Reviews and Ratings Responsiveness:**
  Performance Requirement: Users must be able to post reviews and ratings for vehicles with a response time of under 4 seconds.
  Rationale: Swift responsiveness in posting reviews enhances user engagement and encourages active participation in the community.
- **Feedback and Description Submission Time:**
  Performance Requirement: The system should enable users to provide detailed feedback and descriptions of their experiences within 5 seconds.
  Rationale: Efficient submission of detailed feedback enhances the user's ability to share valuable information, contributing to an empowered community.
- **Rating and Review System Performance:**
  Performance Requirement: The platform's rating and review system should function seamlessly with a response time of under 3 seconds.
  Rationale: Quick performance of the rating and review system ensures users can easily navigate and make informed decisions based on community feedback.

5.1.9 Seamless Interaction through Real-time Communication Channels

- **Initiating Real-time Chats Response Time:**
  Performance Requirement: The system should respond to user requests to initiate real-time chats within 2 seconds.
  Rationale: Quick response ensures users can promptly engage in real-time communication, contributing to effective and swift interactions.
- **Establishing Secure Communication Channels Responsiveness:**
  Performance Requirement: The system must establish secure and responsive communication channels within 3 seconds.
  Rationale: Swift establishment of secure channels ensures users can engage in private and reliable real-time communication.
- **Message Exchange and Real-time Discussions Responsiveness:**
  Performance Requirement: Users should be able to exchange messages and engage in real-time discussions with a response time of under 2 seconds.
  Rationale: Immediate responsiveness in message exchange enhances the user's ability to communicate effectively in real-time.
- **Security and Privacy of Communication Channels:**
  Performance Requirement: The system should ensure the security and privacy of communication channels with a response time of under 3 seconds.
  Rationale: Quick assurance of secure and private communication channels enhances user trust and confidence in real-time interactions.

5.1.10 Building Trust through Insightful Vehicle History Reports

- **Access to Vehicle History Section Response Time:**
  Performance Requirement: The system should respond to user requests to access a vehicle's history section within 4 seconds.
  Rationale: Quick response ensures users can promptly access important information related to a vehicle's history, enhancing transparency in transactions.
- **Display of Detailed Vehicle History Report Responsiveness:**
  Performance Requirement: The system must display a detailed vehicle history report with information such as accident history, service records, and ownership details within 5 seconds.
  Rationale: Swift display of detailed information ensures users can efficiently review comprehensive vehicle history, contributing to informed decision-making.
- **Accuracy and Verification of Vehicle History Information:**
  Performance Requirement: The system should ensure that the provided vehicle history information is accurate and verified, with a response time of under 3 seconds.
  Rationale: Quick verification of information enhances user trust in the reliability and authenticity of the vehicle history data.

5.1.11 Enabling Seamless Experiences with Expert Customer Support

- **Initiating Live Chats or Support Requests Response Time:**
  Performance Requirement: The system should respond to user requests to initiate live chats or support requests within 2 seconds.
  Rationale: Quick response ensures users can promptly seek assistance, contributing to a smooth and positive user experience.
- **Availability of Support Representatives Responsiveness:**
  Performance Requirement: Support representatives should be available to provide expert assistance in real-time, ensuring a response time of under 5 seconds.
  Rationale: Swift availability of support representatives contributes to immediate problem resolution, enhancing user satisfaction.
- **Prompt and Effective Addressing of Support Inquiries:**
  Performance Requirement: The system should ensure that support inquiries are addressed promptly and effectively, with a response time of under 3 seconds.
  Rationale: Quick and effective addressing of support inquiries enhances user confidence and contributes to a seamless experience on the platform.

5.1.12 Enhancing User Journeys with Dynamic AI-Driven Recommendations

- **AI Analysis of User Behavior and Preferences Response Time:**
  Performance Requirement: The system should respond to users' platform navigation and vehicle searches by utilizing AI to analyze behavior and preferences within 3 seconds.
  Rationale: Quick analysis ensures timely and relevant AI-driven recommendations, enhancing user engagement.
- **Generation of Personalized Vehicle Suggestions Responsiveness:**
  Performance Requirement: Users should receive personalized vehicle suggestions based on their activity and preferences within 4 seconds.

Rationale: Swift generation of recommendations ensures users are promptly presented with relevant options, contributing to an improved user experience.

- **Continuous Refinement of Recommendations:**
  Performance Requirement: The system should continuously refine recommendations to enhance the user experience, with updates occurring at least every 24 hours.
  Rationale: Regular refinement ensures that recommendations stay current and aligned with users' evolving preferences, contributing to sustained user satisfaction.

5.2 Safety Requirements

1. User Verification for Video Calling:

- Requirement: Before initiating live video calls, users must undergo a verification process to ensure their identity.
- Safeguards/Actions: Implement a robust user authentication system, possibly involving multi-factor authentication, to prevent misuse or potential harm during video calls.
- Prevention: Clearly communicate the importance of identity verification and the platform's commitment to user safety.
-

2. Guidelines for Mechanic Inspections:

- Requirement: Provide clear guidelines for mechanics conducting virtual vehicle inspections during video calls to ensure the safety of both parties.
- Safeguards/Actions: Offer training materials and a checklist for mechanics to follow, emphasizing ethical and safe practices during inspections.
- Prevention: Regularly update guidelines based on user feedback and industry best practices.
-

3. Real-Time Communication Standards:

- Requirement: Establish clear standards for real-time communication, emphasizing respectful and professional behavior during negotiations and interactions.
- Safeguards/Actions: Implement reporting mechanisms for inappropriate conduct and provide users with the ability to report and block others.
- Prevention: Educate users about community standards and consequences for violating communication guidelines.

4. Transparent AI Recommendations:

- Requirement: Ensure that AI-driven recommendations are transparent and clearly communicated to users to prevent misunderstandings or misinterpretations.
- Safeguards/Actions: Display the basis of AI recommendations, provide users with the ability to question or challenge suggestions, and regularly update algorithms for accuracy.
- Prevention: Foster user understanding of how AI recommendations work through educational materials.

5.3 Security Requirements

1. User Authentication and Authorization:

- Requirement: Users must be required to authenticate and authorize their identity to access the platform.

- Safeguards: Implement secure and multi-factor authentication (MFA) mechanisms to enhance user identity verification.
- Actions to be Taken: Regularly review and update user authentication processes to adapt to evolving security threats.
- Actions to be Prevented: Unauthorized access to user accounts and impersonation must be prevented.

2. Data Encryption:

- Requirement: All sensitive data, including user personal information, transaction history, and payment details, is encrypted both in transit and at rest.
- Safeguards: Implement strong encryption algorithms and secure communication protocols to protect data.
- Actions to be Taken: Regularly update encryption protocols and practices to address emerging security vulnerabilities.
- Actions to be Prevented: Data breaches and unauthorized access to encrypted data must be prevented.

3. Regulatory Compliance:

- Requirement: The platform must comply with relevant regulations governing e-commerce, data protection, and online transactions.
- Safeguards: Establish a legal and regulatory compliance team to monitor and adapt to changing regulations.
- Actions to be Taken: Regularly audit and update policies and practices to ensure compliance with security and privacy regulations.
- Actions to be Prevented: Non-compliance with legal and regulatory requirements must be prevented.

4. Data Access Control:

- Requirement: Access to user data, transaction history, and payment information must be restricted to authorized personnel only.
- Safeguards: Implement role-based access control (RBAC) and ensure that only authorized individuals can access sensitive data.
- Actions to be Taken: Regularly review and update data access controls to maintain data security.
- Actions to be Prevented: Unauthorized access to user data or financial information must be prevented.

5. Privacy Certifications:

- Requirement: Obtain privacy certifications and adhere to relevant industry standards for data protection and user privacy.
- Safeguards: Collaborate with regulatory bodies to ensure the platform meets privacy standards.
- Actions to be Taken: Seek and maintain privacy certifications that validate the platform's commitment to data protection and privacy.
- Actions to be Prevented: Operating without the necessary privacy certifications and approvals must be prevented.

5.4 Software Quality Attributes

5.4.1 Interoperability Requirements

1. Integration with Existing E-commerce Platforms:

- The platform seamlessly integrates with existing e-commerce platforms for specific functionalities, such as payment processing systems. This will ensure a comprehensive user experience without duplicating entire ecosystems.

2. API Integration for Mechanic Ratings:

- API integration will be implemented with third-party sources to gather and display mechanic ratings and reviews. This will enhance the platform's credibility by incorporating external data sources and promoting transparency.

3. Secure Data Exchange for Video Calling:

- Secure data exchange is ensured during live video calling functionalities. This may involve utilizing encrypted protocols and standards to protect user information and maintain the integrity of real-time communication.

4. Data Integration for Vehicle History Information:

- Integration with third-party APIs for reliable and accurate vehicle history information is established. This will ensure that users have access to comprehensive data when making informed decisions about purchasing or selling a vehicle.

5. Cross-Platform Compatibility for Video Calling:

- The live video calling feature is compatible across various operating systems and devices, fostering interoperability and allowing users to engage in real-time video interactions seamlessly.

5.4.2 Usability Requirements

1. **Intuitive User Interface (UI):**

- The platform features an intuitive and user-friendly interface designed to cater to a diverse audience, including buyers, sellers, mechanics, administrators, and enthusiasts.

2. Efficient Navigation:

- Users will be able to easily navigate through the platform, with a clear and logical flow from browsing vehicles to initiating negotiations and accessing additional features like the mechanic portal.

3. Personalization and Customization:

- Offer personalization options, allowing users to customize their profiles, preferences, and saved searches. This ensures a tailored experience that aligns with individual user needs.

4. Accessible Information:

- Essential information, such as vehicle details, negotiation history, and mechanic ratings, will easily be accessible. Clear and concise information presentation enhances transparency and aids users in making informed decisions.

5. Responsive Design:

- Responsive across various devices, ensuring seamless access and usability whether users are accessing it from a desktop, tablet, or mobile device. This is particularly important for features like live video calling..

6. **Feedback Mechanism:**

- A feedback mechanism where users can provide reviews and ratings for the platform, transactions, and mechanic services. This not only fosters community engagement but also helps in continuous improvement based on user insights.

5.4.3 Reliability Requirements

1. Redundancy and Failover:

- The system implements redundancy and failover mechanisms to ensure continuous availability in the event of server failures or disruptions.

2. Real-time Chatbot Monitoring:

- The chatbot's performance and availability is continuously monitored, with automated alerts triggered in case of chatbot unresponsiveness.

3. Seller Availability Monitoring:

- The system tracks and displays the availability status of vehicle sellers, indicating whether they are online and responsive.

4**. Camera Functionality Verification:**

- The system verifies the functionality of live video cameras before initiating video calls, ensuring that the video call feature is reliable.

5. Error Handling and Logging:

- Comprehensive error handling and logging mechanisms is in place to track and diagnose issues, allowing for prompt resolution and minimizing downtime.

6. Performance Metrics Monitoring:

- Performance metrics, such as server response times and system load are monitored to proactively address performance issues and maintain a reliable user experience.

5.4.4 Delivery, implementation, and standard requirements

5.4.4.1 Delivery Requirement

1. Training Period: The development team must complete the system development and testing within 6 months from the project kick-off.
2. Deployment Modes: The system should be available in four modes: web browser access, mobile-responsive web, Android app, and iOS app, ensuring comprehensive user accessibility.
3. User Documentation: Comprehensive user documentation, including user guides and FAQs, should be delivered alongside the system to facilitate user onboarding.

4. Training and Support Staff: A dedicated support team consisting of at least four support staff members should be available during the initial launch to assist users with onboarding and any issues they may encounter.

5.4.4.2 Implementation Requirements

1. Technology Stack: The system will be implemented using Java for the backend and HTML, CSS, and JavaScript for the frontend.
2. Development Period: The development team should complete the frontend and backend work in 12 weeks.
3. Security Measures: Implementation must include data encryption to protect user information and secure login mechanisms, including password hashing.
4. Database Management: The use of a relational database management system (RDBMS) is required to store user data, vehicle listings, and transaction records.
5. Testing Phase: A comprehensive testing phase, including unit, integration, and user acceptance testing, is essential before deployment.

5.4.4.3 Standard Requirements

1. User Authentication: Standard requirements include user authentication using strong passwords and two-factor authentication (2FA) for enhanced security.
2. Compulsory User Fields: During user registration, certain fields, including username, email address, and mobile phone number, must be completed for users to proceed.
3. Accessibility Standards: The platform should adhere to web accessibility standards (e.g., WCAG) to ensure that all users, including those with disabilities, can interact with the system effectively.

5.4.5 Ethical requirements

1. User Privacy and Data Protection:

- User data, including personal information, transaction records, and communication, should be treated with the utmost confidentiality and protected from unauthorized access or misuse.

2. Informed User Consent:

- Users should provide explicit consent before sharing sensitive information or engaging in live video calls, with clear explanations of the purpose and usage of their data.

3. Non-discrimination:

- The system should not discriminate against users based on personal characteristics, such as race, gender, religion, or nationality, in any aspect of the platform's functionality.

4. Responsible AI Usage:

- The chatbot and AI features should be designed to provide fair and unbiased responses, without promoting harmful or discriminatory behavior.

5. User Support and Reporting Mechanisms:

- Users should have access to mechanisms to report unethical or harmful behavior, with a dedicated support team responsible for addressing such reports.

5.5 Business Rules

5.5.1 Facts:

BR-1. Every vehicle listing on the platform must include essential details such as the vehicle's make, model, year of manufacture, and current condition.
BR-2. The platform stores user-generated reviews and ratings for both sellers and mechanics to help other users make informed decisions.
BR-3. Each user account must have a unique username and password for security and authentication purposes.
BR-4. The platform should maintain a record of all past and ongoing transactions, including vehicle history and pricing data.

5.5.2 Constraints:

BR-5. Users are not allowed to list vehicles that do not adhere to the legal requirements and safety standards set by the relevant authorities.
BR-6. Vehicle listings must adhere to a specific format and character limit to maintain a consistent and organized presentation.
BR-7. User-generated content, including reviews and ratings, must comply with community guidelines, prohibiting offensive or harmful language.
BR-8. The platform should enforce data protection regulations to safeguard user information and ensure privacy compliance.

5.5.3 Action Enablers:

BR-9. If a potential buyer expresses interest in a vehicle through the Live Video Calling feature, the platform enables the seller to initiate a live video call to showcase the vehicle.
BR-10. If a user's search criteria match the features of multiple vehicles, the platform should provide AI-Driven Recommendations to suggest similar vehicles that match their preferences.
BR-11. If a user encounters technical difficulties or has questions during the buying or selling process, the Smart Negotiation Bot can initiate a conversation to assist the user.
BR-12. If a user reports a problematic interaction or review, the platform's customer support team should be alerted, enabling them to investigate and resolve the issue promptly.

5.5.4 Inferences:

BR-13. Based on a user's search history and vehicle preferences, the platform can infer the user's preferences and suggest relevant vehicles in their dashboard.
BR-14. The platform can infer the trustworthiness of mechanics by analyzing their past ratings, user reviews, and completed transactions.

BR-15. The system can derive a user's preferred vehicle categories and brands based on their interactions and search history, providing more tailored recommendations over time.

5.5.5 Computations:

BR-16. The platform can calculate the distance between a user's location and the location of a vehicle listing to provide estimated delivery or pickup times.
BR-17. The system can compute trust scores for mechanics by considering their average ratings, response times, and the number of successful transactions.
BR-18. The platform can calculate the total cost of a transaction, including any additional services (e.g., inspection or delivery) selected by the buyer during the negotiation process.

6. Other requirements

1. Data Security and Encryption:
   - All user data, including personal information, financial details, and transaction records, must be securely encrypted both in transit and at rest to ensure data privacy and integrity.
2. Geographical Focus:
   - The system's primary focus is the Pakistani automotive market. It should incorporate data and features specific to this market while being adaptable to expansion into other regions in the future.
3. User Review Moderation:
   - Implement content moderation tools to ensure that user-generated reviews and ratings adhere to community guidelines, promoting a safe and respectful environment.
4. Legal and Regulatory Compliance (Pakistan):
   - The platform must adhere to all relevant legal and regulatory requirements in Pakistan, including data protection laws, e-commerce regulations, and consumer protection laws. It should provide users with clear terms of service and privacy policies in compliance with local laws.
5. Performance and Scalability:
   - The system should efficiently handle concurrent user activities, including live video calls, without significant performance degradation. It should be scalable to accommodate the growth of the user base and the increasing volume of data.
6. Community Building:
   - Promote user engagement and community building within the platform by facilitating knowledge sharing and interaction among users, mechanics, administrators, and enthusiasts. Encourage user-generated content, such as reviews and ratings, to foster an informed community.

7. Glossary

1. E-commerce - Electronic Commerce: The buying and selling of goods or services using the internet or other electronic channels
2. User-centric - A design and development approach that prioritizes the needs and preferences of users to create a more user-friendly and engaging experience.
3. Smart Negotiation Bot - An artificial intelligence-driven chatbot designed to assist users in negotiating the terms of a transaction.
4. Live Video Calling - A feature that enables real-time video communication between users for vehicle inspections and discussions.
5. User-generated Content - Content created and submitted by users, including reviews, ratings, and other contributions.
6. Community Guidelines - Rules and standards that dictate acceptable behavior and content within the platform's user community.
7. Regulatory Compliance - Adherence to legal and industry-specific regulations and standards governing the operation of the platform.
8. Data Encryption - The process of converting data into a code to prevent unauthorized access and protect data privacy.
9. Data Privacy - The protection of user data and personal information from unauthorized access and use.
10. Geographical Focus - The primary target region or market for the platform, in this case, the Pakistani automotive market.
11. Content Moderation - The practice of reviewing and managing user-generated content to ensure it complies with community guidelines and remains respectful and safe.
12. Scalability - The ability of the platform to expand and accommodate a growing user base and data volume.
13. Performance Requirements - Specifications that define the expected speed, responsiveness, and efficiency of the platform.
14. User Support System - A system that provides assistance to users, including customer support, FAQs, and guides.
15. Third-party Data Providers - External sources of data, such as vehicle history information, integrated into the platform.
16. Legal and Regulatory Requirements - Laws, regulations, and standards that the platform must adhere to, including those related to data protection, e-commerce, and consumer rights.
17. Dependency - The reliance of the project on external agents, devices, or resources that are not part of the core platform.
18. Assumptions - Factors or conditions considered to be true without proof, which can impact the project if they turn out to be false.
19. Community Building - The process of fostering a strong and engaged online community of platform users, including mechanics, administrators, and vehicle enthusiasts.

8. Appendices

Appendix-1

In the appendices, the research methodology for the software AutoConnect is detailed, encompassing the identification of existing sites and the formulation of a comprehensive questionnaire for requirement elicitation. The exploration of existing platforms involved an in-depth search to analyze comparable systems, ensuring a thorough understanding of industry standards and user expectations. This process aimed to leverage insights from existing solutions to inform and enhance the development of AutoConnect. Additionally, a meticulously crafted questionnaire was designed to extract essential requirements for the software, encompassing user needs, functionalities, and potential challenges. The questionnaire serves as a vital tool for gathering valuable insights from stakeholders, end-users, and experts, forming a foundational basis for the software's feature set and performance criteria. This dual approach, combining existing site analysis and a targeted questionnaire, contributes to a robust requirement elicitation strategy for the AutoConnect software, ensuring a well-informed and user-centric development process.

Appendix-2

Relative Weights	2	1			1		0.5		
Features	Relative benefit	Relative Penalty	Total Value	Value Percent	Relative Cost	Cost %	Relative Risk	Risk %	Priority
Smart Negotiation Bot	9	7	25	10.3	8	10.5	9	15	0.573
Live Video Calling	9	7	25	10.3	9	11.8	9	15	0.534
Comprehensive Listings	9	7	25	10.3	5	6.5	4	6.6	1.042
Personalized User Accounts	9	9	27	11.1	9	11.8	3	5	0.777
Diverse Portals	9	9	27	11.1	9	11.8	3	5	0.777
Effortless Vehicle Comparison	7	5	19	7.8	4	5.2	4	6.6	0.913
Advanced Search and Filters	8	5	21	8.6	6	7.8	4	6.6	0.772
Empowering User Reviews	2	2	6	2.4	4	5.2	3	5	0.319
Real-time Communication	7	6	20	8.2	8	10.5	4	6.6	0.596
Insightful Vehicle History	8	2	18	7.4	3	3.9	6	10	0.831
Expert Customer Support	3	9	15	6.1	4	5.2	4	6.6	0.721
AI-Driven Recommendations	4	6	14	5.7	7	9.2	7	11.6	0.384
Total	84	74	242	100	76	100	60	100	-

9. References

Prototype File:
https://www.figma.com/file/ATvOXPM3BK0vTlxPXi09Ot/AutoConnect?type=design&node-id=0%3A1&mode=design&t=nEV3mnu8KJzdmGI7-1

Research Paper:
Price Negotiating Chatbot on E-commerce website.