ELISAI MURACI

System Requirements

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| UC Name | *Real-Time Inventory Management* |
| Summary | Accurate and up-to-date inventory of available cars from manager side |
| Dependency | *This system req. derives from Inventory Tracking System Error Handling and Data Consistency and Efficiency.* |
| Actors | Administrators/Managers |
| Preconditions | For this req. to be set on action the System should have stable Network Infrastructure, Communication channels integrations and Data Consistency. |
| Description of the Main Sequence | 1.Retrieve Inventory Data   * The e-commerce platform initiates the inventory management process by retrieving inventory data from integrated inventory tracking systems or databases. * The platform updates its internal inventory database with the retrieved data, reflecting the current stock levels of different car models and variants. * The platform synchronizes the updated inventory data with the inventory tracking systems to ensure consistency and accuracy across all systems. * Data integrity checks are performed to verify the accuracy and completeness of the synchronized inventory data, ensuring that no discrepancies exist between systems.     2. Inventory Monitoring and Notification:   * The platform continuously monitors stock levels of car models and variants in real-time, tracking changes such as sales, restocks, or backorders. * When a car model or variant goes out of stock, the platform identifies the affected items and triggers an alert/notification mechanism. * Notifications are sent to both suppliers and customers: * Suppliers are informed about out-of-stock items, prompting them to provide restocking information. * Customers are notified about the unavailability of certain items and provided with information on when the items are expected to be back in stock.     3. Supplier Interaction and Replenishment:   * Upon receiving notifications about out-of-stock items, suppliers are notified through predefined communication channels (e.g., email, API). * Suppliers provide restocking information, including expected availability dates, quantities, and delivery schedules for the requested items. * The platform updates inventory status based on the information provided by suppliers, reflecting the expected availability dates and quantities of restocked items. * Customers are notified about the availability of restocked items, enabling them to make informed purchasing decisions or pre-orders/backorders if desired. |

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| Description of the Alternative  Sequence | 1. Detection of Data Transmission Failure:   * In this sequence, the system detects a failure in data transmission between the e-commerce platform and the inventory tracking system. * The failure could be due to network issues, system downtime, or errors in data synchronization.     2. Fallback Mechanism Activation:   * If the initial attempts to recover from the data transmission failure are unsuccessful, the system activates a fallback mechanism. * The fallback mechanism may involve using cached inventory data, implementing manual inventory updates, or displaying a message to users indicating temporary unavailability of real-time stock information. |
| Non functional requirements | *Network Stability, Data Manipulation Efficiency and Error Handling* |
| Postconditions | *The inventory information displayed to customers accurately reflects the real-time stock levels of cars available for sale.* |

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| UC Name | *Supplier Communication Integration* |
| Summary | Facilitating communication between the e-commerce  platform and suppliers regarding stock availability and replenishment. |
| Dependency | *Derived from Real-Time Inventory Management.* |
| Actors | Suppliers/Administrators/Managers |
| Preconditions | * Real-Time Inventory Management system is active and accurately tracking inventory. * Stable network infrastructure for reliable communication. * Defined communication channels established between the e-commerce platform and suppliers (e.g., email, API). |
| Description of the Main Sequence | **1. Detection of Inventory Needs:**   * **The system detects inventory needs based on real-time stock levels and customer demand.** * **Identifies items that are out of stock or running low.**     **2. Notification to Suppliers:**   * **Upon detecting inventory needs, the system triggers notifications to suppliers.** * **Notifications include details such as the items needing restocking, quantities required, and urgency.**     **3. Supplier Response:**   * **Suppliers receive notifications through predefined communication channels (e.g., email, API).** * **Suppliers provide information on restocking availability, quantities, and delivery schedules.**     **4. Inventory Update:**   * **The system updates inventory status based on information provided by suppliers.** * **Reflects expected availability dates, quantities, and delivery schedules for restocked items.** |
| Description of the Alternative  Sequence | *1. Failure in Supplier Communication:*   * *If there's a failure in communicating with suppliers (e.g., network issues):* * *The system activates error handling procedures to address the communication failure.* * *Attempts to resend notifications or use alternative communication channels.* |
| Nonfunctional requirements | * *Communication Reliability: Ensure reliable communication channels with suppliers.* * *Timeliness: Ensure timely communication to minimize stockouts and delays.* * *Data Security: Ensure secure transmission of sensitive inventory information.* |

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| Postconditions | *Suppliers are informed about inventory needs accurately and promptly, facilitating timely replenishment and ensuring optimal stock levels for customers.* |

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| UC Name | *Customer Notification System* |
| Summary | Informing customers about stock availability status. |
| Dependency | *Derived from Real-Time Inventory Management.* |
| Actors | Customers, System. |
| Preconditions | * Real-Time Inventory Management system is active and accurately tracking inventory. * Stable network infrastructure for reliable communication. * Defined notification mechanisms such as email or SMS. |
| Description of the Main Sequence | **1. Monitoring Inventory Changes:**   * **The system continuously monitors stock levels in real-time.** * **Detects changes such as items going out of stock or being restocked.**     **2. Customer Notification:**   * **When an item goes out of stock, the system triggers a notification process.** * **Sends notifications to customers via predefined channels (e.g., email, SMS).** * **Notifications include information on the unavailability of items and expected restock dates.**     **3. Providing Information for Informed Decisions:**   * **Customers receive notifications promptly, enabling them to make informed purchasing decisions.** * **Options for pre-orders or back-orders are provided if available.** |
| Description of the Alternative  Sequence | *1. Failure in Notification Transmission:*   * *If there's a failure in transmitting notifications (e.g., network issues):* * *The system activates error handling procedures to address the transmission failure.* * *Attempts to resend notifications or use alternative communication channels.* |
| Nonfunctional requirements | *Non-functional Requirements:*   * *Notification Delivery Speed: Ensure notifications are delivered promptly.* * *Notification Accuracy: Ensure notifications contain accurate information.* * *Notification Channel Reliability: Ensure reliability of communication channels.* |
| Postconditions | *Customers are informed about stock availability status accurately and promptly, facilitating informed purchasing decisions.* |

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| UC Name | *Customer Relationship Management (CRM)* |
| Summary | Managing interactions with customers to enhance their experience, provide personalized assistance, and foster long-term relationships. |
| Dependency | *Derived from Real-Time Inventory Management.* |
| Actors | Customers/Sales Representatives |
| Preconditions | * Real-Time Inventory Management system is active and accurately tracking inventory. - Centralized database of customer information, including contact details, purchase history, and preferences. * Defined communication channels established between the system and customers (e.g., email, live chat). |
| Description of the Main Sequence | **1. Customer Data Management:**   * **The system maintains a centralized database of customer information, including contact details, purchase history, and preferences.** * **Updates customer records with new interactions, purchases, or preferences.**     **2. Customer Interaction:**   * **Customers interact with the system through various touchpoints such as the website, mobile app, or customer service channels.** * **The system provides personalized assistance based on customer data and preferences.** * **Sales representatives utilize customer profiles to offer tailored recommendations and assistance during the sales process.**     **3. Customer Segmentation:**   * **The system segments customers based on various criteria such as demographics, purchase behavior, or engagement level.** * **Segmentation enables targeted marketing campaigns, promotions, and communication strategies.**     **4. Loyalty Programs:**   * **The system manages loyalty programs to reward repeat customers and encourage brand loyalty.** * **Tracks customer loyalty points, rewards, and redemption activities.**     **5. Follow-Up Communication:**   * **The system initiates follow-up communication with customers to gather feedback, address concerns, or offer post-purchase support.** * **Utilizes communication channels such as email, SMS, or phone calls to stay engaged with customers.** |
| Description of the Alternative  Sequence | *1. Customer Data Inconsistency:*   * *If inconsistencies are detected in customer data:* * *The system triggers data validation processes to reconcile discrepancies and ensure data accuracy.* * *Notifies administrators or managers to investigate and resolve data inconsistencies.* |

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| Nonfunctional requirements | * *Data Security: Ensure the security and confidentiality of customer data.* * *Personalization: Provide personalized experiences tailored to individual customer preferences.* * *Responsiveness: Ensure timely responses to customer inquiries and requests.* |
| Postconditions | *Customer satisfaction is enhanced through personalized assistance, targeted communication, and effective resolution of inquiries or concerns, fostering long-term relationships and repeat business.* |

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| UC Name | *Inventory Forecasting and Replenishment* |
| Summary | Predicting future demand for car models and variants based on historical data and initiating replenishment orders to maintain optimal inventory levels. |
| Dependency | *Derived from Real-Time Inventory Management.* |
| Actors | Administrators/Managers |
| Preconditions | * Real-Time Inventory Management system is active and accurately tracking inventory. * Availability of historical sales data and inventory records. * Stable network infrastructure for data retrieval and communication with suppliers. |
| Description of the Main Sequence | **1. Data Analysis and Forecasting:**   * **The system analyzes historical sales data, customer trends, and market demand.** * **Utilizes statistical methods or machine learning algorithms to forecast future demand for car models and variants.**     **2. Replenishment Planning:**   * **Based on demand forecasts, the system generates replenishment plans to restock inventory.** * **Considers factors such as lead times from suppliers, storage capacity, and budget constraints.**     **3. Replenishment Order Generation:**   * **The system automatically generates replenishment orders for items that are forecasted to be in high demand or are running low in stock.** * **Orders include details such as quantities, preferred suppliers, and delivery schedules.**     **4. Supplier Interaction:**   * **Replenishment orders are sent to suppliers through predefined communication channels (e.g., email, API).** * **Suppliers acknowledge receipt of orders and provide confirmation of expected delivery dates.**     **5. Inventory Update:**   * **Upon confirmation from suppliers, the system updates inventory status to reflect expected arrival dates and quantities of restocked items.** * **Adjusts stock levels accordingly to maintain optimal inventory levels.** |
| Description of the Alternative  Sequence | *1. Inaccurate Forecasting:*   * *If demand forecasting results in inaccuracies:* * *The system triggers a review process to analyze the reasons for discrepancies.* * *Adjusts forecasting models or parameters based on new data or insights.* |
| Nonfunctional requirements | * *Forecasting Accuracy: Ensure accurate prediction of demand to prevent overstocking or stockouts.* * *Replenishment Efficiency: Ensure timely generation and processing of replenishment orders.* |

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|  | *- Scalability: Ensure the system can handle large volumes of data for accurate forecasting and efficient replenishment.* |
| Postconditions | *Optimal inventory levels are maintained, ensuring availability of car models and variants to meet customer demand while minimizing excess inventory costs.* |