SOFTWARE REQUIREMENTS SPECIFICATION FOR

APPLICATION FOR GROCERY DELIVERY

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<h1 style="text-align:center">APPLICATION FOR GROCERY DELIVERY</h1>

Task 1:
1.1 PURPOSE OF THE PROJECT

The Grocery Delivery Application serves the purpose of revolutionizing the grocery shopping experience by providing a user-friendly platform for customers to order groceries online and have them delivered to their doorstep. This project aims to enhance convenience and accessibility by simplifying the grocery shopping process, catering to busy individuals, the elderly, and those with mobility constraints. It streamlines operations for grocery store owners, optimizing inventory management, order processing, and delivery logistics, ultimately increasing operational efficiency.

The application offers real-time updates on product availability and order status, fostering transparency and trust between customers, stores, and delivery drivers. It promotes local businesses by partnering with neighborhood grocery stores, helping them expand their reach and adapt to evolving consumer preferences. Additionally, it addresses safety concerns, especially in times like the COVID-19 pandemic, by minimizing physical contact and offering a secure shopping alternative. Through personalized recommendations and promotions, it engages users, while data-driven insights empower stores to make informed decisions. In summary, this project aims to create a more efficient, inclusive, and digitally-driven grocery shopping ecosystem.

1.2 DOCUMENT CONVENTIONS

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Convention for Main title

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Convention for Sub title

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Convention for body

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1.3 SCOPE OF THE PROJECT

The Grocery Delivery Application project encompasses the development of a user-friendly and cross-platform application, available on web browsers, Android, and iOS devices. It aims to simplify and enhance the grocery shopping experience by offering a seamless online platform. Key features include user registration and authentication for secure access, a comprehensive product catalog with advanced search and filtering options, and a user-friendly shopping cart with real-time updates.

Customers can conveniently place orders, select delivery time slots, and make secure payments. Grocery store owners benefit from a management dashboard to handle product listings, inventory, and order processing. The project also includes a delivery management system to optimize routes for timely deliveries and automated notifications to keep users informed about order status and promotions.

 Security measures and privacy compliance are top priorities, ensuring the safety of user data. The application supports multiple languages and currencies for localization and is designed for scalability to accommodate future growth.

 With a well-defined scope, budget, and timeline, the Grocery Delivery Application project promises to provide a transformative grocery shopping experience while helping grocery store owners streamline their operations and expand their online presence.

1.4 Definitions, Acronyms and Abbreviations
GDA: Grocery Delivery Application.
COVID-19: Coronavirus Disease 2019.
UI: User Interface.
UX: User Experience.
API: Application Programming Interface.
IoT: Internet of Things.
GPS: Global Positioning System.
CRM: Customer Relationship Management.
POS: Point of Sale.
KPI: Key Performance Indicator.
ROI: Return on Investment.
B2C: Business to Consumer.
B2B: Business to Business.
SSL: Secure Sockets Layer.
AI: Artificial Intelligence.

1.5 References

[1] Smith, John. "The Impact of Online Grocery Shopping on Retail Operations." Journal of Retail Management, vol. 20, no. 3, 2019, pp. 45-62.

[2] Johnson, Mary. "Digital Transformation in the Grocery Industry." Grocery Business Magazine, June 2020, pp. 30-35.

[3] Nielsen, Consumer Insights. "The Evolution of Grocery Shopping." Nielsen Research Report, March 2021.

2. Overall Descriptions
2.1 Product Perspective
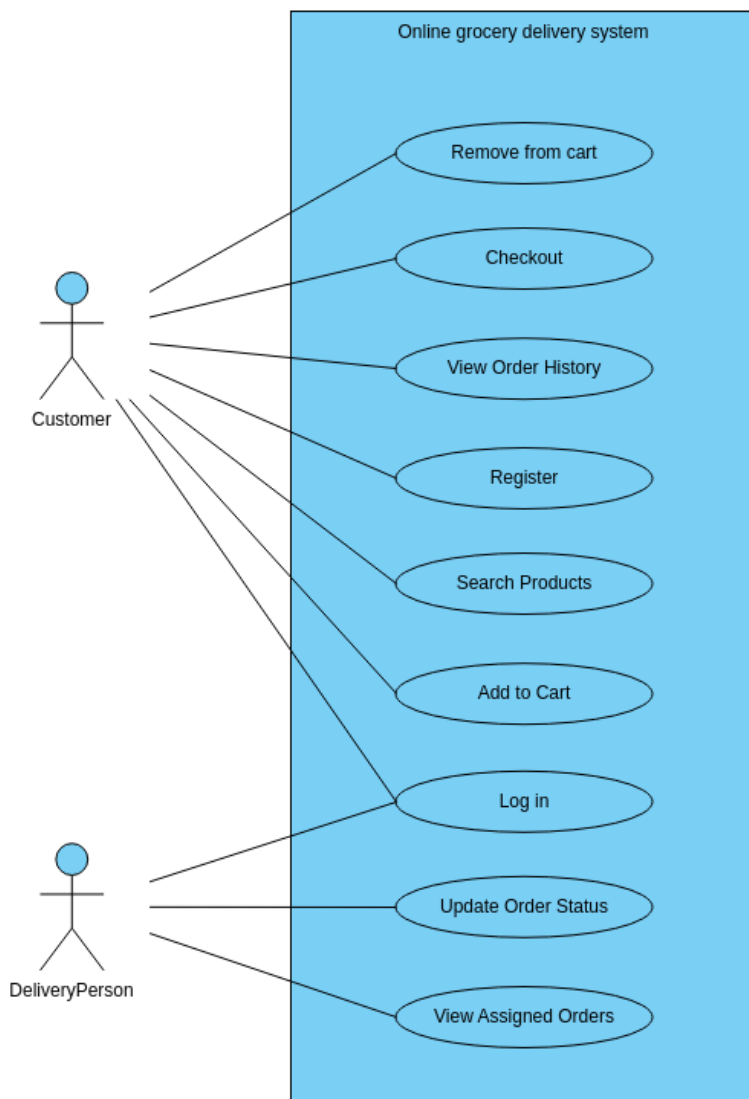
This diagram outlines key use cases, such as 'Order Groceries,' 'Track Delivery,' 'Manage Inventory,' and 'Recommend Products,' demonstrating how customers, delivery drivers, and store owners interact with the application to achieve their respective goals. It highlights the core processes and functionalities that enable users to place orders, monitor deliveries, and manage inventory efficiently, ultimately enhancing the overall grocery shopping experience

2.2 Product Function
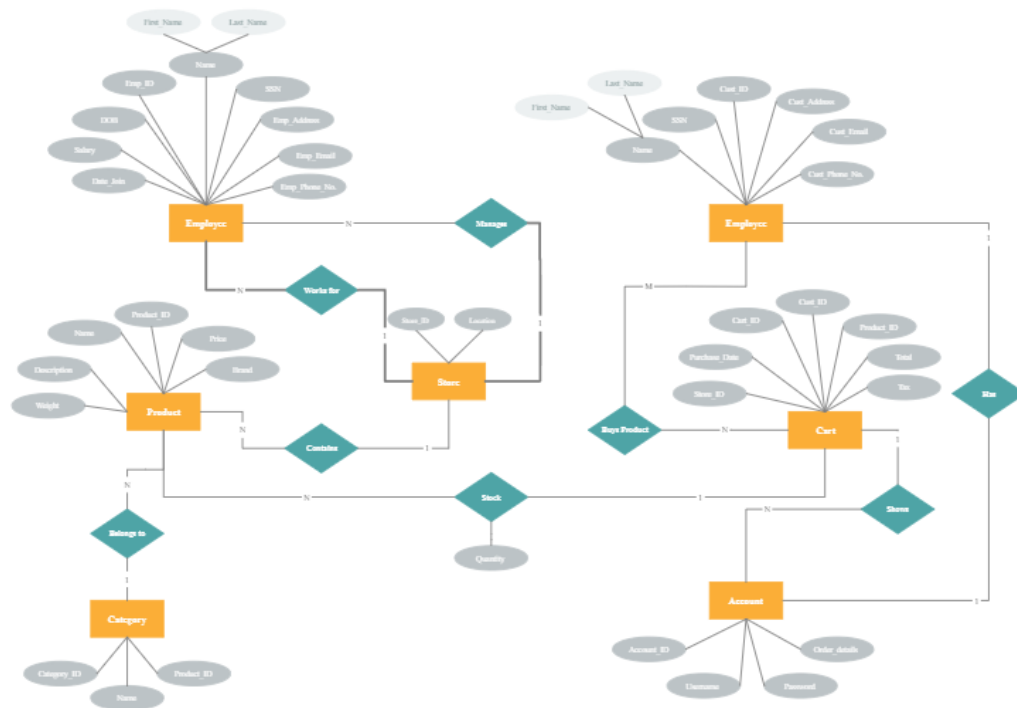
The ER Diagram for the Grocery Delivery Application illustrates the fundamental data structures and relationships that underpin the system's functionality. It includes entities such as 'Customer,' 'Product,' 'Order,' 'Store,' 'Delivery,' and 'Promotion,' among others. These entities are interconnected through relationships that capture how they interact within the application. For example, 'Customer' places 'Order' containing multiple 'Product' items, which are associated with a 'Store.'The ER diagram provides a visual representation of the data model that drives the application's core features. It showcases how customer orders are connected to products, how deliveries are linked to specific orders, and how promotions can target specific customers. This visual representation aids in understanding the data flow and relationships within the Grocery Delivery Application, which is crucial for designing a robust and efficient database to support the system's operations.

2.3 User Classes and Characteristics

The features that are available to the System Admin are:-
User Management,Database Management,System Configuration,Security Management, Monitoring and Reporting, Maintenance and Updates, Incident Response, Compliance and Regulations, User Support and Training,Backup and Recovery, System Integration, Troubleshooting, Performance Optimization, Resource Allocation, Scaling and Load Balancing.

The features that are available to the Customers are:-
User Registration and Profile Management, Browsing and Product Search, Product Details,Adding to Cart, Order Placement, Payment Processing, Order Tracking, Personalized Recommendations, Promotions and Discounts, Customer Support, Order History, Rating and Reviews, Notifications, Wishlists, Feedback and Suggestions, Accessibility Options, Privacy Settings, Logout and Account Deactivation.

2.4 Operating Environment

The operating environment for the Grocery Delivery Application encompasses a comprehensive technological infrastructure. The application's core components include server infrastructure, a database management system, web application and mobile development frameworks, frontend technologies, and APIs for seamless integration with external services such as payment gateways and geolocation services. Security measures, including encryption protocols and intrusion detection systems, are essential to protect user data and application resources. Load balancers and scalability solutions ensure high availability and the ability to accommodate increasing user demand. Regular monitoring, analytics tools, and backup and recovery solutions are in place to guarantee reliability and data protection. Compliance and regulation software may also be used to ensure adherence to local and national laws. Development and testing environments help maintain code quality and minimize disruptions during updates and feature implementations, making the operating environment crucial for the application's success.

2.5 Assumptions and Dependencies

Assumptions:

- Internet Connectivity
- Mobile and Web Access
- Payment Methods

- Delivery Infrastructure
- Product Availability
- Data Accuracy

Dependencies:

- Third-Party Services
- Server and Hosting Providers
- Regulatory Compliance
- User Adoption
- Market Dynamics
- Supplier Relationships
- Payment Gateway Reliability

2.6 Requirement

Software Configuration:-

This software package is developed using React as front end. MongoDB as the back end to store the database.

Operating System: Windows NT, windows 98, Windows XP

Language: React, Visual Studio Code (front end)

Database: MongoDB (back end)

Hardware Configuration:-

Processor: Pentium(R)Dual-core CPU

Hard Disk: 40GB

RAM: 256 MB or more

2.7 Data Requirement

The data requirements for the Grocery Delivery Application are multifaceted and integral to its seamless operation. User data includes customer details, delivery driver information, and store

owner profiles, essential for personalization and communication. Product data encompasses a comprehensive catalog of items, including names, descriptions, pricing, and availability, enabling users to make informed choices. Order data, consisting of order details and status, ensures efficient order fulfillment. Location data aids in precise delivery routing, and payment data is crucial for secure financial transactions. Promotional data tracks discounts and promotions, while feedback and reviews capture user sentiments and support interactions. Analytics and reporting data empower data-driven decisions, and operational data includes server logs for performance assessment. Compliance and regulatory data ensures adherence to local and national laws, and backups secure data against loss. Wishlist and historical data serve users' reference and recall needs, while API data connects to third-party services. Notifications and messaging data facilitate in-app communication. These data requirements collectively underpin the application's functionality, security, and user experience, demanding responsible handling and storage in compliance with data privacy and security regulations.

3. External Interface Requirement
3.1 GUI

- User Registration and Login
- Product Catalog
- Shopping Cart
- Order Placement
- Payment Processing
- Order Tracking
- User Profile
- Promotions and Discounts
- Feedback and Reviews
- Notifications
- Wishlist and Saved Items
- Accessibility Options
- Privacy Settings
- Logout and Account Deactivation

4. System Features

The Grocery Delivery Application encompasses a range of system features designed to revolutionize the grocery shopping experience. These features cater to the needs of customers, store owners, and delivery drivers, streamlining operations and enhancing convenience. Users can register and manage their accounts, effortlessly browse a well-organized product catalog, and place orders with ease, customizing their choices and selecting delivery or pickup preferences. Payment processing is secure and straightforward, supported by multiple methods. Real-time order tracking keeps users informed, while customer support and feedback mechanisms ensure a seamless shopping experience.

For store owners, the application offers robust inventory management tools, enabling them to list products, set prices, and track stock levels accurately. Delivery drivers benefit from clear instructions and real-time location data for efficient route planning and order fulfillment. The system features personalization through promotions and discounts, data-driven analytics for informed decision-making, and user-friendly interfaces for accessibility. With an emphasis on privacy settings, notification management, and ease of use, the Grocery Delivery Application aims to create an efficient, inclusive, and digitally-driven grocery shopping ecosystem that meets the needs of various user classes and enhances the overall shopping experience.

5. Other Non-functional Requirements

5.1 Performance Requirement

Performance requirements for the Grocery Delivery Application are integral to ensuring its responsiveness and reliability. The application must be optimized to handle peak loads efficiently, providing swift response times and smooth user interactions. It should be capable of scaling seamlessly to accommodate a growing user base and surges in demand, particularly during peak shopping hours or promotional events. The application must maintain high availability, minimizing downtime to ensure that users can access and utilize the service without interruptions. These performance requirements are crucial for delivering a seamless and satisfying shopping experience, as users depend on the application for efficient, timely, and reliable grocery delivery services.

5.2 Safety Requirement

Safety requirements for the Grocery Delivery Application are paramount, especially in the context of ensuring the well-being and health of users, particularly during the ongoing COVID-19 pandemic. The application must prioritize safety by minimizing physical contact between customers, store owners, and delivery drivers. This includes contactless payment options, no-contact delivery methods, and stringent hygiene practices in food handling. Data security and privacy measures must be robust to safeguard users' sensitive information.

5.3 Security Requirement

Security requirements are fundamental to the Grocery Delivery Application, encompassing a multi-layered approach to safeguard user data, transactions, and the overall system. The application must employ robust encryption protocols, such as SSL/TLS, to protect sensitive information during data transmission. Firewalls and intrusion detection systems are crucial to prevent unauthorized access and identify potential threats.

User authentication is a critical security feature, ensuring that only authorized individuals can access and modify their accounts. Payment processing should adhere to strict security standards,

protecting financial data from theft or fraud. The application should continuously monitor and audit system activity to detect and respond to security incidents promptly.

Compliance with data privacy regulations, both local and national, is mandatory. This includes stringent data handling practices, consent management, and data access controls. Regular security updates and patches are essential to address vulnerabilities and keep the system resilient against emerging threats.

The Grocery Delivery Application's security requirements aim to provide a safe and secure environment for users, protecting their data, privacy, and financial well-being. By implementing these security measures, the application ensures trust, reliability, and the confidentiality of sensitive information.

6. Other Requirements
6.1 Data and Category Requirement

Data and category requirements play a vital role in the Grocery Delivery Application's functionality and user experience. To ensure smooth operations, the application must maintain a comprehensive and well-organized database of products, encompassing various categories and subcategories. This ensures that users can easily browse, search, and select items based on their preferences and needs. Accurate and up-to-date product data, including names, descriptions, prices, images, and availability, is critical to inform user choices. Moreover, data requirements extend to user information, order details, payment records, promotions, and more. Proper categorization of products and structured data is essential for efficient filtering and sorting, enhancing the overall shopping experience and enabling users to find the groceries they require effortlessly. These data and category requirements form the backbone of the application, ensuring that users can access a wide array of products while experiencing a user-friendly and well-organized interface.

6.2 Appendix

A: Admin, Acronyms, Assumptions B: Browsing, Basket, Business rules C: Catalog, Customer, Conventions D: Delivery, Data requirements, Dependencies E: External interfaces F: Feedback, Frontend G: GUI, Grocery stores H: Hardware configuration I: Inventory, Integration J: Job scheduling K: Key features L: Location services, Login, Logistics M: Mobile app, Members N: Notifications, Non-functional requirements O: Operating environment, Order tracking P: Payment processing, Performance, Promotions Q: Quality assurance R: Rating and reviews, Regulatory compliance, Requirements S: Security, Server infrastructure, Software configuration, Store owners T: Tracking, Testing U: User classes, User requirements V: Vehicle tracking, Vendor partnerships W: Wishlist, Web app.

6.3 Glossary

The glossary for the Grocery Delivery Application comprises a comprehensive list of key terms and concepts integral to understanding the various facets of the application. These definitions are essential for users, developers, and stakeholders to navigate the intricacies of the platform effectively.

For instance, an "Admin" is an individual responsible for managing and overseeing the application, often in charge of store operations and user support. "Business Rules" are established policies that dictate how the application functions, encompassing pricing, discounts, and delivery guidelines.

The "Catalog" represents the complete inventory of products available in the application, organized into categories for user convenience. "Customers" are individuals who use the application to order groceries, while "Conventions" refer to established coding, design, and usability standards that maintain uniformity.

The glossary also covers crucial concepts like "Delivery," the process of transporting orders, and "Data Requirements," which outline the specific data types the application must collect and manage. "Dependencies" are external factors or components that the application relies on, such as third-party services and external systems.

These definitions are vital for ensuring clarity and consistency in communication and for enhancing the overall understanding of the Grocery Delivery Application's operations and functionalities.

6.4 Class Diagram
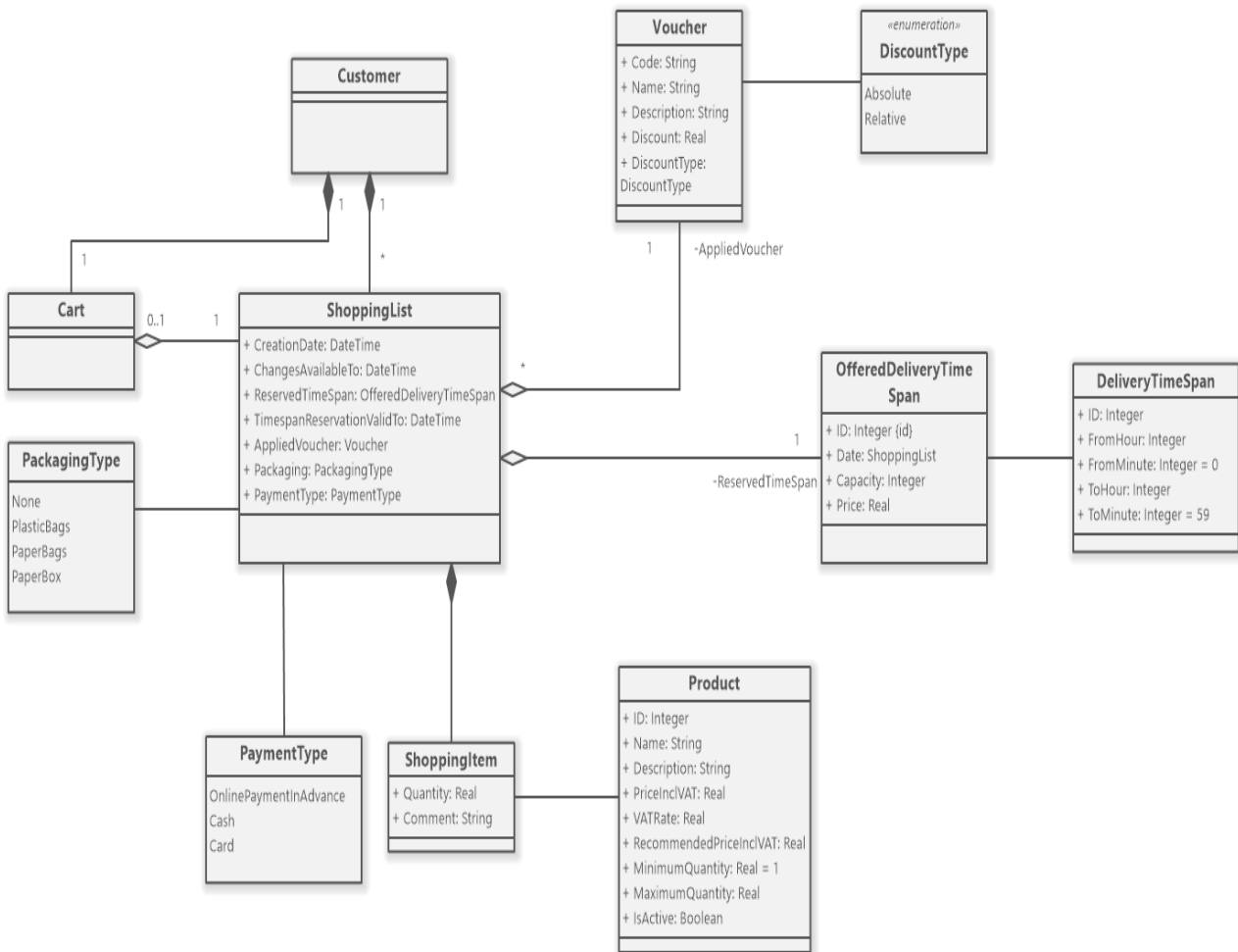
The class diagram for the Grocery Delivery Application is a visual representation of the various classes and their relationships within the system. These classes typically include users (such as customers, delivery drivers, and store owners), core application components (such as the shopping cart, order processing, and payment handling), and external interfaces (representing interactions with payment gateways and location services). The class diagram serves as a blueprint for the application's structure, helping developers understand how different components of the system interact and ensuring a well-organized and efficient design. It plays a pivotal role in modeling the application's architecture, making it a fundamental tool for effective software development and system analysis.