HuaChang Growmax

Software Requirements Specification

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1 DOCUMENT CHANGE CONTROL

Version	Date	Authors	Summary of Changes
1	6/10 /24	Benjamin Tan Chen Hern Wallace Iglesias Chandrio Hein Htet Naing Mahanthe Acharige Sachindri Sudeepa Chandrasir	Finished the first version of the Software Requirements Specification (SRS)

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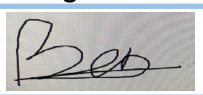
Benjamin Tan Chen Hern	Leader		17/09/2024
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1. Introduction

The software that is going to be developed is a **Sales Order Application** designed for Huachang Growmax. The system will streamline and automate the sales order management process, enabling sales representatives and internal staff to easily create, process, and track orders through an intuitive, web-based interface. The team will create our own databases that are needed for the system and inject existing inventory and customer data into them. This document offers a detailed outline of the software's main functionalities, guiding the team through the development of a system that aligns with Huachang Growmax's business needs.

1.1 Purpose

The purpose of this Software Requirements Specification (SRS) is to document and define the functional and non-functional requirements for the Sales Order Application that is going to be developed. This document will serve as a guide for the development team to build the software, ensuring that all stakeholders' expectations and requirements are met. The target audience includes the development team, project supervisor and stakeholders at Huachang Growmax.

1.2 Scope

The Sales Order Application aims to automate and optimize Huachang Growmax's order management system, replacing manual and semi-automated processes with a streamlined, user-friendly platform.

The system **will**:

- Allow sales representatives to create and manage customer orders efficiently.
- Provide inventory availability information to minimize order processing delays.
- Generate sales reports and track order statuses for management oversight.
- Support multi-user access, with authentication to secure sensitive data.
- Generate real-time sales order reports.
- Provide order confirmation and tracking notifications to customers.
- Provide price history for specific customers.

The system **will not**:

- Handle financial transactions or payment processing.
- Manage human resources or payroll functions.
- Include a customer-facing e-commerce interface.
- Integrate with Huachang Growmax's existing customer and inventory databases.

Applications/Uses

The Sales Order application will be used internally by Huachang Growmax's sales team and management. It will streamline the workflow of creating, processing, and managing sales orders. The system's objectives are to reduce manual data entry, improve order processing efficiency, and increase the accuracy of sales reporting, contributing to enhanced operational efficiency and customer satisfaction.

Benefits:

- Improved order accuracy and efficiency through automation.
- Frequent inventory availability updates to avoid over-ordering or stockouts.
- Better sales performance tracking through detailed reporting.
- Increased customer satisfaction with faster order processing and tracking capabilities.

The **Sales Order Application** will enable Huachang Growmax to improve order accuracy, reduce processing time, and enhance overall customer satisfaction.

1.3 Definitions, Acronyms and Abbreviations

- **SRS**: Software Requirements Specification
- **GUI**: Graphical User Interface
- **DBMS**: Database Management System
- **API**: Application Programming Interface
- **CRM**: Customer Relationship Management
- **UAT**: User Acceptance Testing
- **Huachang Growmax**: The client company, established in 2012, operating in the fertilizer industry
- **Sales Order Application**: The software being developed to manage sales orders for Huachang Growmax.

2. Overall Description

The Sales Order Application is a new, standalone system designed to replace the current manual order management process at Huachang Growmax. It will automate key functions related to order creation, processing, and tracking. The system will have its own databases in order to store crucial data such as inventory and customer data. The application is not a prototype but a fully developed system that will be deployed company-wide, serving Huachang Growmax's sales representatives and management via order confirmation email notification.
serving both internal users (sales reps and management) and external customers via order confirmation notifications.

2.1. Product Features

- **Order Management**: Sales representatives can create, edit, and cancel orders through a streamlined interface.
- **Price History:** Sales representatives will be able to see a specific customer's price order history.
- **Inventory Availability Update**: Inventory availability data will be updated frequently to ensure order accuracy.
- **Reporting and Analytics**: Managers can generate sales reports and track the performance of sales reps.
- **User Authentication**: Secure login and role-based access control to protect sensitive information.
- **Order Tracking**: Customers and internal users can track order statuses and receive automated notifications.

2.2. System Requirements

Minimum Hardware Requirements

- **Processor**: Intel i5 or equivalent
- **Memory**: 8 GB RAM

- **Storage**: 50 GB available disk space
- **Display**: 1366 x 768 resolution or higher
- **Network**: 10 Mbps internet connection for optimal performance

Minimum Software Requirements

- **Operating System**: Windows 10 or later / macOS 10.13 or later
- **Web Browser**: Latest version of Chrome, Firefox, or Edge
- **Database**: MySQL or Microsoft SQL Server
- **Server**: Apache Tomcat or IIS
- **Development Tools**: Visual Studio, Git, and Docker for containerization

Production requirements may involve a more robust setup, particularly for server and database performance, to handle increased loads as the company grows.

2.3. **Acceptance Criteria**

The following major acceptance criteria must be met for the system to be approved for deployment:

- **User Interface**: The system must have an intuitive and easy-to-navigate GUI, validated by user acceptance tests.
- **Order Accuracy**: Orders must be processed with a 99.9% accuracy rate, ensuring no errors in inventory or customer details. (Errors that is made by users will not considered a system error)
- **Performance**: The system must handle at least 10 concurrent users without performance degradation, with pages loading within 5 seconds.
- **Security**: Only authenticated users should be able to access order and customer data. On top of that, only the master admin will be able to add more accounts for the Sales Order Application.

2.4. **Documentation**

The following documents will be delivered alongside the Sales Order Application:

- **User Manual**: Detailed guide for sales representatives and administrative users on how to use the system.
- **Technical Manual**: In-depth documentation for IT and support staff such as, website hosting, database hosting, and system maintenance procedures.
- **Testing Reports**: Reports generated during system testing phases, including results from UAT and external testing.

3. **Functional Requirements**

1.Order Creation

- Sales representatives can create new sales orders by entering product details, quantities, customer information, and delivery dates.
- The system will pull product availability from the inventory database in real-time to ensure the requested items are in stock.

- Sales reps can modify or cancel orders prior to confirmation.

2.Order Processing

- The system will automatically verify inventory levels, assign stock to orders, and update the inventory database.
- Orders will be routed for approval if they exceed pre-set thresholds (e.g., discounts, large quantities).
- Once an order is approved, the system will generate an invoice and update financial records.

3.Order Tracking

- Sales reps and management can track the status of orders in real-time (e.g., processing, shipping, delivered).
- Customers will receive email notifications at key stages, such as order confirmation, dispatch, and delivery.

4.Inventory Management

- The system will update inventory levels in real-time based on orders placed.
- Managers can view and adjust inventory levels directly within the system.

5.Customer Management

- Sales reps will be able to store and manage customer information, such as contact details, purchase history, and order preferences.
- The system will allow for customer segmentation for more personalized sales strategies.

6.Reporting

- Management will be able to generate reports on sales performance, order statuses, inventory levels, and customer data.
- Reports can be customized based on date range, product, region, or sales rep.

7.Notifications

- The system will send automated email notifications to customers when orders are confirmed, processed, and shipped.
- Sales reps and management will receive alerts for pending approvals, low inventory, or critical system issues.

8.User Roles and Permissions

- Sales reps will have access to create and manage their own orders.
- Management will have access to all sales orders and reporting tools.
- System administrators will manage roles, permissions, and user access.

4. **Non-Functional (Quality) Requirements**

*1.*Performance

- The system must be able to process at least 100 concurrent users without performance degradation.
- The response time for database queries (inventory checks, order creation) must be under 2 seconds.

2.Scalability

- The system must be scalable to accommodate future expansion, including additional users, customers, and orders without requiring major architectural changes.

3.Availability

- The system must have 99.9% uptime, ensuring availability during business hours, with scheduled maintenance outside working hours.

4.Security

- Customer data, including payment information, must be encrypted in transit and at rest.
- Only authorized personnel should be able to access sensitive data, such as financial information.
- The system must comply with data privacy regulations, such as GDPR.

5.Usability

- The system should have an intuitive interface with minimal training required for sales reps.
- Error messages and prompts must be clear and guide users to correct actions.

6.Maintainability

- The system should be easy to update, with modular components allowing for isolated changes without affecting the entire application.
- Documentation must be provided for all major components of the system, including APIs and database schemas.

7.Testability

- All functions, including order creation, processing, and tracking, must be testable with automated unit and integration tests.
- The system should have a staging environment for testing before deployment.

8.Reliability

- In case of a system failure, the application should be able to recover without data loss.
- Backup systems should be in place for data, with daily backups stored securely.

5. High–Level System Architecture

The Sales Order Application is designed as a web-based system to streamline the sales order management process for Huachang Growmax. The architecture is organized into three main layers: the Presentation Layer, Application Layer, and Data Layer, ensuring scalability, flexibility, and maintainability. The system will be used internally by sales representatives, administrators, and warehouse staff, and is designed to facilitate order creation, management, and inventory tracking.

5.1. Presentation Layer

The Presentation Layer is the interface through which the internal users interact with the system. This layer focuses on providing an intuitive, user-friendly interface that allows sales representatives, administrators, and warehouse staff to perform their roles efficiently.

Key Responsibilities:

- **Order Management Interface**: A web-based user interface that enables sales representatives to create customer orders.
- **Inventory Management Interface**: Allows warehouse staff to monitor stock levels and update inventory when necessary.
- **Order Status Tracking**: Sales reps can check the status of each order to update clients and coordinate with the warehouse staff on order fulfillment.
- **Role-Based Access Control**: Ensures that users only have access to functions specific to their role:
    - **Sales representatives**: Can manage customer orders, check stock availability, and track order status.
    - **Warehouse staff**: Can view and update inventory information.
    - **Administrators**: Can manage orders, generate reports, and configure user roles.

The Presentation Layer ensures that each type of user has a role-specific interface that allows them to carry out their tasks with ease.

5.2. Application Layer

The Application Layer processes requests from the Presentation Layer and manages the system's core business logic. It ensures that sales orders are processed correctly, inventory is updated in real-time, and all role-based access controls are enforced.

Key Responsibilities:

- **Order Processing**: Sales orders submitted by the sales reps are validated, processed, and sent to the warehouse for fulfillment. The application layer updates order statuses as they move through stages like "Order Received", "In Process", and "Dispatched".
- **Inventory Management**: Checks stock availability when orders are created. Warehouse staff can update inventory levels as stock is replenished or used.
- **User Management**: Handles user authentication and ensures that only authorized users can access the system. It also enforces role-based access control to make sure users only see functions relevant to their role (sales, warehouse, or admin).
- **Order Tracking**: Sales representatives can track orders in real-time, providing customers with accurate delivery expectations.
- **Security Management**: Enforces access control, data encryption, and secure session management to protect sensitive sales data.

The Application Layer ensures smooth communication between the user interface and the database, handling all the system's logic, calculations, and rule enforcement.

5.3. Data Layer

The Data Layer is responsible for securely storing and managing all the data necessary for the system to function. This includes customer information, product inventory, sales orders, and user roles.

Key Responsibilities:

- **Order Database**: Stores all order-related information, including customer details, products ordered, quantities, and order statuses.
- **Inventory Database**: Stores product details, including stock levels, product descriptions, and pricing. This database is updated in real-time based on orders placed and inventory updates from warehouse staff.
- **User Database**: Stores information about users (sales reps, administrators, and warehouse staff), including their roles and permissions.
- **Backup and Recovery**: Ensures that regular data backups are taken to prevent data loss and enable recovery in case of failure.
- **Data Security**: Protects sensitive sales and inventory data by enforcing access control and encrypting data.

The Data Layer supports the application’s critical functions by providing a stable, secure, and scalable repository for all necessary data.

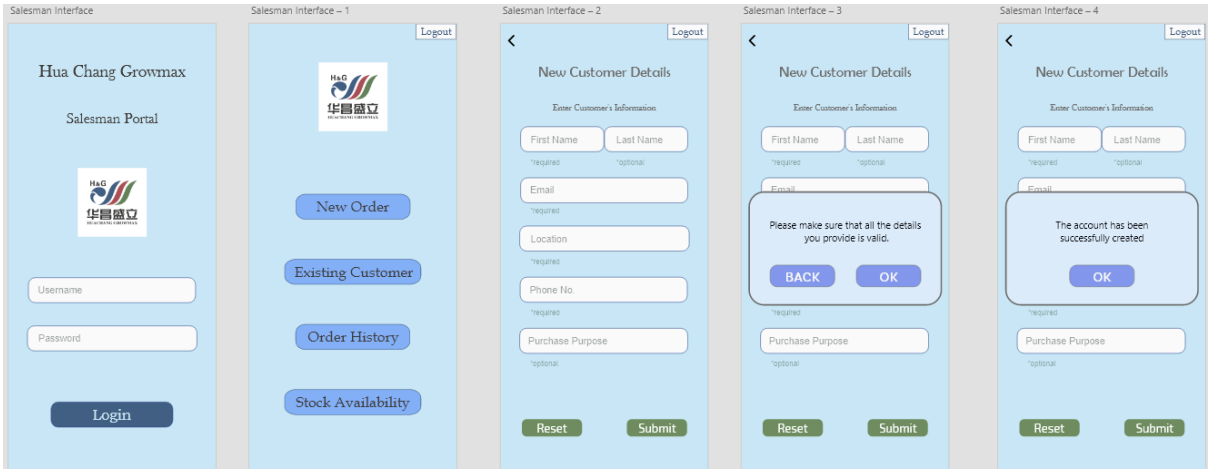
5.4. Data Flow Between Layers

1. **User Input (Presentation Layer)**:
    - A sales representative logs in to create a new order or check inventory levels.
    - A warehouse staff member updates the status of an order.
2. **Business Logic Execution (Application Layer)**:
    - The application layer validates the input (e.g., checking inventory levels before processing an order).
    - It interacts with the data layer to retrieve or update information, such as inventory availability or the status of an order.
3. **Data Storage and Retrieval (Data Layer)**:
    - The data layer stores and retrieves the necessary information (e.g., customer details, product inventory, order status).
    - It ensures data consistency and keeps track of real-time inventory levels and order statuses.
4. **Response Back to User (Presentation Layer)**:
    - Once the business logic is processed and the data is updated, the application layer sends the result back to the user interface.
    - The UI displays the updated information (e.g., order confirmation, stock levels) to the user.

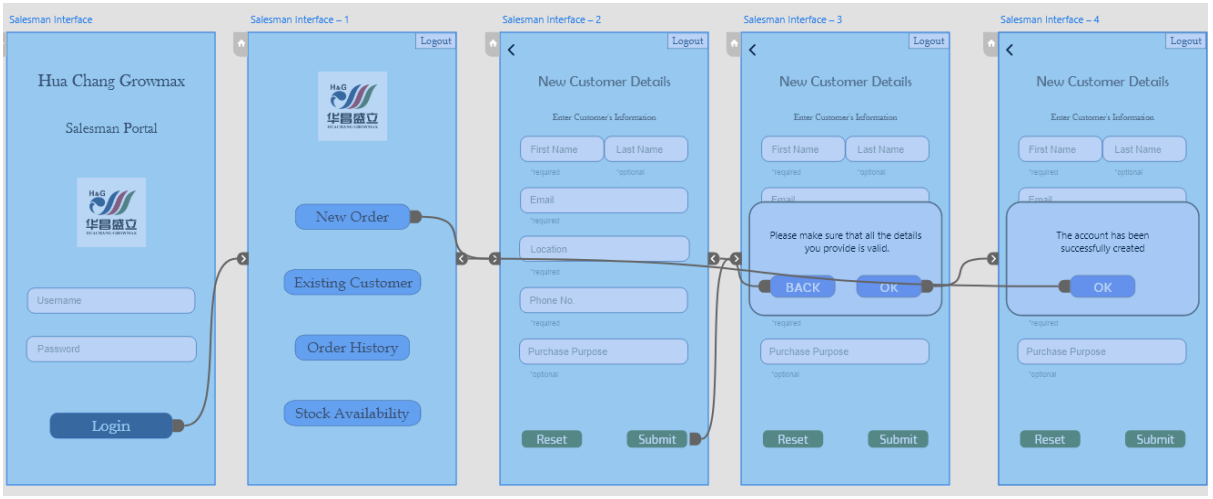
6. Interface Requirements

The different interfaces that the web-based order management system will employ to communicate with users, hardware, software, and communication protocols are described in this section. The smooth operation, data communication, and human interaction that together make up the system's functionality depend on each interface. These interfaces are covered in further detail in the ensuing subsections:

6.1. User Interfaces



This is an example of how the user interface will look like and how the user is able to interact with it. The above prototype shows when the salesman is required to enter a new order and it first allows the user to enter the customer's details to create an account for easier recognition in the future.



The above image shows how each button will redirect the user to a new page when it is clicked, also allowing a friendly user interface that the user can learn in a few hours.

6.2. **Hardware Interfaces**

Standard office and warehouse gear will be the system's primary hardware interface. Specialized hardware beyond the standard computing infrastructure is not needed. Making sure the system can effectively connect with the hardware in the operational environment is vital, too.

- **Desktop and laptop computers:** Salesman, administrators, and warehouse staff will mostly utilize desktop or laptop computers to access the system. Standard web browsers, such as Google Chrome and Mozilla Firefox, will be used by these devices to access the system. Beyond the conventional mouse, keyboard, and monitor, no more accessories are needed.

- **Mobile Devices:** While out in the field, salespeople, in particular, may utilize mobile devices like tablets and smartphones to communicate with the system. All important features, such as order creation and client management, will be available on smaller displays thanks to the system's mobile responsiveness.

- **Servers:** A local or cloud-based web server will host the system. This server will communicate with the database server, process data, and handle web requests. Especially during peak order times, it must enable high availability, scalability, and performance under fluctuating workloads. To handle data storage and guarantee customers receive fast response times, the servers should be equipped with the necessary hardware resources (CPU, RAM, and storage).

- **Database Server:** All customer, order, and inventory data will be managed by the database server. In order to prevent data loss and guarantee the integrity of the system's data, this server will need a large storage capacity and redundancy.

This system does not require any particular hardware communication protocols (such as USB or serial port connectivity), as all interactions will take place over regular internet protocols.

6.3. **Software Interfaces**

For proper operation, the web-based order management system will interact with a number of software programs. For the system to continue operating with integrity, each software component is essential. It is necessary to have the following software interfaces:

- Database Management System (DBMS): To store and manage customer data, order history, stock availability, and user credentials, the software will communicate with a database management system (such as MySQL version 8.0). To protect data integrity and stop unwanted access, SQL queries will be used during communication between the application and the DBMS over a secure connection. Depending on the needs for scalability, the DBMS will either be hosted on the same server or a separate database server.

- Web Server: The system will be run on a web server (such as Nginx or Apache HTTP Server 2.4) that handles user HTTP/HTTPS queries. This program will communicate with the backend elements, manage user requests, and support the frontend interface. Additionally, SSL certifications will be enforced for secure interactions.

- Payment Gateway Integration: To securely process online banking payments, the system will communicate with an external payment gateway (such as Touch 'n Go or Bank QR payment). The payment gateway's API interface will enable smooth transaction processing while guaranteeing compliance to security guidelines .

- WhatsApp API: In order to provide automatic alerts on order status, delivery updates, and any problems detected during order processing, the system will establish a connection with the WhatsApp API. This integration ensures that all stakeholders (salesmen, admins, warehouse workers) are constantly informed in real-time.

- Email Server (Optional): In addition to WhatsApp, the system may communicate with an email server (such as Gmail or Microsoft Exchange) to transmit notifications. Users who would rather get updates via email will have more communication options with this option.

6.4. **Communication Interfaces**

For the system to guarantee data flow between the server, client, and external systems, communication interfaces will be crucial. We'll use the subsequent communication protocols:

- HTTP/HTTPS: The HTTP/HTTPS protocol will be used for all communications between the user's browser and the web server. HTTPS will be used to ensure that all data passed between the client and server is encrypted, preventing unwanted access or interception of sensitive information (e.g., customer details, payment data). To ensure safe communication, the system will enforce SSL/TLS certificates.

- Local Area Network (LAN): Using the company's LAN, administrators and on-site warehouse employees can access the system. Standard Ethernet protocols will be used to control communication within the LAN, enabling quick and safe data transfer. The system ought to be obtainable over the organization's internal network for staff members who don't need internet connectivity.

- WhatsApp Messaging API: The official HTTPS API will be used by the system to connect to the WhatsApp platform. Through this integration, real-time messages about order updates, delivery status, and possible problems can be sent by the system. To avoid unauthorized use, all messages will be encrypted and API calls will require authentication.