**Project** **–** Web based Accounting Application

**Document Type:** High Level Solution Design Document

1. **Introduction**

1. **Purpose:**

* Provide a detailed high-level design (HLD) for the Web-based Accounting Application.
* Outline the system's architecture, functionality, and design considerations.

1. **Scope:**

* Cover architectural, functional, data, interface, security, performance, deployment, and maintenance aspects.
* Focus on providing a comprehensive overview of the system design.

1. **Intended Audience:**

* Development team members.
* Project stakeholders.
* Quality assurance (QA) engineers.
* System administrators.

1. **System Overview**

1. **Objectives:**

* Streamline financial management processes.
* Enhance data accuracy and integrity.
* Provide insights for informed decision-making.

1. **Key Features:**

* Financial reports generation.
* Chart of accounts management.
* Transaction recording and tracking.
* Invoice processing and management.
* Ad-hoc analysis and reporting.

1. **Architectural Overview**

1. **Microservices Architecture:**

* Each user story represented as a separate microservice.
* Ensures modularity, scalability, and maintainability.

1. **Components:**

* Frontend components development using Node.js and AngularJS.
* Backend services implementation with Spring Boot.
* Databases: MySQL for structured data, MongoDB for semi-structured data.
* Containerization with Docker for easy deployment and scalability.
* Continuous Integration with Jenkins.
* Deployment and hosting on AWS.

1. **Interactions:**

* Communication between frontend and backend components via APIs.
* Integration points with external systems for data exchange.

1. **Functional Overview**

1. **User Roles and Functionalities:**

* Finance Managers: Financial reports analysis.
* Accountants: Chart of accounts management.
* Bookkeepers: Transaction recording and tracking.
* Accounts Payable Clerks: Invoice processing and payment tracking.
* Accounts Receivable Clerks: Invoice generation and payment tracking.
* Financial Analysts: Ad-hoc analysis and reporting.

1. **High-Level-Design**

1. **General Ledger**

1. **Chart of Accounts**

**Component:** Chart of Accounts Management Module

**Functionality:**

* Ability to define and customize the chart of accounts.
* Support for multiple currencies.

**Sub-components:**

* Chart of Accounts Editor: Interface for adding, editing, and deleting account categories and subcategories.
* Currency Management: Module to manage currencies and exchange rates.

1. **Transaction Processing**

**Component:** Transaction Processing Module

**Functionality:**

* Real-time posting of financial transactions.
* Automated journal entry generation based on predefined rules.

1. **Periodic Closing**

**Component:** Periodic Closing Module

**Functionality:**

* Year-end closing procedures.
* Ability to close accounting periods.

1. **Accounts Payable**

1. **Vendor Management**

**Component:** Vendor Management Module

**Functionality:**

* Maintain a centralized vendor database.
* Track vendor performance and history.

1. **Invoice Processing**

**Component:** Invoice Processing Module

**Functionality:**

* Automated invoice capture and approval workflows.
* Integration with procurement systems.

1. **Payment Processing**

**Component:** Payment Processing Module

**Functionality:**

* Electronic fund transfer capabilities.
* Payment scheduling and optimization.

1. **Accounts Receivable**

1. **Customer Management**

**Component**: Customer Management Module

**Functionality**:

* Maintain a centralized customer database.
* Monitor and manage credit limits.

1. **Invoicing and Billing**

**Component**: Invoicing and Billing Module

**Functionality**:

* Automated invoicing based on sales orders or project milestones.
* Flexible billing options.

1. **Collections**

**Component**: Collections Module

**Functionality**:

* Aging reports for tracking overdue payments.
* Automated dunning and collection letters.

1. **Financial Reporting**

1. **Standard Reports**

**Component**: Standard Reports Module

**Functionality**:

* Generate standard financial statements with drill-down capabilities.
* Comparative analysis of financial performance.

1. **Custom Reports**

**Component**: Custom Reports Module

**Functionality**:

* Ad-hoc reporting with drag-and-drop functionality.
* Save and share custom report templates.

1. **Dashboards**

**Component**: Dashboard Module

**Functionality**:

* Real-time financial dashboards with key performance indicators.
* Customizable dashboard views.

1. **Budgeting and Forecasting**

1. **Budget Creation**

**Component**: Budget Creation Module

**Functionality**:

* User-friendly budget creation interface.
* Version control for budget iterations.

1. **Forecasting**

**Component**: Forecasting Module

**Functionality**:

* Historical data analysis for accurate forecasting.
* Scenario modelling for 'what-if' analysis.

1. **Compliance and Security**

1. **Regulatory Compliance**

**Component**: Compliance Module

**Functionality**:

* Automatic updates for compliance with accounting standards.
* Audit trails for compliance reporting.

1. **Access Control**

**Component**: Access Control Module

**Functionality**:

* Role-based access control with granular permissions.
* Two-factor authentication.

1. **Data Encryption**

**Component**: Data Encryption Module

**Functionality**:

* Encryption of data at rest and during transmission.
* Regular security audits and vulnerability assessments.

1. **Custom Reporting**

1. **Custom Reporting**

**Component**: Custom Reporting Module

**Functionality**:

* Ability to generate custom reports based on user-defined criteria.
* Advanced reporting features such as data visualization and filtering.

1. **Data Design**

1. **Data Entities:**

* Accounts
* Transactions
* Invoices
* Customers
* Vendors
* Financial reports

1. **Attributes and Relationships:**

* Define attributes for each entity (e.g., account name, transaction amount).
* Establish relationships between entities (e.g., invoice associated with a customer).

1. **Data Flow:**

* Illustrate how data moves through the system.
* Ensure efficient data management and retrieval.

1. **Interface Design**

1. **User Interfaces:**

* Intuitive navigation and user experience.
* Wireframes to visualize UI design.

1. **Application Programming Interfaces (APIs):**

* Define APIs for communication between frontend and backend components.
* Ensure consistency and security in API design.

1. **Integration Points:**

* Integration with external systems for data exchange.
* Maintain data integrity and security during integration.

1. **Security Design**

1. **Authentication and Authorization:**

* Implement secure authentication mechanisms (e.g., OAuth, JWT).
* Role-based access control (RBAC) to restrict user access to authorized functionalities.

1. **Encryption:**

Encrypt sensitive data at rest and in transit (e.g., SSL/TLS for communication, encryption for data storage).

1. **Data Protection:**

* Implement data protection measures to ensure confidentiality and integrity.
* Regular security audits and vulnerability assessments.

1. **Performance Design**

1. **Scalability:**

* Horizontal scaling to handle increasing loads.
* Load balancing strategies for distributing traffic across multiple instances.

1. **Responsiveness:**

* Optimizing frontend and backend code for faster response times.
* Asynchronous processing for time-consuming tasks.

1. **Resource Utilization:**

* Efficient use of hardware resources to minimize costs.
* Monitoring and optimization of resource usage.

1. **Deployment Design**

1. **Hardware and Software Requirements:**

* Specify hardware specifications for servers.
* Software dependencies and versions required for deployment.

1. **Deployment Environments:**

* Development, testing, staging, and production environments.
* Configuration management for consistency across environments.

1. **Deployment Processes:**

* Automated deployment pipelines with Jenkins.
* Rollback strategies for handling deployment failures.

1. **Maintenance and Support**

1. **System Monitoring:**

* Implement monitoring tools for tracking system health and performance.
* Alerts and notifications for critical events.

1. **Error Handling:**

* Comprehensive error handling mechanisms.
* Logging and error reporting for debugging purposes.

1. **Troubleshooting:**

* Procedures for diagnosing and resolving issues.
* Knowledge base for common troubleshooting scenarios.

1. **Ongoing Support:**

* User support channels (e.g., help desk, ticketing system).
* Regular updates and patches for bug fixes and security enhancements.