**Department of Technical Education**

**Government Polytechnic, Chitradurga**

**Capstone project**

**Format- 1**

**Capstone project Scope Document**

**Capstone project Title**: INVENTORY MANGMENT SYSTEM

**Capstone Project Members:** SHESHAGIRI S

DIVYA J

DILEEP G P

DHANYASHREEE A P

**Problem statement:** The current inventory management processes lack real-time visibility, resulting in inaccuracies, delays, and missed opportunities for cost savings. Manual data entry and disparate systems make it challenging to track inventory levels accurately, manage orders efficiently, and optimize stock replenishment. Without a centralized system, businesses face difficulties in maintaining optimal inventory levels, leading to increased carrying costs, stockouts, and customer dissatisfaction.

**Capstone Project Objective:** The primary objective of implementing an Inventory Management System is to streamline inventory operations, improve inventory accuracy, and optimize stock levels. By providing real-time visibility into inventory data, automating order processing, and implementing inventory optimization techniques, the IMS aims to minimize stockouts, reduce carrying costs, and enhance overall operational efficiency.

* Implement real-time inventory tracking to ensure precise data on stock levels across all locations.
* Minimize discrepancies between physical and system inventory through regular cycle counts and reconciliations.
* Establish effective ordering strategies based on demand forecasting and lead times to prevent stockouts and overstocking.
* Implement reorder points and minimum/maximum stock levels to maintain optimal inventory balance.
* Automate manual inventory processes like receiving, picking, and shipping to enhance accuracy and speed.

**Capstone Project Description:** The current inventory management processes lack real-time visibility, resulting in inaccuracies, delays, and missed opportunities for cost savings. Manual data entry and disparate systems make it challenging to track inventory levels accurately, manage orders efficiently, and optimize stock replenishment. Without a centralized system, businesses face difficulties in maintaining optimal inventory levels, leading to increased carrying costs, stockouts, and customer dissatisfaction.

**Capstone Project Deliverables:** The specific deliverables for your inventory management project will depend on our project scope, chosen technology stack, and university/program requirements. However, here's a general overview of common deliverables to consider

**Documentation:**

* **Project Proposal:** Outlines the project goals, objectives, methodology, timeline, and budget.
* **Problem Statement:** Defines the specific inventory management issue you're addressing and its impact.
* **Literature Review:** Analyzes existing inventory management solutions and relevant research.
* **System Requirements:** Specifies user needs, functionalities, and technical requirements.
* **System Design:** Describes the system architecture, components, and data flow.
* **Implementation Plan:** Details development tasks, milestones, and resource allocation.
* **Test Plan:** Outlines testing strategies and expected outcomes.
* **User Manual:** Provides instructions for using the developed inventory management system.
* **Final Report:** Summarizes the project, its achievements, challenges, and future recommendations.

**Technical Deliverables:**

* **Functional Prototype:** A working model showcasing core functionalities of the system.
* **Final Inventory Management System:** The complete, tested, and documented system solution.
* **Source Code:** Well-commented and version-controlled code for the system.
* **Test Results:** Documentation of conducted tests and identified issues.
* **Deployment Instructions:** Guide for installing and configuring the system in a production environment.

**Additional Deliverables:**

* **Presentation:** Capstone presentation summarizing the project and its outcomes.
* **Poster:** Visual summary of the project for conferences or exhibitions (optional).
* **Data and Analysis:** Any collected data and its analysis relevant to the project.

**Key Milestones:**

**Planning and Definition (1-2 weeks)**

* **Finalize Project Scope and Objectives:** Clearly define the problem you're solving and what your system aims to achieve.
* **Conduct Requirements Gathering:** Identify user needs, functionalities, and technical requirements through interviews, surveys, etc.
* **Develop System Design Document:** Outline the system architecture, components, data flow, and technology choices.
* **Create Project Plan and Timeline:** Define tasks, milestones, dependencies, and estimated durations for each activity.
* **Secure Resources and Budget:** Allocate necessary resources (people, software, hardware) and budget for project completion.

**Development and Implementation (4-8 weeks)**

* **Develop Functional Prototype:** Create a basic working model showcasing core functionalities for user feedback and validation.
* **Implement Core System Features:** Develop and integrate key functionalities based on the design document.
* **Conduct Unit Testing:** Test individual components and functionalities for code correctness.
* **Integrate and Test Overall System:** Ensure all components work together seamlessly and meet requirements.
* **Conduct User Acceptance Testing (UAT):** Get user feedback on the system's usability, functionality, and effectiveness.

**Deployment and Launch (1-2 weeks)**

* **M3.1: Finalize System Documentation:** Complete user manuals, technical documentation, and deployment instructions.
* **M3.2: Deploy System to Production Environment:** Install and configure the system in its final operating environment.
* **M3.3: Conduct System Training:** Train users on how to operate and utilize the new inventory management system.
* **M3.4: Go Live and Monitor System Performance:** Launch the system to users and monitor performance, stability, and user adoption.

**Maintenance and Improvement (Ongoing)**

* **M4.1: Address Initial Issues and Bugs:** Fix any identified issues and bugs reported by users or during monitoring.
* **M4.2: Collect User Feedback and Suggestions:** Gather feedback on system usage and potential improvement areas.
* **M4.3: Implement System Enhancements:** Address user feedback and incorporate new features or functionalities based on needs.
* **M4.4: Conduct Regular System Backups and Maintenance:** Ensure data security and system performance through backups and updates.

**Constraints:**

Every project faces limitations, and understanding these constraints is crucial for successful inventory management system development.

**Time:**

* **Project Deadline:** Establish a realistic deadline for project completion, considering available resources and complexity.
* **Development Time:** Estimate the time needed for each development phase (planning, design, coding, testing) and allocate accordingly.
* **User Availability:** Schedule user input, testing, and training sessions around user availability to avoid delays.

**Budget:**

* **Software and Hardware Costs:** Factor in the cost of any software licenses, hardware purchases, or cloud computing resources.
* **Development Costs:** Account for team member salaries, development tools, and any outsourcing expenses.
* **Maintenance Costs:** Consider ongoing costs for system maintenance, updates, and support.

**Technology:**

* **Technology Stack Limitations:** Chosen technologies might have inherent limitations like scalability, data storage capacity, or integration challenges.
* **Team Expertise:** Ensure your team has the necessary skills and knowledge to develop and maintain the chosen technology stack.
* **Existing Infrastructure:** Consider compatibility with existing IT infrastructure and potential upgrade needs.

**Resources:**

* **Team Size and Availability:** Be realistic about the amount of work your team can handle within the given timeframe.
* **Data Availability:** Ensure access to accurate and complete inventory data for system development and testing.
* **User Involvement:** Factor in user availability for testing, feedback, and training sessions.

**Additional Constraints:**

* **Regulations and Compliance:** Adhere to any industry-specific regulations or data privacy compliance requirements.
* **Security Requirements:** Implement necessary security measures to protect sensitive inventory data.
* **Scalability Needs:** Consider the system's ability to handle future growth and increased inventory volume.

**Estimated Capstone project Duration**

The estimated duration for a Capstone project developing an inventory management system can vary depending on various factors such as project scope, complexity, team size, resources availability, and the technology stack being used. However, here's a general breakdown of the estimated duration:

1**. Project Planning and Research (2-4 weeks):** This phase involves defining project objectives, scope, requirements gathering, and conducting research on inventory management systems, technologies, and best practices.

2**. System Design (4-6 weeks):** Designing the architecture, database schema, user interface, and defining system workflows based on the gathered requirements.

3. **Development (8-12 weeks):** Actual implementation of the system components, including backend development, frontend development, database implementation, integration of necessary APIs or third-party services, and testing.

4. **Testing and Quality Assurance (4-6 weeks):** Comprehensive testing of the system to ensure functionality, performance, security, and usability meet the defined requirements. This may involve unit testing, integration testing, system testing, and user acceptance testing.

5. **Refinement and Iteration (2-4 weeks):** Addressing any issues identified during testing, making necessary improvements, and iterating on the system based on feedback from stakeholders.

6. **Documentation and Deployment (2-4 weeks):** Creating documentation including user manuals, technical specifications, and deployment guides. Deploying the system to a production environment and ensuring it's ready for use.

7. **Training and Handover (1-2 weeks)**: Providing training sessions for end-users and stakeholders on how to use the inventory management system effectively. Handing over the system to the client or relevant stakeholders.

8. **Maintenance and Support (Ongoing**): Providing ongoing maintenance and support for the deployed system, addressing any issues, implementing enhancements, and ensuring the system continues to meet the evolving needs of the organization.

**Estimated Capstone project cost:**

1. **Personnel Costs:**

* **Developers**: The cost of developers will depend on their level of experience and the duration of the project. Calculate based on hourly rates or monthly salaries.
* **Designers**: If the project requires UI/UX designers, include their costs as well.

2**. Software and Tools:**

* **Development Tools**: Cost of software development tools, such as IDEs, version control systems, project management software, etc.
* Database Software: If using proprietary database software, consider licensing costs.
* Testing Tools: Cost of any testing frameworks or tools required for quality assurance.

3. **Hardware Costs:**

* **Servers/Cloud Services**: If the project requires servers or cloud services for deployment, include these expenses.
* Devices: If testing needs to be done on specific devices, such as barcode scanners or mobile devices, include their costs.

4. **Training and Documentation:**

* **Training Materials**: Cost of preparing training materials for end-users.
* Documentation: Cost of creating user manuals, technical documentation, etc.

5. **Miscellaneous Costs:**

* **Consultation Fees**: If you require external consultation or expertise, include these costs.
* Contingency: It's advisable to allocate a contingency budget for unexpected expenses or scope changes.

6**. Overhead:**

* **Office Space**: If the project is being conducted within an organization, include the overhead costs associated with office space.
* **Utilities:** Consider any additional utilities or administrative costs.

7**. Licensing Fees:**

* **Third-party Libraries or APIs:** If using paid third-party libraries or APIs, include their licensing fees.

Date

Signature of the student Signature of the cohort owner