Developing an E-Commerce Platform Using the Systems Development Life Cycle (SDLC)

Course Title: CS502052 – Enterprise Systems Development Concepts (ESDC)

Instructor: Phuc H. Duong

Overview

This case study examines the development of "ShopSmart," an e-commerce platform designed to cater to small and medium-sized enterprises (SMEs) looking to establish an online presence. The project follows the Systems Development Life Cycle (SDLC) framework to ensure a structured development process, with particular emphasis on the "Analysis" and "Design" phases.

1. Initiation Phase

- **Objective:** Establish the project's scope and objectives.
- **Key Activities:**
    - Identify business requirements through stakeholder meetings.
    - Conduct market research to analyze competitor platforms and current market trends.
    - Define project scope, goals, and constraints.

2. Planning Phase

- **Objective:** Develop a comprehensive project plan.
- **Key Activities:**
    - Define resource allocation including budget, personnel, and technologies.
    - Establish project timelines with milestones.
    - Develop risk management plans to identify and mitigate potential risks.

3. Analysis Phase

- **Objective:** Gather detailed business requirements and define system specifications.
- **Key Activities:**
    - Conduct interviews and surveys with potential users and SME owners to gather detailed requirements.
    - Develop use cases to illustrate how users will interact with the platform.
    - Perform system analysis to create detailed system requirements documents.
- **Output:**
    - Requirements Specification Document, which includes:

- Functional Requirements: User account management, product catalog, shopping cart, checkout process, payment integration.
- Non-functional Requirements: Performance benchmarks, security protocols, accessibility standards.

4. Design Phase

- **Objective:** Design the architecture and user interface of the e-commerce platform.
- **Key Activities:**
    - Create system architecture diagrams to outline the technical structure, including database schema, server architecture, and integration points.
    - Develop wireframes and mockups for the user interface, focusing on usability and aesthetic appeal.
    - Select appropriate technologies for front-end and back-end development.
    - Design data flow diagrams and entity-relationship diagrams to detail the flow of information and data relationships.
- **Output:**
    - System Design Document, which includes:
    - Architectural diagrams.
    - Database schemas.
    - Interface designs.
    - Detailed design specifications for each module.

5. Development Phase

- **Objective:** Build the e-commerce platform based on the design specifications.
- **Key Activities:**
    - Code development following the design documents.
    - Implementation of database and server infrastructure.
    - Integration of third-party services such as payment gateways.

6. Testing Phase

- **Objective:** Ensure the platform meets all functional and non-functional requirements.
- **Key Activities:**
    - Perform unit testing, integration testing, and system testing.
    - Conduct user acceptance testing with a select group of SMEs.
    - Address and fix any identified issues.

7. Implementation Phase

- **Objective:** Deploy the e-commerce platform in a live environment.

- **Key Activities:**
    - Set up the live environment and deploy the application.
    - Conduct final pre-launch checks.
    - Go live with real-time monitoring to handle any immediate issues.

8. Maintenance and Evolution Phase

- **Objective:** Provide ongoing support and update the platform based on user feedback.
- **Key Activities:**
    - Regular updates and patches to enhance functionality and security.
    - Continuous monitoring of system performance.
    - User support and troubleshooting.

Questions

1. **Requirements Gathering:** How effectively do you think the requirement gathering methods (interviews and surveys) employed in the Analysis phase identified the actual needs of SME owners? Could other methods potentially yield more comprehensive insights?
2. **User-Centered Design:** Considering the Design phase, discuss the impact of the user interface and user experience decisions on the potential success of the e-commerce platform. How crucial are these elements in retaining users and facilitating transactions?
3. **Technology Selection:** Analyze the technology choices made during the Design phase. What criteria should be prioritized when selecting technologies for building an e-commerce platform? Are there any emerging technologies that could have been considered?
4. **Security Protocols:** Evaluate the security measures proposed in the Non-functional Requirements. Are these measures sufficient for an e-commerce platform? What additional security strategies could be implemented to enhance data protection?
5. **Project Management:** Reflect on the Planning phase. How important is project planning in the context of SDLC, and what might be the consequences of inadequate project planning on the development of an e-commerce platform?
6. **Testing and Quality Assurance:** Discuss the role of testing in the SDLC. How can thorough testing impact the performance and reliability of an e-commerce platform? What testing methods would you prioritize for an online shopping platform?
7. **Scalability and Performance:** Considering the system's architecture designed in the Design phase, discuss how well the platform is prepared to scale with increasing numbers of users and products. What architectural choices are key to ensuring scalability and performance?
8. **Stakeholder Feedback:** How can stakeholder feedback during the user acceptance testing phase be effectively integrated into the final product? What processes should be in place to ensure that this feedback leads to meaningful improvements?
9. **Deployment Strategies:** Analyze the deployment strategy used in the Implementation phase. What best practices should be followed when deploying a new e-commerce platform? How can these strategies minimize downtime and customer disruption?

10. **Continuous Improvement:** In the Maintenance and Evolution phase, what strategies should be employed to ensure the platform remains relevant and competitive? How can continuous improvement be balanced with stable operations?