Assignment-2

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Assignment 2: Develop a case study analyzing the implementation of SDLC phases in a real-world engineering project. Evaluate how Requirement Gathering, Design, Implementation, Testing, Deployment, and Maintenance contribute to project outcomes.

Case Study: Implementation of SDLC in a Banking System

Introduction

- **Overview of the Project:**
  - Development of an online banking system to provide services like account management, fund transfers, and bill payments.
  - Objectives: Enhance customer convenience, ensure robust security, and reduce operational costs.
  - Team: Comprising business analysts, developers, testers, and cybersecurity specialists.
  - Timeline: 12 months.

Phases of SDLC in the Banking System Project

1. Requirement Gathering

- Business analysts conducted interviews with stakeholders, including bank staff and customers, to identify needs:
  - Functional: Account creation, transaction history, loan application.
  - Non-functional: High availability, data security, and performance under heavy load.
- Compliance requirements like GDPR and PCI DSS were reviewed.

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2. Design

- **System Architecture Design:** A three-tier architecture with a user interface, application logic, and database layer.
- **Security Measures:** Multi-factor authentication, encryption protocols, and secure APIs.
- Wireframes and prototypes for the user interface were created to visualize customer workflows.

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3. Implementation

- Modular coding approach: Separate modules for user management, transactions, and reporting.
- Use of technologies like:
  - **Frontend:** React for a responsive user interface.
  - **Backend:** Node.js for handling business logic.
  - **Database:** MySQL for secure and reliable storage.

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4. Testing

- **Unit Testing:** Each module (e.g., login, fund transfer) was tested individually.
- **Integration Testing:** Verified seamless communication between frontend, backend, and database.
- **Load Testing:** Ensured the system could handle peak traffic during salary disbursement periods.
- **Security Testing:** Penetration testing to identify vulnerabilities.

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5. Deployment

- Deployed in stages:
  - Pilot deployment in a single branch for limited users.
  - Full-scale deployment across all branches after feedback.
- Tools like Docker and Kubernetes were used for containerization and orchestration.

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6. Maintenance

- Regular updates for new features like mobile banking integration.
- Real-time monitoring of transactions using tools like Splunk.
- Prompt bug fixes and customer support.