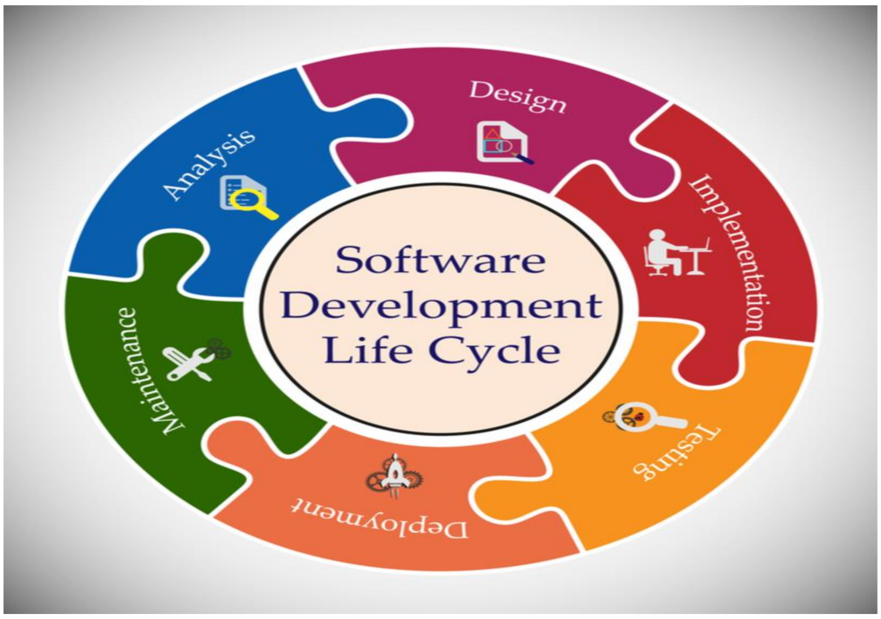
Assignment 2: Develop a case study analyzing the implementation of SDLC phases in a real-world engineering project. Evaluate how Requirement Gathering, Design, Implementation, Testing, Deployment, and Maintenance contribute to project outcomes.

==Software Development Life Cycle (SDLC)



1. **Planning and Requirement Analysis**:
   - Understand client needs and define project scope.
   - Identify quality assurance requirements and assess project risks.
2. **System Design**:
   - Create detailed specifications based on requirements.
   - Develop blueprints, flowcharts, and other design artifacts.
3. **Implementation (Coding)**:
   - Write actual source code based on the design.
   - Integrate different modules and components.
4. **Testing**:
   - Verify system functionality and identify defects.
   - Conduct unit, integration, and acceptance testing.
5. **Deployment**:

    - Roll out the system to users.
    - Install, configure, and ensure data migration.
6. **Maintenance and Support**:
    - Regularly update, fix bugs, and assist users.
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Case Study: Building an E-Commerce Platform

1. Requirement Gathering:

- **Objective**: Understand client needs and define project scope.
- **Implementation**: Conduct interviews, surveys, and workshops with stakeholders. Gather functional and non-functional requirements.
- **Impact**: Clear requirements prevent scope creep and ensure alignment with business goals.

1. **Assign Roles**:
    - Identify project stakeholders (internal and external).
    - Conduct interviews, workshops, and surveys.
    - Document functional and non-functional requirements.
2. **Visualize with Diagrams**:
    - Use tools like Microsoft Visio, Lucidchart, or draw.io.[2].
3. **Analyze and Prioritize**:
    - Categorize requirements.
    - Prioritize based on project goals and constraints.
4. **Validate and Refine**:
    - Review with stakeholders.
    - Ensure clarity and alignment.
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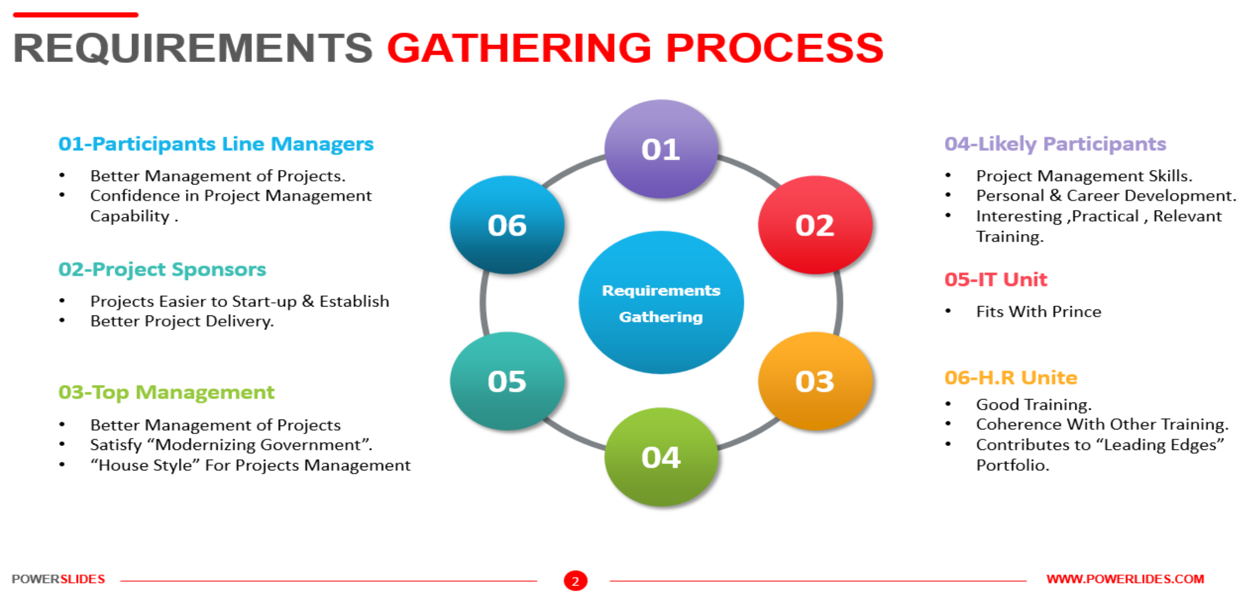

REQUIREMENTS GATHERING PROCESS

01-Participants Line Managers

- Better Management of Projects.
- Confidence in Project Management Capability .

02-Project Sponsors

- Projects Easier to Start-up & Establish
- Better Project Delivery.

03-Top Management

- Better Management of Projects
- Satisfy "Modernizing Government".
- "House Style" For Projects Management

04-Likely Participants

- Project Management Skills.
- Personal & Career Development.
- Interesting ,Practical , Relevant Training.

05-IT Unit

- Fits With Prince

06-H.R Unite

- Good Training.
- Coherence With Other Training.
- Contributes to "Leading Edges" Portfolio.

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2. , Design

- **Objective**: Create a blueprint for the system.
- **Implementation**: Develop system architecture, database schema, and user interfaces.
- **Impact**: A well-designed system minimizes risks, enhances scalability, and improves user experience.

1. **Objective**:

Transform all requirements into detailed specifications covering all aspects of the system.

Plan and assess security risks.

System Design Document: Accurately describes the system design, serving as input for development.

2. **Goals**:

Transform requirements into complete, detailed system design specifications.

3. Implementation (Coding):

- **Objective**: Write code based on design specifications.

- **Implementation**: Developers write and test code, integrating various components.
- **Impact**: Quality code ensures system reliability and maintainability.

Software Development Life Cycle (SDLC) is a critical step where the project begins to take shape. **Objective**:

    - Developers start writing the actual source code for the software.
    - This phase translates the design specifications into a functional product.
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3. **Key Activities**:
    - **Coding**: Writing code based on the design.
    - **Integration**: Combining different modules and components.
    - **Testing**: Ensuring code correctness and functionality.
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4. **Importance**:
    - Implementation brings the project to life.
    - It’s where the actual reorganization happens.

4. Testing:

- **Objective**: Verify system functionality and identify defects.
- **Implementation**: Conduct unit, integration, and user acceptance testing.
- **Impact**: Rigorous testing reduces post-deployment issues and enhances user satisfaction.

1. **Unit Testing**:

   Objective: Verify individual components (units) of the software.

   Implementation: Developers write test cases for specific functions or modules.

2. **Integration Testing**:

   Objective: Test interactions between different modules.

   Implementation: Combine units and test their interactions

3. **System Testing**:

   Objective: Validate the entire system against requirements.

: Test end-to-end functionality.

4. **Acceptance Testing**:

    Objective: Verify if the system meets business requirements.

    Implementation: Conducted by users or stakeholders.

5. Deployment:

- **Objective**: Roll out the system to users.
- **Implementation**: Install software, configure servers, and ensure data migration.
- **Impact**: Successful deployment leads to system availability and user adoption.

1. **Production Installation**:
    - Deploy the software to the production environment.
    - Install, configure, and ensure data migration.
2. **Customer Acceptance**:
    - Verify successful software execution, completeness, and correctness.
    - Essential for a smooth launch of the software.

6. Maintenance and Support:

- **Objective**: Ensure ongoing system performance.
- **Implementation**: Regular updates, bug fixes, and user support.
- **Impact**: Effective maintenance sustains system health and user trust.

Importance of the Maintenance Phase:

- **Bug Fixing**: Identifying and fixing software defects (bugs) missed during testing or reported by users.
- **Enhancements**: Adding new features or functionality as user needs evolve.
- **Adaptation to Changing Environments**: Ensuring compatibility with new hardware, operating systems, and external factors.
- **Performance Optimization**: Monitoring and optimizing software performance.
- **Security Updates**: Applying patches and addressing vulnerabilities.

Types of Maintenance:

Corrective Maintenance: Fixing bugs discovered after software deployment.

Adaptive Maintenance: Updating software to remain compatible with environmental changes.

Perfective Maintenance: Enhancing software based on user feedback or business needs.

Best Practices:

- **Regular Monitoring**: Continuously monitor software performance.
- **Version Control**: Maintain different versions for easy rollback.
- **Security Audits**: Regularly assess security vulnerabilities.
- **User Feedback**: Actively listen to user feedback for improvements.
- **Documentation**: Keep documentation up-to-date.
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