

Software Engineering Assignment

1) Complex General System Example

A good example of a complex general system is an Airport Management System.

Hierarchy:

- Airport (Main System)
 - Air Traffic Control System
 - Passenger Management System
 - Baggage Handling System
 - Security System
 - Retail and Services System

Models to Reduce Complexity:

- Modularization: Dividing into modules.
- Layered Architecture: Organizing into layers.
- Abstraction: Hiding details.
- UML Modeling: Using diagrams to visualize.

2) CMM Levels and Examples

CMM Levels:

1. Initial: Unpredictable processes.
2. Repeatable: Basic project management.
3. Defined: Standardized organization-wide.
4. Managed: Measured and controlled.

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5. Optimizing: Focus on improvement.

Companies at CMM Level 3:

- Infosys
- Tata Consultancy Services (TCS)
- Wipro Technologies
- Cognizant Technology Solutions
- Tech Mahindra

3) Incremental vs. Iterative Software Processes

Incremental: Build in parts, adding functionality.

Iterative: Refine the same feature multiple times.

Example:

- Incremental: Login system first, then cart.
- Iterative: Basic login, then secure login upgrade.

4) Complex Software Product Experience

Project: University Student Management System.

Information System: Manages student data.

Purpose: Automate administrative tasks.

Team Organization:

- Project Manager

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- Developers
- Database Admin
- Testers

Lifecycle Stages:

- Requirements, Design, Implementation, Testing, Deployment, Maintenance.

Model Similar: Waterfall with some iteration.

Improvement: Add prototyping, better stakeholder communication.

5) Most Effective Software Engineering Paradigm

Agile Development (e.g., Scrum) is most effective.

Reasons:

- Flexibility
- Strong collaboration
- Early feedback and frequent delivery.

6) Examples for Prototyping and Spiral Models

Prototyping:

- Mobile apps
- Healthcare portal
- E-learning platform

Spiral Model:

- Defense systems

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- Banking software
- Airline systems.

7) Software Project for Incremental Model

Proposed Project: Online Bookstore.

Scenario:

- First Increment: Book catalog.
- Second Increment: User accounts.
- Third Increment: Shopping cart.
- Fourth Increment: Reviews.

Why Incremental:

- Gradual feature delivery.
- Early usability.
- Adaptability to changes.