Overview of IT Industry

Key Concepts in Software and Software Engineering

Introduction to Software and Software Engineering

- Software: Programs that tell a computer how to function.
- Software Engineering: Systematic approach to design, develop, and test software.

What is Software?

- Software enables hardware to function.
- It is categorized as system software (e.g., OS) and application software (e.g., MS Word).

Types of Software

- 1. System Software: Operating Systems
- 2. Application Software: Productivity software
- 3. Programming Software: Compilers, Debuggers
- 4. Middleware: Connects software components

What is SDLC?

- Software Development Life Cycle (SDLC) is a process used to design, develop, and test software.
- Goal: Produce high-quality software that meets customer needs.

Phases of SDLC

- 1. Planning
- 2. Requirement Analysis
- 3. Design
- 4. Development
- 5. Testing
- 6. Deployment
- 7. Maintenance

SDLC Phase 1 - Planning

- Defines project goals and constraints.
- Involves project managers and stakeholders.

SDLC Phase 2 - Requirement Analysis

- Gathering functional and non-functional requirements.
- Involves use cases and user stories.

SDLC Phase 3 - Design

- Create software architecture, interfaces, and detailed design.

SDLC Phase 4 - Development

- Developers write code and build the application according to design.

SDLC Phase 5 - Testing

- Verifies the software meets the requirements.
- Types: Unit, Integration, System, Acceptance Testing.

SDLC Phase 6 - Deployment & Maintenance

- Deployment: Delivering the software to users.
- Maintenance: Fixing bugs and releasing updates.

What is a DFD?

- A Data Flow Diagram (DFD) represents the flow of data within a system.
- Example: Flipkart's order process - Customer, Cart, Payment, Order Confirmation.

Flowchart for Addition of Two Numbers

- Flowchart Example: Adding Two Numbers
- Start -> Input Number 1 & Number 2 -> Perform Addition -> Output Result -> End.

Use Case Diagram for Bill Payment on Paytm

- Actors: Customer, System
- Use Cases: Select service, Enter bill details, Make payment, Confirm payment.

Conclusion

- Importance of SDLC, DFD, Flowcharts, and Use Case Diagrams in software engineering.