Software Engineering Assignment

Module 1

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(1) What is software? What is software engineering?

Answer: Software in a computer refers to a collection of programs, data, and instructions that enable the computer to perform various tasks and functions. It is the non-tangible component of a computer system that contrasts with the physical hardware.

Software engineering is a systematic and disciplined approach to designing, developing, testing, and maintaining software systems. It encompasses a set of principles, practices, and methodologies used to create high-quality software that meets user requirements, is reliable, and is delivered within budget and on schedule. Software engineering is an essential discipline in the field of computer science and plays a crucial role in the development of software applications and systems.

Software engineering is a dynamic field that continues to evolve with technological advancements. It's a multidisciplinary domain that requires a combination of technical skills, creativity, problem-solving abilities, and effective communication. The goal of software engineering is to produce software that not only works as intended but also meets the needs and expectations of users while being reliable, maintainable, and scalable.

(2) Explain types of software.

Answer: Software can be broadly categorized into two main types:

1. System Software: This type of software manages and controls the hardware components of a computer and provides a platform for running application software. Examples of system software include:
    - Operating Systems (OS): These manage the computer's hardware resources, coordinate the execution of software, and provide user interfaces. Common examples include Windows, macOS, and Linux.

2. Application Software: Application software is designed to perform specific tasks or functions for the user. It includes a wide range of software such as:
    - Word Processors: Like Microsoft Word or Google Docs for creating and editing documents.
    - Web Browsers: Like Google Chrome, Mozilla Firefox, or Microsoft Edge for accessing websites and online content.

Software is created through programming, which involves writing code using programming languages. Once created, software is installed on a computer's storage devices and can be executed by the computer's hardware when needed.

(3) What is SDLC? Explain each phase of SDLC.

Answer: SDLC stands for Software Development Life Cycle. It is a systematic process used by software developers to design, develop, test, and deploy software applications. The SDLC consists of several phases, each of which plays a crucial role in the successful development of software. These phases ensure that software is built efficiently, is of high quality, and meets user requirements. The exact number and naming of phases can vary depending on the methodology used, but here is a typical breakdown of the SDLC phases:

1. Planning and Requirements Gathering:
    - In this initial phase, the project's goals and requirements are identified. Stakeholders' needs are collected, and a detailed understanding of what the software should accomplish is established.
    - A project plan, including budgets, timelines, and resources, is created.
    - Feasibility studies may be conducted to determine whether the project is viable.
2. System Design:
    - During this phase, the high-level system architecture is defined. This includes identifying components, data structures, and their interactions.
    - User interfaces and system interfaces are designed.
    - The goal is to create a comprehensive blueprint for the software.
3. Software Development:
    - This is where the actual coding and development work takes place.
    - Developers write the source code based on the design specifications.
    - Multiple programming languages and development tools can be used depending on the project requirements.

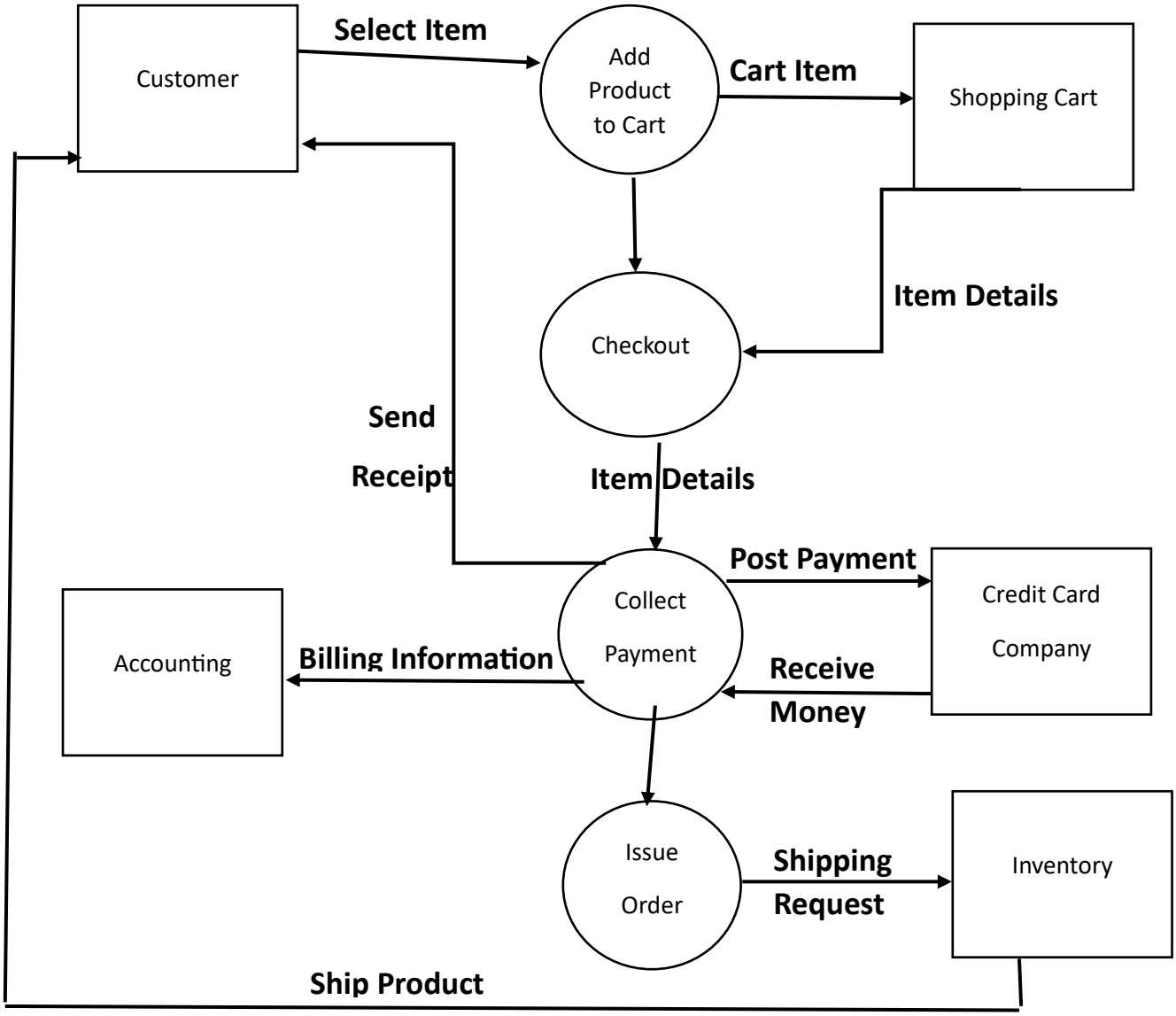
4. Testing:
    - This phase involves testing the software for defects and issues.
    - Different levels of testing are performed, including unit testing (testing individual components), integration testing (testing how different components work together), and system testing (testing the entire system).
    - Bugs are identified, reported, and fixed during this phase.
5. Deployment:
    - Once the software has passed testing and is deemed ready for production, it is deployed to the live environment.
    - Deployment may involve installing the software on servers, configuring databases, and making it accessible to users.
6. Maintenance and Support:
    - After deployment, the software enters the maintenance phase.
    - This phase includes ongoing support, bug fixes, updates, and enhancements as needed.
    - Maintenance can continue for the software's entire lifecycle.
7. Evaluation and Feedback:
    - After deployment, it's essential to gather feedback from users and stakeholders to assess how well the software is meeting its goals.
    - This feedback can lead to improvements and further development iterations.
8. Documentation:
    - Throughout the SDLC, documentation is crucial. It includes design documents, user manuals, and technical documentation.
    - Proper documentation aids in understanding, maintaining, and evolving the software.

The SDLC provides a structured approach to software development, helping ensure that software is created efficiently, on time, within budget, and with a focus on quality and user satisfaction. The choice of SDLC model or methodology depends on the specific project's requirements and the development team's preferences.

(4) What is DFD? Create a DFD diagram on Flipkart.

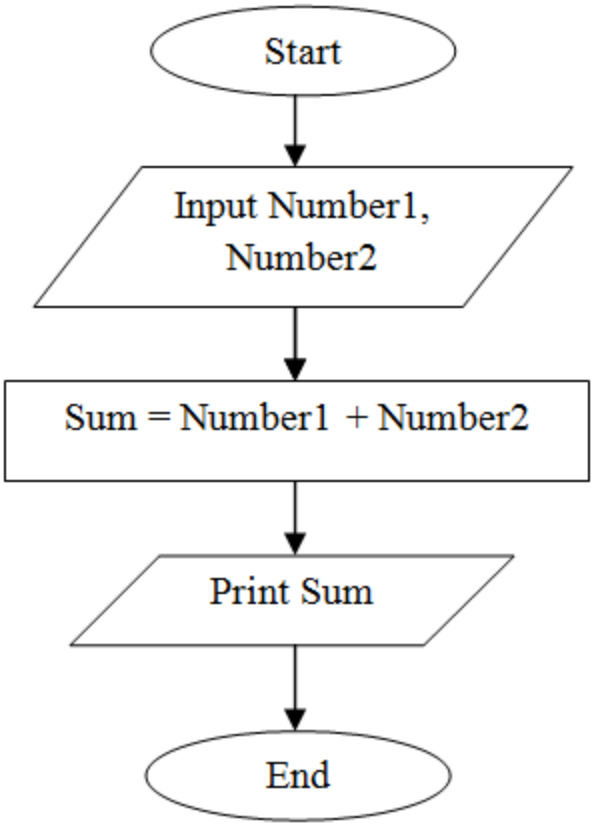
Answer: A DFD, or Data Flow Diagram, is a visual representation that illustrates the flow of data within a system or process. It shows how data moves through various processes, data stores, and external entities. DFDs are used for modeling and understanding complex systems and processes.

Below is the Data flow Diagram for Flipkart shopping :



(5) What is Flow chart? Create a flowchart to make addition of two numbers.

Answer: A flowchart is a visual representation of a process or algorithm, using various shapes and arrows to depict the sequence of steps and decision points in a clear and easy-to-understand manner. Flowcharts are commonly used to illustrate complex processes or to design, document, and understand procedures.



1. It starts with "Start."
2. It then proceeds to "Input First Number," where the user is prompted to enter the first number.
3. From there, it moves to "Input Second Number," where the user is prompted to enter the second number.
4. Next, it goes to "Add the Numbers," where the two input numbers are added together.
5. After addition, it proceeds to "Display the Result," where the result of the addition is shown.
6. Finally, it ends with "End."

(6) What is Use case Diagram? Create a use-case on bill payment on paytm.

Answer: A use case diagram is a visual representation of the functional requirements of a system from the user's perspective. It illustrates the various ways that users (actors) interact with a system to achieve specific goals or perform

specific tasks. Use case diagrams are often used in software engineering to model the interactions between users and the software system.

Here's a simplified use case diagram for the "Bill Payment" process on Paytm: