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Assignment : Module 1

Assignment Name : SE – Overview of IT Industry

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1. What is software? What is software engineering?

→Software is a program or set of programs containing instructions that provide the desired functionality. Engineering is the process of designing and building something that serves a particular purpose and finds a cost-effective solution to problems.

- **Software Engineering :**

➔ Software Engineering is the process of designing, developing, testing, and maintaining software. It is a systematic and disciplined approach to software development that aims to create high-quality, reliable, and maintainable software.

2. Explain types of software.

➔ The **2** main categories of software are

1) application software :

→Application software is designed for end-users to perform specific tasks. Application Softwares are usually defined by developers.

Examples :

Flipkart
Facebook
Google
YouTube

2) **system software:**

➔ System software is software that directly operates the computer hardware and provides the basic functionality to the users as well as to the other software to operate smoothly. System software basically controls a computer's internal functioning and also controls hardware devices such as monitors, printers, and storage devices, etc.

Examples:

Notepad
Clock
Calender

3) **Programming Software** : includes tools and environments used by developers to create, debug, and maintain other software programs.

Examples:

- **Compilers and Interpreters:** Convert source code into executable programs. Examples include GCC for C/C++ and Python interpreter for Python.
- **Integrated Development Environments (IDEs):** Comprehensive tools for software development, like Visual Studio, Eclipse, and IntelliJ IDEA.

4) **Driver software**. It is also known as device drivers, this software is often considered a type of system software. Device drivers control the devices and peripherals connected to a computer, helping them perform their specific tasks. Every device that's connected to a computer needs at least one device driver to function. Examples include software that comes with any nonstandard hardware, including special game controllers, as well as the software that enables standard hardware, such as USB storage devices, keyboards, headphones and printers.

5) **Middleware** : The term middleware describes software that mediates between application and system software or between two different kinds of application software. For example, middleware lets Microsoft Windows talk to Excel and Word. It's used to send a remote work request from an application in a computer that has one kind of OS to an application in a computer with a different OS. It also lets newer applications work with legacy ones.

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

→The Software Development Life Cycle (SDLC) is a process used by software development organizations to develop software with higher quality, lower cost and in the least possible time.

1). Planning / Requirement Gathering

This stage involves understanding what the software needs to do by gathering requirements from stakeholders and creating a project plan with timelines and resource allocation.

2). Analysis

In this phase, the gathered requirements are analysed to understand how the software will achieve its goals. Models like use case diagrams and data flow diagrams are created, and requirements are validated with stakeholders.

3). Designing

Designing involves creating the system architecture and detailed design specifications. This includes making detailed diagrams and prototypes to ensure the system is well-planned before coding begins.

4). Implementation / Coding / Building

This is the phase where developers write the actual code for the software based on the design documents. It includes setting up development environments, coding, reviewing code for quality, and integrating components.

5). Testing (Quality Assurance)

Testing ensures the software works correctly and meets the requirements. Various tests like unit, integration, system, and user acceptance tests are conducted, and any bugs found are fixed.

6). Maintenance

After the software is deployed, this phase involves providing ongoing support, releasing updates, monitoring performance, and ensuring the software continues to function well over time. It also includes planning for the software's end-of-life when necessary.

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

→ A Data Flow Diagram (DFD) is a graphical representation of the flow of data within a system. It illustrates how data is processed by a system in terms of inputs and outputs, showing the steps of data processing and the interaction between different system components.

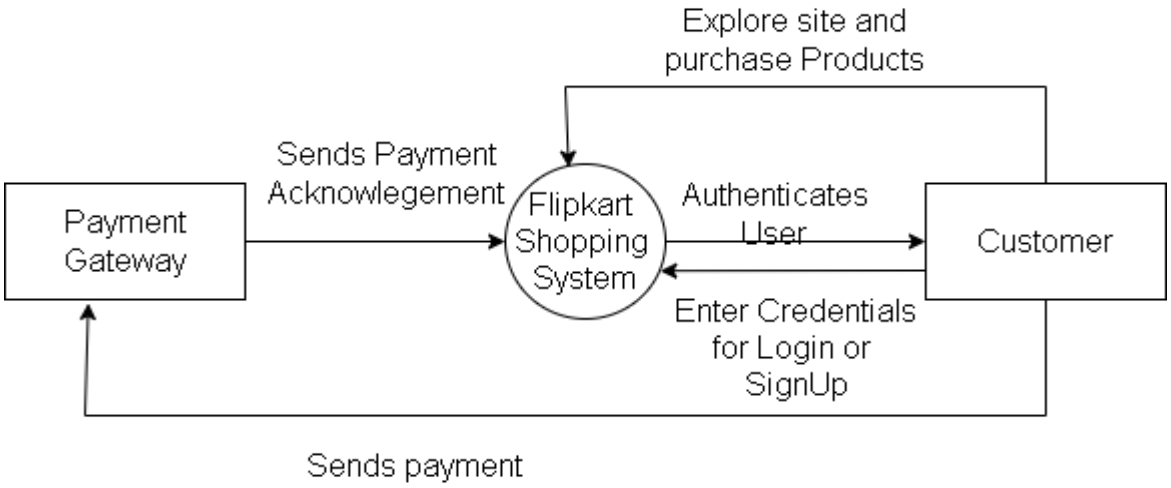
Key Components of a DFD:

1) **Processes:**
   - Represented by circles or rounded rectangles.
   - Show the transformation of data, indicating where data is processed within the system.
   - Labelled with descriptive names, such as "Process Order" or "Validate Login."
2) **Data Stores:**
   - Represented by open-ended rectangles or parallel lines.
   - Indicate where data is stored within the system.
   - Labelled with names that describe the stored data, like "Customer Database" or "Inventory."
3) **Data Flows:**
   - Represented by arrows.
   - Show the movement of data between processes, data stores, and external entities.
   - Labelled with the name of the data being transferred, such as "Customer Info" or "Payment Details."
4) **External Entities:**
   - Represented by rectangles.

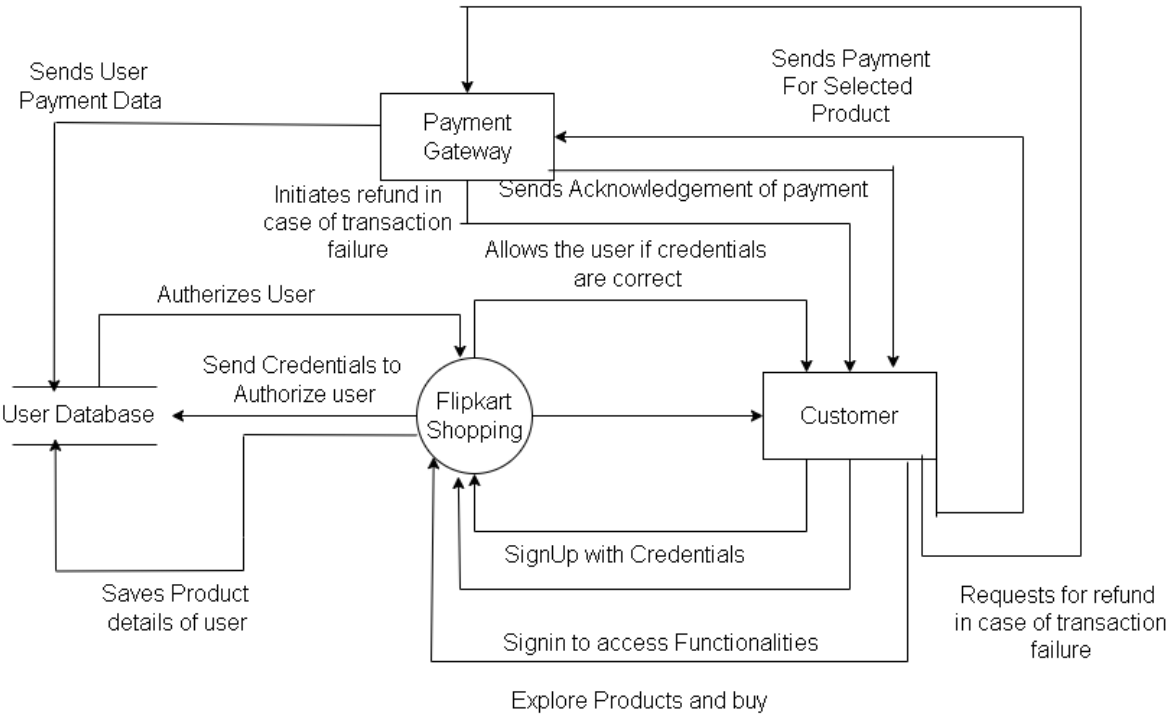
- Labelled with names that identify the external entities, like "Customer" or "Supplier."

DFD diagram on Flipkart

1) Level 0 DFD

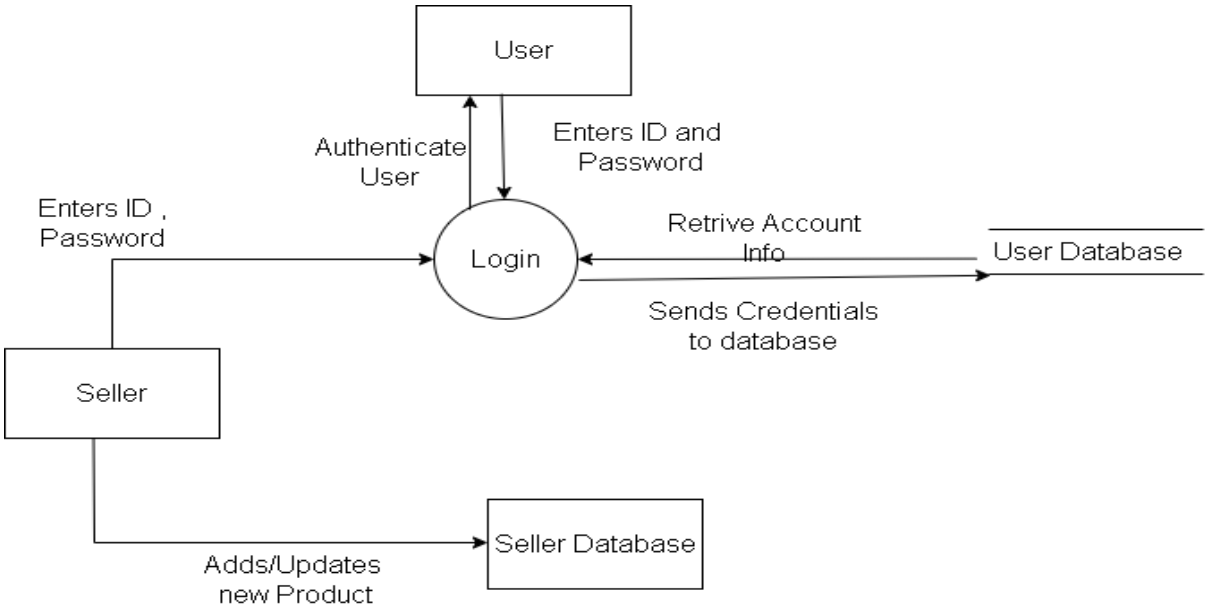


2) Level 1 DFD

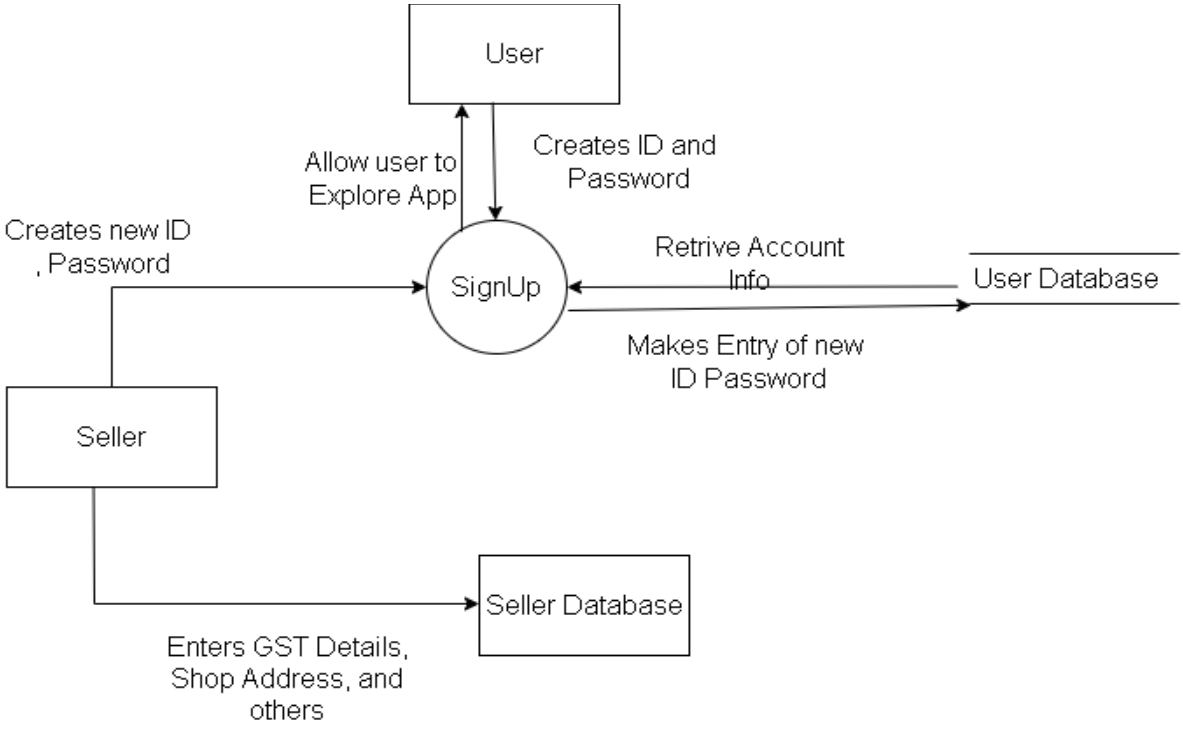


3) Level 2 DFD

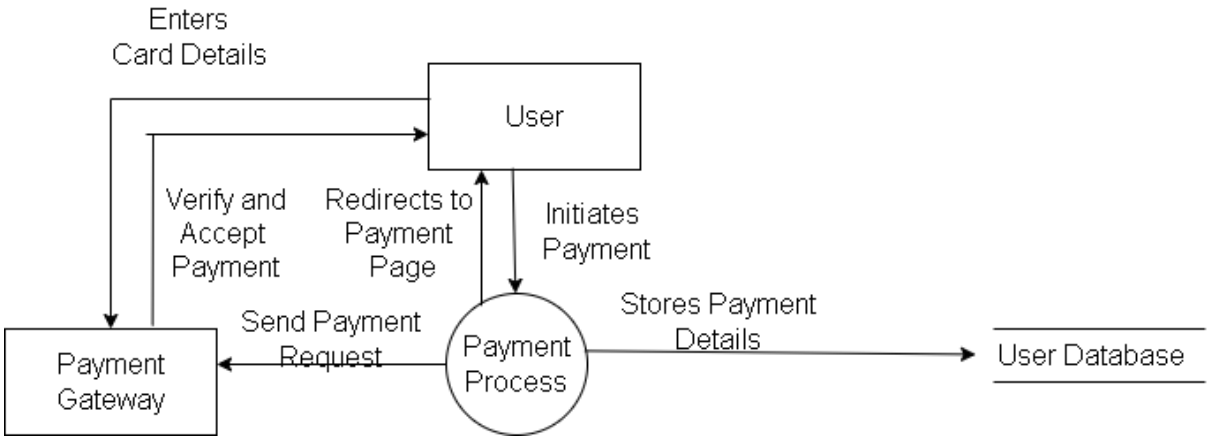
i) Login



ii) Sign Up



iii) Payment



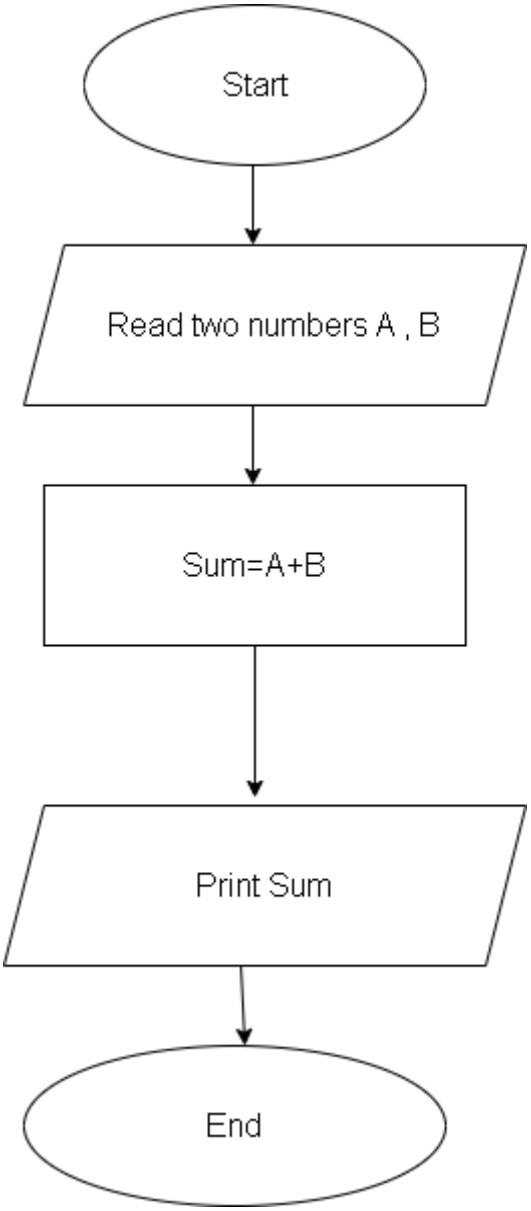
5.What is Flow chart? Create a flowchart to make addition of two numbers

→ A flowchart is a type of diagram that represents a workflow or process. A flowchart can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task.

Below are the symbols and their meanings in Flowchart

Symbol	Name	Function
	Process	Indicates any type of internal operation inside the Processor or Memory
	input/output	Used for any Input / Output (I/O) operation. Indicates that the computer is to obtain data or output results
	Decision	Used to ask a question that can be answered in a binary format (Yes/No, True/False)
	Connector	Allows the flowchart to be drawn without intersecting lines or without a reverse flow.
	Predefined Process	Used to invoke a subroutine or an interrupt program.
	Terminal	Indicates the starting or ending of the program, process, or interrupt program.
	Flow Lines	Shows direction of flow.

Flow Chart for adding two numbers



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

→A Use Case Diagram represents the interaction between actors (users or external systems) and a system under consideration to accomplish specific goals. It provides a high-level view of the system's functionality by illustrating the various ways users can interact with it.

Components of Basic Model

There are various components of the basic model:

1. Actor
2. Use Case
3. Associations

Use Case Diagram for bill payment on paytm:

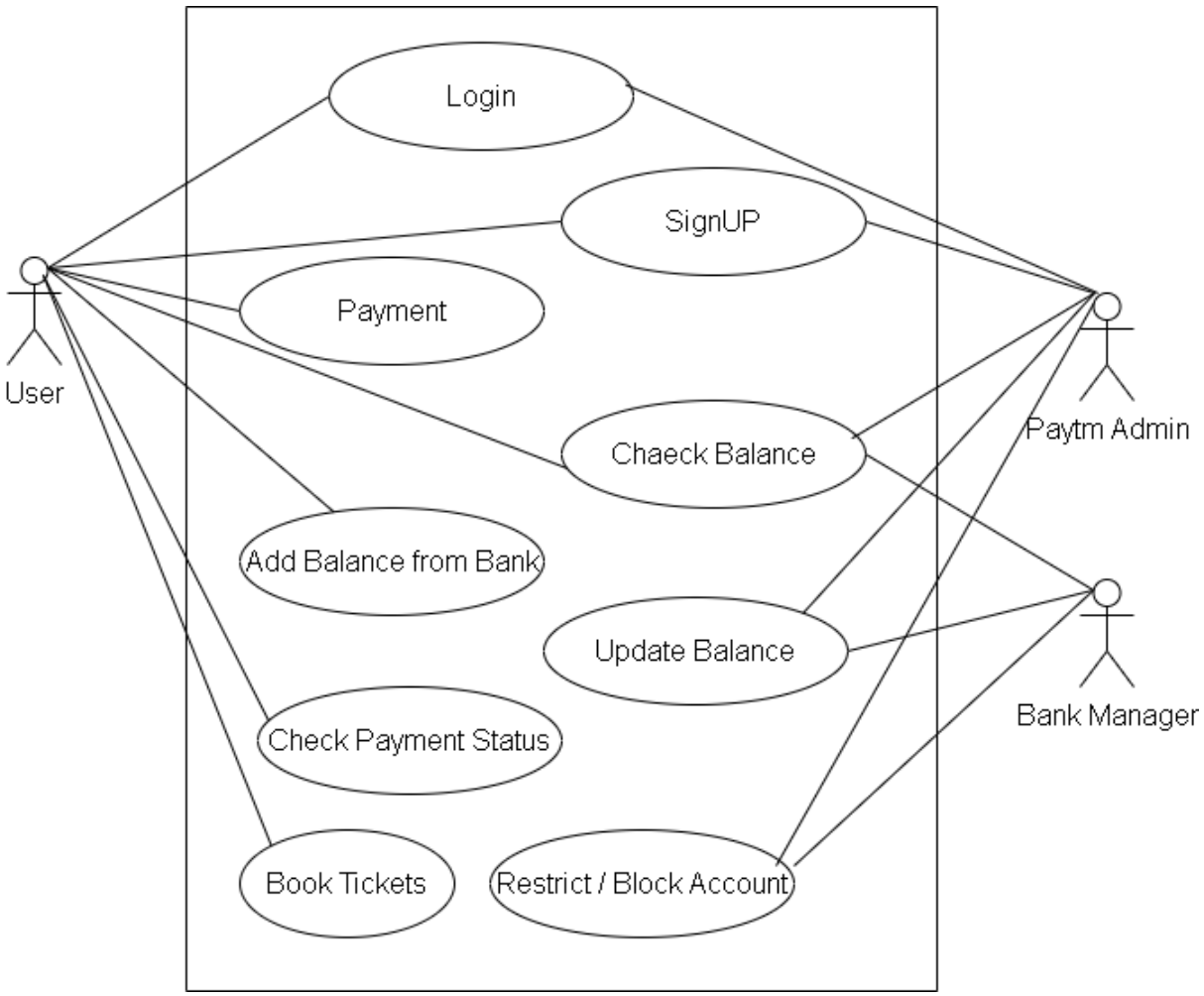


Figure : Paytm Use Case Diagram