Design Engineering

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- The design Model, Pattern-based Software Design.
- Architectural Design :Design Decisions, Views, Patterns, Application Architectures
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- Designing class based components
- conducting component-level design
- User Interface Design: The golden rules, Interface Design steps & Analysis, Design Evaluation

Design Process and Quality

The design phase of software development deals with transforming the customer requirements as described in the SRS documents into a form implementable using a programming language.

The software design process (Design Model) can be divided into the following three levels of phases of design:

1. Interface Design
2. Architectural Design
3. Detailed Design/ Component Level Design

Interface Design

Interface design should include the following details:

- Precise description of events in the environment, or messages from agents to which the system must respond.
- Precise description of the events or messages that the system must produce.
- Specification of the data, and the formats of the data coming into and going out of the system.
- Specification of the ordering and timing relationships between incoming events or messages, and outgoing events or outputs.

Architectural Design

architectural design includes:

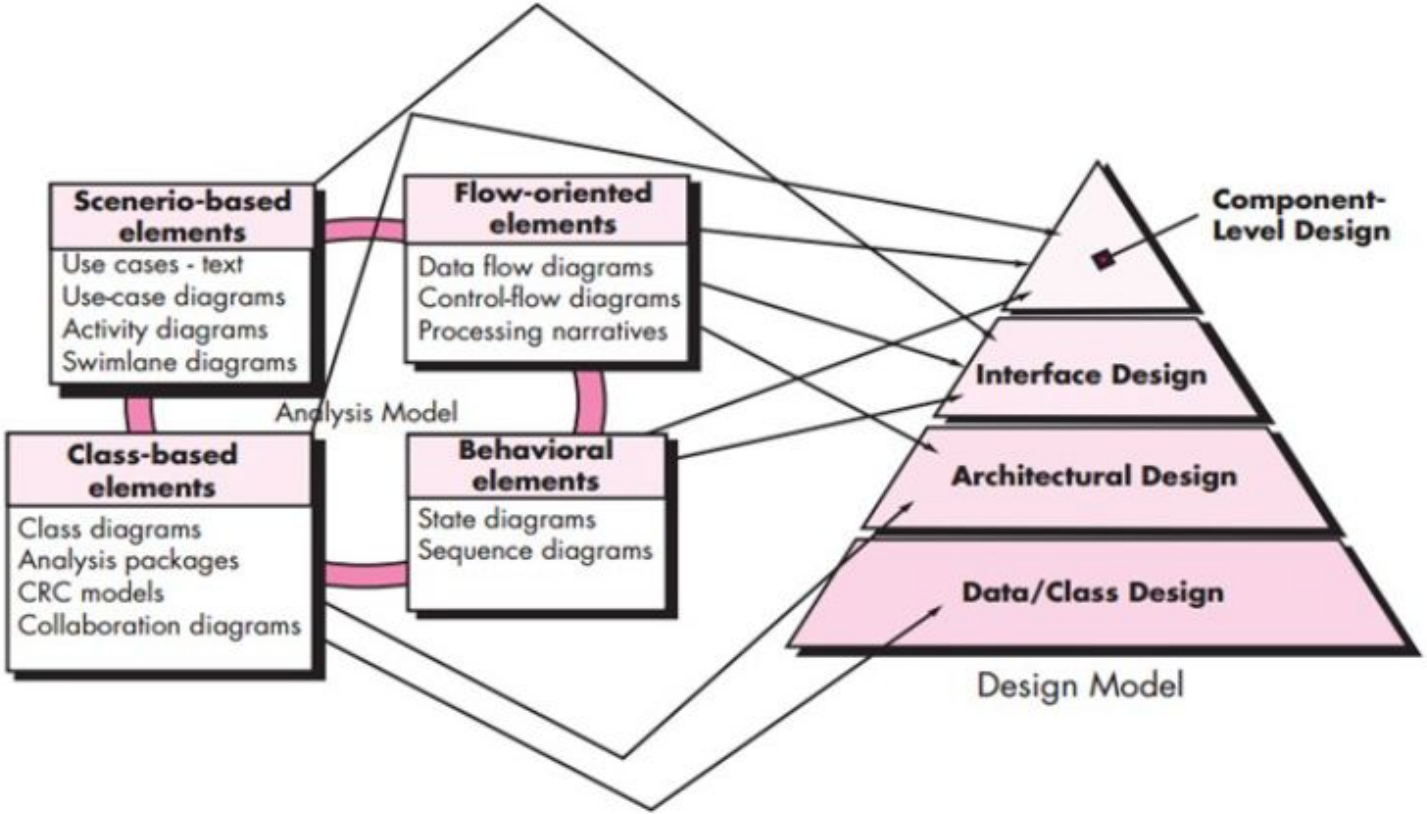
- Gross decomposition of the systems into major components.
- Allocation of functional responsibilities to components.
- Component Interfaces.
- Component scaling and performance properties, resource consumption properties, reliability properties, and so forth.
- Communication and interaction between components.

Detailed Design

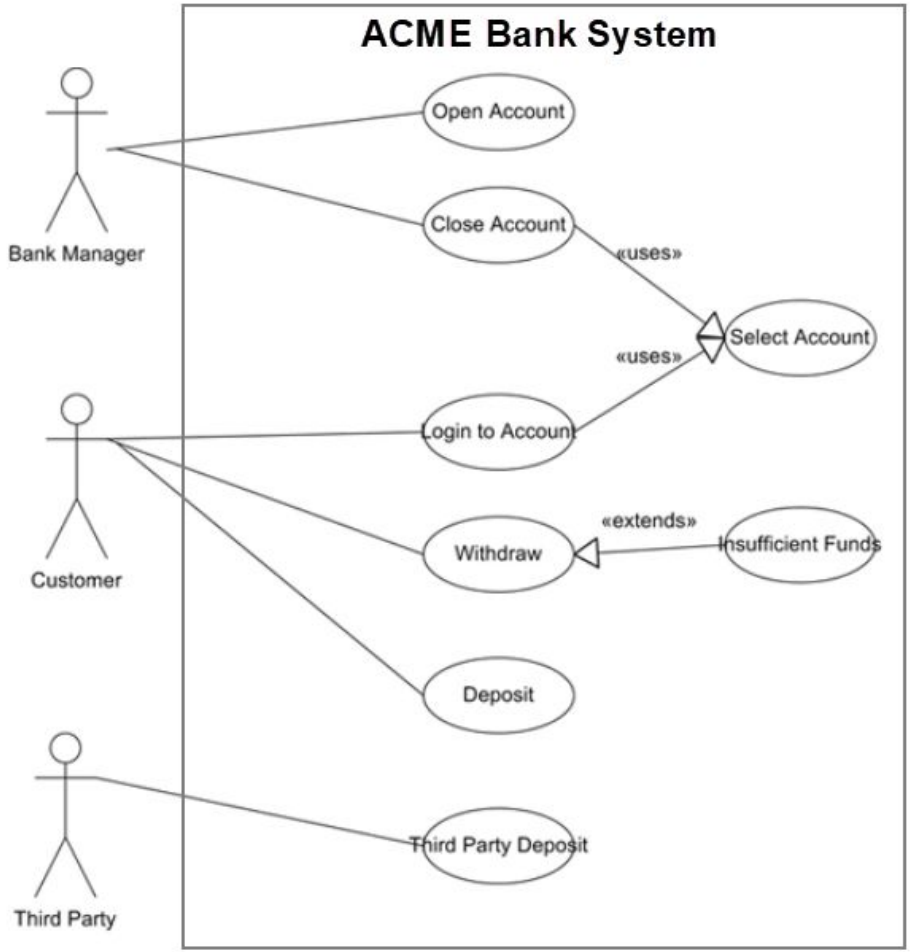
The detailed design may include:

- Decomposition of major system components into program units.
- Allocation of functional responsibilities to units.
- User interfaces.
- Unit states and state changes.
- Data and control interaction between units.
- Data packaging and implementation, including issues of scope and visibility of program elements.
- Algorithms and data structures.

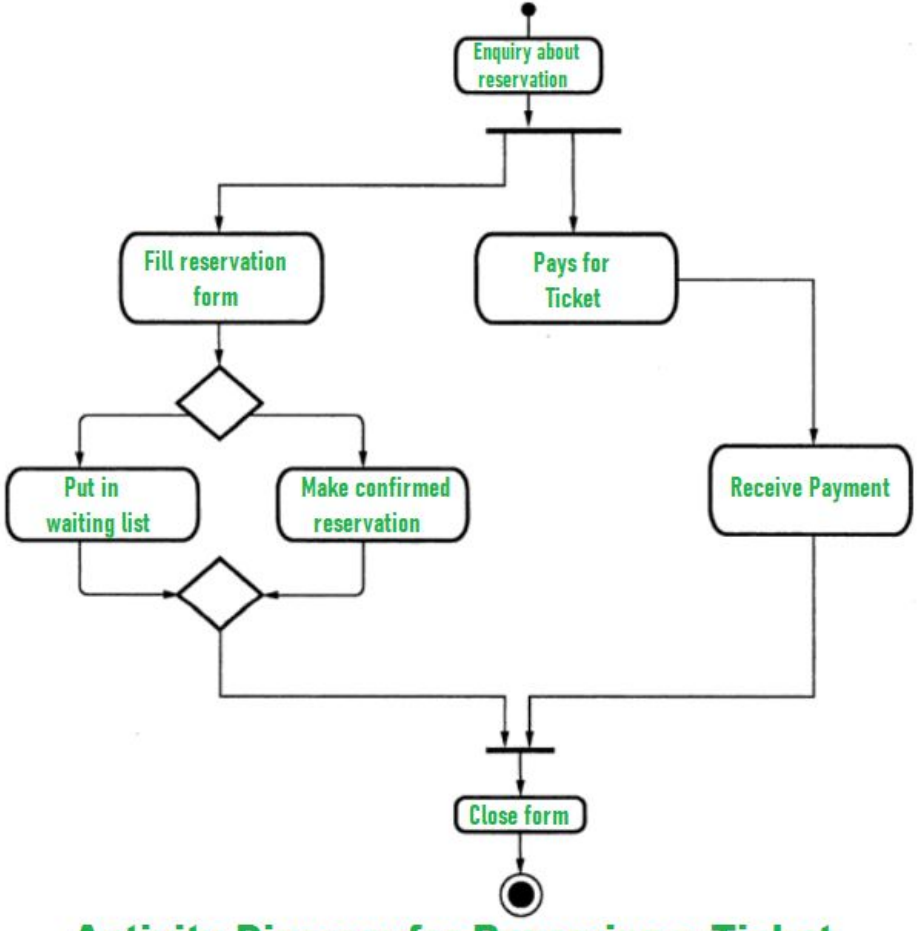
Translating Requirement Model into Design Model



Use case diagram

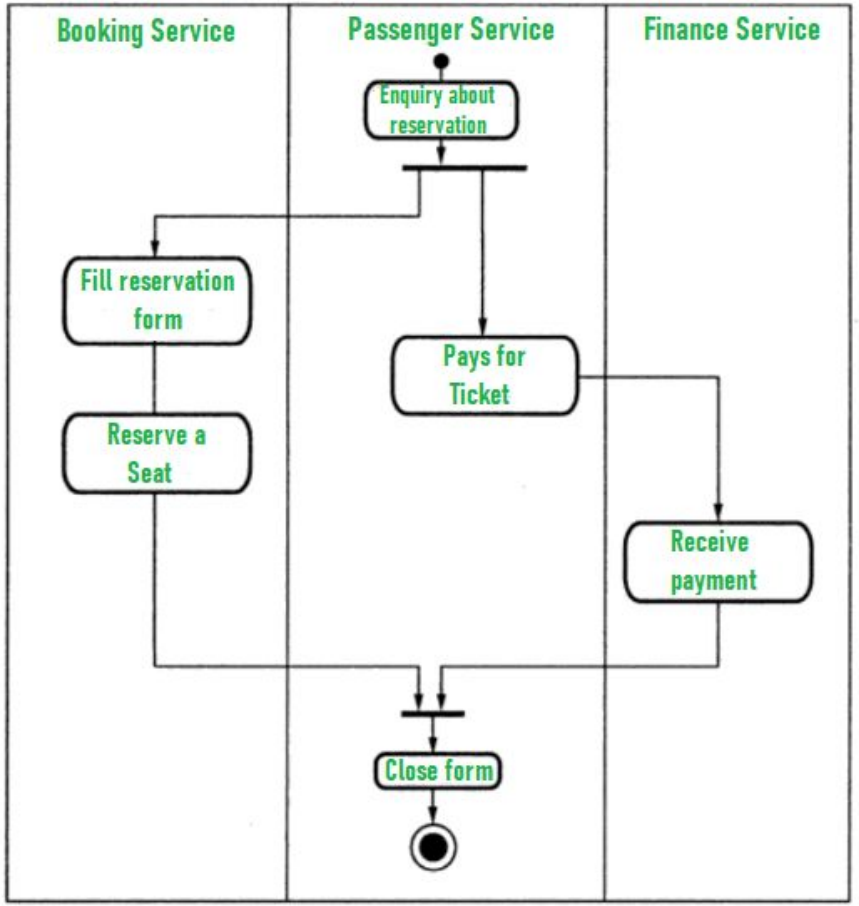


Activity Diagram



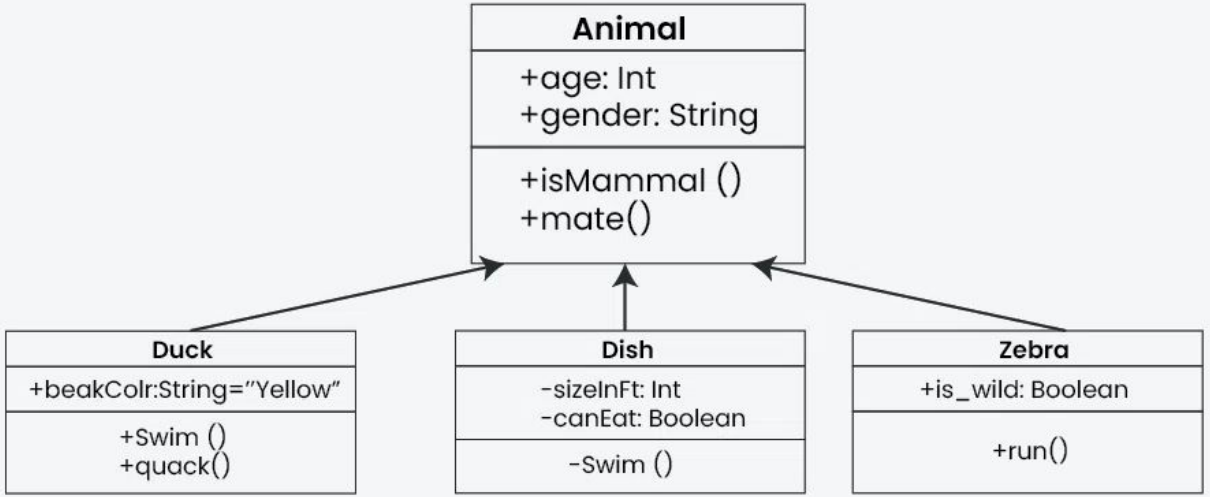
Activity Diagram for Reserving a Ticket

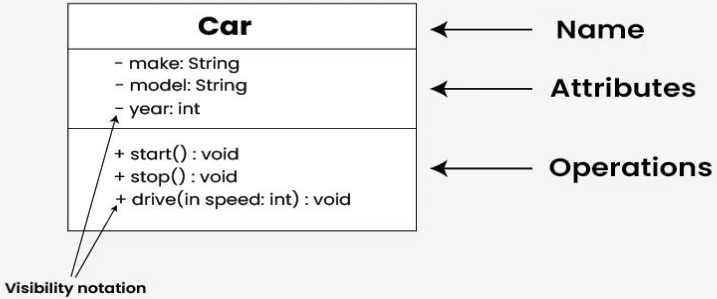
Swimlane Diagram



Swimlane Diagram for Reserving a Ticket

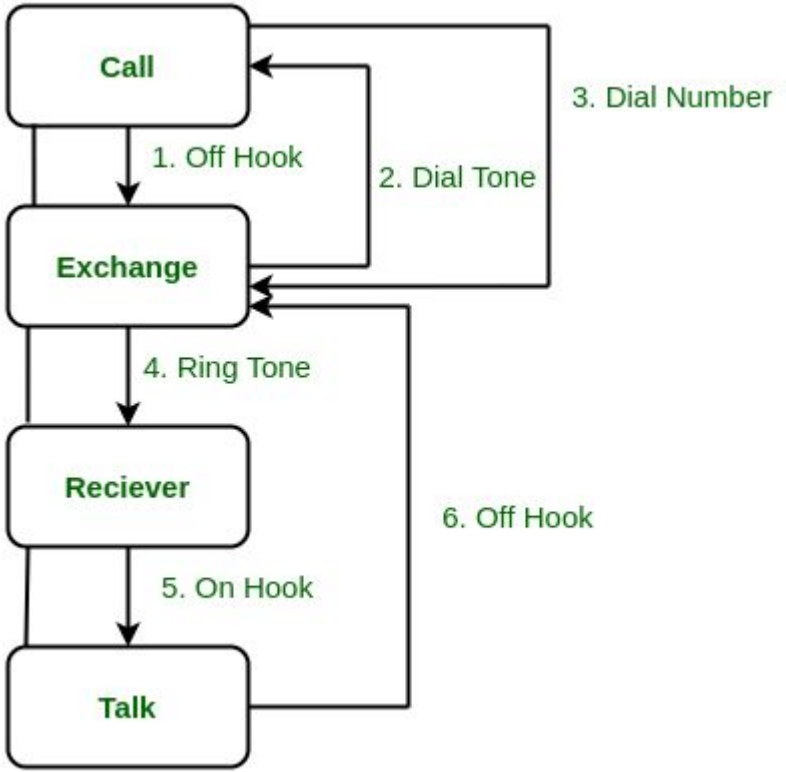
Class diagram



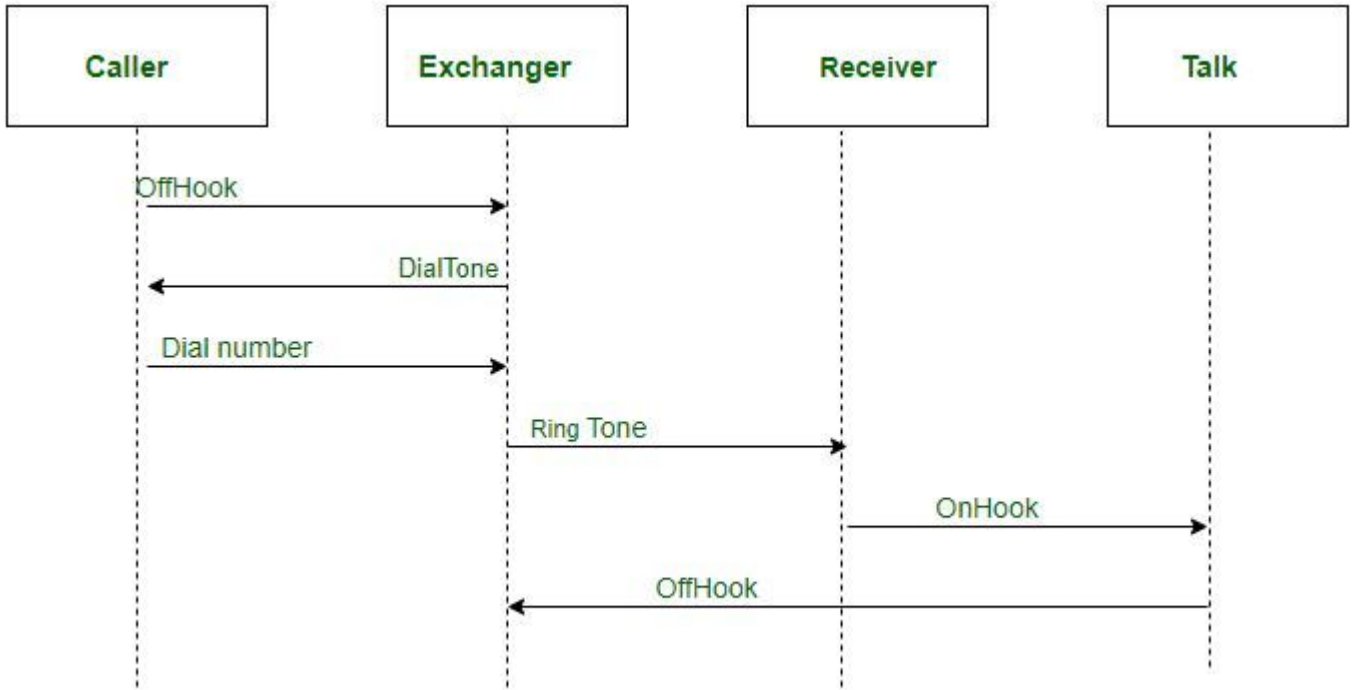


Class Notation

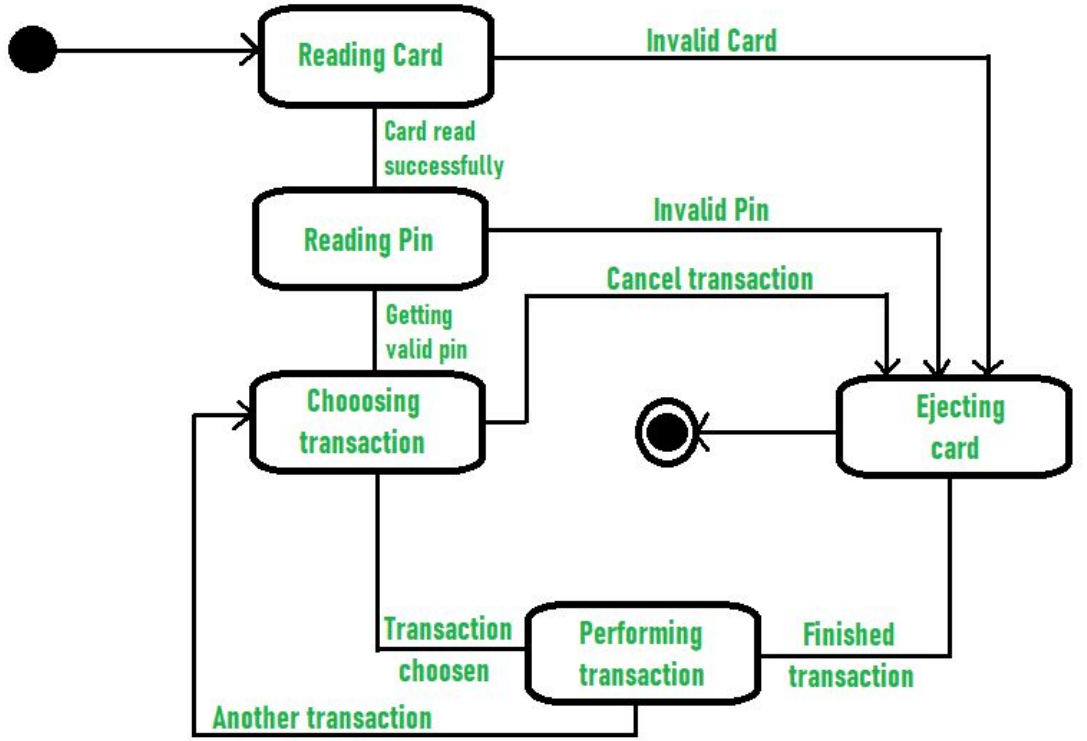
Collaborative Diagram



Sequence Diagram

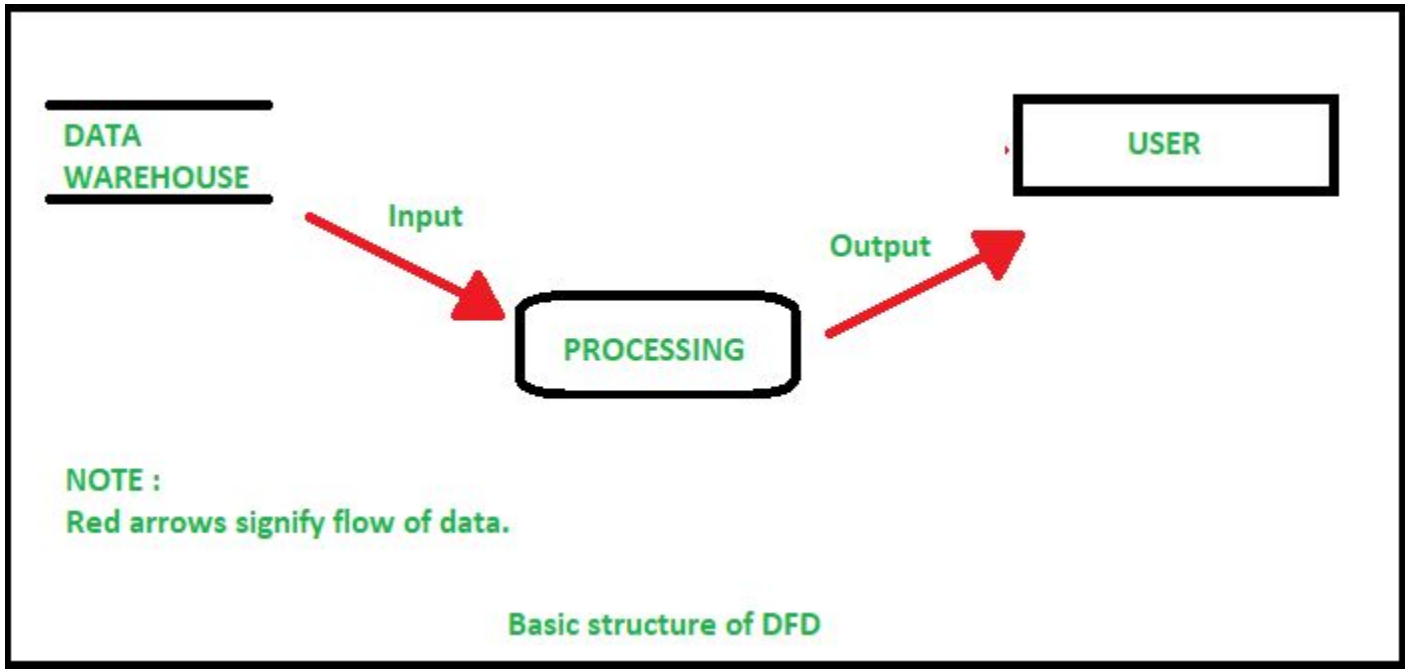


State Diagram



State Transition Diagram for ATM System

DFD



Basic structure of DFD

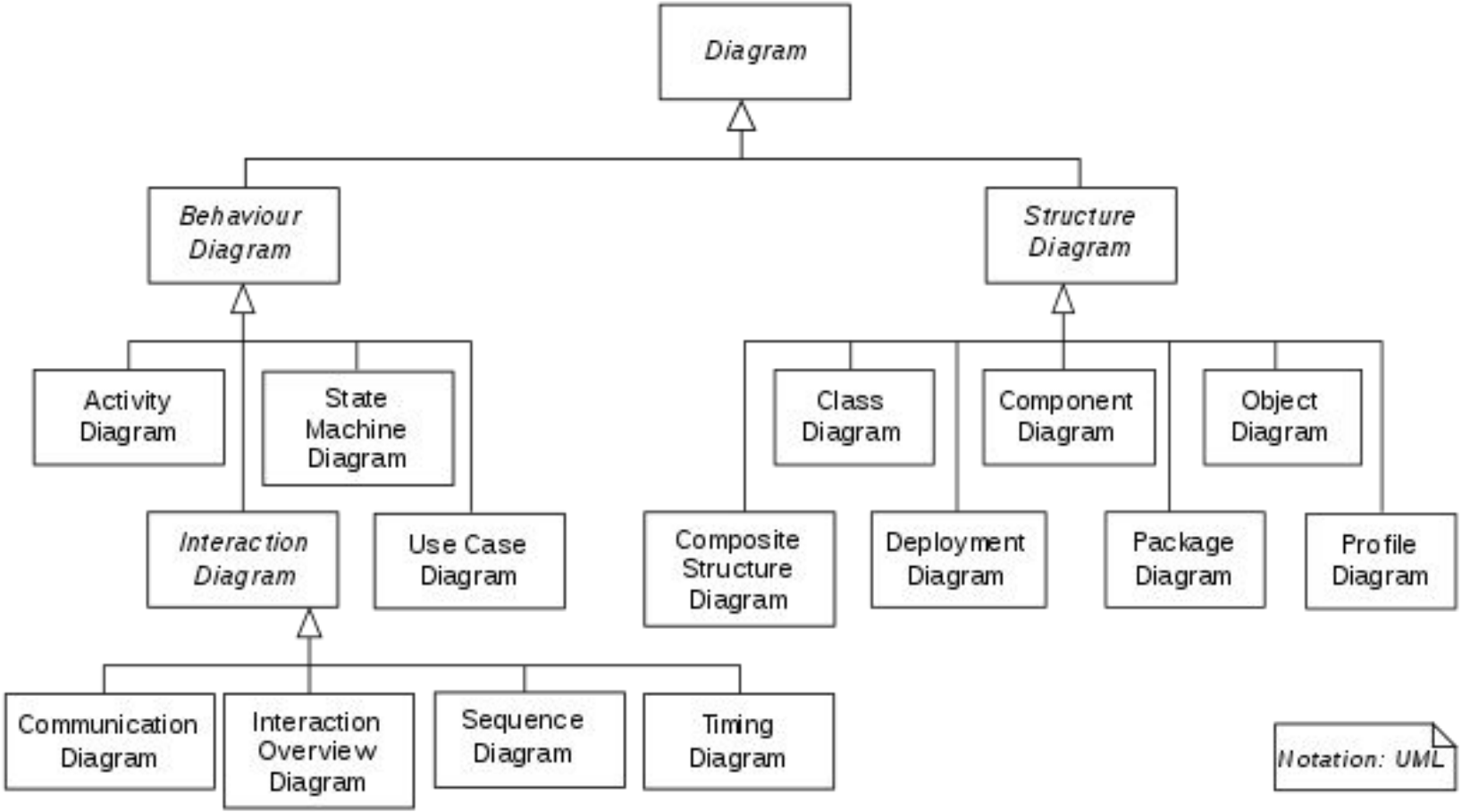


Diagram
Behaviour Diagram
Structure Diagram
Activity Diagram
State Machine Diagram
Interaction Diagram
Use Case Diagram
Class Diagram
Component Diagram
Object Diagram
Composite Structure Diagram
Deployment Diagram
Package Diagram
Profile Diagram
Communication Diagram
Interaction Overview Diagram
Sequence Diagram
Timing Diagram
Notation: UML

User Interface Golden Rules

- **Place the user in control:**
- **Reduce the User’s Memory Load**
- **Make the Interface Consistent**

Architectural design for e commerce

Description:

- Any member can register and view available products
- Only registered member can purchase multiple products regardless of quantity.
- ContactUs page is available to contact Admin for queries
- There are three roles available Visitor, User and Admin.
    - Visitor can view available products.
    - User can view and purchase products.
    - An Admin has some extra privilege including all privileges of visitor and user.
    - Admin can add products, edit product information and remove product.
    - Admin can add user, edit user information and can remove user.
    - Admin can ship order to user based on order placed by sending confirmation mail.

Architectural design for e commerce

Using the code

- Attach the database in your "SQL Server Management Studio Express".
- Run the application on Microsoft Visual Studio as web site.
- Locate the database.

MasterPage details

- OnlineShopping Master Page (Similar MasterPage for Visitor, User and Admin)

Architectural design for e commerce

Web Pages details

- Home Page
- AboutUs Page
- Clothing Page
- OrderUs Page
- ContactUs Page
- Admin Page
- Login Page
- Register Page
- Track

Architectural design for e commerce

Project Details:

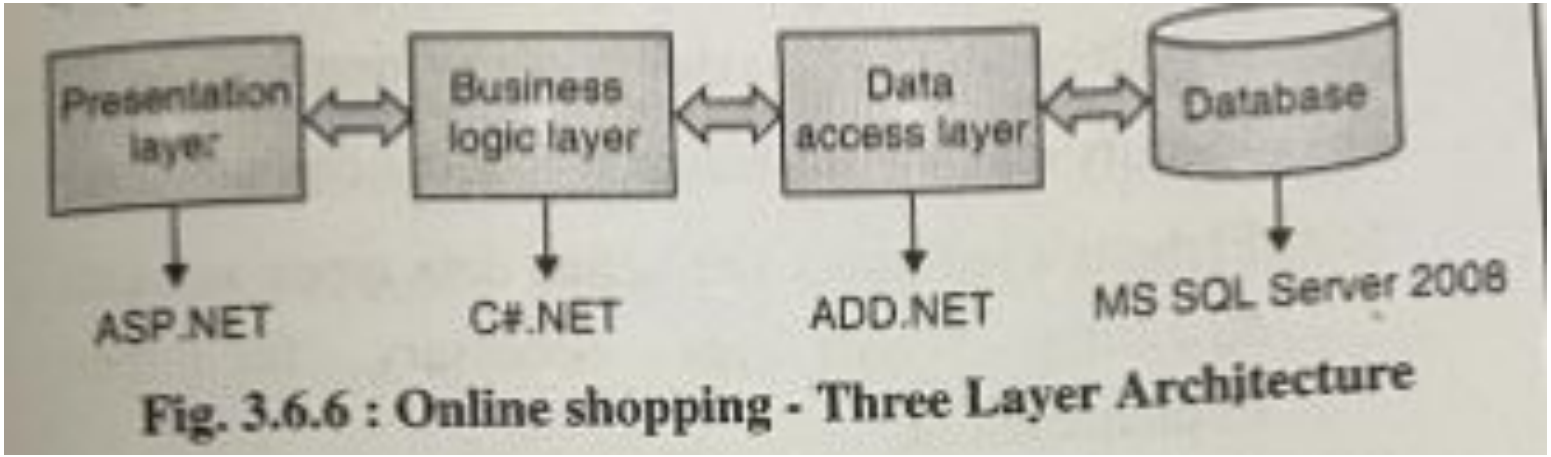


Fig. 3.6.6 : Online shopping - Three Layer Architecture

Architectural design for e commerce

System Requirements: