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TECHNOCORP

System Desing

Introduction to System Design

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Experienced professional with a strong proficiency in various technology domains. I have successfully executed multiple projects for Fortune 500 clients and have collaborated with a company accredited at CMM Level 5. My primary focus area is to assist my clients in achieving digital transformation within their business operations.

Vivek Srivastava

Experienced professional with a comprehensive skill set that encompasses various technologies. I possess deep expertise, visionary thinking, and a notable portfolio of innovative projects. My focus is on assisting businesses in achieving their objectives by leveraging technology and domain knowledge.

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Agenda

- Introduction to System & System Design
- Key Characteristics
- Key Elements
- Key Concepts of System Design
- System Design Phases
- Requirement Analysis
- System Architecture
- Detailed Design
- Implementation
- Testing
- Deployment and Maintenance

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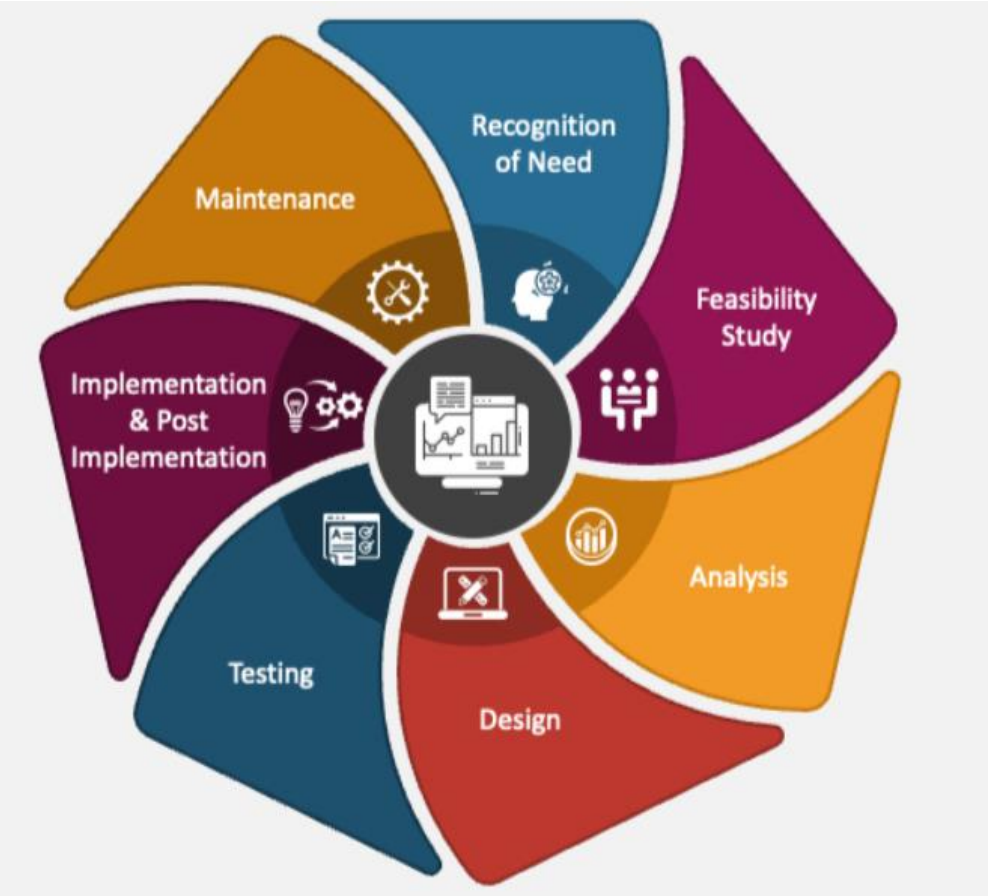
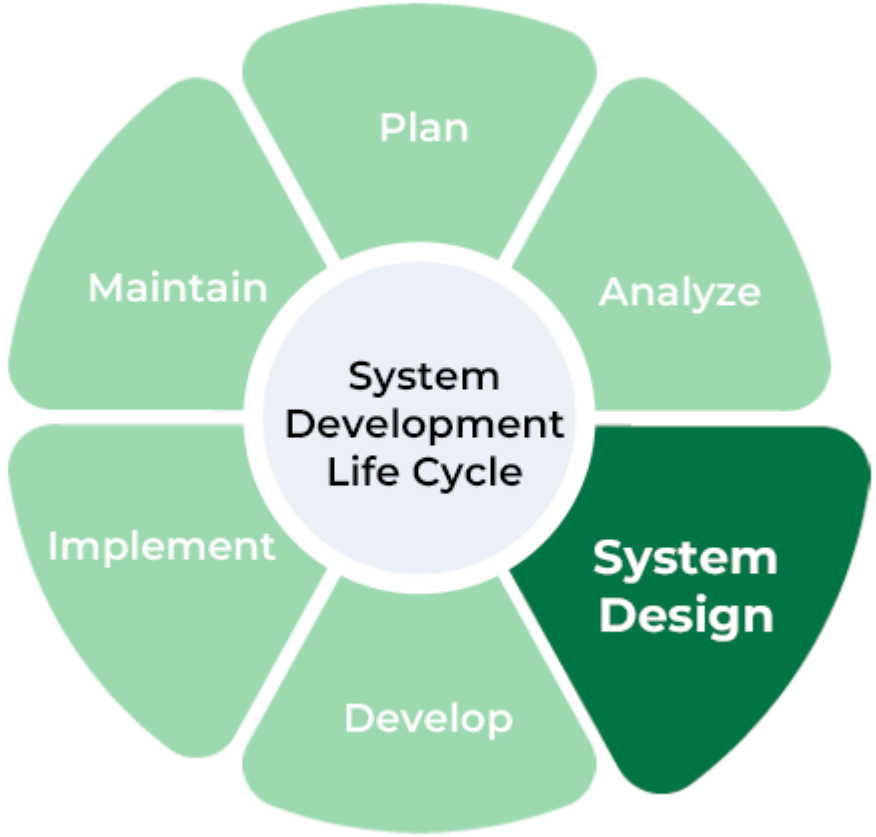
Introduction to System & System Design

- The term "system" typically refers to the complex and interconnected set of components, software, hardware, processes, and resources that work together to achieve a specific set of goals or functions.
- A system is designed to address a particular problem or fulfill specific requirements.
- System design is a process of creating or refining a system to meet specific requirements.
- It involves defining system architecture, selecting appropriate components, designing interfaces, and ensuring the system operates efficiently and effectively.



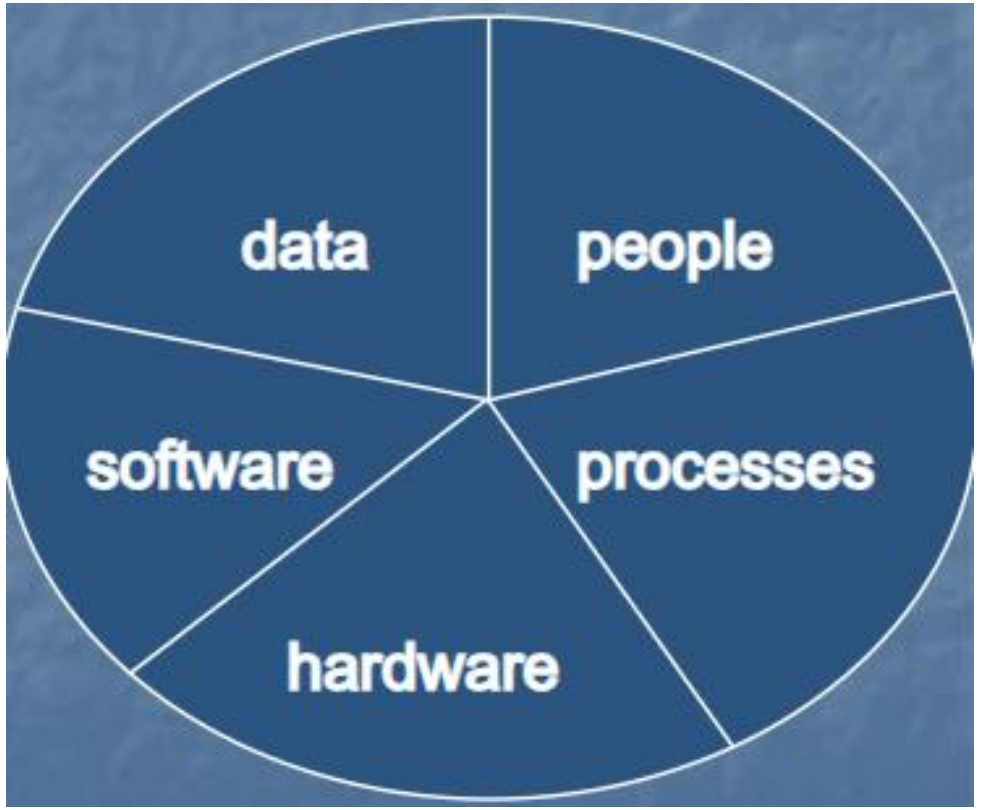
Key Characteristics

- Interconnected Components
- Purpose
- Boundaries
- Interactions
- Hierarchy / Functional Decomposition
- Functional & Non-Functional Components
- Usability
- Optimization
- Security



Key Elements

- People
- Processes
- Hardware
- Software
- Data



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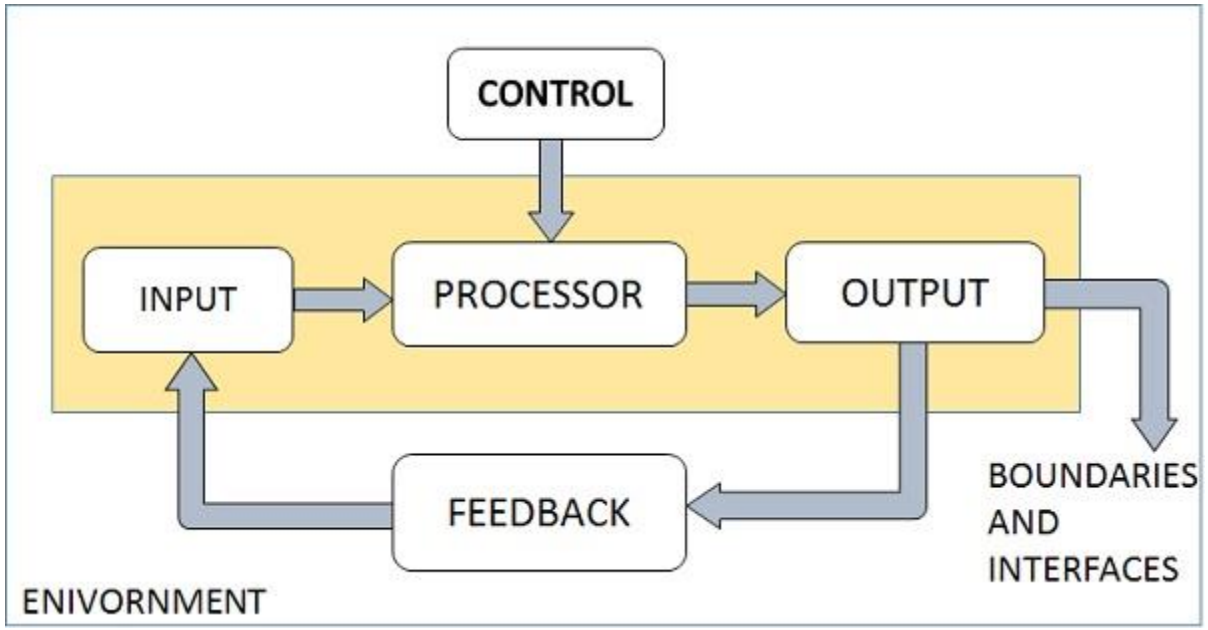
Key Concepts of System Design

- OOPs
- Scalability
- Interoperability
- Redundancy and Fault Tolerance
- State Management
- Design Patterns
- Feedback Loop



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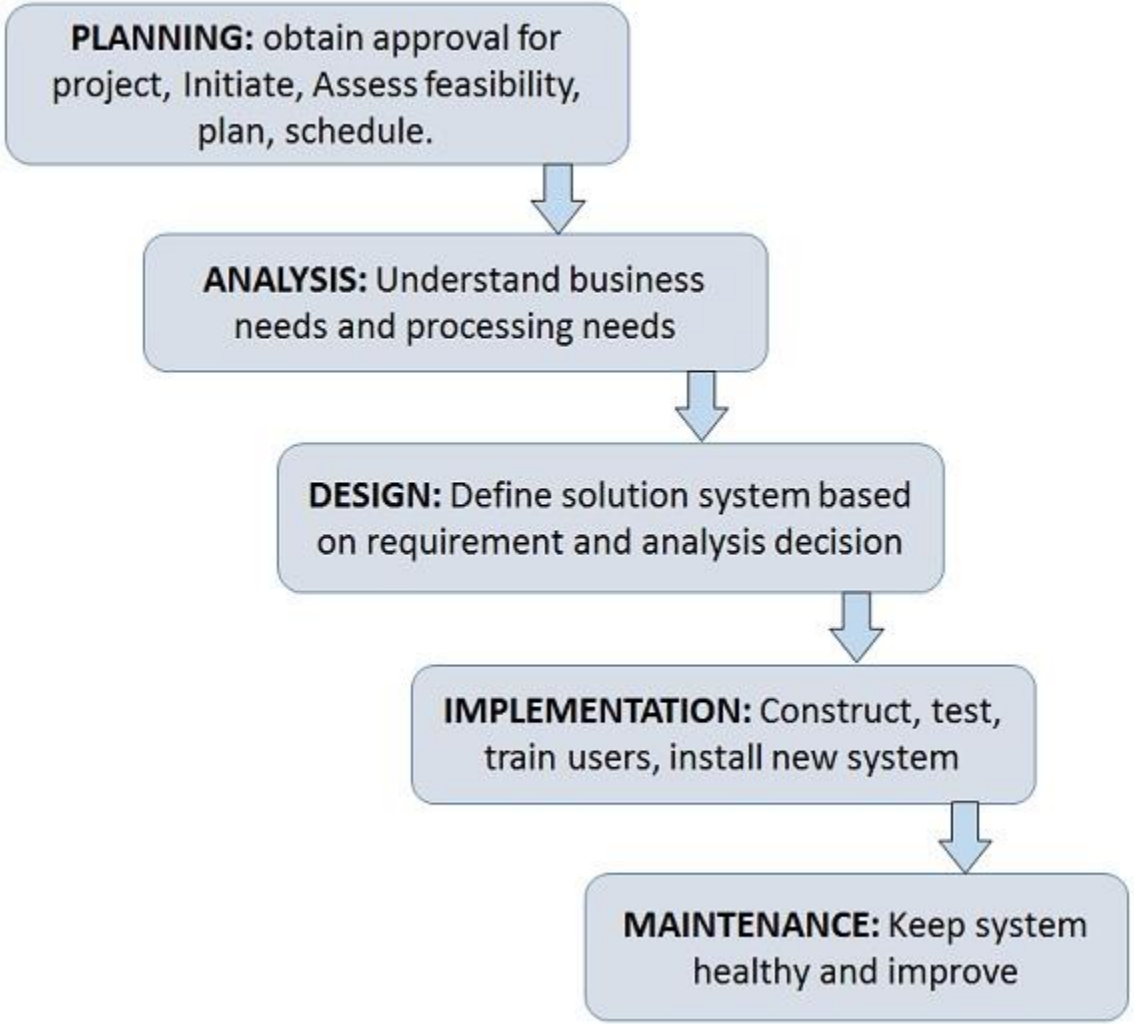
System Design Phases

- Requirements Analysis
- System Architecture
- Detailed Design
- Coding
- Testing
- Deployment and Maintenance



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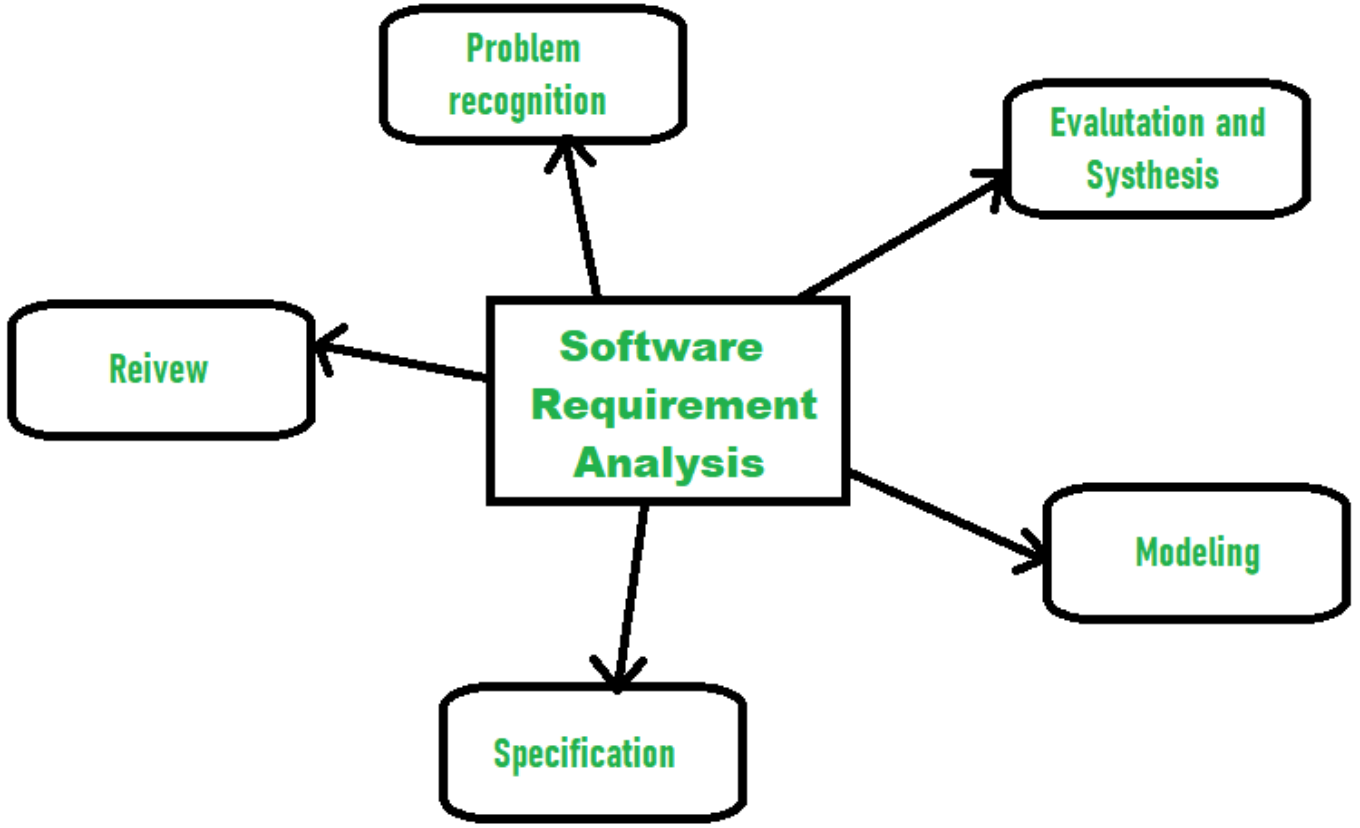
Requirement Analysis

- Identify Stakeholders
- Requirement Elicitation
- SRS Document
  - Functional Requirement
    - User Stories
    - Use Cases
    - Diagram
  - Non-Functional Requirement
    - Capacity Planning
    - Performance Criteria
    - Devices & Hardware
- Validation and Verification
- Traceability
- Prototyping and Mockups
- Communication and Collaboration
- Iterative Process
- Tools and Software



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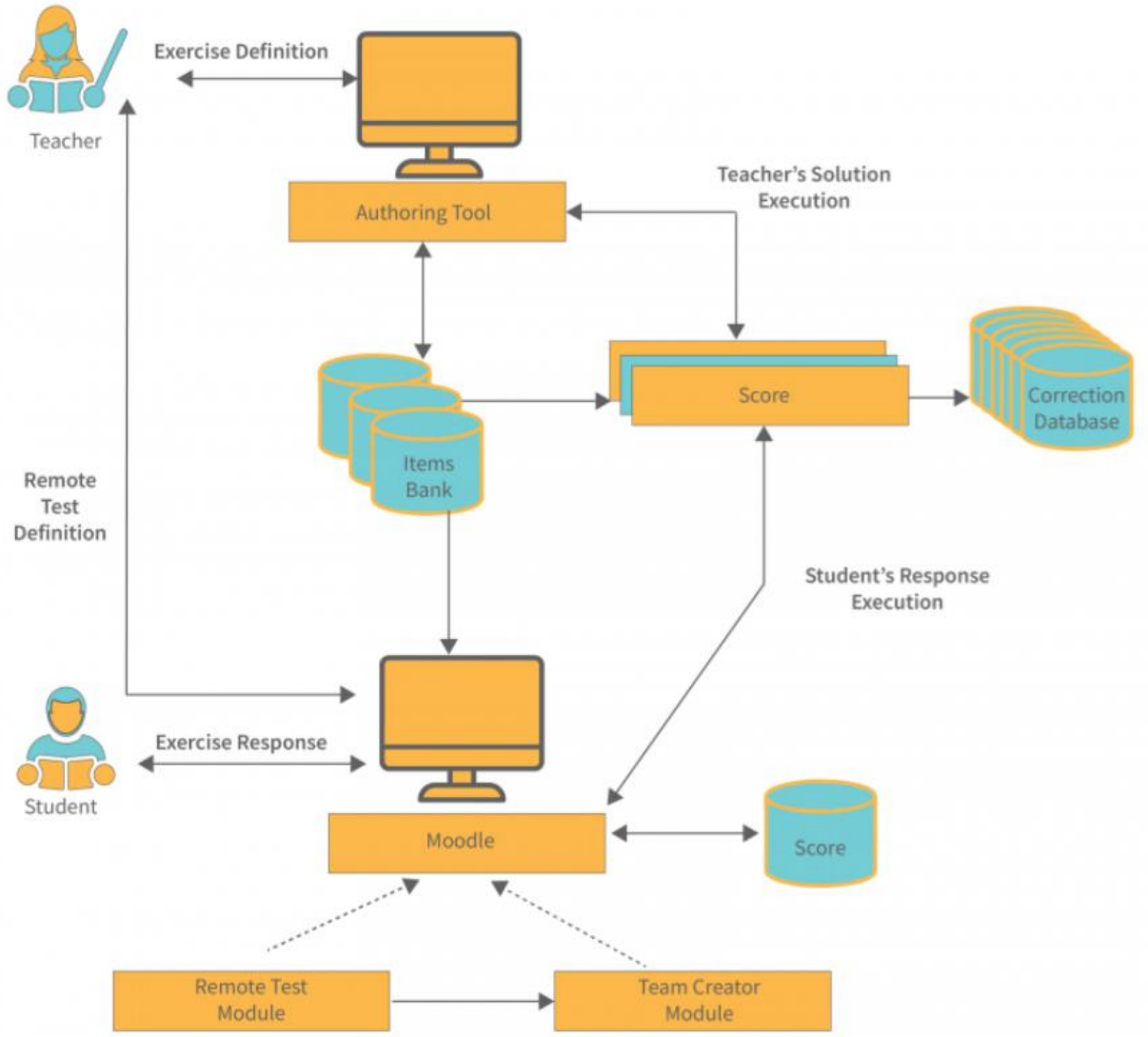
System Architecture

- Components
- Relationships
- Abstraction
- Scalability
- Modularity
- Layering
- Patterns and Styles
- Performance Considerations
- Security
- Technologies and Standards
- Documentation



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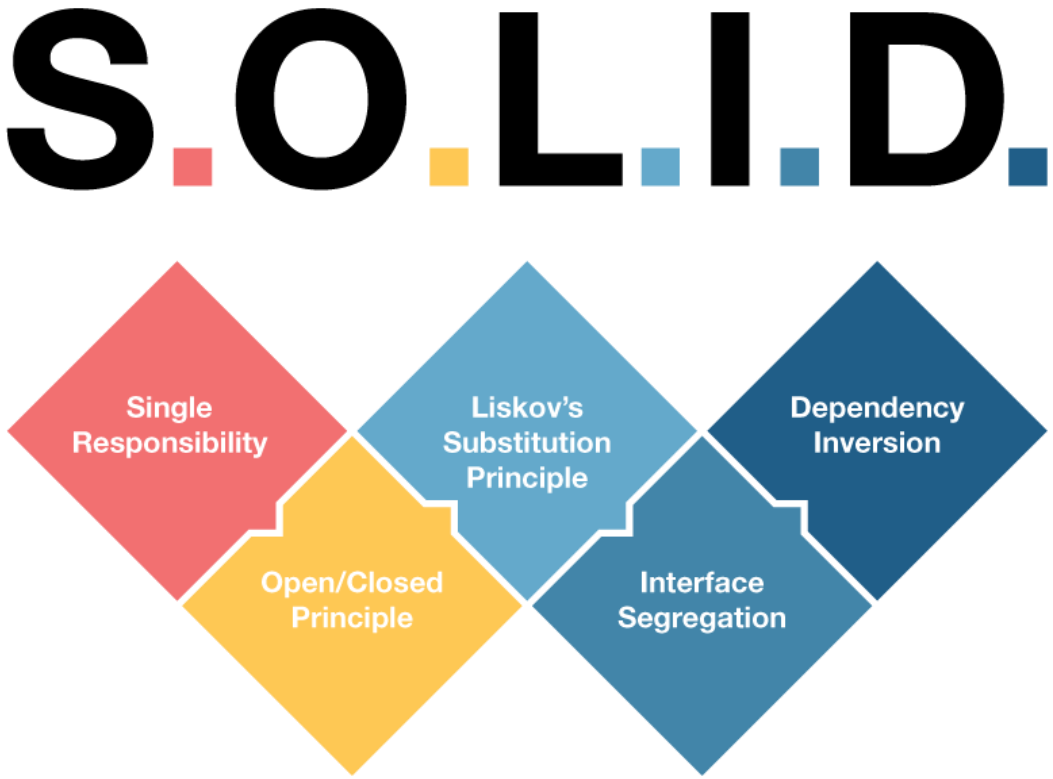
SOLID Principles

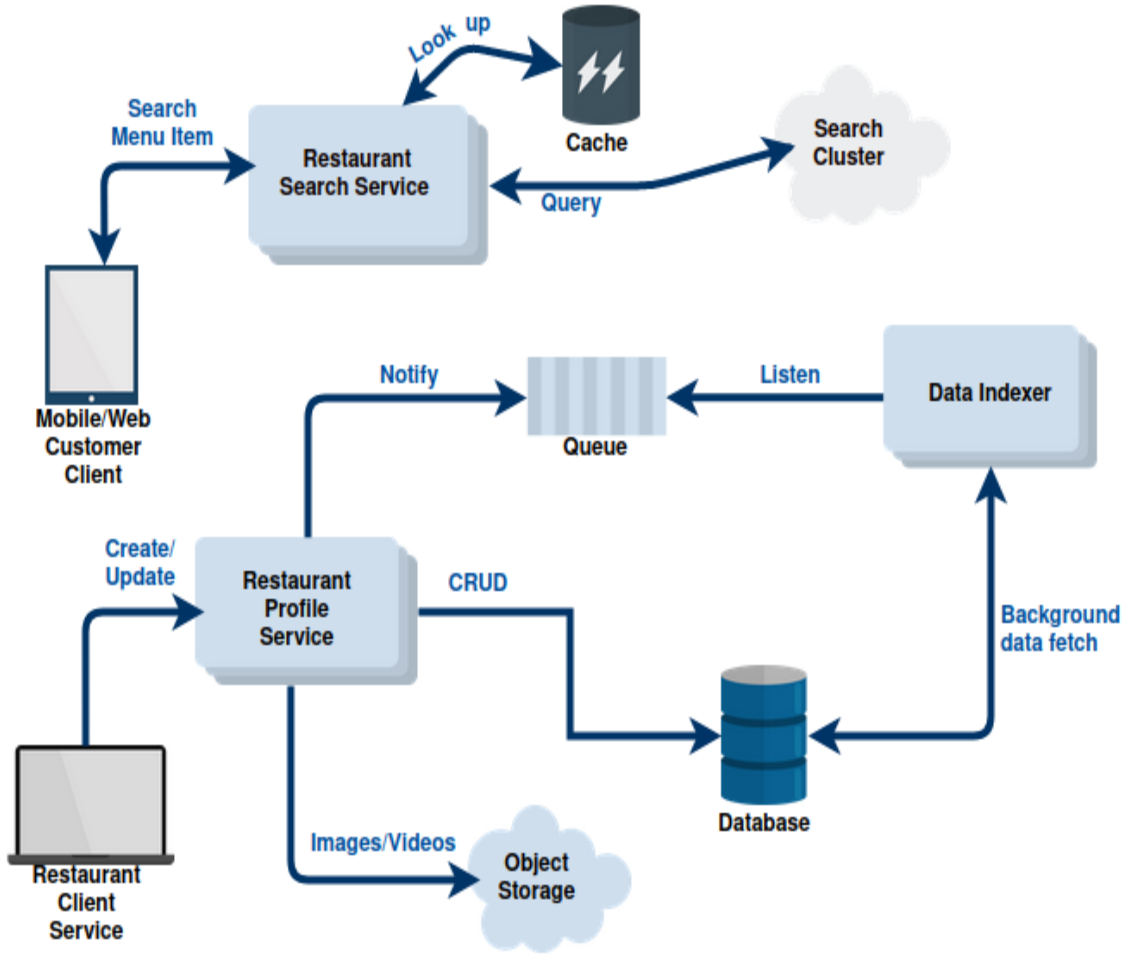
- Single Responsibility Principle (SRP)
- Open/Closed Principle (OCP)
- Liskov Substitution Principle (LSP)
- Interface Segregation Principle (ISP)
- Dependency Inversion Principle (DIP)



Detailed Design

The design phase in the system development life cycle is a critical step where the detailed design of the system is created based on the requirements and high-level architecture established in earlier phases.

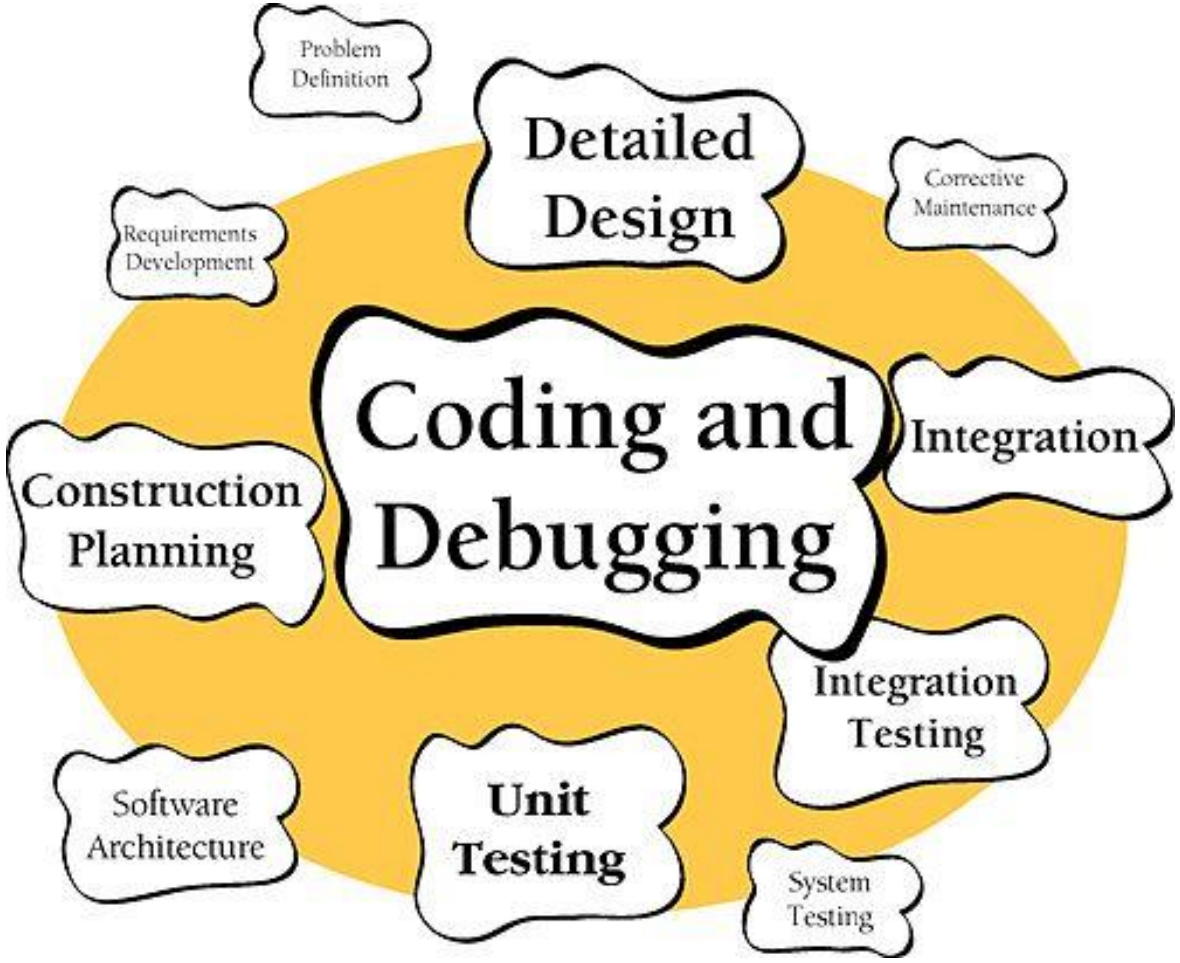
- Detailed System Architecture
- Component and Module Design
- Database Design
- Algorithm and Logic Design
- User Interface Design
- Security Design
- External System Integration
- Performance Considerations
- Performance and Scalability Design
- Documentation
- Prototyping



Coding

The coding phase, also known as the programming phase, is a critical stage where the actual source code for the software is developed.

- Coding
- Programming Language
- Modularization
- Coding Standards
- Testing and Debugging
- Documentation
- Code Review
- Version Control
- Integration
- Optimization
- Security
- Scalability



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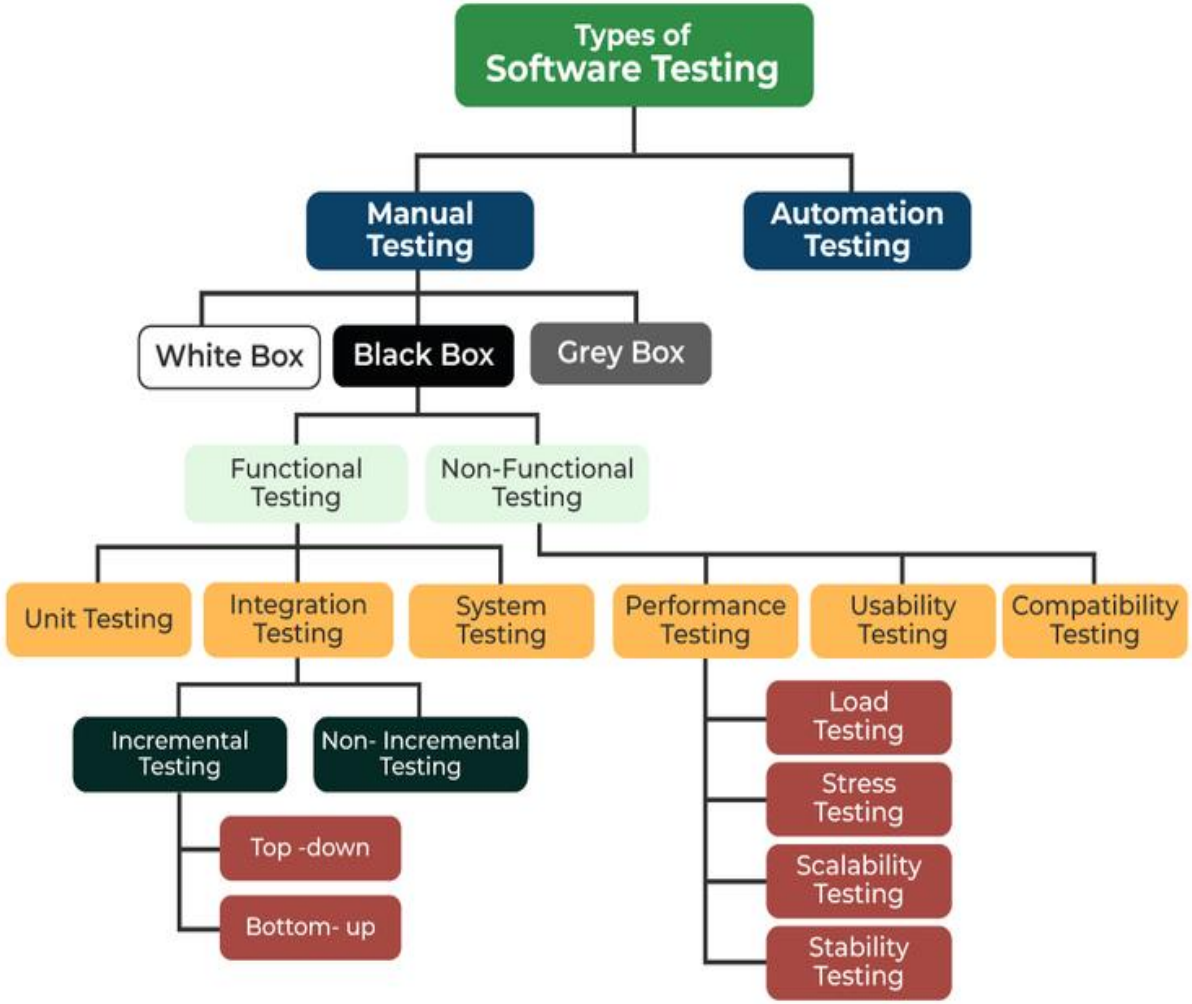
Testing

- White box Testing
- Black box Testing:
  - Types
    - Functional
    - Non-Functional
  - Boundary Value Analysis
  - Equivalence Partitioning
  - Error Guessing



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White Box Testing

- Control Flow Testing
- Branch Testing
- Statement Testing
- Decision Testing

White-box testing	Black box testing
The developers can perform white box testing.	The test engineers perform the black box testing.
To perform WBT, we should have an understanding of the programming languages.	To perform BBT, there is no need to have an understanding of the programming languages.
In this, we will look into the source code and test the logic of the code.	In this, we will verify the functionality of the application based on the requirement specification.
In this, the developer should know about the internal design of the code.	In this, there is no need to know about the internal design of the code.

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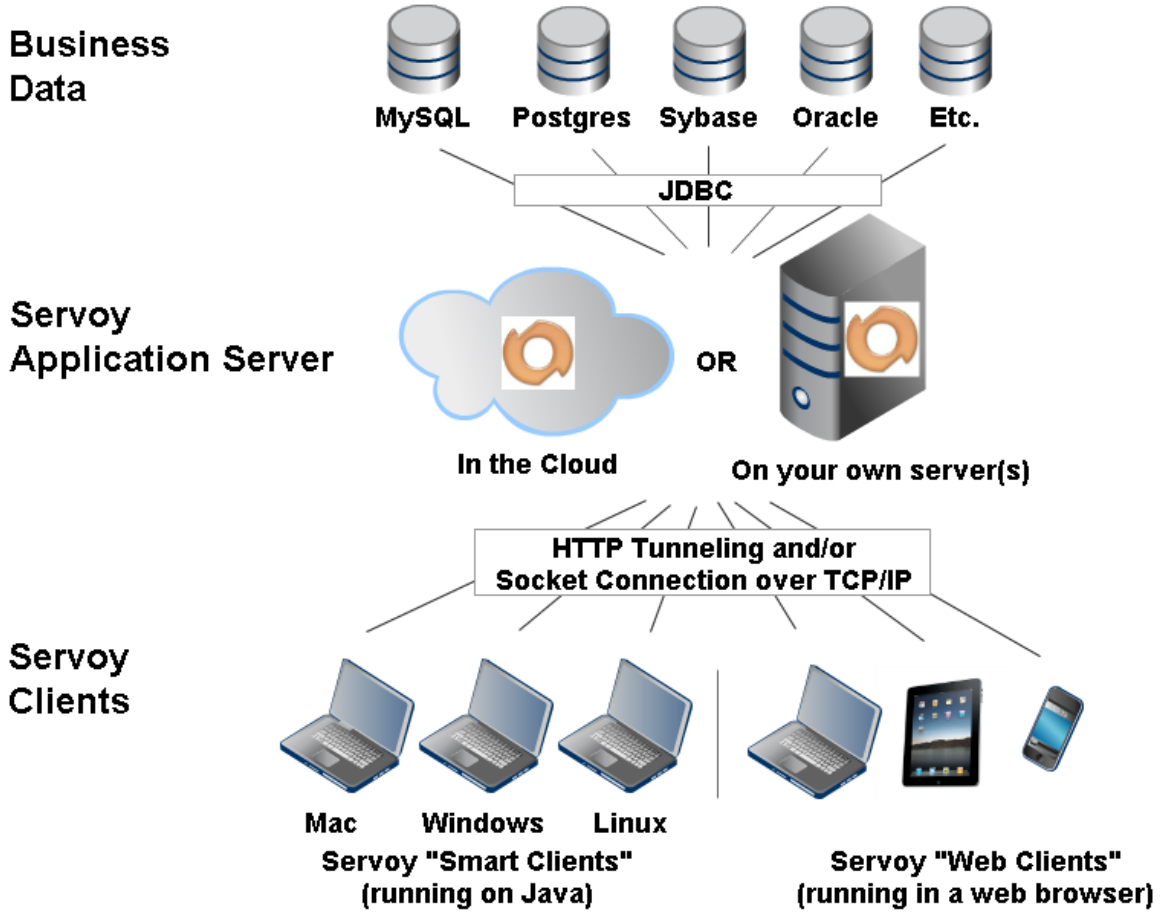
Deployment & Maintenance

- Deployment
  - Installation
  - Data Migration
  - Testing
  - Training
- Maintenance
  - Bug Fixes and Updates
  - Performance Monitoring
  - Security Updates
  - Scalability and Capacity
  - Backup & DR
  - User Support



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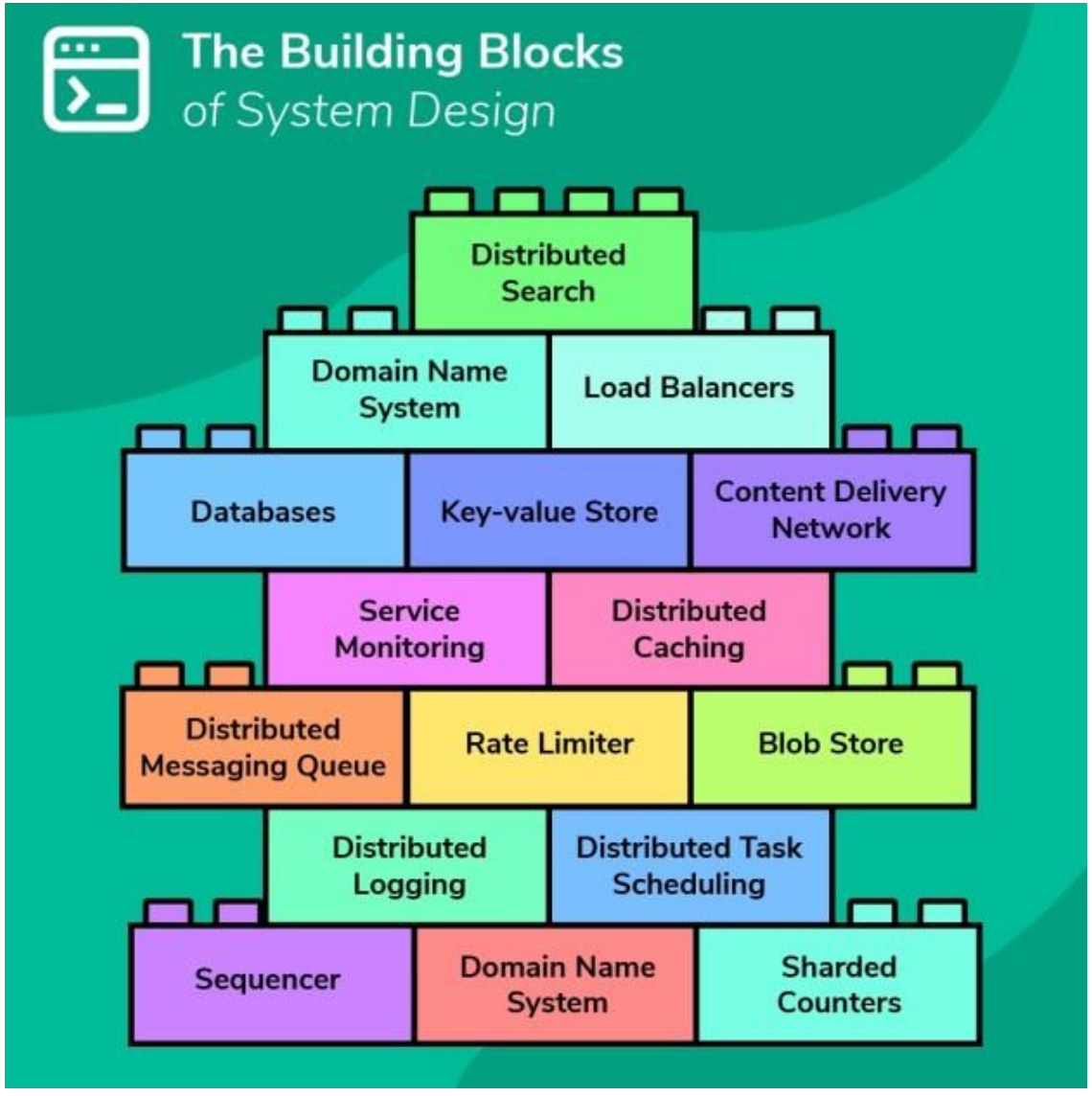
Best Practices in System Design

- Design Patterns
- Code Reusability
- Documentation
- Version Control
- Collaboration & Communication
- Performance Optimization



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Conclusion

- Recap of System Design
- Phases Of System Design
- Best Practices

Q&A

Thank You

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