System Analysis Course

Week 01: Introduction to System Analysis

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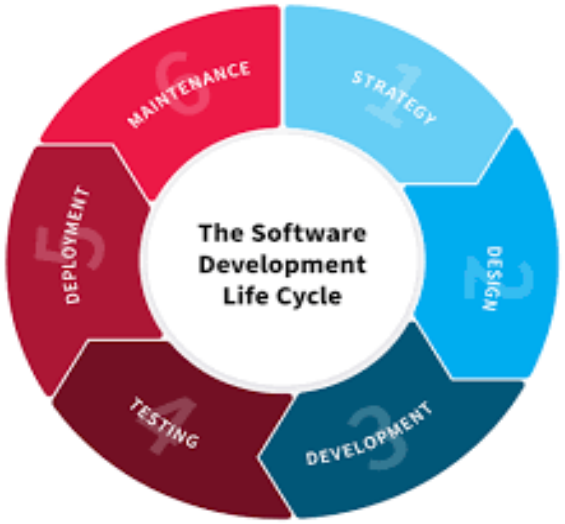
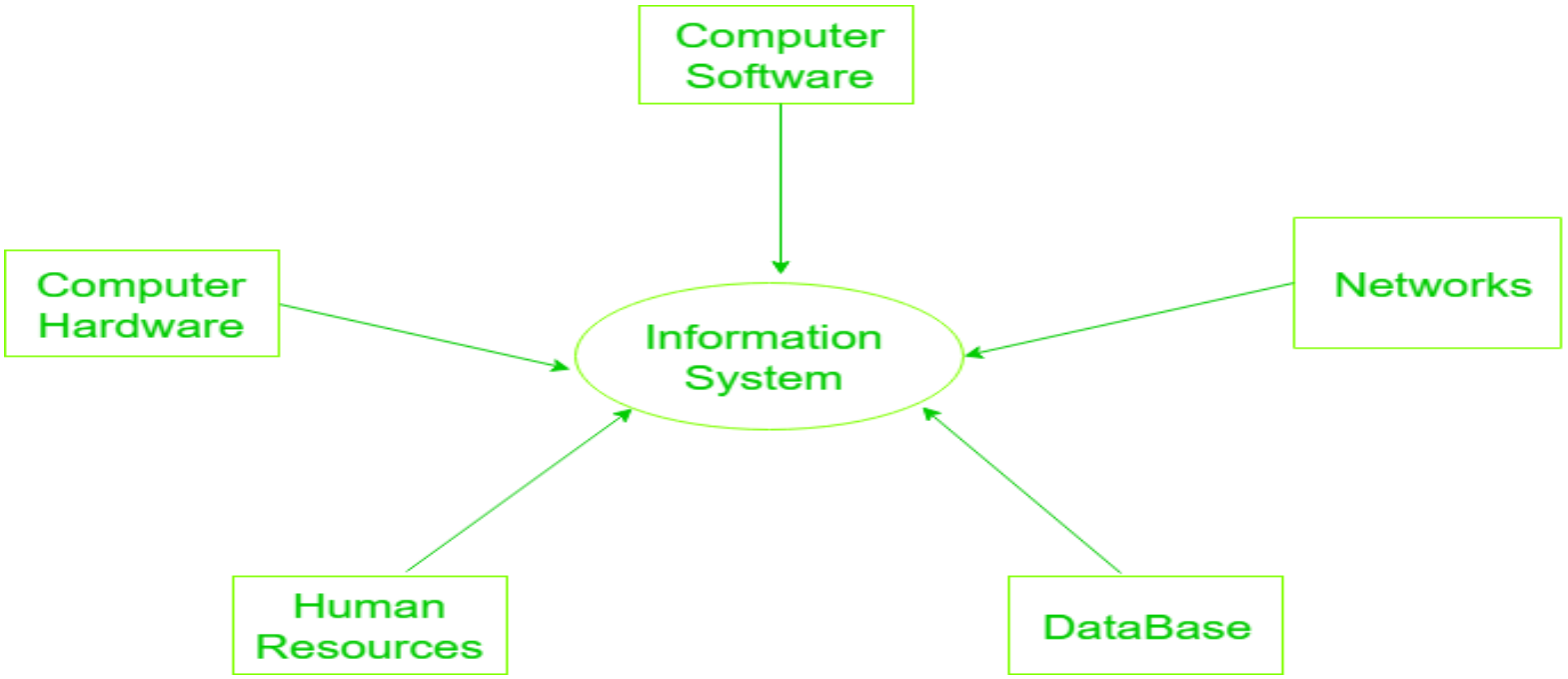


Outline

- Introduction
- System analysis Vs. System Design
- Systems Development Methods
  - Structured Analysis
  - Object Oriented Analysis
  - Agile Development
- SDLC Phases

Introduction

- An **information system** combines information technology, people, and data to support business requirements.



Introduction cont.

- ***Systems analysts*** who plan, develop, and maintain information systems.

- ***Systems analysis*** and design is a step-by-step process for developing high-quality information systems

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System analysis Vs. System Design

- ***System Analysis:*** consists of those activities that enable a person to understand and specify what the new system should accomplish.

- ***System Design:*** consists of those activities that enable a person to describe in detail how the information system will actually be implemented to provide the needed solution.

Analysis	• What is required for the new system to solve the problem
Design	• How the system will operate to solve the problem

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- ***Method Vs. Methodology***

- ***Method:*** A way of doing something. A careful or organized plan that controls the way something is done.

- ***Methodology:*** A set of methods, rules, or ideas that are important in a science or art. A particular procedure or set of procedures.

Systems Development Methods cont.

- Many options exist for ***developing*** information systems, but the most popular alternatives are

1. ***structured analysis***, which is a traditional method that still is widely used.

2. ***object-oriented (O-O) analysis***, which is a more recent approach that many analysts prefer.

3. ***agile methods***, also called adaptive methods, which include the latest trends in software development.

Systems Development Methods cont.

- Although most projects utilize one of these approaches, it is not unusual for system developers to mix and match methods to gain a better perspective.

- An approach that works well for one project might have major disadvantages or risks in another situation. The *important thing is for a systems analyst to understand the various methods and the strengths and weaknesses of each approach.*

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1- Structured Analysis

A. **Structured analysis** is a traditional systems development technique that is time-tested and easy to understand.

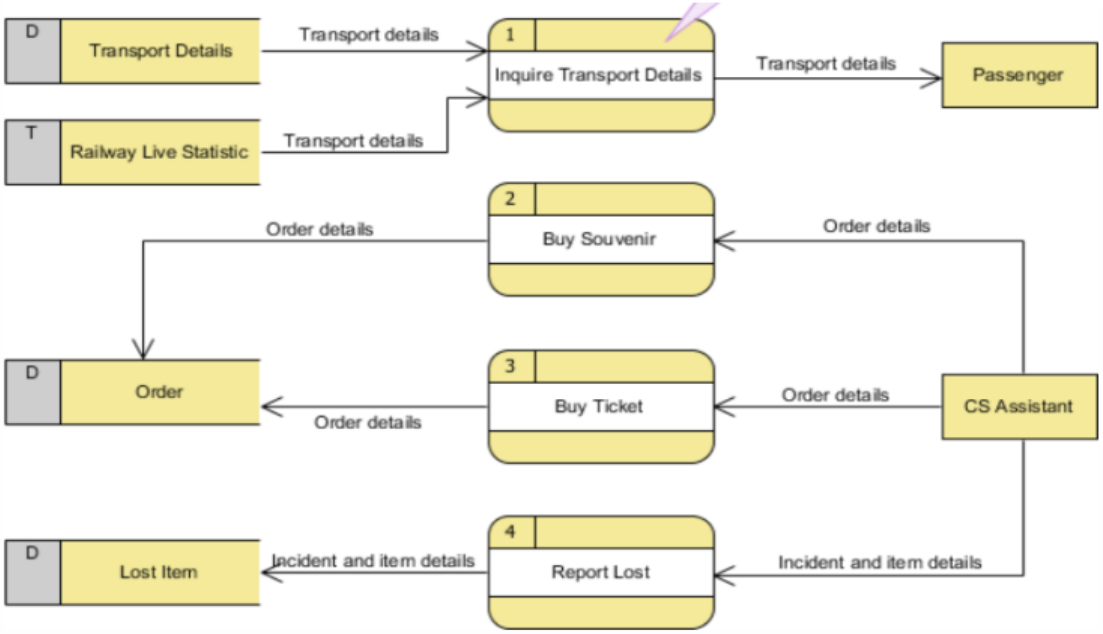
B. **Structured analysis** uses a series of phases, called the **systems development life cycle (SDLC)**, to plan, analyze, design, implement, and support an information system.

C. **Structured analysis** is based on an overall plan, similar to a blueprint for constructing a building, so it is called a **predictive approach.**

D. **Structured analysis** uses a set of **process models** to describe a system **graphically**. Because it focuses on processes that transform data into useful information, structured analysis is called a **process-centered technique.**

1- Structured Analysis Cont.

- A process model shows the data that flows in and ***out of system processes***. Inside each process, input data is transformed by **business rules** that generate the output.
  - Ex: **Data flow diagram**



1- Structured Analysis (SDLC Phases)

- The SDLC describes **activities** and **functions** that all systems developers perform, regardless of which approach they use.
- In the **waterfall model**, the result of each phase is called **deliverable**, or **end product**, which flows into the next phase.

1- Structured Analysis (SDLC Phases) Cont.

- Some analysts see a disadvantage in the built-in structure of the SDLC, because the ***waterfall model does not emphasize interactivity among the phases***. This criticism can be valid if the SDLC phases are followed too rigidly.

- **Solution:** Other analysts regard the waterfall model as a ***two-way water flow model***, with emphasis on iteration and user input.

Waterfall model advantages & disadvantage.

- ***advantages***
  - Waterfall model is easy to understand due to its simple linear structure
  - It helps to define the goals and deliverables at the early stage of the project

- ***disadvantage***
  - Definitely not a great choice complex and long-term project
  - Impossible to make changes at the later stage
  - Time

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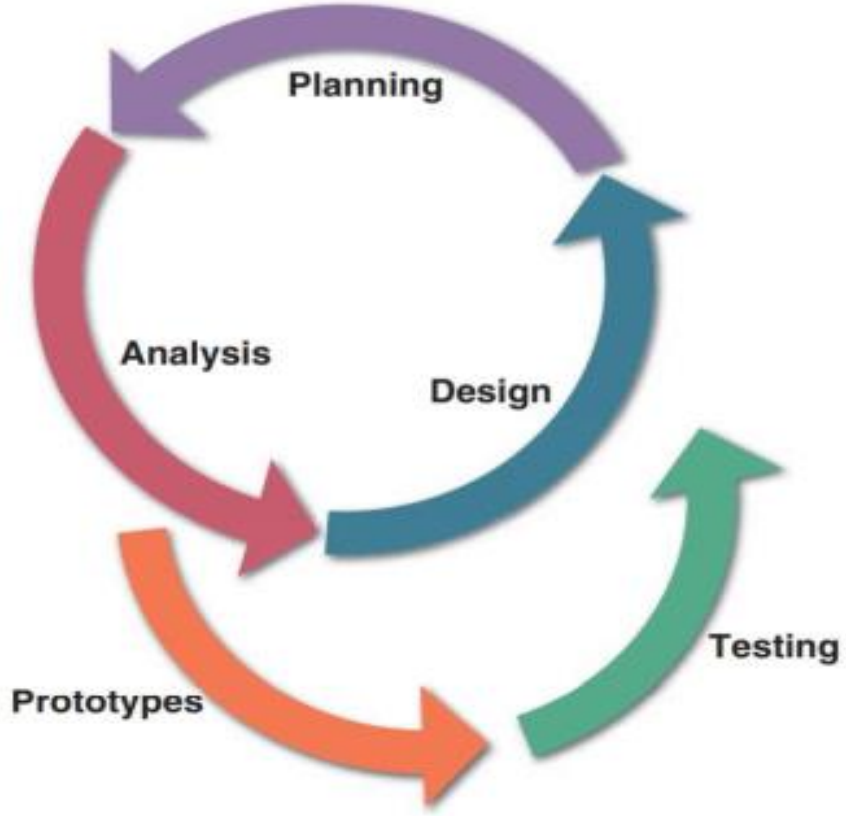
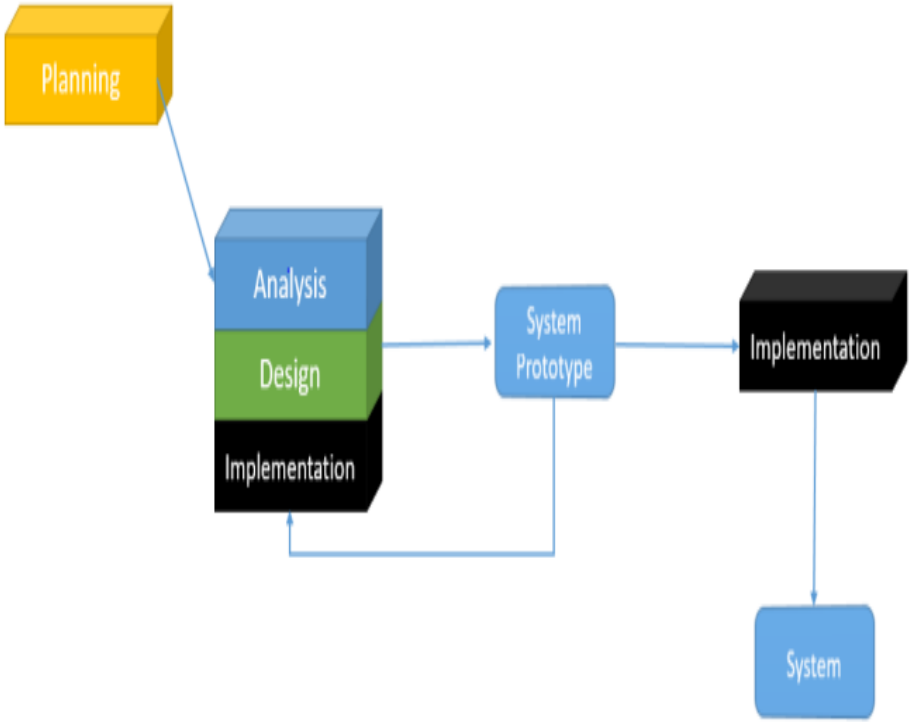
2- OBJECT ORIENTED ANALYSIS.

- Whereas structured analysis treats processes and data as separate components, object-oriented analysis combines data and the processes that act on the data into things called **objects**.
- Systems analysts use O-O to model real-world business processes and operations.
- The result is a set of software objects that represent ***actual people***, ***things***, ***transactions***, and ***events***.
- Using an ***O-O programming language***, a programmer then writes the code that creates the objects.
  - See the next figure in the next slide…

2- OBJECT ORIENTED ANALYSIS Cont.





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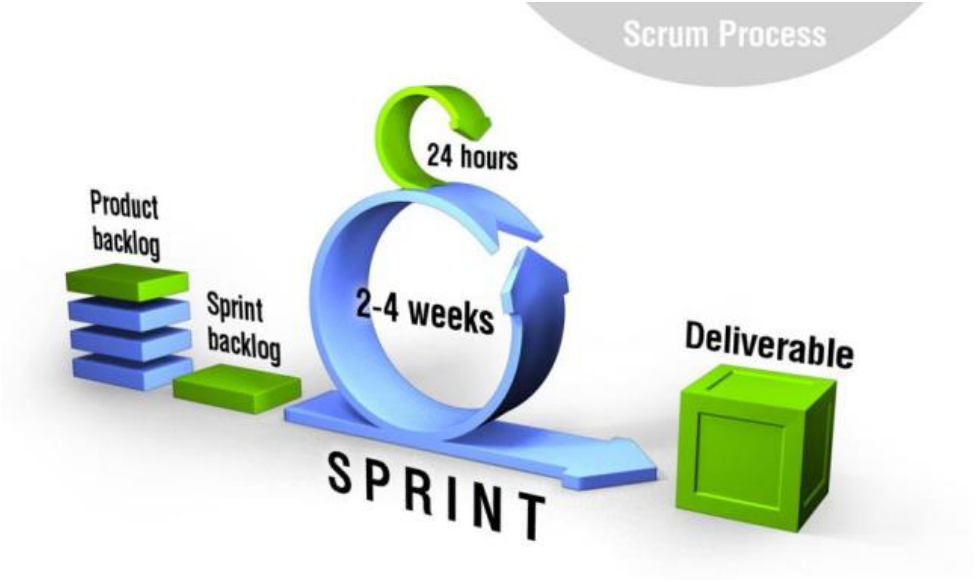
3- AGILE DEVELOPMENT.

- Structured analysis is a traditional approach, and **agile methods** are the newest development. Structured analysis builds an overall plan for the information system, just as a **contractor** might use a **blueprint** for constructing a building.



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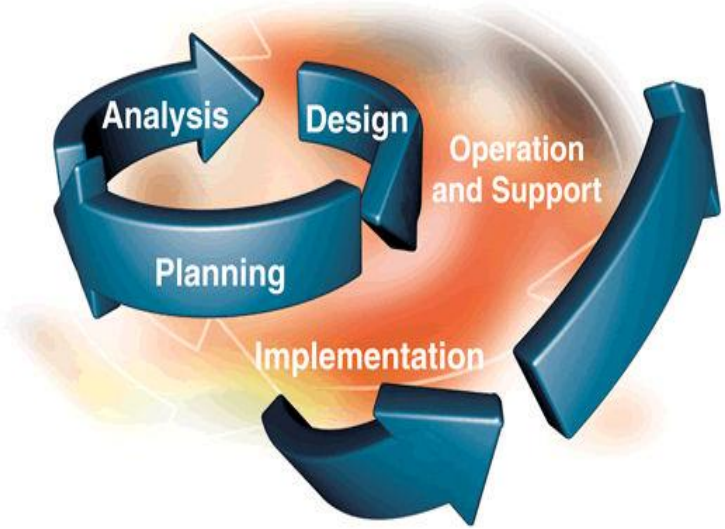
SDLC Phases

- SDLC (System development lifecycle):The SDLC model usually includes five steps, which are described in the following:

1. ***System Planning.***
2. ***System Analysis.***
3. ***System design.***
4. ***System implementation and testing.***
5. ***System Maintenance.***



1- System Planning

- The **systems planning phase** usually begins with a formal request to the IT department, called a **systems request**, which describes problems or desired changes in an information system or a business process.

- A systems request can come from a top manager, a planning team, a department head, or the IT department itself.

- A key part of the preliminary investigation is a **feasibility study** that reviews anticipated costs and benefits and recommends a course of action based on operational, technical, economic, and time factors

Feasibility study

2- System Analysis

- The purpose of the **systems analysis phase** is to build a logical model of the new system. The first step is **requirements modeling**, where you investigate business processes and document what the new system must do to satisfy users.

- To understand the system, you perform fact-finding using techniques such as interviews, surveys, document review, observation, and sampling. You use the fact finding results to build business models, data and process models, and object models.

- The deliverable for the systems analysis phase is the **system requirements document**.

3- System design

- The purpose of the **systems design phase** is to create a **physical model** that will satisfy all documented requirements for the system. At this stage, you design the user interface and identify necessary outputs, inputs, and processes.

- The deliverable for this phase is the **system design specification**, which is presented to management and users for review and approval.

4 – System implementation

- During the **systems implementation phase,** the new system is constructed.
- programs are written, tested, and documented and the system is installed.

- The objective of the systems implementation phase is to deliver a completely functioning and documented information system. At the conclusion of this phase, the system is ready for use. Final preparations include converting data to the new system's files, training users, and performing the actual transition to the new system.

- The systems implementation phase also includes an assessment, called a **systems evaluation**, to determine whether the system operates properly and if costs and benefits are within expectations.

5 – System maintenance

- During the **systems support and security phase**, the IT staff maintains, enhances, and protects the system. Maintenance changes correct errors and adapt to changes in the environment, such as new tax rates. Enhancements provide new features and benefits.

- ***Security*** controls safeguard the system from both external and internal threats.

- A well-designed system must be ***secure***, ***reliable***, ***maintainable***, and ***scalable***

Thank You