

# Amity School of Business

BBA, Semester 2

Analysis and Design of Business System  
(ADBS)

Arpan Sinha

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## Module -IV

# System And Database Design

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## Topics

- System Design
- System Design Goals
- Type of Design
- Design Strategy
- System Decomposition (Modeling, Connection and Coupling of a System)
- System Design Methodologies
- Database Design, Database Management System – an introduction, Overview of Data Models, Relational Database Model – Well structured relations
- Functional Dependency
- Normalization, Roles & Duties of System Administration.

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## System Design

The Design Phase is transition from a user-oriented document (System Proposal) to a document oriented to the programmers or database personnel.

It goes through two phases of development :

1. Logical Design
2. Physical Design

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## Logical Design

- Logical Design is the one that gives the idea of what the system will be and how it will work.
- It describes the input, output, databases and procedures in a system so as to meet the user requirement.

**Following Logical design is Physical design.**

- This produces a working system by defining the design specifications that tell programmers exactly what the candidate system must do. In turn, the programmers writes the necessary programs or modifies the software packages that accepts input from the user, performs the processing and gives the output.

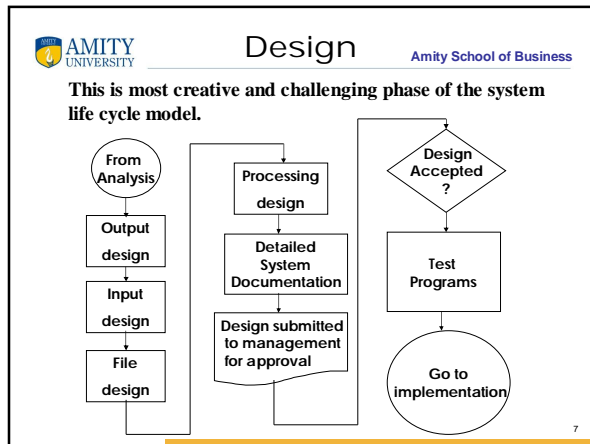
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## Physical Design

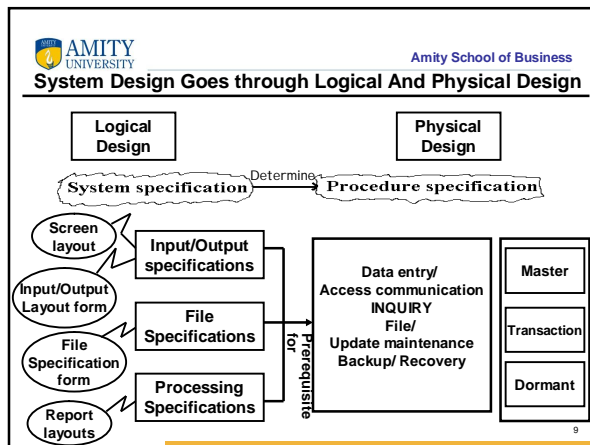
Physical System design consist of following steps:

- 1.Design physical system
  - a. Specify input/output media.
  - b. Design the database and specify backup procedures.
  - c. Code all the programs.
- 2.Plan system implementation
- 3.Devise a test and implementation plan.
- 4.Update benefits , costs, conversion data and system constraints (legal, financial, hardware.)

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- System design Cont.** Amity School of Business
- The Design Covers the followings :
1. Reviews the current Physical System- its data flow, file content, volumes frequencies, etc.
  2. Prepare output specification- i.e., determines the format, content, and frequency of reports, including terminal specifications and locations.
  3. Prepares input specifications- format, content, and most of the input functions.
  4. Prepare edit, security, and control specifications- specifying the rules for edit correction, backup procedures, and the controls that ensure processing and file integrity.
  5. Specifies the implementation plan.
  6. Prepare a logical design walkthrough of the information flow, output, input, controls, and implementation plan.
  7. Review benefits, costs, target dates and system constraints.
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- System Objective** Amity School of Business
- Every system has certain objective
  - Learning of function of a system
  - Performance of system depending on Inputs.
  - Fulfill the requirements
  - Future planning for the functioning of a system as not to be obsolete
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- Design Strategy** Amity School of Business
- A good design strategy is to organize the program modules in such a way that are easy to develop and later to, change.
- Three types of design strategy:
- Bottom-up Approach
  - Top-Down Approach
  - Hybrid Approach
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- Bottom Up Approach** Amity School of Business
- In a bottom-up approach the individual modules of the system are first specified in great detail. These modules are then linked together to form larger subsystems, which are again combined to provides larger subsystem and so on , till one big module is arrived which will be the whole desired system that meets the user requirement.
- Since the design is progressed from bottom layer upwards, the method is called bottom-up design.
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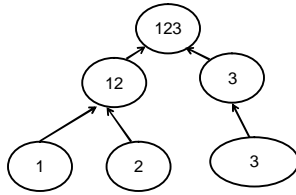


Fig: Bottom Up approach

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## Top-Down Approach

In top down approach a big system is broken down into subsystems (modules) which are further decomposed into lower level modules and iterating until the desired level of detail is achieved.

This is stepwise refinement, in each step the design is refined to a more concrete level, until a level is reached where no more refinement is needed.

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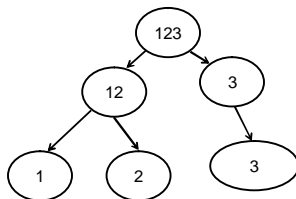


Fig: Top Down Approach

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## Design Methodologies

The feelings that there has to be a more clearly defined logical method for developing a system that meets user requirements has led to new techniques and methodologies that fundamentally attempt to do the followings:

1. Improve productivity of analysis and programmers.
2. Improve documentation and subsequent maintenance and enhancements.
3. Cut down drastically on cost overruns and delays.
4. Improve communication among the user, analyst, designer, and programmer.
5. Standardized the approach to analysis and design.
6. Simplify design by segmentation.

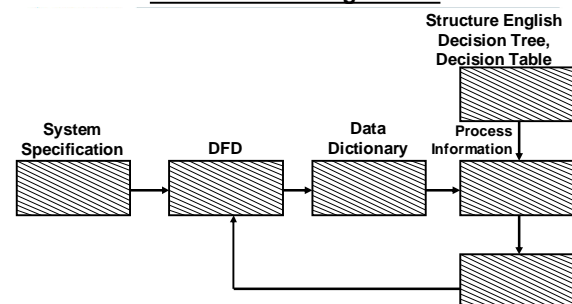
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## Structured System Design

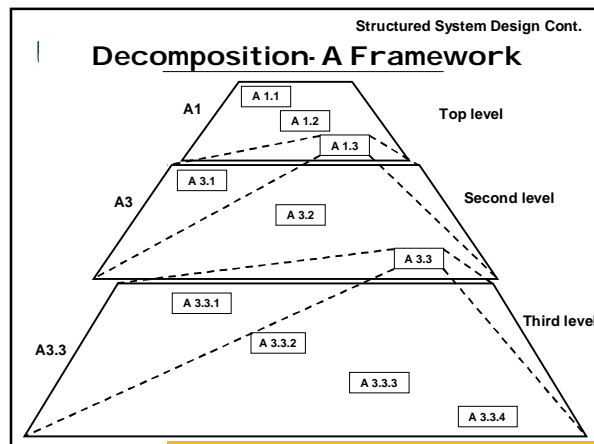
- ❖ Structured design is data-flow-based methodology.
- ❖ The approach begins with a system specification that identifies input and outputs and describe the functional aspects of the system.
- ❖ Structure design partitions a program into small, independent module.
- ❖ Structure design is an attempt to minimize complexity and make a problem manageable by subdividing it into smaller segments, which is called modularization or decomposition.

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### The Structured Design Method



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Structured System Design Cont.

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A design is said to be top-down if it consists of a hierarchy of modules, with each module having a single entry and a single exit subroutine.

**The Primary advantages of this design is-**

1. Critical interfaces are tested first.
2. Early versions of the design, though incomplete, are useful enough to resemble the real system.
3. Structuring the design, per segment, provides control and improves morale.
4. The procedural characteristics define the order that determines processing.

*So Structured design arises from the hierarchical view of the application rather than the procedural view.*

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Structured System Design Cont.

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### Functional Decomposition

The documentation tool for structured design is the hierarchy or *structure chart*. It is a graphic tool for representing hierarchy, and it has three elements :

1. Module
2. Connection
3. Couple

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Functional Decomposition Cont.

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❖ **Module** : It is represented by rectangle with name. It is a contiguous set of statement.

A Module

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Functional Decomposition Cont.

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❖ **Connection** : It is represented by a vector linking two modules. It usually means one module has called another module.

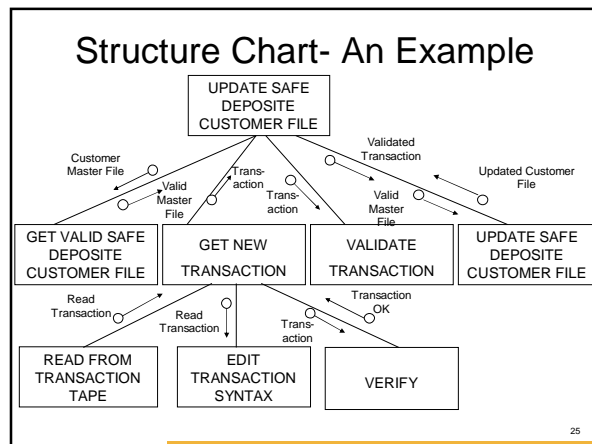
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Functional Decomposition Cont.

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❖ **Couple** : It is represented by an arrow with a circular tail. It represents data item moved from one module to another.

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