System Development Methods
CT00046-3-2

Structured Methodologies

Topic & Structure of the Lesson

- Introduction to Structured Methodologies
- Techniques and Tools

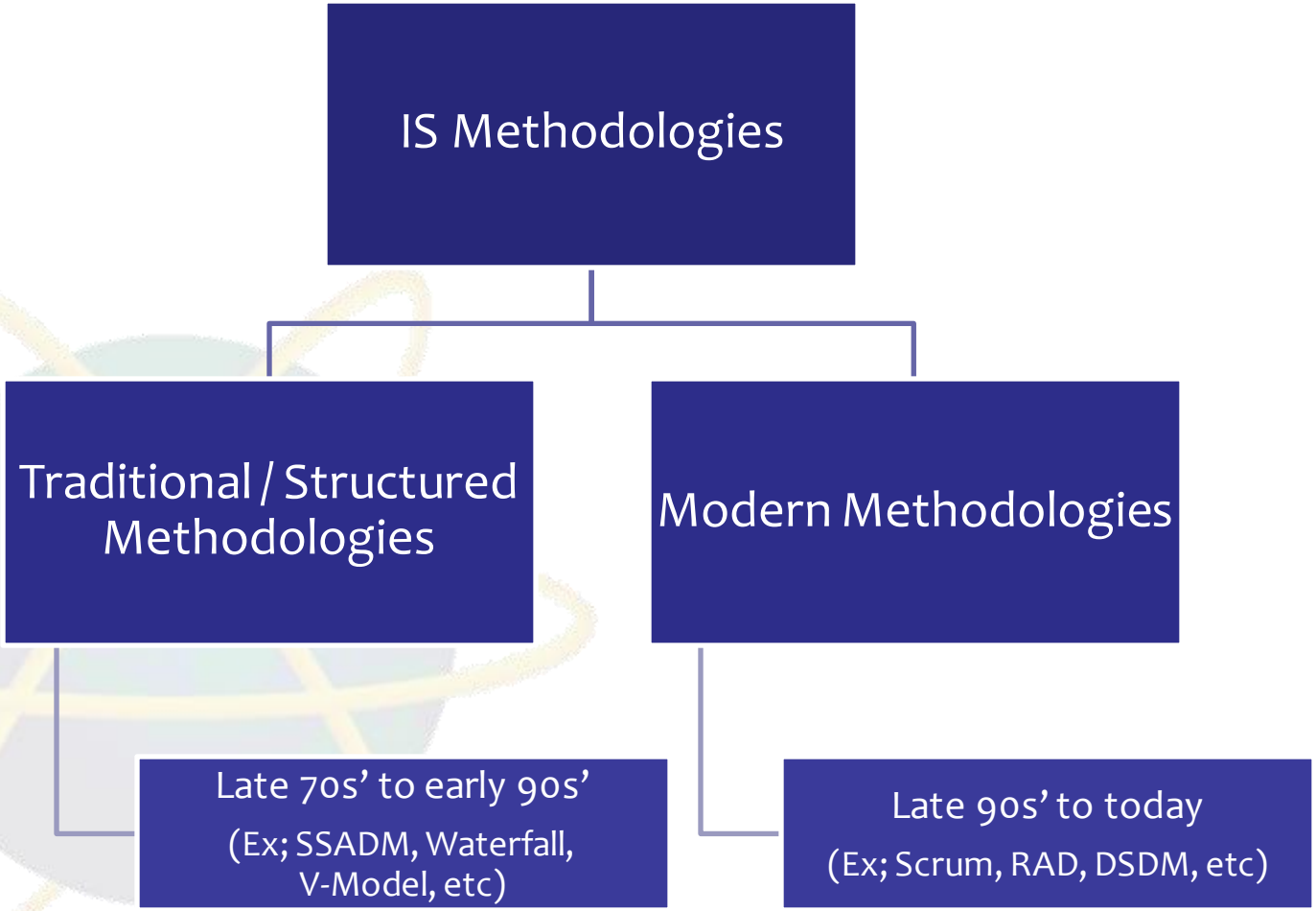
Learning Outcomes

- By the end of this lecture, YOU should be able to :
  - Identify and explain the underlying principles for Systems Development Methodology

Key Terms you must be able to use

- If you have mastered this topic, you should be able to use the following terms correctly in your assignments and exams:
  - IS Structured Methodologies
  - Techniques and Tools
  - Waterfall Model
  - SSADM
  - V-Model

Era of IS Methodologies

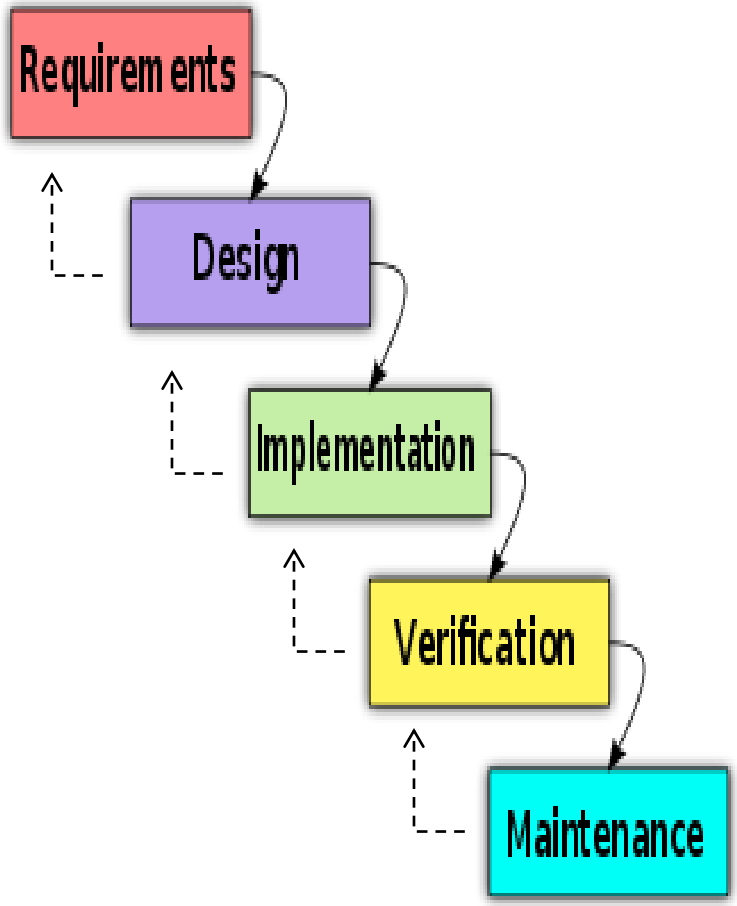


Structured Methodologies

- Developed in the 70's
- Mostly **Traditional Methodologies**
- Very detailed steps explained
  - Formulation for beginners to develop a system.
- Requirements need to be clear and fixed.
- Focus on error free product
- Rigid and strict rules
- Emphasis on full documentation.
- Example methodologies;
  - **Waterfall Model, SSADM, V-Model**
  - *(we will take a look at these three)*

Waterfall Model

- Close to SDLC phases
- Can be used for almost all types of projects
- Highly structured and rigid - sequential development process
  - One should move to the next phase only when its preceding phase is completed and perfected.
- Promotes quality control of process and product.
- Good for beginners.
- Emphasis on good documentation



Waterfall Model

Stages

- **Requirement Gathering and analysis**
  - All possible requirements of the system to be developed are captured and documented into System Requirement Specification (SRS) document.

- **System Design**
  - The SRS is studied and system design is prepared.
  - System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture.

- **Implementation**
  - With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase.
  - Each unit is developed and tested for its functionality which is referred to as Unit Testing.

Waterfall Model

Stages .. cont

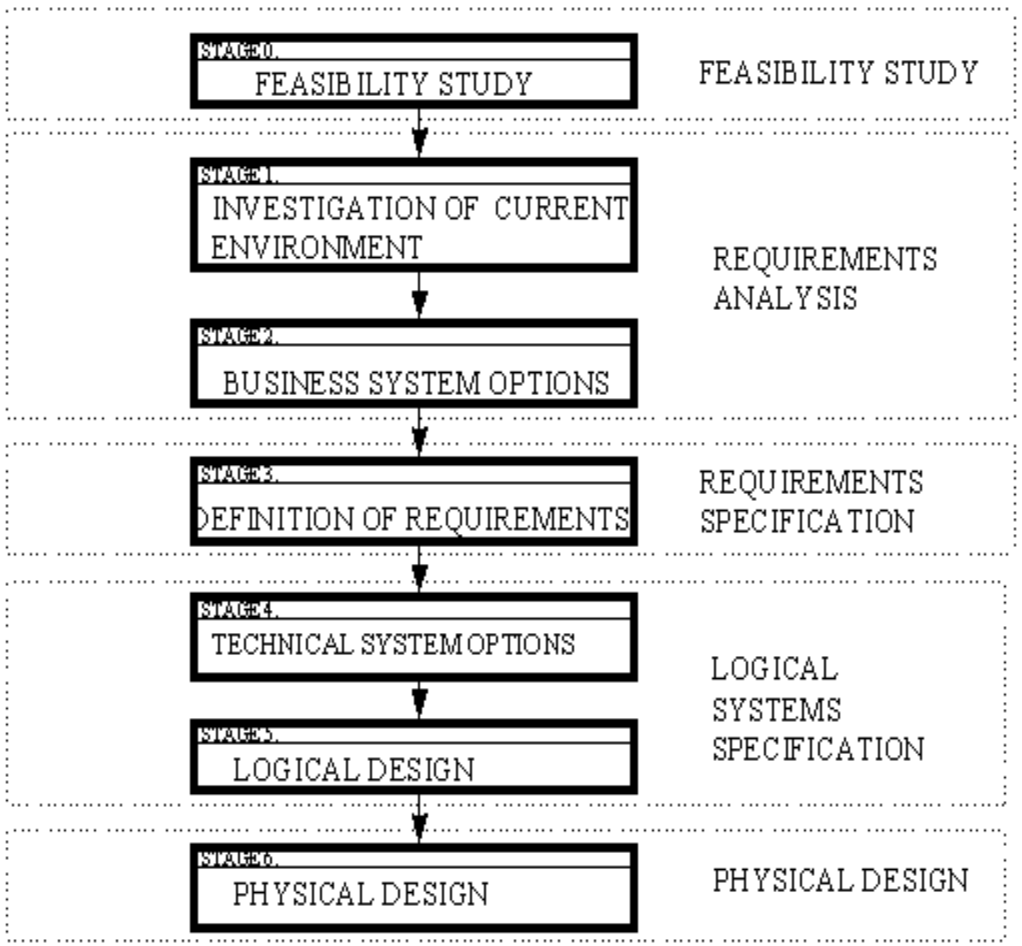
- **Integration and Testing**
  - All the units developed in the implementation phase are integrated into a system after testing of each unit.
  - Post integration the entire system is tested for any faults and failures.

- **Deployment of system**
  - Once the functional and non functional testing is done, the product is deployed in the customer environment or released into the market.

- **Maintenance**
  - There are some issues which come up in the client environment. To fix those issues patches are released.
  - Also to enhance the product some better versions are released.

Structured Systems Analysis And Design Method (SSADM)

- Popular methodology used in the late 80s
- Rigid and document-led approach to system design
- Have detailed DESIGN stage.
- Good for projects with database design.
- Has strategies to align business needs with system development.
- Ends at design stage.



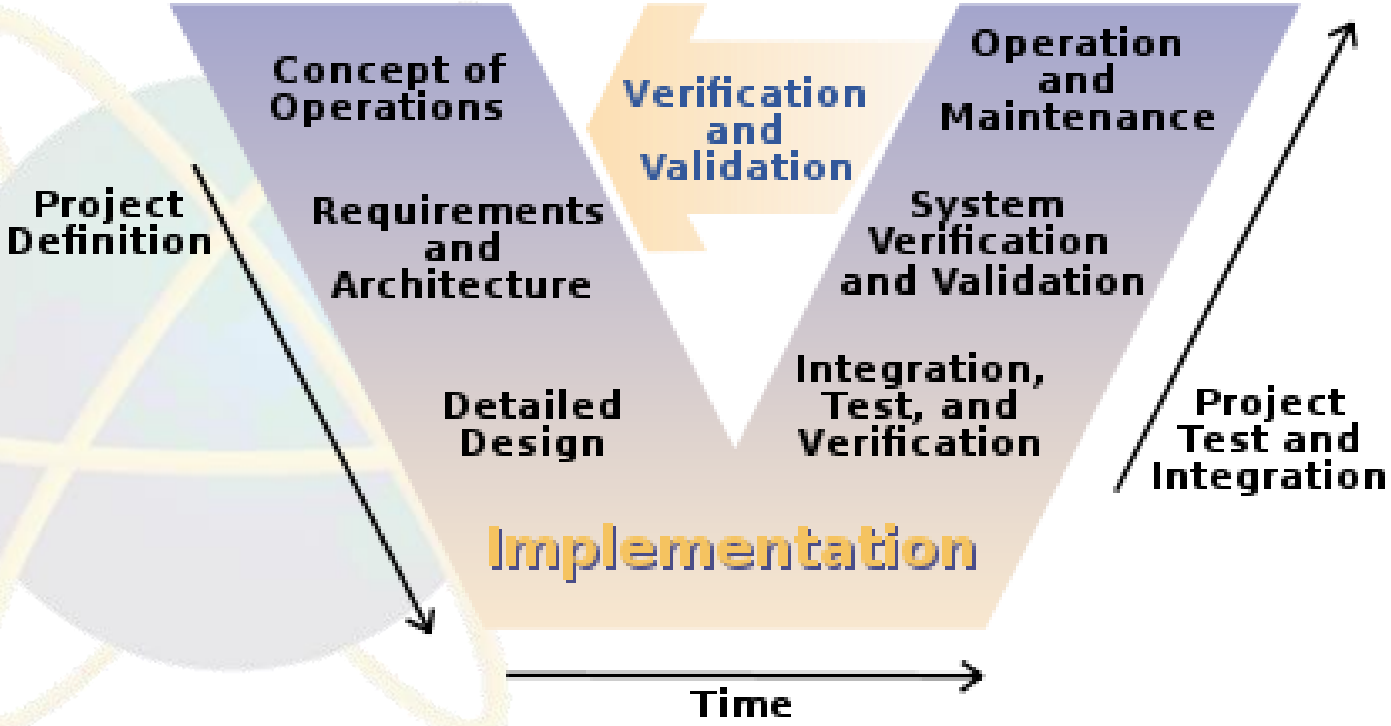
SSADM

Techniques

- Logical Data Modeling
  - To determine the high level requirement for the system
  - System components, entities, main process, etc.
- Data Flow Modeling
  - To determine the 'movement' of data within the system
  - Data transformation, storage, data flow, etc.
- Entity Event Modeling
  - To determine the processes and operations
  - Event sequence, dependency, etc.

V-Model

- Derived and modified from Waterfall Model
- Emphasize of 'check and balance' of development process



V-Model

- Verification is the process of determining that a model implementation **accurately represents the developer's** conceptual description of the model and the solution to the model.
- Validation is the process of determining the degree to which a model is an **accurate representation of the real world f**rom the perspective of the intended uses of the model.

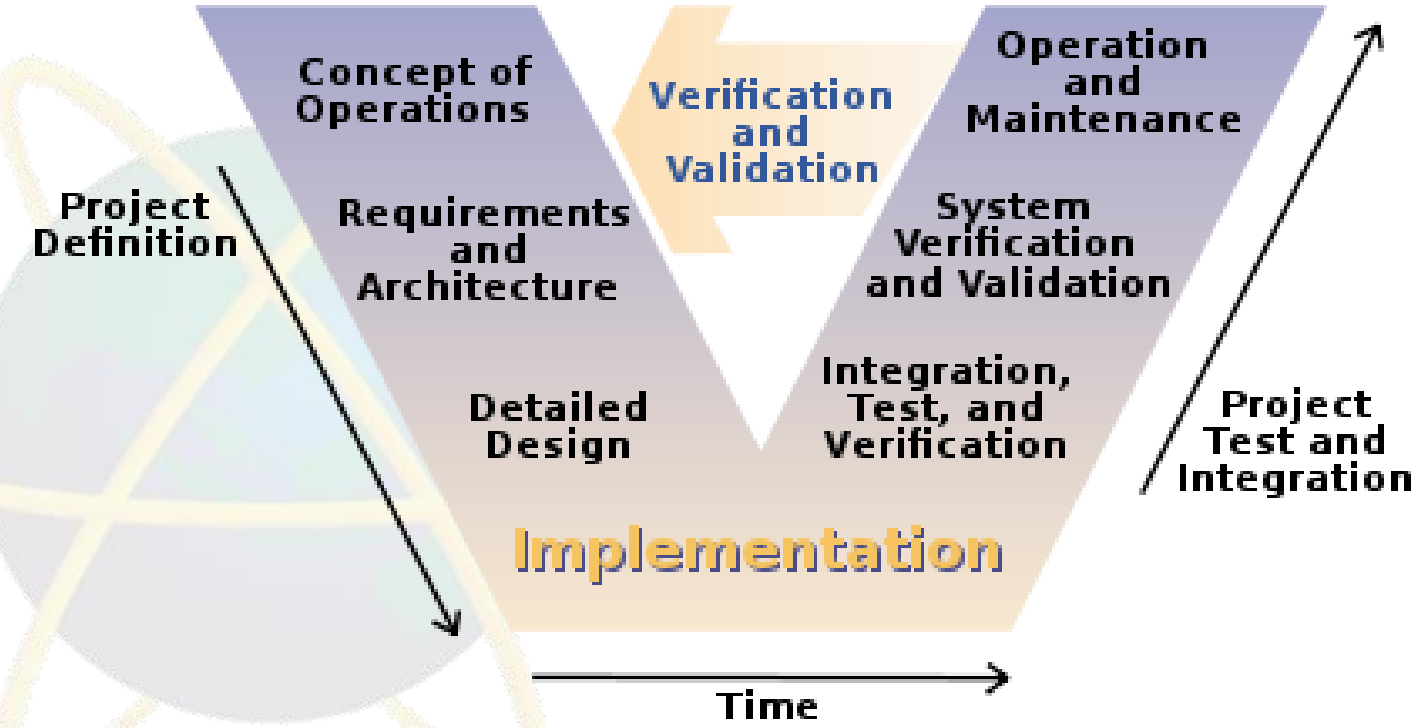
V-Model

Techniques

- Takes the 'top-down' development approach
  - Concept, Architecture Design, high level design, etc.
- Verification and Validation at end of each phase / process.
  - Referring back to project documentation, objectives, scopes, requirements, specifications, etc.
  - Users are consulted for verification and validation.
- Use various testing techniques for product
  - Unit, integration, system, user acceptance, etc.

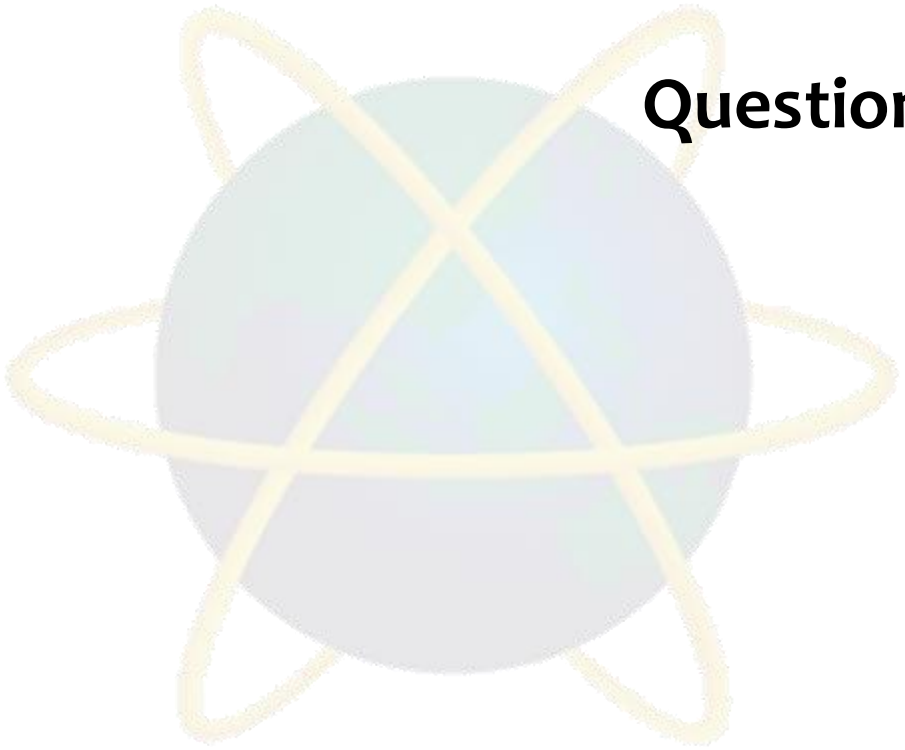
Quick Quiz

- Explain to your class, the **process flow within** a V-Model?



Problems with Structured Methodologies
(in general)

- Rigid phases, discourage skipping of unimportant steps.
- Emphasize of process and product quality rather then customer satisfaction
- Requirement need to be defined in the beginning of the project and not encouraged to change towards the end.
- **Cost** and **time** often unpredictable for large projects.
- Too many '**red-tapes**', wasting time and resources



Question & Answer

Next Session

- Agile Methods

Tutorial Questions

- Find **names** of a few **popular methodologies** used today. What are the types of project that they are used for?
- Discuss the **advantages** using IS Development Methodologies.
- Discuss the ***distinctive*** **disadvantages** using the following IS Development Methodologies.
  - Waterfall model
  - SSADM
  - V-Model