3. System Analisis and Design

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Elements of a System

- Outputs and Inputs
- Processor
- Control
- Feedback
- Environment
- Boundaries and Interface

Types of System

- Physical – These are tangible entities that may be static or dynamic in operation. For example- parts of a computer center are the desks, chairs etc.
- Abstract System – These are conceptual or non physical entities. For example- the abstract conceptualization of physical situations.
- Deterministic System – It operates in a predictable manner and the interaction between parts is known with certainty. For example: Two molecules of hydrogen and one molecule of oxygen make water.
- Probabilistic System – It shows probable behavior. The exact output is not known. For example: weather forecasting
- Social System- It is made up of people. For example: social clubs, societies
- Natural System- The system which is natural. For example- Solar system, Seasonal System.
- Manufactured System- System made by man is called manufactured system. For example- Rockets, Dams, and Trains.

Types of System (cont'd)

- Permanent System- Which persists for long time. For example- policies of business.
- Temporary System- Made for specified time and after that they are dissolved. For example- setting up DJ system.
- Adaptive System- responds to change in the environment in such a way to improve their performance and to survive.
- Non Adaptive System-The system which doesn‘t respond to the environment. For example- Machines
- Open System – It has many interfaces with its environment. It interacts across its boundaries, it receives inputs from and delivers outputs to the outside world.
- Closed System – It is isolated from the environmental influences. A completely closed system is rare.

Case Tools

- CASE tools stand for Computer Aided Software Engineering tools
- Computer based programs to increase the productivity of analysts
- They permit effective communication with users as well as other members of the development team.
- They integrate the development done during each phase of a system life cycle.
- They assist in correctly assessing the effects and cost of changes so that maintenance cost can be estimated.

Advantages of case tools

- they integrate the development done during each phase of system development
- they permit effective communication with users
- they are useful as communication aids with users of the system

Disadvantages of case tools

- Some tools are expensive
- All software engineers need to be trained to use these tools
- A lot of time is wasted in using the tools
- Software developed using CASE tools are of poor quality

System Flow Chart

- System flowcharts are a way of displaying how data flows in a system and how decisions are made to control events.
- To illustrate this, symbols are used. They are connected together to show what happens to data and where it goes.

DFD

- The Data Flow Diagram (DFD) is a graphical representation of the flow of data through an information system.
- It enables you to represent the processes in your information system from the viewpoint of data.
- The DFD lets you visualize how the system operates, what the system accomplishes and how it will be implemented, when it is refined with further specification.

Types of DFD

- Logical data flow diagrams - are implementation-independent and describe the system, rather than how activities are accomplished.
- Physical data flow diagrams - are implementation-dependent and describe the actual entities (devices, department, people, etc.) involved in the current system.

ER Model

An entity–relationship model (ER model) is a data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database

Development Methodologies

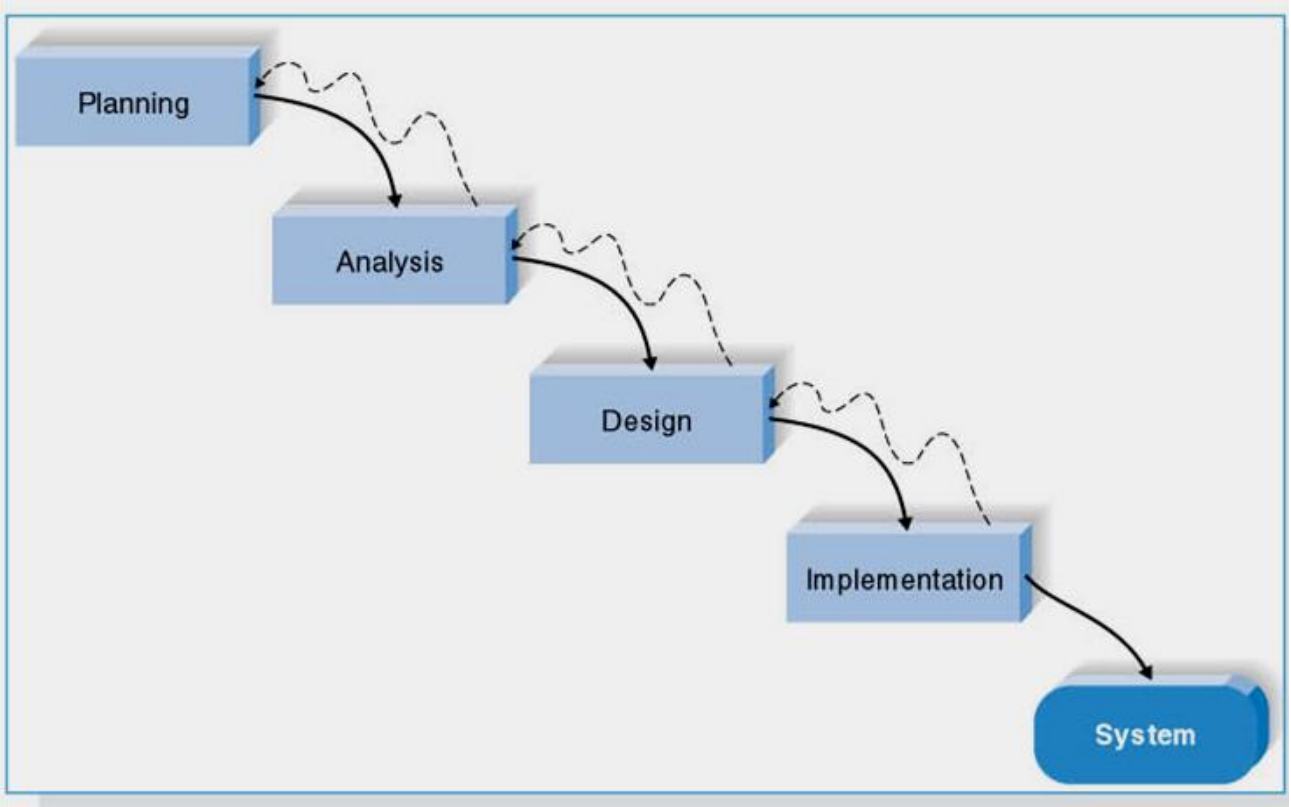
- Waterfall models
- Spiral models
- Iterative models
- Object Oriented/ UML

Criteria for Selecting Methodology in Developing Systems

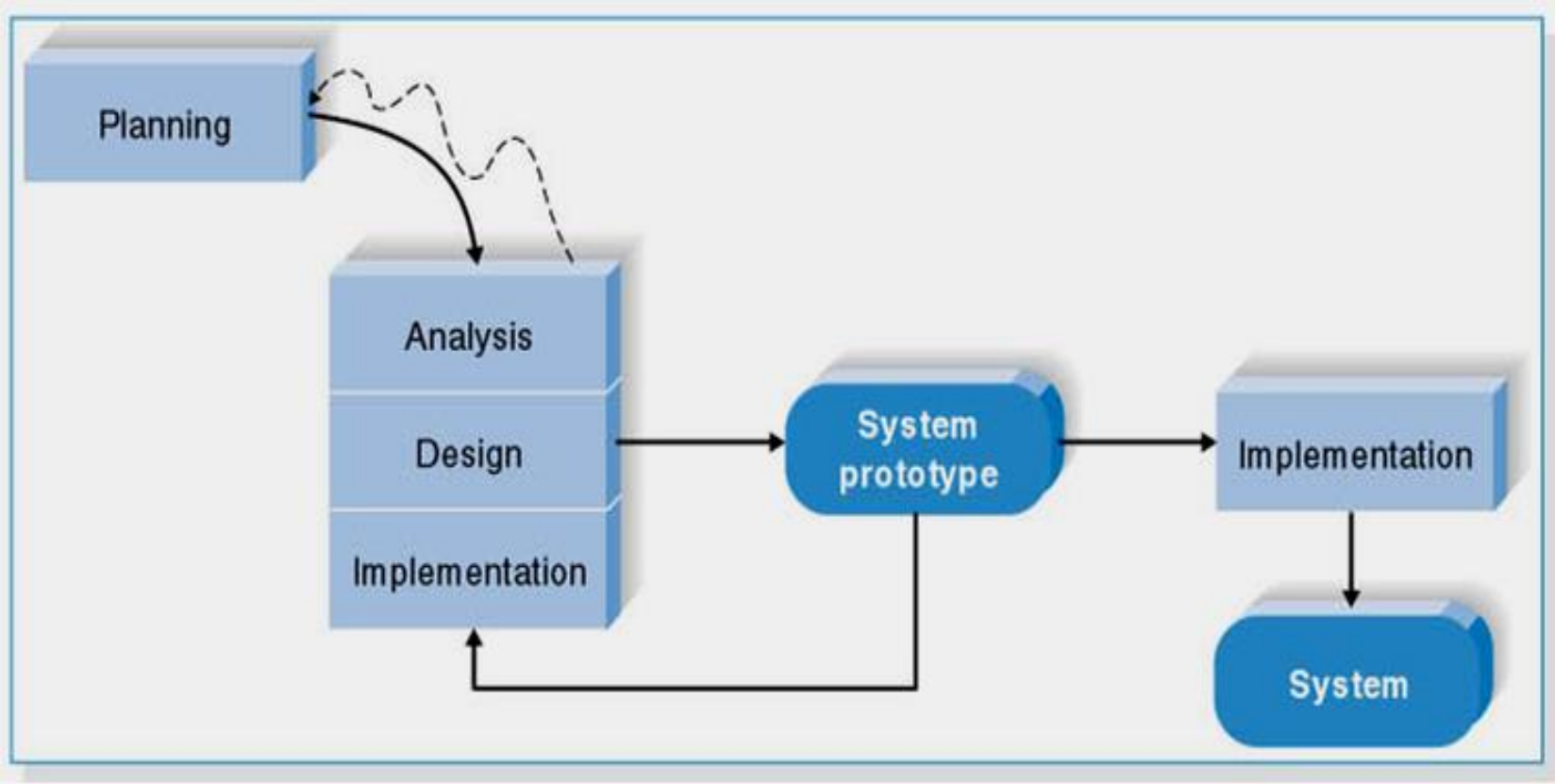
Ability to Develop Systems	Structured Methodologies		RAD Methodologies			Agile Methodologies
	Waterfall	Parallel	Phased	Prototyping	Throwaway Prototyping	XP
with Unclear User Requirements	Poor	Poor	Good	Excellent	Excellent	Excellent
with Unfamiliar Technology	Poor	Poor	Good	Poor	Excellent	Poor
that are Complex	Good	Good	Good	Poor	Excellent	Poor
that are Reliable	Good	Good	Good	Poor	Excellent	Good
with a Short Time Schedule	Poor	Good	Excellent	Excellent	Good	Excellent
with Schedule Visibility	Poor	Poor	Excellent	Excellent	Good	Good

System Development Life Cycle

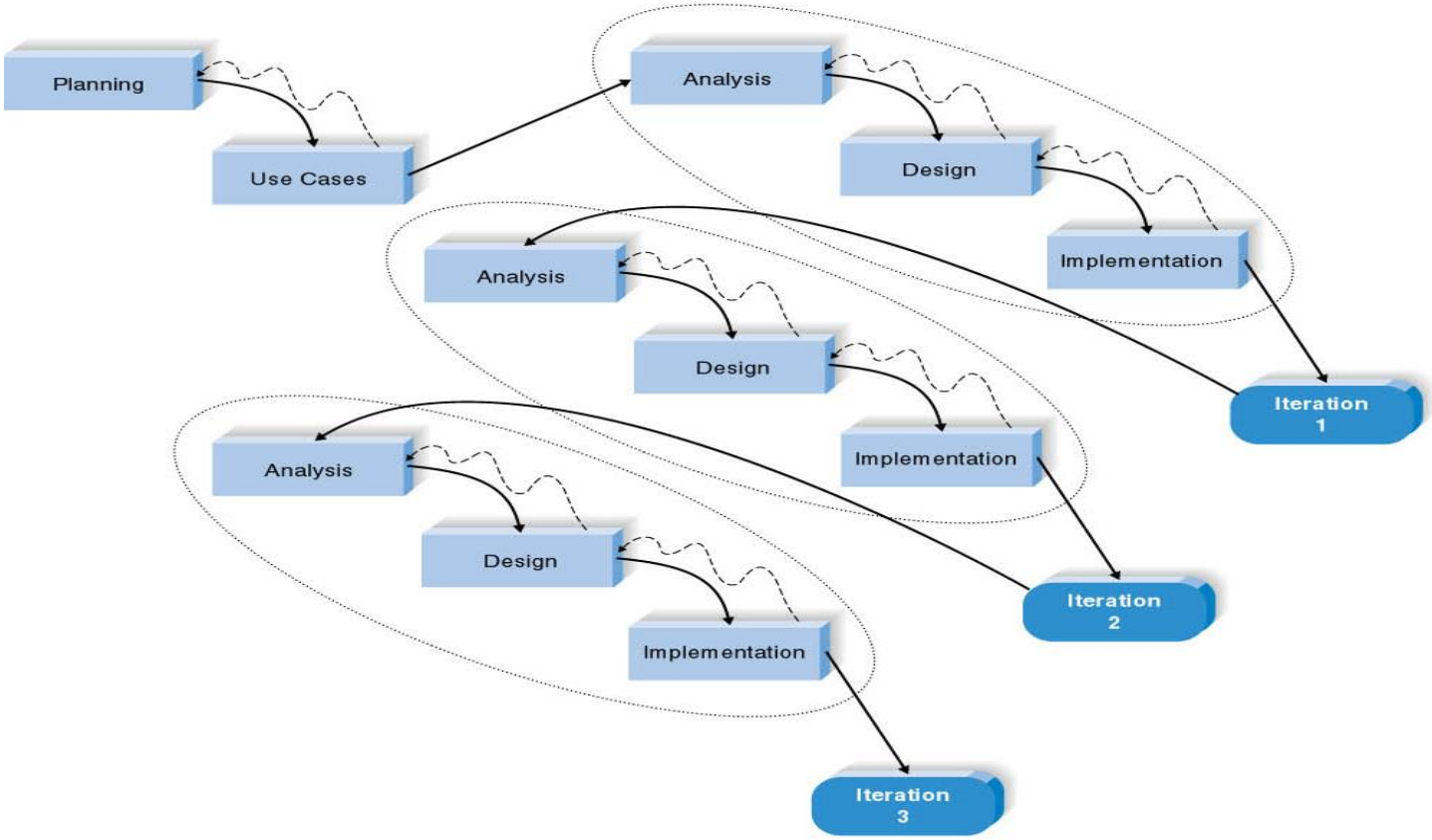
Waterfall Development-based Methodology



Prototyping



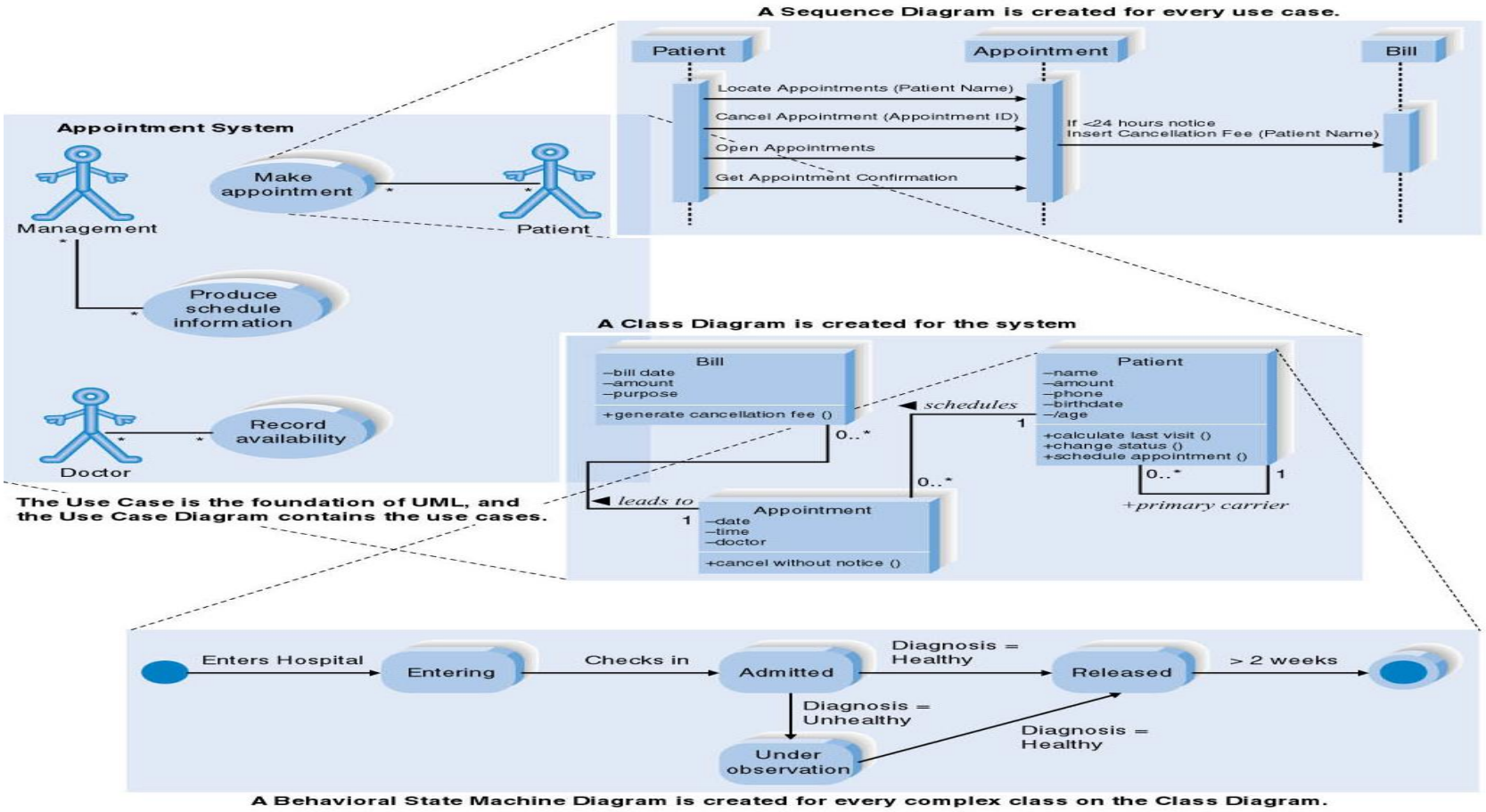
Adaptation of the Unified Process Phased Development Methodology: Example of RAD



Object-Oriented Modeling Techniques

- Major object-oriented modeling techniques include:
  - Use Case diagrams
  - Class diagrams
  - Sequence diagrams
  - Statechart diagrams

Integration of four UML Diagrams



Thank You !

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