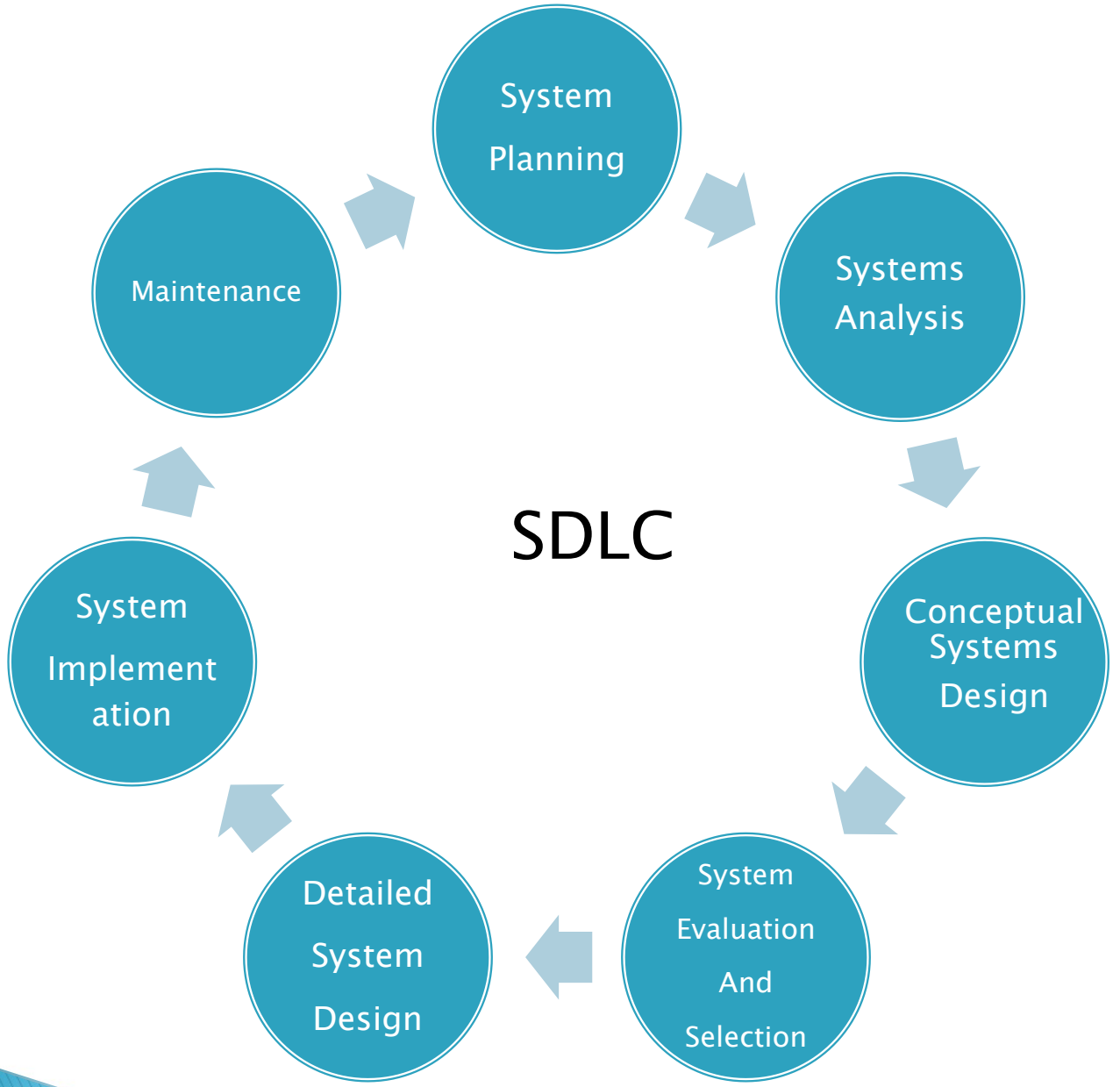
The System Development Life Cycle

The General Systems Design Phase

Objectives

- Define three systems design categories
- Discuss the use of rapid application development (RAD) in general systems design and describe RAD's four key elements.
- Describe the structure-oriented design approach
- Descript the object-oriented design approach
- Compare the structure-oriende design approach with the object oriented design approach.



General Systems Design

Three Categories of Systems Design

- Global-based systems
- Group-based systems
- Local-based systems

Three Categories of Systems Design

Global-based systems

- Covers the entire organization
- Large, complex, high volume of transactions
- Critical to a company's success

Three Categories of Systems Design

Group-based systems

- Developed for departments, or units, or branches of an organization
- Examples, billing system for a hospital, employee management systems for a hospital, patient-records management systems for a hospital

Three Categories of Systems Design

Local-based systems

- Smaller scale system intended to support a small group or users
- Examples: an executive information system (EIS) for a few strategic-level executives

Two Approaches to System Design

- The Structured Approach
- The Object-Oriented Approach

- Will use common methods, tools, and techniques

Four Key Elements of RAD to Design Systems

1. Joint application development (JAD)

2. Specialists with advanced tools (SWAT) teams

3. Computer-aided systems and software engineering (CASE) tools

4. Prototyping

The Structured-oriented design aproach

SDLC, Prototyping, CASE, RAD : uses an engineered disciplined top-down decomposition (The waterfall model)

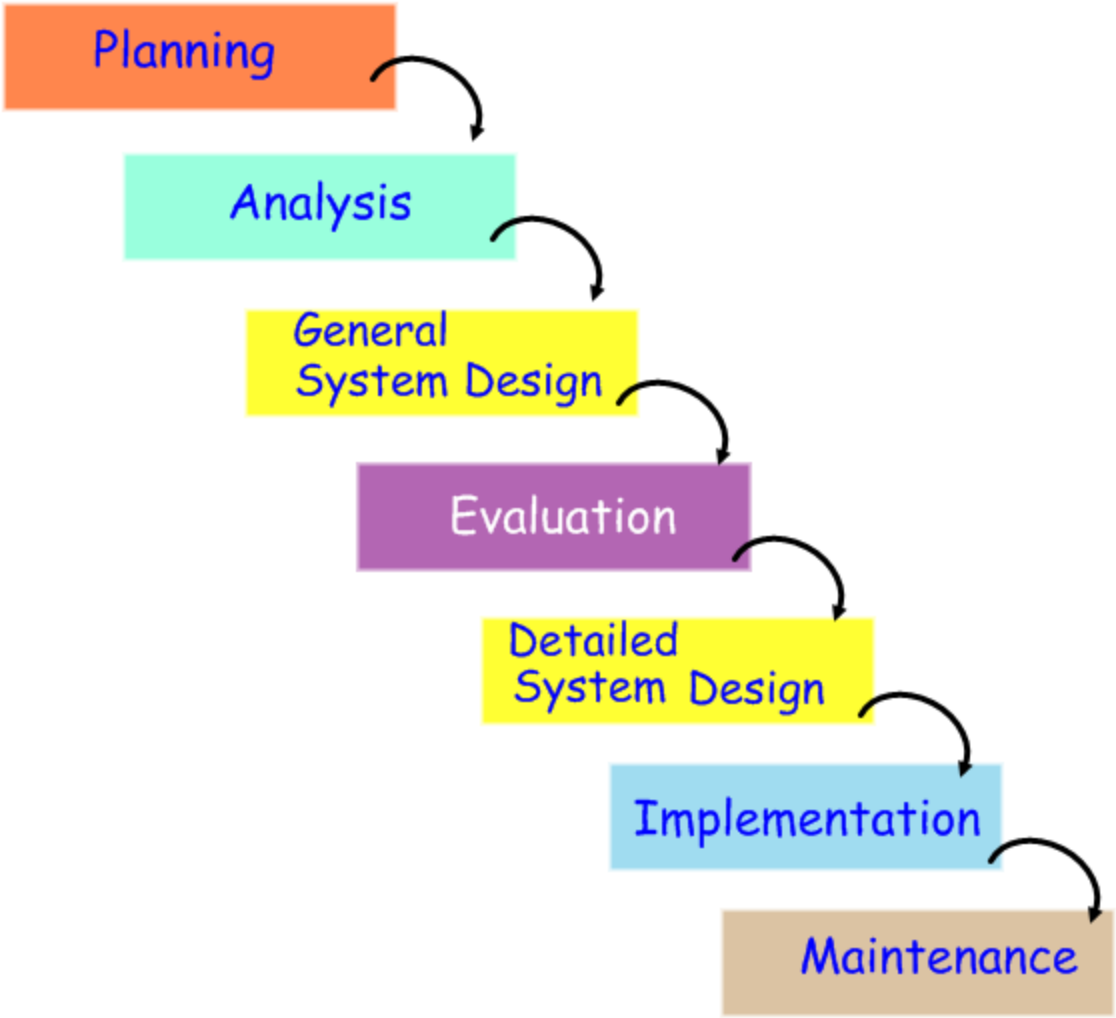
The process-oriented approach

Used when the inputs, processes, and outputs are well defined or established

The data-oriented design approach

Used when the components are less defined and for defining decision-making tasks

The Waterfall Model



The object-oriented design approach

Designing and building systems using reusable software objects; uses methods, tools, and techniques as the structured approach.

Goal of object-oriented approach during the design phase, identify

1. Object Classes
2. Relationships
3. Attributes
4. Inheritance

Object Oriented – Bottom Up Approach

- Have a database or repository of object classes
- The classes are retrieved and extended to apply to new applications, also providing additional object-classes for the library.
- Adds reusability.

Object Oriented – Bottom Up Approach

- Step1 : Identify object classes
- Step 2: Identify Relationships
- Step 3: Identify Attributes
- Step 4: Identify Inheritance and build a class hierarchy

Comparing Structured-oriented and object-oriented design approaches

- Modularity – common to both approaches
- Top-down versus Bottom-up Design
- Using existing Object Class Libraries
- Structured approach defines data in terms of files and databases, and software modules to access the data;
- Object-oriented approach “encapsulates” data and attributes as software objects.

Key Terms

Terms to know, or be familiar with now				Terms for Next Year
Bottom-up design	Global-based Systems	Object	RAD	Encapsulation
Classes	Group-based systems	Object-class library	Specialists with Advanced Tool teams	Inheritance
Data Dictionary	Local-based systems	Object-oriented design	Structured-oriented design	Polymorphism
Data-oriented approach	Messages	Object-oriented programming	Top-down design	Subclass
Executive Information System (EIS)	Modularity	Process-oriented approach		Superclass