Systems Analysis and Design Course

Bachelor Degrees in Computer Science Course

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Section 2: APPROACHES TO DEVELOPMENT

Razwan M.S. Najimaldeen, PhD
Computer Science Dept.
University of Duhok
razwan.mayi@uod.ac

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Systems Development Life Cycle (SDLC)

Phase	Products, Outputs, or Deliverables
Systems planning and selection	Priorities for systems and projects
	Architecture for data, networks, hardware, and IS management
	Detailed work plan for selected project
	Specification of system scope
	System justification or business case
Systems analysis	Description of current system
	General recommendation on how to fix, enhance, or replace current system
	Explanation of alternative systems and justification for chosen alternative
Systems design	Detailed specifications of all system elements
	Acquisition plan for new technology
Systems implementation and operation	Code
	Documentation
	Training procedures and support capabilities
	New versions or releases of software with associated updates to documentation, training, and support

Approaches to Development

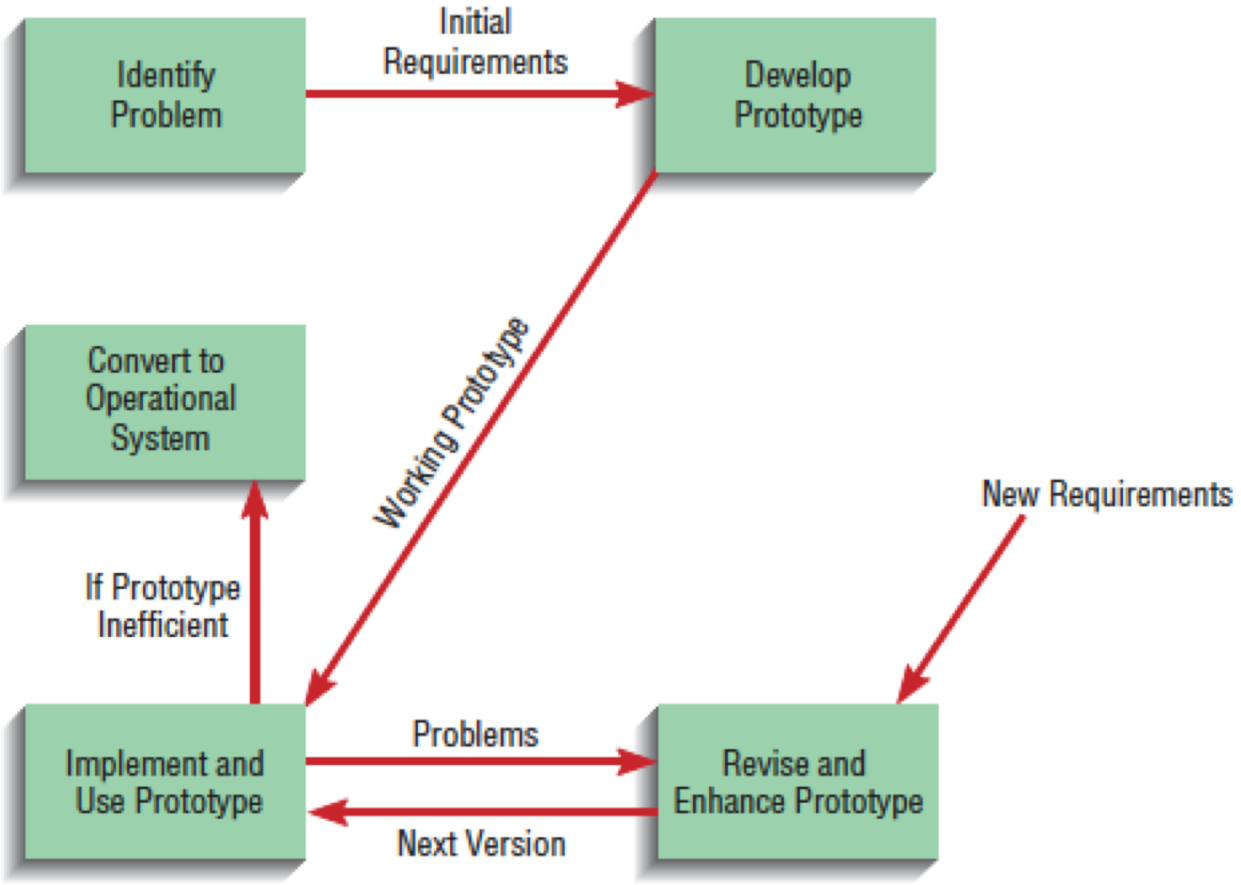
- **Represent different approaches that streamline and improve the systems analysis and design process from different perspectives.**
  - **Prototyping.**
  - **Computer-aided software engineering (CASE) tools.**
  - **Joint application design (JAD).**
  - **Rapid application development (RAD).**
  - **Participatory design (PD).**
  - **Agile Methodologies.**

Approaches to Development

❑ Prototyping.

- **Designing and building a scaled-down but working version of a desired system is known as prototyping.**
- **Can be developed with a computer-aided software engineering (CASE) tool.**
  - ➢ CASE tools make prototyping easier and more creative by supporting the design of screens and reports and other parts of a system interface.
  - ➢ CASE tools also support many of the diagramming techniques you will learn, such as data-flow diagrams and entity-relationship diagrams.

Approaches to Development



The Prototyping Method

Approaches to Development

❑ Computer-Assisted Software Engineering (CASE) Tools.

- **Software tools that provide automated support for some portion of the systems development process.**
- **CASE Tools:**
  - ➢ **refers to automated software tools used by systems analysts to develop information systems.**
  - ➢ **can be used to automate or support activities throughout the systems development process with the objective of increasing productivity and improving the overall quality of systems.**
  - ➢ **helps provide an engineering-type discipline to software development and to the automation of the entire software life-cycle process.**
  - ➢ **assists systems builders in managing the complexities of information system projects and helps assure that high-quality systems are constructed on time and within budget.**

Approaches to Development

- **The general types of CASE tools include:**
  1. **Diagramming tools:** Enable system process, data, and control structures to be represented graphically.
  2. **Computer display and report generators:** help prototype how systems "look and feel" to users.
  3. **Analysis tools:** automatically check for incomplete, inconsistent, or incorrect specifications in diagrams, forms, and reports.

Approaches to Development

4. **A central repository:** enables the integrated storage of specifications, diagrams, reports, and project management information.
5. **Documentation generators**: help produce both technical and user documentation in standard formats.
6. **Code generators:** enable the automatic generation of program and database definition code directly from the design documents, diagrams, forms, and reports.

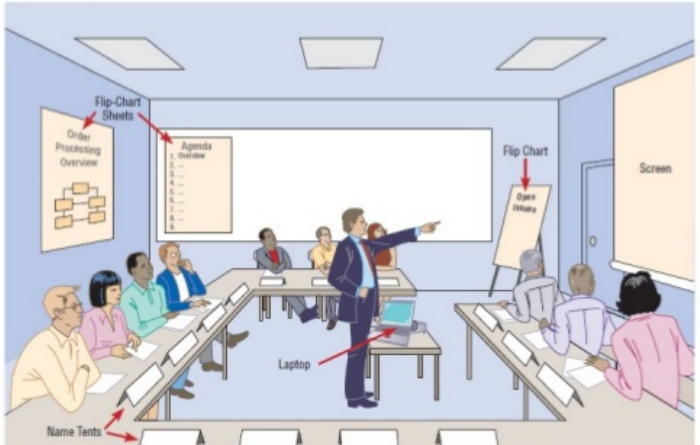
Approaches to Development

❑ Joint Application Design (JAD).

- **A structured process in which users, managers, and analysts work together for several days in a series of intensive meetings to specify or review system requirements.**
- **Developed by IBM in the late 1970's as a new process for collecting information system requirements and reviewing system designs.**
- **The idea is to structure the requirements determination phase of analysis and the reviews that occur as part of the design.**

Approaches to Development

- **Users, managers, and systems developers are brought together for a series of intensive structured meetings run by a JAD session leader.**
  - By gathering the people directly affected by an IS in one room at the same time to work together to agree on system requirements and design details, time and organizational resources are better managed.
- **JAD has become common in certain industries, such as insurance, and in specific companies.**



Approaches to Development

❑ Rapid Application Development (RAD).

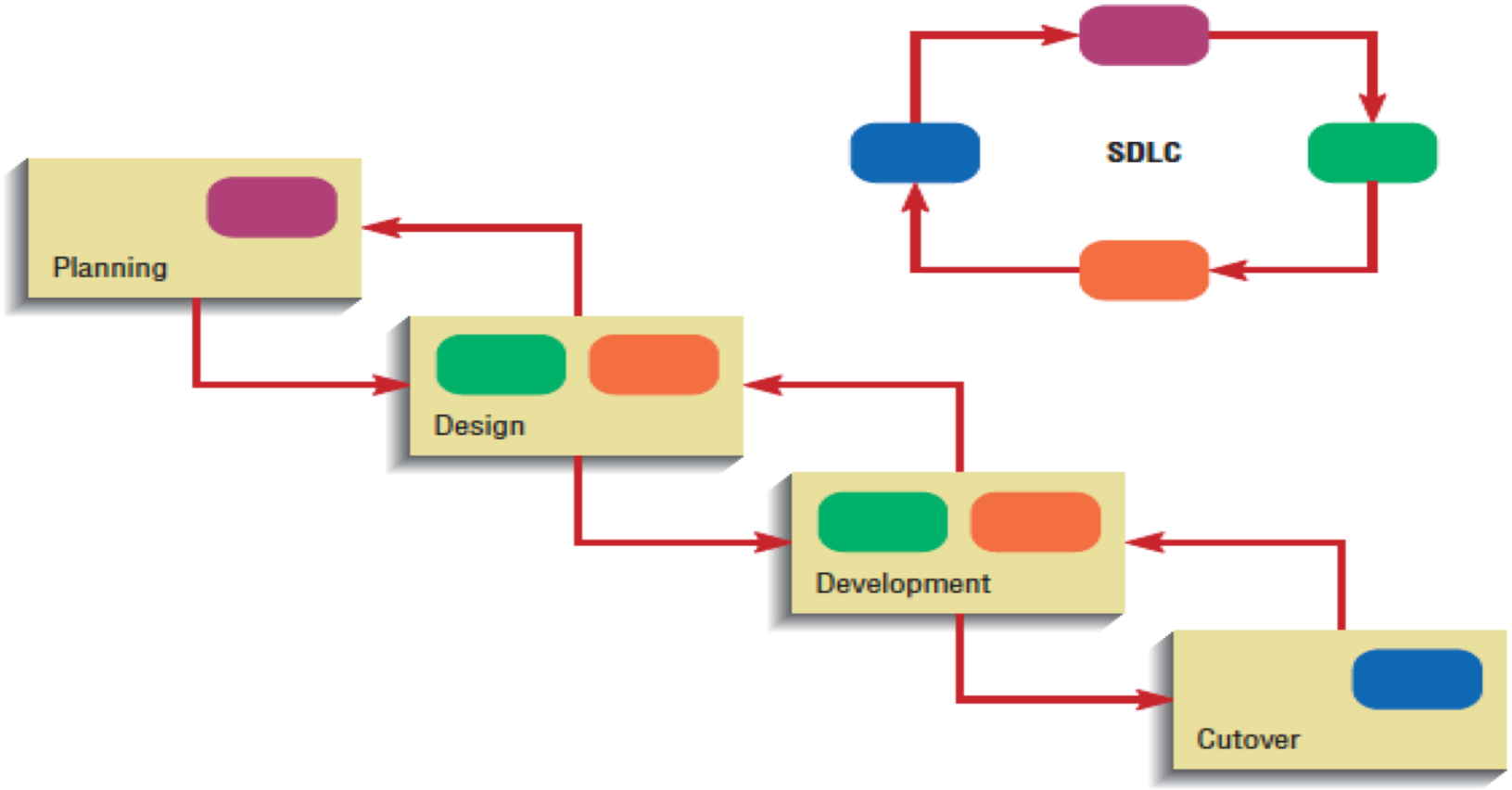
- **Systems development methodology created to radically decrease the time needed to design and implement information systems.**
- **Prototyping, CASE, and JAD are key tools that support Rapid RAD.**
- **The fundamental principle of any RAD methodology is to delay producing detailed system design documents until after user requirements are clear.**
- **RAD involves gaining user acceptance of the interface and developing key system capabilities as quickly as possible.**
- **RAD is widely used by consulting firms and it is also used as an in-house methodology by firms such as The Boeing Company.**

Approaches to Development

- **RAD sacrifices computer efficiency for gains in human efficiency in rapidly building and rebuilding working systems.**
- **RAD methodologies can overlook important systems development principles, which may result in problems with systems developed this way.**
- **RAD was born!**
  - **CASE tools and prototyping software were diffusing throughout organizations, making it relatively easy for end users to see what their systems would look like before they were completed**

Approaches to Development

- **Rapid Application Development (RAD).**



RAD Systems Development Life Cycle Compared to Standard SDLC

Approaches to Development

❑ Participatory Design (PD).

- **A systems development approach that originated in northern Europe in which users and the improvement of their work lives are the central focus.**
- **Represents a viable alternative approach to the SDLC.**
- **Best-known companies that has used PD is Statoil Hydro (Norwegian Oil Company).**
- **PD emphasizes the role of the user much more than do traditional North American techniques such as structured analysis and structured design.**

Approaches to Development

- **PD may involve the entire user community in the development process.**
  - Each user has an equal voice in determining system requirements and in approving system design.
  - An elected group of users controls the process.
- **Typically: under PD, systems analysts work for the users.**
- **PD is partly a result of the roles of labor and management in the northern European workplace where labor is more organized, carries more clout, and is more intimately involved with technological changes than is true in North America.**

THANK YOU