HNDIT1042 Information Management and Information Systems

Advanced Technological Institute
Galle

objectives

- Describe the issues of planning the development of computer-based applications
- Understand the need for control and maintenance of information systems

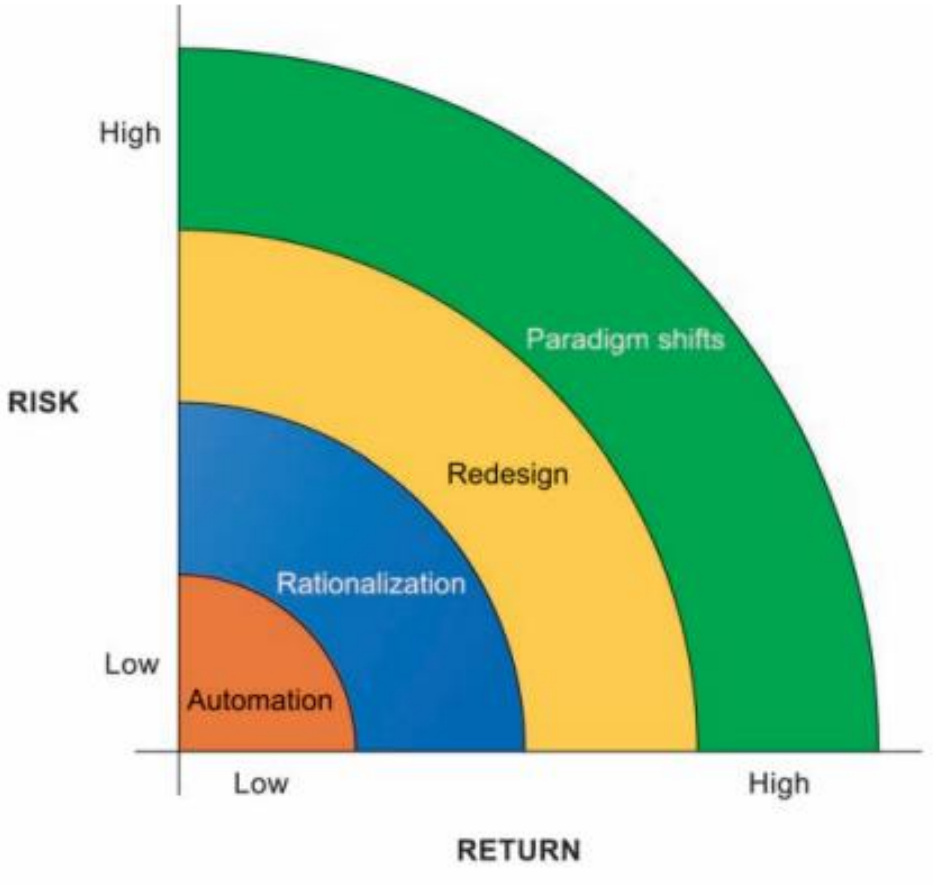
How does building new systems produce organizational change?

- Building a new information system is one kind of planned organizational change.
- The introduction of a new information system involves much more than new hardware and software. It also includes changes in jobs, skills, management, and organization.
- When we design a new information system, we are redesigning the organization.

Systems Development and Organizational Change

- Information technology can promote various degrees of organizational change, ranging from incremental to far-reaching
  (1) automation
  (2) rationalization
  (3) business process redesign
  (4) paradigm shifts

FIGURE 13.1 ORGANIZATIONAL CHANGE CARRIES RISKS AND REWARDS



Automation

- The most common form of IT-enabled organizational change is automation .
- Information technology involved assisting employees with performing their tasks more efficiently and effectively.
- Eg: Calculating paychecks and payroll registers

Rationalization

- A deeper form of organizational change one that follows quickly from early automation—is rationalization of procedures.
- Rationalization of procedures is the streamlining of standard operating procedures.
  - For example, Angostura's new mobile order system is effective not only because it uses computer technology but also because the company simplified its business processes for this function. Fewer manual steps are required.

business process redesign

- A more powerful type of organizational change is business process redesign, in which business processes are analyzed, simplified, and redesigned.
- Business process redesign reorganizes workflows, combining steps to cut waste and eliminate repetitive, paper-intensive tasks.

Example for redesign

- Ford Motor Company's invoice less processing, which reduced head count in Ford's North American Accounts Payable organization of 500 people by 75%.
- Accounts payable clerks used to spend most of their time resolving discrepancies between purchase orders, receiving documents, and invoices.
- Ford redesigned its accounts payable process so that the purchasing department enters a purchase order into an online database that can be checked by the receiving department when the ordered items arrive.
- If the received goods match the purchase order, the system automatically generates a check for accounts payable to send to the vendor. There is no need for vendors to send invoices.

Paradigm shift

- Rationalizing procedures and redesigning business processes are limited to specific parts of a business.
- More radical form of business change is called a paradigm shift.
- A paradigm shift involves rethinking the nature of the business and the nature of the organization

WHAT ARE THE CORE ACTIVITIES IN THE SYSTEMS DEVELOPMENT PROCESS?

Systems development

- Systems development is a structured kind of problem solved with distinct activities.
- These activities consist of systems analysis, systems design, programming, testing, conversion, and production and maintenance.

Requirement Identification and system analysis

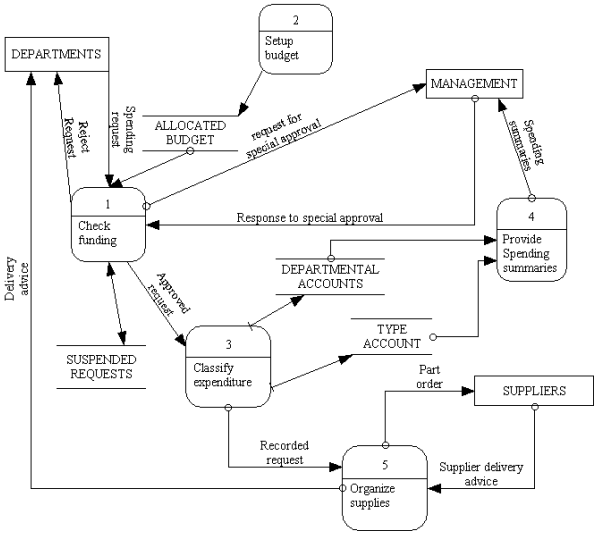
- Systems analysis is the analysis of a problem that a firm tries to solve with an information system. It consists of
  - defining the problem
  - identifying its causes
  - specifying the solution
  - identifying the information requirements
- The systems analyst then details the problems of existing systems. By
  - examining documents
  - work papers
  - procedures
  - observing system operations
  - interviewing key users of the systems

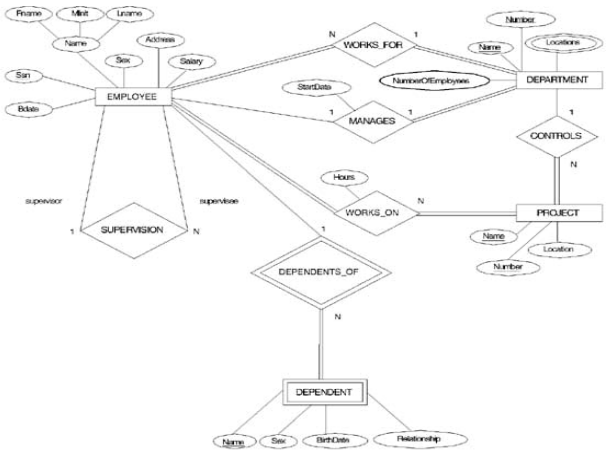
- the solution requires building a new information system or improving an existing one.
- The systems analysis also includes a feasibility study to determine whether that solution is feasible, or achievable, from a financial, technical, and organizational standpoint.
- The feasibility study determines whether the proposed system is expected to be a good investment.

System design

- Systems design shows how the system will fulfill system objective.
- The design of an information system is the overall plan or model for that system.
- Each design represents a unique blend of technical and organizational components

- Data flow diagram





- ER diagram

coding

- During the coding(Programming) stage, system specifications that were prepared during the design stage are translated into software program code.
- Many organizations no longer do their own programming for new systems. Instead, they purchase the software that meets the requirements for a new system from external sources such as
  - software packages from a commercial software vendor
  - software services from a software service provider
  - outsourcing firms that develop custom application software for their clients.

Testing

- Thorough testing must be conducted to establish whether the system produces the right results.
- Testing an information system can be broken down into three types of activities:
  - unit testing
  - system testing
  - acceptance testing.

- Unit testing , or program testing, consists of testing each program separately in the system.
- System testing tests the functioning of the information system as a whole.
- Acceptance testing provides the final certification that the system is ready to be used in a production setting.

Conversion

- Conversion is the process of changing from the old system to the new system.
- Four main conversion strategies are
  - the parallel strategy
  - the direct cutover strategy
  - the pilot study strategy
  - the phased approach strategy.

Production and Maintenance

- After the new system is installed and conversion is complete, the system is said to be in production.
- During this stage, the system will be reviewed by both users and technical specialists to determine how well it has met its original objectives and to decide whether any revisions or modifications are in order.

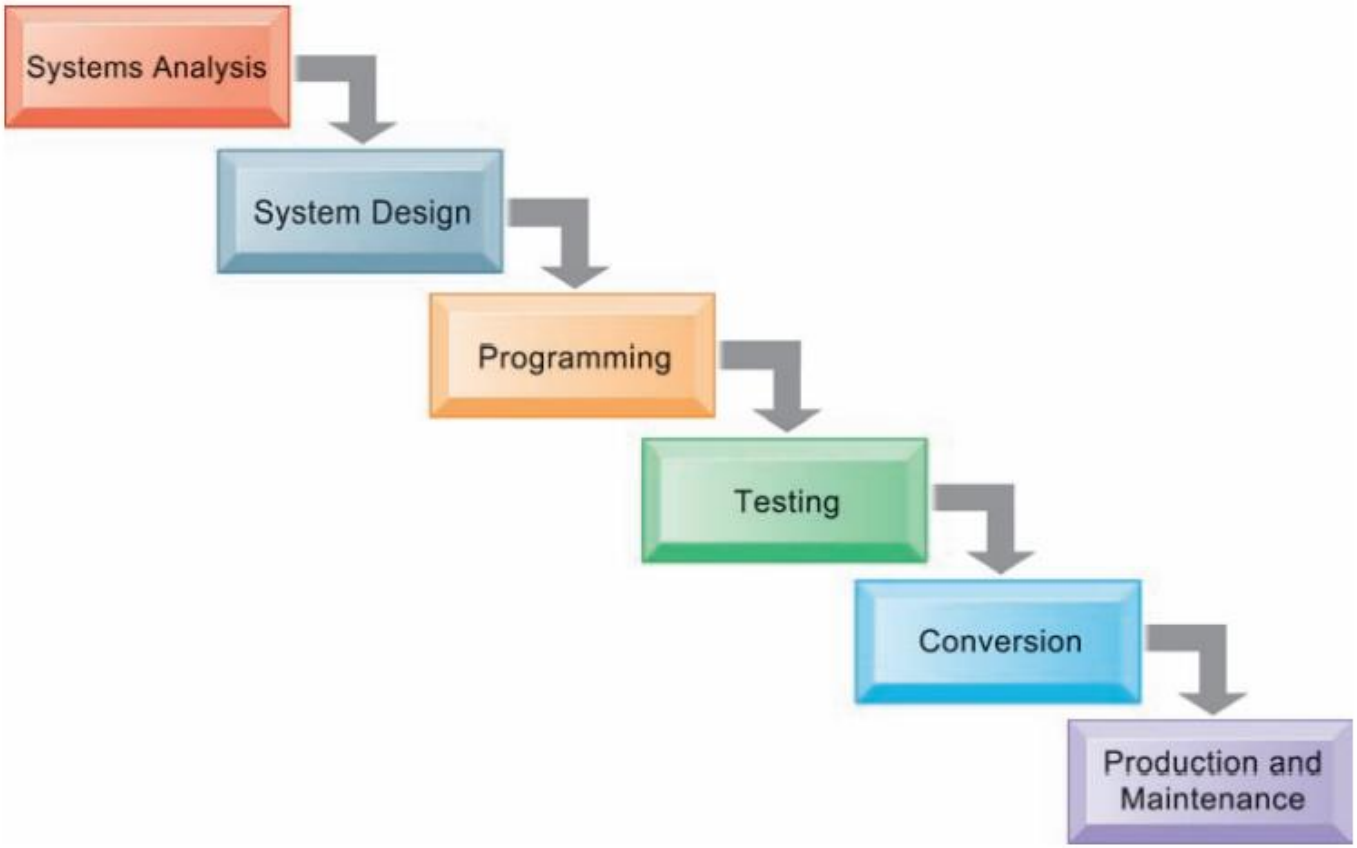
What are alternative methods for building information systems?

- The traditional systems life cycle
- Prototyping
- application software packages
- end-user development
- outsourcing.

The traditional systems life cycle

- The systems life cycle is still used for building large complex systems that require a formal requirements analysis predefined specifications, and tight controls over the system-building process.
- It can be costly, time-consuming, and inflexible.

FIGURE 13.9 THE TRADITIONAL SYSTEMS DEVELOPMENT LIFE CYCLE

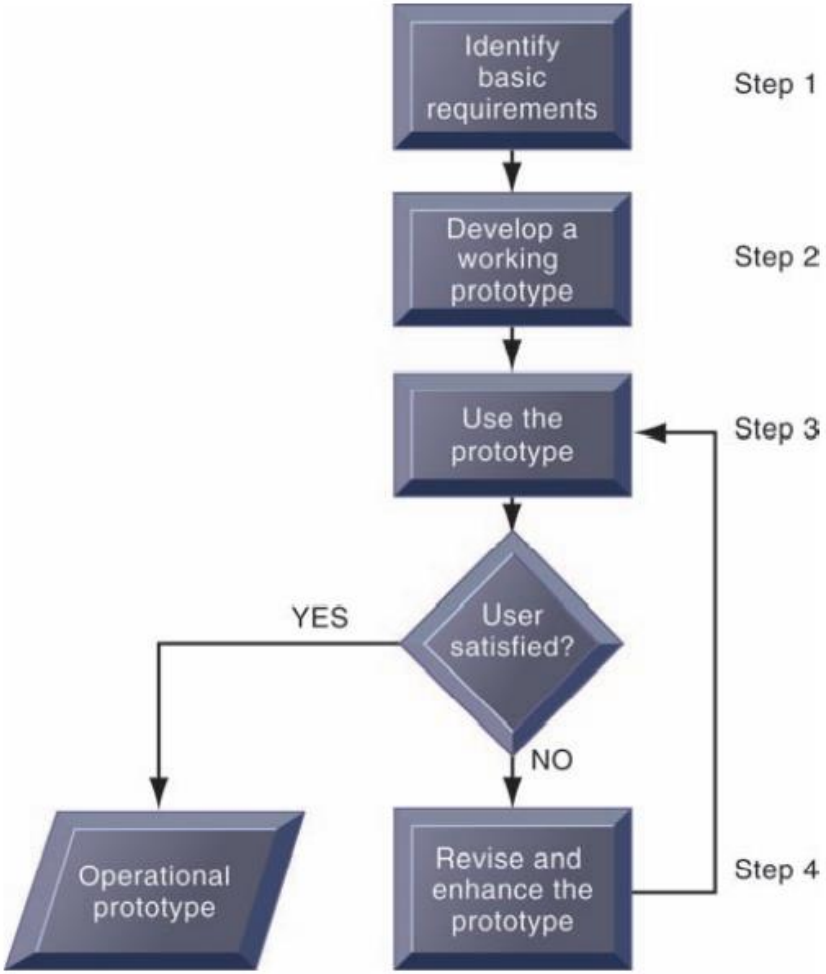


The systems development life cycle partitions systems development into formal stages, with each stage requiring completion before the next stage can begin.

Prototyping

- The prototype is a working version of an information system or part of the system, but it is meant to be only a preliminary model.
- Once operational, the prototype will be further refined until it conforms exactly to users' requirements.
- Once the design has been finalized, the prototype can be converted to a polished production system.

FIGURE 13.10 THE PROTOTYPING PROCESS



The process of developing a prototype can be broken down into four steps. Because a prototype can be developed quickly and inexpensively, systems builders can go through several iterations, repeating steps 3 and 4, to refine and enhance the prototype before arriving at the final operational one.

- Prototyping is most useful when there is some uncertainty about requirements or design solutions and often used for designing an information system.

End-user development

- End-user development allows end users, with little or no formal assistance from technical specialists, to create simple information systems, reducing the time and steps required to produce a finished application.
- Using user-friendly query languages and reporting, website development, graphics, and PC software tools, end users can access data, create reports, and develop simple applications on their own with little or no help from professional systems analysts or programmers.

Application Software Packages and Cloud Software Services and outsourcing

- If a commercial software package or cloud software service can fulfill most of an organization's requirements, the company does not have to write its own software .

- The company can save time and money by using the prewritten, predesigned, pretested software programs from the software vendor.
- Package and SaaS vendors supply much of the ongoing maintenance and support for the system.

outsourcing

- A company could hire an external vendor to design and create the software for its system, but that company would operate the system on its own computers.
- The outsourcing vendor might be domestic or in another country.

What are new approaches for system building in the digital firm era?

- Rapid Application Development (RAD)
- Agile Development

Rapid application development (RAD)

- The term rapid application development (RAD) is used to describe this process of creating workable systems in a very short period of time with some flexibility to adapt as a project evolves.
- RAD also involves close teamwork among end users and information systems
- Simple systems often can be assembled from prebuilt components

joint application design (JAD)

- It is used to accelerate the generation of information requirements and to develop the initial systems design.
- JAD brings end users and information systems specialists together in an interactive session to discuss the system's design.
- Properly prepared and facilitated, JAD sessions can significantly speed up the design phase and involve users at an intense level.

Agile development

- Focuses on rapid delivery of working software by breaking a large project into a series of small subprojects that are completed in short periods of time using iteration and continuous feedback.
- Each mini-project is worked on by a team as if it were a complete project.
- Improvement or addition of new functionality takes place within the next iteration as developers clarify requirements.
- This helps to minimize the overall risk and allows the project to adapt to changes more quickly.
- Agile methods emphasize face-to-face communication over written documents, encouraging people to collaborate and make decisions quickly and effectively.