MANAGEMENT INFORMATION SYSTEM

Dr. Khine Thin Zar
Professor
CEIT Department
YTU

COURSE OUTLINES

- Course Title
  - Management Information Systems
- Grading Policy
  - Exam → 80%
  - Tutorial / Assignment → 20%
- Textbook and Reference Materials
  - Course Manual for Management Information Systems CIS302, University of Ibadan Distance Learning Centre
  - Management Information Systems (Managing The Digital Firm) by Kenneth C. Laudon(New York University), Jane P. Laudon(Azimuth Information Systems), Twelfth Edition
  - Management Information Systems, Sixth Edition, by Effy Oz
- Course Duration
  - 12 Weeks

System Development Life Cycle (SDLC)

LEARNING OUTCOMES

When you have studied this session, you should be able to:

- discuss planning and requirement analysis
- describe how to build or develop the system
- define the alternative methods for building information systems

CONTENTS

- An Overview of SDLC
- Designing System Architecture
- System Development and Organizational Change
- Business Process Redesign
- Alternative Systems-building Approaches

AN OVERVIEW OF SDLC

- Like any other product development, system development requires careful analysis and design before implementation.
- System development generally has the following phases: Planning, Analysis, Design, Implementation and Support

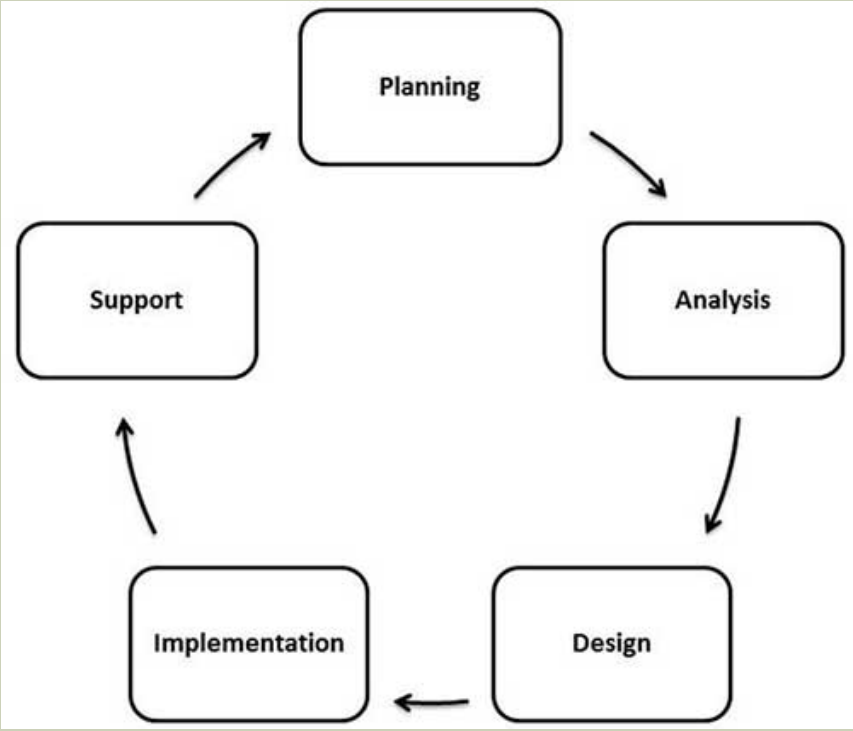

Figure : System Development Life Cycle (Source: Tutorials Point (I) Pvt. Ltd., 2014).

PLANNING AND REQUIREMENT ANALYSIS

Planning

- The project planning part involves the following steps:

1. Reviewing various project requests
2. Prioritizing the project requests
3. Allocating the resources and
4. Identifying the project development team

- The techniques used in information system planning are:

1. Critical Success Factor
2. Business System Planning
3. End/Mean Analysis

PLANNING AND REQUIREMENT ANALYSIS (CONT.)

Requirement Analysis

- An iterative process involving systematic investigation of the processes and requirements.
- Involves understanding the goals, processes, and the constraints of the system for which the information system is being designed.
- The analyst creates a blueprint of the entire system in minute details
- Diagramming techniques like:
  1. Data flow diagrams
  2. Context diagrams

PLANNING AND REQUIREMENT ANALYSIS (CONT.)

- Requirement analysis has the following sub-processes:
    1. Conducting preliminary investigation
    2. Performing detailed analysis activities
    3. Studying current system
    4. Determining user requirements
    5. Recommending a solution

FEASIBILITY REPORT

1. A preamble
2. A goal statement
3. A brief description of the present system
4. Proposed alternatives in details

- Based on the costs and benefits, and considering all problems that may be encountered due to human, organizational or technological bottlenecks, the best alternative is chosen by the end-users of the system.

DESIGNING SYSTEM ARCHITECTURE

- How the system will accomplish this objective
- Consists of both logical design and physical design activity, which produces *'system specification'* satisfying system requirements developed in the system analysis stage.
- The following documents are prepared:
  1. Detailed specification
  2. Hardware/software plan

BUILDING OR DEVELOPING THE SYSTEM

- Includes the construction of programmers and program testing.
- It has the following stages:
    1. Acquiring hardware and software, if necessary
    2. Database design
    3. Developing system processes
    4. Coding and testing each module

TESTING THE SYSTEM

- Testing process focuses on both:

  1. The internal logic of the system/software, ensuring that all statements have been tested;

  2. The external functions, by conducting tests to find errors and ensuring that the defined input will actually produce the required results.

- The system performance criteria deals with turnaround time, backup, file protection and the human factors.

DEPLOYMENT OF THE SYSTEM

- System is put into production to be used by the end users
- Users' feedback is received and based on the feedback
- The system is corrected or improved before a final release or official release of the system

SYSTEM EVALUATION AND MAINTENANCE

- Maintenance is necessary
  - to eliminate the errors in the working system during its working life and
  - to tune the system to any variation in its working environment
- Often small system deficiencies are found, as system is brought into operation and changes are made to remove them.
- System planner must always plan for resources availability to carry on these maintenance functions

SYSTEMS DEVELOPMENT AND ORGANIZATIONAL CHANGE

- Information technology can promote various degrees of organizational change, ranging from incremental to far-reaching
- Four kinds of structural organizational change that are enabled by information technology:

(1) automation,

(2) rationalization,

(3) business process redesign, and

(4) paradigm shifts

AUTOMATION

- The most common form of IT-enabled organizational change
- Assisting employees with performing their tasks more efficiently and effectively
- Examples of early automation:
  - Calculating paychecks and payroll registers,
  - Giving bank tellers instant access to customer deposit records, and
  - Developing a nationwide reservation network for airline ticket agents

RATIONALIZATION

- The streamlining of standard operating procedures
- Making a series of continuous quality improvements in products, services, and operations
- **Total quality management (TQM) :** makes achieving quality an end in itself and the responsibility of all people and functions within an organization.
- **Six sigma :** a specific measure of quality

BUSINESS PROCESS REDESIGN

- A more powerful type of organizational change
- business processes are analyzed, simplified, and redesigned
- Reorganizes workflows, combining steps to cut waste and eliminate repetitive, paper-intensive tasks
- Example: Ford Motor Company's invoiceless processing

PARADIGM SHIFTS

- The more radical form of business change
- involves rethinking the nature of the business and the nature of the organization

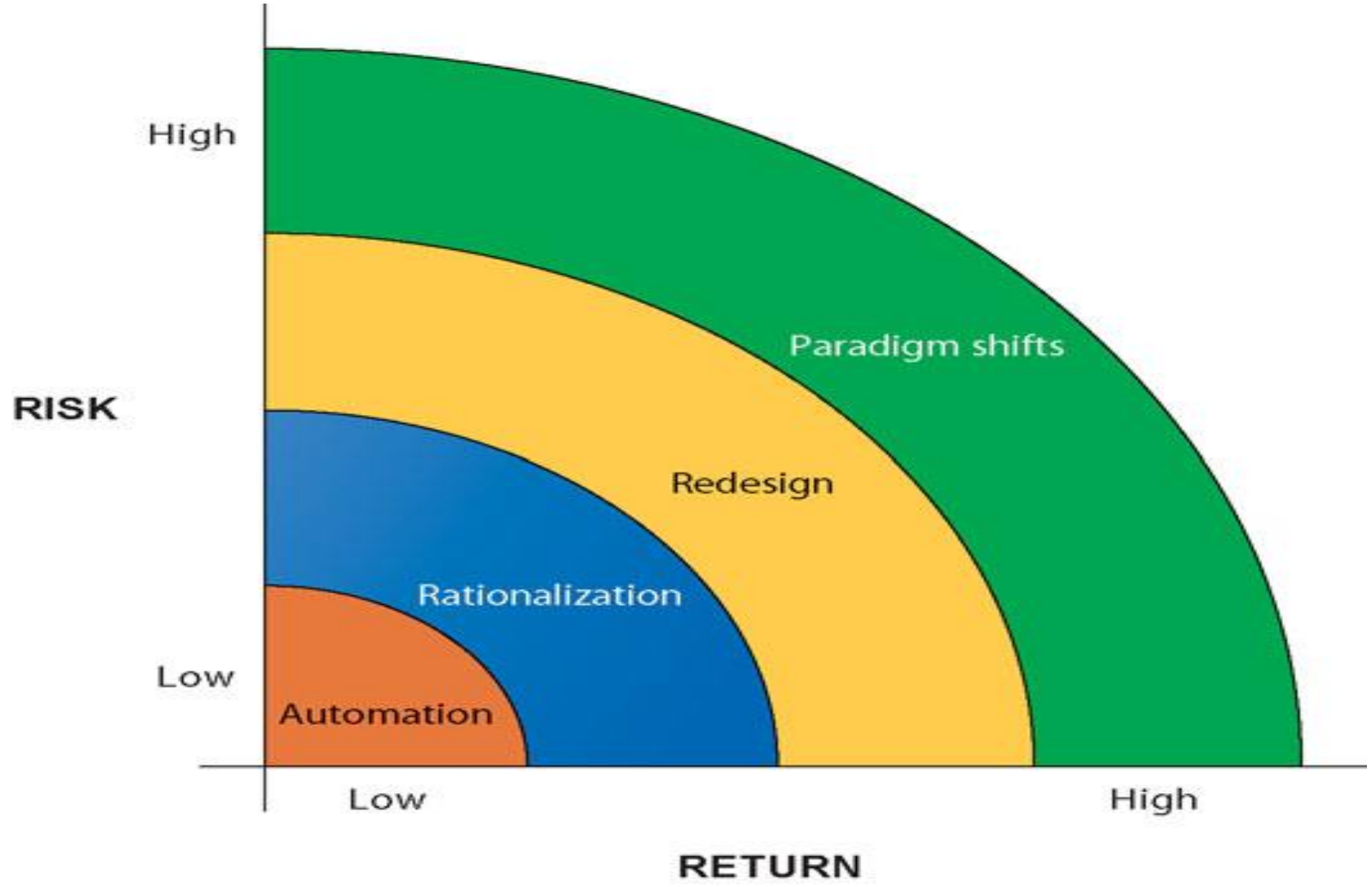

Figure : Organizational change carriers risks and rewards

BUSINESS PROCESS REDESIGN

- Use information technology to improve the business processes
- Turning to business process management
- Provides a variety of tools and methodologies to analyze existing processes, design new processes, and optimize those processes

1. Identify processes for change: One of the most important strategic decisions that a firm can make is not deciding how to use computers to improve business processes, but understanding what business processes need improvement.

2. Analyze existing processes: Existing business processes should be modeled and documented, noting inputs, outputs, resources, and the sequence of activities. The process design team identifies redundant steps, paper-intensive tasks, bottlenecks, and other inefficiencies.

BUSINESS PROCESS REDESIGN (CONT.)

3. Design the new process: Once the existing process is mapped and measured in terms of time and cost, the process design team will try to improve the process by designing a new one.

4. Implement the new process: Once the new process has been thoroughly modeled and analyzed, it must be translated into a new set of procedures and work rules.

5. Continuous measurement: Once a process has been implemented and optimized, it needs to be continually measured. Why? Processes may deteriorate over time as employees fall back on old methods, or they may lose their effectiveness if the business experiences other changes.

COMPLETING THE SYSTEMS DEVELOPMENT PROCESS

- Consist of programming, testing, conversion, production, and maintenance.

Programming:

- System specifications that were prepared during the design stage are translated into software program code.
- No longer do their own programming for new systems
- Purchase the software that meets the requirements for a new system from external sources:
  - software packages from a commercial software vendor,
  - software services from an application service provider, or
  - outsourcing firms that develop custom application software for their clients

COMPLETING THE SYSTEMS DEVELOPMENT PROCESS (CONT.)

Testing:

- conducted to ascertain whether the system produces the right results
- Testing is time-consuming:
  - test data must be carefully prepared,
  - results reviewed, and
  - corrections made in the system
- three types of activities:
  - unit testing,
  - system testing, and
  - acceptance testing.

COMPLETING THE SYSTEMS DEVELOPMENT PROCESS (CONT.)

Conversion:

- The process of changing from the old system to the new system
- Four main conversion strategies can be employed:
  - the parallel strategy,
  - the direct cutover strategy,
  - the pilot study strategy, and
  - the phased approach strategy.

COMPLETING THE SYSTEMS DEVELOPMENT PROCESS (CONT.)

Production:

- The system will be reviewed by both users and technical specialists
- How well it has met its original objectives and to decide whether any revisions or modifications are in order

Maintenance :

- Changes in hardware, software, documentation, or procedures to a production system to correct errors, meet new requirements, or improve processing efficiency
  - debugging or correcting emergency production problems
  - changes in data, files, reports, hardware, or system software
  - making user enhancements, improving documentation, and recoding system components

ALTERNATIVE SYSTEMS-BUILDING APPROACHES

- The size and technological complexity
- Alternative methods:
  - the traditional systems life cycle,
  - prototyping,
  - application software packages,
  - end-user development, and
  - outsourcing

TRADITIONAL SYSTEMS LIFE CYCLE

- The oldest method for building information systems
- A phased approach to building a system
- Formal division of labor between end users and information systems specialists
- The life cycle also emphasizes formal specifications and paperwork
- Costly, time-consuming, and inflexible

PROTOTYPING

- Consists of building an experimental system
- Users can get a better idea of their information requirements
- Used as a template to create the final system
- **Prototype** : a working version of an information system or part of the system, but it is meant to be only a preliminary model
- Refined until it conforms precisely to users' requirements
- Converted to a polished production system

END-USER DEVELOPMENT

- Developed by end users with little or no formal assistance from technical specialists
- **Fourth-generation languages** : software tools that enable end users to create reports or develop software applications with minimal or no technical assistance.
- Nonprocedural, or less procedural, than conventional programming languages
- **Query languages** : software tools that provide immediate online answers to requests for information that are not predefined

APPLICATION SOFTWARE PACKAGES AND OUTSOURCING

- Built on an application software package foundation
- Many applications are common to all business organizations
- If a software package can fulfill most of an organization's requirements, the company does not have to write its own software.
- Using the prewritten, predesigned, pretested software programs from the package.
- Outsource the work to an external organization that specializes in providing these services

ASSESSMENT

1. System development is in phases; list them in the sequential order.

2. What are the contents of a “Feasibility Report”?

3. The system design has two components; list them

4. The development of a system design will involve what stages?

5. As a computer scientist what will you be looking for while testing a system?

6. What do you understand by system deployment?

7. What do you think is the significance of System Evaluation and Maintenance?

Next Week Lecture: **MIS Development Process (MISDP)**

THANK YOU.