MANAGEMENT INFORMATION SYSTEM

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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

MIS Development Process (MISDP)

LEARNING OUTCOMES

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

- *highlight* the need for MIS development process (MISDP) and its challenges
- *describe* information system requirement

CONTENTS

- The Need for MIS Development Process (MISDP) and Its Challenges
- Planning for MIS
- Information System Requirements
- Information System Analysis and Design
- Factors for Success and Failure

THE NEED FOR MIS DEVELOPMENT PROCESS (MISDP) AND ITS CHALLENGES

Needs:

1. The management information system needs good planning.

2. This system should deal with the management information not with data processing alone.

3. It should provide support for the management planning, decision making and action.

4. It should provide support to the changing needs of business management.

THE NEED FOR MIS DEVELOPMENT PROCESS (MISDP) AND ITS CHALLENGES

Challenges:

1. Quantity, content and context of information - how much information and exactly what should it describe.
2. Nature of analysis and presentation - comprehensibility of information.
3. Availability of information - frequency, contemporariness, ondemand or routine, periodic or occasional, one-time info or repetitive in nature and so on
4. Accuracy of information.
5. Reliability of information.
6. Security and Authentication of the system.

PLANNING FOR MIS

- MIS design and development process has to address the following issues successfully:

1. effective communication between the developers and users of the system.
2. synchronization in understanding of management, processes and IT among the users as well as the developers.
3. Understanding of the information needs of managers from different functional areas and combining these needs into a single integrated system.
4. Creating a unified MIS covering the entire organization will lead to a more economical, faster and more integrated system, however it will increase in design complexity manifold.

PLANNING FOR MIS (CONT.)

5. interacting with the complex environment comprising all other sub-systems in the overall information system of the organization.

6. keep pace with changes in environment, changing demands of the customers and growing competition.

7. utilize fast developing in IT capabilities in the best possible ways.

8. Cost and time of installing such advanced IT-based systems is high, so there should not be a need for frequent and major modifications.

9. take care of not only the users i.e., the managers but also other stakeholders like employees, customers and suppliers.

PLANNING FOR MIS (CONT.)

- Once the organizational planning stage is over, the designer of the system should take the following strategic decisions for the achievement of MIS goals and objectives:

1. Development Strategy: Example - an online, real-time batch.

2. System Development Strategy: Designer selects an approach to system development like operational verses functional, accounting verses analysis.

3. Resources for the Development: Designer has to select resources. Resources can be In-house verses external, customized or use of package.

PLANNING FOR MIS (CONT.)

4. Manpower Composition: The staffs should have analysts, and programmers. Information system planning essentially involves:

5. Identification of the stage of information system in the organization.

6. Identification of the application of organizational IS.

7. Evolution of each of this application based on the established evolution criteria.

8. Establishing a priority ranking for these applications.

9. Determining the optimum architecture of IS for serving the top priority applications.

PLANNING FOR MIS (CONT.)

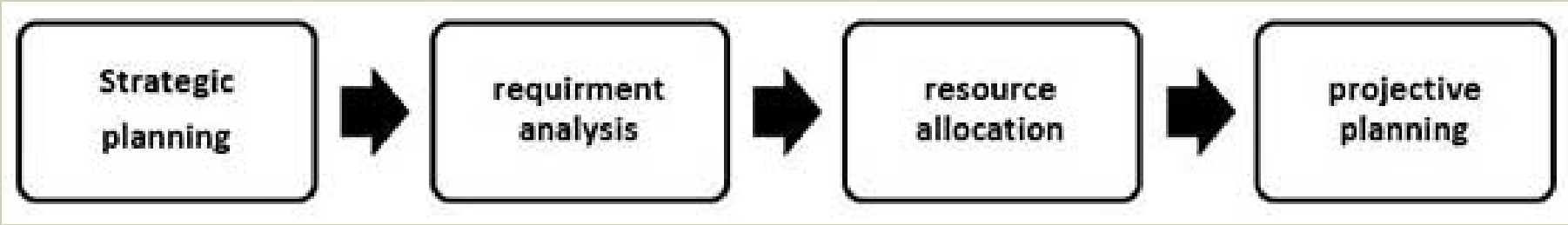

Figure : MIS Development Process (Source: Tutorials Point (I) Pvt. Ltd., 2014).

THE CLASS OF INFORMATION

Info. Class	Example of information	User
Organizational	The number of employees, products, services locations the type of business, turnover and variety of the details of each one of these entities	Many users at all the levels
Functional managerial	Purchases, sales, production, stocks, receivables, payables, outstandings, budgets, statutory info.	Functional heads and others
Knowledge	The trends in sales, production, technology. The deviations from the budgets, targets norms etc. competitor's information, industry & business information plan performance and target; and its analysis	Middle and the top management
Decision support	Status information on a particular aspect, such as utilization, profitability standard, requirement versus availability. Info for problem solving and modeling. Overdue payments and receivables.	Middle management and operations management
Operational	Info on the production, sales, purchase, dispatches consumptions etc in the form of planned VS actual. The info. For monitoring of execution schedules	Operational & management supervisor, section officers.

METHODS OF DETERMINING INFORMATION

- There are four methods of determining the information requirements. They are:
  - Asking or interviewing
  - Determining from the existing system
  - Analysing the critical success factors
  - Experimentation and modeling

Level of uncertainty	Level of management	method
Low(near certainty)	Operations management	Ask questions such as, what do you need?
Precise probabilistic knowledge(A risk situation)	Middle management	Ask to express probability. Determine from the existing systems and methods of decision making and problem solving
Not able to determine in probabilistic terms precisely (very risky)	Middle and top management	Determine through the critical success factors, decision parameters and decision methodology. Sensitivity analysis
High (Total uncertainty)	Top management	Determine through experimentation, modelling and sensitivity analysis

METHODS OF DETERMINING INFORMATION (CONT.)

- **Asking or interviewing**
  - A designer of the MIS puts questions or converses with the user of the information and determines the information requirements.
  - Putting the questions is an art and it should be used properly to seek information.
  - When multiple users or several decision makers in similar functions or positions are involved, a brain storming session is performed to cover.
  - The experts or experienced users are asked to give their best answers
- **Determining from the existing system**
  - In a number of cases the existing system, which has been evolved after a number of years, and has been designed out of experience give you the requirement of information. Moreover, systems from other companies can give additional information requirements.

METHODS OF DETERMINING INFORMATION (CONT.)

- **Analysing the critical success factors**

  – Every business orgn. performs successfully on efficient management of certain critical success factors.

  – Eg. in a high technology business, the management of the technology becomes the critical function. In a consumer industry, marketing and service becomes the critical functions.

- **Experimentation and modeling**

  – When there is total uncertainty, the designer and the user of the information resort to this method for determining the information requirement.

  – The experimentation would decide the methodology for handling the complex situation.

  – Test marketing of a product is an approach of the experimentation to decide the correct marketing strategy.

INFORMATION QUALITY IN MIS

- The quality of information is the result of the quality of the input data, processing design, system design, system and procedures
- Quality Parameters of information
  - **Complete data of all the transactions**: This achieves integrity of data with respect to the time period
  - **Valid transaction and input data**: Ensures the validity of the data and in turn, assures a valid information
  - **Accuracy and precision**: Assures that the results are accurate and precisely correct based on rule, act or law using complete data.
  - **Relevance to the user/decision maker/Stake holder**: Strong link between business goal and MIS goal
  - **Timely information**: Useless if received late
  - **Meaningful and complete information**: incomplete information forces the user to interpret erroneously leading to a wrong decision

INFORMATION SYSTEM REQUIREMENTS

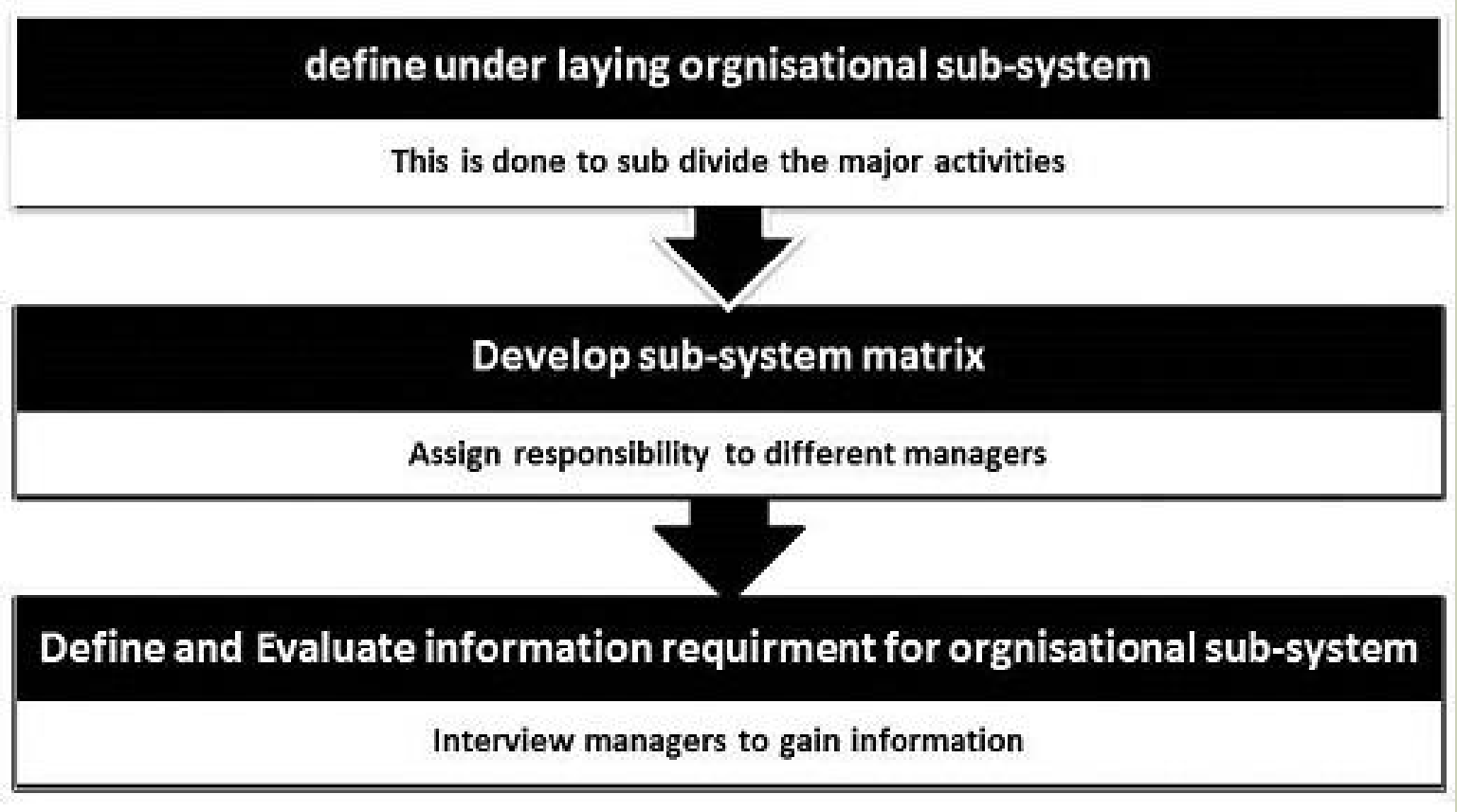

Figure : Information Requirement Analysis (Source: Tutorials Point (I) Pvt. Ltd., 2014).

METHODOLOGIES

1. Business Systems Planning (BSP) - this methodology is developed by IBM.

i. It identifies the IS priorities of the organization and focuses on the way data is maintained in the system.

ii. It uses data architecture supporting multiple applications.

iii. It defines data classes using different matrices to establish relationships among the organization, its processes and data requirements.

METHODOLOGIES (CONT.)

2. Critical Success Factor (CSF) - this methodology is developed by John Rockart of MIT.

i. It identifies the key business goals and strategies of each manager as well as that of the business.

ii. Next, it looks for the critical success factors underlying these goals.

iii. Measure of CSF effectiveness becomes an input for defining the information system requirements.

METHODOLOGIES (CONT.)

3. End/Means (E/M) analysis - this methodology is developed by Wetherbe and Davis at the University of Minnesota (Tutorials Point (I) Pvt. Ltd., 2014).

i. It determines the effectiveness criteria for outputs and efficiency criteria for the processes generating the outputs.

ii. At first it identifies the outputs or services provided by the business processes.

iii. Then it describes the factors that make these outputs effective for the user. Finally it selects the information needed to evaluate the effectiveness of outputs.

INFORMATION SYSTEM ANALYSIS AND DESIGN

1. Problem Definition
2. Feasibility Study
3. Systems Analysis
4. System Design
5. Detailed System Design
6. Implementation
7. Maintenance

INFORMATION SYSTEM ANALYSIS AND DESIGN (CONT.)

- In the analysis phase, the following techniques are commonly used:

1. Data flow diagrams (DFD)
2. Logic Modeling
3. Data Modeling
4. Rapid Application Development (RAD)
5. Object Oriented Analysis (OOA)

TECHNOLOGY FOR INFORMATION SYSTEMS

- The technology requirement for an information system can be categorized as:

1. Devices

2. Data centre systems - the environment that provides processing, storage, networking, management and the distribution of data within an enterprise.

3. Enterprise software - software system like ERP, SCM, Human Resource Management, etc. that fulfil the needs and objectives of the organizations.

4. IT services - It refers to the implementation and management of quality IT services by IT service providers through people, process and information technology

5. Telecom services

SYSTEM TEST PLANNING AND EXECUTION

- The test plan should include for each test:

    1. Purpose
    2. Definition
    3. test inputs
    4. detailed specification of test procedure
    5. details of expected outputs

SYSTEM OPERATION

1. Data security, backup and recovery;
2. Systems control;
3. Testing of the system to ensure that it works bug-free in all expected business situations;
4. The hardware and software used should be able to deliver the expected processing;
5. The system capacity and expected response time should be maintained;
6. The system should be well documented including:
    7. A user guide for inexperienced users,
    8. A user reference or operations manual for advanced users,
    9. A system reference manual describing system structures and architecture.

FACTORS FOR SUCCESS AND FAILURE

1. It should cater to a specific, well-perceived business.
2. The top management should be completely convinced, able and willing to such a system.
3. All users including managers and other employees should be made an integral part of the development, implementation, and use of the system.
4. There should be an operational prototype of the system released as soon as possible, to create interest among the users.
5. There should be good support staff with necessary technical, business, and interpersonal skills.
6. The system should be simple, easy to understand without adding much complexity.

FACTORS FOR SUCCESS AND FAILURE (CONT.)

7. It should be easy to use and navigate with high response time.

8. The implementation process should follow a definite goal and time.

9. All the users including the top management should be given proper training, so that they have a good knowledge of the content and function of the system, and can use it fully for various managerial activities such as reporting, budgeting, controlling, planning, monitoring, etc.

10. it must produce useful outputs to be used by all managers.

11. The system should be well integrated into the management processes of planning, decision-making, and monitoring.

ASSESSMENT

1. The MISDP has helped to curb many problems of MIS yet its implementation is not without challenges. Enumerate some of the challenges that you know.

2. In the planning of MISDP, list four issues one may want to address.

3. Information Requirement Analysis is an important phase of MISDP. Enumerate the process.

4. What categories of technology are available for information system?

Next Week Lecture: **Managing Data Resources**

THANK YOU.