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

Decision Support System

LEARNING OUTCOMES

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

- *explain* the relationship between managers and DSS
- *highlight* the types of DSS
- *list* the components of DSS
- *describe* web-based DSS

CONTENTS

- The Decision-making Process
- Managers and DSS
- Types of DSS
- Components of DSS
- Web-Based DSS
- Expert Systems

DECISION SUPPORT

- The success of an organization depends on the quality of the decisions
- When decision making involves large amounts of information and a lot of processing, computer-based systems can make the process efficient and effective.
- Part of larger enterprise applications
- Example: ERP (enterprise resource planning) systems

THE DECISION-MAKING PROCESS

- A decision is easy to make when one option will clearly bring about a better outcome than any other.
- Decisions become more difficult when more than one alternative seems reasonable and when the number of alternatives is great.
- The problem is deciding on the best alternative.

THE DECISION-MAKING PROCESS (CONT.)

Intelligence	• Collect data from inside the organization. • Collect data from outside the organization. • Collect information on possible ways to solve the problem.
Design	• Organize the data; select a model to process the data. • Produce reasonable, potential courses of action.
Choice	• Select a course of action.

Figure: The three phases of decision making

STRUCTURED AND UNSTRUCTURED PROBLEMS

Structured problem

- In which an optimal solution can be reached through a single set of steps
- Since the one set of steps is known, and since the steps must be followed in a known sequence, solving a structured problem with the same data always yields the same solution.
- **Algorithm:** a sequence of steps
- **Parameters:** the categories of data

STRUCTURED AND UNSTRUCTURED PROBLEMS (CONT.)

Semistructured problem

- Neither fully structured nor totally unstructured
- Daily in many different industries and in many different business functions
- Faces multiple courses of action
- To choose the one alternative that will bring about the best outcome

STRUCTURED AND UNSTRUCTURED PROBLEMS (CONT.)

Structured Problems	Semistructured Problems
How many workers are needed to fully staff production line A?	What are the benefits of merging with XYZ, Inc.?
What is our optimal order quantity for raw material Z, based on our production?	Where should we deploy the next five stores of our retail chain?
How many turbines are needed to supply power to Hickstown?	How will the consumer react if we lower the price of our product by 10 percent?
Which of our regions yields the highest revenue per salesperson?	What is the best advertisement campaign to launch our new financial service?
Which money market fund currently yields the highest return?	What are the benefits of opening an office in Paris, France?
How much would the implementation of pollution-preventing devices cost us?	Which stock will yield the highest return by the end of the year?

Figure: Examples of structured and semistructured problems

MEANING OF DECISION SUPPORT SYSTEMS (DSS)

- Interactive software-based systems
- Helps the management in taking the business decisions
- Allow human-machine interface
- A much better source of information to use in the decision making process
- Interactive computer-based systems and subsystems intended to help decision makers

MANAGERS AND DSS

- In order for decision makers to make quality decisions, they should, to the best of their abilities by:

1. thoroughly check a wide range of alternatives
2. gather full range of goals and implications of choices
3. weigh costs and risks of both positive and negative consequences
4. intensively search for new information for evaluating alternatives

MANAGERS AND DSS (CONT.)

5. take all new information into account, even when it doesn't support initial course of action

6. re-examine positive and negative consequences of all alternatives, including initially rejected ones

7. make detailed provisions for implementation, including contingency plans for known risks

DSS AND MIS

MIS	DSS
Structured decisions Semi-structured	Un-structured decisions
Reports based on routine flows of data	Focused on specific decisions /classes of decisions
General control of organization	End-user control of data, tools, and sessions
Structured information flows	Emphasizes change, flexibility, quick responses
Presentation in form of reports	Presentation in form of graphics
Greater emphasis on models	Assumptions, ad hoc queries
Traditional systems development	Develop through prototyping; iterative process

FRAMEWORK OF DECISIONS SUPPORT SYSTEMS

- Based on the dominant technology component or driver of decision support, the targeted users, the specific purpose of the system and the primary deployment technology
- Targeted to internal or external stakeholders
- A mainframe computer, a client/server LAN, or a Web-Based architecture
- To help people understand how to integrate, evaluate and select appropriate means
- More data, in less time, in greater detail, with easy to use interfaces

NEED FOR AN EXPANDED FRAMEWORK

- DSS are intended to improve and speed-up the processes by which people make and communicate decisions
- Need to understand categories of decision support
- Some DSS focus on data, some on models and some on communications
- Could be categorized in terms of the generic operations it performs
- File drawer systems, data analysis systems, analysis information systems, accounting and financial models, representational models, optimization models, and suggestion models

AN EXPANDED FRAMEWORK

- The framework focuses on one major dimension with 5 generic types of DSS and 3 secondary dimensions.
- The primary dimension is the dominant technology component or driver of the decision support system
- The secondary dimensions are the targeted users, the specific purpose of the system and the primary deployment technology.
- Hybrid systems driven by more than one major DSS component.

TYPES OF DSS

- Data-Driven DSS
- Model-Driven DSS
- Knowledge-Driven DSS
- Document-Driven DSS
- Communications-Driven and Group DSS
- Inter-Organizational or Intra-Organizational DSS
- Function-Specific or General Purpose DSS

DATA-DRIVEN DSS

- The first generic type of Decision Support System
- Take the massive amounts of data available
- "free-flow" the data
- Include file drawer and management reporting systems, data warehousing and analysis systems, Executive Information Systems (**EIS**) and Spatial Decision Support Systems
- Emphasize access to and manipulation of large databases of structured data
- Example: Business Intelligence Systems

MODEL-DRIVEN DSS

- Use accounting and financial models, representational models, and optimization models.
- Use data and parameters provided by decision-makers to aid them in analysing a situation
- Isolate from the main Information Systems of the organization
- Rely on models to help executives understand the impact of their decisions

KNOWLEDGE-DRIVEN DSS

- Maintains a parallelism in the framework and focuses on the dominant knowledge base component.
- Suggest or recommend actions to managers
- A related concept is Data Mining
- A class of analytical applications that search for hidden patterns in a database
- The process of sifting through large amounts of data to produce data content relationships

DOCUMENT-DRIVEN DSS

- To help managers retrieve and manage **unstructured documents and Web pages**
- Integrates a variety of storage and processing technologies
- The Web provides access to large document databases including databases of hypertext documents, images, sounds and video.
- Examples : policies and procedures, product specifications, catalogues, and corporate historical documents

COMMUNICATIONS-DRIVEN AND GROUP DSS

- Includes communication, collaboration and decision support technologies
- A Group DSS is a hybrid Decision Support System that emphasizes both the use of communications and decision models.
- An interactive computer-based system intended to facilitate the solution of problems
- Group DSS, two-way interactive video, White Boards, Bulletin Boards, and Email

INTER-ORGANIZATIONAL OR INTRA-ORGANIZATIONAL DSS

- New technologies and the rapid growth of the Internet is customers and suppliers.
- **Inter-organizational DSS** provides stakeholders with access to a company's intranet and authority
- **Intra-Organizational DSS** that are designed for use by individuals in a company as "standalone DSS"

FUNCTION-SPECIFIC OR GENERAL PURPOSE DSS

- A budgeting system may be purchased from a vendor or customized in-house
- An important purpose in solving a routine or recurring decision task
- Classified as a Model-Driven, Data-Driven or Suggestion DSS
- General purpose DSS software helps support broad tasks like project management, decision analysis, or business planning.

COMPONENTS OF DSS

1. The user interface
2. The database
3. The models and analytical tools and
4. The DSS architecture and network

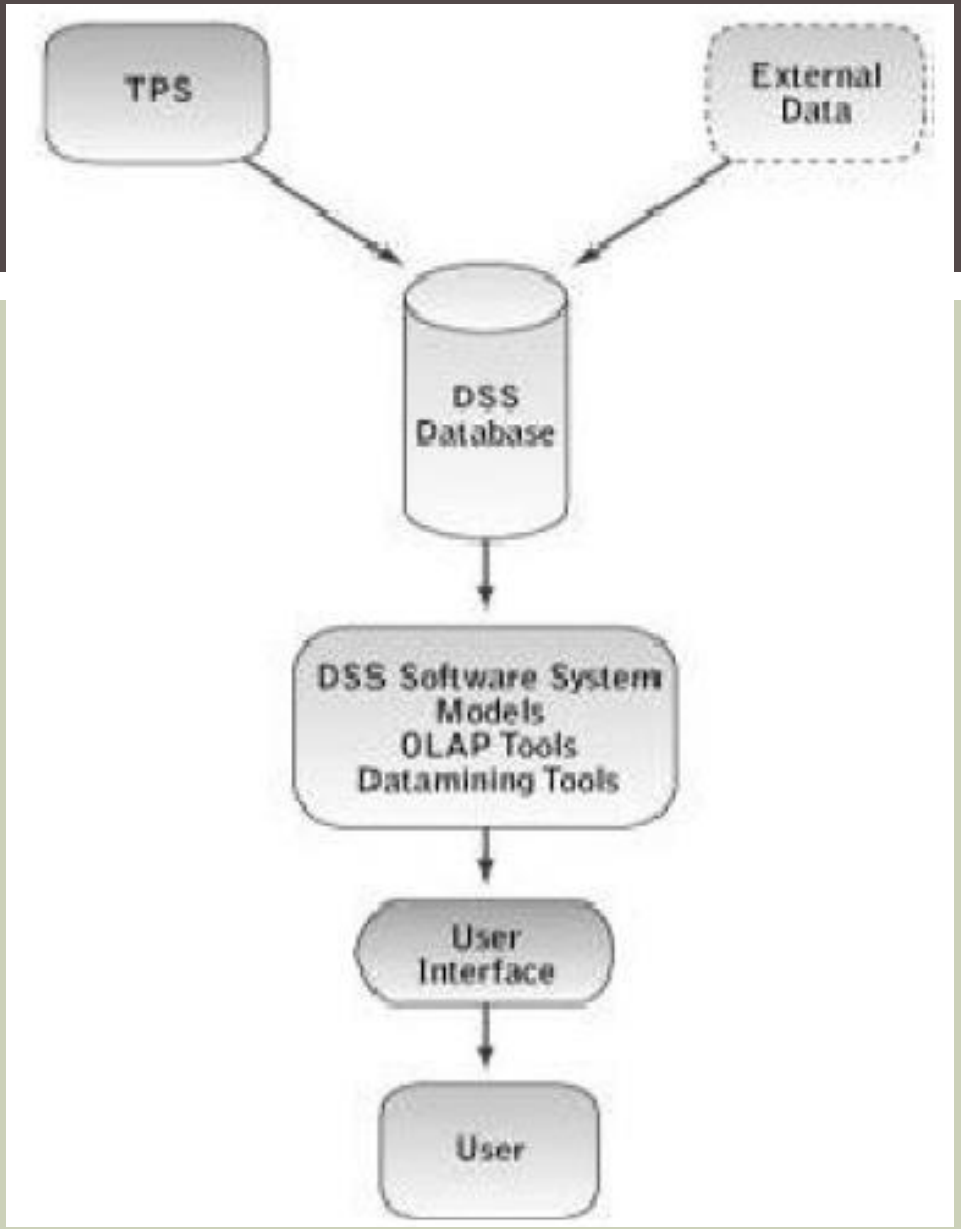

Figure: Overview of a DSS (Source: http://studynama.com)

WEB-BASED DSS

- The Internet and the Web in the customer DSS decision-making process
- Example: to purchase a new home and use the Web to search real estate sites
- Need to find out how much your monthly payments will be based on the interest rate
- Web site has several helpful calculators (customer decision support systems)
- Make your decision about the purchase of the home or know instantly that you need to find another house.

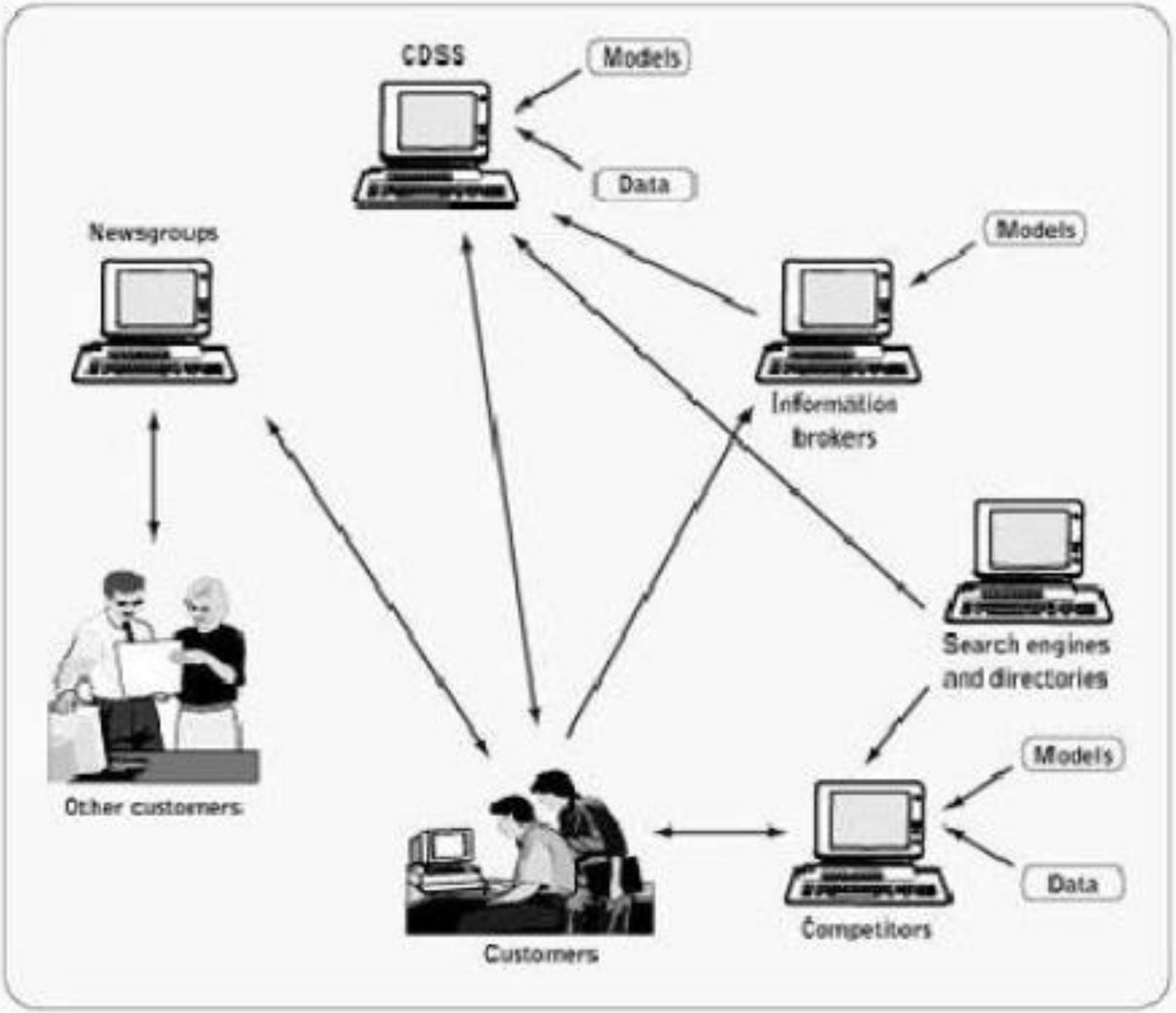

Figure: Customer decision support on the Internet (Source: http://studynama.com)

BENEFITS OF DSS

- Enhance efficiency
- Fast decision-making
- Time saving
- Cost reduction
- Increase control, competitiveness and capability
- interpersonal communication
- Promote learning or training
- Support managerial processes

DISADVANTAGES OF DSS

- Increase development cost
- Increase Information overload
- Over decision making
- Depend on DSS
- Reduce Staff's skill

EXPERT SYSTEMS

- To emulate the knowledge of an expert to solve problems and make decisions in a relatively narrow domain.
- A *domain* is a specific area of knowledge.
- to replicate the unstructured and undocumented knowledge of the few (the experts)

EXPERT SYSTEMS (CONT.)

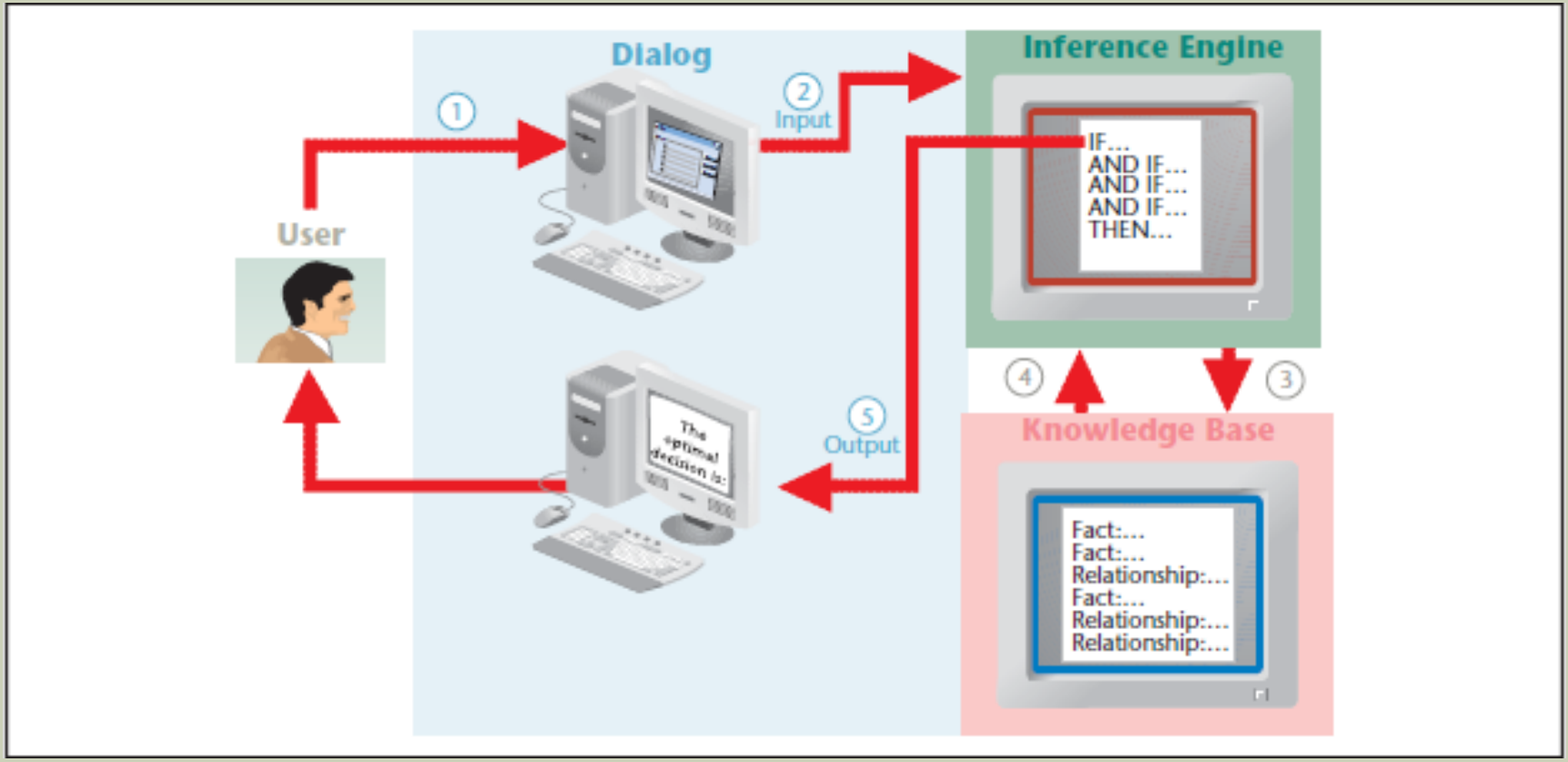

Figure: Components of an expert system; numbers indicate the order of the processes

ASSESSMENT

1. Define DSS.
2. List the types of DSS
3. List the components of DSS

Next Week Lecture: **Operational Information Systems**

THANK YOU.