INFORMATION SYSTEMS

TYPES OF INFORMATIONS SYSTEMS

1. Transactional Processing Systems
2. Management Information Systems
3. Decision Support Systems
4. Executive Support Systems
5. Expert Systems
6. TRANSACTIONAL PROCESSING SYSTEMS

* A transaction is any business related exchange, such as a sale to a client, or payment to a vendor
* TPS processes and record transactions as well as update records
* They automate the handling of date about business activities and transactions
* They record daily routine transactions such as sales orders from customers, or bank deposits and withdrawals
* They are the oldest type of business information systems, and handle routine tasks, they are critical to business organizations

TPS CONT’D

* TPS are vital for the organization, as they gather all the input necessary for other types of systems
* It could be difficult to generate monthly sales reports for middle management or critical marketing information to senior managers without TPS
* TPS provide the basic input to the company’s database. A failure of TPS often means disaster for the organization.
* Imagine what happens when an airline reservation system fails; all operations stop and no transaction can be carried out until the system is up and running again.
* There would be long queues form in front of the ATMs and tellers when a bank TPS crashes
* TPS were created to maintain records and do simple calculations faster, more accurately and more cheaply than people could do the tasks
* Examples – Airline reservation systems, Automated teller machines, and order processing systems, registration systems, Payroll systems and point of sale systems

1. MANAGEMENT INFORMATION SYSTEMS

* Is a system for processing data in order to give proper information to the management for decision making
* MIS, collects raw data, and analyze it for useful decision making by management
* MIS provides managers with information and support for effective decision making and feedback
* MIS is organized along functional lines within an organization.
* MIS provides information to the users in the form or reports, which are usually generated through accumulation of transaction processing data.
* They provide routine information to decision makers
* They are used to make structured, recurring and routine decisions, such as restocking decisions or bonus awards.
* They focus on operational efficiency and provide summaries of data.
* Takes the relatively raw data available through a TPS and converts it into meaningful aggregated form that managers need in order to conduct their responsibilities

MIS CONT’D

Output of MIS includes

1. SCHEDULED REPORTS

These were originally the only reports provided by early management information systems

They are produced periodically, such as hourly, daily, weekly, monthly.

An example might be a weekly sales report that a store manager gets each Monday showing total weekly sales for each department compared to sales this week last year or planned sales

1. DEMAND REPORTS
2. EXCEPTION REPORTS

These are produced to describe unusual circumstances. For example the store manager might receive a report for the week if any department sales were more than 10% below planned sales.

3.DECISION SUPPORT SYSTEMS

- Provide problem specific support for non-routine, dynamic and often complex decisions or problems.

DSS users interact directly with the information systems, helping to model the problem interactively.

DSS basically provide support for non-routine decisions or problems and an interactive environment in which decision makers can quickly manipulate data and models for business operations.

DSS might be used to help management team decide where to locate a new distribution facility. This is a non-routine, dynamic problem.

DSS CONT’D

* Each time a new facility has to be build, the competitive environmental, or internal contexts are most likely to be different
* New competitors or government regulations may need to be considered, or the facility may be needed due to a new product line or business venture
* When the structure of a problem or decision changes, or the information required to address it is different each time the decision is made, then the needed information cannot be supplied by an MIS, but must be interactively modelled using a DSS.
* DSS provide support for analytical work in semi-structured or unstructured situations
* Enables managers to answer “What If” questions by providing powerful modelling tools (with simulation and optimization capabilities) and to evaluate alternatives e.g. evaluating alternative marketing plans.
* DSS have less structure and predictable use.
* They are user friendly and highly interactive.
* Although DSS use data from the TPS and MIS, they also allow inclusion of new data, often from external sources such as current share prices or prices of competitors.

EXECUTIVE INFORMATIONS SYTEMS

EXECUTIVE INFORMATION SYSTEMS

* Eis provide a generalized computing and communication environment to senior managers to support strategic decisions.
* They draw data from the MIS and allow communication with external sources of information
* Unlike DSS, the EIS is not designed to use analytical models for specific problem solving
* EIS are designed to facilitate senior managers’ access to information quickly and effectively.
* EIS has menu-driven user-friendly interfaces, interactive graphics to help visualization of the situation.
* It also has the communication capabilities that link the senior executives to the external databases they require.
* Top executives need ESS because they are busy and need information quickly and in an easy to read form.
* Senior executives want to have direct access to information and want the computer setup to directly communicate with others.
* They want structured forms for viewing and want summaries rather than details.

EXPERT SYSTEMS

* It’s an advanced DSS that provides expert advice by asking users a sequence of questions dependent on prior answers that led to a conclusion or recommendation.
* It is also made of knowledge base ( database of decision rules and outcomes ), inference engine (search algorithm ), and a user interface.
* ES users Artificial Intelligence technology.
* It attempts to codify and manipulate knowledge rather than information.
* ES may expand the capabilities of a DSS in support of the initial phase of the decision making process.
* It can assist the design phase of the decision making process by suggesting alternative scenarios for “what if” evaluation.
* An ES assists a human in the selection of an appropriate model for the decision problem
* ES can simplify model-building. Simulation modeling lends itself to this approach.
* ES can provide an explanation of the results obtained with a DSS
* ES capabilities may be employed during DSS development

1. OTHER INFORMATION SYSTEMS

These are special purpose information systems. They are more recent types of information systems that cannot be characterized as one of the types discussed above.

1. OFFICE AUTOMATED SYSTEMS (O.A.S)

* Support general office work for handling and managing documents and facilitating communication.
* Text and image processing systems evolved as from word processors to desktop publishing, enabling the creation of professional documents with graphics and special layout features.
* Spreadsheets, presentation packages like “PowerPoint”, personal database systems and note taking systems (appointment book, notepad, card file) are part of an O.A.S.

1. ARTIFICIAL INTELLIGENCE SYSTEMS

* AI, is a broad field of research that focuses on developing computer systems that simulate human behavior, that is systems with human characteristics.
* These characteristics include, vision, reasoning, learning and natural language processing.
* Examples include (Expert systems, Neural networks, Robotics)

1. KNOWLEDGE WORK SYSTEMS

* Support highly skilled knowledge workers in the creation and integration of new knowledge in the company
* Example is the CAD (Computer Aided Design) systems
* These can be used by product designers not only allow them to easily make modifications without having to redraw the entire object, but also to enable them to test the product without having to build physical prototypes.
* Architects, use CAD software to create, modify, evaluate and test their designs; such systems can generate photo-realistic pictures, simulating the lighting in rooms at different times of the day, perform calculations, for instance the amount of paint required.
* Surgeons use sophisticated CAD systems to design operations.
* Financial institutions use knowledge work systems to support trading and portfolio management with powerful high-end PCs.
* These allow managers to get instantaneous analyzed results on huge amounts of financial data and provide access to external databases.

INFORMATION CONCEPTS

INFORMATION.

* Is data that has been organized. Information is data given context and endowed with meaning and significance.
* Information is a value-added data. “A set of classified and interpreted data used in the decision making process”
* Information is important at every level in the organization for decision making, planning, organization, implementing, and monitoring and controlling. Information is valuable because of its content, form and timing of presentation.
* Information is the basis of every decision taken in an organization.
* The efficiency of management depends upon the availability of regular and relevant information.
* A good system must be able to produce information that carries the following characteristics:

1. Relevant – Information must pertain to the problem at hand
2. Complete – partial information is often worse than no information.
3. Accurate – Erroneous information may lead to disastrous decisions.
4. Current – Decisions are often based upon the latest information available
5. Economical – in a business setting, the cost of obtaining information must be considered as one cost element involved in any decision.
6. Timeliness – Information must reach a use in a timely manner, just when needed, not too early, because by the time it is used, it would be out of date, not too late, because the use will not be able to incorporate it into his or her decision making.
7. Appropriateness – Information must be relevant to the person who is using it. It must be within the sphere of his/her activities so that it can be used to reduce uncertainty in his/her decision-making.
8. Conciseness – Information should always contain the minimum amount of detail that’s appropriate for the user. Too much detail causes information overload.

INFORMATION CONCEPTS

* INFORMATION HIERACHY

In business intelligence, there is DIKW Pyramid represents the relationship between data, information, knowledge and wisdom.

Each building block is a step toward a higher level – first comes data, then information, next is knowledge, and finally comes wisdom.

Data are raw facts such as employee number, hours worked in a week, inventory part numbers, or sales orders.

Information is a collection of facts organized and processed so that they have additional value beyond the value of individual facts.

Knowledge is the awareness and understanding of a set of information and ways that information can be made useful to support a specific task or reach a decision.

Wisdom is the ability to make a good judgement based on what you know.

INFORMATION RESOURCE MANAGEMENT

* Has become a popular way to emphasize major change in the management and mission of the information systems function in the many organization.
* In many organizations, IRM may be viewed as having five major dimensions

1. Strategic Management
2. Operational Management
3. Resource Management
4. Technology Management
5. Distributed Management
6. STRATEGIC MANAGEMENT

* The IS function must manage information technology so that it makes major contributions to the profitability and strategic objectives of the firm
* The information systems’ function must change from an information service utility focused only on serving a firm’s transaction processing or decision support needs
* Instead it must be a producer or packager of information products or an enabler of organizational structures and business processes.
* The functionality above can give a firm a comparative advantage over its competitors

STRATEGIC MANAGEMENT CONT’D

The chief information officer;

Many companies have created a senior management position, the chief information officer, (CIO), to oversee the use of IT. The CIO has three main responsibilities

1. Oversee the support services of traditional computer services, telecommunications, office automated systems, and other IS technology support systems.
2. Concentrates on long-term planning an strategy. CIO does not direct day to day information service activities.
3. Works with other top executives to develop strategic information systems that help make the firm more competitive in the marketplace.
4. OPERATIONAL MANAGEMENT

* The IRM concept stresses that information technology and information systems can be managed by functional organizational structures and managerial techniques commonly used throughout other business units.

Information services departments perform several basic functions and activities. These can be grouped into three basic IS functions. IE.

Systems development, operations and technical services.

Systems development management means managing activities such as systems analysis and design, prototyping, applications programming, project management, quality assuarance, and system maintenance for all major business/IT development projects.

OPERATIONAL MANAGEMENT CONT’D

Operations:

* IS operations management is concerned with the use of hardware, software, network, and personnel resources in the corporate or business unit data centers of an organization.
* Operational activities that must be managed include data entry, equipment operations, production control, and production support.

Technical services

* Computing and telecommunication services for interconnection of stake-holders
* Data management services
* Application software services e.g. Enterprise systems
* Education, research and development services.

DECENTRALIZED COMPUTER FACILITIES

* Distributed networks of computers at multiple work sites can allow top management to delegate more decision making to middle managers.
* Management can decentralize operations by increasing the number of branch offices while still having access to the information and communications capabilities they need to control the overall direction of the organization.
* Information technology can encourage either centralization or decentralization of information systems, business operations, and management.