Information Systems

Information Management in a Global Society - Hackbarth

Information Technology has Flattened the World

We Live in a Global Village

Social Accountability, Diversity, and Inclusivity

International Companies Operate Differently than National, State or Local Companies

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Information Management in a Global Society cont.

Strategic Business Objectives of Global Information Systems
- ◦ Operational Excellence but with Cultural Differences
- ◦ Developing New Products, Services, and Different Business Models
  - ◦ Reimaging or Repurposing Traditional Products and Services
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- ◦ Competitive Advantage in the Global Context
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Major issues in Information Ethics
- Privacy
- Accuracy of Data or Information (Corruptibility)
- Intellectual Property (Ease of Reproducing)
- Accessibility of information (Literacy)
  - Reading, writing, reasoning, and calculating

Security, Privacy, and Ethical Issues

Information Security or "infosec" or "data security" or "cybersecurity" is a set of practices intended to keep data secure from unauthorized access or alterations.

Cybersecurity is the broader practice of defending Information Technology (IT) assets from attack.

Three Objectives of Information Security or (CIA)

- **C**onfidentiality
- **I**ntegrity
- **A**vailability

Information Security Measures

- Technical Measures (Hardware and Software)
- Organizational Measures (Internal policies and procedures to protect information)
- Human Measures (Awareness Training)
- Physical Measures (Physical access control to facilities)

Security, Privacy, and Ethical Issues, cont.

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Some of the greatest risk to privacy are Trojan horses, ransomware, and other forms of malware that can wreak havoc with your data.

Automation and Support Systems

Automation is the creation and application of technology to monitor and control the production and delivery of products and services.
- Uses automated equipment in a system of manufacturing or other production process.

An automated system is composed of elements that perform a set of task that have been programmed.

Benefits of automated systems
- Eliminates paper documents
- Utilizes employees time better by focusing on non-standard decision-making
- Identifies business processes as you automate repetitive human tasks
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Data is the "bridge" between Hardware and Software **and** Processes and People.

A management information system (MIS) is a computer system consisting of hardware and software that serves as the backbone of an organization's operations. An MIS gathers data from multiple online systems, analyzes the information, and reports data to aid in management decision-making.

The purpose of information management is to: design, develop, manage, and use information with insight and innovation. support decision making and create value for individuals, organizations, communities, and societies.

Some of the common types of Management Information Systems include process control systems, human resource management systems, sales and marketing systems, inventory control systems, office automation systems, enterprise resource planning systems, accounting and finance systems and management reporting systems.

Decision Support and Expert Systems

Definition of a Decision Support System

◦ A Decision Support System (DSS) is a set of related programs and data required to assist with analysis and decision-making within an organization.

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Enterprise Systems (ERP)

Enterprise resource planning (**ERP**) is the ability to deliver an integrated suite of business applications. **ERP** tools share a common process and data model, covering broad and deep operational end-to-end processes, such as those found in finance, HR, distribution, manufacturing, service and the supply chain.

Is a type of **software** that organizations use to manage day-to-day business activities such as accounting, procurement, project management, risk management and compliance, and supply chain operations. Has a consistent feel throughout.

ERP system modules include: product lifecycle management, supply chain management (for **example** purchasing, manufacturing and distribution), warehouse management, customer relationship management (CRM), sales order processing, online sales, financials, human resources, and decision support **system**.

Enterprise Systems (ERP), cont.

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Business Test Contents Information Systems

A. INFORMATION SYSTEMS IN BUSINESS AND SOCIETY - HWANG

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Hardware technology

- Computer hardware consists of electronic devices that input, process, output, and store data according to instructions encoded in software programs.

- Every computer has a central processing unit (CPU), which is also called a central processor, main processor or microprocessor. The CPU contains control unit and arithmetic/logic unit. As the brain of the computer, the CPU executes instructions that make up software programs.

- The CPU works in conjunction with random access memory (RAM), which is also called main memory. This is the temporary memory used to store the results of computations.

- Storage hardware is used to save data and software programs. Hard disks (also called magnetic disks) are the most common storage device. Solid-state storage (also called an SSD drive) is much faster than a hard disk and gaining in popularity. USB flash drives are portable SSD drives.

Hardware technology – cont.

- The exploding power of computer hardware and networking technology has dramatically changed how businesses organize their computing power. Here are key emerging hardware trends:

- Grid computing involves connecting geographically remote computers into a single network to create a virtual supercomputer by combining the computational power of all computers on the grid.

- Virtualization is the process of presenting a set of computing resources so that they can all be accessed in ways that are not restricted by physical configuration or geographic location.

- Cloud computing is a model of computing in which computing processing, storage, and software are provided as a pool of virtualized resources, which can be accessed on an as-needed basis from any connected device and location.

- Automatic computing is an industry-wide effort to develop systems that can configure themselves, heal themselves when broken, and protect themselves from intruders.

Software technology

- Computer software is a collection of instructions that tell the computer how to work. This is in contrast to computer hardware, from which the system is built and actually performs the work.

- Open source software is not restricted to any specific operating system or hardware technology. One of the most well-known open source software is Linux, an operating system related to Unix.

- Software as a service (SaaS) is a cloud-based service in which a vendor hosts software programs and makes them available to a client firm over the network.

- Pre-packaged software is a pre-written commercially available software product that eliminates the need for a firm to build its own software.

- Software outsourcing enables a firm to contract custom software development to third-party IT vendors. A service-level agreement (SLA) defines the level of service a client firm expects from a vendor, laying out the metrics by which service is measured, as well as penalties should agreed-on service levels not be achieved.

Database management systems

- A database refers to any collection of electronic records that can be processed to produce useful information.

- A Database Management System (DBMS) is software designed to store, retrieve, define, and manage data in a database. It acts as an interface between application programs and the physical data files.

- A relational database is a collection of data items with pre-defined relationships between them. These items are organized as a set of tables with columns (fields) and rows (records).

- Each table in a relational database has a designated column used as a primary key, which is the unique identifier for all the information in any row of the table.

- A database query is a request for data from a database. A structured query language (SQL) is the standard language for managing data stored in a relational DBMS.

Database management systems – cont.

- A data warehouse is a database that stores current and historical data of potential interest to decision makers throughout the company.

- A data mart is a subset of a data warehouse in which a highly focused portion of the organization's data is placed in a separate database for a certain group.

- Online Analytical Processing (OLAP) performs multidimensional analysis of business data and provides the capability for complex calculations, trend analysis, and sophisticated data modeling. Unlike relational databases, OLAP tools do not store individual transaction records in two-dimensional, row-by-column format. Instead, OLAP tools use multidimensional database structures called cubes to store arrays of consolidated information.

- Data mining is a process of discovering patterns in large data sets to predict outcomes. Businesses can learn more about their customers to develop more effective marketing strategies.

Network and internet technology

- Most networks contain a connecting point between the computers. Hubs send data packets to all other connected devices. Switches have more intelligence than hubs and can forward data to a specified destination. While hubs and switches create a network, routers connect a network to different networks. Routers are responsible for finding the shortest path to the final destination for data packets.

- Client/server computing is a distributed computing model in which some of the processing power is located within small client computers. These clients are linked to one another through a network that is controlled by a server computer.

- Packet switching is a method of slicing digital messages into parcels called packets, sending the packets along different communication paths as they become available, and then reassembling the packets once they arrive at their destinations.

- A protocol is a set of rules and procedures governing data transmissions between two points in a network. Transmission Control Protocol/Internet Protocol (TCP/IP) is a set of protocols specifying how data should be packetized, addressed, transmitted, routed, and received between computers.

Network and internet technology – cont.

- There are different kinds of networks in terms of their geographic scope. A local area network (LAN) connects personal computers to other digital devices within a half-mile radius. Wide area networks (WANs) span broad geographic distances – entire regions, states, continents, or the entire globe.

- Web 2.0 refers to the second generation of the World Wide Web. It is best characterized by websites that emphasize user-generated content and participatory culture (e.g., social networking sites)

- Bluetooth is the popular name for the 802.15 wireless networking standard, which is useful for creating small personal area networks (PANs).

- The 802.11 set of standards for wireless LANs and wireless Internet access is also known as Wi-Fi.

- Radio frequency identification (RFID) systems provide a powerful technology for tracking the movement of goods throughout the supply chain.

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Enterprise Systems (ERP) – cont.

Supply Chain
- ◦ **Supply chain management** is the **management** of the flow of goods and services and includes all processes that transform raw materials into final products.

Types of Supply Chain Tools
- ◦ Shipping status alerts and Updates
- ◦ Lean inventory
- ◦ Warehouse Management
- ◦ Specialized Freight handling
- ◦ Bidding and spending of dollars
- ◦ Supplier management
- ◦ Order processing
- ◦ Compliance tools
- ◦ Demand Forecasting
- ◦ Analytics and Reports
- ◦ Transport Logistics
- ◦ Security Features
- ◦ Collaboration Tools

Systems investigation and analysis

- Systems development starts with the investigation of existing systems. Main activities include identifying a problem that a firm faces, identifying its causes, and specifying the solution.

- System analysis identifies the information requirements that must be met by a system solution. The information requirements of a new system involve identifying who needs what information, where, when, and how. Requirement analysis carefully defines the objectives of the new system and develops a detailed description of the functions that the new system must perform.

- Feasibility study determines whether the proposed system is expected to be a good investment, whether the technology needed for the system is available, and whether the organization can manage the changes introduced by the system.

Systems planning development and implementation

- The Software Development Life Cycle (SDLC) is a structured process that describes all systems development activities. It is a phased approach that formally divides systems development into the following stages:

- Systems Investigation - Problems and opportunities are identified.

- Systems Analysis - Existing systems and work processes are studied.

- Systems Design - Defines how the information system will do what it must do to solve the problem.

- Implementation - System components are assembled and the new system is placed into operation.

- Maintenance - Ensures the system operates and is modified to keep up with business changes.

Systems planning development and implementation- cont.

- Object-Oriented systems development is an approach to software design in which the decomposition of a system is based upon the concept of an object.

- The prototype is a working version of an information system. Prototyping consists of building an experimental system rapidly and inexpensively for users to evaluate. By interacting with the prototype, users can get a better idea of their information requirements.

- Rapid application development (RAD) is a software development methodology that uses minimal planning in favor of rapid prototyping.