

Chapter 8: Major Applications and Current trends of Information Systems

As stated in previous chapter, an IS is a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making and control in an organization. Its role is to support the key aspects of running an organization, such as communication, record- keeping, decision making, data analysis and more. Companies use this information to improve their business operations, make strategic decisions and gain a competitive edge.

Using ISs effectively requires an understanding of the organization, management, and IS shaping the systems. All ISs can be described as organizational and management solutions to challenges posed by the environment. Three basic activities—input, processing, and output—produce the information organizations need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Environmental actors, such as customers, suppliers, competitors, stockholders, and regulatory agencies, interact with the organization and its information systems.

IS handles the flow and maintenance of information that supports a business or some other operation in the following ways and more.

- Information Storage: Keeping a log of activities is important for all the organizations, to understand the reason for the problems and so to provide solution to the same.
 - it simple to store operational data, revision histories, communication records and documents.
 - It simplifies the process of finding the data easily.
- Simplified Decision Making: eases the process of decision making and simplifies the process of delivering the required information and hence assists in taking better decisions instantly.
 - helping decision makers by providing accurate and time based information helping them in making the right decisions
- Behavioral Change: help communication better between the employers and the employees.

- as it stores documents and files in folders that can be accessed and shared by the employees.

This ensures to oversee the flow of information between the management and the lower-level employees.

- This also allows the front-line employees to be a part of the decision making process and hence feel motivated and committed towards doing a task.

An understanding of the effective and responsible use and management of IS is important for managers, business professionals, and other knowledge workers in today's internetworked enterprises. ISs play a vital role in the e-business and e-commerce operations, enterprise collaboration and management, and strategic success of businesses that must operate in an internetworked global environment. E-business is a very broad concept that involves a business organization to use electronic medium to carry out all specialized or overall business activities.

- It includes any process that a business organization conducts over electronic and computer enabled network.

E-commerce is the buying and selling of products and services via the internet. Thus, the field of ISs has become a major functional area of business administration. In the business environment there is a range of requirements for information.

Senior managers need information to help with their corporate planning. Middle management needs more detailed information to help monitor and control business actions. Teams with operational roles need information to help carry out their duties. Thus, companies tend to have several IS operating at the same time. The most common types of IS include: **Office Automation System, Transaction Processing System, Management Information System, and Decision Support System.**

8.1 Office Automation System

An office automation system (OAS) is a collection of communication technology, computers, and persons to perform official tasks. It executes office transactions and supports official activities at every organizational level. These activities can be divided into clerical and managerial activities. **Clerical activities** performed with the help of an office automation system include preparing written communication, typesetting, printing, mailing, scheduling meetings, calendar keeping.

etc. **Under managerial activities**, an office automation system helps in conferencing, creating reports

and messages, and controlling the performance of the organization. Many applications like word processing, electronic filing, and e-mail are integrated into the office automation systems.

Word Processing

- Word processing is used for the preparation of documents like letters, reports, memos, or any type of printable material by electronic means. The text is entered by keyboard and displayed on the computer's display unit and can be edited, stored, and reproduced with the help of commands present in the word processor.
- Word processors have facilities for spell checking, grammar checking, counting (character, lines, pages, etc.), automatic page numbering, index creation, header, and footer, etc

Email

- E-mail or electronic mail facilitates the transfer of messages or documents with the help of computers and communication lines. This helps in the speedy delivery of mails and also reduces the time and cost of sending paper mail.
- E-mail supports not only the transfer of text messages but also has options for sending images, audio, video, and many other types of data.

Voice Mail

- Voice mail, an important call service, allows the recording and storing of telephone messages into the computer's memory. The intended person can retrieve these messages at any time.

8.2 Transaction Processing System

Every firm needs to process transactions in order to perform its daily business operations. A transaction refers to any event or activity that affects the organization. Transaction process is a term that refers to the adding, changing, deleting, or looking up of a record in a data file or database by entering the data at a terminal or workstation. Depending on the organization's business, transactions may differ from one organization to another.

In a manufacturing unit, for example, transactions include order entry, receipt of goods, shipping, etc., while in a bank, transactions include deposits and withdrawals, cashing of cheques, etc. However, some transactions, including placing orders, billing customers, hiring employees, employee record keeping, etc., are common to all organizations.

To support the processing of business transactions, transaction processing systems (TPS) are used in organizations.

Example: Bill system, payroll system, Stock/ inventory control system.

8.3 Management Information System

Management information systems (MIS) are specially developed to support the planning, controlling, and decision-making functions of middle managers. MISs extract transaction data from underlying TPSs, compile them, and produce information products in the form of reports, displays, or responses. These information products provide information that conforms to the decision-making needs of managers and supervisors.

MISs use simple routines like summaries and comparisons which enable managers to take decisions for which the procedure of reaching a solution has been specified in advance. Generally, the format of reports produced by MIS is pre-specified.

A typical MIS report is a summary report, such as a report on the quarterly sales made by each sales representative of the organization. Another type of MIS report is an exception report that specifies the *exception conditions* the sales made by some sales representative is far below than expected. Usually, MISs are used to produce reports on a monthly, quarterly, or yearly basis. However, if managers want to view the daily or hourly data, MIS enables them to do so.

In addition, they provide managers online access to the current performance as well as past records of the organization. Many different types of report are produced in MIS. Some of the reports are a summary report, on-demand report (user selects a particular profile and then clicks the "Report" button), ad-hoc reports (create reports on an as-needed basis one time) and an exception

report.

- Example: Sales management systems, Human resource management system.

8.4 Decision Support System

A decision support system (DSS) is an interactive computer-based IS that, like MIS, also serves at the management level of an organization. However, in contrast to MIS, it processes information to support the decision-making process of managers. It provides middle managers with the

information that enables them to make intelligent decisions. A DSS in a bank, for example, enables a manager to analyze the changing trends in deposits and loans in order to find out the yearly targets.

DSSs are designed for every manager to execute a specific managerial task or problem. Generally, they help managers to make semi-structured decisions, the solution to which can be arrived at logically. However, sometimes, they can also help in making complex decisions.

To support such decisions, they use the information generated by OASs and TPSs. DSSs have more analytical power as compared to other ISs. They employ a wide variety of decision models to analyze data or summarize a vast amount of data into a form (usually form of tables or charts) that make the comparison and analysis of data easier for managers.

They provide an interactive environment so that the users could work with them directly, add or change data as per their requirements, and ask new questions.

Example: Financial planning systems, Bank loan management systems.

8.5 Current trends of Information Systems

An IS is a complex decision support system which is used by firms to enhance and improve their business operations. It is a tool used to help management make informed decisions for their business based on information gathered from all business departments. There are many more trends emerging through advances in ISs.

✓ Globalization

- The first trend to note is the continuing expansion of globalization.

- The use of the Internet is growing all over the world, and with it the use of digital devices.
- ✓ **Data mining** is used by companies to collect data regarding consumer purchases and other economic trends.
 - An important trend in ISs is the ability for firms to use data mining.
 - Using a broad range of techniques, you can use this information to increase revenues, cut costs, improve customer relations
 - This allows management to use the information gathered to establish goals and directions for future business operations
- ✓ **Collaborative:** is the ability for firms to network with other companies for business purposes.
 - Electronic data interchange (EDI) is used by manufacturing firms to shorten their supply chain.
 - EDI is used to transfer the necessary information for ordering more products.
 - Networking also allows companies to transfer money through different bank accounts which gives firms the opportunity to pay bills and purchase materials much quicker.
 - Advances in ISs have led to the creation of new careers in both database management and consultancy.
- ✓ **Social media**
 - Social media growth is another trend that continues. Facebook now has over one billion users!
- ✓ **Personalization**
 - Ever since the advent of Web 2.0 and e-commerce, users of ISs have expected to be able to modify their experiences to meet their personal tastes.
 - From custom backgrounds on computer desktops to unique ringtones on mobile phones, makers of digital devices provide the ability to personalize how we use them.
 - More recently, companies such as Netflix have begun assisting their users with personalizations by making suggestions.
- ✓ **Mobile**
 - Perhaps the most impactful trend in digital technologies in the last decade has been the advent of mobile technologies.

- Beginning with the simple cellphone in the 1990s and evolving into the smartphones and tablets of today, the growth of mobile has been overwhelming.
- **Here** are some key indicators of this trend: Mobile device sales, Internet access via mobile, The rise of tablets.

✓ **Wearable**

- The average smartphone user looks at his or her smartphone 150 times a day for functions such as messaging (23 times), phone calls (22), listening to music (13), and social media (9).
- Many of these functions would be much better served if the technology was worn on, or even physically integrated into, our bodies.
- This technology is known as a “wearable.”
- **Wearables** have been around for a long time, with technologies such as hearing aids and, later bluetooth earpieces.
- But now, we are seeing an explosion of new wearable technologies.
- Perhaps the best known of these is Google Glass, an AR device that you wear over your eyes like a pair of eyeglasses.
- Visible only to you, Google Glass will project images into your field of vision based on your context and voice commands.
- Another class of wearables are those related to health care.
- The UP by Jawbone consists of a wristband and an app that tracks how you sleep, move, and eat, then helps you use that information to feel your best.
- It can be used to track your sleep patterns, moods, eating patterns, and other aspects of daily life, and then report back to you via an app on your smartphone or tablet.
- As our population ages and technology continues to evolve, there will be a large increase in wearables like this.

✓ **Findable**

- The “Internet of Things (IoTs)” refers to the idea of physical objects being connected to the Internet.
- Advances in wireless technologies and sensors will allow physical objects to send and receive data about themselves.
- Many of the technologies to enable this are already available – it is just a matter of integrating them together.

✓ **Autonomous**

- A final trend that is emerging is an extension of the IoTs: autonomous robots and vehicles.
- By combining software, sensors, and location technologies, devices that can operate themselves to perform specific functions are being developed.
- These take the form of creations such as medical nanotechnology robots (nanobots), self-driving cars, or unmanned aerial vehicles (UAVs).
- A nanobot is a robot whose components are on the scale of about a nanometer, which is one-billionth of a meter.
- While still an emerging field, it is showing promise for applications in the medical field.

For example, a set of nanobots could be introduced into the human body to combat cancer or a specific disease.