A&E OPTIONS
your information systems technology partner

Basics of Information Systems

PART 2

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Date Created: 11-July, 2011
Date Updated 30 May 2012
Document Version: 1.1

BASICS OF INFORMATION SYSTEMS

1. Introduction

1.1 Benefits of Information Systems Technology (IS/T)

Generally IS/T facilitates doing things *faster, easily, conveniently, securely, reliably*, etc.
Examples: 24 hr loan processing; renewal of driving license in 15 minutes, bank ATMs, etc

The main benefits of IS/T are:

- **Facilitates Efficiency** and **Effectiveness** in achieving goals and objectives
  Efficiency: means achieve objectives with minimum cost in terms of resources - time, human resources, finance, equipment, etc
  Effectiveness: means meeting set goals and objectives

- **Promotes innovation and competitiveness**
  Innovation: new and better way of doing things
  Competitiveness: Doing things better than competitors

2. Components of Information Systems Technology

Information Systems Technology (IS/T) products and services include:
Computers (desktop, laptops), mobile phones, printers, MP4 player, DVD-video, internet, electronic mail, SMS, data processing systems (e.g loan processing) and many digital products and services.

There are 5 components that make up IS/T products and services. They are:
1. Software
2. Hardware
3. Networks and Communications
4. Data
5. People

Computer software is at the heart of computer-based information systems, because they drive the other components or subsystems of the information system. As the name implies, 'soft' and 'ware' refer to the intangible part of the computer system

Definition: Software is a set of coded instructions written in a ***programming language*** that directs a computer system or device to process information as part of automating a task.

The task could be typing, playing music, showing a movie, preparing financial statements or guiding a rocket to strike its target. It is the software of a computer system that provides its functionality. It determines what a computer system can do. Through the use of software, human activities are automated to make them easier, faster or efficient than manual means.

Alternative names for computer software: *1) program 2) application*

All software can be classified under three main areas:

- *Application Software:* Example Accounting software
- *Operating System:* Example MS Windows.
- *System Development Software (or programming software)***:** Example: Visual Basic.

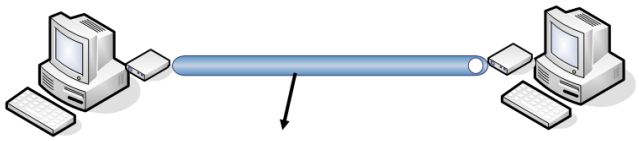
Hardware is the physical ('hard') parts and accessories of a computer system of IS/T products and services. Examples are the desktop computer, pen-drive, CD-ROM, printer, etc. The hardware of a computer system provides its processing power. Computer hardware is just like any electronic device, the distinctive difference is that it operates under the direction of software.

There are three main types of computer hardware:

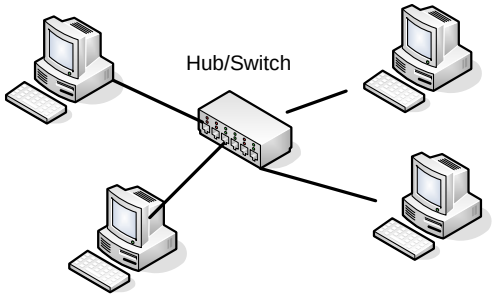
1. *End User Computing Equipment:* Examples: Desktop personal computers (PCs), portable computers (i.e. laptops or notebooks, and palmtops
2. *Shared Computing Equipment:* Examples: Servers
3. *Communication and networking hardware***:** Switches, phones and satellite equipment.

Networks and Communications technologies provide the means to transmit text, voice, or video over distances spanning continents and planetary bodies. Communications and networks are handled by hardware devices such as modems, switches and routers.

Network and communication system are illustrated below:



- Telephone line or twisted pair cable
- Coaxial cable
- Fibre Optic cable



Data: The fundamental reason why computer systems exist is because of the need to process and manage large volumes of data and information. Information aids decision making. Informed decision making leads to the right actions. The right set of actions leads to achievement of organisational objectives. Information is therefore the most important resource of a computer system.

As part of creating products and delivering services, firms generate large volumes of data related to discounts, sales figures, inventory, customer details, accounting entries and personnel details. The data generated or processed fuel the business activities that produce the goods and services.

Firms are resorting to computer-based *databases* because they offer efficient data storage and retrieval facilities in support of organisational processes. They provide timely, accurate and relevant information to support effective decision making.

Databases have become an integral part of our lives; at birth and at death, hospital visits, enrolling in a school, electoral voting, checking in at the airport, withdrawing money from the bank and many activities that require some form of a database access.

People form part of IS/T products and services because without them they cannot function. *People* play the most critical role in information systems. Successful utilisation of IS/T depends more on people and strategy, not machines. The people or stakeholders in an IS/T environment fall under three major categories:

- Users
- Information Systems Personnel,
- Vendors/Suppliers, Service Providers and Consultants

Terminologies

Information System (IS) and ***Information Technology*** (IT) are often used interchangeably. But there is a clear distinction between the two terms. Information systems existed long before computing technologies were invented. An Information System refers to the people, processes and tools that work together to collect, store, retrieve, process, analyse and/ or

distribute information. Information Technology is the combination of computer technologies i.e. hardware, software, networking and telecommunications used to manage information.

Information systems may rely on *IT* or not. Information system is an all embracing term. Therefore *IT* is a subsystem of *IS*. *IT* is the technology components of a computer-based information system.

In recent times, the term **Information and Communications Technology (ICT)** has been added to the fray of terminologies. The term is really not different from *IT* in meaning. Indeed *ICT* and *IT* can be used interchangeably.

The term **IT Infrastructure** is used to refer to the physical or hardware components namely the computer hardware, system software, the telecommunication and networking devices that provide the **platform** for the timely processing, storage and transmission of information.

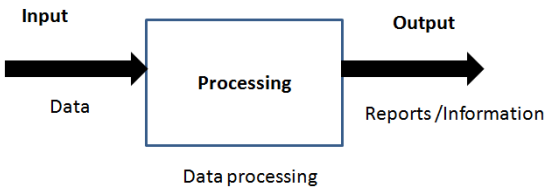
Assignments

1. Distinguish between ***software, hardware, network &communication*** components of an information system technology product or service.
2. People are part of information systems and considered to be critical. Explain this assertion.
3. Data is the most import component of IS/T. Explain why?
4. What are the advantages of IS/T to organisations?

PROFICIENCY IN BUSINESS INFORMATION SYSTEMS

2.1 Introduction

Business Information Systems like all type of information systems are best understood by **purpose-input-processing-output** system model.



Any information system has a **purpose**. The purpose of the information system is the reason why the information system exists or needed. It is the benefits or advantages that the business gains from the system. The **inputs** are the data required for the system to work. At the input data is captured. The processing acts on the input-data by calculating, classifying, sorting,

etc. The **output** is the result of data processing and is usually a report or information which is used to achieve the purpose.

Example: Payroll System

Purpose: To manage the payroll of staff efficiently so that remunerations are paid promptly.

Input: Employee details such as *pay-rates, tax rates, schedules, hours-worked, entitlements*

Processing: calculating the employee salaries – basic, allowances and deductions

Output: pay-slips and various payroll reports

We now look at different business information systems using the purpose-input-processing-output model.

a) Sales and Marketing Information System

Purpose: Example: T
Overall Purpose: To increase sales or market share by say 10%

Objectives
To automate and improve the sale of goods and services by:

- Processing and tracking of customer orders (*Order Processing).*
- Tracking shipment and deliveries (*Deliveries).*
- Tracking customers' purchases and preferences, calculating and giving discounts, sending flyers and thank you notes, providing information on product features and new products (*Customer Relationship).*
- Determining prices using data on sales trends, customer preferences and revenue projections (*Pricing).*
- Providing information on sales trends and customer preferences for *product development*.

Input: Customer details, orders, pricing list, products/services details, sales commissions, sale policy.

Processing: Process quotations, discounts and sales; Maintain stock levels (optional)

Output:

- Customer profiles – top customers, customer preferences
- Product performance – top selling products
- Quotations or proforma invoices, order status
- Sale invoices
- Sales reports - sales by products, sales by regions, top customers, sales forecast,

b) Production/Manufacturing Information System

Purpose: Example:
Overall Purpose: To control cost of production and improve upon the quality of products and services.

Objectives
To automate and improve upon the processes used to produce goods by:

- Generating production plans and schedules (*Production planning).*
- Keeping records and reporting the usage of raw materials and finished goods (*Logistics and Inventory control).*
- Keeping records of production and work-in-progress (*Manufacturing goods/services*).
- Keeping records on equipment, their maintenance schedules, maintenance and repairs activities (*Plant Maintenance).*
- Keeping records on safety activities *(Plant safety).*

Input:

- Inventory details of raw materials and finished goods (i.e. quantities and costs),
- equipment details (name, type, specifications, parts, conditions, etc),
- production and maintenance events, personnel details, etc

Processing:

- raw material usage and cost of production computations
- calculate efficiencies in terms of costs and how production targets are being met

Output:

- Production plans and schedules.
- Orders for raw materials and supplies
- work-in progress, finished goods
- Equipment maintenance schedule
- Safety compliance report.
- Various management reports on production and costs

c) Finance and Accounting Information System

Purpose: Example:
Overall Purpose: To manage financial assets effectively and increase the wealth of shareholders.

Objectives:
To automate the finance and accounting processes used to manage financial assets by:

- Recording budget amounts for revenue and expenditures and comparing with actual amounts (*Budgetary control)*
- Tracking credit sales and receipts (*Debtors' management***)**.
- Tracking credit purchases and payments (*Credit Purchases management)*

- Keeping records of cash inflows and outflows (*Cash management)*
- Keeping records on fixed assets and their depreciation (*Asset Management)*
- Recording transactions and posting into accounts, generating trial balance and financial statements – income statement, balance sheet and cash flow statements (*Financial accounting and reporting*)

Input: Customers' details, suppliers' details, invoices (sales and purchases), receipts, payment vouchers, staff expense claims, inventory and fixed asset register.

Processing: Processing include posting, computing and creating trial balance and financial statements. The processing covers:

- *Cash management:*
  - Cash sales
  - Cash payments to suppliers
  - Cash expenses
- *Credit Sales and Purchases* – sales and purchase invoice processing
- *Asset management:* Fixed assets and their depreciation schedule

Output:

- Invoices (sales and purchases) - where these are produced from the system
- Receipts from customers, where the computer system produces receipts after receiving payment from a customer.
- Financial statement reports, various financial reports for analysis on debtors, creditors, cash flows, profitability are generated from the financial transactions captured on the system.

d) Human Resource Information System

Purpose: Example:
Overall Purpose: To motivate and improve the productivity of staff:

Objective

To automate the following processes used to manage human resources:

- *Recruitment and Selection:* capturing job specification and applicant details and the selection outcomes.
- *Training and Development:* keeping records of job positions and their competencies, training needs and training provided.
- *Performance Appraisals*: Keeping records on staff appraisals and performances.
- *Compensation and Benefits:* Keeping records on staff scales, positions, entitlements, awards, etc.
- *Leave management*: Maintaining leave schedules and staff vacations

Input: Staff details, job classifications, job scales, skills/qualifications, entitlements, leave

schedules, performance appraisals, etc.

Processing:

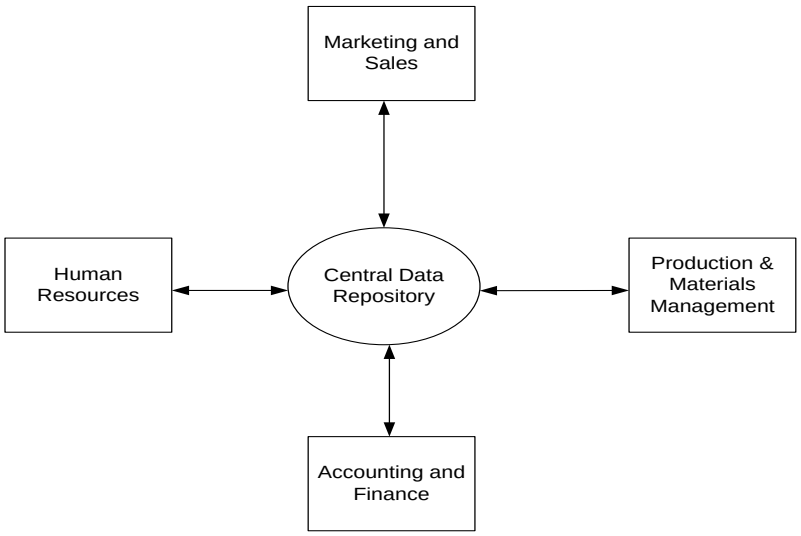
- *Recruitment and Selection:* capturing job specification and applicant details and the selection outcomes for recruitment and selection processes
- *When new employee joins the organisation*: capturing the details of new employee
- *Training and Development:* keeping records of job positions and their competencies, training needs and training provided.
- *Performance Appraisals***:** Process records on staff appraisals and performances
- *Compensation and Benefits:* Process records on staff scales, positions, entitlements, etc.
- *Leave management*: Maintaining leave schedules and staff vacations.

Output:

- Employees at post and not at post.
- Print out of employee record: personal data, historical data - training received, promotions, performance/achievements/awards, disciplinary actions.
- Employee reports such as job analysis report, turnovers, employee productivity, etc.

e) Integrated Information System

Another name is Enterprise Systems or Enterprise Resource Planning (ERP) . An integrated system is illustrated below:



When information systems are integrated they provide accurate and timely information
The benefits of integrated information systems include:

1. They integrate the functional areas of the business, realising the goal of common business processes in an organisation.
2. They eliminate redundant efforts and duplicate data.
3. They allow management to manage the business operations and not just to monitor them.
4. Some companies have used enterprise systems to gain competitive advantage through cost reductions in business operations (typically in labour costs, order processing and stock control) and improved services and revenues.

f) E-business and E-commerce

The use of information and communication technologies to conduct business activities is termed ***E-business***. ***E-Commerce*** is an aspect of e-business that deals with buying and selling of goods and services. The Internet has become the most common electronic platform for conducting e-business and e-commerce.

In e-commerce the selling company sells its products and services through a website known as a **virtual store**. The customer or payer presents a credit card, debit card, electronic check or digital cash as payment for a service or product at the online store. Credit cards are the most common form of e-payment. VISA and MasterCard are examples of Issuers – well known in the market.

Electronic payment or e-payment is the payment for goods and services over an electronic media such as the Internet. It enables merchants to receive electronic-based payments for purchases through a virtual store such as a web site or point-of-sale equipment

Assignment

Using the purpose-input-processing-output model describe a Church Management Information System.