UNIT III

LESSON

5

MIS APPLICATIONS AND ETHICAL ISSUES

CONTENTS

5.0 AIMS AND OBJECTIVES

After studying this lesson, you will be able to:

- Discuss various applications of MIS
- Discuss various ethical issues

5.1 INTRODUCTION

We will here discuss the characteristics of major computerized information systems (viz. Accounting Information Systems, Inventory Control Systems, Marketing Systems and Human Resource Development Systems) of an organization in generalized perspective along with the basic concepts of accounting, inventory, marketing and HRD (Human Resource Development). We will also examine the inputs and outputs of typical accounting, inventory, marketing and HRD systems in brief.

5.2 MIS ADVANTAGES OR APPLICATIONS

5.2.1 Accounting Information Systems

All organizations need systematic maintenance of their records that help in the preparation of the financial statements such as Profit & Loss Accounts and Balance Sheet. Accounting is the most important service activity in business. It is generally called the language of business. Accounting is mainly concerned with the collecting, recording and evaluating the financial data and communicating information to the management and other people. It is viewed as an information system since it has inputs (financial data), processes (evaluation of data) and outputs (financial statements). An accounting information system satisfies the information needs of management and other people (investors and shareholders, creditors, consumers, etc.) as summarized in Table 5.1.

Table 5.1: Information Needs of Various Users from an Accounting System

Users	Information Needs
Management	Cost planning and cost control of operations Profitability of the firm Strategic and tactical decisions
Shareholders	Profitability of the firm & Investors Soundness of their investment Growth prospects of the firm
Creditors	Liquidity of the firm Profitability and financial soundness of the firm
Employees	Settlement of salaries, wages, bonus, etc. Participation in management decisions
Government	Managing the industrial economy of the country Collection of sales, excise and other taxes
Consumers	Financial growth of the firm & Public Social role of the firm in different sectors of the economy

Types of Accounting Information Systems

There are three general types of accounting information systems – (a) Financial Accounting System, (b) Management Accounting System and (c) Cost Accounting System.

(a) ***Financial Accounting System:*** This system provides financial statements to investors, governmental authorities and other interested parties in accordance with their reporting formats.

(b) ***Management Accounting System:*** It provides reports to managers (i) for strategic and tactical decisions *and (ii) on profitability of the firm.*

(c) ***Cost Accounting System:*** It provides reports to managers for cost planning and cost control of operations.

All three types of accounting information systems process the same accounting transactions and often share the data files. Therefore, an accounting information system is generally developed as an integrated system providing all the reports of the above three types. Accounting information system may also be integrated with other information systems like inventory, sales and marketing systems.

Typical Financial Accounting System

The major objectives for implementing a computerised financial accounting system for an organisation are:

- Maintaining account books.
- Preparation of a General Ledger.
- Generating Accounts Receivable and Accounts Payable statements.
- Generating Profit & Loss Account and Balance Sheet.
- Generating updated financial data for other systems (viz. Cost and Management accounting systems).

The various inputs to the system are:

- Cash Vouchers
- Bank Vouchers
- Sale Vouchers or Bills to Customers
- Purchase Vouchers or Bills from Vendors/Suppliers
- Journal Vouchers

A typical financial accounting system is illustrated in Figure 5.1. It generates the following outputs:

- Account Books viz. Cash Book, Bank Book, Sales Book, Purchase Book, Journal and General Ledger
- Trial Balance
- Trading Account
- Profit and Loss Accounts
- Balance Sheet
- Accounts Receivable Statement
- Accounts Payable Statement

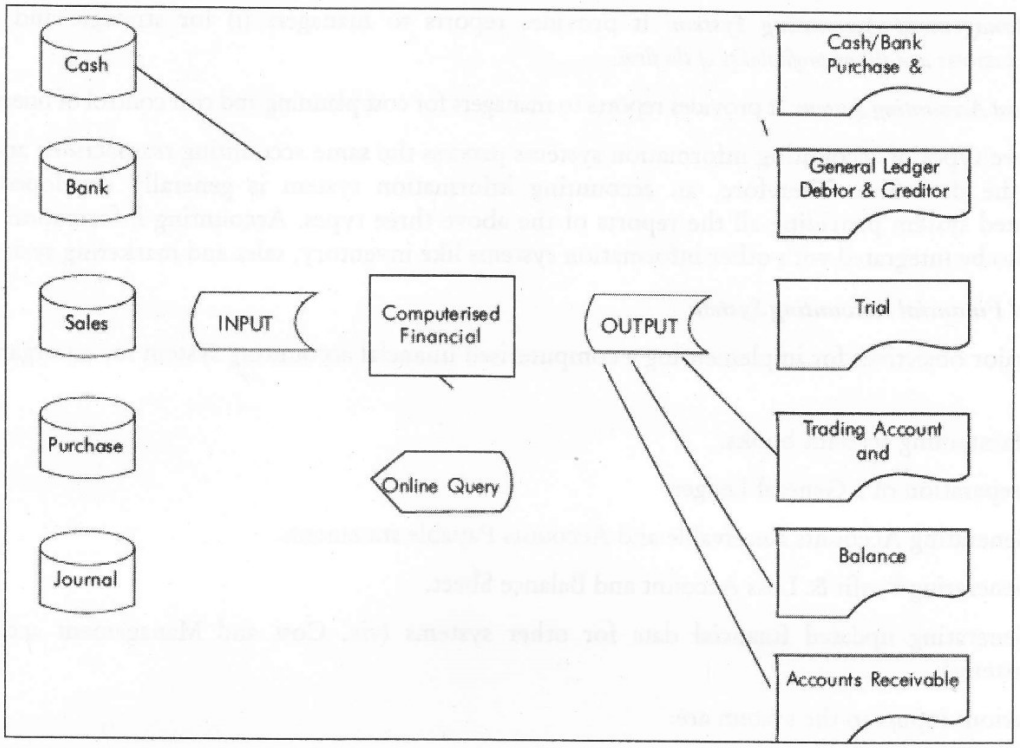

Figure 5.1: A Typical Financial Accounting System

A typical accounting information system includes Financial Accounting, Cost Accounting and Management Accounting systems. It may be integrated with other systems viz.

Invoicing and Order Processing System, Inventory Control System, Production Planning and Control System and Payroll System as illustrated in Figure below. The major objectives of an accounting information system are:

- Preparation of Account Books and Financial Statements
- Generation of MIS reports.

The various inputs to the system are:

- Updated financial data from General Ledger and Accounts – Receivable/Payable System
- Updated sales data from Invoicing System
- Updated purchase data from Inventory System
- Updated production data from Production Planning and Control System
- Updated pay data from Payroll System.

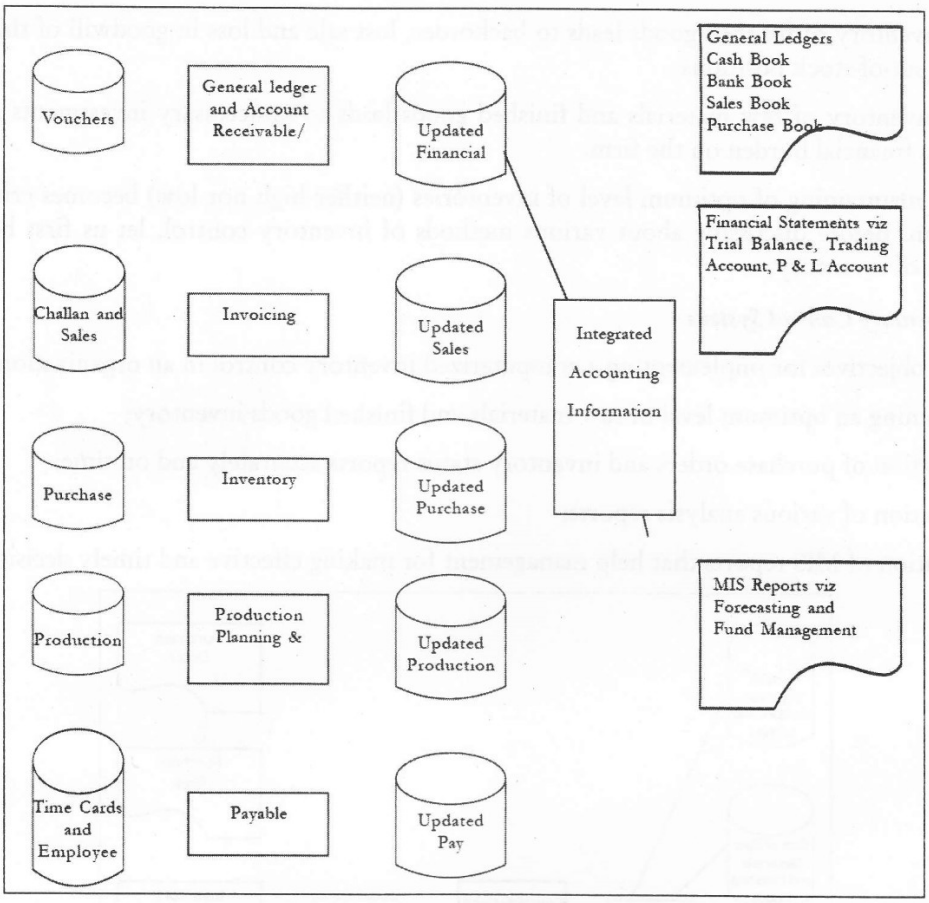

Figure 5.2: A Typical Integrated Accounting Information Systems

A typical accounting information system generates the following outputs:

- Account Books viz. Cash Book, Bank Book, Sales Book, Purchase Book, Journal and General Ledger.
- Financial Statements viz. Trial Balance, Trading Account, Profit and Loss Account, Balance Sheet, Accounts Receivable Statement and Accounts Payable Statements.
- MIS Reports viz. Cost Analysis, Forecasting and Funds Management Reports.

5.2.2 Inventory Control Systems

All organizations need an efficient system to maintain and control the optimum level of investment in all types of inventories. 'Inventory' refers to the stock of raw materials and finished goods available in the firm for production and sale. An inventory control system ensures that proper stock levels of each item are maintained. The improper stock levels (low or high) cause the following problems:

- Low inventory of raw materials leads to idle time in a production process and hence, causes wastage of resources (labour, power, equipments, etc.) needed for production. It may also lead to decrease in sales due to out-of-stock especially during periods of peak demand.

- Low inventory of finished goods leads to backorder, lost sale and loss in goodwill of the company due to out-of-stock positions.
- High inventory of raw materials and finished goods leads to unnecessary investments and hence, causes a financial burden on the firm.

Therefore, maintaining of optimum level of inventories (neither high nor low) becomes critical for an organization. Before discussing about various methods of inventory control, let us first be aware of basic terms of inventory.

Typical Inventory Control System

The major objectives for implementing a computerized inventory control in an organization are:

- Maintaining an optimum level of raw materials and finished goods inventory;
- Preparation of purchase orders and inventory status reports accurately and on time;
- Preparation of various analysis reports;
- Generation of MIS reports that help management for making effective and timely decisions.

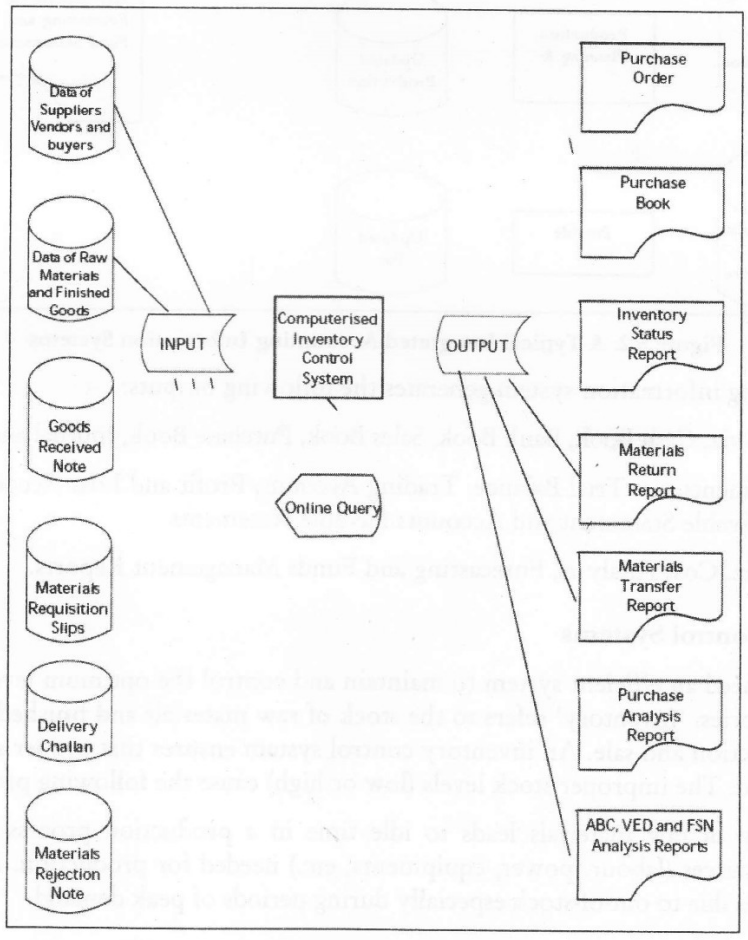

Figure 5.3: A Typical Inventory Control System

The various inputs to the system are:

- Data of suppliers, vendors and buyers including code, name, address and other details of each supplier, vendor and buyer.
- Data of raw materials and finished goods including code, name, category, size, price and other details of each item along with their quantity.
- Goods Received Note (GRN) indicates the quantity received of various items along with other details.
- Materials Requisition Slips indicate the quantity issued of various items to production department or vendors along with other details.
- Delivery Challans indicate the quantity sold of various items to buyers alongwith other details.
- Materials Rejection Note indicates the quantity of items rejected to vendors/suppliers alongwith reasons of rejection.

A typical inventory control system is illustrated in Figure 5.3. It generates the following outputs:

- Purchase Order includes P.O. No., P.O. Date, supplier name, address, item code/name, category, quantity ordered, price, amount alongwith terms and conditions.
- Purchase Book includes the quantity and other details of items received.
- Inventory Status Reports (Detailed and Summary) includes the quantity and other details of items sold, received, issued and rejected along with their closing balance.
- Materials Return Report indicates the quantity of items rejected along with other details.
- Materials Transfer Report indicates the quantity of items issued to other branches/departments along with other details.
- Purchase Analysis Reports (Supplier and Item wise) indicates the quantity and other details of items purchased during a period from various suppliers.
- ABC, VED and FSN Analysis Reports classify inventory items on different criteria.

5.2.3 Marketing Systems

The importance of the information systems for the purpose of marketing can be better realised by understanding the meaning and role of the marketing function in a business process. Marketing is a strategic as well as an analytic process that aims at identification of customer requirements; commits to produce, sell and service to the satisfaction of the customer and is responsible for the financial growth of the business. A well known management scientist Kotler has suggested that the starting point of discipline of marketing lies in two basic factors namely human needs and wants. Kotler elaborates: 'A human need is a state of felt deprivation of some basic satisfaction. Human wants are desires for specific satisfiers of these deeper need....Marketers do not create needs, needs pre-existing marketers. Marketers, along with other influential in the society, influence wants.'

Typical Marketing Information Systems

Marketing information systems are required to assist the management in decision making about pricing of products, packaging, new product development, product-mix analysis, advertising, product promotion policy, sales strategy, inventory control and production schedule. We would discuss the marketing and sales related information systems synergistically because both marketing and sales functions are mutually interrelated and a typical scenario in an organization set up today place marketing and sales department in one box.

Traditionally, marketing/sales manager used periodic sales reports as yardstick to measure the performance of sales process in various market segments and evaluate marketing systems. This system lacked flexibility, timeliness and decision support information because of its clerical approach and delays. Gradually, these traditional sales reporting system needed to be upgraded to online decision support system to provide the necessary strategic, tactical and operational control for all levels of the management. The significance of such system is that these systems are online and therefore feedback to the executives is instantaneous. The marketing executives can take immediate remedial steps if they find any deviation in terms of sale values or quantity. The consistent monitoring of the marketing systems enables flexible budgets, strategic plans and effective tactical and operational control. Most marketing systems are designed as an inquiry or feedback forms that provide inputs to marketing planning, control and marketing research. Typical formats of the inquiry or feedback forms may be computerized and preferably networked internally within the marketing office and externally with the remote logistics and marketing centres. Technically facilities of telecommunication network like leased lines, V-SAT, intranet, etc. may be used over a well defined marketing communication system. The choice of this networking solution should be taken after conducting a proper feasibility, cost-benefit and technical analysis study because such systems are expensive. Ideally, the marketing information systems should incorporate the basic formats described as follows:

1. Performance analysis is based on sales summary to date compared with past periods, budgets and other standards. Typical areas of performance analysis include total sales by product/region/personnel, sales and marketing expenses, profitability analysis, sales cancellation reports, etc.
2. Analytical reports are the exception reports providing in-depth analysis and are derived from the performance analysis reporting system. These include typical summarised reports on sales by brands, sales by industry, sales by customer type, sales by region, etc. These also include trend analysis and ratio analysis such as sales turnover to sales expense, total sale of a product to total industry sale of the product, etc.
3. Inquiry system is an important marketing control system that enables a marketing or sales executive to retrieve answers to the specific queries about sales performance of a particular brand in a particular market segment, performance of sales personnel based at particular region and similar numerable queries providing a bird's eye view on trends, problems and possible marketing opportunities.
4. Credit and discounting system is a part of financial and marketing control systems that assist in planning of a credit and discounting policy for various market segments based on information about sales volume in terms of value and quantity, efficiency of the distribution system , level of competition and the condition of the demand and supply environment in the market. One of the major responsibilities of a marketing manager is to ensure the smooth recovery of the sales proceeds by strengthening the credit and recovery system, monitoring carefully the old outstandings and taking steps to formulate credit limits for the customers.

5.2.4 Human Resource Planning

Human resource planning is governed by the demand and supply forecasting techniques to identify the current and the future human resource requirements of an organization (Refer Figure 5.4). Demand forecasting is an estimation of future requirements in human resources in number and quality. Generally, the basis of the forecast is the annual budget that is translated into activity levels for various management functions. The popular techniques used in demand forecasting are work analysis and ratio analysis. Work analysis initiates with the information on estimated saleable products or budgeted volumes of output for individual departments. This information is drawn from the project budget or the annual corporate budget. On the basis of the above information the productive hours are compiled in a project. The productive hours yield information on estimation of direct labour requirement or number of permanent employees. For example, suppose in a manufacturing company the planned output for a year is 60000 units. Standard working hours for a unit output are 15 hours. Then planned hours for work in a year are 60000x 15= 9,00,000 hours. Let the productive hours per worker in a year be estimated as 4000 hours. Then the number of direct labour involved in production is estimated as 900,000/4000=225. Thus, activity level forecast is used to determine the direct labour requirements. Ratio trend analysis is accomplished by employing past ratios, say, the number of direct and indirect workers in similar projects. In this analysis considerations on changing methodology of management style and past experience is also taken as a factor. Further cost/benefit analysis combined with ratio trend analysis yield the estimation of indirect labour requirement of non permanent employees or consultants sourced from outside the organization. Supply forecasting estimates the number of people that shall be available from within and outside the organization taking into consideration estimated absenteeism, wastage of time or other internal and external environmental factors.

Human Resource Information Systems

Since the scope of human resource management continues to transcend the trivial personnel managerial functions it would be appropriate to discuss the HRD information systems classified as typical personnel management information systems and human resource management information systems.

Typical Personnel Management Information Systems (PMIS)

PMIS are traditional operational management based systems that undertake the data processing of routine personnel activities such as payroll and employee personnel data constituting address, marital status, rank, department, employment histories, vacation, leave records, qualifications, skills, special assignments, training undertaken, increment or promotion with due date, performance grade, etc.

The importance of PMIS cannot be undermined considering the volume and intricacy of payroll data processing and wide scope/variations in general reports required for day to day personnel management. Computer based payroll systems generally run on batch processing mode. A batch run is used to generate pay slips and print cheques by processing the whole of data needed for the purpose, periodically. The payroll system works on the salary structure of the employee, his leave records and generates gross pay of employee by making appropriate deductions, adjustments or additions on account of loans, tax, insurance, provident fund, superannuation fund, conveyance, overtime or any other relevant data. This data is generally available in different files of payroll database system and is linked with a key field known as employee code. Besides payroll, PMIS constitutes integrated operational information system that contains all activity based and remuneration based information pertaining to the employee such as leave record, performance grading, perks and allowances entitlement, other confidential reports, appointment letter documents, etc.

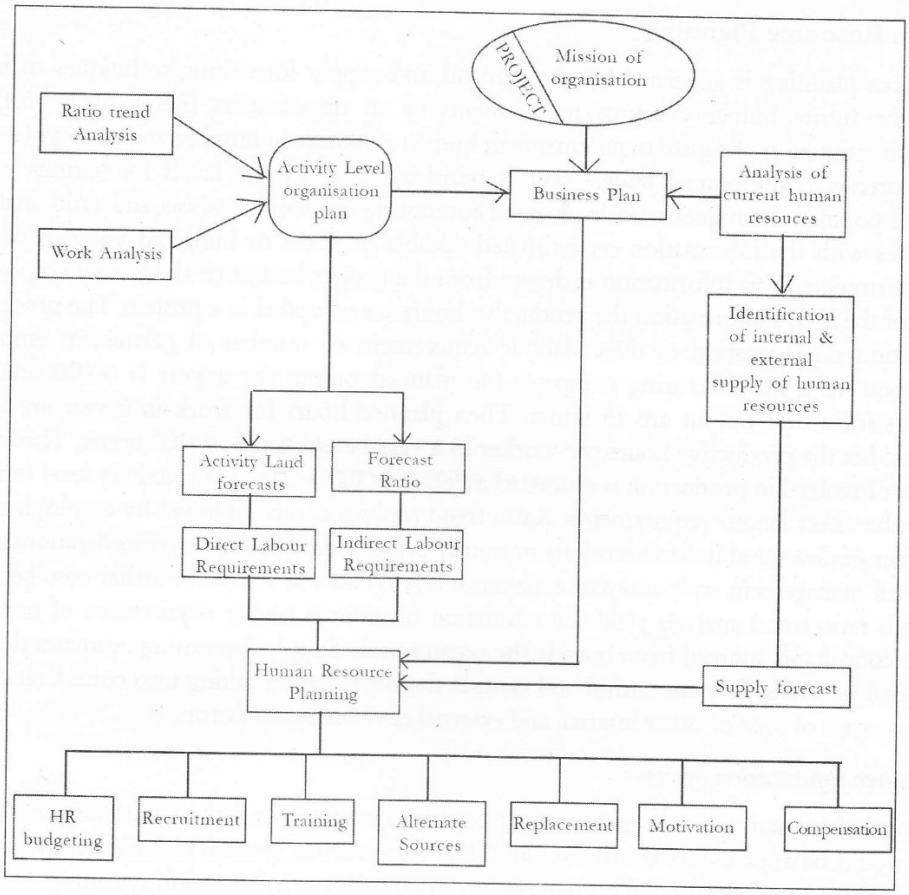

Figure 5.4: Human Resource Planning System

Human Resource Management Information Systems (HRMIS)

Consideration based on an employee as a resource ordains human resource planning by the HRD management in consultation with the top management. HRMIS are primarily based on the requirements of human resource planning. The scope of HR management includes work design, recruiting, performance analysis, reward and motivation plan, work evaluation, salary structure design, employees' skill analysis and systematic training. The work design includes decisions on the content of a particular job in an organization in terms of techniques, systems and procedures. There is a need to maintain data on particulars of the jobs, duties, responsibilities and interrelationships of the tasks force and the skills. A typical information system that has gained importance may be referred to as skill inventory information system or human resource assessment bank. The objective of such information system is to identify the talent resources of the organization to optimize its effective use. This information system includes a computer simulation work force model. The simulation technique is used to evaluate alternative human resource plans such as new recruitment, transferring, retraining, project feasibility, etc., under various human resource management approaches.

Another significant human resource information system is salary control information system. The salary control information system ensures that the salary policies of the company are implemented in such a way that the salary costs remain within a limit of the human resource budget. The human resource budget is a product of number of employees to be recruited or maintained and the rates at which they are to be paid

over a budget year. The genesis of the human resource budget is based upon the salary surveys in the industry, human resource plans, present salary levels and the forecasts of additional costs arising from general and individual salary reviews. This budget relies upon the current business held by the company and the forecast of the additional business projected to be garnered by the company by the diversification or the marketing plans. The salary control information system provides a system of salary audit. The salary audit ensures that the salary levels are in direct correlation with the ever fluctuating market rates in the industry. The external data from the industry is required to be compared with the internal data of the salary structure within the company. A salary control ratio suggesting how far the average salary for a grade in an organisation varies from the industry average may be calculated. For example, if (Average of all salaries in a grade)/(Average salary of the industry for the same grade) is equal to 1 then the distribution of the salary may be considered on target. Otherwise, if this ratio is less than or greater than 1 then such case ordains a proper study to justify or correct such variation. The appropriate differential without much discrimination ought to be maintained between the new staff and the old staff. The salary progression policy has to be formulated such that unjustifiable up gradation in the salary or the position of a particular segment of staff or individual may not erode the motivation of the majority of the staff. The other decisional aspect that salary control system is supposed to inspect is the phenomenon known as salary attrition. Salary attrition occurs as the number of new recruits joins at a lower salary than the number of old staff leaves the company so that the salary costs over a period are maintained at a budgetary level subject to overall regular increments. The attrition measurement in terms of retaining merit in relation to a salary financing system is a high level decisional area. The salary control information systems should be designed to assist decision making in the forecast of future expenditure on salary and access the actual costs incurred by the company on account of attrition.

Scope and Trends in Human Resource Management

The ultimate aim of human resource management is manifold. Most significant aspect of HRM is the management development in particular, improving upon all round skills of the staff and motivating them for optimum performance in general. The information systems are needed to build to assess the performance of each employee in relation with their key objectives and responsibilities. Most information systems for human resource management provide a system of organization review, human resource review, performance appraisals, management skill inventory and training schedules. These are the important decisional support systems that most of the top line managers rely upon for strategic planning and tactical and operational control.

5.2.5 Enterprise Wide Information Systems

The modern approach to install computerized information systems is based on enterprise wide computing which combines resource planning and integration of manufacturing, distribution and financial applications, messaging and electronic mail, document management and database systems, usage of internet technology within the organization and data warehousing. Technology decisions ought to be flexible to incorporate fast paced innovations of the future. Enterprise workgroup computing constitutes a variety of custom applications that automate a wide spectrum of work processes ranging from information flow automation to group applications designed to facilitate decision making. Workflow applications automate highly structured paper intensive applications such as financial accounting or inventory control by routing paper electronically. Such systems reduce time, cut errors and costs. Groupware projects are being implemented on personal computers in Local Area Network using Lotus notes or Microsoft Exchange. These groupware software systems assist employees to create, store and retrieve data and share amongst groups over a computer network. However, the latest emphasis is on Enterprise Workgroup Computing

(EWC), which enables deployment of resources across the entire enterprise so that the employees are able to use same workgroup applications regardless of their computer systems platform or locations. The reason for this trend is because of limitations of groupware systems such as inability to handle transaction processing, questionable reliability for mission critical applications and lack of interoperability and scalability. Since the needs of corporations are diverse and complex, a cross platform information infrastructure overriding the shortcoming of Groupware systems is necessitated. MRP (Manufacturing Resource Planning) applications are no longer adequate for many enterprises. The requirement is of online, multisite, real time transactions and business process oriented computing.

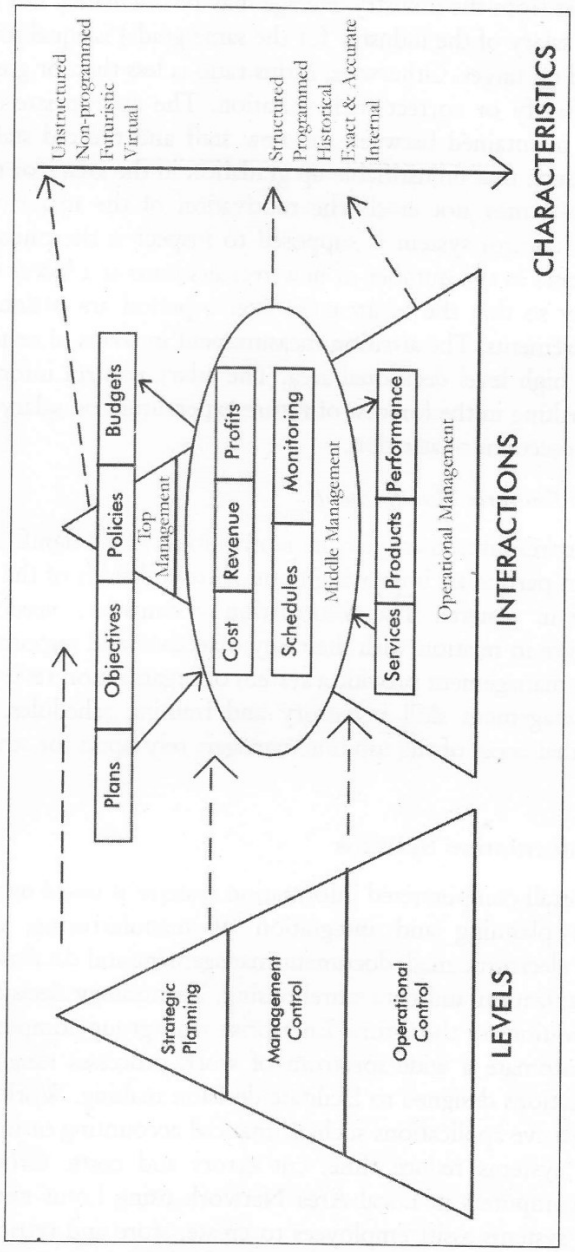

Figure 5.5: Levels, Interactions and Characteristics of Business Activities

Enterprise Resource Planning Systems

Most commonly, ERP (Enterprise Resource Planning) systems are practiced in manufacturing sector though lately service sector organizations are also planning to deploy ERP solutions to streamline their business processes. ERP packages are mainly transaction processing systems involving database updation and managing varied business processes like communications amongst employees, complex data exchanges from point of purchase order invoicing through delivery at customer premises and notching transaction implications at all nodes in the channels of communication. The groupware such as Lotus notes and Microsoft exchange can be integrated with ERP packages. The prominent ERP packages available are Marshal (from Ramco Systems), MAMIS (from Mastek Ltd), Oracle applications, Avalon CIIM, BAAN IV (from Netherlands Baan Co.), MFG/PRO, Scala ERP, SAP R/3 Systems applications and products (from SAP AG Germany). Avalon CIIM, an integrated family of manufacturing, distribution and financial applications has been installed at corporates like Escorts, Allwyn and Wockhardt. Cadbury India has embarked upon massive communication systems implementing SAP R/3 ERP system and installing VSAT (Virtual Small Aperture Terminal) networks, LANs (Local Area Networks) at each site for creating seem less communications amongst employees at sites, branch offices and suppliers and data flows amongst business processes. In spite of massive advantages of ERP systems, there is a caveat for not many of the information systems enthusiastic corporate still not installing these systems because of very high costs, maintenance and implementation problems. These systems propel every individual of work team in an organization to embrace the collaborative and knowledge management culture for its ultimate success foregoing the erstwhile legacy subsystems. This cultural change in an organization is quite tedious. Moreover, technology makes the information systems more open that many traditional management systems do not encourage.

5.2.6 Electronic Commerce

Traditionally, commerce is a dynamic business process which enables the interaction between a buyer and seller for a business transaction. E-commerce is an extension of the commerce on the Internet. In a lay lexicon, E-commerce is selling products and services online on the Internet. The foundation for successful e-commerce lies in an effective Internet public relations strategy. E-commerce is extension of an online cash register. Before a business can expect to engage in successful e-commerce, Internet public relations and marketing must play a crucial role in laying the foundation for effective sales. Unless a business can successfully address the many phases consumers experience in e-commerce and not just the transaction, e-commerce ventures may not be effectively successful. E-commerce must address the complete customer life-cycle. Internet public relations are unarguably the first phase of the e-commerce life-cycle. In order to make a consumer willing to engage in e-commerce with a business, the business must present an image of reliability, trustworthiness, quality, professionalism and responsibility.

E-Commerce has a tremendous impact on the structure of business supply chains. The companies worldwide are adopting the Web based network to integrate its suppliers for efficiency in the commerce and major cost savings. These solutions have given rise to the virtual enterprises in which the scope of their business is expanding at a brisk rate. An important example in this context is a prominent automobile company Chrysler Corp. This company is linked with its suppliers through a Web based network. An estimated annual savings as a result of this network is to the tune of $2 billion per annum. E-Commerce based integration of supply chains has retrograding impact on the intermediaries in the business because the manufacturers have direct communication links with the

suppliers and the buyers. In India, a company, Manipal Control Data Electronic Commerce Ltd, which is a joint venture with US based Control Data Systems, is offering e-commerce services. The backbone for this service is MCDNET with centers at Mumbai, Bangalore and Delhi. One of the customers of this venture is a Bangalore based company Vero President which a prominent company engaged in production of modular enclosures for electronic products. One of the international major e-commerce sites is the Cisco connection Web site. This Web site is available in 14 international languages.

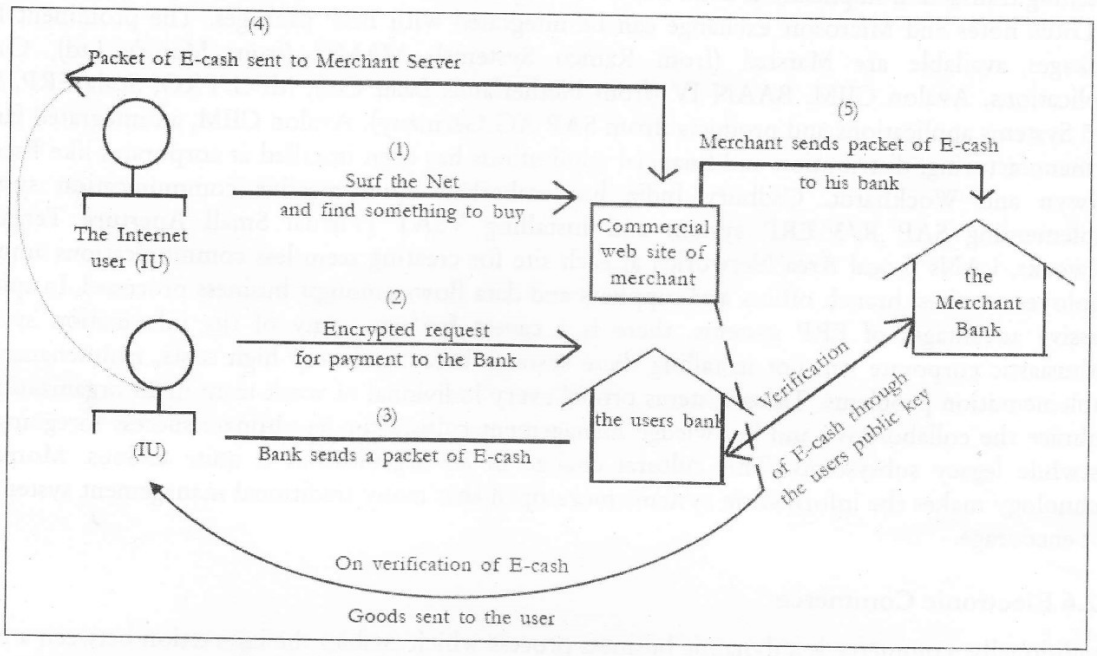

Figure 5.6: An illustration of E-commerce – E-cash System

Other example of a successful e-commerce Web site is an online bookstore from a company called Amazon. The user may surf Amazon.com to choose from the range of books priced at a lower rate than regular retail book store and make an order online using his credit card facility.

Though the growth of the e-commerce has been phenomenal over the years, the major surge in the popularity of e-commerce will depend upon the resolving of the security issues involved in this type of trade. Over the years, many users have deterred shopping online because of their concern about the vulnerability or risk involved in use of their credit cards online. Major risks include frauds, thefts and viruses. However, this risk has now been reduced considerably due to development of secure Internet protocols and payment systems. The SET (Security Electronic Transaction) project aims to deliver a transparent encryption system which would address to the security issues involved in this trade. This project has backing of major credit card issuers like Visa International and Master Card. Some of the major companies which are technically assisting in this project are IBM Corp., Microsoft, Netscape Communication Corp., AOL (America Online), Sun, GTE, Terisa Systems and Verisign. Major technology in vogue and expected to be used in future also for the purpose of security is the public key encryption. The popularity of this technology is owing to it's lower costs. The feasibility of e-commerce has increased owing to the widespread use of the Internet, the development of the security standards and protocols and the additions of the electronic payment systems. Some of the prominent solutions available include third party payment organizations and credit card payment systems on the

Internet. Dig Cash, France was the pioneer third party organization to implement a virtual money system with which the merchant and client could transact business with a comprehensive degree of security. Some of the other prominent third party organizations offering sale electronic transactions are Cybercash, Ecash, ClickShare and First Virtual Payment System. The systems used by these organizations are based on RSA security system for transmitting encrypted data over the Internet. Most of these organizations generally offer real-time secure digital signature based authentication services and act as an intermediary between the customer, the merchant and the credit card clearing house. e-cash offers a novel facility of downloading the electronic cash (virtual money from its client bank for transaction, (Refer Figure 7.6). Third party payment organizations are one of the popular and reliable means to provide the safety over the Internet for e-commerce besides the other technological ventures like Netscape's Secure Socket layer system, Enterprise Integration Technologies' Secure HTTP and IBM, MasterCard and Visa International initiative SET. According to a report of OECD (Organization for Economic Cooperation and Development) e-commerce would grow to the tune of $ 2 billion by 2001 form today's approximately $500 million. Besides business to customer online transactions one of the most important implications of the e-commerce has been EDI (Electronic Data Interchange) over the Internet to facilitate an online business globally.

5.2.7 EDI (Electronic Data Interchange)

The EDI technology connotes the intercompany computer to computer communication of the standard business transaction in a standard format using the VANs (Value Added Networks) and the Internet. The medium of the Internet has several advantages over VAN systems in conducting the EDI. Traditionally, VAN providers charge for EDI on per transaction basis therefore the organizations tend to transmit transactions in a batch to their customers to save on costs. Over the Internet the connection charges are fixed therefore the organizations prefer to transmit transactions on requirement basis. Thus, the Internet not only speeds up the transaction time and enables more efficient real-time commerce. EDI is the preferred mode of business in the automobile, rail-road, chemical, grocery, pharmaceutical, paper products, metals, oil and gas, ocean freight, office products and the warehousing industry. The major benefit of using EDI is that the use of paperless transactions in globally understandable formats results in cost savings as well as better efficiency. EDI services are primarily integrated into industrial trade operations through the purchase function. The corporate users especially with the overseas transactions cannot afford to ignore EDI because the major international ports such as Singapore, Colombo, Hong Kong, Dubai and most of the European trade organizations insist all its trading partners to switch over to EDI in order to maintain the business. In India, the Government has initiated several steps for a comprehensive and time bound implementation of EDI technology by all the organizations involved in overseas trade. Kochi is the first Indian port to implement EDI transactions based on UN/EDIFACT (EDI for Administration, Commerce and Transport). The most prominent organization that offers EDI infrastructure in India is VSNL(Videsh Sanchar Nigam Ltd). Some of the important customers of VSNL using EDI facilities are the port trusts such as Jawahar Lal Nehru Port Trust, P&O Shipping, ERDC Calcutta, Samrat Shipping and Maersk. A major public sector company BHEL also uses VSNL infrastructure for EDI facility. NIC (National Informatics Centre) also offers EDI facilities through its VAN infrastructure. The important private company joint ventures offering EDI facilities using their VANs are Global Telecom Services Ltd/General Electric Information Systems, Satyam Infoway/ Sterling US, Mahindra Network Services/Singapore Network Services Pvt. Ltd. A Chennai based Indian company Satyam Infoway (P) Ltd is implementing a pilot project for the Indian automobile industry represented by ACMA (Automotive Component Manufacturers Association) and the Association of Indian Automobile Manufacturers. The project aims to network automobile manufacturers, component suppliers and dealers with an EDI (Electronic Data

Interchange Application). This would speed up the transaction cycle of the industry. The project covers 11 major companies like Bajaj Auto, Telco, Mahindra and Mahindra, Ashok Leyland, Brakes India, Mico, Shriram Pistons, Sundaram Clayton, Sundaram Fasteners, Lucas TVS and Remsons Industries. Though the benefits of EDI are perceptible, there are certain legal issues which need to be resolved to enhance its popularity in the business world. The major legal issue is that Indian laws do not accept electronic data as the evidence of a business transaction. However, this hurdle may not choke the development of the EDI because it has got the global acceptance.

5.2.8 Business Intelligence

Business Intelligence is a broad field of study. The major thrust of business intelligence theory looks at certain factors to make high quality decisions. These factors include customers, competitors, business partners, economic environment and internal operations. Here is some more information on how these factors help businesses make quality decisions.

Customers

Without customers a business can't survive. Businesses need to sell their products and services. Business intelligence helps businesses understand their customers better, looking at their preferences, helping businesses adapt to their customers demand. Business intelligence is used to collect data from customers usually within the marketplace. There are many ways to collect data from your customers; it can be as easy as a POS system (point of sale), collecting data on what customers are buying and which products they are not interested in, collecting data on customer habits and preferences by asking them in surveys or polls. There are even marketplace specialists that watch customers behavior in the marketplace and report back to the companies giving them insight into how their customer respond to stores, personnel and product and services that a business sells.

Once this data is collected, it is up to an organization to use this data appropriately. Business intelligence is a process in which vast amounts of data can be viewed and vetted giving managers and business owner's important information that can be resourceful.

Competitors

Not only do businesses have to keep customers satisfied buying their products, they also have to compete with competitors that are constantly looking to poach a businesses customers and make them their own. Businesses today must constantly evaluate the effectiveness of their competitors and choose smart strategies that not only hold their competitors at bay, but also grow their own businesses market share. Business intelligence can help a business determine the strategies that your competitors are using to steal customers away, as well as help your own business to differentiate itself from others, effectively growing a larger and more profitable customer base.

Business Partners

Business partners are essential to any business, whether it is suppliers, payment processing companies, customer support companies or delivery companies that help your business throughout its cycle, it is important to make sure that all businesses partners associated with your business are in balance with you. Having a supplier that isn't able to keep up with your demand or having a customer service contractor that is unable to help you with certain support problems can cause your business to fail. If you want your business to work smoothly and effectively, all business partners must be in line with each other. For instance, today many businesses share key data with their suppliers so that their suppliers can anticipate present and future inventory levels and make adjustments, which inevitably

help your business. Sharing information is key and being able to gather information and sharing appropriate information is where business intelligence is important.

Economic Environment

Another way that business intelligence can help an organization is by taking into consideration key economic indicators such as consumer spending, inflation, unemployment, upturns and downturns in the economy, etc. Without business intelligence, your organization can't process information effectively in order to modify strategies that fit the current economy.

Internal Operations

Internal operations are usually defined as the on going day to day activities of a business or organization. If your want your business to be successful, you need to be able to view your business's strengths and weaknesses on a daily basis. You also need to see at any moment, just how much profit your business is making and your liabilities. Without decent foresight, you might make hasty decisions such as commit to new spending or paying off debt when your business could allocate those funds some where else. Business intelligence is extremely important to gauge your current state of business, as well as all parts that constitute the whole of the business together to see where funds are needed, what part of a business is weak and what parts of your business is strong.

Once businesses know what to look at to give them information that they need to analyze, it is important to gather this data and then use business intelligence methodologies to sift through the data to provide solutions to common everyday business problems. One of the ways to accomplish these tasks is with Key Performance Indicators. KPI, are a way that business intelligence can analyze and evaluate the current state of a business and then use this information to choose a strategy and then execute this strategy.

Some businesses track Key Performance Indicators each year or quarter, some each month or week and if you have the means, many corporations try to track specific data daily in order to fine tune or tweak their strategies.

Computers, databases and a group of analysts usually work on business intelligence's methodology. Usually each company has their own business intelligence methodology that fit their specific needs. Some of the more popular ways to create Key Performance Indicators are through Goal Alignment Queries, Baseline Queries and Metrics related Queries.

Goal Alignment Queries are a way to determine what your businesses goals are in using Business Intelligence. Is it your businesses goal to grow more market share, to make more profit per item, to start a new revenue stream, to find new manufacturer or suppliers, etc.

Baseline Queries help you understand your current approach to collecting data and whether or not this approach is satisfactory, where its weaknesses are and what its strengths are. For instance, if you would like to monitor your customers actions more closely, what are the current tools in place (POS systems, surveys, market research, etc.), how do these current tools perform, which are weak, which ones need tweaking and what tools can be added.

Metrics Related Queries are extremely important in the Business Intelligence process, because data can only be beneficial to a company if you can come up with a way to measure it. Metrics related queries looks at data and comes up with solutions to accurately measure data to meet businesses needs. Once data is measurable, you can easily analyze it and determine what is working and what is not.

Business intelligence is a very broad topic of study, however If you would like your business to succeed, it is extremely important to understand the factors of business intelligence and learn how analyze and use the data created by this methodology.

5.3 ETHICAL AND SOCIAL ISSUES OF INFORMATION SYSTEM

It probably goes without saying that the security and ethical issues raised by the Information Age and specifically the Internet are the most explosive to face our society in decades. It will be many years and many court battles before socially acceptable policies and practices are in place.

5.3.1 A Model for Thinking about Ethical, Social and Political Issues

Many of these issues not only touch our society as a whole, but also raise lots of questions for organizations, companies, and the workplace in general. We hear arguments for free speech, personal responsibility, and corporate responsibility. There are discussions about the government's role in all this.

How you act, individually and as groups, in this gray area may well define the future of our society. Though that may sound a bit dramatic, you must understand that you are part of the development of "acceptable usage" of this new medium and will help define the direction in which it goes. That's no exaggeration: You use the Internet frequently (and be assured the frequency will increase), therefore you are...!

Five Moral Dimensions of the Information Age

Figure below shows the relationship between ethical, social, and political issues in an information society. You could change this diagram somewhat to avoid the impression that the five dimensions are separate. You'd show significant overlap of each area, and most of the diagram would be in shades of gray. The five dimensions we'll discuss are: information rights and obligations, property rights, accountability and control, system quality, and the quality of life.

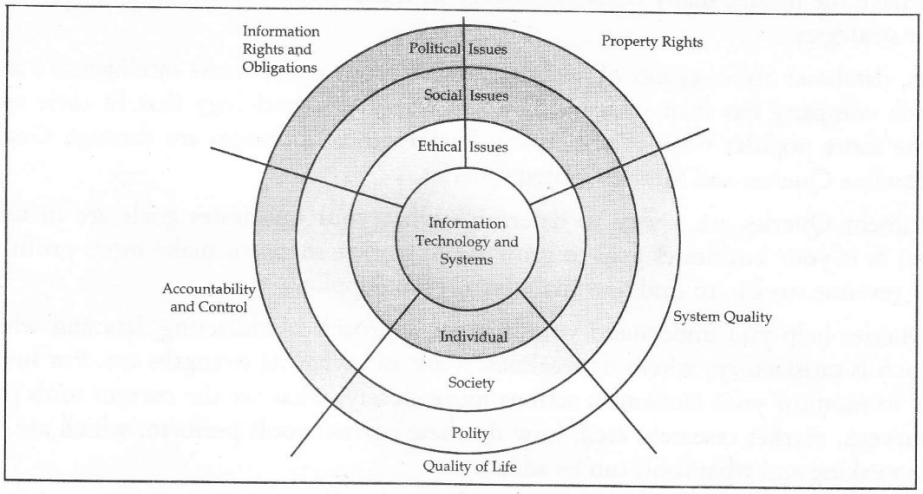

Figure 5.8: Ethical, Social and Political is an Information Society

5.3.2 Key Technology Trends that raise Ethical Issues

Information technologies pose problems and threats to established societal rules, and new advances pose new situations and possible threats to privacy and ethics. In addition to the technologies in the book, you need to understand the most recent technological threats to your privacy in cyberspace:

You say to yourself, "Hey I don't really care. Nobody will ever care about what I do or where I go on the Internet." Well, you might want to think twice about that. There have been reported instances of companies accessing databases from various sources as part of the screening process to determine what chat rooms, Web sites, etc., prospective employees have visited. How can that be, you ask? The technological trends we discuss, such as advances in data storage, will give you one clue. The scenario at the beginning of this section about a personal profile is possible through the technique called data mining.

5.3.3 Ethics in an Information Society

Did you ever hear the old warning, "Just because you can, doesn't mean you should?" Well, a lot of things are possible on the Internet nowadays, but that doesn't mean you should do them.

Ethics is easily managed in small groups because the group itself tends to control the individual's behavior. The larger the group, the harder it is to manage the actions of individuals. Now stretch that to a huge number of people with many frames of reference and experiences. Responsibility to the group becomes harder to police and accountability for an individual's actions is harder to enforce.

Basic Concepts: Responsibility, Accountability and Liability

Every action causes a reaction. When you're using the Internet, computers on campus, or your employer's computer, *you should be aware of:*

1. ***Responsibility:*** Accepting potential costs, duties, and obligations for your decisions.
2. ***Accountability:*** Determining who should take responsibility for decisions and actions.
3. ***Liability:*** Legally placing responsibility with a person or group.
4. ***Due Process:*** Ensuring the laws are applied fairly and correctly.

Responsibility, accountability, and liability are all yours when it comes to your actions in cyberspace. Every Internet Service Provider has a "usage policy," even the so-called anonymous e-mailers that hide your real identity. Hot Mail is a popular Internet email service that allows you to mask who you really are. You could send out all the, shall we say, unethical, threatening, nasty, aberrant email you like. You think: "Hey, no one will really know who I am. This is cool."

And then here comes the message from Hot Mail to cease and desist. Your free email account is cancelled because you violated Hot Mail's usage policy. Then your local Internet Service Provider contacts you and tells you you're terminated, baby! You violated its usage policy by your actions. By now you're really mad, not to mention embarrassed (at least we hope so). It's true. It happens.

Just because you think you can, doesn't mean you should. Would you stand in the middle of campus and shout insults? As the text points out, "Using information technology in a socially responsible manner means that you can and will be held accountable for the consequences of your actions." Just as you are subject to rules, whether you like them or not, in public, you are subject to societal rules in cyberspace. Anonymity isn't a license for socially unacceptable behavior.

Some people seem to absolve themselves of responsibility by putting the blame on the computer - "Hey, the computer screwed up," or "Since it was an anonymous username, I didn't think I'd get caught." It just doesn't work that way. No one can hide behind the technology. Humans control the computers, not the other way around.

And if you have received threatening, aberrant emails or flames in chatroom or discussion groups, and haven't reported them according to the usage policies, you may be as much a part of the problem as the perpetrator!

Ethical Analysis: It's safe to say you'll find yourself in situations where your ethics are challenged. What should you do? Try:

1. Separating fact from fiction.
2. Remembering, no matter how thin you slice it, there are always two sides.
3. Determining who's really involved.
4. Compromising; it doesn't always have to be an "either-or" outcome.
5. Anticipating the outcome; it will help you devise better solutions.

Ethical Issues of the Information Age

Today in western societies more people are employed collecting, handling and distributing information than in any other occupation. Millions of computers inhabit the earth and many millions of miles of optical fiber, wire and air waves link people, their computers and the vast array of information handling devices together. Our society is truly an information society, our time an information age. The question before us now is whether the kind of society being created is the one we want. It is a question that should especially concern those of us in the MIS community for we are in the forefront of creating this new society.

The four main ethical issues of the information age are:

1. ***Privacy:*** What information about one's self or one's associations must a person reveal to others, under what conditions and with what safeguards? What things can people keep to themselves and not be forced to reveal to others?
2. ***Accuracy:*** Who is responsible for the authenticity, fidelity and accuracy of information? Similarly, who is to be held accountable for errors in information and how is the injured party to be made whole?
3. ***Property:*** Who owns information? What are the just and fair prices for its exchange? Who owns the channels, especially the airways, through which information is transmitted? How should access to this scarce resource be allocated?
4. ***Accessibility:*** What information does a person or an organization have a right or a privilege to obtain, under what conditions and with what safeguards?

Case: Hospital Information System

Molecular biology is one of two technologies that will shape how medicine will be practiced for future time (generation). Now a day's, we diagnose on the basis of present symptoms which require immediate control & attention but future doctors will be able to spot the signs of any disease years before the disease actually occurs. But at the same time information is another important factor which will effect on healthcare.

Because of the vital importance & roll of information on healthcare, the number of healthcare websites in every country is increasing. In America, out of 90 mn. people with access to web more than two-third (majority) are reported to have used into it to search the health information, and as a result doctor-patient relationship has been turned upside-down.

Because of the patient activism, which started in 1980 and with the help of the Internet, the role of doctors has been changing. With the help of Internet, the patients can form small groups and exchange their ideas, opinions, experience and can demand from society, doctors & pharma companies and can make independent decisions. This empowerment of consumers is one of the great benefits of electronic

Contd...

connectivity. As a result, patients will no longer accept medical paternalism, incompetence and arrogance and will become much more forceful about taking decisions related to their own care.

In India also because of the electronic technology break-thorough patients may demand drugs available in US. That would put pressure on Government to change their decisions on certain issues like raising the *pharma budgets or allowing the patients to buy the drugs privately.*

Now doctors also predict that patients will also be aware rebellion about extravagant and alarming variations in treatment procedures and will raise their voice. Doctors can't ignore & avoid the best clinical practice for treatment and rather they will forcefully have to make it standardized treatment procedure.

Doctors of 2020 will have less excuses to deviate from standards, will be well equipped with latest, more sophisticated & reliable diagnostic information, data about a patient's genetic make-up and access to online guidelines & suggestions of best clinical practices, and even physician's-decision support software's will tell them what to do.

Questions

1. How the use & application of computers in medical science & research can improve the standard in medical research?
2. What is the importance of databases in modern medical research?
3. How different managers in the hospital management hierarchy will use the information for their own different purposes?
4. Comment on whether the Decision Support System for doctors will be welcomed by doctors and patients. (With reference to doctor's cognitive style & their background) Identify & discuss the importance of informal & formal information to medical researchers & medical practitioners outlined in this case study.

5.4 POSITIVE AND NEGATIVE IMPACTS OF INFORMATION SYSTEMS

Management's focus must continually change to take advantage of new opportunities. Changes should take place throughout the organization. They require lots of attention and planning for smooth execution.

Table 5.3: Positive and Negative Impacts of Information Systems

Benefits of Information Systems	Negative Impact
Information system can perform calculations or process paperwork much faster than people.	By automating activities that were previously performed by people, information systems may eliminate jobs.
Information systems can help companies learn more about the purchase patterns and the preferences of the customers.	Information systems may allow organisations to collect personal details about people that violate their privacy.
Information systems provide new efficiencies through services such as automated teller machines (ATMs), telephone systems, or computer controlled airplanes and air terminals.	Information systems are used in so many aspects of everyday life that system outages can cause shutdowns of businesses or transportation services, paralyzing communities.
Information systems have made possible new medical advances in surgery, radiology, and patient monitoring.	Heavy uses of information systems may suffer repetitive stress injury, technostress, and other health problems.
The internet distributes information instantly to millions of people across the world.	The internet can be used to distribute illegal copies of software, books, articles, and other intellectual property.

Check Your Progress

1. What is financial accounting system?
2. What is Enterprise Resource Planning Systems?

5.5 LET US SUM UP

Managers will also be faced with ongoing problems of security and control.

Information technology has changed many ways in which ethics, legalities, and even privacy has been impacted. The threat of electronic theft, whether of assets or identities, is a very common problem in this technological era. Invasion of privacy and threat to security are also problems which have sprung up with IT systems becoming commonly accessible.

Accounting is the most important service activity in business. An accounting information system satisfies the information needs of management and other people. There are three general types of accounting information systems - Financial, Management and Cost accounting systems. In order to participate in the design of accounting information systems, managers must be aware of the basic accounting concepts. Book keeping is concerned with maintenance of account books while financial accounting with preparation of financial statements. A typical accounting information system includes Financial Accounting, Cost Accounting and Management Accounting Systems. The major objectives of an accounting information system are - (i) Preparation of Account Books and Financial Statements, and (ii) Generation of MIS reports. Cash Book, Bank Book, Sales Book, Purchase Book, Journal and General Ledges are the major account books generated by the system. The financial statements include Trial Balance, Trading Account, Profit and Loss Account, Balance Sheet, Accounts Receivable Statement and Accounts Payable Statement. A typical accounting information system must generate MIS reports viz. Cost Analysis, Forecasting and Fund Management Reports.

Inventory is concerned with the stock of raw materials and finished goods available in the firm. The improper stock levels (law or high) cause many problems to the company. Therefore, maintaining of optimum level of inventories becomes critical for an organisation. The major objectives of an inventory control method are - (i) to determine the time when an order has to be place for a particular item; and (ii) to determine the quantity of an item to be ordered. In periodic inventory method, a fined quantity of an item is ordered at regular intervals. In perceptual inventory method, an item is ordered when its inventory reach at the reorder level. The inventory of all category of items cannot be determined by using same method. The inventory items are classified into various types based on the ABC, VED and FSN analytical techniques. A typical inventory control system generates purchase order, purchase book, inventory status reports, materials return report, and materials transfer report, purchase analysis reports and various analytical reports.

Marketing is a strategic and analytical management function that aims at identification of customer requirements and commits to produce, sell and service to the customer's satisfaction. The marketing concept emphasizes the company's commitment to the consumer sovereignty. Product mix analysis aims at analytical decision on new product development and removal of some products from the product line to ensure optimum profitability. Advertising aims at fostering brand awareness, brand positioning and building of the brand image if the company's product. The goal of every commercial organisation is to minimise the brand equity. Most common marketing strategy is based target marketing. There are mainly three elements of target marketing namely market segmentation, market