Chapter 2

LITERATURE REVIEW

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A few years' ago, economists never looked upon IT as one of the main areas in any sector. It is, however, now being increasingly recognised that IT is important not only to promote growth, but also to develop an organisation. IT is expected to play an important role in improving efficiency, productivity and competitiveness. Foundations were further raised in IT infrastructure for developing knowledge-based economy and an information- rich society (Malaysia, 1996).

The study by Frankie (1996) in small and medium industries highlighted the importance of IT in management, decision making, customer service and creates sophisticated working environment. Furthermore, IT usage leads to increase in productivity, time saving, reducing human error and improvement in cash flow. There have also been studies on appropriate usage of IT in individual departments. Ho (1995) stated in a more specific term the benefits of IT for large companies. IT is considered important in adding value and reducing transaction cost. A centralised information system (CIS), according to Ho, is important for large companies to make decision, planning and controlling.

Several studies were done by Emergy (1987), Liebenan and Backhouse (1990), and Cristoff (1990) on IT. They discussed the concept of Management Information System (MIS) within the application of IT to the administration and management of an organisation. They unanimously agreed that MIS is the key factor in business

enhancement. They agreed that IT is a powerful tool in planning, controlling and decision-making.

Brown (1991) suggested that each organisation should have a strategic business based IT policy. He added that rapid changes force organisations to focus on information technology policies. In order to achieve their goals in a competitive environment, organisations should utilise information effectively and efficiently. This is very important since globalisation and internationalisation of markets invariably force organisations to maintain competitiveness.

Forest (1994) stressed that as we move into the information and computer age, the key for profit and growth of an organisation is not the cheap resources anymore i.e. cheap land, cheap energy and cheap labour. Now, the key factor in business growth is by giving greater emphasis to the development of IT and professional IT workforce. Forest concluded that business management theorist, industrialist and assorted gurus characterised future organisations by: increased competition, where the critical difference between winning and losing will be the extent to which the organisation has put in place computer, telecommunication, and other information technologies including office automation systems.

Peppard and Rowland (1995) concluded that the most important lessons in managing IT are that there is a level of appropriate latest technology in performing tasks. Examples of universal and generic use of IT in various areas are as follows:

Retail	Point-of-sale terminals provide faster customer checkout, identify customer preference and improve inventory control. Smart Cards will replace traditional shopping.
Distribution	Notebooks and palm-tops together with cellular phones are being used to enhance marketing process in any point of the world. Managers and secretaries able to utilise it whenever they need information for quick decision-making.
Education	Computer-aided learning via multimedia is an essential tool for beginners in any field. Internet links students, lecturers and researchers to the rest of the world in providing comprehensive information
Manufacturing and Engineering	Computer Aided Design and Manufacturing (CAD/CAM) makes faster production process. Computer Integrated Manufacturing (CIM), Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRPII) enable more effective planning of inventories.
Financial Services	Telephone banking, ATM and information kiosks provide 24 hour banking services.

The literature is filled with varied views and diverse observations on technology and information economics, both theoretical as well as empirical. But there is comparatively little contemporary writing on the contribution of IT to banking activities. IT is expected to promote growth especially in the deepening of the financial sector. It is for this reason that the banking sector in most developing countries has included within the objectives of the bank, the encouragement and promotion of usage of IT.

An important result of Cheah's (1990) study on computerisation of a credit department in a commercial bank highlighted the inefficiency in the old manual system. According to Cheah, the computerisation has contributed to the efficiency in commercial banks that handle thousand of records daily. With computers, updating records can be done instantly. Thus, report generating and queries are done immediately.

Gillis (1985) in his work on microcomputers in financial institutions emphasised the need to understand primary application of PCs and selection of proper software packages. He also stressed the importance in understanding current trends and the need to develop new plans in updating financial institution to move ahead. Gillis emphasised the use of right software in the departments. He gave priority in the usage of application-oriented decision aid in financial institutions. A number of important issues such as budgets and costs, maintaining support services and the importance of security in the financial institutions have been identified in the study.

2.1 THE DEVELOPMENT OF COMPUTER

Several attempts to build mechanical computing machinery were made before 1940s. The electromechanical calculator or MARK 1, electrical and mechanical components to perform simple arithmetic on data were about 8 feet high and 55 feet long. This device, developed in 1937, was able to multiply 10 digit numbers in less than 10 seconds and contained about 760,000 parts and 500 miles of wire. Atanasoff-Berry Computer (ABC) developed in 1942 was designed as a special purpose device that could solve up to 29 equations simultaneously. ABC links processor with a memory device. Collosus, electronic computer developed in 1943 in England was used during World War II. The electronic Numerical Integrator And Calculator (ENIAC) was the first electronic digital computer developed in 1946. It could make 300 calculations/multiplication per second and it weighed more than 30 tons with 18,000 vacuum tubes. ENIAC can be considered as the beginning of revolution in the computer field. Due to army request, the emphasis was to make computing devices powerful, smaller and faster. This led to

invention of EDVAC in 1952. EDVAC was the first system that practised the concept of storage and processing of arithmetic/ logic operations.

2.11 The first generation. The logic and data in early computers were on-off switches, where vacuum tubes were the preferred technology to perform this task (Alter, 1992). The Universal Automatic Computer 1 (UNIVAC 1) which used vacuum tubes was the first computer used for business applications in 1954. This period was the beginning of programs and programming languages (Stair, 1986).

2.12 The second generation. At this stage, transistors using the semiconductor element germanium were used. Transistors that could perform the same on-off switching as vacuum tubes were smaller, faster, less fragile, generated less heat and used less electricity during operation comparatively (Alter, 1992). The computer system could store data permanently using magnetic tape and disks. Better printers and greater range of temporary storage were also developed. The high level languages such as FOTRAN, COBOL and BASIC were used for various applications. Moreover, compilers were developed to translate high level languages into machine languages i.e. instructions that can be executed by computers. The second generation gave priority to software compared to hardware. This generation of computers also first used the computerised management information system.

2.13 The Third Generation. The third generation computers saw a more powerful, reliable and compact computers. It used a prototype of integrated circuits (IC) where transistors, resistors and capacitors are simultaneously made in a piece of semiconductor. Since the introduction of six different compatible IBM 360s in 1965, with integrated and

miniaturised circuits, computer development had been very rapid. These included (Stair, 1986):

- Increased processing speed and accuracy

- Multi-tasking or several operations performed simultaneously

- Integration of hardware and software

- Data communications improvements

- Cheaper hardware

In 1969, IBM announced that software would be charged differently from hardware; this meant buyers had to pay for software separately.

2.14 The Fourth Generation. Classifying computer generation would be a difficult task from the third generation onward due to rapid developments. In the early 1970s, the fourth generation began by the use of large-scale integration (LSI) and very large scale integration (VLSI) i.e. combining multiple circuits into a single chip. The development of this individual chip by Intel in 1971 called a microprocessor resulted in the appearance of small microcomputers on the market. The first commercially developed microprocessor in 1971 was the Intel 4004, and few years later, Intel 8008 expanded the capacity by providing multi-use arithmetic and control circuitry (Scott, 1995). The Apple I and Apple II microcomputers were introduced with several new features such as a small speaker for sound, built-in BASIC and ability to connect to a colour television for graphics.

2.15 The fifth generation. Fifth generation computers depend on extending very large scale integration (VLSI) and logic oriented programming. Japan with its highly publicised fifth generation project, the United States, and other countries and companies

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invested millions of dollars into fifth generation. Some computer science experts predicted fifth generation computers to be developed by the end of this century, will converse with people in human-like manner and will be able to mimic human senses, manual skills and intelligence (French, 1996).

Although distinctions among the first three generations of computers are clear, defining the next generation is difficult. Some people believe that the fourth generation started in early 1970s and continues today. Other people believe that we are in the sixth generation. The capabilities to define the new generations have not yet been attained as technological developments continue. It would be difficult to define computer generation and developments as no commonly agreed view has emerged and it may not evolve for decades (Alter, 1992).

2.16 Basic types of computers

a)   Analogue. Analogue computers operate using continuous variable signals. It is primarily used in scientific applications. Analogue computers process data in the form of electrical voltages. The output is often in the form of smooth graphs.

b) Digital. Digital means digits or numbers. Digital computers process data in the form of arithmetical and logical function. Discrete values (e.g. 0,1,2,3...) occur at each step in the operation. Most computers used in business are digital computers.

c) Hybrid. Computers that have combination of analogue and digital features.

2.17 Classifying computers

There are some similarities in different types of computers; they use input device to read data, have a central processing unit (CPU), have output devices and have storage

media, but it can be distinguished by its characteristics such as size, power and cost (Stern, 1996).

I) Microcomputers. Microcomputers are also called Personal Computer (PCs) or micros. It is usually used by one individual and is the smallest in the market. PCs are the cheapest and least powerful computer systems. Normally PCs are used with simple application software i.e. word processor, spreadsheet, desktop publishing and programming languages. Nowadays PCs also used to communicate electronically. In general, PCs are used as productivity tools for business users, device to access networks, business application in small firms, entertainment and education purposes. PCs range in price from RM2500 to RM10 000.

II) Minicomputers. Minicomputers are known as Minis or mid-range computers. It is a scaled-down version of mainframe and physically smaller compared with mainframes. It is specifically designed as multi-user systems; many users can share and access the system using terminals or PCs. Midrange systems can be linked to larger systems. Conventional medium scale Data Processing has traditionally been carried out on these machines. Since minis cost about RM100,000 or more companies lease rather than purchase them.

III) Mainframes. Mainframes were the first computer used in business in the early 1950's. Hundreds or thousands of users from various terminals away from the computer's location can use it as input/output device i.e. conventional large-scale data processing. These large computer systems are often too expensive and usually firms lease them. IBM dominates the market for these computers. They typically cost about RM250,000.

IV) Supercomputers. The most advanced, the fastest, the largest and much expensive type of computers are used in scientific and industrial research, by large organisations and the government to control their networks. Supercomputers are used in weather forecasting, controlling information superhighway networking and sales forecasting. A supercomputer costs RM500,000. With tremendously high cost, supercomputers are usually used by large organisations such as National Aeronautical Space Administration and oil companies (Scott; 1995).

Comparison

Primary storage capacity to the CPU is referred as memory size. Today's PCs have main memories measured in megabytes (MB) and gigabytes (GB), millions and trillions of storage positions respectively. The processing speed is typically measured in nanoseconds or billionths of a second and picoseconds or trillionths of a second. Raw computing power is measured in MIPS or millions of instructions per second. Comparison between computers is shown in table 2-1.

Table 2-1: Classification of computers

Category	Microcomputer	Minicomputer	Mainframe	Supercomputer
Cost	RM2500 to RM10000	RM 100,000 or more	RM 250,000 or more	RM 500,000 or more
Speed	20-100MIPS or more	Nanoseconds; hundreds of MIPS	Nanoseconds; hundreds of MIPS	Picoseconds; thousands of MIPS
Memory	640k-128MB or more	Hundreds of MB to GB	Dozens of GB	Hundreds of GB or more
Size	Fit on desktop	Fit on closet	Fill a room	Fill a room
Connectivity	Single user, can be networked, high end PCs may be multi-user systems	Multi-user (100s)	Multi-user (1000s)	Multi-user (1000s or more)

Source: Stern (1996), Scott (1995), MCSB Systems (M) Bhd

Until early 1980s microcomputers were 8-bit machines. At that time, microcomputers only used some basic spreadsheets, word processors and simple application packages (French 1996). The changeover from 8-bit to 16-bit microcomputers lay the foundation for the rise of personal computers (PC). IBM and its compatible, e.g. Compaq, Dell and Toshiba, with common operating system MS-DOS produced the popular PC models. Today microcomputers are very powerful which challenge the power of minicomputers, whilst minicomputers are tending to rival all but the largest mainframe computers in power (Anderson, 1990). More remarkable in some ways is the rise in the usage of laptop, notebook or palmtop such as Psion series. A further advancement of the PC can be seen from the growth of Local Area Network (LAN) where a number of PCs can be connected to share resources. It is considered a better alternative than multiple terminals connected to minicomputers or mainframe. Today it is a difficult task to distinguish between computers as PCs tend to use larger memory and act as servers. Now there are PCs that are more powerful than minicomputers and minicomputers better than mainframes. The rapidly increasing popularity of graphic data processing and other advanced software have multiplied the computing power and memory capacity requirements (Otala, 1992).

2.17 Distinction between hardware and software

A computer is an electronic and electromechanical machines working together, which can receive and understand information, process that information according to instructions and produce appropriate results. In other words, a computer is a device that receives (input) and stores information, as well as carries any instructions concerning information

and produces the results (output). Any computer regardless of its size comprises two components:

a) **Hardware**. The physical parts of a computer system are called hardware. A typical computer comprises a central processing unit (CPU), screen or monitor, keyboard, mouse and printer. A basic computer system consists of input, control unit, arithmetic logic unit (ALU), memory unit and output.

b) **Software**. A computer's operations are performed under the control of a stored program or programs written for computers are called software. Software is a set of instructions, which tells the computer what to do or to make the computer perform tasks. In other words, the information the hardware handles is known as software. It is usually held in the computer's memory whilst the instructions are being carried out. The internal operations interface, called the operating system (OS), drives the internal operation of a computer. Application software are used to write application packages in accounting, budgeting, payroll and so forth. Examples of application software or programming languages are BASIC, C++, PASCAL, FOTRAN and COBOL. Statisticians use statistical packages such as E-views, SPSS, and SAS. Computers are fast becoming user-friendly. Icons and templates are used to assist computer illiterates. Today, non-computer science majors are able to use WINDOWS-based word processor, spreadsheet and presentation software.

2.2 COMMUNICATION

If we look at the entire technological aspects of information technology then the three important path of development would be computers, communications and

electronics. After looking at the development in computing, it is necessary to grasp how computers are able to communicate with one another.

Communication method/mean can be divided into:

a) Oral communication

Oral communication might occur in a direct conversion or face to face situation. Another means of oral communication would be the telephone. The department head may telephone the manager to get some verbal approval in case of emergency. In this case the question and the answer are provided verbally.

b) Paper-based communication

These communication methods include the use of dispatch notes, memoranda and all kind of printouts. This method is considered cheaper than electronic communication but there may be a delay in the delivery of information.

c) Electronic communication.

Today, the most crucial method in business world would be electronic communication. The usage of computer systems enables transfer of electronic data, for example through the use of electronic mail. Electronic communications are speedy, accurate and reduce dependency on human processing.

2.21 Transmission media

When input/output device is located away from computer, the transmission needs some telecommunication link.

a) *Copper wire* - Telephone line use twisted pair of copper cable. One pair of twisted cable is able to transmit data or one telephone call up to 14.4 KBPS. The transmission rate is slow and there is only minimal anti-interference screening.

b) *Coaxical cable* – Less risk of distortion of data at higher rates of transmission i.e. one optical cable can carry 2016˙ simultaneous data transmissions (Scott, 1995). High grades of coaxical cable allow broadband transmission. Coaxical cable is similar to television aerial cable.

c) *Fibre-optic cable* – High data transmission rate, up to 1 billion bits per second, and it is interference free. Fibre-optic is very popular in WAN. Transmission is in the form of light through glass fibres. Fibre-optic cable using laser technology is highly reliable, low cross talk and no danger from electricity, heat or sparks.

d) *Microwave* –Wireless communication, radio and cellular phones use high-frequency radio waves called microwaves. The disadvantage of microwaves is that it need base stations to be positioned in inland.

e) *Satellite*- It overcomes the problem of transmission over the ocean. Malaysia's satellites MEASAT I and II are able to provide immediate point-to-point and point-to-multipoint telecommunications and broadcasting services throughout the country (Malaysia, 1996). The range of frequencies that a channel can carry is called bandwidth. Frequencies are measured in cycles per second or in Hertz and there are three ranges i.e. narrow band (up to 300 Hertz), voice band (300-3000Hertz) and broad band (over 3000 Hertz).

Table 2-2:Comparison of data transmission

Communication channel	Simultaneous transmission
Telephone	1
Coaxical cable	80
Microwave	672
Fibre-optic	2016

2.22 Transmission equipment

The transmission equipment used to connect terminals to computer consists:

a) **Modems**. Telephone network handles data in analogue form while computer uses data in discrete digital form. To convert the data from digital to analogue and vice versa, a device called modem is needed. Conversion of data is done by this device as follows: sending modem modulate digital data into analogue form and receiving modem demodulate the analogue signal into digital form.

b) **Multiplexors**. In a system where several terminals or micros share the same link, a multiplexor is used. A multiplexor is necessary to send several incoming transmissions down in a single communication channel at the same time. Its main function would be to stop the data from multiple transmission being mixed up with one another. Nowadays, front-end processors are acting as a multiplexor to do the same task.

2.3 ELECTRONIC OFFICE

The joint advances of computer technology and communications technology, which are the foundation of IT, lead to development of modern office. Now, every desk has a computer terminal and information is transmitted through it. The development of

electronic office makes workers work in a new environment and do their jobs in a different way. The communication, behaviour and social life of workers undergo rapid changes with the emergence of IT. The nature of office work is handling and processing information. The development of computer technology as well as application software makes office workers life easier.

a)   Word Processor and Spreadsheet. Word processing is the task of editing and producing typed documents or letters using computer while spreadsheet is used mainly to do calculation. A number of word processing software and spreadsheet is available in the market with different format, user interface and function. The most famous software in use are Microsoft Word, Word Perfect, Microsoft Excel and Lotus.

b) Computer graphic. The British Computer Society definition of computer graphic is the representation of information in the form of graphs, charts, diagrams or animation. Graphics programs are usually user-friendly, allowing the user to select the required graph from the menu. Nowadays, graphics-based word processing software is available in the market.

a) Desktop Publishing (DTP). Usually desktop publishing is used to produce occasional documents, brochures, bulletins and advertisements. It is mainly a combination of graphics and texts to be seen as artwork.

b) Document Image Processing (DIP). DIP is an electronic form of filing, a document including handwriting and printed text is translated into digital form through a scanner, and stored on a storage device such as optical disk. Canon one of the manufacturer indicated that optical disk could contain 60 000 pages of A4. DIP is applied in electronic data interchange, desktop publishing and management of accounting transactions.

e) **Telex.** Since 1970s Telex become famous as international message transmission system. Telex transmits and receives printed message through telephone line. With telex same message can be sent to a large number of users.

f) **Facsimile (Fax).** The original document is converted into electronic form by the fax machine and transmitted through telephone line exactly as duplicate copy of the original document. Nowadays, with a fax modem, PCs communicate directly with the receiving fax machine. Fax is faster, reliable and a low cost alternative to the post.

g) **Electronic Mail/Voice Mail.** Email sends message electronically via telephone line and a central computer. It can be used to send reports, memos, short messages and greetings as well as documents. Similarly, voice mail systems make the sender's message to be recorded at the receivers voice mailbox. In other words, voice mail is a spoken memo. Today, Internet users can utilise free email services by hotmail and rocketmail.

h) **Teleconferencing.** Teleconferencing is a combination of computer and telecommunication technology whereby several people, maybe from different parts of the world linked up via computer and video, converse at the same time. Teleconferencing is used by multinationals to conduct meetings among parent company and its sub-systems.

i) **Electronic Data Interchange (EDI).** EDI, computer to computer data interchange is another form of email. Different computer produces different documents, which are not compatible. Thus, an agreed format is needed, so that all parties accept transaction through electronic communication. The International Standards Organisation (ISO) has defined Office Document Architecture for transmission of office document. On a larger

scale, multi-continent satellite links enable banks in the world's financial centres and local banks to exchange data (Scott, 1995).

j) Electronic Fund Transfer. Computers are used to transfer fund. The society for Worldwide Interbank Financial Telecommunications (SWIFT) is a system for the electronic transfer of funds internationally between banks. Many companies using AUTOPAY system now pay employees salary by providing computer data to the bank.

k) Internet. Over the last year Internet has received a wide coverage by individuals and organisations. It is considered as an international telephone services for computers. Using World Wide Web, users are able to find various services.

2.31 Electronic office and its effect on business

Large volume of transactions or processing can be done quickly and accurately with office automation. Furthermore, the concept of paperless office is increasingly practised as data transmission is slowly changing from paper to electronic processing. Paper files are replaced by magnetic tapes, diskettes, CD-ROM and optical disks. Computerisation also affect office staff. Today office staff are required to be computer literate at least to handle simple software such as word processor, spreadsheet and desktop publishing. Management changes are obvious with advancement in IT. Organisation today should incorporate IT at all levels in every activity. In one way people in higher position face strategic and organisational challenges in the area of IT since they are 'information handicapped' or computer illiterate. Managers should develop some knowledge in EIS, DSS and ES to make accurate, reliable and up-to-date

decision- making. The development of multi-user systems changes the organisation structure. In other words, centralised data storage and retrieval using servers enable distributed data processing. The head office or the head of department can control and monitor its subsystems and co-ordinate an expanding organisation with the computerisation of management information systems. An organisation should update itself in the pace of technological change; hardware and software will be outdated after certain years. Management should allocate budget for maintenance and replacement of new systems. Online services such as homepage in the Internet result in better customer services.

2.4 NETWORKS

Data communication between two or more computer systems is known as computer networks. In a smaller scale, a few computers can be linked in an office. Computers can be linked to one another for many reasons. These computer-to computer links might be via internal cable for local or within the building, and data transmission link for geographically separated computers. Networks were introduced in 1970s and become increasingly common in 1980s and 1990s.

2.41 Local Area Network (LAN). A LAN is a network of computers in a building linked by cable lines. It usually includes a server, a powerful microcomputer or minicomputer. LAN has a generally accessible hard disk, which will be shared by the rest of the network. LAN interconnects processors, printers, facsimile, telephones and hundreds of devices to communicate with one another.

2.42 Wide Area Network (WAN). WANs use minicomputers or mainframes on a wide geographical area i.e. hundreds or even thousands of kilometres. The networks are linked via telecommunications line. WAN can link two or more LANs using bridges and gateways. WANs incorporate circuit-switched data networks, packet-switched data networks and public-switched telephone networks (Burch, 1989).

2.43 File servers. File servers are used in database and accounting applications. A low-end file server might be used in a network of around 10 users running MSOffice software and a database. On the other hand, a high-end file server might be used in a department of about 100 users handling transactions and accounting system.

2.44 Network topologies. Physical arrangement of nodes in a network is called network topology. A node is any device such as a computer or peripheral like printer that is connected to a network. Basically there are four types of LAN system configuration:

i) **Bus topology.** In a bus structure, messages are sent through a single communication channel. The devices can communicate with each other and it is quick and reliable. Bus system often uses a network called *Ethernet*. Ethernet pioneered by Xerox and now been widely used by other manufacturers. If the number of users increases, communication speeds in a bus network slow down.

ii) **Ring Topology.** In contrast to bus topology, the ring system may or may not have a server. As higher transmission made, performance will deteriorate and this will cause more interrupts and delays.

iii) **Star Topology.** In a star network, a server controlled by microcomputer or minicomputer will be linked with other microcomputers with a cable. Even though

Star network are not widely used, there are some LANs which were implemented based on existing telephone wiring in a building.

iv)   **Tree Topology**. In a tree network, large-scale processing is done by mainframe or minis, and lower-level processing by minis or micros. Tree networks also use Ethernet and commonly encountered as wide area networks.

2.5 MANAGEMENT INFORMATION SYSTEM (MIS)

A system designed to handle all required operations of data, such as storing, retrieving and cataloguing (Stokes, 1985). According to Weik (1969) MIS is an information system designed and operated to assist in decision making at any specified management level or set of levels. Many modern MIS are fully automated from source data automation to online, real time storage, retrieval and display of data with operation in a conversational mode. The scope of MIS is to provide the informational needs of management. A good MIS will provide the desired information for the right person at the right time and place.

2.51 Decision Support System (DSS)

DSS is a form of MIS. It is usually designed to produce information in such a way to help management to make better decisions. DSS is used by management to assist in decision making on issues that are complex problems with high levels of uncertainty. DSSs does not make decisions but gives a number of alternatives and evaluates them in various potential conditions. By using this, managers improve their understanding of the problem and their actions. DSS with major emphasis upon user-friendliness and

flexibility ranges from simple information models based on spreadsheets to expert systems. Example of types of decision support by DSS include:

a) Decision on whether to lease or buy company property.

b) To examine capital investment and consequences of alternatives.

2.52 Executive Information System (EIS)

An EIS serves the executive underlying attainment facts and figures. It is a form of computer workstation on top of executives' desks. EIS gives executive easy access and retrieval of internal and external information needed. An EIS have information about the organisation from high to low level, data manipulation facility, user friendly graphics presentation and a template system.

2.53 Expert system (ES)

Expert system is a master data bank or reference file with a large amount of specialised data tabbed from experts in that particular field. Expert systems have been used in a number of field, e.g. legal, engineering, medicine, tax matter, banking and financial services.