Implications of Management Information System in the Bangladesh Army

Muhammad Badr-ul-Islam*

Abstract

The paper discusses the recent developments of MIS in the world in general and in the Bangladesh Army in particular with the Computer as the mainstay of the system. The paper discusses development of computers, need for a database, MIS & information resource management and end-user computing in the Bangladesh Army. The paper uses examples from the US sports and aviation industries. It suggests methods of improvement in MIS in the Bangladesh Army with some formats of typical major subsystems and uses. The paper concludes by suggestions on improvements of computer use in real time intelligence.

1.0 INTRODUCTION

Computers were introduced into the Bangladesh Army in the late 1980s. Initially they were mainly used in the Military Secretary's Branch for the Career planning of Officers. They were also used as word processors in the different levels of the Army. Recently they are being used in training and development also. Their main use now can be collectively called the Management Information System (MIS).

MIS is an information system using formalized procedures to provide managers (commanders and staff in the context of the Army) at all levels in all functions with appropriate information from all relevant sources (both internal and external to the organization) to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible. It will be noted from this definition that the emphasis is on the uses to which the information is put and no mention is made of the means by which the information is

* Retired Major of Bangladesh Army & presently working as a Senior Lecturer, School of Business, American International University-Bangladesh (AIUB).

processed. This emphasis is correct for it is the end use of the information that is important and not the intermediate processing stage.

Conceptually, a management information system can exist without computers, but it is the power of the computer, which makes MIS feasible. The question is not whether computers should be used in management information systems, but the extent to which information use should be computerized. The concept of a user -machine system implies that humans best perform some tasks, while others are best done by machine. The user of an MIS is any person responsible for entering input data, instructing the system, or utilizing the information output of the system. For many problems, the user and the computer form a combined system with results obtained through a set of interactions between the computer and the user.

Limitations of this paper include the Official Secrets Act 1923 of Bangladesh for which major findings and recent use of MIS in Bangladesh Army cannot be highlighted.

2.0 DEVELOPMENT OF COMPUTERS

2.1 Advances in Computers

Advances in materials science, manufacturing and concepts of computing promise to maintain the historic growth pattern in hardware power. Over the last 40 years we have seen the cost drop by a factor of 10 each decade and the capability increase by a factor of at least 100 each decade (authority: US Office of Technology Assessment, 1985). There are four ways in which this momentum will most likely be maintained.

A computer can work no faster than the speed required for each transistor, or switch to turn on and off. In slow chips like the Intel 80888, used in many PCs, switches have a speed measured in nanoseconds (billionths of seconds). But some semiconductor experimental devices have been taken up to 20 picoseconds (trillionths of a second) before literally melting down (at these speeds, enormous heat is generated.)

At the heart of contemporary information system is a collection of hardware devices that do the actual manipulation of numbers, symbols,

and works. At the center of this computer system is the central processing unit (CPU). Strictly speaking the CPU is the computer. The characteristics of the CPU, its speed and its total capacity are very important in determining the usefulness of an information system in a modern organization.

A contemporary computer system is composed of CPU and four other hardware devices. The CPU uses secondary storage devices (magnetic disks, tape) that feed information and programs into CPU and sort them for later use.

Information can be put into secondary storage and the CPU by several input devices. These include on-line terminals, card readers and other devices that capture information from the environment, such as point-of-sale optical scanners. A number of output devices receive information from the computer system and display it so that individuals can understand it. Such output devices include printers, terminals, cards and other forms.

In contemporary systems, many communication devices act as an intermediary between end user and the CPU. These devices are themselves computers that switch among users and control the telecommunications functions of the CPU. They also manage the input and output devices.

Before describing the CPU and other hardware, it is important to have a clear understanding of time and size in the computer world. Modern secondary storage devices generally operate at the level of milliseconds (thousandths of a second). This means that a modern disk drive can find a student record on a magnetic disk in 25 to 50 milliseconds. But it would take several seconds to find a name on a much slower tape system. In modern mainframes, the CPU can execute at a speed of approximately 30 million instructions per second (30mips). At this speed, the CPU is operating at the level of nanoseconds (billionths of second), or one instruction for every 30 nanoseconds. Even with this speed, the sales of mainframe computers are now under attack from more nimble PCs and portable laptops and notebooks, particularly those with wireless modems.

Size, like speed is an important consideration in a system. Information is stored in a computer in the form of 0s and 1s(binary digits, called bits)

that are strung together to form bytes. One byte can used to store one character, like the letter A. A thousand bytes are called a kilobyte. Small PCs have internal CPU primary memories in the order of kilobytes. A large PC CPU today can store anywhere from 640 kilobytes up to perhaps 40 gigabytes (40 thousand million bytes) of information. This means, theoretically, that the machine can store up to 40 thousand million alphabetic letters or numbers. Some large organizations, like the US Social Security Administration or the US Internal Revenue Service, have a total storage capacity- adding up all their disk drive capacities- measured in trillions of bytes. If all of their records were added together, including those stored on punched cards, physically recorded, and tapes, the total would be at the terabyte (thousands of billions of bytes) level of information storage.

One of the functions of communication devices and various kinds of memory buffers and storage areas in the system is to stage the flow of information into and out of the machine in such a way as to maximize the utilization of the CPU. A major development of the last 40 years in information systems has beeo the creation of operating systems software and other buffering and storage devices, all of which combine to enhance the total utilization of the CPU. Today it is visualized by experts that soon, through computers, we will have translating telephones allowing two people or a group of people across the globe to talk to each other even if they do not speak the same language. They also say that a phone call will include highly realistic 3-D holographic moving images – making it seem more like a visit than a conversation.

User-machine interaction is facilitated by operations in which the user's input-output device (usually a visual display terminal) is connected to the computer. The computer can be a personal computer serving only one user or large computer that serves a number of users through terminals connected by communication lines. The user input-output device permits direct input of data and immediate output of results. For instance, a person using the computer interactively financial planning poses "what if" questions by entering input at the terminal keyboard; the results are displayed on the screen in a few seconds.

The computer-based user-machine characteristics of an MIS affect the knowledge requirements of both system developer and system user. The designer of a management information system must have knowledge of

computer and of their use in information processing. The user-machine concept means the system designer should also understand the behavior of humans as users of information.

Information system applications should not require user to be computer experts. However, users need to be able to specify their information requirements; some understanding of computers, the nature of information, and its use in various management functions aids users in this task.

2.2 Integration of Computers

Management information systems typically provide the basis for integration of organized information processing. Individual applications within information systems are developed for any by diverse sets of users. If there are no integrating processes and mechanisms, the individual applications may be inconsistent and incompatible. Data items may be specified differently and may be compatible across applications that use the same data. There may be redundant development of separate applications when actually a single application could serve more than one need. A user wanting to perform analysis using data from two different applications may find the task very difficult and sometimes impossible. The first step in integration of diverse information system application is an overall information system plan. Even though application systems are implemented one at a time, their design can be guided by the overall plan which determines how they if in with other functions. In essence, the information system is designed as a planned federation of small systems.

Information system integration is also achieved through standards, guidelines, and procedures set by the MIS function. The enforcement of such standards and procedures permits diverse applications to share data, meet audit and control requirements, and be shared by multiple users. For instance, an application may be developed to run on a particular small computer. Standards for integration may dictate that the equipment selected be compatible with existing computers and that the application be designed for communication with the centralized database.

The trend in information system design is toward separate application processing from the data used to support it. The separate database is the

mechanism by which data items are integrated across Amy applications and made consistently available to a variety of users.

3.0 NEED FOR A DATABASE

Terms "information" and "data" are frequently used interchangeably; however information is generally defined as data that is meaningful or useful to the recipient. Data items are therefore the raw material for producing information.

The Underlying concept of a database is that data needs to be managed in order to be available for processing and have appropriate quality. This data management includes both software and organization. The software to create and manage a database is a database management system.

When all access to and use of the database is controlled through a database management system, all application utilizing a particular data item updates it for all uses. Integration though a database management system requires a central authority for the database. The data can be stored in one central computer or dispersed among several computers; the overriding requirement is that there be an organizational function to exercise control.

It is usually insufficient for human recipients to receive only raw data or even summarized data. Data usually needs to the processed and presented in such a way that the result is directed toward the decision to be made. To do this, processing of data items is based on a decision model. For example, an investment decision relative to new capital expenditures might be processed in terms of a capital expenditure decision model.

Decision models can be used to support different stages in the decision-making process "Intelligence" models can be used to search for problems and/or opportunities. Models can be used to identify and analyze possible solutions. Choice models such as optimization models may be used to find the most desirable solution. Following example in finding problems and solving them is shown:

3.1 Using Information in Finding Problems

Communities across the U.S. are starting to use information as well as fire hoses to combat arson. Boston, New Haven, Knoxville, Phoenix, San Francisco and Seattle all run programs that collate fire department records with tax, building ownership, and other data --and growing numbers of insurance companies-- are suing similar surveys to reduce arson fraud by policy holders.

The new arson information tracking programs are already paying of: In 1983 year the Federal Bureau of Investigation reported a 12% drop in arson in the US although experts say it is tool early to link the national drop in arson directly to information management systems, the results from cities that have installed such systems are encouraging. For example, in Phoenix, which installed an arson information program in 1978, arson cases dropped last year to 497 or 35% of all fires, from 739, 49% of the total in 1974.

For an arson information system to be effective, cities have fund they must strike up a cooperative relationship with insurance companies, which already collect many of the same data. The new arson prevention system encourages the exchange of information instead of duplicating efforts. In other words, multiple approaches are needed to meet a variety of decision situations. The following are some example of problems and the type of model that might be included in an MIS to aid in analysis in support of decision-making.

Problem	Example of Model
Amount of inventory safety stock	Inventory model which computes safety stock under a variety of assumptions, and alternative model
Personnel selection	Personnel search
New product pricing	New product introduction model
Expenditure control	Budgetary control model.

In a comprehensive information system, the decision-maker has a variable a set of general models that can be applied to many analysis and secession situations plus a set of very specific models for unique decisions. Similar models are available for planning and control. Models are generally most effective when the user can use interactive dialog to build a plan or to iterate through several decision choices under different conditions.

When the concept of MIS was first introduced, many propionates envisioned a single, highly integrated system that would bring together processing for all organizational functions. Others questioned whether it was possible to design adequate computer-based information systems to support management planning and decision-making functions, especially strategic planning. The questioned the value of applying advanced information technology to all ill-defined judgmental process.

Over time the concept of a single, highly integrated system was demonstrated to be too complex to implement. The MIS concept is now that of a deformation of subsystems, developed and implemented as needed but conforming to the overall plan, standards and procedures for the MIS. Thus rather than a single global MIS an organization may have many related information systems which serve managerial needs in various ways.

A data processing system processes transactions and produces reports. It represents the automation of fundamental, routine processing to support operations. Prior to computers data processing was performed manually or with simple machines. A management information system is more comprehensive; it encompasses processing in support of a wider range of organizational functions and management processes. However, every MIS will also include transaction processing as one of its functions.

What does it take to make a data processing system into a management information system? Can a rather mundane data processing system be an MIS if simple database retrieval capabilities and one or two decision models are added? This not a useful question MIS is a concept and an orientation toward which an information system design moves rather than an absolute state. Therefore, the significant issue is the extent to which an information system adopts the MIS orientation and supports the management functions of an organization. The answer is usually a matter of degree rather than a simple yes or no.

3.2 Use in Airlines & Sports

One important aspect of the difference between MIS and routine data processing the capability of provide analysis, planning and decision making support. An MIS orientation means users have access to decision models and methods for querying the database on an ad hoc basis; the

database is also, of course an essential part of routine transaction processing and reporting. Furthermore an MIS orientation means information resources are utilized so as improve decision-making and achieve improved organizational effectiveness. Information resources are also used as a means of achieving a competitive advantage. Other examples of MIS use are shown below:

Airlines Think Information Systems Make a Competitive Deference

In 1983 the U.S. Justice Department initiated an investigation to decide whether computer reservation systems were being used unfairly to reduce competition.

The major airlines provide travel agents with access to computer reservation systems that include data on the schedules of all airlines providing the service displays its flights to an advantage (such as listing them first). There are three large systems, but the American Airlines system dominates.

	Percent of use
American Airlines	39
TWA	16
Untied Apollo	29
Others	13
	100

Using Information Analysis to Win at Football

"We can describe everything to the computer, said Chuck Clause, defensive line coach for the Philadelphia Eagles. "We can identify formations, draw pictures, define pass patterns of who caught the ball, yardage what every receiver was doing and how the blocking was".

Because of the number of players not the field and the diversity of possible plays, football is particularly suitable to computer analysis. Neal Dahlen, a scout for the San Francisco 49ers, said he could analyze and evaluate nearly 40 variables in any individual play on the term's computer. Based on information

Gleaned from computer printouts, 49er coach Bill Walsh often scripted the first 20 plays of game before he even arrives at the stadium.

As an example of the value of this analysis, a weakness was uncovered by a computer analysis of the lineup patterns of the Kansas City Chief. When the gable was between the 20-yard line and the goal line the Chiefs lined up in the same formation 70 percent of the time. The San Diego Chargers' 372F Shoot Pump play was developed to exploit the weakness.

"Currently an NFL rule bars computer terminals from the sidelines or the press boxes. The hometown advantage would be too great for teams that have complex computer systems on their own turf." said Pete Adamant, an NFL spokesman. Nevertheless, American football insiders expect that the rule will be made more liberal within the next few years.

4.0 MIS AND INFORMATION RESOURCE MANAGEMENT

Information resource management (IRM) is an approach to management based on the concept that information is an organizational resource. The resource is defined very broadly. The people of IRM include data communications, word processing, and personal computers as well as traditional data processing. The IRM concept tends to emphasize the organizational effectiveness of the information system resource rather than the technical sophistication or effectiveness of the information system resource rather than the technical sophistication or efficiency of the hardware and software. The MIS concept includes the resource view of information. The IRM concept is applicable to management of the MIS function. An emerging trend consistent with the evolution of the MIS concept is end-user computing.

5.0 END-USER COMPUTING IN THE BANGLADESH ARMY

A recent major development affecting the structure and design of MIS is end-user computing and Decision Support Systems. Users are provided with terminals or personal computers and powerful software for accessing data, developing models, and performing information processing directly. This development made possible by he increasing power and decreasing cost of the technology is a significant force for change in the way information resources are organized, provided, and used. In many organizations, the MIS function is undergoing a transition form centralized control their own development and operation information systems. MIS as concept continues to evolve. It is related

to, but not equivalent with data processing and other information systems-related to but not equivalent with data processing and other information systems-related concepts. Two such concepts that can be considered extensions of the MIS concept are decision support systems (DSS) and information resources management (IRM). A Group Decision Support System (GDSS) is in vogue particularly in situations where nobody likes to take individual responsibility for being wrong e.g. the recently developed Nuclear Command of the Indian Military. A decision support system (DSS) is an information system application that assists decision-making. DSS tend to be used in planning, analyzing alternatives and error search for solutions. They are generally operated through terminal-based interactive dialogs with users. They incorporate a variety of decision models.

All levels of management in the Army need reliable information on which to base decisions, to plan, organize and to control. People gather information directly by observing and experiencing events but as organizations become large and more complex like the present Bangladesh Army, it is almost impossible for management, particularly in the middle and higher levels (Brigade and above), to observe or experience all operations. In some of decentralized organizations within the Army (like the intelligence units) management virtually never see the actual events and have to rely almost entirely on information provided through formal and informal channels. Although much information is based via discussions, meetings and casual conversation, such methods generally do not give a complete picture nor do they provide information in the correct form for the intended use.

As the Bangladesh Army has grown there has been a shift from informal to more formal methods of disseminating information. The more formal information system (via reports and returns, operating statements, special analysis, variance returns, balance sheets etc.) have the advantages, of comprehensives consistency and reasonable accuracy but may suffer from the disadvantages of not meeting the exact requirements of the problem in hand, a lack of flexibility, time lag from event or operation to report and cost.

5.1 Function Subsystems:

Typical major subsystems for Bangladesh Army could be:

Major Functional Subsystem	Some Typical Uses
Operations	Operations forecasting, planning and execution.
Training	Training, planning & scheduling, cost control analysis.
Administration	Morale and discipline.
Logistics	Planning and control of purchasing, inventories and distribution.
Personnel	Planning personnel requirements, analyzing performances, career planning, reward administration etc.
Major Functional Subsystem	Some Typical Uses
Budgeting, finance control and accounting	Financial analysis, cost analysis, capital requirements planning, income measurement (from various assets of the Army).
Intelligence	Information system planning, cost-effective analysis.
Top management	Strategic planning, resource allocation etc.

The major uses of a computer-based information system in the Army could be the following:

Users	Uses
Field Commanders (Battalion and Brigade)	Obtain operations data. Assistance with planning, scheduling, identifying out-of-control situations, and making decisions.
HQ staffs	Information for analysis. Assistance with analysis, planning, and reporting.
Top management (Brigade and above)	Regular reports. Ad hoc retrieval requests. Ad hoc analyses. Ad hoc reports. Assistance in identifying problems and opportunities. Assistance in decision-making analysis.

6.0 CONCLUSION

Many databases can be designed for use by the Bangladesh Army in the computer based information system but it is the implementation, which matters. The users must have the will as well as the experience in the matters involved. Use of computers in the Management of the Army is not a novel concept. In fluid and mobile battle situations the difficulties of power supply and wireless communications related to the computers can be solved by the Signals units affiliated to the formations. However it will be difficult at the combat unit level. The use and success of GIS (Ground information System) by the US Forces in the Nineties in the Middle East and more recently in Afghanistan has shown us that computer based information systems can and should be implemented in modern battle situations. However, it should be made clear by events unfolding now in Iraq that knowledge, scientific developments and usages are not the exclusive domains of any culture, religian, race, creed, colour or nation but the gifts of the Almighty to whomever He chooses. The database for the GIS is already designed; the software can be modified from the existing user-friendly software. The issue primarily in the security forces is *Real Time Intelligence* i.e. getting accurate information to the correct people in sufficient time to be of any use. Like any business organization the competition here is hostile intelligence and MIS is the systematic way to address the problems of storing and retrieving information by people concerned. The "Search" option of the MS Windows can be used to locate information in the database among the documents and folders. Handwritten reports can be stored by using scanners and the software TextBridge. Similar software can be developed in Bangla. Recently Bangladesh scientists have developed the Supercomputer with the use of several PCs. These can be integrated into the security forces MIS for storing and retrieving critical information.

Note : The views expressed in this article reflect author's personal opinion only.

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