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Management Information System (MIS) and Its Implementation in Organization: Bangladesh Perspective

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ABSTRACT

Management Information System (MIS) for Bangladesh should, therefore, provide high-quality information and data to promote and sustain unit and individual readiness and support the informational needs of commanders and staffs through the entire range of Bangladesh Government. It should be embedded into all aspects of command, control, communication, computers and intelligence (C4I). It should envisage the use of information and communication technology (ICT) to enable people to fulfil their responsibilities, to ensure access to information resources, to foster professionalism and to enhance the interaction within and outside the community. the purpose of communicating with its units, managing inventory, making decisions in the least possible time, the need for having a good Information System is vital now-a-days. In today's world, an organization is measured not only by its collection but how efficiently it is managed.

KEYWORDS : Information, System, Data, Communication, Organization, Security, Control, Management.

1. INTRODUCTION

1.1 In today's digital world information and information system has become the way of life. More importantly, management of information system has become the essence of any organizational growth and efficiency. MIS refers to the study of information system focusing on their use in managing organizations. MIS combines the theoretical and work of computer science, management science and operations research with a practical orientation towards building systems. Information, System and Information System – these three terms are closely associated with MIS. **Information** is data that have been processed and put into meaningful context. Information is produced when facts are analysed, interpreted and evaluated for a specific situation and then presented to the appropriate decision-maker. A **system** can be defined as a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process. An **information system** (IS), thus, can be defined as a set of interrelated components that collect, retrieve, process, store, and distribute information for decision making, coordination, and control in an organization.

1.2 Information is a vital functional element of any organization. Relevant and timely information is vital for effective performance of managerial functions such as planning, organizing, leading, and control. Thus, with its power to make differences, information systems have become an important component of a successful organization. As an organization, defence services in most of the countries, happen to be one of the largest organizations in terms of human resources, inventories, budgetary expenditure and other aspects. As usual, the role of information systems in the defence services has expanded over the years than any other organizations. MIS can facilitate the overall system of the Defence Services by human resource management, financial and accounting management, inventory/supply chain management, training management, decision support system and integrated command, control and communication system.

1.3 As the role of IT changes, the demands that it makes, the opportunities that it presents and the way that we must manage it, also changes. A proper understanding of MIS, therefore, needs to be an integral part of vision conceptualization. These responsibilities belong not only to the commanders at the top of the hierarchy, but to people throughout the organization, in their decisions about how they are going to use technology, what developments they will seek, and how they will ensure that their staff use it. In consonance with the need of the time and the ever-increasing necessity of MIS, an IT roadmap has been defined by Bangladesh Computer Council (BCC). This road-map as **Draft ICT Policy** identifies fundamental requirements of hardware, software and human resource developments for the purpose of effective implementation of MIS. The policy objectives and action plan should be developed and activated in such a manner so that the system can easily be introduced and replace the existing system without causing confusion in the present working environment. At the same time, this should also duly address the security aspects of the organization.

1.4 MIS is a very versatile subject and its implementation process is more complex. This article will initially discuss the importance of MIS in Bangladeshi Organization. It will then focus on the modalities of implementing MIS in Bangladesh. Finally, it will address the security challenges, training and related aspects of MIS implementation.

2. MIS IN PROTECTION PROVISIONS CONTEXT

2.1 The proper management of IS is a major organizational challenge. In security services, security management deals with theories, concepts and techniques for forecasting, planning, directing, co-ordinating and controlling human, physical and informational resources. The ultimate aim of security management is to install the national security through operations on land and/or sea and/or air and being prepared for all these at all times. All these demands accurate, uninterrupted and timely handling of all IS for the purpose of efficient security management by the decision makers and planners.

2.2 **Need for MIS in Security Services**: The need for MIS in security services so to say in modern day fighting has many connotations. Firstly, the commander's area of interest has increased by several orders of magnitude by the development of long range weapon systems and automated sensors and scanning devices. Secondly, the speed of movement on the arena has increased enormously. Finally, the need for high degree of flexibility and the need to make most effective use of scarce resources has always been a factor to consider. These entire ranges of modern fight field environment demand the necessity of MIS for security services' organizational management.

2.3 **Role of MIS in Security Management**: When used for the security management purpose, MIS can assist in various ways. The fundamental roles are as follows:

a. Assisting leaders and staffs to make decisions, for their various functions of planning, directing, and controlling long term and broader issues.
b. Provide selected data/information at a time when these are useful to superiors to make decisions. Provide decision information for respective classes of problems.
c. Provide information to leaders and staffs at various hierarchical levels in an easy format. Provide information only when action is possible and appropriate.
d. Provide information that is always current.
e. Provide any form of analysis, data or information whenever it is required.

2.4 **Need of Information at Various Levels:** Decision makers at the strategic level are charged with weighing risks and making major policy decisions on such matters as force structure, weapon systems etceteras (etc). They need the type of information that supports these strategic plans and decisions. At the tactical level, they establish the control and provide the direction and co-ordination required for implementing the strategic plans and decisions. Accordingly, their information needs have to be tailored. At the operational level, commanders and staff officers schedule and implement specific tasks. Obviously, their information needs are different. In short, decision makers at different levels in the hierarchy, use their time differently, need internal information with varying degrees of detail, and need different mixes of internal and external information in order to make their decisions.

3. Uses of Information System (IS) in Military Management

3.1 **Integrated Command Control System**: The military is a multi-dimensional but disciplined organization. It has got different wings and divisions. The army maintains a strict command control system at all times. Use of information systems can facilitate the army by integrating all its resources, activities and resource management systems with secured computer and telecommunication systems to establish a better command control system.

3.2 **Decision-Support System**: In certain situations, the top and mid-level officers have to decide very quickly. In those cases, a good decision support system (DSS) which consists of a reporting system of the organizations resources can help the military management a lot. A DSS provides managers with analytical modelling, data retrieval and information presentation capabilities. By using DSS, the army leaders will be able to explore possible alternatives and receive tentative information based on alternative sets of information which will ultimately enhance the decision making capability of the army.

3.3 **Human Resource Management**: The army is not all about the military hardware. Its main resource is its people. So, managing its people could be done efficiently if a modern human resource system is used. In any modern organization, the role of recruiting, training and capacity building and retaining its people have got the highest preference. Human resource information systems support activities such as identifying potential employees, maintaining complete records on existing employees and creating programmes to develop employees' talents and skills. A typical human resource management system keeps all the information regarding any individual working in an organization. Since the army is one of the largest organizations in terms of its people, the use of IS in managing its people effectively is certainly essential.

3.4 **Inventory / Supply Chain Management**: Supply chain management is the coordination of all activities and information flows in buying, making and moving a product. It integrates supplier, distributor, and the users' logistics requirements into one cohesive process to reduce time, redundant effort and inventory costs. As a big organization, the army maintains a huge inventory consisting of military hardware to foods and steady supply chains of these inventories. MIS can play a major role in managing these inventories and their supply chain efficiently.

3.5**Military Project Management**: Managing any project, whether it's a military or civil is multi-dimensional and critical. Typically, a military project is large in size. A lot of parameters are involved in the success of such a project. Tracking all the tasks involved in a project and meeting all the requirements is always tough and requires a lot of hard work. But, use of IS can play a vital role in managing a military project efficiently.

3.6 **Financial and Accounting Management**: The army has to maintain its payroll, procurement and other accounting and financial activities. Using a proper financial and accounting management system can facilitate the military to do these jobs smoothly. Typically, these systems include order processing, inventory control, accounts payable, receivable, payroll and general ledger systems. The use of such system will help the army to allocate financial resources efficiently and gain control on financial resources within the organization.

3.7 **Inter Services Operation Integration**: The army has to work closely with other military services like the navy, the air force and different intelligence agencies. Use of MIS can integrate the operations and activities of different services.

3.8 **Military Preparation and MIS**: Now-a-days, in military training, uses of IS are playing a significant role. Using the IS, virtual battlefields can be simulated in the training laboratory. This will eliminate the cost of organizing real battle field training to a certain extent. MIS will provide the army an easy access to the information of different issues related to military training.

4. MODALITIES OF IMPLEMENTING MIS IN BANGLADESH

4.1 Traditionally, MIS have been evolved as by-products of the process of automating or improving existing systems within an organization. In this manner, it is unlikely that the system would provide exactly the sort of information, which the decision makers in the organization would need to make their decisions. Although data and information are frequently abundant, they are sometimes not enough and of the right kind for setting objectives, evaluating alternatives, making decisions, anticipating problems and measuring results against specified tasks.

4.2 Therefore, the design of an MIS should examine the organization's conceptual requirements for information. It should focus on the tasks and decisions made within the organization and provide the kind of information that the decision makers need to perform these tasks and make effective decisions.

4.3 Implementing MIS in Bangladesh: Recently, a full phased department has been emerged to establish and implement the future IT vision for Bangladesh Government Services. A draft IT policy has been prepared by ICT Ministry. It is expected that such an initiative will allow Bangladesh Government for better management of its activities. It is also expected that such an implementation will enable us to receive on-line information countrywide and for areas around the globe where the personnel of Bangladesh are deployed. Users of Bangladesh should work in an environment of 'paperless office concept', thus enhancing institutional capacity and proper workflow management. With this vision in mind the immediate attention, for implementing effective MIS in the should be:

a. Integrated computer network system for Bangladesh.
b. Database management system of Bangladesh.
c. Software development for Bangladesh.
d. Office automation.
e. Web presence of Bangladesh.
f. Information security.
g. Training on MIS to build IT literate workforce.
h. Procurement and up-gradation of computer hardware and software.

5. INTEGRATED COMPUTER NETWORK

5.1 **Computer Network and System Configuration**: Computer Network design should be given the highest priority to minimize cost and avoid duplication of efforts to ensure continuous network facilities within the organization. ICT Department should plan and coordinate the network system of the entire Bangladesh with following options to match future expansion/adaptability with new technology:

a. Future connectivity to area/division headquarters. Other affiliated organizations and institutions of the area will be connected to the collocated regional backbone.

b. Connectivity to major installations of Dhaka area including upazila.

c. Connectivity to Network Operations Centre to be established at the ICT Department where policy based network administration will be conducted.

5.2 **Transport Media**: Transport media is one of the major considerations for an integrated network system. Major factors to be considered in this regard are reliability, speed, accuracy and above all security, which is otherwise a major concern for any security services. Available options in this regard are discussed below:

a. **Satellite Terminals**. Providing individual Very Small Aperture Satellite Terminal (VSAT) for all the development, obviously a better option as far as speed and reliability is concerned. But at the moment this will not probably be the viable option for Bangladesh as far as monetary involvement is concerned.

b. **Existing Tele Communication**. Existing Public Service Telephone Network (PSTN) and Private Auto Branch Exchange (PABX) lines, which are used for peacetime telephone communication between garrisons, can be also used as media. Though existing national PSTN system uses microwave links for distance communication but the desired speed and security can not be obtained through this media. More so, huge amount voice and data traffic in the same media will jam the communication channels.

c. **Fibre Optic Based Communication**. The other option may be the use of Bangladesh Railway's fibre optic media running almost in all the places where railway lines are available. The total distance needs to be laid by the army is approximately 30-50 kilometres, which will take a total cost of about one and half core only. The above-mentioned formations/garrisons not having railway line nearby may be linked through microwave links or individual VSATs. The total cost excluding rent in this case will come down to 10 crores in case of microwave option and 20 crores in case of VSAT option.

6. MIS Implementation – Other Major Areas

6.1 **Office Automation**: Office automation refers to the use of computer, communication system and office equipment technology to support the activities of an office. Office automation will augment/complement and at places replace human resource by computer to a greater extent to increase productivity, improve quality and effectiveness. It is other way known as Electronic Document Management (EDM). For this, the prerequisite is to bring each office or unit under an integrated network with compatible platform. All existing books, pamphlets, précis, written instructions etc are to be recorded in system memory/storage devices instead of books and files. There will be a common server to share those. Efforts should be made to use minimum paper for office communication.

6.2 **Software Development**: Success and failure in adopting the technology greatly depends on the manpower expertise in software development and hardware adoption. In a defence organization, where security is the prime concern, every effort should be made to develop software experts/engineers from integral manpower, so that they can develop necessary software as per the need of the organization/installation/units/formation. If purchased or customized software are used, outside experts should not be allowed to access and debug the software once the data are fed to the system. Own expert/hi-skilled personnel should then maintain and debug the software and system.

7. SYSTEM IMPLEMENTATION

7.1 System implementation implies that the intended users, for whom it is prepared, can use the system without significant problems. Before attempting to implement new system proposals, careful consideration must be given to communicating them to the people concerned. This communication will be at three levels; namely senior level, organizational level and data processing department to apprise them of the implications and desired actions by them. The activities involved during this stage are:

a. **File Conversion**. This involves conversion of old files, reports, forms for necessary codification and validation so that those are compatible to new system.

b. **Testing**. Here, newly coded and validated files are tested so as to check and confirm the existing organizational functioning and standards.

c. **Training**. This involves end user training at different level to ensure smooth change over.

d. **Actual Change Over**. This is a crucial time and care must be taken not to fall in unexpected complexities. There are three alternatives available, and any one of the followings may be adopted depending on the requirement and situation:

(1) **Parallel Run**. Old and new system is run in parallel to give confidence to the user and then gradually changed to new system. Requirement of additional staff or their over-working may pose problems.

(2) **Direct Change Over**. At a stipulated date, the new system is brought into force.

(3) **Partial Change Over**. Part of the activities of the system is carried out on the old system while the remaining is changed over to new system. After a period of time, the confidence of the user is built up and then all activities are changed to new system.

7.2 **MIS Implementation Phases for Bangladesh**: Implementing MIS in army cannot be done overnight. It is a long and lengthy process. It should be done in phases keeping the resources constraints and budget allocation in mind. A four-year plan which is formulated by the ICT Department to implement the project.

8. SECURITY CHALLENGES, TRAINING AND RELATED ASPECTS OF MIS IMPLEMENTATION

8.1 **Security Challenges:** Whatever the benefits of a system may be, security would always be a major concern in defence services environment. Therefore, along-with the implementation process of MIS, a comprehensive security arrangement is to be made by ICT Department. Access to information should be on need-to-know basis. Security in ICT environment broadly involves the managerial and technological safeguard applied to software and data against either accidental or deliberate unauthorised use. Any security measures are only as good as the honesty and integrity of the people who run the system. Security of the ICT environment can be achieved by adopting following measures:

a. By controlling access to the system.

b. Ensuring data protection.

c. Ensuring protection during data transmission.

d. Security of personnel and physical security.

8.2 **Controlling Access to the System:** Based on security requirements, control will be exercised in accessing and sharing of data depending on its importance. It will also establish data classification, system configuration and levels of control. The security instruction will specify who will be allowed access and to what type of data. To exercise control on access, normal measures like personal identification can be employed. Where necessary this will be supplemented by extra perimeter protection and the introduction of limited/named access. Smart cards and biometrics devices like fingerprint, eye retina scan etc may be used.

8.3 **Data Protection:** Data stored in the computers are most vulnerable to security breach in an ICT environment. Ensuring security of data stored in computer is a complex matter. However, if security at the server end can be ensured then 90 per cent security of the whole system will be achieved. This will be achieved by ensuring one or combination of the following measures:

a. **Hardware Security**: To ensure hardware security, data stored in the hardware will restrict operator's mode of operation on the stored data. Depending on the data value, operator's mode of operation will be controlled. Several modes of operation like read-only or execute-only or non-accessible or recording access only can be enforced differently at different ends.

b. **Software Security**: There should be system software to manage and control the hardware resources. The system software will identify operators and supervise the access procedure. The steps that should be involved in the system software are as under:

(1) **Logging-in**: A user in a network has to log-in at the start of the operation. This would provide a compulsory means for authentication by reference to personal details already held in the database. Such authentication will be required at intervals also to ensure that the same user is at work.

(2) **Controlled Access**: After authentication has been done, the system software will itemise all programs and data to which a user will be allowed to have access. Access to computers should be by designation rather than by individual name except in exceptional circumstances. Access must be restricted to designated computers for all users except in exceptional circumstances.

(3) **Virus/Worm Check:** All network access will be monitored by anti-virus software that includes network based anti-virus tools and utility for different network services. The gateway to the network shall be routed though a separate server for virus check and anti-virus actions. When a virus is beyond its capability to clean, the incoming mail will be automatically bounced back to the originator with a note.

(4) **Floppy / Removable Media Check**: Minimum use of floppy/ removable media is to be ensured. If need be those are to be disabled.

8.4 **Preparation:** There is an acute shortage of skilled manpower in the ICT field world wide and also in Bangladesh. With the increased number of computers and peripherals in different units, headquarters, organizations and institutions; there is a need for adequate number of trained manpower in various fields of ICT. MIS implementation and maintenance will also ask for more number of ICT literate and experts in security services. Considering the requirement of additional ICT workforce and the modalities of MIS implementation, the training on ICT should include maximum officers and men to be trained on the following specific fields:

a. Software development.

b. System analysis and design.

c. Network administration/management.

d. Network security.

e. System engineering.

f. SQL and relational database.

g. Web development and multimedia animation.

h. Network and distributed computing.
j. Hardware operation, trouble shooting and maintenance.
k. Statistical analysis of databases.
l. Database administrator.
m. C++ programming.

8.5 The preparation may be classified according to the levels of expertise required for job performance from individual level to small group level to organizational level as mentioned below:

a. **Basic Training**. Basic Training on computer is already imparted to all officers. The syllabi covered may be made more detailed and elaborate. In addition, respective arms and services' training institutions may impart corps-specific basic training on computer. The lessons should also be more advanced to meet the future needs.

b. **Diploma Courses**. It includes selected officers of all arms and services to be trained on required subjects at military/civil training institutions.

c. **Degree Courses**. Degree courses on computer science are conducted in the institutions. Selected officers of all departments are attending the course. The intake may be increased initially till the shortfall of ICT.

d. **Post Graduate Courses**. Selected officers can be sent to post graduate courses. Selection will be made from amongst officers who have successfully completed degree courses on Computer Science and ICT related disciplines.

9 POSSIBLE IMPEDIMENTS AND LIKELY SOLUTIONS

9.1 **Financial Aspects**: System automation and technologies involved thereto has always been costly affairs. MIS implementation process will also involve procurement, development and maintenance of hardware and software. This will also involve huge expenditure in developing transport media, building experts, and in some cases organizational change. Not only that, once a system is introduced, the maintenance cost of the system thereafter also calls for substantial amount of share from the organizational budget. All these expenses might create a 'no-go' attitude in people's mind. But, considering the long-term benefit and to keep pace with the 'e-revolution' we have to possess a positive attitude and think for acceptable option for its implementation. A sound understanding of the need, judicial planning and step by step implementation can give a sound solution to the issue. Low cost hardware alternatives and open source systems software should be given preference. The applications software should be developed locally, and if possible, by the internal experts. This will ensure minimum cost as well as security for the organization.

9.2 **Adaptation to New System:** By nature, people always tend to stick to old practices and systems. But with implementation of MIS, there will be changes in the practices, there will be changes in the system, there will be changes in the way of doing things. These changes will create a lot of concern among the people in an organization. It may even create organizational chaos. So, implementation policy should be designed in such a way that involves minimum changes. Before the full-scale implementation, adequate time should be given to make people aware of the system through constructive training, continuous practice and adaptation.

10 CONCLUSION

10.1 Information is a vital ingredient for any organization. A well developed and well maintained IS is, therefore, an important factor for organizational success. MIS refers to the planning, developing, organizing and maintaining an IS for efficient functioning of an organization. As an organization, defence services in most of the countries, happen to be one of the largest organizations in terms of human resources, inventories, budgetary expenditure and other aspects. MIS can facilitate the overall system of the defence services by human resource management, financial and accounting management, inventory/supply chain management, training management, decision support system and integrated command, control and communication system.

10.2 MIS have been evolved as by-products of the process of automating or improving existing systems within an organization. But the system doesn't always provide enough and right kind of data, which the decision makers in the organization need to make their decisions. Therefore, the design of an MIS should examine the organization's conceptual requirements for information. Before designing, focus should be placed on organization's strategy, its structure and possible effect of change in the organization's functions.

10.3 Security is the major concern for defence organization. Security in ICT environment broadly involves the managerial and technological safeguard applied to software and data against either accidental or deliberate unauthorized use. Security of the ICT environment can be achieved by controlling access to the system, ensuring data protection and ensuring security during transmission. System automation and technologies involved thereto has always been costly affairs. The applications software should be developed locally, and if possible, by the internal experts. Initially, we may have to depend on outsourcing in terms of experts, technologies and advices. Gradually the aim should be to qualifying own personnel to that extent so that they are capable of developing and maintaining own system.

11 RECOMMENDATIONS

11.1 Considering the need of the time, resources and constraints, following steps are recommended:

a. To implement MIS, building an integrated network using Bangladesh Railway's fibre optic network as backbone may be one of the viable options for Bangladesh.

b. A board of officrs at all level may be formed to carry out detail study for the inclusion of Division MIS Cell in the present department. They should highlight/recommend the likely process/procedure involved in organizational change, command control set up/chain and budgetary aspect involved in it.

c. To familiarise the new system to the end-users short/long term phase-wise training curriculum to be planned and worked out. The aim should be to build own experts to handle and maintain the system.

d. Since the initial set up cost of any new system usually shoots high, therefore, due considerations should be given in allocating adequate budget to initiate the process of MIS implementation.

BIBLIOGRAPHY

Books

1. James A. O'Brien, *Management Information Systems: A Managerial End User Perspective,* Second Edition, Boston, IRWIN, 1993.

2. James Hall-Sheehy, *Computer Basics for Human Resource Professionals*, Service Book Club: 1988.

3. Prof. S Sampath, *Technology Stepping into 21st Century*, Delhi:1994.

4. Robert J. Seidel and Peter D. Weddle, *Computer Based Instruction in Military Environment*, New York and London.

5. A. Ramesh Babu, Y. P. Singh and R.K. Sachdeva, *A reference manual, Establishing a management information system*, at www.fao.org.

6. J W D Ward and G N Turner, *Military Data Processing and Microcomputers*, Shrivenham: March 1982.

7. Brain K Williams, *Using Information Technology*, 2nd Edition.

Policies/Articles/Publications/Papers

8. Computerization and Information Technology; Its Incorporation in Bangladesh Army, AHQ Project Study Paper Presented by 6 Air Defence Artillery Brigade.

9. Draft IT Policy for Bangladesh Army, Prepared by IT Directorate, AHQ, (Dhaka Cantonment: 2003).

10. "Management Information System – an Overview ' Chapter from Defence Management Précis.

11. Md Mizanur Rahman, Prospect Of Management Information System Highliting Present Computer Infrastructure in Bangladesh, Commandant's Paper, 2003.