An Organizational Level Advancement Ofmis and Its Security Milestones Intechnological Era

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Abstract:

Today the most vital asset of any enterprise is its data and to maintain its security. In order to make your business successful in this era of modern economy and to compete with the advancing world, one must have to understand the importance of data management. Management Information System is a source of managing large amount of data of any firm and it has a powerful influence on the performance of an organization by maintaining its data electronically. This paper discusses the impact of MIS on performing various functions of an organization and how this software can increase the profitability, growth and innovation of an organization. In short, a positive relationship between an organization and MIS is discussed. With the increasing complexity in technology, there arise some serious issues of security which includes hacking, spoofing, cybercrime etc that needs to be catered. This research therefore covers possible solutions to such security threats along with some techniques and also discusses various types of information systems. The need therefore is to produce a way that encourages operating a secure information system for an organization.

1. Introduction

When it comes to taking decisions in an organization, Management Information System is a tool of great importance. In (MIS) broader terms, Management Information System can be associated with all computer based systems that offer professionals and managerial personnel with the equipments and tools to manage, organize and evaluate different departments of business organizations efficiently and effectively. As per Kumar (2006), this process helps the managers in taking constructive decisions. It also aid in commencement of operation within any organization or business. With the growth of an organization, the pressure of scale, expanding momentum of modification and

complexity has made the processing capacity of adequate information inevitable.

The main focus of MIS is to minimize business limitations or faults and to bring the removal of differences. For this purpose different applications and processes of MIS are being used. It has developed productivity particularly in terms of cost, time and quantity and quality of product. It is recognized both locally and internationally.

Within the framework of globalization, widespread of IT and the internet, the 20th and 21st centuries has faced vast international challenges. All these challenges obligate organizations to expand in terms of creativity to guarantee uninterrupted development of high quality products. The applications of Information Management technology have emerged and contributed in a positive manner in establishment of these organizations. They are being spread fast in our present day world as a result of all this advancement in the modern era.

1.1 Literature Review

Number of important topics are highlighted by previous studies on IS security such as IS security effectiveness (Woon and Kankanhalli 2005) [1], the design, development, and alignment of the ISP by (Siponen and Iivari 2006) [2], planning and risk management (Straub 1998; Straub and Welke 1998)[3], the economics of IS security and evaluation of IS security investments (Cavusoglu, Cavusoglu, and Raghunathan 2004) [4]. These studies have expanded our understanding of IS security from various perspective but their number is not commensurate with the importance of the subject underrepresented in the leading IS journals like (Siponen and Willison 2007)[5].

An emerging research stream on the human perspective of information security focuses on identifying the factors leading towards compliance attitude regarding information security and end–user behaviour. 64 percent of the respondents reported that actions of the insiders are responsible for some of the losses related to information security they have incurred. The major information security issue related to insiders includes Employees' abuse and misuse of IS. It is assumed by most of the earlier empirical studies that investigated end-users behaviour claiming employees simply choose to engage in inappropriate behaviours. Therefore, preventative strategies (e.g., sanctions) for reducing computer abuse and misuse are the main focus of these studies. For example, the method to discover computer abuse and discipline perpetrators is investigated by (Straub and Nance, 1990) [6] suggesting that serious violations should be punished by the organizations to the most possible extent because other such behaviour would be deterred by such punishments.

(Willison, 2006) [7] focused on computer crime by employees in an effort to understand the problems related to information security posed by employees. He also investigated the relationship between the offender and the context using situational crime prevention theories and rational choice. Willison effectively influence the decision-making processes of their employees by arguing that the actual behaviours of offenders at various stages of their misuse should be a main focus of organizations in order to implement controls (safeguards) that would reduce the employees' ability to misuse the IS at each stage. To explain the influence of organizational factors, information security policy and information awareness programs

on preventing computer abuse, (Lee and Lee, 2002) [8] proposed a conceptual research model based on deterrence theory and several social theories. Computer abuse that originates from insiders and outsiders by assessing the role of deterrence is analysed by Lee in 2003. She also analyze organizational factors and found that enhancement of social bonds through organizational factors (attachment, commitment, involvement, and norm) is an effective mechanism in preventing computer abuse. The relationship between the control element (specification, evaluation, and reward) and security precautions taken is mediated by mandatories; this was shown by (Boss et al., 2009). [9]

Finally, there is a paucity of empirical studies that analyse the impact of information security awareness on information security, despite the importance of information security awareness. Information security awareness was conceptually analysed by (Siponen; 2001) [10] and methods were suggested to enhance awareness based on several theoretical perspectives. User awareness of security policies; security education, training, and awareness (SETA) programs; and computer monitoring are the main security countermeasures which the organization can use to reduce user's IS misuse. Recently (Michael Dreyfuss) [11] presents an article in which he proposed two step decision support model for investing in information technology security both development and application. The first step involves the mapping of the risk level of each of the systems components followed by the determination of how much to invest on various technological tools to enhance information security. (Moreover Nicolas Mayer) [12] proposed that connection with

Enterprise Architecture Management contributes to deal with security issues.

2. Problem Statement

Security issues such as hacking and data theft are key problems which has bad impact on the working of organizations and its processes. This can be prevented through biometric verifications at high level, strong password systems and Java language.

3. Background of MIS

Since a data framework is a collection of segments which can build viability and accomplish better data for basic leadership. At the point when a data framework is executed to enhance administration by heads of an association, it is called as MIS. Thus, keeping in mind the end goal to enhance the productivity and viability of the associations, the chairmen chose to execute data framework to their associations. MIS is a gathering of instruments, labor, programming and system to accomplish a few business undertakings at various levels in the association .This framework can expand the effectiveness of the administration. Consequently a few associations have thought to apply this collection of parts to their affiliations. There is huge weight on numerous associations to make their strategic, operational and key procedures more powerful and productive all through the improvement of unassuming worldwide condition.

The most vital improvement in the utilization is the advancement of big business asset arranging frameworks. ERP (Enterprise Resource Planning) frameworks are a data innovation set-up that gives the stream of data between all arrangement forms in associations. ERP (Enterprise Resource

Planning) frameworks allow the administration to react productively to the expanded business. A truth about ERP system is that they know-how to utilize their abilities to maximize the outcome productively and fulfill the organizations requirements. Therefore, different associations still incorporate their frameworks by means of custom programming without ERP frameworks. In this manner use and reception of ERP frameworks ought to be reflected as a main consideration which ought to be suitable for the present business forms and for association.

3.1 Evolution of MIS

An evolution of MIS can be divided into three periods:

- Data processing
- Management information systems
- Strategic information system

3.1.1 Data processing

The principal period is Data Processing which focuses mainly on the increasing business viability. Having insufficient control over assets and arrangement, it happens through mechanization of basic helpful data processes.

3.1.2 Management information system

The second era which is known as Management Information System concerns about improving the directorial proficiency by boundless information requirement satisfaction. Capacities of information technology resources were perceived by the managers of the organizations so they acquired their own frameworks.

3.1.3 Strategic information system

The third period is the Strategic Information System which is focused on improving hierarchical adequacy benefited by exerting influence on the entire authoritative methodologies of business [11].

4. MIS as Information Systems

MIS concentrates on the motorization of numerous business exercises that expect to serve great strategies for announcing, arranging and operation control. MIS has tried to give methods to adapt up to administrative issues and conditions around all territories of the administration of data. MIS is an assistant for any association and furthermore underpins administrative undertakings. MIS usage is extravagant with costly resources, along these lines this execution of MIS extend requires thorough arranging of its plan, execution and operation forms.

4.1 Profound work on MIS

As discussed in 1.1 that several studies have been conducted over the past 5-10 years to make IS more advance and secure with less chances of any security threats, some of the profound work regarding MIS is below:

i.   "Fenix" is the designation of an impressive project within SAF, called "Fenix Project" which is analogous to the name of the information system that are used for maintenance of aviation and is named as "Fenix System". The Fenix System is a new repair, maintenance and overhaul system for SWAF [12].

ii.   The imperative point of this venture is that MIS gives exact data to help the basic leadership process and permit the associations

control, intending to be worked successfully. Administration Information System is at first worried about preparing crude information into helpful data and is then exchanged to the different offices in an association for precise basic leadership. The data framework is the strategy to guarantee that data is open to the administrators in the shape they need it and when they require it [13].

iii. Management Information Systems are the critical factor to help and finish viable basic leadership in an association. This exploration finds the utmost to which administration data frameworks suggestions are useful in settling on effective choices in any association theory. The investigation demonstrates that there is no impact of strategic anticipating basic leadership while there is an unmistakable impact of Strategic anticipating the Decision Making [14].

iv. The key role of Management Information System is formulating decisions. The process which involves the making of decision and how it is effective on directorial or top management level any company or organization is discussed .It also highlights the area of importance on automated decision making. Discussion is held on the problems, limitations and challenges of MIS. For the integrity of the information, it also discusses the recommendations [15].

5. MIS Components

MIS essentially can be characterized as giving right data to the ideal individual on opportune place at ideal time in the correct frame at the correct cost Management Information System .Management Information System (MIS) can likewise be characterized as an arrangement of putting away, gathering and dispersing information as data expected to complete the operations of administration. It comprises of valuable data, which impacts

administrations to feel the beat of the association and take choices fittingly. Indeed a full MIS comprises of the considerable number of frameworks that the association utilizes to create the data that coordinates administration's activities and choices.

Fig.1. Information System Components

5.1 Importance of Management Information System (MIS)

In today's world an important role is played by MIS in companies and organizations. It is also extensively used by worldwide organizations. It's a given that every single administrative capacity are performed through basic leadership; for taking judicious choice, auspicious and solid data is fundamental and is obtained through a sensible and very much organized technique for data gathering, handling and spreading to choice makers [16].

Recording, processing, routing and tabulating can now be done by the organization that makes use of MIS.

It plans and controls the managerial functions.

The flow of two way interaction is greatly supported by MIS.

It is helpful in coordination and is involved in facilitating the departments by making them known to the problems even of

the other departments which throw light on the good coordination.

MIS is a nerve Centre as it plays an important role in globalization. It not only enables the world to come closer but it also vanishes the distances between the economies of different states of the world making them single interdependent economic system. In this way the linguistic and geographical barriers may be brought down.

Communication is now cheaper and efficient through MIS.

By the help of MIS business processes are computerized and businesses are streamlined making them cost effective and money making machines.

5.2 Comparative study of MIS and ERP

MIS is actually taken in wider and broader terms. It's a concept, an idea where as ERP is an application of MIS.ERP may be considered as a specific concept of MIS working as a centralized repository with certain modules under control for performing specific tasks. If ERP is a book then it would be fair enough to call MIS knowledge.

6. Enterprise Resource Planning (ERP)

ERP frameworks had showed up as the basic of viable data administration and it is the foundation of the associations. A few associations have experienced a test with the frameworks mix which is not an issue of the framework. In this way ERP frameworks have turned into the source to help the business procedures and increment adequacy and effectiveness of agreeable

Figure No 2: ERP Flowchart

relationship with on-screen characters in the production network. ERP frameworks mat not be reasonable for each association. There are numerous associations which haven't picked

ERP frameworks [17].

6.1 Benefits and drawbacks of ERP

Because of one common system there would be least duality and enhanced proficiency. It provides better customer services. It supports interactions between business partners. Because of this the need for in-house development is removed. Different modules in ERP function effectively to ensure that work is being managed properly by all means. It only happens because of viable manufacturing, managing materials effectively and timely distribution. It increases flexibility by automating data. It supports benchmarking, accuracy and relevancy and virtual transaction. It provides customer satisfaction. [18] However, ERP systems are very costly and which means bringing ROI in the field.

They are very difficult to handle which means it requires trained and skilled staff to maintain the system. It needs constant upgrading. On Tech people would take a long time to learn it. It's not a single day learning process.

7. Types of Information Systems

Information Systems can be described in terms of three types of systems:

1. Transactional Processing Systems (TPS)
2. Management Information Systems (MIS)
3. Expert Systems

MIS has several subsets such as:

- Customer Relationship Management (CRM)
- Decision Support Systems (DSS)
- Enterprise Resource Planning (ERP)
- Knowledge Management System (KMS)
- Executive Information Systems (EIS)

7.1 Customer Relationship Management (CRM)

An endeavor application component in charge of keeping up an organization's connections with present and future clients by sorting out and planning, advertising, deals and giving better client benefits alongside specialized help. There has positive connection between finance framework and the way specialists deal with their clients. The other is that the clients' experience will straightforwardly impact clients' fulfillment.

Figure No 3: CRM

7.2 Decision Support System (DSS)

DSS is computer based information which aids in decision making. This system may work for organizations or business institutions. This system forms the backbone of decision making process [19].

Characteristics of DSS

The analysis based on semi structured or unstructured problem is supported by DSS.

1. It helps in making unique and instantly changing decisions.
2. IT helps in bringing information from extraneous holdings.
3. It involves using of mathematical and statistical expertise.
4. It's easy to construct.
5. It executes sensitivity analysis. Sensitivity analysis gives the idea that how the changein one part of the model affects the other part.
6. Benefits of DSS
7. Increases professional proficiency
8. Catalyzes the decision making process
9. Speeds up the process of finding solutions to complex issues in organizations.
10. Promotes communication within an organization
11. Improves intellect and research training
12. Helps in evidence generation for making decisions
13. Supports automate managerial processes
14. Promotes innovation and creativity in ideas to catalyze the organizations performance.

The flow of DSS is shown in figure 4. These characteristics help to determine the various uses of DSS.
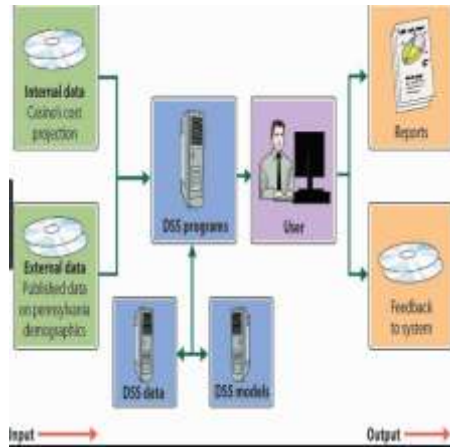

Figure No 4: Decision Support System

7.3 Knowledge Management System (KMS)

All the frameworks we are centering here go under information administration classification. A Knowledge Management System is not totally transformed from all these data frameworks, but rather it expounds the effectively existing frameworks by incorporating more data. Indeed, even a few firms see KMS as a developing and capable wellspring of upper hands. Nonetheless, the usage of KMS contrasts from that of customary venture data frameworks. The usage of KMS is troublesome and unsafe since these frameworks are unstructured thus mechanically creative. Along these lines, exertion is required to recognize determinants influencing KMS usage in organizations. [20]
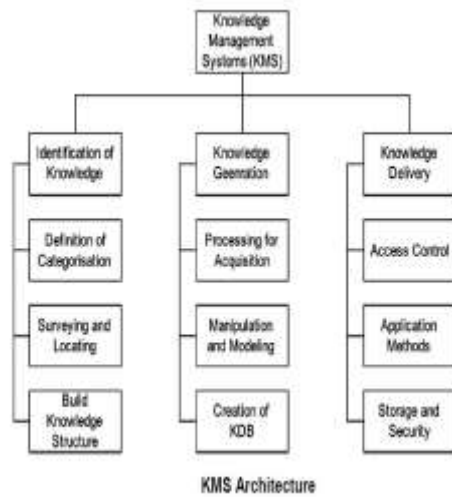

Figure No 5: Knowledge Management System

7.4 Executive Information Systems (EIS)
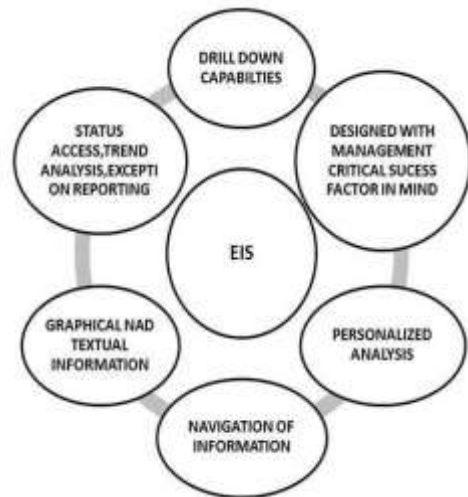The cycle is shown in figure 6 below.

Figure No 6: EIS cycle

Executive support should be utilized by the senior chiefs straightforwardly to convey support to non-modified choices in vital administration.

8. Information System Security

Information systems have now made the current technological system so many dependents on them that the problems which are threatening Information Systems are also big threat to everyday activities of organizations. There are many current problems such as malicious software, hacking, spoofing, snipping, jamming, spamming, hacking and identity theft. The reliability and security of MIS are being threatened by these current issues. [21]

8.1 Issues Identified

Today the most of the data theft occurs through computer crime as it is technological era. As the Information Systems evolved, a large amount of data is stored in electronic form. Due to this a large number of users can view it. As more viewers can make access to data electronically so data is susceptible to the threat.

Many of the common threats to Information System such as hardware failure, personnel actions, user errors, electrical problems, software failure can easily approach large amount of data. It is so threatening for Information Systems 0f an individual or business, when the telecommunication is itself threatened.

8.2 Proposed Solutions

- **Security**: The software should be able to hinder access to database by log in id as database is heart and soul of MIS. Inbuilt safeguards should be there to protect database from manipulation and modification by unauthorized users.
- **Backup and Recovery**: There should be a feature in a system that allows a user to take a regular back up. For the user to be adequately protected against the sabotage or system failure, the system should have the feature that enables the full or incremental backup. So that in the case if system fails the transactions, statements or balances may be recover by the data that the user backed up.
- **Biometric Controls**: Use physical characters to identify the user such as voice verification, hand geometry, retina scanning, genetic pattern analysis, signature dynamics, and face recognition.
- **Domain Controller:** By placing the data on the dedicated server known as Domain Controller and all systems should be a member of that server by joining its domain
- **Maintain a strong Firewall**: Firewalls are recommended by PCI security gauges for consistence.
- **Fault Tolerance**: The glitches like unreliable power supply should be tolerant by the system. These glitches occur during the course of operation. During the problem periods, the function should be continued and the user should be notified
- **End of Period Processing**: The data should be handled by the system in terms of fixed period of operation. e.g. One financial year or quartered it should be able to relate data to multiple periods as various periods required reporting to be done. With minimum human intervention, the calculations should be post accurately at the end of the periods.
- **Support Infrastructure and Maintenance**: There should be availability of support infrastructure and maintenance service. To keep the system running at peak efficiency all the time they must be accessible to the user all the time.
- **Version Upgrading**: There is no software that works well without up gradation. Similarly MIS software also needs up gradation in its functionalities to grow its organization in a productive manner. To manage the cost of upgrades, it is preferable to add new functionalities as per pre-determined schedule.

• **Technicality and Architecture**: The programming language should be modern and current robust e.g. C, C++, Java so that despite unreliable infrastructure, the software is stable.

• **Performance**: The software should be able to maintain the performance in terms of speed as the database grows in size. Database growth should not slow down the speed or performance.

• **Java**: Java can save MIS system through hacking.

9. Development of MIS

With mentioned issues and solutions of system security the development of MIS and other related IS can be improved by considering management and information system hierarchy side by side and not by following any one of the mentioned stages as shown in figure7. This will as a result look after all the concerns of a user and will help to develop more efficient and trustworthy system.
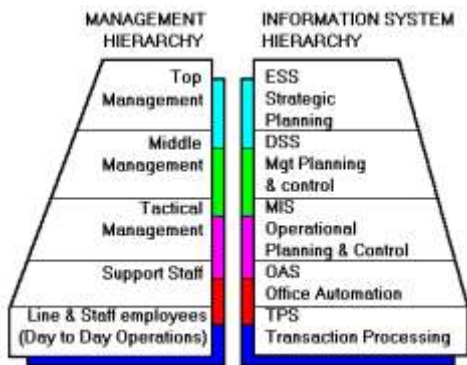

Figure No 7: Interrelated hierarchies

As a result the security and infrastructure will be based on the model

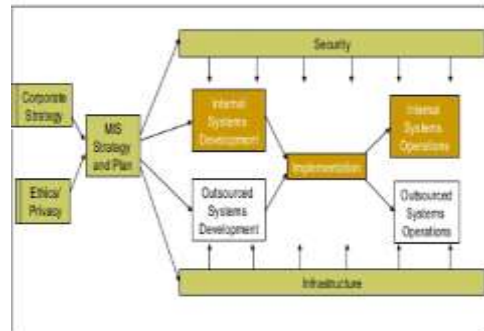shown before building up a successful MIS sytem in various organizations.

Figure No 8: MIS Development

Thus, changing the requirements according to the user demand. Internal and outsourced has to be considered beforehand to implement a secure system keeping in consideration the corporate strategies and privacy matters. This can be seen in figure 8.

10. Conclusion and Future Work

Although the significance of information has been realized and acknowledged by many companies and organizations as it is a key asset for any organization. Management Information System is a centralized database that has played key role in managing this information by supporting management. It also assists in making strategic decisions.

Unfortunately there are some security misuses that need to be removed. Still the preventative measures to ensure the security of their information is taken by few companies. The organization would face great problems if their data is stolen or invaded. This makes organization realized that security and

reliability of data has great significance. It has been observed over the past 2 years that the main causes of security hacks are as show n in figure
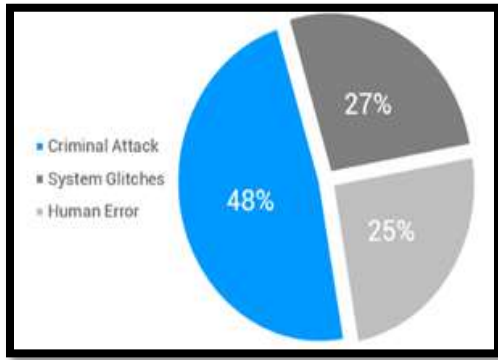

Figure No 9: Main causes of data breach in 2016

The need is to understand the difference of a secure and insecure system in any organization if the quality of work is dependent on management information systems. Hence, it has been deduced that once a highly efficient system with enhanced power is made by spending some cost; the overall working of organizations, educational institutes and other related sectors can be managed more effectively leading to utilize technology in advancing era whether it is MIS or any other IS.

The main goal of this research is to throw light on the impact of MIS on the business organizations and the security problems along with the solutions faced by organizations. If all the mentioned perspectives and solutions are kept in mind and are practically applied then accordingly the growth of security in systems including network, data and cloud security will be as shown in Figure 10 in the coming years.
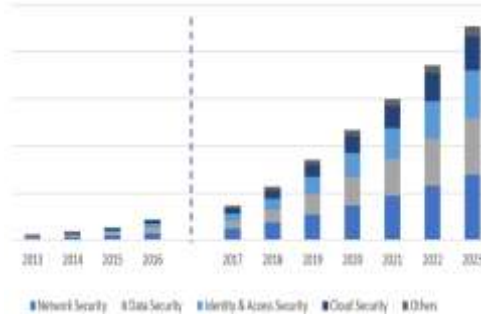

Figure No 10: Growth rate of security in systems in future

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