Management Information System in tailoring industry

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Abstract: The paper presents an attempt for analysis of the theory in the sphere of the Management Information System (MIS). The information needs of the various managerial levels are pointed out and the stages in the development of MIS are defined. The growing importace of the application of MIS in tailoring industry is shown.

Key words: Information Technology (IT)**,** Management Information System (MIS), tailoring industry

INTRODUCTION

We are living in a time of great change and working in an Information Age. Managers have to assimilate masses of data, convert that data into information, form conclusions about that information and make decisions leading to the achievement of business objectives. For an organisation, information is as important resource as money, machinery and manpower. It is essential for the survival of the enterprise.

Before the widespread use of computers, many organisations found difficulties in gathering, storing, organising and distributing large amounts of data and information. Developments in computer technology made possible for managers to select the information they require, in the form best suited for their needs and in time they want. This information must be current and in many cases is needed by many people at the same time. So it have to be accurate, concise, timely, complete, well presented and storable. Most firms nowadays depend on IT. But personal computers (PCs) themselves will not improve organisational productivity: this only comes about if they are used efficiently and effectively.

The information system is the mechanism to ensure that information is available to the managers in the form they want it and when they need it. It is designed to support their work through providing relevant information for their decision-making. Computer systems can clearly aid organisations in the processing of data into accurate, well-presented, up-to-date and cost-effective information. Weather that information is also concise, relevant, timely and complete will depend largely on the capabilities of the people involved in its processing and selection.

Defining the terms

Technology is a general term for the processes by which human beings fashion tools and machines to increase their control and understanding of the material environment. The term is derived from the Greek words *tekhne*, which refers to an art or craft, and *logia*, meaning an area of study; thus technology means, the study, or the science of crafting.

Information technology (IT) and computers can be viewed as tools enabling the rapid capture, manipulation, storage and communication of information. They may help the managers to administrate and control, to make decisions but not to lead. IT is a term that covers the hardware and software used for storing, processing or communicating information. It is through IT that companies can define, gather, store, manipulate, and communicate data to smooth the flow of information.

Although the terms data and information tend to be used interchangeably, there is a real distinction between the two concepts. Data are row, unanalysed numbers and facts about events. Information, in contrast, results when data are organised and analysed in some meaningful way.

Strategy concerning computer technology application may be viewed as IS strategy and IT strategy. IS strategy is concerned with ascertaining an organisation's demand for applications and overall development of organisation systems, whereas IT strategy will concern itself with how those demands are actually satisfied (Barnatt, 1994). In other words, company's requirement will determine the means sought to fulfil their technological solution. The informational strategy will provide the foundation for the IT strategy. In a good company, IT strategy should be linked to the business strategy.

The term management information system (MIS) made its first appearance in U.S. navy report on the use of computers to construct a single integrated system to manage all navy resources.

The MIS idea spread rapidly throughout the administrative systems community, encouraged by a spate of subsequent reports and conferences sponsored by the American Management Association. MIS was an "information" system because it informed managers, not because it was full of information in technical sense, though the distinction soon blurred as the idea of MIS spread.

MIS is every system, which provides information for the managerial activities in an organisation. For about a decade, from its introduction in 1959 to the end of the 1960s, this very broad definition of MIS spread rapidly and was endorsed by industrial corporations, consultants, academic researchers, management writers, and computer manufacturers.

 The term "management information system"(MIS) is synonymous with computer-based systems. Used broadly, it is seen as the system satisfying all the information needs of managers. MIS is the study of providing information to people who make choices about the disposition of valuable resources in a timely, accurate, and complete manner at a minimum of cognitive and economic cost for acquisition, processing, storage, and retrieval. Another definition emphasises the use to which the information is put, rather than the way it is produced:

"A system to convert data from internal and external sources into information and communicate that information in an appropriate form, to managers at all levels in all

functions to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible."(Bee and Bee, 1999)

Others, however, give it more limited scope. They see it as a system collecting and analysing data and producing reports. Its purpose is to help managers to solve structured problems. But it should also fulfil a number of other purposes:

- It should provide a basis to analyse warning signals that can originate both externally and internally; this is the main function of data base ;
- It should automate routine operations thus avoiding human work in the processing tasks;
- It should assist management in making routine decisions;
- It should provide the information necessary to make non-routine decisions;
- It should serve as a strategic weapon to gain competitive advantages.

MIS may be viewed as a mean for transformation of data, which are used as information in decision-making processes. Figure 1 shows this understanding about information as data processed for a definite purpose. (Lucey, 1997)
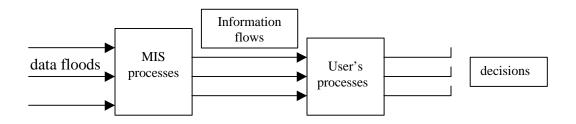

Figure 1. MIS and decision-making process

There are so many definitions of MIS. For the purpose of this research, MIS can be defined as a system providing management with accurate and timely information necessary to facilitate the decision-making process and enable the organisation's planning, control, and operational functions to be carried out effectively. So in this way MISs increase competitiveness of the firm by reducing cost and improving processing speed.

MIS is by its very nature an eclectic discipline. It is the study of providing information to people who must make choices about the disposition of valuable resources in a timely, accurate, and complete manner at a minimum of cognitive and economic cost for acquisition, processing, storage, and retrieval.

The beauty of MIS is that it ties together a whole set of operations that general managers already thought were important (such as reporting, financial controls, and production scheduling) and bound them to the exciting but disruptive technology of the computer, thus blurring distinctions between the technical and the managerial.

Differing information for different management levels

Efficient MIS enables management to plan co-ordinate, organise and control. It provides information needed for strategic planning and for day to day operations. The various levels of management typically require the information they receive to be formatted in

different ways. These different levels of management decision-making can be described as follows: strategic, tactical and operational. So the information could be:

- operational information – largely internal, mainly historical, detailed information on a daily or weekly basis, often quantitative, high precision, narrow in scope.
- tactical information – internal and external sources, with concern on the current and future performance, aggregated (summarised), information on products, sales, investment profits etc.
- strategic information – largely external (information on economic conditions, technological developments, the actions of competitors), forward looking, qualitative; information is important, precision is unimportant, wide ranging, incomplete.

Decisions are impossible without information and managers are constantly seeking more and better information to support their decision making, hence the growth of IS. It is a term that today is often taken to mean networks of computers, but strictly speaking should also include non-computerised channels of communication such as regular meetings or even phones. Of course, neither the word "information" nor most of the things to which it was applied were new. As one might expect, information was originally the event that took place when a person was informed of something. In the early twentieth century, the term "information" was frequently associated with communication (especially in the public relations sense), with intelligence (in the military sense), and with the acquisition of knowledge. It continued to imply that a human recipient was being informed (just as the word "education" today implies that a person is being educated).

The design of the MIS must take into account the information needs of the various managerial levels, as well as the routine transaction-processing needs of the total organisation. For example, as shown in table 1, the information sources for operation control are found largely within the organisation, while the information sources for strategic planning tend to be outside the organisation.). However, the value of information is offset by the cognitive and economic costs of acquiring, processing, storing, and retrieving it.

Table 1. Information Requirements by Decision category

CHARACTERISTICS OF INFORMATION	OPERATIONAL CONTROL (FIRST LINE)	TACTICAL CONTROL (MIDDLE LEVEL)	STRATEGIC PLANNING (TOP LEVEL)
Source	Largely internal		Largely external
Scope	Well defined,narrow		Very wide
Level of aggregation	Detailed		Aggregate
Time horizon	Historical		Future
Currency	Highly current		Less current
Required accuracy	High		Low
Frequency of use	Very frequent		Less frequent

To survive, every organisation collect information, communicate it internally and process it so that managers can make decisions quickly and effectively in pursuit of organisational objectives in a changing, competitive environment. The IS is the nervous system witch allows an organisation to respond to opportunities and avoid threats. It is widely

acknowledged that firms with the best and most effective ISs are those that have clear and well thought out IS strategy.

The speed at witch companies gear up to the new market conditions and maintain a responsible MIS will play a major role in determining their success or failure in this changing environment. It can give a company sustainable competitive advantage by improving production, sales and administration performance.

The ability to use computers creatively to collect, organise, distribute, and control information is spelling the difference between success and mediocrity in industries ranging from banking to women's clothing. Computers are changing the way the business is done.

Almost all business organisations normally have some kind of information system for management. Accounting rules, stock control and market monitoring systems are the most traditional and common examples. The power of technology has transformed the role of information in business firm. Now information has become recognised as the lifeblood of an organisation (Figure 2). Without information, the modern company is dead. (Papows, 1998)
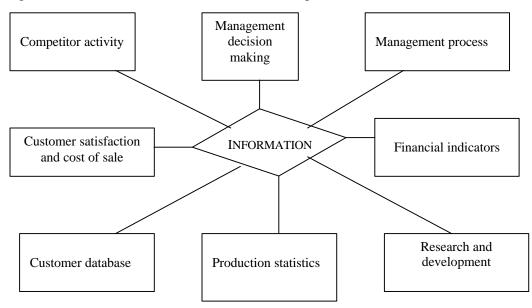
Figure 2. Information – the life-blood of the organisation.

Despite the enormous investment in IT during recent years, demonstrating the effects of such investment on organisational performance has proven extremely difficult.

However, it is possible, indeed likely, that in many instances IT has the potential to provide important benefits within the same year the investment is made. In any event, research reflecting relationships between IT investment and organisational performance and productivity might be more convincing if it were based on IT investment in both current and earlier periods. There are huge variations across organisations, some have spent vast sums on IT with little benefit, while others have spent similar amounts with tremendous success." They hold that the greatest benefits of IT appear to be realised by organisations when IT investment is coupled with other complementary investments such as organisational reengineering,
restructuring, and redesign.

Stages in the development of Management Information Systems

Organisations have always had some kind of management information systems, even if it was not recognised as such. Developments in the use of the new technology have gone through several stages.

Stage 1: **EDP.** When computers were first introduced into organisations, they were used mainly to process data for a few business functions – usually accounting and billing. Computers were located in electronic data processing (EDP) departments, because of the specialised skills needed to operate the extensive and complex system.

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         ┌─────────────────────┐
         │  Organisational data │
         │  (from EDP department)│
         └─────────────────────┘
                    │
                    ▼
┌──────────┐   ┌─────────┐   ┌──────────────┐
│ Managers │◄─►│   MIS   │◄──│ External data │
└──────────┘   └─────────┘   └──────────────┘
                    │
                    ▼
              ┌──────────┐
              │ Reports  │
              └──────────┘
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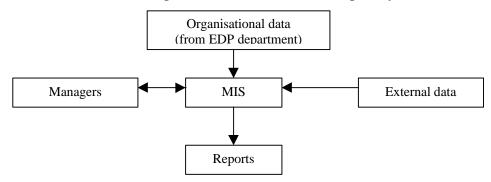
Figure 3. Diagram of MIS

Stage 2: **MIS.** The growth of EDP departments spurred managers to focus more on planning their organisations' information systems. As the EDP departments' function expanded beyond routine processing of masses of standardised data, they began to be called management information system (MIS) departments. Figure 3 is a diagram of MIS (Kroenke, 1987). MIS uses data created mainly in the EDP departments and it can be developed only when there already exists such department. It does not make any changes in these data. MIS could obtain information from internal and external sources.

Stage 3: **DDS.** Later on, when remote terminals were introduced, more than one department began to use the same system. At this stage the MIS has grown beyond a data processing role and included the provision of a number of decision support systems (DSSs). While the MIS controls routine operations using data processing methods, the DSS is seen as supporting decisions on "less routine issues" and solving "semi-structured" problems.

Stage 4: **ARTIFICIAL INTELLIGENCE and EXPERT SYSTEMS.** One of the fastest growing areas of information technology, artificial intelligence uses the computer to simulate some of the characteristics of human thought. The term artificial intelligence (AI) means the simulation of human thought process in order to select the best mode of behaviour, e. g. taking a decision or responding to a situation. Expert systems are a major application of AI. They act like a human "expert" in analysing unstructured situations. Expert systems are also called "knowledge-based" systems since they are built on a framework of known facts and responses to situations.

It is believed that we are moving rapidly from industrial-based society to an information-based one. The application of computer technology to management information and decision support systems has certainly had an effect on how managers perform their tasks and on how organisations behave.

Impact of organisational factors on information systems

Information systems are seen as a strategic resource within the organisation: that is, they have an important impact on key operations which determine the livelihood of the organisation.

When the organisation is a small, simple set-up the need for sophisticated information can be virtually non-existent. In a small firm with a manager, a small number of staff and customers, that manager will probably know every aspect of the business in detail and will probably keep his/her own records of useful information in his/her informal information system. The situation becomes trickier if within this one business there are two different types of activity. The manager might begin to feel the need for some formal system for managing information in order to allow him/her to prioritise the use of time and concentrate on the important indicators of business success.

A great number of small and middle enterprises (SME) seemed to lag technologically from the bigger firms and might be excluded from the e-markets (figure 4). This may have a negative influence on their future development. The managers of SME probably think that the business processes in their firms are not such complicated and do not require the use of IT (Official Publication of the EC, 2000).
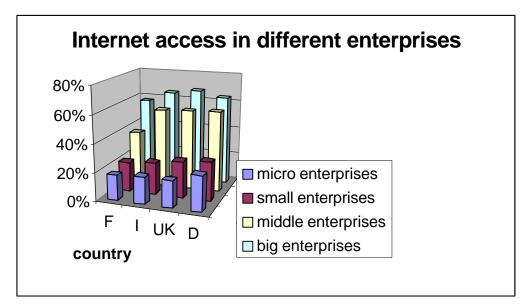

Figure 4. Internet access in different enterprises

It is obvious that the need for management information increases with the complexity of the organisation, the complexity of the tasks carried out and the rate of change in the environment of the organisation. Companies where responsibilities are clearly defined and understood will find it much easier to set up effective information systems, as will those where the structure and culture are not in conflict. By structure is meant the way in which an organisation is physically arranged in departments and/or locations. Culture is a term for the set of traditional and habitual ways of thinking, feeling, reacting to opportunities and problems that confront an organisation (Bee &Bee, 1999). Both structure and culture might influence the way information flows through the organisation.

The changing nature of organisations and work

The development of the IT offers enormous opportunities to improve the way in which organisations work. However, the introduction of a new technology does not lead automatically to improved performance. It might result in greater job insecurity and might cause fear from the process of adapting the workforce to the requirements and pressures of implementation of modern MIS. On the other hand, MIS made it easier to store, process and access information than ever before. Employment might be also affected through the changes in demand for more and broader skills and for fewer unskilled people. More than ever, organisations seamed to be dependent on highly skilled and motivated workforce.

To benefit from their investment in new IT and MIS, firms probably need to address not only the technological environment within they operate, but also their relationships with suppliers, customers and other trading partners, systems of productions, the physical configuration of machines, and the development of labour and skills. Organisational change in MIS should therefore ideally consist of a set of closely-related developments in the structure of firms, in production and work processes, in labour and in skill requirements, and in technological systems.

Communication researchers have for many years explored how verbal and nonverbal communication patterns affect a host of phenomena ranging from persuasion to productivity. As the global economy and online communities collide, more and more organisations have come to depend on collaborative technology to support distributed teamwork.

Flexible working arrangements, such as part-time work, working at or from home, self-employment and flexible employment contracts might become increasingly prominent in he shift towards the introduction of information society. The implementation of modern MIS might improve the firm's competitiveness and make them flexible, more responsible and more profitable through decreasing the cost and creating possibilities for accessing new markets and customers.

Computers and MIS in tailoring industry

Computers have been used in the clothing industry since the earliest introduction of IT. In those days only the very large tailoring companies had the resource to take up this technology. They used them mainly for business data processing.

During this decade, the textile industry has progressively taken up computerisation. The application of computers is wide ranging covering almost all activities necessary to run a textile business: accounting and transaction processing, sales and marketing, production planning, computer-aided management, real-time management etc. Over time the nature of computer systems in their implementation has taken several forms: standalone applications based on one computer; an integrated centralised system where one large computer handles a range of applications; applications catered for by having ones data processing distributed over a network of computers.

A lot of clothing companies continued to invest not only in very latest production technology, but also in design technology and computer systems. They use computers complete with Intranet so that a lot of people working on PC's throughout the group could access and work with data on the main computer. MIS in clothing companies should include the control of the stock, processing of each individual order, accounting etc. Most of the tailoring enterprises have a web site and in this way e-commerce is widening. E-commerce offers a unique opportunity for economic growth, to improve industry's competitiveness and to stimulate investment in innovation and the creation of new jobs. Commercial communications are an essential part of most electronic commerce services. Electronic commerce is global and requires increased international coordination. Its implementation opens not only new markets, but it also changes the way in which business is made. E-commerce over the World Wide Web is growing at an astronomical pace. Many of the top e-commerce sites report revenue growth exceeding 100 percent per year. Electronic commerce will allow the companies of tailoring industry to compete on the world's scene, regardless their geographic situation. Europe is late in developing and
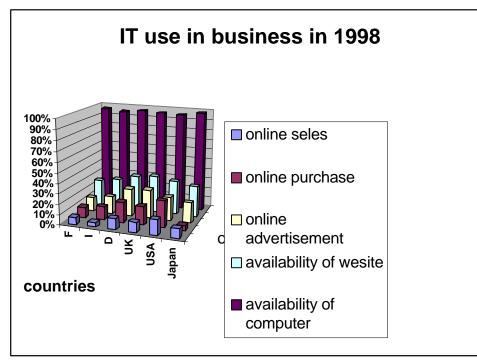

Figure 5. IT usage in business in 1998

implementing of the modern IT (figure 5). A small number of companies use all possibilities of IT. (Official publications of the EC, 2000)

The effect of the use of modern IT might have many fold: higher efficiency, increased productivity, optimised processes, enhanced quality control and thus improved products; better design; lower cost and shorter lead times.

The development of the IT and the process of globalisation usually has direct influence on the labour market and leads to the appearance of new flexible tailoring companies. The implementation of modern MIS improves the production process in the enterprise and changes the relationship between managers and their subordinate.

Conclusion

Computers and MISs are one of the important organisational resources for the firms of clothing industry. The tailoring companies should spend a huge amount of money for buying, development and maintenance of such systems. A great number of enterprises could not operate properly and successfully without the implementation of MISs in the new changing environment. The modern IT will become the main force determining the pattern of the 21st century and giving great opportunities in all spheres of our life.

MISs have great contribution to increased competitiveness and effectiveness of managers in decision-making process and solving of different problems which appeared in managing an organisation.

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