CHAPTER 1

MIS PHILOSOPHY

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PREAMBLE :

The chapter describes MIS scenario and philosophy in general. With the fundamental fact that there is no general MIS which can be standardised for all the organisations, a model is developed.

In this chapter-1 MIS Philosophy, a model is developed considering

(a) Various parameters and their attributes

(b) Trends in MIS design, development and implementation

(c) Experiencing from the history of emerging MIS

which are very essential to be considered while designing any MIS for any organisation. The model helps in arriving at a suitable design that could help in considering the requirements of the organisation appropriately that would contribute for effective implementation.

1.1.0 OBJECTIVES AND SCOPE

MIS word has been used for last twenty five years or more but its meaning has always remained a matter of interpretations. Especially, when you talk of computer based MIS, there is no single model design of computerized MIS which can be generalized for all the organizations. And it is rightly so because Management Information System has to change itself with the management and their need of information systems.

Although lots of studies have taken place in the areas of management Information Systems, it was felt that no consolidation is made about the aspects which has direct bearing on the success or the failure of the MIS--more so in reference to the Indian environment which is totally different than those of the developed countries. And if we critically observe, most of the work on MIS is done in those countries which is hardly relevant to us.

If you look at the scenario of MIS in India, almost all MIS which was designed to take care of the organization's information need have remained far from its implementation. And when we analyse the reasons for not getting implemented they are converging to a few identified parameters. This study is basically carried out to understand the process of identifying those parameters which are must to be taken care of while designing the MIS for an organization and deciding the methodology of MIS implementation. The study basically

aims at the successful implementation and therefore the entire thrust is given cn the philosophy of MIS design considering the type of the organization, size of the organization and the culture of the management rather than focusing on the system development tools and the nitty-gritty of the theory of a system design. The study is also concentrated cn evolving the methodology of systems implementation and therefore the approach to the implementation of real life projects have been discussed and included as the part of the study.

1.1.1 SPHERE OF STUDY

When the study was started by the author, it was with the global objective of sharing the experience of systems implementation and identifying the shortcoming of design and implementation process which leads to the failure of a systems project. But subsequently, it was felt that merely identifying the problem areas would be an astrologer's approach whc tells you all about the future problems without any remedy. And therefore, the entire study was concentrated on problem prevention approach and derived the exhaustive guidelines for an appropriate system design and its implementation methodology. In the process, the sphere of the study is extended from business applications to academics and from hardware/software optimization to Human Behavioral aspects of the systems implementation.

The presentation of the study is divided in the following

major sections. These sections, being part of a common study, do not have the exclusive identity, however, the attempts have been made to minimize the overlapping and redundancy in concept presentations wherever possible.

The study is divided in three major sections which are further splited in individual chapters. The major sections are :

I MIS Philosophy

II MIS Implementation Methodology

III MIS Projects

Through this study, the aim is to contribute in terms of extending the MIS definition to Indian context, to present the approach adopted for MIS Design and implementation in key decision making areas.

1.1.2 MIS SCENARIO (1969-1994)

Concept of MIS was coined in early sixties in US and in early seventies in India. Various dimensions of MIS were presented in different international journals where the main focus remained on summarised presentation of an information system. By mid seventies in US and in early eighties in India the definition of MIS started getting shift and MIS was labelled as an information system supporting management in its process of planning and decision making. This was a true derivation of the objective of MIS but then it remained far away from its implementation. The gap in implementation got wider in India as compared to US because the inception of PC's got

delayed in India. Only in early '85 Indian market started getting the feel of revolutionary change of Information Technology and thereby the changing concept of information system. Till 1985 the information system was more or less the outcome of data processing and not much advantage was seen in terms of MIS support for decision making.

With micros in the market and because of the conceptual change in hardware architecture and technology, the concept of on-line system and networking came out as an easy, economical solution. This made it possible to introduce the concept of DSS, MIS and Expert Systems. Further the information integration and communication became possible by networking solution in terms of LAN and WAN. Even the information system in special sector like defence, telecommunication, transportation and research came out as true real time system with an advancement in remote sensing technique, image processing and other graphical user interface developed in last decade.

If we look at the Indian scene of MIS development of last 25 years I would consolidate the phases as under :

- MIS Conceptualisation 1969-1979
- MIS Development 1980-1987
- MIS Implementation 1988-1994

While talking of implementation phase it signifies the effort and the direction. However, the purpose and utilization is far away from its objectives in most

cases. And when the desired results are not achieved the right approach is to look at the problem all over, review and arrive at the right approach. .pa

MIS IN LARGE PUBLIC SECTOR

Although substantial investment in hardware/software and manpower was made by the large public/government undertakings no significant results have been achieved in terms of MIS development/implementation. Individual application areas have been computerised and various summarised data have been generated which forms a part of organisational MIS. In most cases, these applications are restricted to the accounting system. There are exceptions like NDDB or BHEL like organisations who have progressed much higher in terms of computerisation but a formal MIS which helps in planning and decision making process is still to emerge as true MIS.

MIS IN LARGE PRIVATE SECTOR

In large private sector, in last decade, the investment on hardware/software has gone up multifold. The orientation has changed and the management has been realising the increasing cost of manpower and need of improved efficiency and productivity. Therefore, the trend has been observed on cut on manpower and higher thrust on automation in whatever areas it is possible. When computerisation is aimed at improved productivity and efficiency, automatically it gives a direction towards information systems helping in decision making

process. There are many organisations in last couple of years who have been in forefront in terms of computerisation. Many of these organisations have integrated their manufacturing process information with other support functions like materials, finance, marketing etc. Many organisations have DSS environment. And there are engineering organisations having extensive CAD/CAE applications.

1.2.0 3-D INTERFACE FOR SUCCESSFUL MIS IMPLEMENTATION

1.2.1 INTRODUCTION :

While studying and reviewing the parameters that lead to the success or the failure of Management Information Systems in any organisation, it becomes quite apparent that no MIS can be standardised for any organisation since there are various parameters which make the systems design different from organisation to organisation. Precisely, this is the fundamental objective of analysing the factors that needs to be considered while designing the management information systems for any organisation. In this paper these factors are identified, analysed and required approach is derived which can lead to a successful MIS design and implementation.

PHILOSOPHY OF MIS MODEL :

Any organisation would be looking for the management information systems which can help them in planning, execution and control and would expect it to be a tool for their decision making. No MIS would be successful unless it is coherent with the style of management and designed as per the functional requirement of the management and the organisation. The successful MIS is one which takes care of the parameters important for building the MIS model. These parameters take care of all those aspects which

otherwise leads to the failure of MIS at the implementation stage. The model of MIS is based on the concept of 3D-Interface.

1.2.2 3-D INTERFACE :

3-D interface is a precisional model approach which is normally ignored while designing the MIS database.

The following three dimensions are considered for the said interface :-

DIM 1 :- TIME

Time dimension deals with the span of computerisation and the time in which the MIS base is envisaged.

Time dimension would largely depend on the other two dimensions i.e. MAGNITUDE and ENVIRONMENT. Over and above it depends on various other factors which are contributing in arriving at the feasible time estimates required for MIS implementation. These factors are as under :

PRESENT STATUS :

To consider the starting point. This would mean that the New System is going to be the change from Manual System to a Computerised System or from one Computerised System to another Computer based system.

It would be very clear that both the above situations are entirely different and right from the planning and design stages they draw the different considerations.

HARDWARE CAPABILITIES :

The system design is largely dependent on the hardware configuration and capability of operating systems. Especially, main memory and auxiliary storage would be important aspects to be considered for the design of a system.

COMPLEXITY OF THE SYSTEM :

The complexity is of course taken care of while you consider the other two dimensions viz. Magnitude and Environment. However, the complexity is to be viewed from the angle of design complexity vis-a-vis the interfaces between different application areas. For example, interface between Inventory, Production Planning and Sales or Interface between Finance, Sales and Production Planning.

MANPOWER :

Available manpower is an important aspect for Time estimate of a given project. While considering the manpower, besides the in-house people available for the project, one time aid from the consultants could also be considered when available time is shorter than usually required.

DIM 2 :- MAGNITUDE

The magnitude dimension takes care of the quantitative aspect of computerisation in terms of number of systems, number of programs and the volume of

transactions.

The weightage of the magnitude dimension is different if the hardware is of the PC range and or otherwise.

Magnitude Dimension is decided based on the three factors. These three factors give clarity about the activities and efforts involved and while Magnitude Dimension is viewed together with Time and Environment, it gives the direction about the implementation methodology for the MIS.

The three basic factors are as under :-

SCOPE :

A review process or initial feasibility study is required to be carried out which scans through each application area and recommends whether the system required to be computerised or not. And if `yes' what is going to be the scope of the system.

Similar exercise if carried out for all the functional areas with respect to its priority level. This priority levels are pre-set by the management as a part of their perspective plan of MIS.

VOLUME :

The Volume defines the efforts required for the Analysis and the Design of the system. This would precisely include various Input/Output and number of programs involved. The assessment of the volume shall

consider `System's Life Cycle' approach and work out the plan of systems development and implementation phases in the context of other two dimensions viz. Time and Environment.

PLATFORM :

The hardware and software platform is an important parameter. The system design and software development shall largely depend on the hardware and the operating system. In '70s and early '80s it was directly dependent as hardware capabilities and the versatility of operating system. But in present day it decides about the software tools available on a given hardware and thereby the time required for the software development. Even the design will outrightly change if the platform is Micro's instead of Mini OR Supermini systems. Similarly, design and the programming efforts shall be much different if the same is to be ported in RDBMS environment.

The platform shall not only change the Magnitude Dimension but it would radically change the Time Dimension also.

DIM 3 :- ENVIRONMENT

Environment dimension takes care of the operating environment of the organisation. It analyses and elaborates the attributes like the Level of professional management, background of operating

personnel/users in terms of education, exposure to computer etc.

The second phase of environment dimension considers the MIS environment, envisaged in terms of on-line, real time, TP application etc.

The 3-D interface not only analyses the above aspects but also works out the detailing of each dimension so as to take care of each component at the stage of system design itself.

Although Environment Dimension is also interdependent on other two dimensions viz. Time and Magnitude, it considers two fundamental aspects. These two aspects are :-

ORGANISATION :

The Organisation aspect shall take care of the operating environment of the organisation. It analyses and elaborates the attributes like the level of professional management, back ground of the operating level personnel/users in terms of education, exposure to the computer etc. The level of operating personnel is also a key decision area for the successful implementation of a system.

SUPPORT :

This aspect considers MIS environment in terms of the support required for on-line, real time, OLTP, or

LAN/WAN environment. The support would mean the basic design consideration for the environment in which it has to work. Though this aspect is also part of the Time and Magnitude Dimensions, it has special emphasis here in terms of the environment dynamics. Environment dynamics would consider organisation and support as a combined entity and would give the due weightage accordingly.

1.2.3 **METHODOLOGY FOR ARRIVING AT 3-D INTERFACE** :

The methodology elaborates the process of 3-D interface for its implementation to the real life situation. The methodology is divided into two stages depending on the characteristics of various factors involved in 3-Dimensional model. These two stages and their corresponding attributes are as under :

Stage I - SYSTEMS ANALYSIS : **ATTRIBUTES** :

- Present Status
- Complexity of the System
- Scope
- Volume
- Platform
- Support

Stage II - EXTERNAL INPUT : **ATTRIBUTES**

- Hardware Capabilities
- Organisation
- Manpower

Stage I

SYSTEMS ANALYSIS :

The systems analysis is a normal procedure for any systems design process. But with the special requirement as a process for 3D-Interface, the attributes are reviewed critically and as far as possible quantified in order to assess the factual position. Since the sensitivity of each factor changes the approach to the working of 3D-Model, the systems analysis is performed in greater details than the usual way of systems analysis.

Attributes :

For each attribute the relevant informations are to be collected and compiled.

ATTRIBUTES	DATA REQUIRED	CORRESPONDING WEIGHTAGE RESPONSE
a. Present Status	- Change from Manual system to a computerised system	10
	- From computerised system to another computerised system	5
b. Complexity of the system	- Integration of two systems	7
	- Integration of more than two systems	10
	- Stand alone MIS	5
c. Scope	- Need to computerise Or desirable	2
	- Full application area or Partial	1-5
	- Priority Low/Average/High	1-3
d. Volume	- No. of Input Files/ Data Structure	1-2
	- File size Max/Min	1-2
	- No. of programs/links	1-3
	- No. of output/queries	1-3
e. Platform	- Mini/Micro Computer	1-3
	- RDBMS	0-3
	- Software Tools	0-2
	- Operating System (proprietary/open)	1-2
f. Support	- On-line	5
	- Real Time with analog interface	10
	- Networking	5
	- OLTP	7

Stage II

EXTERNAL INPUT

External Input are collected in order to complete the information required to understand the 3D-Model. These are the attributes which are not covered as a part of systems analysis process. The response to these attributes comes from the top management and depends on management decision about investment on the hardware, and the philosophy of man-management. The attribute like organisation is derived through the feedback of consultant who quantify the aspects related to organisational culture, level of user group etc.

The response to each attribute can be collected and compiled :

ATTRIBUTES	DATA REQUIRED	CORRESPONDING RESPONSE
Hardware capabilities	- Main memory	0-3
	- Auxilliary Storage	0-3
	- OPEN SYSTEM	0-2
	- Hardware Redundancy	0-2
Organisation	- Professional Management	0-4
	- Operating Level people	0-3
	- Background of Users	0-3
Manpower	- Available Time Enough/or Not	0-5
	- Manpower - As required	0-2
	- Support from consultants	0-3
Support	- On-line	5
	- Real Time with analog interface	10
	- Networking	5
	- OLTP	7

1.2.4 BUILDING UP THE MODEL

Once the attributes are listed down with the corresponding data and weightage, what is required is assigning the weightage in a given situation. While assigning the weightage value, one has to be careful in understanding the concept that these weightages are directly proportionate to the effort involved. Therefore, assigning the weightage value would rightly reflect the corresponding efforts. For example, where the 'SCOPE' of the application area is "full", weightage shall be 5 (Maximum) as compared to 'partial' which could be 1 to 4. Similarly, in 'Platform', attribute availability of RDBMS shall have 0 weightage value instead of 3 in case RDBMS is not available; considering that RDBMS demands reduced software efforts.

The above methodology shall be more clear if we work out one case and pass through the process in arriving the three coordinates value and construct a model.

Let us assume the following situation.

ATTRIBUTES	DATA REQUIRED	CORRESPONDING WEIGHTAGE RESPONSE
a) Hardware	Change from Manual System to Computerised	10
b) Complexity of the System	- Integration of two systems	--
	- Integration of more than two systems	10
	- Stand alone	--
c) Scope	- Need to computerise	2
	- Full application	5
	- Priority - High	3
d) Volume file	- Number of Input	2
	- File size	1
	- Number of programs	3
	- Number of output/queries	2
e) Platform	- Minicomputer	3
	- RDBMS available	0
	- Software Tool-Not available	2
	- Proprietary system	2
f) Support	- On line	5
g) HW Capability	- Main memory - limited	2
	- Aux.Storage - limited	2
	- No open system	2
	- No HW redundancy	2
h) Manpower	- Available Time	2
	- Manpower not as required	1
	- Support from consultants	2
i) Organisation	- Professional Management	2
	- Operating level people	2
	- Background of the user	3

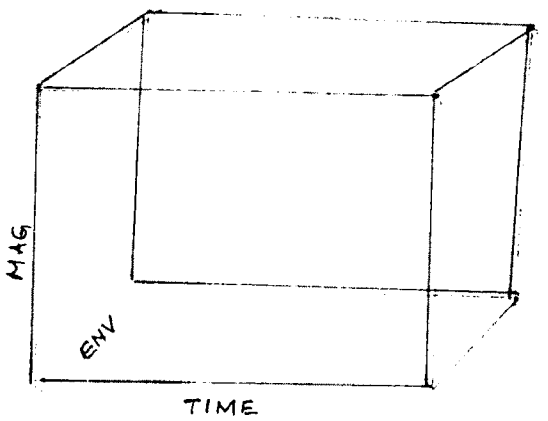
Now let us try to sum up the value as per each dimension.

DIM 1 TIME (a) + (g) + (b) + (h) = 33

DIM 2 MAGNITUDE (c) + (d) + (e) = 25

DIM 3 ENVIRONMENT (i) + (f) = 12

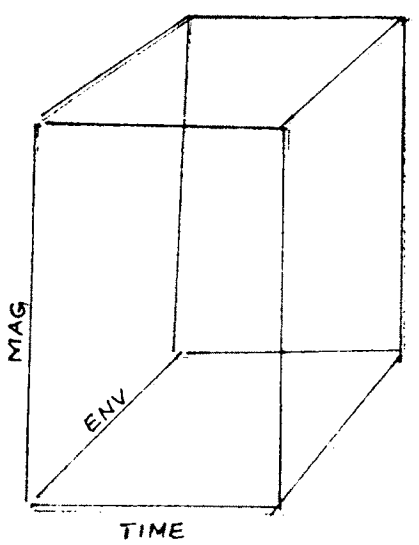
If we try to plot in a pictorial form :



Similarly, presume the co-ordinated values as

DIM 1	TIME	=	20
DIM 2	MAGNITUDE	=	28
DIM 3	ENVIRONMENT	=	18

The pictorial view shall be as under :



1.2.5 SENSITIVITY OF THE MODEL

From the above diagrammatic representation it becomes clear that the size of the box represents the efforts required while the shape of the box represents where more efforts are required and where relatively less efforts are needed.

The sensitivity of the model can be observed when you change the weightage of different attributes which leads to the change in the co-ordinate value. Let us look at some of the glaring examples which give the direct impact on the model.

Situation	Result
- Bring RDBMS as platform	Reduced efforts
- Have larger RAM and Auxilliary storage	Reduced efforts
- If complexity of system is 'Stand alone'	Reduced efforts
- If available time for 'Manpower' is not enough	More efforts
- If operating level people are not having adequate background and users having poor background	More efforts
- If the support is required for Real Time system with analog interface	More efforts

And many such situations can be simulated which reduce or increase the efforts required.

Also, presently all the three dimensions can not have equal value because total weightages of each

dimensions are not perceived as equal. DIM1 has 40 weights, DIM2 has 30 and DIM3 has 20. If we accept the arguments that the efforts required in all the three dimensions are the same, then we have to assign the weightages in such a way that the total weightage for each DIM is the same. The approach here is to introduce the concept of 3D-Model. The perceptional changes can always be introduced without any difficulty in the described framework.

1.2.6 APPROACHES FOR IMPLEMENTATION :

As a part of methodology we have discussed the two stages of process which helps in arriving at the various attributes, its corresponding values and ultimately deriving the values of each dimensions. We also discussed the sensitivity of each dimension and knew that how the value of each dimension is changing with each situation. Now let us try to understand the approaches required under given situation.

1.2.7 APPROACH IN DIFFERENT SITUATION :

In different situations model building exercise shall project a different diagram. Say-

- Bring RDBMS and it will reduce the effort.
- Have larger RAM and storage which will reduce the effort.
- Now look at the situation where unlimited manpower is available.
- Look at the situation where users are trained.

In all these situations, sensitivity of the model shall be tested and it would project a different model.

1.2.8 **SHORTCOMING OF THE MODEL** :

Since all the three dimensions do not have equal number of attributes they do not have equal weightages. And therefore, in any situation all the three dimensions do not have equal value. This characteristic of a model is a shortcoming of the model since theoretically there is no dimension which is less important.

1.2.9 **IMPLEMENTATION METHODOLOGY OF MIS** :

When we understand various attributes of the model, we run through the process of understanding and analysing various components which decide the weightages of these attributes. These weightages are proportionate to the efforts involved. Therefore, we get the clear direction about where we shall have to concentrate our efforts. For example, when we look at the Environment DIM we know that professional management shall have less problem in systems implementation as compared to conventional management. Similarly, with adequate manpower and educated users the implementation efforts are likely to be much less.

Approach for implementation shall therefore be different for the different situation. For the

smoother and successful implementation, systems analyst shall have clarity about what all factors are important and needs to be taken care of for the systems implementation. By careful study of each attribute, which demands efforts, a guideline can be worked out by a systems analyst beforehand which can become a reference point at every stage of implementation.

In a special situation where management approach is not professional, users do not have adequate background and have inadequate operating personnel, a strategic and conscious decision can be taken not to go for an ambitious project of total on-line system and integrated MIS. Rather it can be planned for partial on-line envrionment and a stand alone MIS emerging out of individual computerised application preferably on Micros platform.

Building up the model must therefore help in deriving the necessary strategy and guidelines for the successful systems implementation.

1.3.0 EXTENSION OF MODEL

The extension of the 3D-Model is envisaged by equalising the weightages of all the 3 Dimesions. Therefore the diagram itself shall reflect the picture of proportionate efforts involved. This extension is not felt absolutely necessary here because the

approach is to develop the understanding of various attributes involved and to derive the required implementation guidelines.

The objective is fulfilled by creating an appreciation about the fundamental aspect that it is not possible to have general purpose MIS because there are so many attributable variables which makes the system a success or a failure.

1.3.1 CONCLUSION

The successful MIS has a very little contribution from the hardware and software expertise. The nucleus of the success of a system is its implementation and the focus of the implementation depends on various parameters which can be placed under three co-ordinates viz. Time, Magnitude and Environment. The 3-D interface is an approach to the total solution but the success depends on how best the methodology is adopted. This approach is going to be a vital aspect in the time to come since the focal point of computerisation is now shifting from software development to the systems implementation. It is observed that more and more tools are making the software development process easier everyday but with the complexity of the organisational environment, the implementation process has become more and more challenging.

Our contribution through this chapter is as follows :

A three dimensional general purpose model is evolved out which gives a comprehensive guidelines for all the required parameters to be taken care of for the MIS design and development which is likely to be implemented successfully.

In general we find many models of MIS are designed and developed at various organisations. However, this meet the unrecoverable failure at implementation stage because of the lack of insight on MIS outlook. We have contributed and presented through this chapter, the methodology which help in overcoming the attributes that leads to the failure and help effective implementation.