Development Of MIS

- How a designer will get the idea to develop the MIS.

  Development of LONG RANGE plan of the MIS.

  - Introduction
  - Contents Of MIS Plan
  - MIS Plan Linked to the Business Plan
    - MIS Goals and Objectives
    - Strategy For the plan achievement
    - The architecture of the MIS
    - The System Development Schedule
    - Hardware and Software Plan

Introduction

- **Any kind of business activity calls for long range plans for success, the same being true for MIS.**
- **In MIS, the information is recognized as a major resource which need to be managed very well and calls upon the management to plan for it and control it.**
- **Many organization misinterpreted the computer and they were used as a computing and accounting purposes and not as a information processor for management .**
- **Due to advance in technology now the computer can be used as a tool for processing and communication.**

- **Computer can communicate to any distance and share data, information and physical resources of other computer.**
- **Computer can be used for storing large database or knowledge base.**
- **Computer can be used to know the current status of any aspect of the business due to its on-line real time processing capability.**
- **Due to these capabilities of computer , information can be considered as a valuable asset to the organization.**
- **To manage such valuable information there should be a system**

- **This system should deal with management information and not with data processing alone.**
- **It should provide support for management planning, decision making and action.**
- **It should support the needs of the lower management as well as that of the top management.**
- **It should satisfy the needs of different people in the organization at different levels having varying managerial capabilities.**
- **It should provide support to the changing needs of business management.**
- **In short, we need a Management Information System flexible enough to deal with the changing information needs of the organization.**

- **We need an open system and design of such system is very complex task.**
- **It can be achieved only if MIS is planned , The plan of MIS is concurrent to the business plan of the organization.**
- **Development of MIS depend upon the information need of management.**

Contents of the MIS plan

- **A long range MIS plan provides direction for the development of the systems, and provides a basis for achieving the specific targets or tasks against a time frame.**

MIS Plan is linked to the Business Plan

Business plan	*MIS plan*
Business goals and objectives.	Management information system, objectives, consistent to the business goals and objectives.
Business plan and strategy.	Information strategy for the business plan implementation playing a supportive role.
Strategy planning and decisions.	Architecture of the Management Information System to support decisions.
Management plan for execution and control.	System development schedule, matching the plan execution.
Operation plan for the execution.	Hardware and software plan for the procurement and the implementation.

MIS Plan is linked to the Business Plan

- **MIS Goals and Objective**

It is necessary to develop the goals and objectives for the MIS which will support the business goals. The MIS goals and objectives will consider management philosophy, policy constraints, business risks, internal and external environment of the organization.

The typical statements of the goals are as under.

- **Provide online information on the stocks, markets and the accounts balances.**
- **The query processing should not exceed more than three seconds.**
- **The focus of the system will be on the end user computing and access facilities.**
- **Information support will be the first in the strategic areas of management such as marketing or service or technology.**

Such statements of the goals and objectives enable the designer to set the direction and design implementation strategies for the MIS plan.

Strategy for the plan achievement.

The designer has to take a number of strategic decisions for the achievement of the MIS goals and objectives. They are:

(a) Development strategy: An online, a batch, a real time.

(b) System development strategy: Any approach to the system development . Operational versus Functional; Accounting versus Analysis; Database versus Conventional approach; Distributed versus Decentralized processing; one Database versus Múltiple databases SSAD vs OOD.

(c) Resource for system development: In-house versus external, customized Development versus the use of packages.

(d) Manpower composition: Analyst, programmer skills etc.

The architecture of the MIS

- **The architecture of the MIS plan provides a system structure and their input, output and linkages.**
- **It also provides a way to handle the systems or subsystems by way of simplification, coupling and**

decoupling of subsystems.

The system development schedule:

- **A schedule is made for development of the system.**
- **The system development schedule link with the information requirement which in turns link with the goal and objective of the business.**

Hardware and software plan

- **Give more importance for the technical and operational feasibility and economics of investment.**
- **One can take the phased approach of investment starting from the lower configuration of hardware going over to higher as development takes place. The process is to match the technical decision with the financial decision.**
- **The selection of the architecture, the approach to the information system development and the choice of hardware and software are the strategic decision in the**

design and development of the MIS.

- **The organizations which do not care to take proper decisions in these areas suffer from over-investment and under-utilization.**

Hence It is important to note the following :

1. The organization's strategic plan should be the basis for the MIS strategic plan

2. The information system development schedule should match with the implementation schedule of the business plan.

3. The choice of information technology is a strategic business decision and not a financial decision.

A Model of the MIS Plan

Contents	Focus
Corporate information	Where are we ?
Corporate philosophy	What is the foundation of business ? Policy, guidelines, culture
Corporate mission/goals/objectives	Where do we want to reach ?
Business risk and rewards	What is the risk ? is it worth the risk ?
Business policy and strategy	How do we achieve the goals and objectives ?
Information needs	What is the key in formation ?
Architecture of the plan	What are the tools for achievement ?

Continue….Model of the MIS Plan

Contents	Focus
Schedule of development	➢When and how will it be achieved ? ➢Details of the systems and subsystems and their linkages charted against the time scales.
Organisation of the plan	➢Who will achieve it ? ➢Manpower and delegation details. Internal and external resources.
Budget	➢How much will it cost ? ➢Details on the investment schedule and benefits.

Ascertaining the Class Of Information

- **We know that MIS design should provide all kinds of Information to all level of manager .**
- **Then designer should know that what kind of information is required to all levels of manager.**
- **To get the Information need of the management for business execution is a complex task.**
- **Information need is not static it's dynamic.**
- **This complexity can be handled if the information is classified on the basis of its application and the user.**
- **According to this information is classified as---**

Information Class	Example of information	User
Organizational	The number of employees, pr oducts, services. Locations, the type of business, turnover and variety of the details of each one of these entities.	Many users at all the levels
Functional	Purchases, sales, production, stocks receivables, payables, outstanding, budgets.	Functional heads
Knowledge	The trends in sales, The deviations from the budgets competitors' information.	Middle and the Top Management.
Decision support	Status information on a particular aspect, such as utilization, profitability standard. Non-moving inventory, overdue payments	Middle management and operations management
Operational	Information on the production, sales, purchase,dispatches consumptions, etc.	Operational and management Supervisor, Section Officers.

- **Organizational Information**

- **The information entity is one, but its usages are different.**
- **Since the usage of the organizational information is at different levels for different purposes, it is advisable to store the data in the form of the database which will be used by the users for generating their respective information needs.**
- **One can define the organizational information as a whole and provide suitable information system architecture to generate the information for various users.**

- **Functional Information**

- **This information is used by a manager to plan and control his function.**
- **Functional information is largely factual, statistical and detailed in multidimensions of the function.**
- **The functional information is normally generated at equal time intervals; say monthly, quarterly, etc. for understanding the trend . Such information is used for planning, budgeting and controlling the operations of the function.**
- **Functional information is also used for some aspects of business: like, the stocks of finished goods, receivables, and orders on hand, the raw material stocks, orders pending and payable .**

- **The functional information can be assessed on the following three parameters-**
  - **The work design,**
  - **the responsibility and**
  - **functional objectives.**

What kind of function is going to happen accordingly we can get functional information.

- **Work design : For example, for the customer order scrutiny the available stock, the price, the terms of payment and the probable delivery is an information set evolved out of the work design of customer order processing.**
- **Responsibility: Every Manager has some responsibility to achieve the target and goals so inform them these information at regular intervals so that they can change their decisions.**
- **Functional objectives: Each function has its own objectives which are derived out of the corporate goals.**
  - **The total sales per month is Rs 10 million.**
  - **The finished goods inventory, not to exceed Rs 1 million.**
  - **The outstanding more than six months not to exceed Rs 0.2 million.**
  - **The employee attendance per month should be 99 per cent.**

- **Knowledge Information**
- **The knowledge information creates an awareness of those aspects of business where the manager is forced to think.**
- **For example, whether the sales are declining and the trend is likely to continue in the next quarter.**
- **The product is failing continuously on one aspect and the reason of failure is the process of manufacturing.**
- **It highlights the deviations from the norm or standard.**
- **The nature of this information is analytical and relates to the past, the current and the future.**
- **The knowledge information is reported in graphic formats for a quick grasp and managerial response.**

- **Decision Support Information**
- **Most of the information required by the middle and the top management is for decision making.**

- **The information does not act as a direct input to the decision making but supports the manager in the efforts of decision marking.**

- **For example, the information on the non-moving inventory justifies the decision of its disposal at throwaway prices.**

- **Another Example ,The demand forecasts information aids in the decision on determining the economic order quantity for production or a sale.**

- **The source of this information could be internal or external to the organization.**

- **It can be determined by identifying the tools, techniques, models and procedures, used by the managers in the decision making.**

- **Operational Information**
- **This information is required by the operational and the lower level of the management.**

- **The main purpose of this information is fact finding and taking such decisions which will affect the operations at a micro level.**

- **For Example, the decisions may be to stay on overtime, draw additional material, change the job from one machine to the other, and send a reminder to the supplier for the supply of material.**

- **These decisions are such that they make the routine administration of the business smooth and efficient.**

- **These decisions do not fall in the category of the managerial decisions.**

- **The sources of operational information are largely internal through transaction processing and the information relates to a small time span and is mostly current.**

Determining the Information Requirement

- **The sole purpose of the MIS is to produce such information which will reduce uncertainty in a given situation.**

- **What kind of method should be used to collect the information is depend upon the certainty and uncertainty level of that situation/problem.**

- **The difficulty to determine a correct and complete set of information is on due to the following factors :**

1. The capability of the human being as an information processor, a problem solver and a decision maker.

2. The nature and the variety of information.

3. Reluctance of decision makers to spell out the information for the political and the behavioral reasons.

4. The ability of the decision makers to specify the information.

Based on the uncertainty scale the following methods are suggested.

- **Asking or interviewing**
- **Determining from the existing system**
- **Analysing the critical success factors**
- **Experimentation and modeling.**

Methods of Handing Uncertainty

Level of uncertainty	*Level of management*	*Method*
Low (Near certainty)	Operations management.	Ask Questions
Probabilistic knowledge (A risk situation)	Middle management	Determine from the existing systems
No probabilistic knowledge (Very risky)	Middle and top management	Determine through the critical success factors.
High (Total uncertainty)	Top management	Determine through Experimentation and modeling

Asking or Interviewing (Operational mgr||Low Risk)

- Asking Question and interviewing an art.
- Question can be asked as open Q and closed Q.
- When more decision makers are involved in similar function or position then we can adopt Brain Storming Session.
- Delphi method can be adopt . Ask the experts to give their best answers.

Determining from the Existing System

(Middle Mgr || Probabilistic knowledge || Risk Situation)

- We can get the information from the textbooks, handbooks, research studies which can determine the information requirement
- We can get information from some systems such as the accounts receivables, the accounts payables, the pay roll, the inventory control, the financial accounting, etc.
- We can get the information from existing system's manual.

Analyzing the Critical Factors

(Middle &Top Mgr || No Probabilistic knowledge || Very Risky Situation)

- Every business performs successfully on the basis of certain critical factors. The analysis of these functions or factors will determine the information requirements.
- Many times a function is singularly critical to the successful functioning of a business.

For example:

- In a high technology business, the management of the technology becomes the critical function.
- In a service organization, the management of service becomes a critical factor.
- In a consumer industry, marketing and service become the
- critical functions.
- The information requirements of such organizations relate to these critical factors.

Experimentation and Modeling (Top Mgr || High || Total Uncertainty)

- The experimentation would decide the methodology for handling the complex situation. If the method is finalized, the information needs are determined as they have evolved through the experimentation.
- For Example, to decide the correct marketing strategy about a product Test marketing of a product is an approach of the experimentation.
- Some time models are also used for deciding the initial information needs and they are modified during the implementation stage.
- Benefit of the modeling is user can have a hand on experience and it can be modified or get replaced completely with cost effectiveness.

Development and Implementation of MIS

- **After decide the MIS development plan which consist of systems and subsystems , next step is to development the strategy which determines where to begin and in what sequence the development can take place.**

- **The designer first develops systems independently and starts integrating them with other systems.**

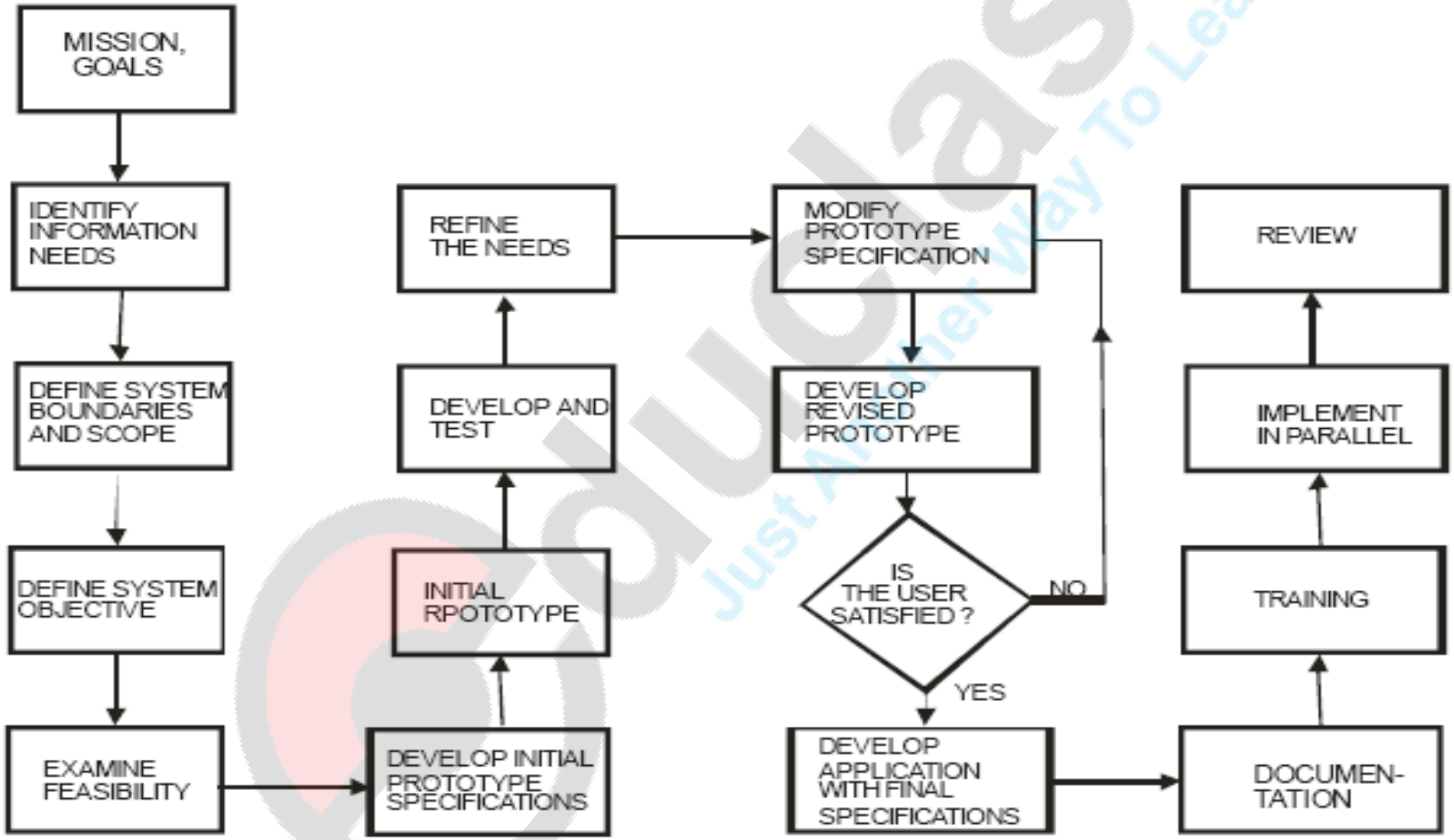
There are two types of development approaches which can be chosen on the basis of -- the system is open or closed and the uncertainty or certainty level of the information need. These two approaches are---

- Prototype Approach
- Life Cycle Approach

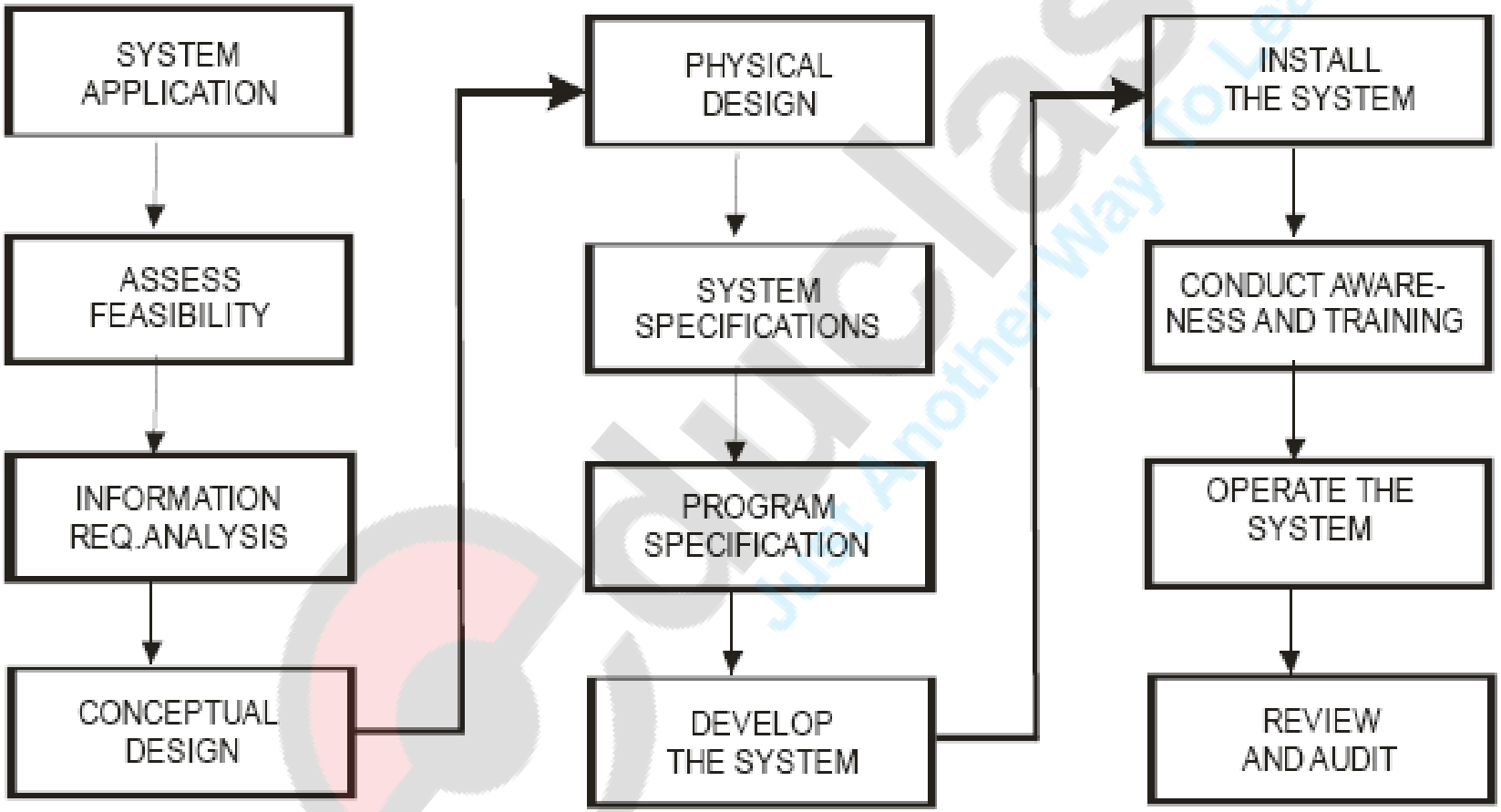
Comparison of two Approaches :

Prototyping approach	*Life cycle approach*
Open system with a high degree of uncertainty about the information needs.	Closed systems with little or no uncertainty about the information needs.
Necessary to try out the ideas and application.	No need to try out the ideas and application as it is already proven.
When experimentation is necessary to determine the scope of the system .	When experimentation is not necessary as scope of the system is fully determined.
User of the system wants to tryout the system before he commits the information requirements.	The user is confident and confirms the information needs.
The system and application is highly custom oriented.	The system and application is universal and governed by the principles and practices.

Prototype Approach



Life Cycle Approach



Implementation of the management information system

- Implementation of system brings the changes in the organization and the success or the failure of system implementation depends upon the liking and disliking of the system by the employees i.e. their behavior.

- The designer has to handle the human factors carefully.

- The user of the system has a fear complex---Fear about security and fear about the role played by the person i.e. new system can reduce the importance in the organization.

- There are certain guidelines for the systems designer for successful implementation of the system. The system designer should follow following points---

Guidelines for the systems designer for successful implementation of the system.

- **Not question beyond a limit the information need of the user.**
- **Not forget that designer role is to offer a service and not to demand.**
- **The designer should respect the demands of the user.**
- **Not mix up technical needs with the information needs. He should try to develop suitable design with appropriate technology.**
- **Impress upon the user that the quality of information depends on the quality of input which he provides.**
- **Impress upon the user that he is one of the users in the organization and that the information is a corporate resource and he is expected to contribute to the development of the MIS.**

-

- **Designer should inform the user that your participation is very important to make success of MIS.**
- **Realize that the user is designer's best guide on the complex path of development.**
- **Not expect perfect understanding and knowledge from the user as he may the user of a non-computerized system.**
- **Impress upon the user that the change, which is easily possible in manual system, is not that easy in the computer system .**
- **Impress upon the user that perfect information is non-existent; his role therefore still has an importance in the organization.**
- **Conduct a periodical user meeting to know the ongoing difficulties of the users.**
- **Train the user.**

Hence Implementation of the MIS in an organization is a process where organizational transformation takes place. This change can occur in a number of ways.

The Levin's model suggests three steps in this process.

The first step is----

- Unfreezing ---The organization to make the people more receptive and interested in the change.

The second step is----

- Choosing--- A course of action where the process begins and reaches the desired level.

And the third step is----

- Refreezing--- Where the change is consolidated and equilibrium is reinforced. Many a times, this process is implemented through an consultant.

MIS: Development Process Model

The Factors of Success and Failure

Many organizations use MIS successfully, others do not. Though the hardware and the software is the latest and has appropriate technology.

There are some factors which make the MIS a success and some others, which make it a failure. These factors are—

Factors Contributing to Success

If a MIS is to be a success then it should have all the features listed below--

- MIS should focus on the major issues of the business.
- An appropriate information processing technology is required.
- The MIS is oriented, defined and designed in terms of the user's requirements.
- The MIS is kept under continuous supervision, so that its open system design is modified accordingly.

- **MIS should follow communication theory.**
- **The systems must consider all the human behavioural factors .**
- **Information should be considered as a global resource in design of MIS.**
- **The design of the MIS has such features which make up a user-friendly design.**
- **The MIS design should have basic capability to quickly meet new needs of information.**
- **Information should be considered as corporate resource and hence generated centrally.**
- **MIS should provide critical information to Top Management.**

Factors Contributing to Failure

Many a times MIS is a failure. The common factors which are responsible for this are ---

- **The MIS is conceived as a data processing and not as an information processing system.**
- **The MIS does not provide that information which is needed by the managers.**
- **Underestimating the complexity of the business and not considered in the MIS design.**
- **Adequate attention is not given to the quality control aspect of the inputs.**

- **Lack of training and appreciation.**
- **The MIS does not meet certain critical and key factors of its users.**
- **Lack of user-friendly system . Lack of administrative discipline .**
- **A belief that the computerized MIS can solve all the management problems of planning and control of the business.**
- **Wrong coding and deviating from the system specifications.**
- **The MIS does not give perfect information to all the users in the organization.**

Approaches to MIS development

- Identify Business Goals
- Determine Critical Business factors
- Develop Business strategy and IS strategy
- Identify critical business applications
- Make decision analysis and enumerate operational and strategic decision
- Develop business performance indicators
- Identify information entities to decision support to business
- Determine IS structure to generate information to build MIS
- Build MIS superset as prescribed in general model of MIS

Strategic Management of Business

- Strategic management is a process of formulating, implementing and evaluating cross-functional decisions that will enable an organization to achieve its long term goals and objectives.
- The focus of strategic management is on dealing with competition and risk of emerging threats to business.
- It is the highest level of managerial decision making activity, formulated by the top management and executed by the organization's CEO and the executive *team*.
- Strategic management process is very complex and requires strong information support measure, monitor, and track and controls the strategy operations and its performance.
- This requirement can be fulfilled if organization designs and implements a design of Management Information System (MIS) focusing exclusively on developing of business strategy, supporting its implementation, measuring its execution progress, monitoring and tracking its performance.
- The design of such MIS is called as Strategic Design of MIS.

Why Strategic Design of MIS?

- Business is no more a domestic affair; it is now international, crossing the national boundaries due to Internet and with the growth of the technology. The world has become a global village.

The impact of this paradigm shift on the business and industry is the following:

- Market for goods and services is now global.
- Information access is available 24 x 7 on Web.from anywhere.
- Customer has a wider choice of selection of products and its vendors.
- The business model therefore is customer driven.
- The competition to business is from world market.
- The new business models, based on internet web platform, face more competition as well as threat to business.
- Due to global networking capability of internet, the business model now is distributed on an international platform.
- Business process cycles have shrunk due to fast communication and collaboration between busi-ness partners.
- Organisation structures have become flat, lean and flexible.
- Organisations are now manned by knowledgeable workers who are empowered to make decisions rejecting the principle of management by 'Command and Control'.
- Information security and privacy have assumed greater importance and is a major critical factor in business model.

Strategic design of MIS is required due to the shifting from conventional firm to Digital firm , where there is no boundaries of business. Business going digital has increased the competition from all angles

Michel Porter has identified five forces , these are the threats to Business-

Forces(Threat to Business)

- Threat from substitutes
- Threat from new design
- Threat from new entrants
- Business Rivalry among competitors
- **Bargaining power of suppliers**
- **Bargaining power of customers**

The paradigm shift in the way business is conducted today has rejected t he 'Push model' and adopted 'Pull Model of the business.

The MIS design of a digital firm therefore has to be focusing on business strategy and hence it is termed as a 'Strategic Design' of MIS.

The strategic Design of MIS achieves the following---

- **Ensures information support to strategic decision making.**
- **To achieve set business operations and performance parameters targets.**
- **Controls critical success factors which drive the business.**
- **Manages mission critical applications efficiently and effectively.**
- **Enables continuous monitoring and controlling of Business performance parameters and business operations parameters.**
- **Ensures through feed forward control for ensuring the achievement of business performance**

Contemporary design of MIS provides only the Organizational information required by all , This design can help management when scenario is Not very competitive, Not very Risky, Business largely local, not global.

-

- Contemporary design of system is not appropriate due to the change in business scenario.
- Now the business is competitive, customer driven, risk ridden and it is global.
- The focus of management attention cannot be only on What has been achieved but also How It has been Achieved.
- Since business management is more strategic management, MIS must also focus on strategy, its implementation and results it produces.
- It must have a strong component devoted exclusively for strategy monitoring, tracking and evaluation for management review and action.
- The strategic design of MIS focuses on assessing and reporting on what has been achieved in business operations through Business operation measuring parameters and Key performance measuring parameters. After deriving these parameters the system develops

- Balance Score Card.
- Score Card.
- Dash Board.

How to Develop Measures of Business operations and business Performance

Let us illustrate this approach by taking a case of retail business operations of a mall like ' BIG BAZ-ZAAR'. Some business details of the big bazaar are given below.

- Business: Retail. Selling day to day needs of customers.
- Type of business: Service
- Number of items: Over 5000 and 8000 SKUs.
- Employees: 300 per shop.
- Floor boys, Supervisors, Customer care personnel, Floor managers.
- Billing Clerks, Accounts and Administration Personnel.
- Number of visitors: 5000 per day, 9 am to 9 pm.

KRAs:

1. Correct assessment of Customer needs and behaviour to keep their interest in the mall f buying.
2. Management of customer choices and preferences.
3. Inventory by SKU and floor and shelf space management.
4. Pricing and Promotion: Schemes, Offers, membership and its impact.
5. Customer Servicing Cycle: Entry to Exit with goods and bill.

CSFs:

1. Managing shelf space to stock required SKUs as per the needs to satisfy maximum scope customer requirement resulting into higher revenue.
2. Ability to reach customers through advertising and mailing to induce their frequent visits to mall.

3. Ability to provide efficient floor service in finding, handling and billing the items.
4. Minimum billing time, short queues and no rush at billing counters.

KPIs:

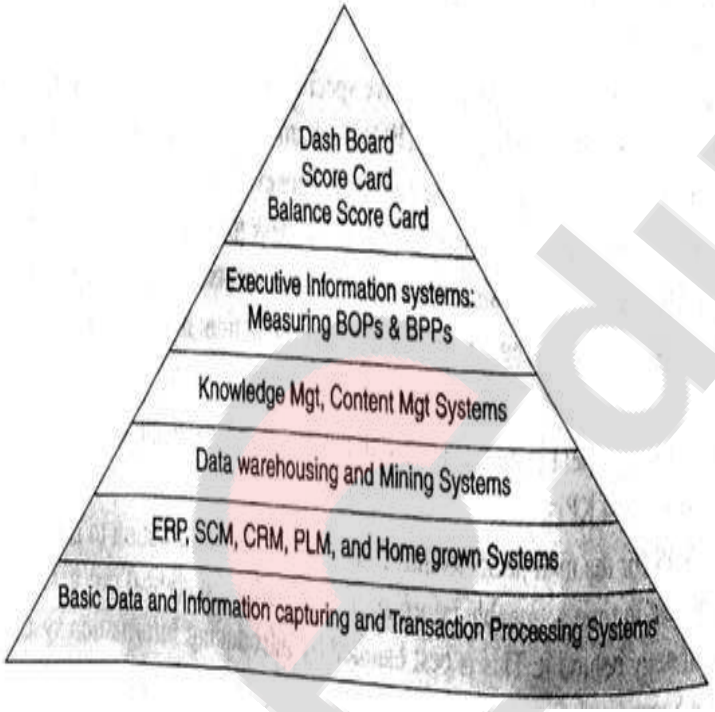
1. **Business Operations Parameters:**
   - Number of visitors per day (foot prints).
   - Number of bills per day.
   - Billing value (revenue) per day
   - Range of billing value: lowest and highest.
   - Billing value distribution by morning, afternoon and evening.
   - Number of member customers.
   - Most bought items by class: cosmetics, apparels, crockery etc.
   - Incidence of returns of sold items.
   - Number of customer queries on the floor: availability, price, performance, preferences, brand etc.
   - Fast and slow moving SKUs in each class.
2. **Business Performance Parameters:**
   - Ratio of number of Bills to number of visitors: Target 80%.
   - Ratio of member customers to number of visitors: Target 70%.
   - Customer visit pattern:
     Morning 30%, Afternoon 20%, Evening 50% vs Actual.
   - Average bill value vs Target average bill value. Rs 1200.
   - Inventory to Ssales ratio by class of items; Target: One to four.
   - Average sales per day by class vs average sales per day on its extra promotion strategy: Target 30%.

Strategic Design of MIS

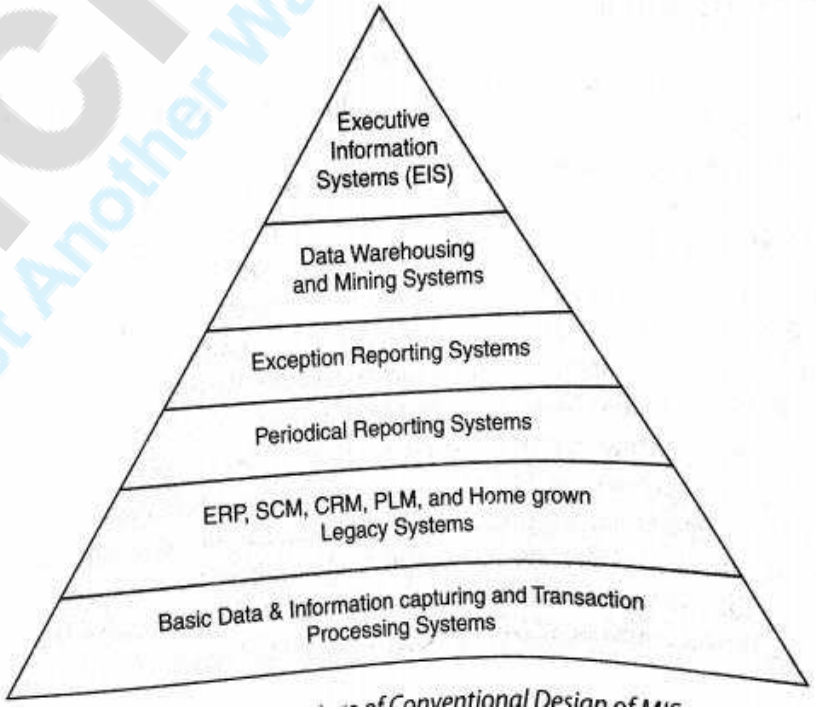
- **Strategic Design of MIS support strategy management of business through following information assistance-**
- **Provide a measure of business operation parameter to evaluate the business growth and trend over a time expected from strategy implementation.**
- **Provide a measure of business performance parameter to evaluate the effectiveness and efficiency of business.**
- **Highlighting non performing areas of concerns and attention.**
- **Bring attention to issues and problems inhibiting the performance.**
- **Support strategic, managerial and operational decision making processes.**
- **Automate managerial decision making, where possible.**
- **Build knowledge and business intelligence to support strategy formulations.**

VESIT_MCA

Strategic Design of MIS



Conventional Design of MIS



1. Study business environment and the competition.
2. Be clear on requirement of competitive necessities and advantages.
3. Define business goals and mission.

5. Determine critical success factors (CSF) of the business.
6. Build Business strategies to succeed in KRAs.
7. Determine KPIs(key Performance Indicators): BOPs & BPPs to reflect on strategy and its implementation.
8. Identify mission and goal critical business applications.
9. Identify the data needed to compute BOPs and BPPs.
10. Develop Balance Score Card, Score Card & Dash Board formats.
11. Develop consistent IS and IT strategy to implement strategic design.
12. Ensure MIS design has a component which links strategy to business results.
13. Examine the enterprise management systems and home grown systems to confirm that they are supportive to SD of MIS.

Business Strategy Implementation

- Business strategy needs to be defined with clear specifications with description to understand for efficient execution.
- Every strategy needs to be factored into subsystems strategies. Such breakup helps in resource estimation and allocation while implementing the strategy.
- Time is the essence of strategy implementation.
- Business strategy success is larger if implemented successfully as per time schedule and with milestone achievements.
- Though strategy is successfully implemented it is necessary to find whether it impacts business and produces results and achieves business goals.

Fig: Strategy Implementation and Performance Measurement process

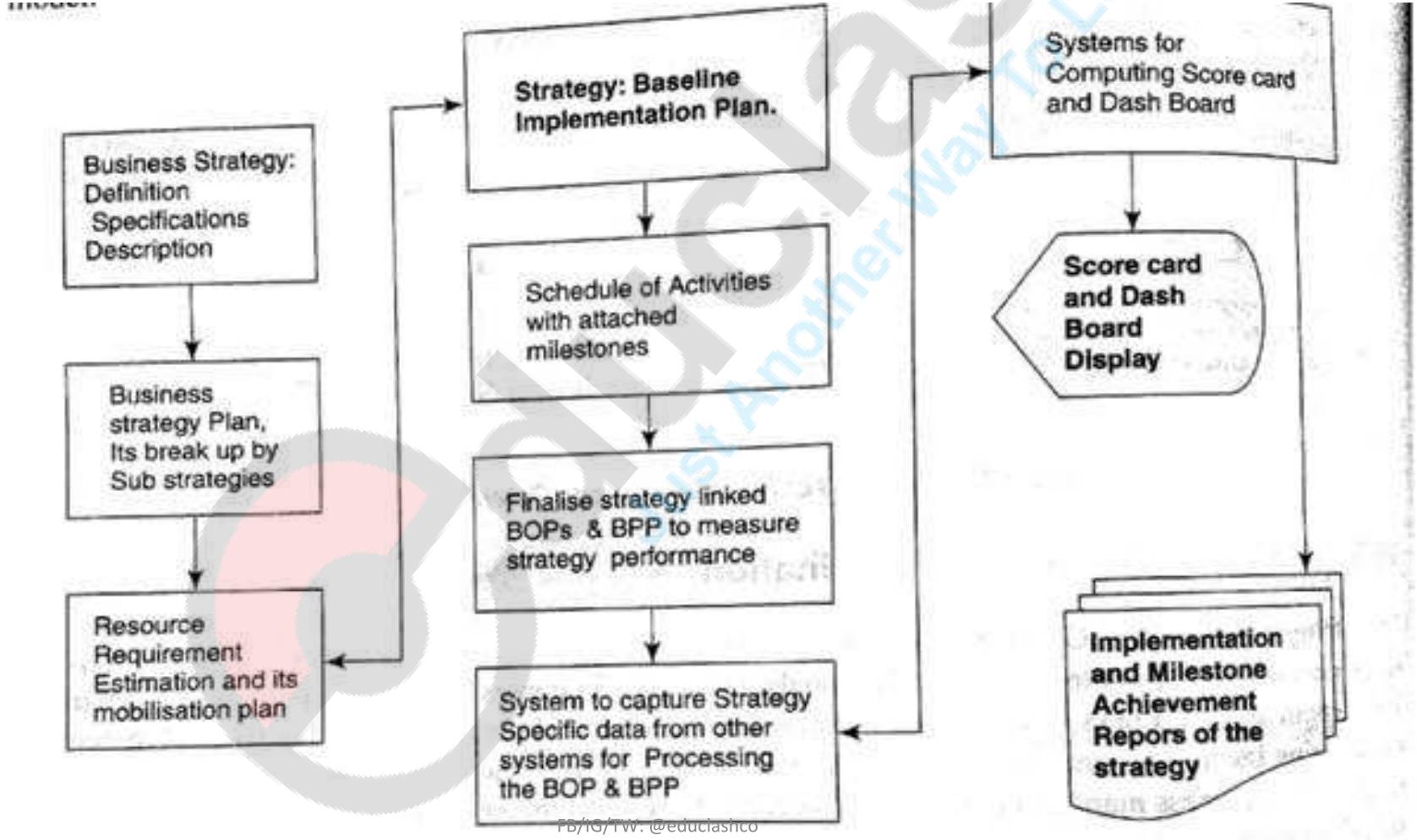


Fig: SD of MIS as a Control System to Manage Business Performance