Development of MIS
Development of MIS (Long Range Plans)

- To achieve success it is necessary to make plan first
- Constructing MIS plan take information as resource
- Use proper data entry methods and plan can be made from proper resources of organizations
- MIS plan must be flexible enough to deal with changes according to time, situation and adopt latest technology
- MIS plan can contain following major elements-
  - Deal with business plan
  - Strategy for plan achievement
  - The architecture of mix
  - The system development schedule
  - Hardware versus software plan
Development of MIS (Contents of the MIS plan)

- A long range MIS plan provides direction for the development of the systems.
- It provides a basis for achieving the specific targets or tasks against a time frame.
- Plan is strictly related with goals and objectives of the MIS:
  - Provide an online information of everything
  - Quick process of query
  - The focus of system will be on the end user
  - Information support system will contain strategic, tactical, and operational areas of business
## Development of MIS (MIS Plan vs Business plan)

<table>
<thead>
<tr>
<th>Business Plan</th>
<th>MIS Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business goals and objectives</td>
<td>MIS objectives and business goals</td>
</tr>
<tr>
<td>Business plan and strategy</td>
<td>Information strategy for business plan, implementation playing a supportive role</td>
</tr>
<tr>
<td>Strategy planning and decisions</td>
<td>Architecture for mis to support decision</td>
</tr>
<tr>
<td>Management plan for execution and control</td>
<td>System development schedule, matching the plan execution</td>
</tr>
<tr>
<td>Operational Plan for execution</td>
<td>Hardware and software plan for implementation</td>
</tr>
</tbody>
</table>
Development of MIS (Strategy for plan achievement)

- The designer takes number of strategic decision to achieve goal and objective of organization.
- Various strategies are:
  a) *Development strategy*: An online, a batch, a real time. Technology platform
  b) *System development strategy*: Any approach to the system development- operational versus functional, Accounting versus analysis, database versus multiple databases
  c) *Resources for system development*: In house versus external, Customised development versus the use of packages.
  d) *Manpower composition*: Analyst, programmer skill and know-how
Development of MIS
(Architecture of the MIS)

- Provides a system structure and their input, output and linkages
- Provides a way to handle the system or subsystems by way of simplification, coupling and decoupling of subsystems
- Spells out in detail the subsystems from:
  - data entry to processing,
  - analyst to modeling and,
  - storage to printing
Development of MIS
(Schedule for development)

- A schedule is made for the development of the system
- Preparing information schedule
  - first importance is given to the system requirement
- The development schedule is changed according to be weighted against the time scale for achieving certain requirement linked with business plan
- Schedule can be revised according to performance of business
Feasibility studies can effect on planning of MIS

Hardware and software which is selected for MIS plan should be technically sound and up to date

Selection of proper hardware and software should be part of strategic level decisions

Proper selection of hardware and software should link with goals and objectives of organizations
## Development of MIS (Model of the MIS plan)

<table>
<thead>
<tr>
<th>Content</th>
<th>Particulars</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Information</td>
<td>Business environment and operations</td>
<td>Where are We?</td>
</tr>
<tr>
<td>Mission, Goal and Objectives</td>
<td>Information needs</td>
<td>Where do we want to reach?</td>
</tr>
<tr>
<td>Business risks and rewards</td>
<td>Risk analysis and current status</td>
<td>What is risk?</td>
</tr>
<tr>
<td>Policy and strategy</td>
<td>Details of policies and status</td>
<td>How do we achieve goals?</td>
</tr>
<tr>
<td>Information needs</td>
<td>Strategic planning</td>
<td>What is key information?</td>
</tr>
<tr>
<td>Architecture of plan</td>
<td>IT detail</td>
<td>What are tools of achievement?</td>
</tr>
<tr>
<td>Schedule of development</td>
<td>Detail of system and subsystem</td>
<td>When it will achieve?</td>
</tr>
<tr>
<td>Budget and RoI</td>
<td>Detail of investment schedule and benefits</td>
<td>What is cost of budget and RoI?</td>
</tr>
</tbody>
</table>
To develop a successful system, total development process broken down into smaller basic activities or phases.

- Systems Planning
- Systems Analysis
- Systems Design
- Systems Implementation
- Systems Operation and Support
Development of MIS (Factors responsible)

- **External Factors**: conditions that exist in organization’s external environment.
  - **Industry level**:
    - characteristics as degree of diffusion of certain technologies,
    - availability of external know-how, for example, technology suppliers,
    - degree of innovativeness of the industry,
    - requirements imposed by major customers and external markets
    - overall levels of competition and technology sophistication
  - **National Policies**

- **Other Factors**:
  - **Customer Satisfaction**: Customer of the services should be satisfied by the presented system.
  - **Effective**: in terms of organizational benefit & user satisfaction.
  - **Efficient**: should use all the resources, organization values efficiently.
Development of MIS
(Factors responsible)

- Internal Factors: internal of the firm
  - Past Experience with Technology: in terms of exposure and organizational learning ultimately affects its future in developing technology.
  - Organizational Characteristics: characteristic like size
    - Larger firms → large capital investments, skilled human resources involved in the implementation and operation of such technologies.
    - Smaller firms → less affected by organizational inertia, greater degree of involvement of organizational member’s especially top management during implementation.
    - Ready to use software and less expensive equipments of MIS application are more attractive to smaller firms.
  - Organizational Pursued strategy:
    - on both orientation and technology policy.
    - Strategy reflects its action with market and technology, which ultimately modify its experience and consequently its overall characteristics and capabilities.
## Ascertaining Class of Information

<table>
<thead>
<tr>
<th>Information Class</th>
<th>Example</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational</td>
<td>Employee, products, services, location, turnover etc.</td>
<td>Many users at all levels</td>
</tr>
<tr>
<td>Functional</td>
<td>Purchase, sales, productions, stocks, marketing etc.</td>
<td>Functional heads and others</td>
</tr>
<tr>
<td>Managerial</td>
<td>Payable, outstanding, budget, statutory information</td>
<td>Middle and top level management</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Entire organization</td>
<td>Middle, top and bottom level management</td>
</tr>
<tr>
<td>Decision Support,</td>
<td>Status of information, various standard etc.</td>
<td>Middle and low level management</td>
</tr>
<tr>
<td>Operational</td>
<td>Information on production, sales, purchase etc.</td>
<td>Operational and management supervisor</td>
</tr>
</tbody>
</table>
Determining the Information Requirement

- Difficult to determine a correct and complete sets of information
- Factors responsible:
  - Capability constraint of human being as an information processor
  - Nature and the variety of information in précised terms
  - Reluctance of decision maker to spell out the information
  - Ability of the decision makers to specify information
- Methods of determining information requirements:
  - Asking or interviewing
  - Determining from existing system
  - Analyzing the critical success factors
  - Experimentation and modeling
# Methods of handling Uncertainty

<table>
<thead>
<tr>
<th>Levels of uncertainty</th>
<th>Level of management</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Operational management</td>
<td>Interview</td>
</tr>
<tr>
<td>A risk situation</td>
<td>Middle management</td>
<td>Determine from existing system</td>
</tr>
<tr>
<td>Very risky</td>
<td>Middle and top management</td>
<td>Determine threw critical success factors</td>
</tr>
<tr>
<td>High</td>
<td>Top management</td>
<td>Experiment , modeling and sensitivity analysis</td>
</tr>
</tbody>
</table>
Management Information Systems

Shaping the Future of IT

About Us

A Leader in IT Education and Research

Since pioneering one of the nation’s first Management Information Systems (MIS) curricula over four decades ago, the MIS Department at The University of Arizona has become a leader in IT education and research.

For over 28 consecutive years, U.S. News & World Report has ranked our program among the top five in the country.

Dynamic Research and Faculty

Our program reflects the vigorous dynamics of technology today. Our research is generating real-world solutions that improve business today. Our alumni hold leadership positions in diverse business environments — from Fortune 500 technology and consulting enterprises to emerging new ventures. Our distinguished faculty win research and teaching awards. We continue to pioneer in grant-funded basic and applied research and in educating over 5,000 undergraduate, graduate, and doctoral students in data science programs.

As we enter our fourth decade in MIS, we see many changes taking place. Today more and more corporations are outsourcing software design, development, and maintenance activities, as well as call and data center operations, to offshore facilities. It is critical that we produce MIS professionals who understand the strategic role information

https://mis.eller.arizona.edu/about-us

Development and implementation of MIS

- plan consists of various system and subsystems
- choice of the subsystem depends on its positions in the total MIS plan
- designer first develops systems independently and starts integrating them with other systems
- basically 2 approaches affected on MIS
  - Prototype approach
  - Life cycle approach
Development process model of prototype approach

1. Define New System Requirements
2. Create Preliminary Design
3. Create Initial Prototype
4. User Evaluation of Prototype
5. Modify Prototype based on User inputs
6. Satisfied?
   - Yes: Construct Final System
   - No: Thoroughly Evaluate and Test the System
7. Documentation
8. Training
9. Implementation
10. Review

SA
Development and implementation of MIS (Prototype approach)

- useful for complex system
- prototyping is a process of
  - progressively ascertaining the information needs
  - developing methodology
  - trying it out on a smaller scale with respect to the data and the complexity.
- designers task is complex and full of difficult in this approach
- multiple user can involve in this approach
Development process model of Life Cycle approach

- Confirm user requirements
- System analysis
- System design
- Programming
- Use and Evaluation
- Implementation
- Testing
Development and implementation of MIS (Life Cycle approach)

- useful when periodic reviews of system take place
- useful in modification of system required after particular time period
- provide system a stability with regular evaluation
- approach is based on rules and regulation on which system follows
- can not allow significant change in system.
- used in closed system where outcome of system is already decided before implementation of system
# Prototype v/s Lifecycle Approach

<table>
<thead>
<tr>
<th>Prototype Approach</th>
<th>Lifecycle Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Useful in open system where high amount of uncertainty about information is there</td>
<td>Useful in closed system which have certain information</td>
</tr>
<tr>
<td>Necessary to try out some assumption in decision making process</td>
<td>No need to try out any assumption</td>
</tr>
<tr>
<td>Experiment is necessary and control the cost before system has been implemented</td>
<td>No need to experiment anything</td>
</tr>
<tr>
<td>Tryout system before it</td>
<td>The user is confident about the system</td>
</tr>
</tbody>
</table>
Guidelines for proper implementation of MIS

- Identify role of user in system and give priority to user not designer
- Don’t mix technical need with information need
- Don’t challenge application of information in decision making
- Maintain quality of information in system
- Provide information as corporate resource
- Take regular feedback of user with proper interaction with user
- Ensure the overall system effort has management acceptance
- Enlist user’s participation by conducting periodic meetings time to time
- Realize user that are serving are true guide of system
- proper change in system time to time
- proper training to user with proper guidelines about usage of system
Management of information quality in the MIS

The quality of parameters is assured if following steps are taken.

- All the input is process and controlled as input and process design
- All updating and correction are completed the data processing begins
- Inputs are subjected with validity checks
- Access of data file is protected and secured through authorization scheme
- Ensure that complete data is processed in one transaction
- Due attention is given to the proper file name
- Back up of data and files are taken to safeguard loss of data
- Time to time audit constructed
- Modification of system is necessary
- Development with standard specification of design and development
- System controlled through program and provide required access control
- MIS model is consistent with business plan
MIS factors of Success

- Integrate MIS into the managerial functions to ensure that MIS focuses on major issues of business by setting clear objectives.
- Selecting an appropriate information processing technology required to meet data processing and analysis needs of MIS users.
- Orient, define and design MIS in terms of the user's requirements and ensure its operational viability.
- Keep MIS under continuous surveillance, so that its open system design is modified according to the changing information needs.
- Focus of MIS to be on the results and goals.
- Highlight the factors and reasons for non-achievement.
- Do not allow MIS to end up into an information generation mill avoiding the noise in the information and the communication system.
MIS factors of Success

- Recognize that a manager is a human being and therefore, systems must consider all human behavioral factors in the process of the management.
- Recognize that the different information needs for different objectives must be met with.
  - The globalization of information in isolation from the different objectives leads to too much information and information and its non-use.
- Make it easy to operate and, therefore, have a user-friendly design.
- Recognize that the information needs become obsolete and new needs emerge.
  - Design to have a basic potential capability to quickly meet new needs of information.
- MIS to concentrate on developing the information support to manager critical success factors
  - Concentrating on the mission critical applications serving the needs of the top management.
MIS factors of Failure

- When conceived as a data processing and not as an information processing system.
- does not provide that information which is needed by the managers but tends to provide the information generally the function calls for.
  - The MIS then becomes an impersonal system.
- underestimates the complexity in the business systems and does not recognize it in the MIS design leading to problems in the successful implementation.
- adequate attention not given to the quality control aspects of the inputs, the process and the outputs leading to insufficient checks and controls in the MIS.
- developed without streamlining the transaction processing systems in the organization.
- Lack of training and appreciation that the users of the information and the generators of the data are different, and they have to play an important responsible role in the MIS.
MIS factors of Failure

- does not meet certain critical and key factors of its users such as:
  - a response to the query on the database,
  - an inability to get the processing done in a particular manner,
  - lack of user-friendly system and
  - dependence on the system personnel.
- believing that the computerized MIS can solve all the management problems of planning and control of the business.
- lack of administrative discipline in following the standardized systems and procedures
- wrong coding and deviating from the system specifications resulting in incomplete and incorrect information.
- not giving perfect information to all the users in the organization.
MIS Categories

- Four categories of management information systems:
  1. data bank information system
  2. predictive information system
  3. decision-making information system
  4. decision-taking information system
MIS Categories

- Data bank information system
  - to observe, classify, and store any item of data which might be potentially useful to the decision maker.
  - Examples of the kind of data that might be recorded in such a database for a given village, region, or area are as follows:
    - Number of farms
    - Number of units of arable land (hectares, acres)
    - Average farm size
    - Amounts of selected farm inputs applied annually
    - Production per year on a unit of land for selected crops
A second example of data that might be recorded in a database (this time involving data internal to the organization) is as follows:

- Number of extension staff by category and assigned to a particular village, region, or area
- Number of work hours devoted by staff to selected concerns for a particular village, region, or area
- Total extension salary costs and other expenses by village, region, or area
- Number of demonstrations conducted for selected farm technologies by village, region, or area
- Number of on-farm trials conducted for selected farm technologies by region or area
- Number of radio, TV, and print media releases regarding selected farm technologies by time period and region or area

Each of these databases can be summarized and converted to single tabular presentations of information of interest to management.

When information from two or more time periods is compared, trends can be observed.
MIS Categories

- Predictive Information System.
  - moves beyond pure data collection and the determination of trends over time.
  - Predictive information systems provide for the drawing of inferences and predictions that are relevant to decision making.
  - If data from the above examples were to be used in this way, it is possible to obtain information useful for making predictions or for drawing inferences.
  - For example, tables containing the following information for a given village, region, or area might be produced:
    - The ratio between the number of farms and the various categories of extension staff members
    - The ratio between the amount of farmland and the various categories of extension staff members
    - Amount of extension financial operating resources allocated per year to selected farmer problems or concerns
    - Amount of extension financial resources, both salary and operating expenses, allocated per year to selected extension approaches to solving different farmer problems or concerns
MIS Categories

- Decision-Making Information System.
  - This system goes one step further in the process of decision making and incorporates the value system of the organization or its criteria for choosing among alternatives.
  - An extension organization's values are many and varied.
  - They include concerns for resolving farmer problems
  - increasing and providing for stability of farmer incomes, and improving the quality of farm life.
  - also include an intent to provide well for staff members (training, adequate salaries, etc.) and to aid in the process of bringing about rural economic development.
MIS Categories

- Decision-Making Information System.
  - Information regarding these various attributes helps managers to make more enlightened decisions. Examples of ways that an extension organization uses information from a decision-making information system are as follows:
    - Change in specific farm outputs (yields, practices) following selected extension activities
    - Change in staff productivity following selected interventions (in-service training, better transport, etc)
    - Comparison of relative costs and relative effectiveness of alternative extension delivery methods
    - Analysis of economic returns to farmers who adopt recommended practices as compared to those who do not
MIS Categories

- Decision-Taking Information System.
  - Examples of decision-taking information systems are not usually found in an extension organization. This is a decision system in which the information system and the decision maker are one and the same.
  - Management is so confident in the assumptions incorporated in the system that it basically relegates its power to initiate action to the system itself.
  - Airplanes carry automatic pilot systems, which are an example of a decision-taking system. Once activated, the system itself keeps the plane on course and at the proper speed and altitude (according to parameters determined by the pilot).
  - Another example of decision-taking information systems is found in modern factory production.
    - In automobile production, continuous inventories of parts are maintained by computer as cars move down an assembly line. Orders are placed automatically by the computer when additional parts are needed. This is done without the intervention of a manager.
- The choice of an appropriate management information system (MIS) category primarily depends on the nature of the decisions it supports.