
IT 304: Management Information System (MIS)

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Topics

- Data
- Information
- Information classification
- Information characteristics
- Information presentation

Information is Key

- The Information we have is not what we want
- The Information we want is not the Information we need
- The Information we need is not the Information we can obtain
- The Information we can obtain costs more than what we want to pay for it.

~Peter L. Bernstein, Economist, US

Information is a Resource

- It is Scarce
 - Available / Not available
 - Constraints in availing it
- It has a Cost
 - Who decides the “cost”
 - Which parameters can be considered for computing “cost” of gathering information
 - Relation between Cost and Effectiveness of the Information
 - Cost: Fund? Man Power? Effort? Duration?

Information is a Resource

- It has plethora of Uses
 - ❑ Who understands the uses?
 - ❑ “Understand” on basis of what? Who decides that basis?
 - ❑ “Uses” vs “Cost”
 - ❑ Trade-off between “Uses” vs “Cost”?
 - ❑ Biasness towards “Uses” / “Cost”?
 - ❑ Who takes the decision?

- There is an **opportunity cost factor** involved if one does not process Information
 - ❑ Extraordinary scenario requires taking “risk”
 - ❑ “Risk” is always an opportunity
 - ❑ Such opportunities often requires escalated cost.

Why we need Information?

- To ensure effective and efficient information collection, processing, and decision making
- Specific skills are needed **information collection, processing, and decision making**
- Effectiveness & Decision making are independent
- **Goal:** Effective Decision making
- This helps in overall development of an organization.

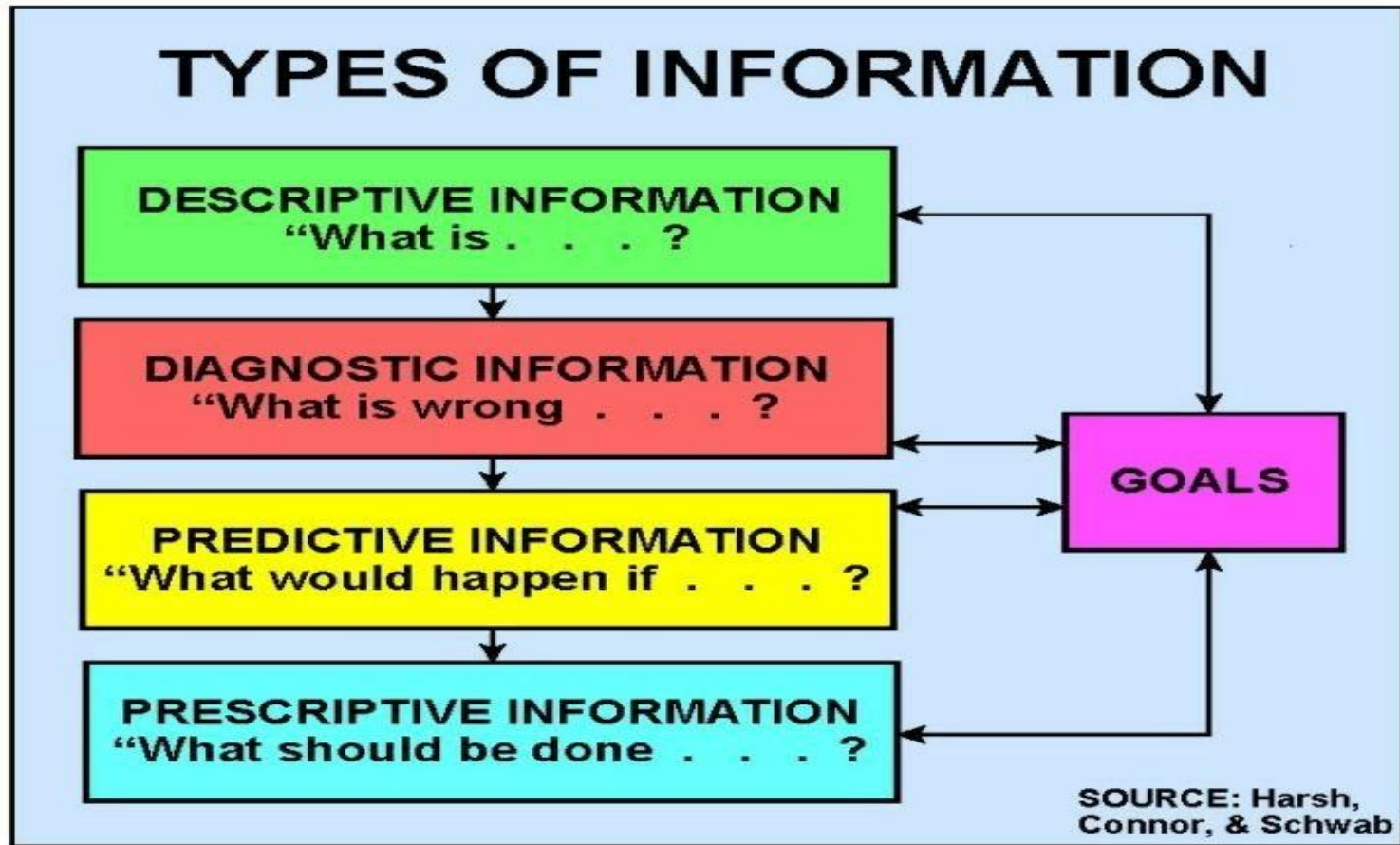
Data and Information

- Data is something that is given or provided.
- Data always corresponds to the 'fact'.
- Data represents something in the real world.
- Information is the data that have a meaning within a context.
- Accumulated data is always processed into a form that is meaningful
- Data -> *processed* -> Information/ Observation

Types of Information

- Descriptive information
- Diagnostic information
- Predictive information
- Prescriptive information

Types of Information



Information classification

- Action and No-action
- Recurring and Non-recurring
- Internal and External
- Planning information:
 - Standards
 - Norms
 - Specifications

Information classification

- Control information
 - Report status of an activity through feedback
- Knowledge information
 - Library reports
 - Research studies, etc.

Characteristics of useful Information

- Relevant
- Complete
- Accurate
- Current
- Economical

Relevant information

- Information must pertain to the problem at hand.
- For example,
 - Total number of years of education may not be relevant to a person's qualification for a job.
 - Rather the relevant information might be the experience that the person has in the related domain of work.
- Similarly, this information should be presented to the person by the organization in such a way that, the person understands the context.
- Here context refers to: experience is more important than the number of years of education.

Complete information

- Partial information is often worse than no information.
- For example
 - Sales person is accumulating data from different sectors including surrounding households
 - Data collected would be used for analysing sale of a food product before the company plans to launch it in market
 - Following data is collected:
 - Demographics, Family income, Family strength (inferred)
 - Consumption habits of the targeted population
 - Without this data, relevant and complete information cannot be extracted by analysing the data.

Accurate information

- Erroneous information may lead to disastrous decisions
- For example:
 - Inaccurate record of a patient's reaction to a medicine
 - Can harm the patient's health unknowingly
 - Doctor may not always be responsible for this failure
- Inaccurate data vs missing data
- Absence of an information in a dataset is not considered as inaccurate.

Current information

- Decisions are often based on latest information.
- What was a fact (based on data) since yesterday, may not be valid for today.
- For example:
 - Investing in stock market
 - We should not look into yesterday's data
 - Instead look for today's data before investing.
- Analysing Trends belongs to Information processing part.

Economical information

- In a business setting, the cost of obtaining an information
- Must be considered as one cost element involved in any decision making.
- For example,
 - Demand for a new product must be surveyed
 - To reduce risk of marketing failure
 - But if market survey is too expensive then the cost of obtaining an information may diminish the profit sales.

Characteristics of useful Information

- Relevant
- Complete
- Accurate
- Current
- Economical

Information presentation

- Data may be collected in the best possible way
- And also processed analytically
- However, if it is not presented properly, then
- It may fail to communicate any value to the recipient.

Information communication

- How Information is communicated/ flown within an organization depends upon the following factors:
 1. Methods employed for Information transmission
 2. Manner of Information handling
 3. Limitations and Constraints of Information transmission/ deployment

Information communication

1. Methods of transmission

- ❑ Involved entities
 - One to one
 - One to many
 - Many to many
- ❑ Verbal (Unofficial communications)
- ❑ Electronic (Official/Unofficial communications)
- ❑ Documented (Official communications which can be referred later)
 - Draft
 - Orders
 - Advisory, etc.

Information communication

2. Manner of information handling

- ❑ Action/ No-action
- ❑ Official/ Unofficial
- ❑ Individual action/ Group task/ Supervision

Information communication

3. Limitations and constraints of recipients

- ❑ Insufficient Information/ Data
- ❑ Limited workforce
- ❑ Knowledge
- ❑ Desire/ Involvement
- ❑ Organizational level (lowest tier/ middle tier/ top tier)

Improving communication

- Organizations generally opt for the following two methodologies to improve Information communication:
 - Summarization
 - Message routing

Summarization

- Too much information causes
 - Noise
 - Divert from context
 - Confusion
 - Misunderstanding
 - Missing purpose
- Summarization helps in suppressing the above.

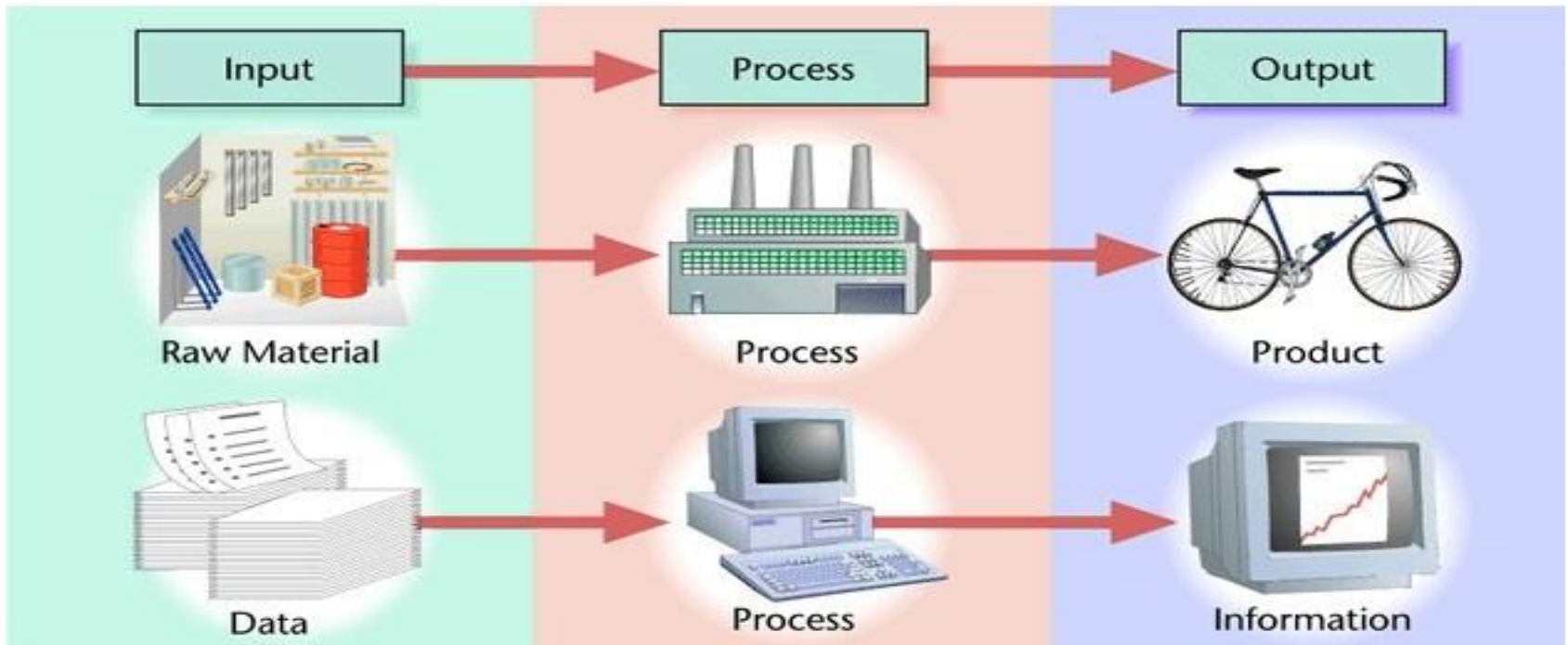
Message routing

- Distribute information to all who are accountable
- Accountable persons can take subsequent action
- Achieved by sending copies of the reports
- Identifying the concerned/responsible persons
- Not all accountable persons could be responsible
- Finding an accountable + responsible person is also a strategy in any organization.

System

- Set of components that work together
- Works together for a common goal
- Example: Computer-based information systems
- It takes data as raw material
- Process the data
- Produce information as output.

Information System



Information Systems

Components of Information system

- Data
- Hardware
- Software
- Telecommunications
- **People**
- **Procedures**

Components of Information system

- Data

- Input that a system takes to produce information.

- Hardware

- Computer and peripheral devices
 - Also includes data communication equipment.

Components of Information system

■ Software

- ❑ Set of instructions that defines,
- ❑ How to collect data, process, display, and store.
- ❑ Data collection may not always be software dependent !!

■ Telecommunications

- ❑ Facilitates fast transmission and reception of data
- ❑ Data in the form of text, picture, video, audio, animation
- ❑ Includes all hardware and software to facilitate the above.

Components of Information system

■ People

- ❑ Information system professionals and Users
- ❑ Employees for analysing organizational information needs
- ❑ Employees to Design and Construct new information systems
- ❑ Employees to code computer programs
- ❑ IT Administrators to monitor the hardware resources
- ❑ IT Administrators to maintain necessary software resources.

Components of Information system

■ Procedures

- ❑ Guidelines for achieving optimal and secure operations of data
- ❑ Priorities in running different applications
- ❑ Security measures for a computer-based information system
- ❑ Abstraction measures for an information system
- ❑ Guidelines for Information handling in an organization.

Topics Covered

- Information
- Data
- Types of Information
- Classification of Information
- Useful Information
- Information Presentation
- Information Communication
- Summarization and Message Routing
- Components of Information System (Organization)

Types of Information Systems



Horizontal-cut of Information pyramid

- Information pyramid is Horizontally cut in three levels
- Based on the 3-tier working architecture of an organization
- Employees are segregated according to the three tiers
- Separate tasks or roles are assigned to the employees in each level

Functional areas Information system

- Vertical partition of Information Pyramid is done
- Based on the number of departments in an Organization
 - ❑ Sales and marketing
 - ❑ Manufacturing and production
 - ❑ Finance and accounting
 - ❑ Human resources
 - ❑ Etc.

Levels of Information system

- Operational level
- Management level
- Strategic level

Managers of Information system

- Operational managers
- Middle managers
- Senior managers

Departments of Information system

- ❑ Sales and marketing
- ❑ Manufacturing and production
- ❑ Finance and accounting
- ❑ Human resources
- ❑ Etc.

Levels of Information system

- Operational level
- Management level
- Strategic level

Types of Information Systems

- Operational-level systems
 - ❑ Support operational managers
 - ❑ Keeps track of elementary activities and transactions
 - ❑ Monitors; sales, receipts, payroll, credits, etc.
- Management-level systems
 - ❑ Supports middle managers
 - ❑ Tasks: monitoring, controlling, decision-making, etc.
 - ❑ Responsible for smooth working of a system.

Types of Information Systems

- Strategic-level systems
 - Support senior management
 - Tackle and address strategic issues
 - Analyze long term trends.

Managers of Information system

- Operational managers
- Middle managers
- Senior managers

Managers of Information system

- Operational managers

- Works for the operational level systems
- Supervising employees at the operational level of an organization
- Supervising employees at the lowest tier of an organization
- Assigned tasks such as data collection, requirement analysis from clients, sales, etc.

Managers of Information system

- Middle managers
 - ❑ Works for the management level systems
 - ❑ Supervising employees at the middle tier/ level of an organization
 - ❑ Handles tasks such as Data Analysis, Algorithm design, Decision making, Report generation, etc.
 - ❑ Follow orders from the highest tier employees and enforces them to the lowest tier employees
 - ❑ Monitors lowest tier employees and provides feedback to the highest tier employees

Managers of Information system

- Senior managers
 - ❑ Works for the strategic level systems
 - ❑ Orders/ enforces procedures to the management level systems
 - ❑ Decides how organization would run
 - ❑ New rules are presented to middle tier managers. Middle tier managers finalizes various strategies for implementation. Middle tier managers enforces tasks to lowest tier managers for functioning the new strategy.
- All stakeholders are not considered in the Information pyramid, as stakeholders can be from outside Organization as well.

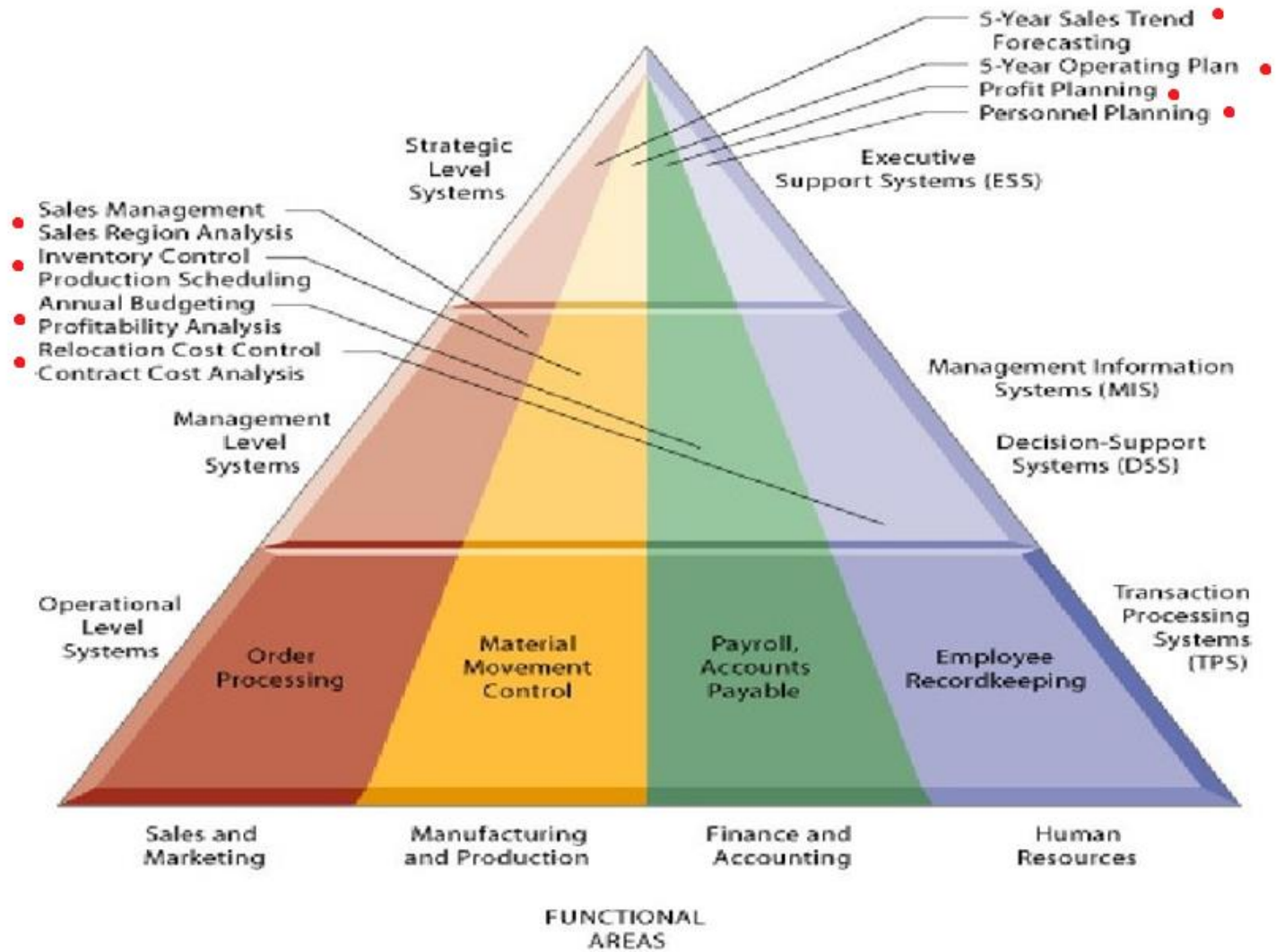
Support systems - Information system

- Executive support system
- Management information system
- Decision support system
- Transaction processing system

Information system divisions

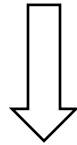
Level	Manager	Support system	Department
Strategic level	Senior managers	ESS	Sales & Marketing
			Manufacturing Production
			Finance & Accounting
			Human resources
Management level	Middle managers	MIS and DSS	Sales & Marketing
			Manufacturing Production
			Finance & Accounting
			Human resources
Operational level	Operational managers	TPS	Sales & Marketing
			Manufacturing Production
			Finance & Accounting
			Human resources

Types of Information Systems

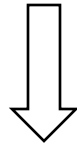


Tasks based Work flow

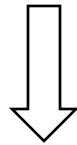
Task definition



Identify the **Level** (strategic, management, operational)



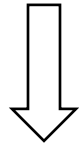
Identify the **Managers** (senior, middle, operational)



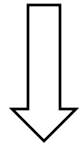
Select the **Department** (sales, production, finance, HR)

Task-based Work flow - Example

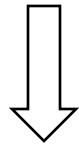
5-year Sales trend and Forecasting



Strategic level



Senior managers



Sales and Marketing Department

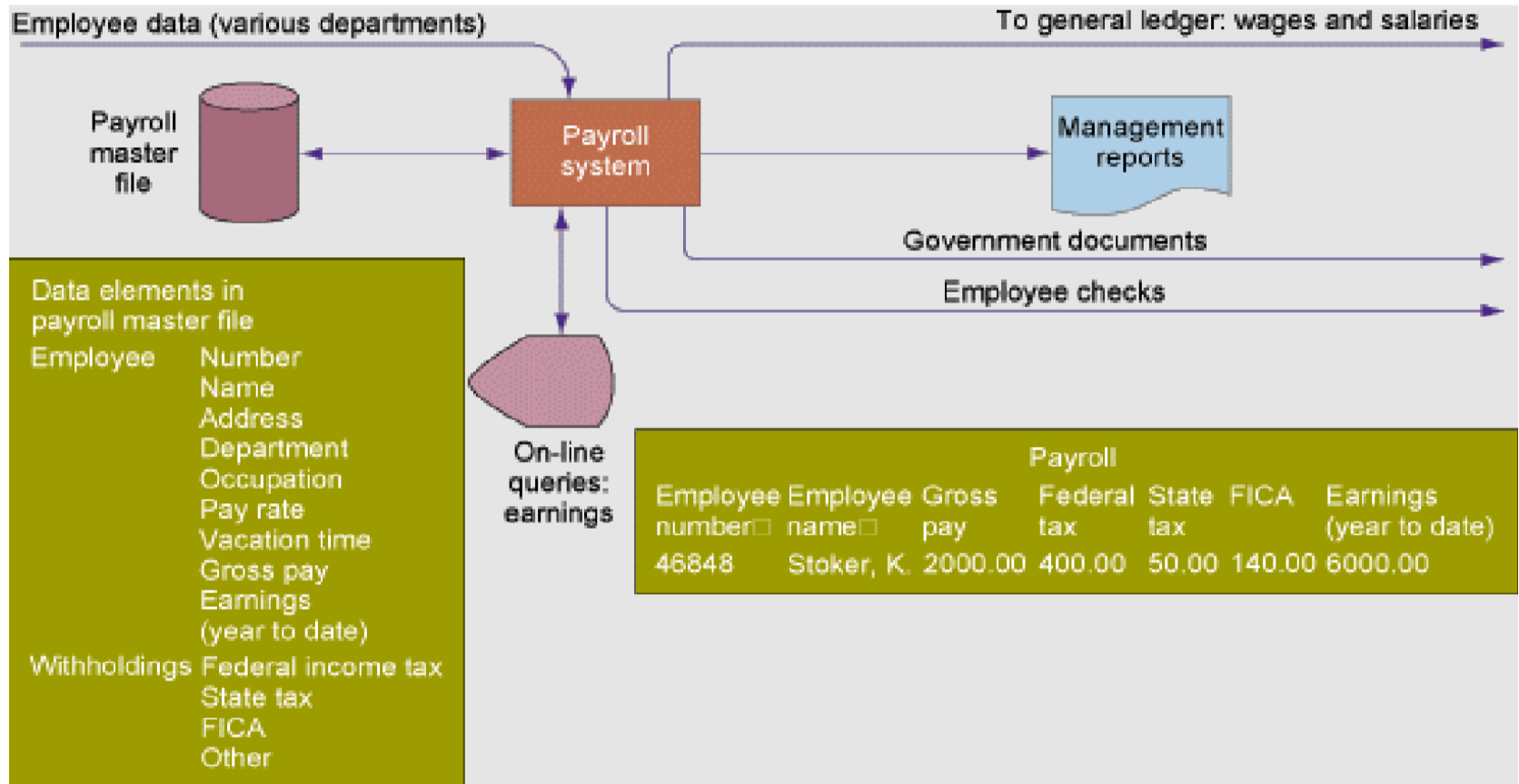
Transaction Processing System

- Basic business systems serve the operational level
 - TPS: A system that helps to perform and record the daily routine transactions which is necessary to conduct run an organization
 - Examples:
 - ❑ Point of sale systems
 - ❑ Payroll systems
 - ❑ Stock control systems (Logistics management)
 - ❑ Booking system
 - ❑ Branch-based banking systems
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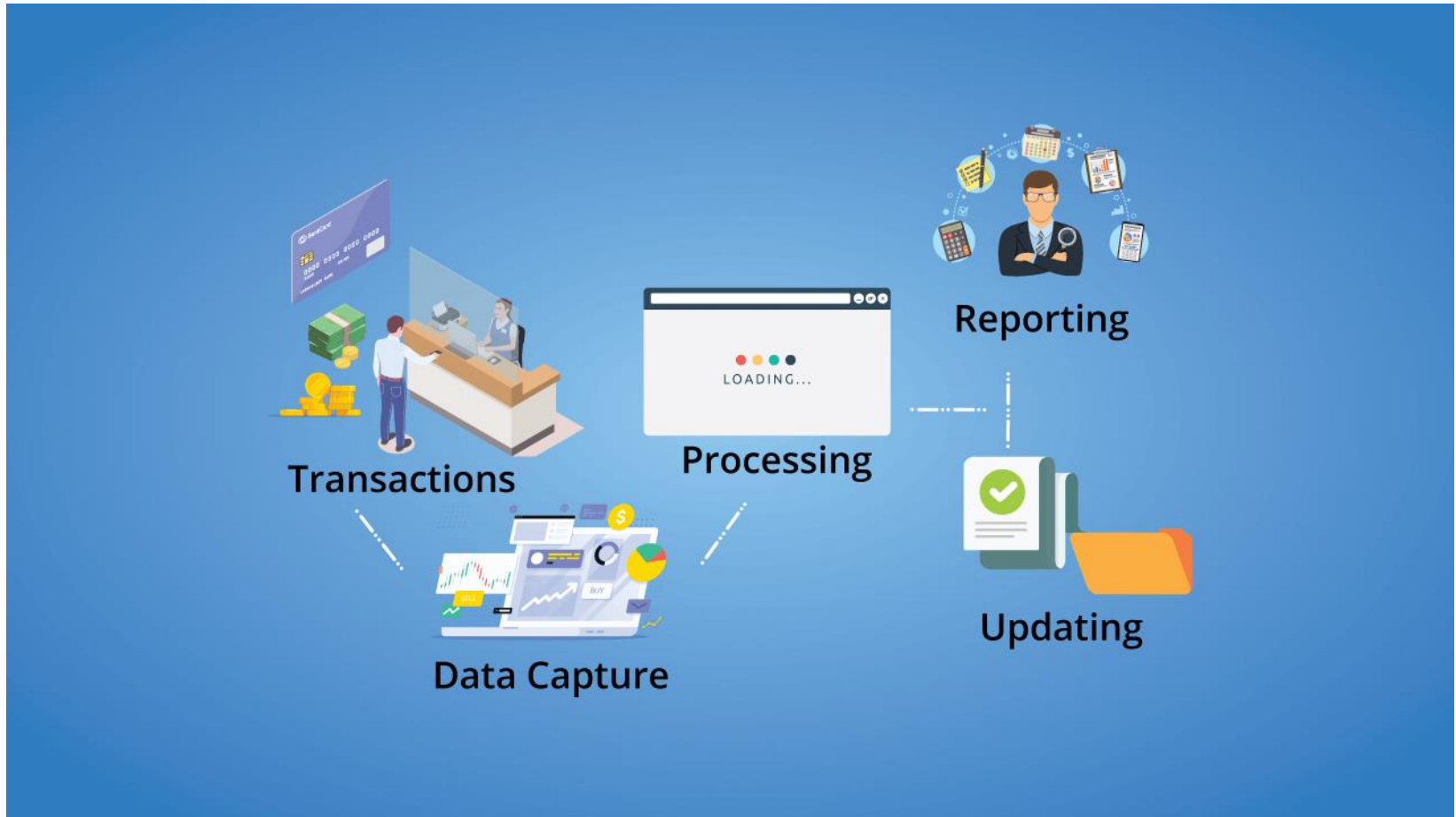
Transaction Processing System

- The goals, tasks, and resources are pre-defined
 - Defined by the middle-level management
 - Example: Payroll System
 - ❑ Accounting transaction processing system
 - ❑ Tracks money spend for employees and stakeholders
 - ❑ Generates reports for Middle-level management
 - ❑ Does all transaction requires to be incorporated in report for Middle-level?
-

TPS: Payroll management



TPS: Branch-based banking systems



Transaction Processing System

- TPS failure may lead to unrecoverable loss to the organization
 - Also leads to loss for the linked stakeholders
 - Middle level managers require TPS (reports/modules) to monitor internal status of operations ... conduct meetings with stakeholders based on TPS input.
-

Types of TPS

TYPE OF TPS SYSTEM					
	Sales/ marketing systems	Manufacturing/ production systems	Finance/ accounting systems	Human resources systems	Other types (e.g., university)
Major functions of system	Customer service Sales management Promotion tracking Price changes Dealer communications	Scheduling Purchasing Shipping/receiving Operations	General ledger Billing Cost accounting	Personnel records Benefits Compensation Labor relations Training	Admissions Grade records Course records Alumni records
Major application systems	Sales order information system Sales commission system Sales support system	Machine control systems Purchase order systems Quality control systems	General ledger Payroll Accounts receivable/payable Funds management systems	Employee records Benefit systems Employee skills inventory	Registration system Student transcript system Curriculum class control systems Alumni benefactor system

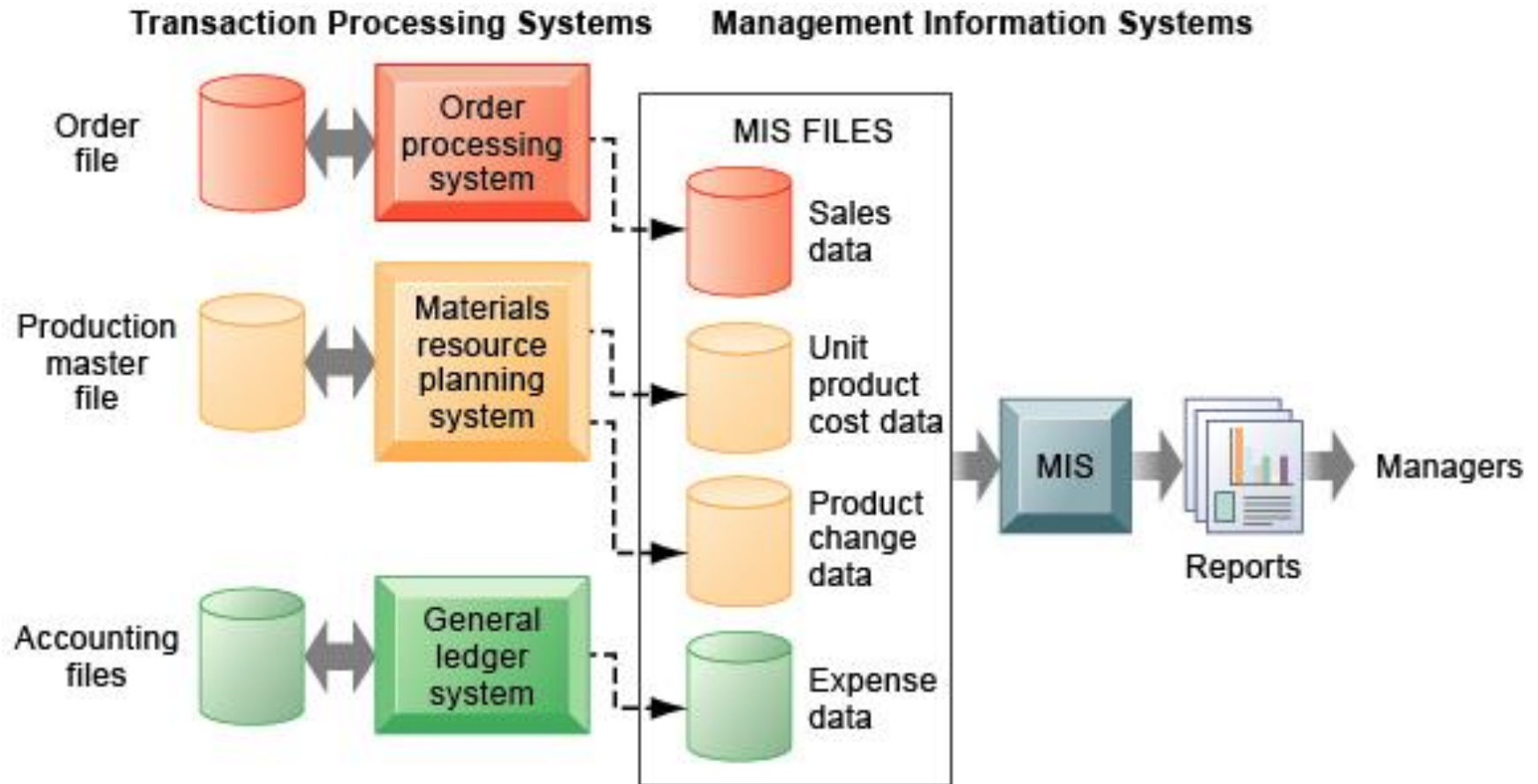
Management Support Systems

- Serves the middle management
 - Structured and semi-structured decisions
 - Guideline for TPS working
 - Report on firm's current performance, based on the Transaction support system
 - The past and present data
 - Internal orientation related to managing employees
 - Provide answers to routine questions with predefined procedure for answering them
 - Typically MIS level have little analytical capability.
-

Management Support Systems

- Report generation based on Operational level employee performance
 - Online/remote access to management level information
 - Historical record of organization
 - MIS summarizes the basic operations performed in an organization
 - MIS reports are generally weekly, monthly, quarterly, or yearly. However they can be daily/hourly if required
-

TPS: Operational level at Industry



TPS: Operational level at Industry

Consolidated Consumer Products Corporation Sales by Product and Sales Region: 2005

PRODUCT CODE	PRODUCT DESCRIPTION	SALES REGION	ACTUAL SALES	PLANNED	ACTUAL versus PLANNED
4469	Carpet Cleaner	Northeast	4,066,700	4,800,000	0.85
		South	3,778,112	3,750,000	1.01
		Midwest	4,867,001	4,600,000	1.06
		West	4,003,440	4,400,000	0.91
	TOTAL		16,715,253	17,550,000	0.95
5674	Room Freshener	Northeast	3,676,700	3,900,000	0.94
		South	5,608,112	4,700,000	1.19
		Midwest	4,711,001	4,200,000	1.12
		West	4,563,440	4,900,000	0.93
	TOTAL		18,559,253	17,700,000	1.05

Decision Support System

- Serves the middle management.
 - Support non-routine decision making
 - Non-routine example:
 - What is the impact on production schedule if February sales are doubled?
 - Uses external information as well as information from TPS and MIS
 - Output in the form of Decision analysis.
-

Decision Support System

- Takes decisions what are
 - Unique
 - Rapidly changing
 - Emergency situation
 - DSS most important in scenarios which is new to the organization
 - Highest analytical power is with DSS
 - What about senior level ?
-

Decision Support System

- DSS narrows down the data and analysis in a easily understandable form for the decision takers

Executive Support Systems

- Serves the senior management
 - Helps in Strategic level
 - Addresses non-routine decisions
 - ❑ Judgement
 - ❑ Evaluation
 - ❑ Insight
 - Incorporate data about external events
 - ❑ New Tax laws
 - ❑ New Business competitors
 - ❑ New Market developments
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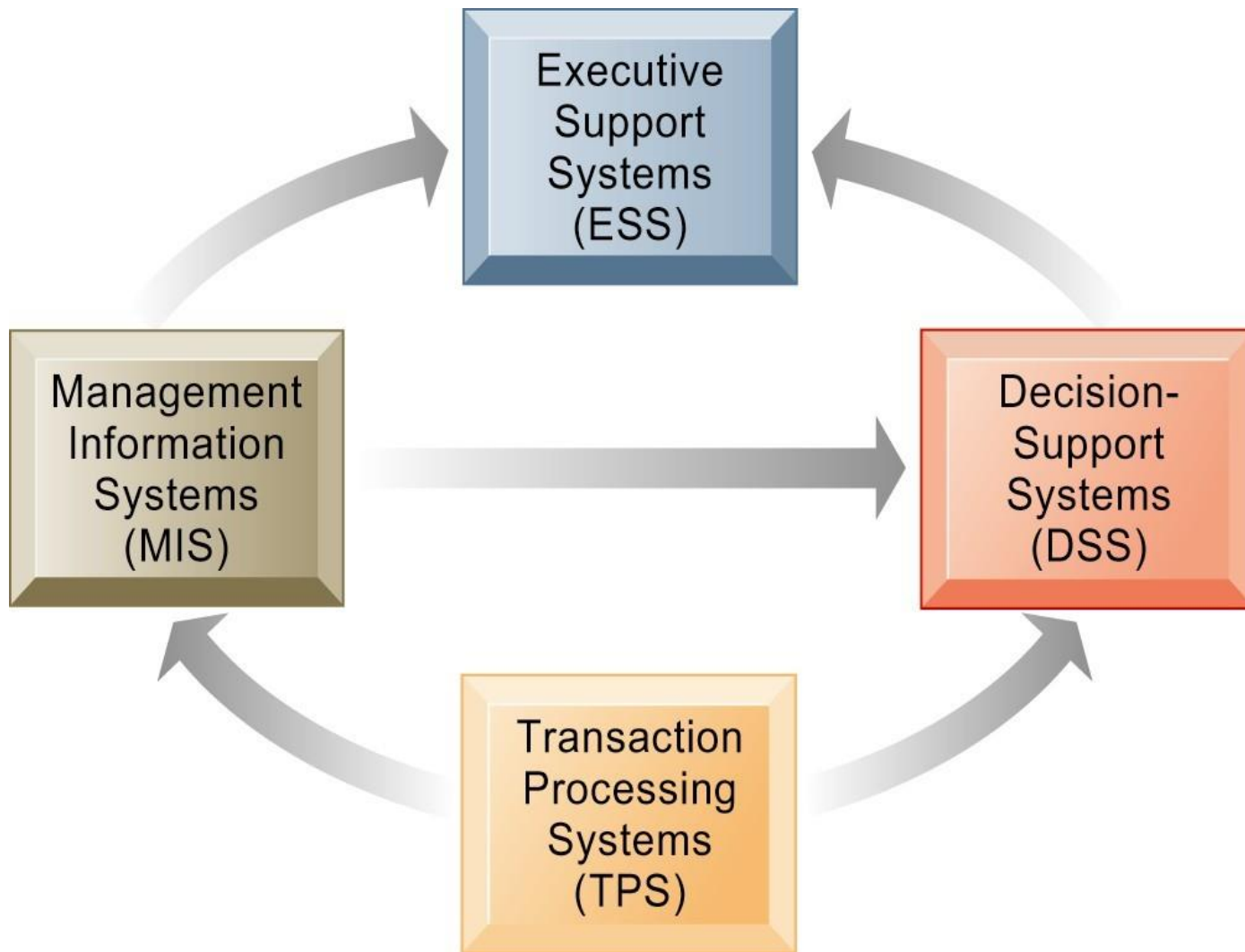
Executive Support Systems

- Collect summarized information from MIS & DSS
 - Provides Input in form of Aggregated data
 - Processing by ESS is interactive with MIS & DSS
 - Output is in the form of Projections.
-

Types of Information Systems



Interrelationship among Systems



Interrelationship among Systems

- All systems are interrelated
 - MIS
 - DSS
 - ESS
 - TPS
 - TPS is the major producer of information.
 - Information from TPS is collectively used by MIS, DSS, ESS.
 - Usually these systems are loosely coupled.
 - Recently, technologies are being developed to closely integrate information residing in each system.
-

System – Information - Management

- System: emphasizes on a fair degree of integration and a holistic view;
 - Information: stressing on processed data in the context in which it is used by end users;
 - Management: focuses on the ultimate use of such information systems for managerial decision making.
-

Management information system

- It is a system of collecting, processing, storing, disseminating, and utilizing data in the form of information that are needed to carry out the functions of management.
- The term is used broadly in a number of contexts and includes (but is not limited to):
 - Decision support systems,
 - Resource and people management applications, Enterprise Resource Planning (ERP),
 - Supply Chain Management (SCM), Customer Relationship Management (CRM),
 - Project management and database retrieval applications.

MIS vs IS

- IS may not perform decision making.
- Associate of MIS, i.e. DSS always performs the decision making task.
- MIS must indicate how data should flow in the organization.
- MIS also looks into why there is delay in data communication within the organization (if any).

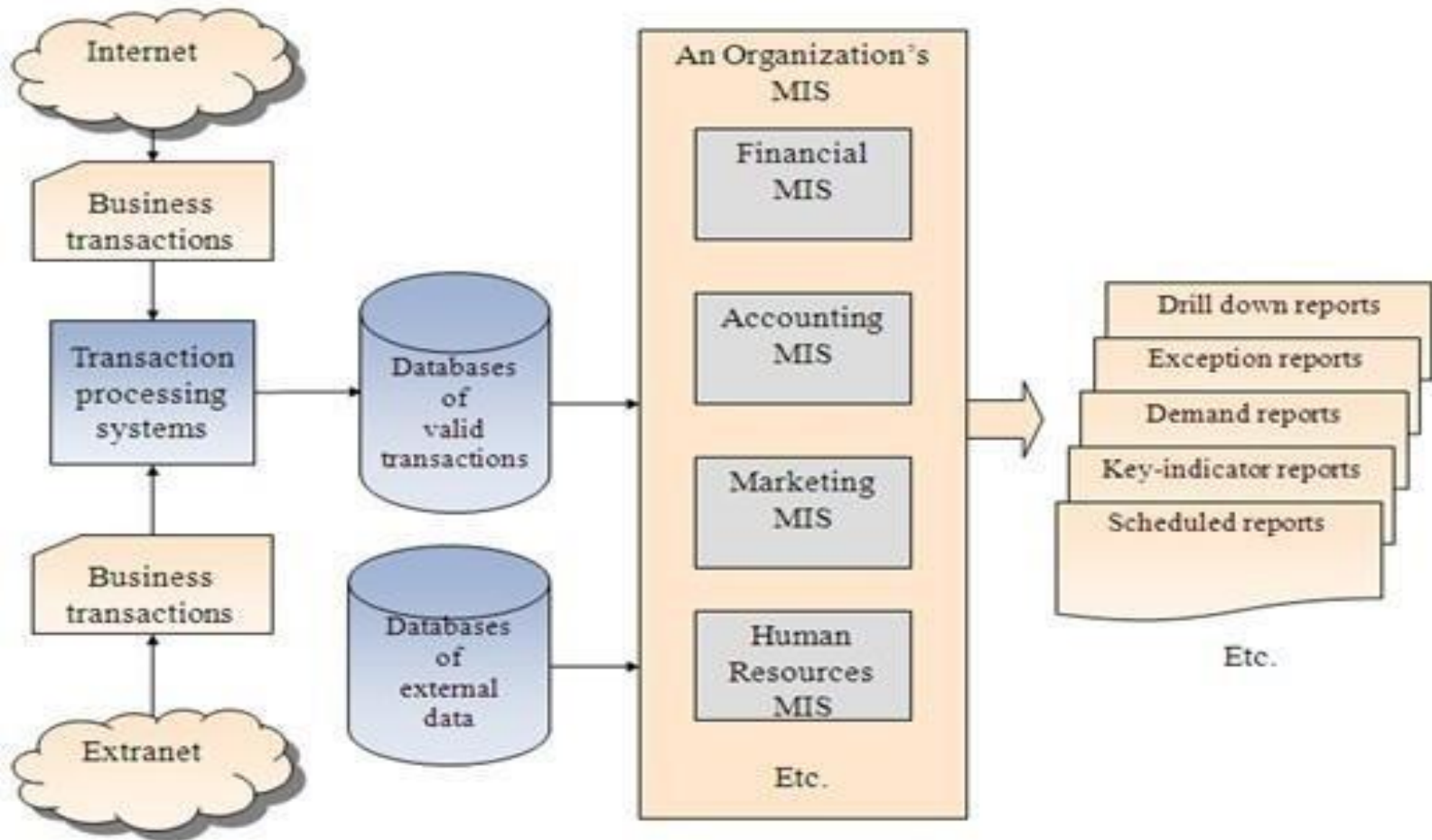
MIS vs IS

- Information system can be applied to any area of business.
- MIS is specific to areas that involve management and decision making.
- Information system necessarily involves hardware and software.
- Management information system may not necessarily use H/W and S/W.
- MIS may use manual reports to take decisions.

MIS vs IS

- MIS can also be used to analyze other information systems involved in an organization.
- MIS summarizes and reports on the basic operation of an organization.
- The data collected from TPS, is processed and communicated by the MIS within the organization.

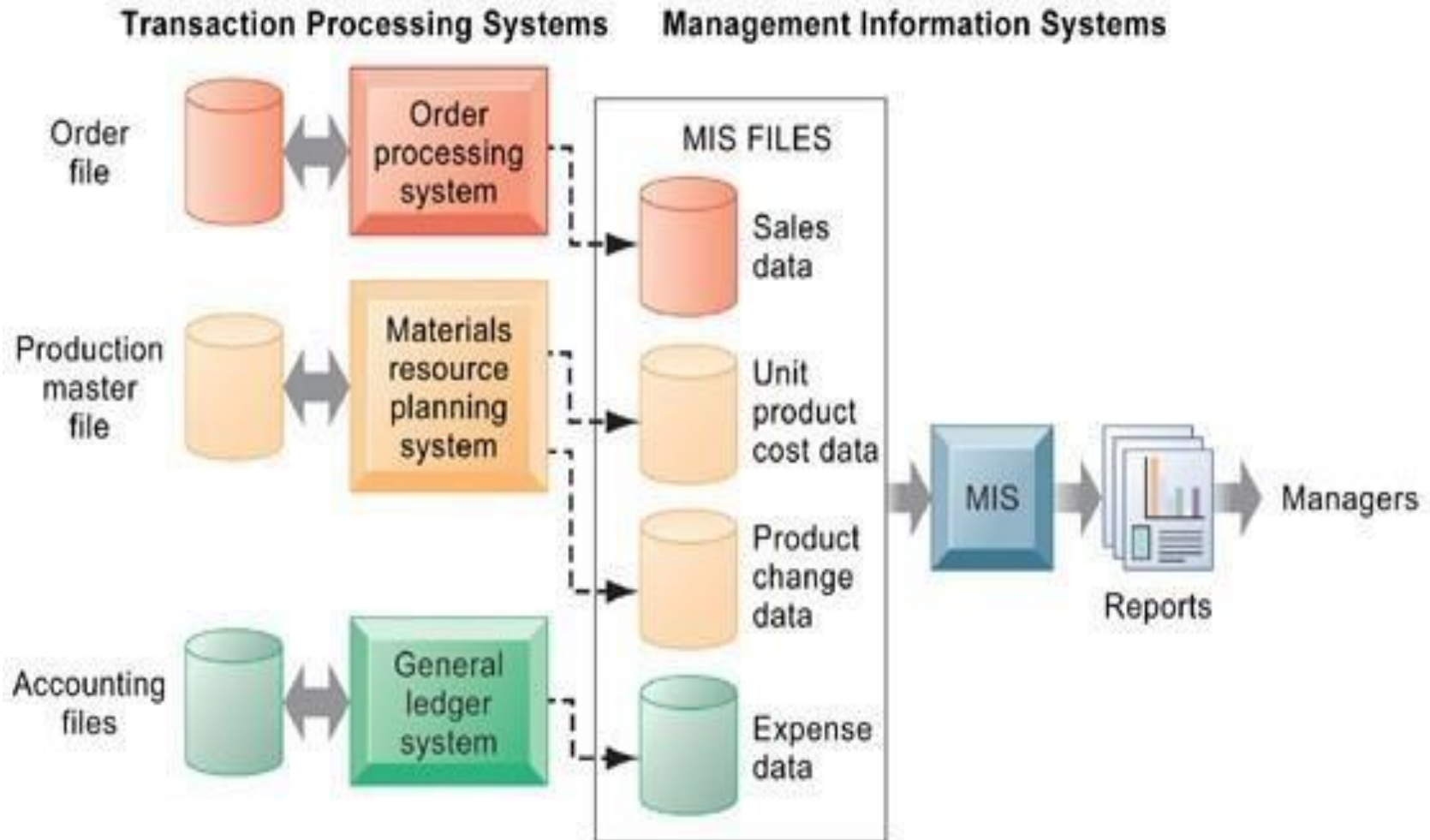
MIS – Functional View



Types of Information Systems



How MIS Obtain Data from TPS



TPS data to MIS

Three transaction processing systems.

Supply summarized data to MIS.

Three-Four MIS present corresponding to the three TPS.

MIS considers data that are important for the organization.

Sends reports to Senior level managers.

Senior level gains access to the information through MIS.

Impact of MIS

Management of Marketing, Finance, Production, and Personnel becomes efficient.

Tracking and monitoring becomes easy.

MIS helps in understanding the business.

Brings common understanding of terms and terminologies across all stakeholders of an organization.

Goal of MIS are driven by goal of organization.

Impact of MIS

Indirectly pulls all stakeholders of the organization towards a similar goal.

Helps in systemization of business operations.

Brings discipline in its operations which everyone is required to follow.

Provides relevant information to the people in organization.

Monitors results and performances.

Impact of MIS

Provides alerts to managers at each level.

Maintains records of all deviations from desired results.

Clear idea on objectives and budgets.

IT enabled MIS is responsible for change in policies of an organization.

Adoption of new technology based on working of the MIS.

Pointers for MIS Design

- Address data problems, such as Bias and Errors.
- Done using high level validations, checking and controlling the procedures.
- Procedures needed for transmitting the information from the source to the destination.
- Handling of noise and distortion by summarization and message routing
- Ensuring that no information is suppressed and important information is emphasized.

Pointers for MIS Design

- To provide specific attention to quality parameters, such as Utility, Satisfaction, Privacy.
 - By controlling inputs to the MIS on the factors of impartiality, validity, reliability, and consistency.
 - Should make a distinction between the different kinds of information for the purpose of communication.
 - A decision oriented information should be distinguished from a non action/knowledge-oriented information.
 - To recognize some aspects of human capabilities as a decision maker.
-

Pointers for MIS Design

- It should meet the needs of the total organization.
 - MIS design should have the features of filtering, blocking, and delayed delivery.
 - MIS is required to ensure that the information within organization is never misused.
-

Planning for MIS

- Organization's strategic plan (Business plan) should be followed by MIS.
 - MIS planning depends solely on decisions, guidelines implemented by the Organization.
 - Strategy planned for MIS should follow Organization strategy.
 - The Information Master Plan establishes a framework for all detailed information system planning.
 - Information Master Plan typically has one long-range plan for three to five years (or more) and one a short-range plan for one year.
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Planning for MIS

- The long-range plan provides general guidelines towards long-term goal.
 - The short-range plan provides a basis for specific accountability as to operational and financial performance.
 - MIS plan contains four main sections
 - Information system goals
 - Objectives and architecture (assessment of organizational context)
 - Inventory of current capabilities
 - Forecast of development
-

Challenges of Information Systems

- Strategic Business Challenge:

- How can businesses use IT to design competitive and successful organizations?

- Globalization Challenge:

- How can firms understand the business and system requirements of a global economic environment?

- Information architecture challenge:

- How can organizations develop an information architecture that supports their business goals?
-

Challenges of Information Systems

- Information system investment challenge
 - How can organizations determine the business value of information systems? [1]

- Responsibility and control challenge
 - How can organizations design systems that people can control and understand?

 - How can organizations ensure that the information systems are used ethically and in a socially responsible manner?

[1] Bakis, Nick, Mike Kagioglou, and Ghassan Aouad. "Evaluating the business benefits of information systems." *Proceeding of 3rd International SCRI Symposium, Salford Centre for Research and Innovation, University of Salford, Salford, UK. 2006.*

Quality of Information

- Information may be presented ethically
 - Information may be transmitted efficiently
 - Information may be interpreted correctly
 - However, *information may not be used efficiently*.
-

Quality of Information

- Quality of information:
 - Determined by how it motivates a human action
 - How much it contributes to decision making

 - Perception of Decision-maker on Quality Information
 - Utility of Information
 - Information satisfaction
 - Error
 - Bias
-

Utility of Information

- Form utility

- Format in which Information is provided.

- Time utility

- Timing of Information delivery

- Place utility

- Availability of Information

- Possession utility

- Location of Information. Who holds the Information.
-

Information Satisfaction

- Information is a combination of specific items
 - Importance of each item is often not disclosed (on purpose)
 - Organization/Decision maker usually look at the context of the information
 - Therefore, Information satisfaction should be measured based on degree of Satisfaction of the Decision-maker
 - This degree actually indicates satisfaction level of the overall Information.
-

Problems with Poor-Quality Data

- Wastage of resources
 - Fund wastage
 - Effects quality of analysis
 - Negative customer experience
 - Delay in deliverables
 - Hinders compliance with outside organizations or Govt. standards.
-

Data Quality Dimensions

- Accuracy
- Completeness
- Consistency
- Timeliness
- Validity
- Uniqueness

Data collection types

- Quantitative

- Data that can be counted.

- Qualitative

- Factors other than numerical values
 - Observations, Descriptions, etc.

Qualitative vs Quantitative Data

Quantitative Data

- Countable or measurable, relating to numbers.
- Tells us how many, how much, or how often.
- Fixed and universal, "factual."
- Gathered by measuring and counting things.
- Analyzed using statistical analysis.

Qualitative Data

- Descriptive, relating to words and language.
- Describes certain attributes, and helps us to understand the "why" or "how" behind certain behaviors.
- Dynamic and subjective, open to interpretation.
- Gathered through observations and interviews.
- Analyzed by grouping the data into meaningful themes or categories.

Quantitative Data

- Nominal: labeled data (color name)
- Ordinal: ordered (rating score)
- Interval: range (temperature)
- Ratio: height, income, annual sales

Quantitative Data Analysis

- Regression
- Simulation
- Cohort
- Clustering
- Time-series

Qualitative Data Analysis

- Content analysis
- Narrative analysis
- Disclosure analysis
- Thematic analysis
- Grounded theory analysis

Data collection methods

- Interviews
- Questionnaires and surveys
- Observations
- Documents and records
- Focus groups
- Verbal histories
- Subjective tests

Type of reports from MIS

- Scheduled report
- Key indicator report
- Demand report
- Exception report

Type of reports from MIS

- Scheduled report

- ☐ Produced periodically
- ☐ Schedule (daily, weekly, monthly)

- Key indicator report

- ☐ Summarizes the previous day's critical activities

- Demand report

- ☐ Gives certain report at manager's request

- Exception report

- ☐ Produced when a situation is unusual or requires management action.

Error and Bias

- Error and Bias reduces Quality of Information
 - A detected biasness can be adjusted by a Decision-maker (Decision support system)
 - Errors cannot be addressed by Decision-makers
 - Goal is to focus on Quality, rather on Quantity of Information
 - Goal is to focus on Error free data and Bias free analysis.
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Error addressing part of TPS

- Why Error occurs in Information?
 - ❑ Incorrect data measurement and collection
 - ❑ Wrong processing procedures
 - ❑ Wrong recording/correcting
 - ❑ Incorrect master file
 - ❑ **Deliberate Falsification**
-

Avoiding Errors

- Internal control
 - Internal / External Auditing
 - Addition of confidence limits
 - Instructions in measuring or processing of data
-

Types of Bias in Information System

- Uncertainty bias:

- Remove recipient from contact of detailed data.

- Presentation bias:

- Bias by order and grouping.
 - Bias by selection of the limits.
 - Bias by the selection of the Graphic layout.
-

Presentation Bias

- Ordering and Grouping

- Biasness may be introduced due to various grouping strategies.
- Biasness may be introduced based on the type of ordering strategy selected.

- Choice of limits:

- Use of too low or too wide limits may introduce bias.

- Choice of Graphics:

- Presentation graphics selection may introduce bias
 - Different types of graphs may lead to biasness
-

Presentation Bias

- Choice of Scale:

- Affects the perception of differences in trend charts.

- Choice of Size:

- Size of every element should be nearly same as much possible.

- Choice of Color:

- Red may be used to draw attention
 - May lead to mis-information
 - May be used to forge information
 - To deviate from the actual context.
-

Cause of Bias

- Data Acquisition
 - Processing of Information
 - Related to Output
 - Related to Feedback
-

Biases related to Data Acquisition

■ Availability Bias:

- ❑ Number of subjects are very important
- ❑ Data collected over a large population may be misleading
- ❑ A highly publicized event/element/subject may always get higher reach with respect to other not so publicized event/subject.

■ Selective Perception

- ❑ Own experience bias
- ❑ Data acquired based on what one expected as outcome
- ❑ Survey taken on Cricketers to decide whether Indian citizens to play outdoor games.

like

■ Frequency bias

- ❑ Absolute number of success are more important than their relative number; Lottery example.
-

Biases related to Data Acquisition

- Concrete information

- People reply more on concrete information rather than on statistical data.

- Illusory correlation

- People usually choose inappropriate variable for prediction.

- Data presentation bias

- Mode of presentation
 - Mixture of Quantitative/Qualitative data
 - Etc.
-

Bias during Information Processing

- Inconsistency

- People are sometimes inconsistent in their processing of information

- Conservation

- Decision-makers are often conservative

- Non-linear extrapolation

- Decision-makers are unable to visualize exponential growth or decay.

- Decision environment

- Complexity of the information
 - Emotional stress
 - Social pressure
-

Bias related to Output

- Response mode
 - Question format
 - Scale effects
 - Wishful thinking
 - Our thought should not lead towards the final output
 - Illusion of control
 - Situation that has gone out of control
 - We may change parameters to direct output towards desired outcome
-

Bias related to Feedback

- Personnel feedback
 - Selected candidates are notified
 - Rejected candidates never gets acknowledgement
- Success Attribution
 - On success refer to the Hard work done
- Failure Attribution
 - On failure refer to the Hard luck !!
- Feedback from eye witness of a scene may be wrong
- Decision-makers may always find some problems in a scenario.
 - Even though past results are good.

Decision-making

- The process of
 - ❑ Recognizing and defining the nature of a decision
 - ❑ Decision is always Goal oriented
 - ❑ Decision needs to be continuous
 - ❑ Identifying alternatives
 - ❑ Choosing the “best” alternative
 - ❑ Enrolling the alternative into practice within the organization.
-

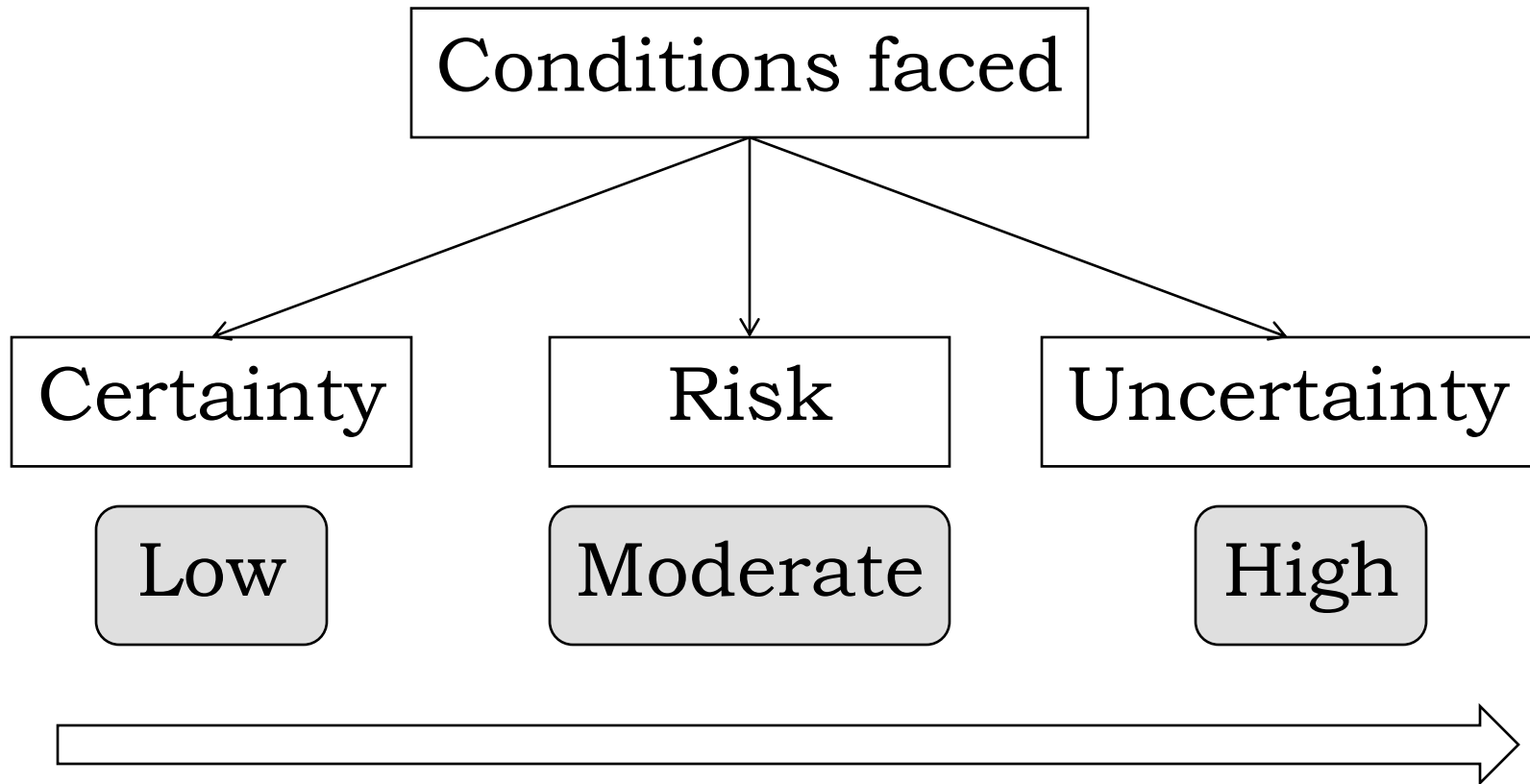
Types of Decisions

- Programmed decisions
 - It represents a **structured** decision
 - Some decisions that occur **frequently**
 - Can be a combination of both (structured + frequent)

 - Non-programmed decisions
 - An **unstructured** decision
 - Occurs less frequently than a programmed decision.

 - Most often both are needed for a Decision maker.
-

Decision making conditions



Ambiguity and chances of making a bad decision

Decision making under certainty

- Alternatives
 - Known with certainty
 - Alternatives are known
 - Outcomes
 - Known with certainty
 - Decision making is straightforward as there is no ambiguity in resources and condition
 - All the possible alternatives and outcomes are known prior to taking decision.
-

Decision making under risk

- Set of Alternatives and Outcomes are known.
 - Probability of what Alternative may lead to which Outcome is known.
 - Probability is of primary importance in such decision making
 - Decision making is thus at RISK
 - Need to study the probabilities before taking decisions.
-

Decision making under uncertainty

- Set of Alternatives and Outcomes are not known
- There can be more number of possible alternatives than those decided by DSS
- There can be more number of outcomes than those taken by DSS
- Probability of what alternative will lead to which outcome is also not known
- Such problem is called a Stochastic problem, that changes dynamically.

Types of Decision making model

- Rational or Normative decision maker model
 - Administrative or descriptive decision maker model
-

Classical Rational Decision Model

- Following are considered while taking a decision
 - Obtain complete and perfect information
 - Eliminate uncertainty
 - Evaluate everything rationally and logically
 - Finally, takes a decision that is supports all stakeholders of an organization and for the organization as well.
-

Steps in Rational Decision Model

1. Identify problem
 2. Identify decision criteria
 3. Allocate weights to criteria
 4. Develop alternatives
 5. Analyse alternatives w.r.t stakeholders
 6. Select the best choice
 7. Implementation
 8. Evaluate effectiveness
-

Administrative Decision Model

- Following are considered while taking a decision
 - Use incomplete or imperfect information
 - Constrained by bounded rationality
 - Tend to satisfy immediate concerns
 - Finally, takes a decision that is may be satisfactory for all stakeholders, but not optimum for the organization
 - Usually do not get much time and resource to analyse
 - Decisions are quick and is taken when really quick decision is on demand.
-

Administrative Decision Model Factors

■ Bounded Rationality

- ❑ Thought, Knowledge, Skills, Values, Ethics, Habits
- ❑ Are very restricted in administrative decision model
- ❑ For the Decision makers of an organization.

■ Satisficing

- ❑ Decision makers look for alternatives
 - ❑ Never targets to find all alternatives
 - ❑ Chooses the first available alternative
 - ❑ To satisfy the current need of organization
 - ❑ Compromises long-term effects.
-

Administrative Decision Model Factors

■ Coalition

- ❑ A political force in decision making
- ❑ Group formed with informal alliance among employees
- ❑ All experts do not participate in this group
- ❑ Group is formed to find a quick solution to a problem.

■ Intuition

- ❑ Belief on something without conscious consideration
- ❑ Often taken by non-experts
- ❑ Group formed with non-experts (coalition) often leads to quick but unstable decisions for an organization.

Administrative Decision Model Factors

- Escalation of Commitment
 - Decision maker often sticks to its decision
 - Even if the decision is proven to be wrong.

 - Risk Propensity
 - The extent to which a decision maker can take a risk
 - Its willingness to take the risk is very important
 - Data Analytics may help in supporting risk taking.
-

Group Decision Making

■ Interacting groups

- ❑ Consists of an existing group
- ❑ Sometimes new groups are formed for a quick solution
- ❑ Decisions taken by groups are very fast but unstable.

■ Delphi

- ❑ This term is used to represent a situation
- ❑ When opinions are taken from Experts
- ❑ Where Experts are always anonymous.

■ Nominal group

- ❑ A structured technique designed to generate creative and innovative ideas.

Limitations of Interacting Groups

■ Halo Effect

- ❑ Presence of a dominating person in a group
- ❑ Leads to one way directed decision making from the group.

■ Bandwagon Effect

- ❑ Group member only following other members
 - ❑ Never gives any input to decision making
 - ❑ Often decisions given by them are overlooked by group members
 - ❑ Such a member tends to be Passive in the group
 - ❑ Induces biasness towards popular thoughts
 - ❑ Never participates in progressive thinking.
-

Delphi group characteristics

- Complete anonymity among participants
 - Statistical assessment of the group response is done by the co-ordinator
 - Final feedback (that is analysed) is given as response to experts who participated in the group, by maintaining anonymity of members
 - Such a method often helps to obtain an unbiased review of a decision.
-

Delphi group requirements

- Anonymous team
 - Identifying the Panellists or Experts
 - Rounds of questionnaire
 - Group response
 - Statistical assessment of anonymous responses
 - Group consensus as reports.
-

Normal group technique

- Collective enquiry
 - Idea generation collectively
 - Identify problems
 - Establish priority
 - Postulate and standardizes new policies
 - Removes controversies and uncertainties
 - Neutralizes dominant individuals
 - Voting on final decision.
-

Advantages of Group decision making

- Availability of more information and knowledge
 - Generation of more alternatives
 - More likelihood of the acceptance of the final decision
 - Enhanced communication of the decision
 - Better decisions are taken from Group of experts.
-

Disadvantages - Group decision making

- Longer process leading to additional costs
 - Compromise decisions because of indecisiveness
 - One person may dominate the group.
-

Knowledge

- It refers to the fact, feelings, or experience known by a person or group of people
 - It is richer and more meaningful than an information.
 - It involves mental processes of comprehension, understanding, and learning gained through experience or study
 - It is an outcome of making comparisons and identifying consequences.
-

Types of Knowing

- Explicit and Implicit knowledge
 - Knowledge expressed in words or numbers
 - Knowledge shared through discussion
 - Explicit knowledge is already written on documents, reports, models or databases
 - Implicit knowledge can be written down but not yet written.

 - Tacit knowledge
 - Knowledge carried in mind
 - Example – skills, experiences, insight, intuition, and judgement
 - Knowledge that is difficult to articulate or written in documents
 - Can be shared through discussion and interactions.
-

Types of Conversation

- Socialization (Tacit to Tacit)
 - Externalization (Tacit to Explicit)
 - Internalization (Explicit to Tacit)
 - Combination (Explicit to Explicit)
-

Types of Conversation

- Externalization conversation is most important
 - i.e. discussion between Tacit and Explicit
 - One shares ideas and another drafts them
 - Both are equally important and responsible
 - Tacit knowledge generated Explicit knowledge
 - Proper drafting of Explicit knowledge could help in bringing new Tacit ideas in turn.
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Thank You