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DIGITAL HRM

M.B.A (HRM) First Year

Semester – II, Paper-IV

Director, I/c

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FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining 'A^{+}' grade from the NAAC in the year2024, Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over221 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University has also started the Centre for Distance Education in 2003-04 with the aim of taking higher education to the doorstep of all the sectors of the society. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even to housewives desirous of pursuing higher studies. Acharya Nagarjuna University has started offering B.Sc., B.A., B.B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is my aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn be part of country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson-writers of the Centre who have helped in these endeavors.

***Prof*.K. Gangadhara Rao**
M.Tech., Ph.D.,
Vice-Chancellor I/c
Acharya Nagarjuna University

204HR26: DIGITAL HRM

UNIT – I

MIS System: Introduction to MIS, Meaning and Nature, Types of information and information systems. Information concepts and information technology: Definition and difference between data and information, relevance of information to decision making, sourceand types of information.

UNIT – II

Human Resource Information Systems: Introduction, Concept and Definition; Information Needs in HRM; HRIS Models; Acquiring and Implementing HRIS; Computers and HRIS andUsers in HRM; Database in HRIS.

UNIT – III

Digital Transformation in HRM- Digitization, Digitalization, Digital Transformation- Importance- Steps in HR Digital Transformation Process- Strategies to turn HR Digital – HR Challenges of Digital Transformation- Benefits of Digital Transformation- HR Role in Digital Transformation

UNIT –IV

Digital Technologies and their impact: On the hiring/ on boarding, Selection and Training – Types of digital Technologies- Implications of digitalization for the employment of different categories of workers- Transformation of labor relations – wages- performance- Digitization of search, hiring, selection and dismissal of personnel when introducing the digital technologies

UNIT –V

HR Analytics: Concept, Key HR Analytics Metrics, Data Requirement for HR Analytics Tools, HR Analytic Process, Descriptive and Prescriptive HR Analytics.

Case Analysis: The Question Paper shall have a compulsory question on Case Analysis.

PRESCRIBED BOOKS:

1) Yadav D(2011) Foundation of Information Technology. New Age International Private limited, Publisher.
2) Efrain Turban(2012) Introduction to Information Technology 2nd Edition, Wiley Publication
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7) Eric Frick(2019) Information Technology Essentials An Introduction to Information Technology, ERIC Frick Industries.
8) Goyal Brothers (2021) Text book of Information Technology Ist Edition Prakashan Publications
9) Puneet Kumar, Sushil Bhardwaj (2021) Fundamentals of Information Technology, , Kalyani Publications 2021
10) Girodhar Joshi Management Information Systems OXFORD PRESS

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LESSON-1
MANAGEMENT INFORMATION SYSTEM

Objectives

Define key MIS terms (e.g., information system, database, ERP, DSS).
Recall components of an information system.
Identify types of information systems used in organizations
Define key MIS terms (e.g., information system, database, ERP, DSS).
Recall components of an information system.
Identify types of information systems used in organizations

Structure

1.1 Introduction
1.2 Concept and Definition
1.3 Nature of MIS
1.4 Types Of Information
1.5 Dimensions Of Information System
1.6 Operating Elements Of Information Systems
1.7 Types Of Information Systems
1.8 Summary
1.9 Key words
1.10 Self Assessment Questions
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1.1 Introduction

Modern management techniques are highly information oriented. Management is the art of directing human activities for productivity. It directs the active operation within the enterprise and combines the work of employees with the available infrastructure equipment and material for the accomplishment of the centre's common goals. In other words, management is the sum total of three different steps involved in it, i.e., (i) Formulation of policy and its translation into plans, (ii) Execution and implementation of plans, and (iii) Exercising administrative control over the plans. Management is thus the executive function, which is concerned with carrying out broad policies laid down by authorities. Management is also used as a way of referring to the process of managing the process of planning, organising, staffing, guiding, supervising and controlling. It comprises the process or activities that describe what managers do in the operation of their organization — Plan, organise, initiate and control operations.

The information explosion over the past years has had a profound impact upon the complexity of management and organization. As a decision-maker, the manager is essentially a processor of information. Modern management looks for the ability to obtain, store, process, retrieve and display right information for the right decision, which is vital. In order to remain ahead of competitors and to keep pace with technological advancements and their impact on the firms' products or services, the manager must keep himself abreast of selected information and

organise it for decision-making. MIS is a system that aids management in performing its job. The management process can be described as: planning, directing, organizing, controlling and feedback.

Making decisions concerning complex systems (e.g. management of organizational operations, industrial processes, the command and control of military combat units, management of resource sharing networks) often strains our cognitive capabilities. The decision support system supports the decision-making process in a semi- structured and unstructured environment.

1.2 Concept and Definition

A Management Information System (MIS in short) is an organized procedure that provides past, present, and prediction information. It plays now-a-days an important and decisive role in planning and decision making by furnishing uniform and timely information. Modern management information systems are computer based systems with built in automatic data retrieval, data capture, selection, sorting, data processing data analysis and data exchange capabilities. MIS is a system which provides management with the information it requires to monitor progress, measure performance, detect trends, evaluate alternatives, make decisions and to take corrective action.

MIS is, thus, a system in which required data are collected and transmitted to help the managers at various levels in the process of planning, implementation and evaluation. In other words, MIS is a system which collects, analyses, stores and displays information to the decision-makers at all levels for the management of resources, flows of material, personnel, money facilities and machines.

It can be concluded that MIS is a computer-based organizational information system which provides information for management activities and functions. The concept of MIS is better understood if each part of the term is defined .

Management

As already explained in the introduction it comprises the processes or activities that describes what managers or executives do in the operation of their organization: plan, organize, initiate and control operations. They plan by setting strategies and goals and selecting the best course of action to achieve the plan. They organize the tasks necessary for the operational plan, set these tasks up into homogeneous groups and assign authority delegation. They control the performance of the work by setting performance standards and avoid deviations from standards. As decision-making is such a fundamental prerequisite to each of the foregoing processes, the job of the MIS becomes that of facilitating decisions (structured decisions) necessary for planning, organizing and controlling the work and functioning of the organization.

Information

Information consists of data that have been acquired, processed or otherwise used for inference purposes, argument, or as a basis for forecasting or decision-making. Information can be facts or figures, qualitative or quantitative, which are essential for arriving at decisions.

System

A system is a set of interrelated elements linked together for a common objective. There is a functional relationship between the different components or parts. The system concept of MIS

is therefore one of optimising the output of the organization by connecting the operating system through the medium of information exchange. We are concerned with 3 systems: (1) Organization, (2) The system of management,

(3) Management information system, that provides information for making decisions regarding the integration of the organization through the process of management. The computer system is an important component of the MIS system.

The objective of an MIS is to provide information for decision-making on planning, initiating, organizing and controlling the operations of the sub-system of the firm and to provide a synergistic organization in the process. MIS supports decision-making at all levels of the organization.

1.3 Nature of MIS

The process of management in any organization (be an industry, govt. organization, business, public enterprise) has become very complex now-a-days. The reasons for complexity can be attributed to four primary aspects: (i) the technological revolution, (ii) research and development, (iii) product changes, and (iv) the information explosion. The technological revolution has influenced every sector of economic and social activity like transportation, communication, agriculture, manufacturing, and product techniques. The changes will continue at an accelerated pace. This demands considerable improvement in management. It is imperative that in order to cope with these changes, the manager will require large amount of selective information for the complex task and decisions ahead. Thus, the technological revolution requires a managerial revolution. Increase in expenditure on research and development has greatly accelerated technological changes. This has not only made the product and supporting operations more complex but the life cycle of the product is being shortened. The effect of research and development is tremendous on their operations and the system should therefore provide for better planning, better management and better information to accommodate the effects.

Particularly in the context to product changes, today's manager must deal with an enormously high product mortality rate. The competition for any product today (may be a car, a television set, a washing machine etc.) is so much that every manufacturing organizaton is always at the tip of iceberg' which calls for better management and the system approach. This implies that today's manager must keep himself abreast of the factors influencing his other firm's products and future operations. This requirement demonstrates the need for a properly designed management information system.

Finally the information explosion has profound impact upon the complexity of management and organizations. The information is available in a variety of sources and forms which should be made available to the managers at appropriate time This necessitates the creation and development of management information system for better decisions.

Above all there is an increase in the complexity of management, which calls for improvement in the management process. The reasons for the complexity of management are: (1) the theory of information feedback system, (2) a better understanding of the decision-making process, (3) operations research or management science techniques that permit an experimental or simulation approach to complex problems, (4) computers.

Information systems (IS) are critical to the operation of modern organizations. They are interconnected networks of hardware, software, data, people, and procedures designed to collect, process, store, and disseminate information to aid in decision-making, coordination, and control. The rise of digital technologies, as well as the increased use of computers and the internet, has altered how organizations operate and interact with their stakeholders. In a rapidly changing business environment, information systems have become critical tools for organizations of all sizes and types to remain competitive, efficient, and effective. They assist organizations in achieving their objectives by enhancing internal operations, facilitating communication and collaboration, and assisting in strategic decision-making. Information systems study is multidisciplinary, combining elements of computer science, management, and information technology.

In today's business, information systems are critical because they allow organizations to collect, store, and process data to make informed decisions. These systems can be used to improve internal and external communication and collaboration, as well as gain insights into customer behavior and market trends. Furthermore, by providing real-time data and analysis, they can help businesses become more agile, responsive to market changes, and competitive. Information systems are critical for businesses to operate effectively and efficiently in today's fast-paced and data-driven environment.

The combination of hardware, software, data, people, and procedures that organizations use to collect, process, store, and disseminate information is referred to as an information system. These systems aid in decision-making, coordination, and control, and they assist organizations in achieving their objectives. Simple manual systems to complex computer-based systems that automate many business processes are examples of information systems.

"Information system (IS) is the study of complementary networks of hardware and software that people and organizations use to collect, filter, process, create, and distribute data."

"Information systems are combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational settings."

"Information systems are interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization in an organization."

These definitions focus on two distinct aspects of information systems: the components that comprise an information system and their role in an organization

1.4 TYPES OF INFORMATION

Internal information and external information are the two broad categories of information. The illustration below depicts the scope of internal and external information in the context of business organizations.

Internal Information: Internal Information is defined as information generated by the organization's operations at various management levels in various functional areas. Internal information is summarized and processed as it progresses from the lowest to the highest levels of management. Internal information is always about the organization's various operational units.

Production figures, sales figures, personnel, account, and material information are all examples of internal information. This type of information is typically consumed by middle and junior management levels. However, top-level management consumes summarized internal in format on.

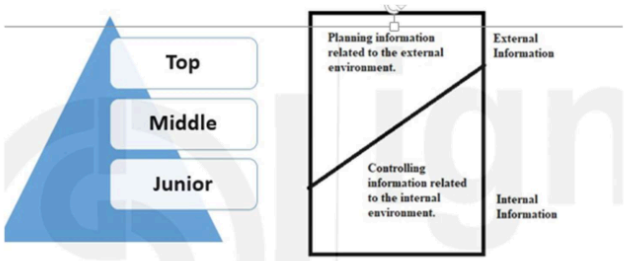

Fig 1.1: Types of information

External Information: External information is typically gathered from the business organization's surroundings. External information is defined as information that comes from outside the organization and has an impact on its performance. External information includes government policies, competition, economic status, and international market conditions. External information is typically required by top management cadres and is useful in developing long-term policy plans for organizations.

1.5 Dimensions Of Information System

The dimensions of information systems can be viewed as a framework for analyzing and designing information systems. They are:

Organizational Dimension:

Organizations include information systems. The standard operating procedure and culture of an organization will be embedded in an information system. Functional specialities, business processes, culture, and political interest groups are all part of this. This refers to the people, policies, and procedures that govern how an organization's information system is used and managed. This refers to how the information system fits into the organizational structure and how it supports the organization's goals and objectives. A sales management system, for example, is part of the organizational dimension because it helps to improve sales performance.

Management Dimension

Managers perceive environmental business challenges. Information systems provide managers with the tools and information they need to allocate, coordinate, and monitor their work, make decisions, create new products and services, and make long-term strategic decisions. The

policies, procedures, and rules that govern the use of the information system are referred to as this. The management dimension includes things like passwords, backup procedures, and data security policies.

Technology Dimension

Management makes use of technology to carry out their duties. Computer hardware/software, data management technology and networking/telecom technology are all part of it. It is one of many tools used by managers to deal with change. This includes the hardware, software, data, and network components that comprise an information system's technical infrastructure. A server, a personal computer, and database software, for example, are all examples of technical dimensions.

Strategic Dimension

This entails aligning information systems with an organization's overall goals and strategies. This includes decision-making processes as well as the impact of information systems on the competitiveness and success of the organization.

User dimension

This refers to the information system's end users and how they interact with it. An e-commerce website, for example, is part of the user dimension because it allows customers to purchase goods and services.

Each of these dimensions is interconnected and has an impact on an information system's overall performance and effectiveness. To ensure that an information system meets the needs of the organization and its users, it should take into account all three dimensions

1.6 Operating Elements Of Information Systems

The components that allow an information system to function effectively and efficiently are known as its operating elements. They are as follows:

Hardware: A system's physical components, such as computer equipment, peripheral devices, and other supporting equipment.

Software: A set of instructions that instructs the hardware on what to do. System software (such as the operating system) and application software are both included.

Data: Information that the system stores and processes. It can include both structured (like a database) and unstructured data (such as a text document).

•**Procedures**: The steps and processes that are followed to complete specific tasks such as data entry, information processing, and report generation.

•**People:** Those who use the system as well as those who support and maintain it.

•**Network**: The communication channels that connect the various system components and allow them to work together.

•**Policies and security measures**: The guidelines and measures that ensure the system's information's confidentiality, integrity, and availability.

•The following are the major processing functions in information systems:

•**Business transaction processing**: Capture, collect, record, store, and process events of business interest so that their impact is reflected in organizational performance records.

•**Master file updates:** The effect of these transactions is carried over to the organizational performance status files. At any given time, master files must reflect the status of any entity after incorporating the impact of current transactions.

•**Information report generation:** After processing transactions and updating master files, information reports are generated to assist managers in making decisions.

•**Processing of interactive inquiries**: Online information processing systems allow managers to respond to business queries raised on data files, both master and transaction files.

•**Providing interactive analytical support**: Key decision makers require not only interaction with data files for data extraction using scientific and planning models but also online processing support to analyze the impact of some potential actions. A Decision Support System is created when the system can extract data from relevant files and address it to the models selected by the user.

1.7 Types Of Information Systems

Information systems can be classified into several types based on their functions, organizational level, and nature of data processed:

- Transaction Processing Systems (TPS)
- Management Information Systems (MIS)
- Decision Support Systems (DSS)
- Executive Information Systems (EIS)
- Expert Systems (ES)
- Artificial Intelligence Systems (AI)
- Enterprise Resource Planning Systems (ERP)
- Supply Chain Management Systems (SCM)
- Customer Relationship Management Systems (CRM)
- Knowledge Management Systems (KMS)

Transaction Processing System (TPS):

A transaction processing system is an information system that processes data resulting from business transactions. Their goals are to provide transactions so that records can be updated, and reports can be generated, i.e., to perform storekeeping functions. The transaction is carried out in two stages: batch processing and online transaction processing.
Examples: Bill system, payroll system, Stock control system.

Management Information System (MIS):

A Management Information System is intended to take relatively raw data available through a Transaction Processing System and summarize and aggregate it for the manager, usually in the form of a report. Middle management and operational supervisors are likely to use its reports.

MIS generates a wide range of report types. A summary report, an on-demand report, an ad-hoc report, and an exception report are among the reports available.
Examples: Sales management systems, Human resource management systems.

Decision Support System (DSS):

A Decision Support System (DSS) is an interactive information system that provides information, models, and data manipulation tools to assist decision- making in semi-structured and unstructured situations. The end user is more involved in creating DSS than an MIS because DSS includes tools and techniques to assist in gathering relevant information and analyzing options and alternatives.
Examples: Financial planning systems, Bank loan management systems.

Experts System:

Experts systems include expertise to assist managers in diagnosing and solving problems. These systems are based on artificial intelligence research principles. Experts Systems is a data-driven information system. It acts as an expert consultant to users by applying its knowledge of a specific area. An expert system's components are a knowledge base and software modules. These modules perform knowledge inference and provide answers to user questions.

Office Automation System:

An office automation system is a type of information system that automates various administrative processes such as documenting, data recording, and office transactions. The administrative and clerical activities are separated in the office automation system. Email, voice mail, and word processing are some of the business activities performed by this type of information system.

Executive Support System:

An Executive Support System (ESS) assists top-level executives in planning and controlling workflow as well as making business decisions. It is similar to the Management Information System (MIS).

- It provides great telecommunication, better computing capabilities, and effective display options to executives, among other things.
- It provides information to them in the form of static reports, graphs, and textual information on demand.
- It helps monitor performance, track competitor strategies, and forecast future trends, among other things

1.8 Summary

In this unit, you have been introduced to information systems. First, we have reviewed several definitions, focusing on the components of information systems: technology, people, and process. Next, we have studied how the business use of information systems has evolved over the years, from the use of large mainframe computers for number crunching through the introduction of the PC and networks, all the way to the era of mobile computing. Software and technology innovations allowed businesses to integrate technology more deeply during each phase.

We are now to a point where every company uses information systems and asks: Does it bring a competitive advantage? So, in the end, that is really what this course is about what every businessperson should understand, what an information system is and how it would use to bring a competitive advantage.

1.9 Key words

Transaction Processing System (TPS):

A transaction processing system is an information system that processes data resulting from business transactions. Their goals are to provide transactions so that records can be updated, and reports can be generated, i.e., to perform storekeeping functions

Management Information System (MIS):

A Management Information System is intended to take relatively raw data available through a Transaction Processing System and summarize and aggregate it for the manager, usually in the form of a report.

Decision Support System (DSS):

A Decision Support System (DSS) is an interactive information system that provides information, models, and data manipulation tools to assist decision- making in semi-structured and unstructured situations

Office Automation System:

An office automation system is a type of information system that automates various administrative processes such as documenting, data recording, and office transactions. The administrative and clerical activities are separated in the office automation system

Executive Support System:

An Executive Support System (ESS) assists top-level executives in planning and controlling workflow as well as making business decision

1.10 Self Assessment Questions

1. Explain how MIS helps organizations make decisions?
2. Describe the difference between data and information?
3. Summarize how MIS supports different functional areas (HR, Finance, Marketing)?
4. Explain how information flows across an organization?
5. Interpret simple business scenarios and identify the information needed?

1.11 Reference Books

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LESSON-2

DECISION MAKING IN MIS

Objectives

Define decision making in the context of MIS.

Recall types of decisions (structured, semi-structured, unstructured).

Identify types of decision-support systems

Structure

2.1 Introduction
2.2 Decision-Making Process
2.3 Decision Support System
2.4 Components of Decision Support Systems (DSS)
2.5 Application
2.6 Advantages of Decision Support Systems (DSS)
2.7 Summary
2.8 Key words
2.9 Self assessment Question
2.10 Reference Books

2.1 Introduction

Decision-making is a cognitive process that results in the selection of a course action among several alternative scenarios. Decision-making is a daily activity for any human being. There is no exception about that. When it comes to business organizations, decision-making is a habit and a process as well.

Effective and successful decisions result in profits, while unsuccessful ones cause losses. Therefore, corporate decision-making is the most critical process in any organization.

In a decision-making process, we choose one course of action from a few possible alternatives. In the process of decision-making, we may use many tools, techniques, and perceptions. In addition, we may make our own private decisions or may prefer a collective decision.

Usually, decision-making is hard. Majority of corporate decisions involve some level of dissatisfaction or conflict with another party.

2.2 Decision-Making Process

Following are the important steps of the decision-making process. Each step may be supported by different tools and techniques.

Step 1: Identification of the Purpose of the Decision

In this step, the problem is thoroughly analyzed. There are a couple of questions one should ask when it comes to identifying the purpose of the decision.
What exactly is the problem?
Why the problem should be solved?
Who are the affected parties of the problem?
Does the problem have a deadline or a specific time-line?

Step 2: Information Gathering

A problem of an organization will have many stakeholders. In addition, there can be dozens of factors involved and affected by the problem. In the process of solving the problem, you will have to gather as much as information related to the factors and stakeholders involved in the problem. For the process of information gathering, tools such as 'Check Sheets' can be effectively used.

Step 3: Principles for Judging the Alternatives

In this step, the baseline criteria for judging the alternatives should be set up. When it comes to defining the criteria, organizational goals as well as the corporate culture shouldbe taken into consideration.

As an example, profit is one of the main concerns in every decision making process. Companies usually do not make decisions that reduce profits, unless it is an exceptional case. Likewise, baseline principles should be identified related to the problem in hand.

Step 4: Brainstorm and Analyze the Choices

For this step, brainstorming to list down all the ideas is the best option. Before the idea generation step, it is vital to understand the causes of the problem and prioritization of causes. or this, you can make use of Cause-and-Effect diagrams and Pareto Chart tool. Cause-and-Effect diagram helps you to identify all possible causes of the problem and Pareto chart helps you to prioritize and identify the causes with the highest effect.

Then, you can move on generating all possible solutions (alternatives) for the problem in hand.

Step 5: Evaluation of Alternatives

Use your judgment principles and decision-making criteria to evaluate each alternative. In this step, experience and effectiveness of the judgment principles come into play. You need to compare each alternative for their positives and negatives.

Step 6: Select the Best Alternative

Once you go through from Step 1 to Step 5, this step is easy. In addition, the selection of the best alternative is an informed decision since you have already followed a methodology to derive and select the best alternative.

Step 7: Execute the decision:

Convert your decision into a plan or a sequence of activities. Execute your plan by yourself or with the help of subordinates.

Step 8: Evaluate the Results:

Evaluate the outcome of your decision. See whether there is anything you should learn and then correct in future decision making. This is one of the best practices that will improve your decision-making skills.

2.3 Decision Support System

DSS is an information system application that helps in decision-making. DSS is used in planning and analyzing alternatives. DSS differs from most traditional information system in that each DSS is distinct from the other information system and is specifically made for managers.

All though it is used by managers it is part of organization"s MIS. A DSS is prepared for a specific managerial task and special problem and thus its use is limited to that problem. Decision support systems tend to be designed to serve management control level and strategic planning level managers.

The elements of DSS include a database, a model base and software providing interactive dialogue facility for a manager. The data in the database is a combination of master files, and data from external sources. The second component of DSS is a library of models to manipulate and analyze the data in the desired ways.

The third component is the user interface through this the user can communicate with the DSS. The physical interface generally consists of a terminal attach to the mainframe computer either directly or by telephone. DSS can be differentiated from MIS in terms of its processing capabilities. whereas MIS process data to convert it into information, DSS processes information.

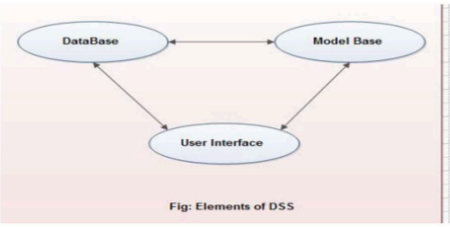


Fig: Elements of DSS

to support the decision making process of a manager. e.g. a salary information system provides information to every employee regarding his basic salary, allowances and deductions. However if any employee wants to make deposits in some schemes for income tax rebates he can make use of DSS. DSS helps the user to decide in which scheme how much he should invest to get maximum benefits. Decision Support System characteristics and Components Decision Support System are interactive information systems that depend on a (having different things working together as one unit) set of user-friendly hardware and software tools to produce and present information that is targeted to support the management in the decision-making process. The decision support systems help management decisionmaking by combining data, fancy (or smart) (related to careful studying or deep thinking) models and user-friendly software into a single powerful system that can support structured or (without rules, schedules, etc.) decision-making. The decision support system is under user control, from early beginning to final putting into use and daily use. Decision support system helps to close the information gap to enable managers to improve quality of their decisions. While MIS is carefully thought believed useful for structured decisions, DSS is carefully thought about to be more useful for decisions at the

strategical/strategic levels, where decision-makers are often angrily stood up to with complex decisions which are beyond their human abilities to (creation/combination)e properly the factors involved. DSS refers to a class of systems, which support in the process of decision-making and does not always give a decision itself. These systems can be used to validate decision by performing sensitivity analysis on different guidelines of the problem. read more about information technology and human resources meaning While developing decision Support System, the focus must be on identifying a problem and a set of capabilities that users consider useful in arriving at decisions about that problem. While developing DSS, therefore, care must be taken to make sure that the Decision

Support Systems possess the following desirable characteristics:

1. Should aid the decision-maker in decision-making.
2. Should be able to address semi/un-structured decision-making situations.
3. Should support decision-makers particularly at tactical/strategic levels.
4. Should be able to create general-purpose models, simulation capabilities and other analytical tools available to decision-maker.
5. Should enable users to use DSS without assistance from MIS/technical professionals.
6. Should be readily adapted to meet information requirement for any decision environment.
7. Should provide mechanism to enable rapid response to a decision-maker"s request for information.
8. Should have the capability to interface with corporate database.
9. Should be flexible to accommodate variety of management styles.
10. Should facilitate communication between/among various levels of decisionmaking.
11. Should have in-built flexibility and ability to evolve as user-sophistication grows.
12. Using of interactive methods are better advised.

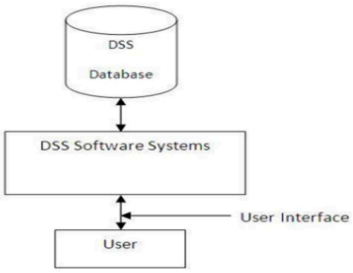
2.4 Components of Decision Support Systems (DSS)

Decision support systems consist of three main components, namely database, software system and user interface.

1. DSS Database: It contains data from various sources, including internal data from the organization, the data generated by different applications, and the external data mined form the Internet, etc. The decision support systems database can be a small database or stand alone system or a huge data warehouse supporting the information needs of anorganization. To avoid the interference of decision support system with the working of operational systems, the DSS database usually contains a copy of the production database.

2. DSS Software System: It consists of various mathematical and analytical models that are used to analyze the complex data, thereby producing the required information. A model predicts the output in the basis of different inputs or different conditions, or finds out the combination of conditions and input that is required to produce the desired output. A decision support system may compromise different models where each model performs a

specific function. The selection of models that must be included in a decision support system family depends on user requirements and the purposes of DSS. Note that heDSS software contains the predefined models (or routines) using which new models can be built to support specific type of decisions.



Some of the commonly used mathematical and statistical models are as follows:-

Statistical Models: They contain a wide range of statistical functions, such as mean, median, mode, deviations etc. These models are used to establish, relationships between the occurrences of an event and various factors related to that event. It can, for example, relate sale of product to differences in area, income, season, or other factors. In addition to statistical functions, they contain software that can analyze series of data to project future outcomes.

Sensitivity Analysis Models: These are used to provide answers to what-if situations occurring frequently in an organization. During the analysis, the value of one variable is changed repeatedly and resulting changes on other variables are observed. The sale of product, for example, is affected by different factors such as price, expenses on advertisements, number of sales staff, productions etc. Using a sensitivity model, price of the product can be changed (increased or decreased repeatedly to ascertain the sensitivity of different factors and their effect on sales volume. Excel spreadsheets and Lotus 1-2-3 are often used for making such analysis.

Optimization Analysis Models: They are used to find optimum value for a targetvariable under given circumstances. They are widely used for making decisions related to optimum utilization of resources in an organization. During optimization analysis, the values for one or more variables are changed repeatedly keeping in mind the specific constraints, until the best values for target variable are found. They can, for example, determine the highest level of production that can be achieved by varying job assignments to workers, keeping in mind that some workers are skilled and their job assignment cannot be changed. Linear programming techniques and Solver tool in Microsoft excel are mostly used for making such analysis.

Forecasting Models: They use various forecasting tools and techniques, including he regression models, time series analysis, and market research methods etc., to make statements about the future or to predict something in advance. They provide information that helps in

analyzing the business conditions and making future plans. These systems are widely used for forecasting sales.

Backward Analysis Sensitivity Models: Also known as goal seeking analysis, the technique followed in these models is just opposite to the technique applied I sensitivity analysis models. In place of changing the value of variable repeatedly to see how it affects other variables, goal seeking analysis sets a target value for a variable and then repeatedly changes other variables until the target value is achieved. To increase the production level by 40 percent using the backward sensitivity analysis, for example, first, the target value for the production level can be set and then the required changes to made in other factors, such as the amount of raw material, machinery and tools, number of production staff, etc., to achieve the target production level.

3. DSS User Interface: It is an interactive graphical interface which makes the interaction easier between the DSS and its users. It displays the results (output) of the analysis in various forms, such as text, table, charts or graphics. The user can select the appropriate option to view the output according to his requirement. A manager, for example, would like to view comparative sales data in tabular form whereas an architect creating a design plan would be more interested in viewing the result of analysis in a graphical format. The present-day decision support system built using the Webbased interface provides its users some special capabilities like better interactivity, facility for customization and personalization, and more ease of use.

2.5 Application

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One example is the clinical decision support system for medical diagnosis. Other examples include a bank loan officer verifying the credit of a loan applicant or an engineering firm that has bids on several projects and wants to know if they can be competitive with their costs.

DSS is extensively used in business and management. Executive dashboard and other business performance software allow faster decision making, identification of negative trends, and better allocation of business resources.

A growing area of DSS application, concepts, principles, and techniques is in agricultural production, marketing for sustainable development. For example, the DSSAT4 package, developed through financial support of USAID during the 80's and 90's, has allowed rapid assessment of several agricultural production systems around the world to facilitate decision-making at the farm and policy levels. There are, however, many constraints to the successful adoption on DSS in agriculture.

DSS are also prevalent in forest management where the long planning time frame demands specific requirements. All aspects of Forest management, from log transportation, harvest scheduling to sustainability and ecosystem protection have been addressed by modern DSSs. A comprehensive list and discussion of all available systems in forest management is being compiled under the COST action Forsys • A specific example concerns the Canadian National Railway system, which tests its equipment on a regular basis using a decision support system. A problem faced by any railroad is worn-out or defective rails, which can result in hundreds of

derailments per year. Under a DSS, CN managed to decrease the incidence of derailments at the same time other companies were experiencing an increase.

2.6 Advantages of Decision Support Systems (DSS)

Time savings. For all categories of decision support systems, research has demonstrated and substantiated reduced decision cycle time, increased employee productivity and more timely information for decision making. The time savings that have been documented from using computerized decision support are often substantial. Researchers, however, have not always demonstrated that decision quality remained the same or actually improved.

Enhance effectiveness. A second category of advantage that has been widely discussed and examined is improved decision making effectiveness and better decisions. Decision quality and decision making effectiveness are however hard to document and measure. Most researches have examined soft measures like perceived decision quality rather than objective measures. Advocates of building data warehouses identify the possibility of more and better analysis that can improve decision making.

Improve interpersonal communication. DSS can improve communication and collaboration among decision makers. In appropriate circumstances, communicationsdriven and group DSS have had this impact. Model-driven DSS provides a means for sharing facts and assumptions. Data-driven DSS make "one version of the truth" about company operations available to managers and hence can encourage fact-based decision making. Improved data accessibility is often a major motivation for building a data-driven DSS. This advantage has not been adequately demonstrated for most types of DSS.

Competitive advantage. Vendors frequently cite this advantage for business intelligence systems, performance management systems, and web-based DSS. Although it is possible to gain a competitive advantage from computerized decision support, this is not a likely outcome. Vendors routinely sell the same product to competitors and even help with the installation. Organizations are most likely to gain this advantage from novel, high risk, enterprise-wide, inward facing decision support systems. Measuring this is and will continue to be difficult.

Cost reduction. Some researches and especially case studies have documented DSS cost saving from labor savings in making decisions and from lower infrastructure or technology costs. This is not always a goal of building DSS.

Increase decision maker satisfaction. The novelty of using computers has and may continue to confound analysis of this outcome. DSS may reduce frustrations of decision makers, create perceptions that better information is being used and/or creates perceptions that the individual is a "better" decision maker. Satisfaction is a complex measure and researchers often measure satisfaction with the DSS rather than satisfaction with using a DSS in decision making. Some studies have compared satisfaction with and without computerized decision aids. Those studies suggest the complexity and "love/hate" tension of using computers for decision support.

Promote learning. Learning can occur as a by-product of initial and ongoing use of a DSS. Two types of learning seem to occur: learning of new concepts and the development of a better factual understanding of the business and decision making environment. Some DSS serve as "de facto" training tools for new employees. This potential advantage has not been adequately examined. Increase organizational control. Data-driven DSS often make business transaction data available for performance monitoring and ad hoc querying. Such systems can enhance management understanding of business operations and managers perceive that this is useful. What is not always evident is the financial benefit from increasingly detailed data.

Regulations like Sarbanes-Oxley often dictate reporting requirements and hence heavily influence the control information that is made available to managers. On a more ominous note, some DSS provide summary data about decisions made, usage of the systems, and recommendations of the system. Managers need to be very careful about how decisionrelated information is collected and then used for organizational control purposes. If employees feel threatened or spied upon when using a DSS, the benefits of the DSS can be reduced. More research is needed on these questions.

Disadvantages of Decision Support Systems (DSS)Decision Support Systems can create advantages for organizations and can have positive benefits, however building and using DSS can create negative outcomes in some situations.

Monetary cost. The decision support system requires investing in information system to collect data from many sources and analyze them to support the decision making. Some analysis for Decision Support System needs the advance of data analysis, statistics, econometrics and information system, so it is the high cost to hire the specialists to set up the system.

Overemphasize decision making. Clearly the focus of those of us interested in computerized decision support is on decisions and decision making. Implementing Decision Support System may reinforce the rational perspective and overemphasize decision processes and decision making. It is important to educate managers about the broader context of decision making and the social, political and emotional factors that impact organizational success. It is especially important to continue examining when and under what circumstances Decision Support System should be built and used. We must continue asking if the decision situation is appropriate for using any type of Decision Support System and if a specific Decision Support System is or remains appropriate to use for making or informing a specific decision.

Assumption of relevance. According to Wino grad and Flores (1986), "Once a computer system has been installed it is difficult to avoid the assumption that the things it can deal with are the most relevant things for the manager"s concern." The danger is that once DSS become common in organizations, that managers will use them inappropriately.

There is limited evidence that this occurs. Again training is the only way to avoid this potential problem.

Transfer of power. Building Decision Support Systems, especially knowledge-driven Decision Support System, may be perceived as transferring decision authority to a software

program. This is more a concern with decision automation systems than with DSS. We advocate building computerized decision support systems because we want to improve decision making while keeping a human decision maker in the "decision loop". In general, we value the "need for human discretion and innovation" in the decision making process.

Unanticipated effects. Implementing decision support technologies may have unanticipated consequences. It is conceivable and it has been demonstrated that some DSS reduce the skill needed to perform a decision task. Some Decision Support System overload decision makers with information and actually reduce decision making effectiveness.

Obscuring responsibility. The computer does not make a "bad" decision, people do. Unfortunately some people may deflect personal responsibility to a DSS. Managers need to be continually reminded that the computerized decision support system is an intermediary between the people who built the system and the people who use the system. The entire responsibility associated with making a decision using a DSS resides with people who built and use the system.

False belief in objectivity. Managers who use Decision Support Systems may or may not be more objective in their decision making. Computer software can encourage more rational action, but managers can also use decision support technologies to rationalize their actions. It is an overstatement to suggest that people using a DSS are more objective and rational than managers who are not using computerized decision support.

Status reduction. Some managers argue using a Decision Support System will diminish their status and force them to do clerical work. This perceptual problem can be a disadvantage of implementing a DSS. Managers and IS staff who advocate building and using computerized decision support need to deal with any status issues that may arise.

2.7 Summary

This perception may or should be less common now that computer usage is common and accepted in organizations information overload. Too much information is a major problem for people and many DSS increase the information load. Although this can be a problem, Decision Support System can help managers organize and use information. Decision Support System can actually reduce and manage the information load of a user. Decision Support System developers need to try to measure the information load created by the system and Decision Support System users need to monitor their perceptions of how much information they are receiving. The increasing ubiquity of handheld, wireless computing devices may exacerbate this problem and disadvantage.

2.8 Key words

DSS Database: It contains data from various sources, including internal data from theorganization, the data generated by different applications, and the external data mined form

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Sensitivity Analysis Models: These are used to provide answers to what-if situations occurring frequently in an organization. During the analysis, the value of one variable is changed repeatedly and resulting changes on other variables are observed

Optimization Analysis Models: They are used to find optimum value for a target variable under given circumstances. They are widely used for making decisions related to optimum utilization of resources in an organization

2.9 Self assessment Question

1. **Evaluate** whether the information provided is sufficient for a decision?
2. **Justify** the use of a particular MIS tool for a scenario?
3. How can you assess the risks associated with using inaccurate or incomplete information?
4. Evaluate the quality and relevance of information used for decision-making.
5. Discuss the effectiveness of decision-support systems.
6. Critically assess decisions made using MIS tools.

2.10 Reference Books

1.Pearlson, K. E., Saunders, C. S., & Galletta, D. F. (Year). Managing and using information systems: A strategic approach (Edition). Publisher.

2. Murthy, C. S. V. (Year). *Management information systems: Text & applications* (Edition). Publisher.

3. De, R. (Year). MIS: Management information systems in business, government and society. Publisher

4. Goyal, D. P. (Year). *Management Information Systems*. Publisher.

LESSON -3

HRIS

Objectives

Explain how HRIS supports HR activities.

Describe data flow in HRIS.

identify the components of HRIS?

Structure

3.1 Introduction
3.2 Meaning and Definition of HRIS
3.3 Advantages of HRIS
3.4 Basic system requirements
3.5 Cost-benefit analysis
3.6 The HR Function
3.7 Summary
3.8 Key words
3.9 Self assessment questions
3.10 Reference Books

3.1 Introduction

Many well-known examples of the use of information technology for competitive advantage involve systems that link an organization to suppliers, distribution channels, or customers. In general, these systems use information or processing capabilities in one organization to improve the performance of another or to improve relationships among organizations. Declining costs of capturing and using information have joined with increasing competitive pressures to spur numerous innovations in use of information to create value.

The ideas do not constitute a procedure leading inexorably to competitive advantage. However, they have been of value when combined with an appreciation of the competitive dynamics of specific industries and a grasp of the power of information. Results from "The Gap Between IT and Strategic HR in the UK",(June 2006) a study by talent management solutions company Taleo, show a significant disconnect between HR's strategic functions, including talent acquisition and workforce planning, and IT ability to support these business initiatives.

The survey of 100 senior HR managers, all in organizations employing more than a thousand people, found that only a quarter thought that strategic functions such as workforce planning, leadership development and performance management were well supported by their IT systems. Only a third felt confident in systems support for recruitment and employee progression. Other findings included:

Current technology systems were out-of-date. Over half the respondents (55%) felt that more sophisticated technology systems and processes were needed to support recruitment and development. IT focused on lower-level, administrative functions. Respondents said that payroll and employee administration (68%) and evaluation and management reporting (53%) were adequately supported by IT.

However, more strategic HR initiatives such as performance management (28%), leadership development and planning (25%) and strategic workforce planning (25%) were not well supported.

Inadequate data and technology systems obstructed workforce management. Just 29% of respondents felt that they had sufficient systems in place to gain a clear picture of existing employee skills.

The HR function was striving to become more strategic. 63% of respondents cited talent management (including recruitment) as a significant priority in the year ahead.

Taleo Research Vice President, Alice Snell said: "The gap between the support of administrative functions and strategic HR responsibilities needs to be addressed in order for HR directors to deliver results to the Board. When HR directors can assess the workforce changes needed by the business, acquire and develop the talent needed to optimise the workforce, and then measure the results, their true value can be realised."

"Findings of this study clearly show that HR is evolving to play a more strategic role in supporting fundamental business objectives, but the systems being used by HR functions are not keeping up," added Neil Hudspith, Senior Vice President, International Operations, Taleo. "It's clear hat talent management and other strategic initiatives are being recognised as essential functions by ambitious companies that want to retain and recruit the best people, but organisations need to arm their HR directors with the tools and technology needed to support this strategy. The right HR technology is a critical element of any HR strategy moving forward."

3.2 Meaning and Definition of HRIS

Human Resources Information System, is a system that lets you keep track of all your employees and information about them. It is usually done in a database or, more often, in a series of inter-related databases. These systems include the employee name and contact information and all or some of the following:

department,
job title,
grade,
salary,
salary history,
position history,
supervisor,

training completed,
special qualifications,
ethnicity,
date of birth,
disabilities,
veterans status,
visa status,
benefits selected,
and more.

Any HRIS include reporting capabilities. Some systems track applicants before they become employees and some are interfaced to payroll or other financial systems. An HRIS is a management system designed specifically to provide managers with information to make HR decisions

You notice that this is not an HR system...it is a management system and is used specifically to support management decision making . The need for this kind of information has increased in the last few years, especially in large and/or diverse companies, where decision making has been moved to lower levels

And large companies generally have the advantage when it comes to HRIS's...the cost to develop an HRIS for 200 people is usually close to that for 2000 people...so it is a better investment for large companies...larger companies tend to have systems that have a fairdegree of customization

Therefore, HRIS can be defined in simple words as given below.

Human Resource Management Systems (HRMS, EHRMS), Human Resource Information Systems (HRIS), HR Technology or also called HR modules, shape an intersection in between human resource management (HRM) and information technology. It merges HRM as a discipline and in particular its basic HR activities and processes with the information technology field, whereas the planning and programming of data processing systems evolved into standardised routines and packages of enterprise resource planning (ERP) software. On the whole, these ERP systems have their origin on software that integrates information from different applications into one universal database. The linkage of its financial and human resource modules through one database is the most important distinction to the individually and proprietary developed predecessors, which makes this software application both rigid and flexible.

3.3 Advantages of HRIS

An HRIS can reduce the amount of paperwork and manual record keeping
It retrieves information quickly and accurately
It allows quick analysis of HR issues

Most HRIS Contain:

Personal history - name, date of birth, sex

Work history - salary, first day worked, employment status, positions in the organization, appraisal data and hopefully, pre-organizational information

Training and development completed, both internally and externally nCareer plans including mobility Skills inventory - skills, education, competencies...look for transferable Skills

The pressure is on for proactive HR innovations that contribute directly to the bottom-line or improve employee morale and efficiency. Ajuwon (2002) points out that the typical HR professional gets involved with one step in many different flows of work. Very often the involvement of HR has no purpose except to validate the process in some way and acts as an interruption to the flow of work. In other words, the HR function is a 'gatekeeper for information that's been deemed too highly classified for the data owner.' So HR is not actually making a measurable contribution - in fact, the opposite. HR involvement creates a queue or delay in the process. We should ask if the HR involvement is really necessary. Once upon a time the HR database had an 'all-or-nothing' quality - probably because it was paper-based. But now technology allows controlled access to various portions of the database. So an employee can safel amend his or her own address or bank account details, while the ability to change certain appraisal details might be confined to the line manager. In either case, there is no reason for HR to be involved. HR should move on from the role of intermediary.

Not surprisingly, the use of employee self-service systems for records, information, payroll and other functions is becoming increasingly common. Libraries of forms can be kept online to be downloaded as and when required. Systems can be enhanced to include streaming video and other new software providing wide access to corporate videos, training, etc. Obviously, e-mail announcements and newsletters can also be used to alert employees to new developments or urgent requests.

Ajuwon (2002) argues that HR should be proactive in the process and highlights three different perspectives for action:

The process perspective - getting the fundamental building blocks (people processes) right and ensuring their relevance at all times. This demands close and detailed knowledge of HR processes and a commitment to improvement and efficiency. HR professionals need to understand their own objectives and the relationship with business strategy.

The event perspective - a focus on providing a framework for knowledge management. In other words, capturing the experience and information available in that harnesses the organisation and making it available to individuals.

The cultural perspective - acknowledging that HR has a 'pivotal role in the proactive engagement of the entire organisation in a changing climate. During the 1990s the business process re-engineering approach resulted in many organizations taking a 'root and branch' look at HR and other processes. Subsequent reorganizations may have produced fresh, streamlined processes but often they became inappropriate or inefficient as circumstances changed. It is not enough to design a corporate human resource strategy or acquire a piece of technology. There has to be some way of ensuring effective operational delivery. A more fluid, constantly changing methodology is required. Ajuwon ncontends that we have the means:

"It‘s more than innovating and/or streamlining your HR processes; or building an HR portal or introducing a culture change programme "It‘s about weaving together all three in a way that sustains change, engages the entire organization and deploys the organization‘s knowledge assets to gain competitive advantage and deliver profitability, even in times of economic downturn."

Human resource systems can differ widely. They may be:

Intranets using web-type methods but operating purely within one organization or location.

* Extranets - encompassing two or more organizations.

* Portals - offering links to internal information and services but also accessing the worldwide web.

Advantages

- Familiarity (looking like web pages)
- Attractiveness (colourful, clearly laid out, graphics)
- Integration (linking different HR systems such as basic personnel records, employee handbooks, terms and conditions, contracts, various entitlements and payroll)
- Allowing employees and managers to enter, check and amend controlled ranges of personal and other information.
- Eliminating printing, enveloping and mailing of personnel and other employee information
- Reducing need for telephone handling of routine enquiries by HR staff.

3.4 Basic system requirements

1. Desktop PCs for accessing and inputting information locally. Standard browsers are used to access information (e.g. Netscape or Internet Explorer).

2. Organization-wide server. In a small company this need be nothing more than a PC as well. The server must have an intranet server software package installed (Microsoft Internet Information Server, or Netscape Communications Server are examples.)

3. Server-side software such as HTML, Java, Javascript, Perl.

4. Intranet communications protocol running on both PCs and the server.

5. Relational database/Information processing software for records, payroll, etc.

If data is to be accessed then the procedure is made slightly more complicated with the need for CGI scripts and database server software on the server.

6. Basic documents such as policy manuals typically loaded in HTML – but formats such as Adobe Acrobat PDF are also an alternative.

3.5 Cost-benefit analysis

Difficult to quantify because the greatest return is in improved morale. Robert Musacchio, CIO with the American Medical Association in Chicago is quoted as having installed between 50-60 intranet applications for 1400 employees at $10,000 to $20,000 per application Musacchio says a self-service employee-benefits site, which provides information on benefits and lets employees pick health-care, day-care, and retirement investment options, was built for "almost six figures." Musacchio figures it provided a 40% return on investment, based on the time saved by human resource managers who don't have to answer employees' questions about these topics because they're answered by the application".('Intranet ROI: Leap Of Faith',(Information Week Online, May 24 1999.)

Fletcher argues that businesses have to adopt a 'Human Capital Management' approach to make the most of any organization's greatest asset: the skills, knowledge and experience of its staff. She describes how, in the 1990s, most large businesses introduced 'Human Resources Information Systems' (HRIS) and that, in combination with re-engineering (the buzzword of the time), this enabled them to "replace antiquated, time-consuming personnel processes with automation."

Walker (Walker, A.J. 'Best Practices in HR Technology' in Web-Based Human\ Resources, McGraw Hill, 2001) states that if HR technology is to be considered successful, it must achieve the following objectives: It must provide the user with relevant information and data, answer questions, and inspire new insights and learning.

Efficiency and effectiveness HRIS must be capable of changing the work performed by the HumanResources personnel by dramatically improving their level of service, allowing more time for work of higher value, and reducing their costs. But, despite extensive implementation of Enterprise Resource Planning (ERP) projects, Human Resource Information Systems (HRIS), and HR service centres costing millions of dollars, Walker concludes that few organizations have been entirely happy with the results. Why is this?

Many systems have been implemented by cutting HR staff, outsourcing and imposing technology on what was left. Arguably this approach should, at least, have cut costs. But Walker argues that survey results demonstrate that overall HR departments have actually increased their staffing levels over the past decade to do the same work. Moreover he considers that:

"Most of the work that the HR staff does on a day-to-day basis, such as staffing, employee relations, compensation, training, employee development, and benefits, unfortunately, remains relatively untouched and unimproved from a delivery standpoint."

Fletcher explores the issue of effectiveness in a very telling paragraph (page 15) in which she states that: "Executives struggle with what to measure and how to clearly tie employee metrics to business performance." Not only are they pressured by the vast costs of Human Capital Management (payroll, etc.) but they also have to report to analysts "whose valuations consist partly of measuring such intangible assets as the corporate leadership's team to execute on strategy or the ability of the business to attract and retain skilled talent." She concludes that:

Executives are not sure about the kind of data that would prove to analysts that their employees are delivering better and creating more value than their competitors Analysts are struggling to make sense of intangibles, often falling back on a 'revenue per employee' metric which does not tell the whole story.

3.6 The HR Function

The business process should be re-engineering the HR function first, then Eengineering the HR work. He suggests the formation of re-engineering teams of providers, customers and users to examine the whole range of HR activities - including those which are not being done at present. The end product is a set of processes organized into broad groupings such as resourcing, compensation or training and development. These processes should then be examined by the reengineering team and redesigned to:

Be better aligned with organizational goals.

Streamlined so as to be cost-effective in comparison with the 'best in class'.

Have a better integration with other processes.

From this redesign comes the picture of a new HR function. What next? The organization could be restructured and the tasks handed out existing or new staff. But Walker argues that the most effective approach is to introduce new technology to deal with the redesigned processes.

3.7 Summary

For HR to survive in this brave new world it needs to "possess a technology acumen like never before." A tall order, one suspects, for many die-hard personnel traditionalists. But if they do not demonstrate the ability to recommend appropriate technology and control automated HR processes, organizations will use other people for these tasks some replacements for 'traditional' HR executives may have no direct experience of human resource management at all. Instead, they may have "led a line of business and have had P&L responsibility, understand what it means to be accountable for delivering business result

3.8 Key words

HRIS (Human Resource Information System)

A digital system used to store, manage, and process employee information such as attendance, payroll, performance, and benefits.

ATS (Applicant Tracking System)

A software tool within HRIS that tracks job applicants through the hiring process—posting jobs, screening resumes, and scheduling interviews.

Employee Self-Service (ESS)

A feature that allows employees to update personal information, view payslips, request leave, and manage profiles without HR assistance.

Manager Self-Service (MSS)

Tools that let managers approve leave, update team data, view reports, and manage performance evaluations.

Core HR / Core HRIS

Foundational HR functions such as employee records, job data, organizational structure, and compliance tracking.

Payroll Integration

The connection between HRIS and payroll systems that ensures employee data (salary, time worked, deductions) automatically syncs for accurate payroll processing.

Time & Attendance Management

HRIS features that track employee work hours, overtime, shift schedules, and biometric attendance.

Performance Management

HRIS modules used for setting employee goals, tracking performance, conducting evaluations, and managing appraisals.

Learning Management System (LMS)

A module or system integrated with HRIS that handles employee training, certifications, and development programs.

Compensation Management

Tools to plan salary increments, bonuses, and reward structures.

3.9 Self assessment Questions

1. What HR processes did I streamline through the HRIS?
2. How often did you propose improvements that reduced manual work?
3. How well did I contribute to HRIS projects like system upgrades, module implementations, or integrations

3.10 Reference Books

1.Pearlson, K. E., Saunders, C. S., & Galletta, D. F. (Year). Managing and using information systems: A strategic approach (Edition). Publisher.

2. Murthy, C. S. V. (Year). *Management information systems: Text & applications* (Edition). Publisher.

3. De, R. (Year). MIS: Management information systems in business, government and society. Publisher

4. Goyal, D. P. (Year). *Management Information Systems*. Publisher.

LESSON -4

HRIS MODELS

Objectives

Define HRIS and its core functions.

List common HRIS modules (Payroll, Attendance, Recruitment, Performance, etc.).

Identify different HRIS models (Cloud, On-Premise, Hybrid).

Recall basic HRIS terminologies (ESS, MSS, ATS, LMS).

Structure

4.1 Introduction
4.2 Characteristics of Human Resources Planning
4.3 The Need for Manpower Planning
4.4 Markov Models
4.5 Significance of HR Planning
4.6 Nature of HR Planning
4.7 Summary
4.8 Key words
4.9 Self Assessment Questions
4.10 Reference Books

4.1 Introduction

Manpower Planning (MPP) now referred to as Human Resource Planning (HRP) is an attempt to meet organization‘s need for Human Resources with the available supply of manpower in the local and national labor markets. For many organizations, specialized departments within personnel may be established to concentrate exclusively on manpower planning. Issues that these departments may address include: ϖ How many employees does the organization currently employ? ϖ What is the age profile, by the department, of our employees? ϖ Where in the organization are these employees to be found? ϖ Which are the biggest departments in the organization? ϖ What skills do our employees? ϖ How many employees, on average, leave the organization every year

In which areas of our business do we tend to _lose‘ more employees? These questions are fundamental to the day-to-day activities of manpower planners and are crucial for the future success of the business. Human resources are considered the most valuable, yet the most volatile and potentially unpredictable resource, which an organization utilizes. If an organization fails to place and direct human resources in the right areas of the business, at the right time, and at the right cost (Bramham, 1990; Smith, 1971), serious inefficiencies are likely to arise creating considerable operational difficulties and likely business failure. Consider the rather unlikely, but

illustrative example, of a business, which one-day finds that all its employees in the accounts department suddenly retire! This ridiculous situation is an extreme example of poor manpower planning. Most organizations would keep records on the age profile of their departments so that such events can be created for with specific development, progression, recruitment and training plans. Such contingencies would ensure that human resources are channeled through organizations in an orderly and disciplined fashion.

In order to hire personnel on a scientific basis one should establish in advance a standard with which applicants can be compared. This standard should\ establish minimum acceptable qualities necessary adequate performance of job duties and responsibilities to determine human abilities required for execution.

HRP determines the human resource needs of the whole enterprise and its every department for given future period for the various operations envisage in connection with the accomplishment of organizational objectives and departmental goals. HRP is the predetermination of the future course of action chosen from a number of alternatives for procuring, developing, managing, motivating, compensating, career planning, succession planning and separating human element of the enterprise. It determines a conscious choice of patterns of the humanization of work environment in an organization.

According to Geisler, —HR planning is the process – including forecasting, developing and controlling – by which a firm ensures that it has the right\ number of people and the right kind of people at the right places at the right time doing work for which they are economically most usefull.

According to Wendell French, human resource planning may be defined – —as the process of assessing the organisation‘s human resources needs in the light of organisational goals and making plans to ensure that a competent, stable work force is employedl.

According to E.W.Vetter, human resource planning is —a process by which an organisation should move from its current manpower position to its desired manpower position. Through planning, management strives to have the right number and right kind of people at the right places at the right time, doing things which result in both the organisation and the individual receiving maximum long-run benefitl.

Leon C Megginson is of the opinion that, human resource planning is —an integrated approach to perform the planning aspects of the personnel function in order to have a sufficient supply of adequately developed and motivated people to perform the duties and tasks required to meet organisational objectives and satisfy the individual needs and goals of organisational membersl.

4.2 Characteristics of Human Resources Planning

From the above definitions, we can get some general characteristics of human resources planning. They are Human resources plan must incorporate the human resources needs in the light of organisational goals.

2. Human resource plan must be directed towards well-defined objectives.

3. Human resource plan must ensure that it has the right number of people and the right kind of people at the right time doing work for which they are economically most useful.

4. Human resource planning should pave the way for an effective motivational process.

5. A human resource plan should take into account the principle of periodical reconsideration of new developments and extending the plan to cover the changes during the given long period.

6. Adequate flexibility must be maintained in human resources planning to suit the changing needs of the organisation. Human resource planning or manpower planning are synonymous. It incorporates all human beings at all stages in the organisation. It is essentially\ concerned with the process of estimating and projecting the supply and demand for different categories of personnel in the organisation for the years to come.

4.3 The Need for Manpower Planning

1. The rationale of human resources planning stems from the challenges posed by an overflowing realization that managerial success depends on the success of human resources management. If the desired people were not in position, then the implementation of the plans would suffer.

2. Capabilities, skills, performance abilities and potentialities of each individual are evaluated in the human resources audit. On many occasions, replacement charts or succession plans are kept so tha otential executives are located for every position in the organization during the given future period.

3. Forecasting and auditing provide background information about internal factors like current and expected skills and vacancies. Accordingly manpower planning can be done. The normal wastage of HR due to turnover, death, superannuation, needs to be planned. Thus, manpower planning must be supported by human resource forecasting, human resource auditing and human resources analyzing.

4. There is an increasing awareness among the managers that no business can survive and grow without adequate and appropriate human resources and their proper management. Taking cognizance of the emerging trends, the human resources planning must respond to the need for structural changes on the one hand and to the emerging set of human expectations on the other.

5. Adequate investment in human capital is indispensable in a business environment. A substantial improvement in quality of life and quality of work life backed by total quality management, require systematic human resource planning.

6. Planning will help in positioning needed employees at the desired time taking into account the lead time for the process of identifying the shortages, getting the vacancy cleared and going through the selection process. It identifies and develops the personnel to move up and assume greater responsibility.

7. Human resources planning must always be backed by proper evaluation and appraisal systems. Periodical appraisal of performance, both in qualitative and quantitative terms, throws light on actual performance as a result of planning. Scientific performance appraisals facilitate in identifying the gaps existing so that corrective measures can be undertaken.

8. Changes in the environment are continuously taking place. Human resource planning suggests training and development programmes so that personnel can adapt to these changes.

9. Human resource planning helps in reducing the cost of production and keeps the wheels moving, by providing adequate personnel, utilizing the human resources present in the organisation itself and effectively controlling and utilizing them. It should be sufficiently obvious at this stage that manpower planning involves both a quantifiable and quantitative dimension leading to:

Recruitment plans: to avoid unexpected shortages etc.,

The identification of training needs: to avoid skill shortages

Management development: in order to avoid bottlenecks of trained but disgruntled management who see no future position in the hierarchy but also to avoid managerial shortages – this often requires careful planning.

Industrial relations plans: often seeking to change the quantity and quality of employees will require careful IR planning if an organization is to avoid industrial unrest.

In practice, _manpower planning is concerned with the demand and supply of labor and problems arising from the process of reconciling these factors' (Tyson and York, 1989:76). In summary the need for manpower planning lies with the long-term and short-term operational needs for the organization but also, critically, with the needs and aspirations of individuals within the business. It is with respect to this issue that we must now turn The Creation of a Manpower Plan

The creation of manpower plan involves certain factors, which contribute to the planning of manpower resources both in terms of internal considerations, and external factors which influences the final outcome of the manpower plan.

Internal Considerations

Wastage analysis

Initially the manpower planner will be concerned with the average number of employees that leave and therefore need replacing just in order to maintain a constant number of employee resources in the organization. In large organizations with many departments and demarcated lines of responsibility this can become quite a difficult statistical task requiring considerable time and effort in the collection, synthesis and analysis of data. In smaller organizations it can often be calculated very simply because the informality and personal nature of the organization creates a climate where everybody knows everyone else and when someone leaves it is quite an important and visible event. In large organizations it is far more likely that an employee is simply seen as a

payroll number, or a job code. The constant ebb and flow of _numbers‘ within the organization requires a far more rigorous calculation of _wastage‘ than the rule of thumb and management owner discretion in smaller firms.

The simplest way of calculating wastage is through a turnover analysis:
Number leaving in one year / Average number of employees x 100 = x%
However, this gives a somewhat crude and unrealistic picture of wastage because it fails to locate where these people are leaving from. In general, though, it gives a broad picture of the current state of employee in total and it is usual to consider a 25% turnover rate as perfectly respectable in modern largescale organizations. Anything approaching 30-35% may well start alarm bell ringing because it suggests that a large amount of money is being directed into advertising and recruiting employees who are more likely to leave than in an average 25% turnover organization. However, as we suggested above when the manpower planner comes to formulate plans and policies to address this turnover this figure does not provide much useful and practical information. For example, where are these people leaving from? What is the average age of the person who is leaving? For example, it could be that your turnover figure has become distorted over the recent past because of the age profile of the organization and in any one year it may be that there are far more employees than on average reaching retirement age. Consequently it would be more useful to decompose this figure into those that are retirements from those, which are _voluntary‘. Furthermore, turnover might be limited to one particular category of employment, one department, a certain grade or one geographical area. The variety of influences which affect employee turnover are far too numerous to be captured by one calculation such as the labor turnover ratio. Thus for practical reasons we need a more subtle index of turnover which is more closely dentifiable with factoral influences.

An alternative to the labor turnover ratio is the Labor Stability Index (Bowex, 1974), which is calculated from the following formula: Number of employees exceeding one year‘s service / Number of employees employed one year ago x 100 = x%

The calculation by contrast calculates and emphasis those that stay and hence is known as a stability index. Its importance can be demonstrated through a calculation and comparison with the turnover ratio. Consider two companies: Company X, which in January 1990 employs 2,00 assistants, but from which by January 1991 800 have _voluntary‘ left. This gives a turnover of 800/2,000 x 100 =40%.

Company Y which January 1990 employs 2,00 assistants, but from which by January 1991 only 100 have actually _voluntarily‘ left the company, although they have been replaced eight times during the year. This would again give a turnover of 40%. The labor stability index by contrast would show that Company X has a stability rate of only 60% whereas company Y has a far more impressive stability rate of 95%.

Far more sophisticated techniques have evolved in order to more accurately plot and account for employee wastage. In recent years many companies have become interested in the length of service of employees and it is possible to develop a frequency distribution of leavers by length of service.

It is possible to identify three distinct phases in the analysis of turnover. Following the work of the Tavistock Institute, in particular by Hill and Trist (1953, 19550 in two notable papers of study at the Park Gate Iron and Steel Company, a relationship was established between an initial _induction crisis', a period of _differential transit', and a concluding _settled connection'. During the induction crisis it can be seen that the relationship between the individual andthe organization is unsettled and a little insecure as the frequency of leavers was far greater in the first eighteenth months of service than during subsequent periods of employment. This can be seen as a _trial period' in which employees are not sure if they are going to stay. Furthermore, the _shock' of employment and the concomitant attention to discipline, hard work and regular time keeping takes some time to adjust to. In the crisis period therefore there are likely to be a far greater incidence of inductees leaving than in subsequent periods. Hill and Trist also found that other problems associated with manpower planning could be discerned during this period as the rates of _unsanctioned' absence and industrial accidents were far greater during the induction crisis than during the period of settled connection. In attempting to explain and analyze this relationship they found considerable evidence to suggest that accidents would fall and relatively _sanctioned absences' would rise. This was explained as a result of the quality of the relationship established between the individual and the organization. After the induction crisis a more stable and secure relationship was established such that a more positive relationship between the individual and the organization reduced accidents and unauthorized absences so thatOnly sickness, therefore, remains; and the suggests is that recourse is had to some kind of sickness when the individual, no longer able, in virtue of his improved relationship, to project his…bad feelings on to the firm as freely as he once did.

Thus the authors conclude that employees internalize stress and dissatisfaction and do not blame' the organization after the induction crisis. The word blame' is used by the authors to denote a psychological reaction to the organization such that the individuals are looking to punish or hit back at the organization for the stress of employment. Accidents are likely to be higher because of the lack of commitment and dedication to the organization, and thus absences are more likely to be a result of the organization's fault rather than the individual employee. Therefore an overall fall in the level of absence after the induction\ crisis suggests _a dynamic connectedness between sanctioned absence (in the form of sickness) and the phase of settled connection' (Hill and Trist, 1955:136). Consequently the employee moves from being a victim at the psychological level to one who increasingly looks to himself for the cause of sickness or the need for absence.

Such internal considerations as absence, accidents and sickness ratios provide, as Timperely and Sission (1989) state, manpower planning policy implications in that _there are inherent predictabilities in the process, allowing wastage to be expected and therefore, forecast'. Not only do manpower planners need accurate information on absence and turnover rates but also statistical records and forecasts of retirements by department, sabbaticals, and the average number of employees engaged intraining and retraining.

4.4 Markov Models

These models are often used by manpower planners in the consideration of internal factors, which need to be considered in the development of a manpower plan. The Markov model and variants of it attempt to model the flow of individuals within the organization. It states that

organizations have predictable wastage patterns according to length of service, and that this pattern can be discerned early on in an individual‘s career. Once _survival‘ rates have been calculated and barring no future shocks, a fairly stable pattern of progression and replacement needs over time can be calculated. Furthermore, adaptations of the basic Markov model are used to project recruitment on the basis of stable patterns of both wastage and promotion. From this a planner can predict the probability and the likely time span of an individual progressing from one grade to another further up the hierarchy. From a consideration of these factors important planning information can be used in the recruitment and selection process, but also importantly in the training needs of individuals progressing from one grade to another further up be used in the recruitment and selection process, but also importantly in the training needs of individuals such that the organization does not suffer from supply shortages. If a planner knows with some certainty that an individual tends to spend only two years in a particular managerial grade before being promoted to some other department, contingent a training and recruitment plans can be made so that shortages in that area can be eliminated. Thus if _recruitment, promotion and wastage patterns of staff are stable over reasonable periods of time. The probability that someone in a particular grade at any time will be in some other grade at a later time can be established from the detailed recent career histories of staff‘ (Timperely and Sission, 1989: 111).

Integrated Strategic Planning and HR Planning The starting point of effective human resource planning is the organisations‘ overall purpose or mission. Strategic plans are as unique as the organisations that develop them, but underlying most organisational strategies that is the determination of some unfulfilled need for products or services that the\ organisation can satisfy. Providing these products or services then becomes part of the organisation‘s goals. An organisational goal is a long-term broad purpose or aim. Part of strategic planning is the development of organisational goals and objectives.

To a great extent, organisational goals influence the nature of all managerial processes and of human resource management in particular. This means that the structure of the organisation, the specific jobs to be performed, and the financial and technological resources needed and the qualifications and numbers of people employed will consistently reflect organisational goals. Human resource planning is the ongoing planning of the organisation‘s human resources, philosophy, policies and programmes in the context of the overall strategic plans and the changing conditions within and outside the organisation.

4.5 Significance of HR Planning

From the above, it is clear that any failure in HR planning will be a limiting factor in achieving the objectives of the organisation. If the number of persons in an organisation is less than the number of persons required, then, there will be disruptions in the work, production will be hampered and the pace of production will be slow and employees will be burdened with more work. If there is surplus manpower in the organisation, there will be unnecessary financial burden on it in the form of a large pay bill if employees are retained in the organisation or if they are terminated the compensation will have to be paid to the retrenched employees. Therefore, it is necessary to have adequate number of persons in an organisation to attain its objectives.

In order to achieve the objectives of the organisation, the HR planner should be concerned with the timing and scheduling of planning of human resources. Furthermore, the management has to be persuaded to use the results of manpower planning studies.

Manpower planning can also be used as an important aid in framing the training and development programmes for the employees because it takes into account the anticipated changes in the human resource requirements of the organisations.

4.6 Nature of HR Planning

1. Manpower planning involves all the activities with regard to human resources, which belong to a heterogeneous species. Manpower planning includes determination of manpower needs both in quantitative and qualitative terms. The determination of needs must be made in advance to permit adequate time for education, training and development.

3. It includes an inventory of present manpower in order to determine the status of the present supply of manpower so that the labour force can be used to its full capacity.

4. To be effective, manpower planning must focus not only on the people involved but also on the working conditions and the relationships in which they work.

5. Manpower is an important asset of an organisation, which is affected by its social, cultural, economic and psychological backgrounds.

Therefore, the manpower must be planned and utilized carefully

HR Planning at different levels HRP may be made at different levels and for different purposes. National planners may make a HR plan at the national level wereas a company may make a HR plan at the unit level. 1. HRP at Naitonal Level: HRP at the national level helps to plan for educational facilities, health care facilities, agricultural and industrial develoment, and employment plans etc. The government of the country plans for human resources at the national level. National plans for HR forecast the demand and supply of human resources at the national level.

It also plans for occupational distribution, sectoral and regional allocation of human resources.

2. HRP at the Sectoral Level: HRP at the sectoral level helps to plan for a particular sector like agriculture, industry etc. It helps the government to allocate its resources to the various sectors depending upon the priority accorded to the particular sector.

3. HRP at the Industry Level: HRP at the industry level takes into account the output/operational level of that particular industry when manpower needs are considered.

4. HRP at the Unit Level: HRP Planning at the company level is based on the estimation of human resource needs of the particular company in question. It is based on the business plan of the company. A manpower plan helps to avoid the sudden disruption of the company‘s production

since it indicates shortages of particular types of personnel, if any, in advance, thus enabling management to adopt suitable strategies to cope with the situation.

5. HRP at the Departmental Level: HRP at the departmental level looks at the manpower needs of a particular department in an organisation.

4.7 Summary

HRP determines the human resource needs of the whole enterprise and its every department for given future period for the various operations envisage in connection with the accomplishment of organizational objectives and departmental goals. HRP is the predetermination of the future course of action chosen from a number of alternatives for procuring, developing, managing, motivating, compensating, career planning, succession planning and separating human element of the enterprise. It determines a conscious choice of patterns of the humanization of work environment in an organization.

4.8 Key words

Operational HRIS

A system model focused on daily HR tasks such as employee data management, attendance, and payroll processing

Tactical HRIS

Supports mid-level HR decision-making such as recruiting, training, performance evaluation, and compensation planning.

Helps improve HR processes.

Strategic HRIS

Used for high-level, long-term decision-making such as workforce planning, succession planning, and organizational development.

Helps leadership make strategic workforce decisions.

Comprehensive HRIS

A full-suite system combining operational, tactical, and strategic HR functions in one platform (e.g., SAP SuccessFactors, Workday).

Provides an end-to-end HR technology ecosystem.

Limited-Function HRIS

An HRIS focused on one or two specific modules (e.g., payroll only, attendance only).

Used by small organizations with minimal HR needs.

On-Premise HRIS

System is installed and maintained on the organization's own servers.
Offers high control but requires technical support.

Cloud-Based HRIS / SaaS HRIS

A web-hosted system where data and functions are accessed online.
Easier updates, scalability, lower maintenance.

Hybrid HRIS

Combination of on-premise and cloud components.
Allows gradual transition from older systems to modern HRIS.

Transaction Processing Model

Processes high-volume, repetitive HR transactions such as leave requests, payroll updates, and attendance logs.
Ensures accuracy and efficiency for routine tasks.

4.9 Self Assessment Questions

Explain how HRIS improves HR processes.

Describe the difference between operational, tactical, and strategic HRIS functions.

Interpret HRIS reports and dashboards.

Explain data privacy and compliance requirements in HRIS.

4.10 Reference Books

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LESSON-5

DATA BASE IN HRIS

Objectives

To Understand the Elements of Data Management

To Know the Human Resource Process

To Highlight the Data warehouse for storage

To Discuss the different Methods of storing Data

Structure

5.1 Introduction
5.2 Elements of Data Management
5.3 Data Format
5.4 Human Resource Process
5.5 Data Storage And Retrieval
5.6 Data Storage
5.7 Data Warehouse for Storage
5.8 History of Data Warehousing
5.9 Different Methods of Storing Data
5.10 Concerns in Using Data Warehouse
5.11 Summary
5.12 Key words
5.13 Self assessment question
5.14 Reference Books

5.1 Introduction

Only some of the organizations have sufficient policies and procedures in place to collect the majority of necessary human resource data. For those not having sufficient policies and procedures in place, this deficiency limit their ability to extract, report or analyze performance in areas where information is not collected and maintained in a structured format.

The organizations themselves should be aware of many of the shortcomings in their HR data. Partly, this may be the result of a number of internal audits that had been carried out in the organizations, and partly, feedback from staff and external bodies. Issues surrounding data quality indicates that data collection policies and procedures are not always implemented successfully in practice.

The organizations, which take, planned and measured approach to the implementation and ongoing management of their HRIS, tend to make more effective use of their systems. These organizations were better positioned to generate information for a greater range of strategic and operational human resource purposes. The other organizations take a less structured, more urgent

approach, as short-term human resource processing requirements drove their management of the system.

5.2 Elements of Data Management

As noted above data management can be viewed as comprising the following tasks:

Capture refers to movement of data from the instrument or simulation to the storage mechanism. This often involves some form of data selection or compression. It also involves the creation of Meta data.

Storage refers to the place and procedure required for storage of data by the use of automatated data vaults and tape stores Management refers to indexing and cataloguing the data and providing methods to organize and move it from site to site or between programs which involves meta data and self-defining data formats.

Analysis refers to processing or fusion and mining the data to extract the science.

Visualization refers to presenting the data in a variety of forms to aid analysis and the dissemination of results.

5.3 Data Format

Only some of the organizations had sufficient policies and procedures in place to collect the majority of the necessary HR data. For those not having sufficient policies and procedures in place, this deficiency may limit their ability to extract, report or analyze performance in areas where information cannot be collected and maintained in a structured and easy to access format.

Data has motion, going from one location to another. It is more and more moving between systems, persons, departments, and organizations. This is essential, as it indicates that data is actually used, rather than just stored. In order to emphasize the actual use of data, there is need for information or knowledge. When data is in motion, there is not only a change of place or position, but also change in other aspects. The data "format" may change when it is transferred between systems. This includes changes in data structure, data model, data schema, data types, etc. The "interpretation" of data may also vary when it is passed on from one person to another. Changes in interpretation are part of data semantics rather than data structure. The "level of detail" may change in the exchange of data between departments or organizations, e.g. going from coworkers to managers or from local authorities to the central government.

In this context often changes are seen in the level of detail, by the application of abstraction, aggregation, generalization, and specialization. Moreover, the "systems development phase" of data models may vary. This is particularly the case when implementation-independent data models are mapped to implementation-oriented models (e.g. semantic data models are mapped to operational database specifications) strategic HR issues, this represented something of a missed opportunity. However, many managers consider that there is scope to improve the information that is provided to them on a regular basis.

Continuous Improvement Although the organizations review aspects of their HR information needs, processes and data quality from time to time, it is not usually done as part of a systematic management plan and business plan. There may be lack of basic financial and

operational information on costs, which made it impossible for the organizations to measure the cost-effectiveness of their HRIS, including core and shadow systems, and the return on their investment.

5.4 Human Resource Process

The Human Resource Process includes maintenance of personnel records, annual review and revision of employee handbook, audit of HR strategies,\ policies and procedures, implementation of employment/termination procedures, employee development program, performance management process, on-site support, employee retention programs, employee morale building, and compensation plan review.

Recruiting and Employment Process

Different activities of recruiting service process are employment verification, job description development strategy, applicant screening, reference and background check, conduct of interviews etc. This process involves back-office support for recruitment processes, skill testing and new employee orientation programme

Benefits Administration Processes

Various activities of this process are brokerage services, custom benefit plan strategies and design, benefit analysis, cost control and reduction, recommendations, development of employee communications, eligibility and enrollment services, employee claims resolution, monthly invoice audit and reconciliation, on-line employee access to benefits information, health and welfare, defined benefit, defined contribution, employee call center, Ecommerce etc.

Other Processes

Other processes are payroll process, HR outsourcing processes, talent solutions consulting processes, contact center processes, health care processes, talent and organizational change processes, personnel policies & procedures, human resource administration processes, training & development processes, wage and salary administration processes, employee relations processes, knowledge management processes etc.

5.5 **Data Storage And Retrieval**

A data storage and retrieval system separates information regarding the expertise of individuals into four files, which can be independently and separately accessed. The records in the various files include fields for indicating the beginning and end of a range of topics within a hierarchical classification system, the level of the topic within the classification system and a field for facilitating alphabetic sorting of topics independently of hierarchical level, and a novel code format for the beginning and end of range indicators permits a small computer to effectively manipulate data in a hierarchical classification system.

5.6 Data Storage

Data storage is a method of operating a computer system having memory for storing and retrieving information concerning a subject, which comprises the following. (a) in the computer system memory, storing subject data concerning a plurality of subjects wherein said data includes descriptive phrases regarding various matters with which said subjects are concerned and wherein

said data includes identifying information for identifying the subjects associated with said descriptive phrases;

(b) assigning selected designation numbers to said descriptive phrases and storing said selected designation numbers in the computer system memory in association with the corresponding descriptive phrases and with the identifying information wherein said designation numbers correspond to a respective plurality of topics;

(c) in the computer system memory, storing a plurality of topic headings with each heading being designated to include a specified range of designation numbers;(d) in the computer system, for each designation number assigned to a descriptive phrase, determining which of said topic heading range includes said designation number and storing that designation number and corresponding descriptive phrase in association with the associated topic heading;

(e) searching the computer system memory for one of the phrase descriptive of a selected matter of interest, a range of designation numbers, and a designation number, and if a descriptive phrase is identified, determining the designation number;

f) using one of said range and designation number determined in step (e) to retrieve from the computer system memory the corresponding identifying information concerning the associated subject.

Primary Storage

Primary storage relates to semiconductor memory chips and is used to store the data and programmes currently in use. In some data processing, all instructions and data are entered in primary storage by which the computer completes its processing for results to be presented. Each storage element of memory is directly accessible which can be examined and modified without affecting other cells. Thus primary memory is also called Random Access Memory (RAM). In some applications, computer‘s primary storage capabilities are insufficient and unable to handle the instructions and data needed for processing. Primary storage has volatile memory for which it is desirable to save the results of processing.

Secondary Storage

Secondary storage is the nonvolatile memory that is stored externally to the computer. Three secondary storage media used with all sizes of computer are magnetic tapes, magneticdisks and optical technology. Through secondary storage, large volume of information can be conveniently stored for future retrieval. The two types of secondary memory available are serial access memory and random access memory. It is helpful to understand in terms of a cassette tape to provide serial access memory and L.P. record to provide random access memory.

5.7 Data Warehouse for Storage

A data warehouse is a computer system designed for analyzing the historical data of an organisation, such as sales, salaries, or other information from day-to-day operations. Normally, an organization summarizes and copies information from its operational systems (such as human resources) to the data warehouse on a regular schedule, such as every night or every weekend;

after that, management can perform complex queries and analysis on the information without slowing down the operational systems.

The data warehouse also normally stores information at a coarser grain than the operational systems: for example, if the operational systems contain a record for every sale, the data warehouse might simply contain the total number of sales for each product at each store.

The data warehouse need not be a relational database, as it must be organised to hold information in a structure that best supports not only query and reporting, but also advanced analysis techniques, like data mining. Most data warehouses hold information for at least one year and sometimes can reach half century, depending on the business/operations data retention requirement. As a result these databases can become very large.

5.8 History of Data Warehousing

Data Warehouses became a distinct type of computer database during the late 1980's and early 1990's. They developed to meet a growing demand for management information and analysis that could not be met by operational systems. Operational systems were unable to meet this need for a range of reasons:

The processing load of reporting reduced the response time of the operational systems,

The database designs of operational systems were not optimised for information analysis and reporting, Most organizations had more than one operational system, so companywide reporting could not be supported from a single system, an Development of reports in operational systems often required writing specific computer programs which was slow and expensive

As a result, separate computer databases began to be built that were specifically designed to support management information and analysis purposes. These data warehouses were able to bring in data from a range of different data sources, such as mainframe computers, minicomputers, as well as personal computers and office automation software such as spreadsheet, and integrate this information in a single place. This capability, coupled with userfriendly reporting tools and freedom from operational impacts, has led to a growth of this type of computer system.

As technology improved (lower cost for more perform As technology improved (lower cost for more performance) and user requirements increased (faster data load cycle times and more features), data warehouses have evolved through several fundamental stages:

Offline Operational Databases - Data warehouses in this initial stage are developed by simply copying the database of an operational system to an off-line server where the processing load of reporting does not impact on the operational system's performance.

Offline Data Warehouse - Data warehouses in this stage of evolution are updated on a regular time cycle (usually daily, weekly or monthly) from the operational systems and the data is stored in an integrated reporting-oriented data structure

Real Time Data Warehouse - Data warehouses at this stage are updated on a transaction or event basis, every time an operational system performs a transaction (e.g. an order or a delivery or a booking etc.)

Integrated Data Warehouse - Data warehouses at this stage are used to generate activity or transactions that are passed back into the operational systems for use in the daily activity of the organization.

Data warehouse operations comprise of the processes of loading, manipulating and extracting data from the data warehouse. Operations also cover user management, security, capacity management and related functions.

Optional Components

In addition, the following components also exist in some data warehouses:

1. Dependent Data Marts: A dependent data mart is a physical database (either on the same hardware as the data warehouse or on a separate hardware platform) that receives all its information from the data warehouse. The purpose of a Data Mart is to provide a sub-set of the data warehouse's data for a specific purpose or to a specific sub-group of the organisation.

2. Logical Data Marts: A logical data mart is a filtered view of the main data warehouse but does not physically exist as a separate data copy. This approach to data marts delivers the same benefits but has the additional advantages of not requiring additional (costly) disk space and it is always as current with data as the main data warehouse.

5.9 Different Methods of Storing Data

All data warehouses store their data grouped together by subject areas that reflect the general usage of the data (Customer, Product, Finance etc.). The general principle used in the majority of data warehouses is that data is stored at its most elemental level for use in reporting and information analysis. Within this generic intent, there are two primary approaches to organising the data in a data warehouse.

Dimensional Approach

The first is using a "dimensional" approach. In this style, information is stored as "facts" which are numeric or text data that capture specific data about a single transaction or event, and "dimensions" which contain reference information that allows each transaction or event to be classified in various ways. As an example, a sales transaction would be broken up into facts such as the number of products ordered, and the price paid, and dimensions such as date, customer, product, geographical location and sales person. The main advantages of a dimensional approach is that the Data Warehouse is easy for business staff with limited information technology experience to understand and use. Also, because the data is preprocessed into the dimensional form, the Data Warehouse tends to operate very quickly. The main disadvantage of the dimensional approach is that it is quite difficult to add or change later if the company changes the way in which it does business.

Database Normalisation Approach The second approach uses database normalisation. In this style, the data in the data warehouse is stored in third normal form. The main advantage of this approach is that it is quite straightforward to add new information into the database, whilst

the primary disadvantage of this approach is that it can be quite slow to produce information and reports.

Advantages of Using Data Warehouse

Through data ware house, business decision makers can obtain various kinds of trend reports e.g. the item with the most sales in a particular area / country for the last two years. This may be helpful for future investments in a particular item. There are many other advantages of using a data warehouse, some of which are explained below. The data ware house

enhances end-user access to a wide variety of data.

increases data consistency.

increases productivity and decreases computing costs.

combines data from different sources, in one place.

provides an infrastructure that could support changes to data and replication of the changed data back into the operational systems.

5.10 Concerns in Using Data Warehouse

The use of data warehouse has the following concerns for the storage of data for an organization.

Extracting, cleaning and loading data could be time consuming. But this can be made easy with the help of warehousing tools.

Data warehousing project scope might increase.

Problems with compatibility with systems already in place e.g. transaction processing system.

Providing training to end-users, who end up not using the data warehouse.

Security can be developed into a serious issue, especially if the data warehouse is web accessible.

Retrieval System

One form of retrieval system relates to locating and retrieving books in a library. With the advent of computers, the development of on-line automated catalogs for bibliographic retrieval became a reality. Another form of data retrieval involves searching data bases based on specific query criteria, and such data storage and retrieval systems of great complexity and sophistication are possible

With the advent of the personal computer, three developments occurred. First, data base application programs are created, which make it possible for any computer-literate person to create and use his own database.

Second, the data base application programs make it very easy to modify, change, and adapt the form and structure of existing databases. Third, by creating individual databases, data control and security is moved much closer to the database.

Effectiveness of the data base application program is directly related to the power, sophistication, and ease-of-use of the query or search routines incorporated into the program. The ability of the data base application program to employ Boolean algebraic search routines, combined with the b capacity to handle searches expressed, as complex, large formulas is critical.

A significant dimension of a retrieval system is its ability to define and accommodate hierarchical searching procedures. This critical and useful dimension, usually missing from most systems because of complexity in implementation, must be incorporated at the time of storage and retrieval.

While single-site data bases require no special characteristics, data base systems intended for multiple-site configuration pose special problems if the data control and security benefits inherent in single-site data bases are not to be compromised in an effort to catalog individuals at multiple sites and/or to provide multiple-site access to the data base.

Data retrieval can be regarded as a natural instance of multicriteria decision-making. Queries are formulated as selection criteria aggregated by means of appropriate operators. Retrieval is then performed as a process by evaluating the degrees of satisfaction of the criteria by each document, and then aggregating them. Another decisional instance concerns the problem of improving retrieval performance by taking into account user indications on documents relevance. Relevance feedback mechanisms exploit user-system interaction in order to improve retrieval results by means of an iterative process of query refinement. In this process the main decisional issue is that of finding new concepts, with which to expand-modify the initial query so that it better reflects the user's information needs.

TRANSACTION PROCESSING A transaction is a unit of program execution that accesses and possibly updates various data items. It refers to collection of operations that form a single logical unit of work. Transaction processing is designed to maintain a database in a known, consistent state, by ensuring that any operations carried out on the database that are interdependent are either all completed successfully or all cancelled successfully. Transaction processing allows multiple individual operations on a database to be linked together automatically as a single, indivisible transaction. The transaction-processing system ensures that either all operations in a transaction are completed without error, or none of them are. If some of the operations are completed but errors occur when the others are attempted, the transaction-processing system ―rolls back‖ all of the operations of the transaction (including the successful ones), thereby erasing all traces of the transaction and restoring the database to the consistent, known state that it was in before processing of the transaction began. If all operations of a transaction are completed successfully, the transaction is ―committed‖ by the system, and all changes to the database are made permanent; the transaction cannot be rolled back once this is done.

Transaction processing guards against hardware and software errors that might leave a transaction partially completed, with a database left in an unknown, inconsistent state. If the computer system crashes in the middle of a transaction, the transaction processing system guarantees that all operations in any uncommitted (i.e., not completely processed) transactions are cancelled. The concept of a transaction, and a transaction processing service simplifies construction of such enterprise level distributed applications while maintaining integrity of data in a unit of work. A transaction is a unit of work that has the following

properties:

ATOMICITY: A transaction should be done or undone completely and unambiguously. In the event of a failure of any operation, effects of all operations that make up the transaction should be undone, and data should be rolled back to its previous state.

CONSISTENCY: A transaction should preserve all the invariant properties (such as integrity constraints) defined on the data. On completion of a successful transaction, the data should be in a consistent state. In other words, a transaction should transform the system from one consistent state to another consistent state. For example, in the case of relational databases, a consistent transaction should preserve all the integrity constraints defined on the data.

ISOLATION: Each transaction should appear to execute independentlyof other transactions that may be executing concurrently in the same environment. The effect of executing a set of transactions serially should be the same as that of running them concurrently. This requires two things:

1. During the course of a transaction, intermediate (possibly inconsistent) state of the data should not be exposed to all othertransactions.

2. Two concurrent transactions should not be able to operate on the same data. Database management systems usually implement this feature using locking.

DURABILITY: The effects of a completed transaction should always be persistent and durable for the human resource information system of different organizations.

Transaction management is one of the most crucial requirements for enterprise application development. Most of the large enterprise applications in the domains of finance, banking and electronic commerce rely on transaction processing for delivering their business functionality. Given the complexity of today's business requirements, transaction processing occupies one of the most complex segments of enterprise level distributed applications to build, deploy and maintain. Enterprise applications often require concurrent access to distributed data shared amongst multiple components, to perform operations on data. Such applications should maintain integrity of data (as defined by the business rules of the application) under the following circumstances: distributed access to a single resource of data, and access to distributed resources from a single application component.

In such cases, it may be required that a group of operations on (distributed) resources be treated as one unit of work. In a unit of work, all the participating operations should either succeed or fail and recover together. This problem is more complicated whe a unit of work is implemented across a group of distributed components operating on data from multiple resources, and/or the participating operations are executed sequentially or in parallel threads requiring coordination and/or synchronization.

In either case, it is required that success or failure of a unit of work be maintained by the application. In case of a failure, all the resources should bring back the state of the data to the previous state (i.e., the state prior to the commencement of the unit of work).

Application Components

Application components are clients for the transactional resources. These are the programs with which the application developer implements business transactions. With the help of

transaction manager, these components create global transactions, propagate the transaction context if necessary, and operate on the transactional resources with in the scope of these transactions. These components are not responsible for implementing semantics for preserving properties of transactions. However, as part of the application logic, these components generally make a decision whether to commit or rollback transaction

Resource Managers

A resource manager is a component that manages persistent and stable data storage system, and participates in the two-phase commit and recovery protocols with the transaction manager. A resource manager is typically a driver or a wrapper over a stable storage system, with interfaces for operating on the data (for the application components), and for participating in two-phase commit and recovery protocols coordinated by a transaction manager. This component may also, directly or indirectly, register resources with the transaction manager so that the transaction manager can keep track of all the resources participating in a transaction. This process is called as resource enlistment. For implementing the two-phase commit and recovery protocols, the resource manager should implement supplementary mechanisms using which recovery is possible. Resource managers provide two sets of interfaces: one set for the application components to get connections and perform operations on the data, and the other set for the transaction manager to participate in the two-phase commit and recovery protocol.

Transaction Manager

The transaction manager is the core component of a transaction-processing environment. Its primary responsibilities are to create transactions when requested by application components, allow resource enlistment and delistment, and to conduct the two-phase commit or recovery protocol with the resource managers.

Responsibilities of Transaction Manager The Transaction Manager of an organization has the following important responsibilities.

1. Establish and maintain transaction context 2. Maintain association between a transaction and the participating resources.

3. Initiate and conduct two-phase commit and recovery protocol with resource managers.

Make synchronization calls to the application components before beginning and after end of two-phase commit and recovery process A typical transactional application begins a transaction by issuing a request to a transaction manager to initiate a transaction. In response, the transaction manager starts a transaction and associates it with the calling thread. The transaction manager also establishes a transaction context. All application components and/or threads participating in the transaction share the transaction context. The thread that initially issued the request for beginning the transaction, or, if the transaction manager allows, any other thread may eventually terminate the transaction by issuing a commit or rollback request.

Before a transaction is terminated, any number of components and/or threads may perform transactional operations on any number of transactional resources known to the transaction manager. If allowed by the transaction manager, a transaction may be suspended or resumed before finally completing the transaction.

Once the application issues the commit request, the transaction manager prepares all the resources for a commit operation (by conducting a voting), and based on whether all resources are ready for a commit or not, issues a commit or rollback request to all the resources.

Transaction Demarcation

A transaction can be specified by what is known as transaction demarcation. Transaction demarcation enables work done by distributed components to be bound by a global transaction. It is a way of marking groups of operations to constitute a transaction.

The most common approach to demarcation is to mark the thread executing the operations for transaction processing. This is called as programmatic demarcation. The transaction so established can be suspended by unmarking the thread, and be resumed later by explicitly propagating the transaction context from the point of suspension to the point of resumption.

The transaction demarcation ends after a commit or a rollback request to the transaction manager. The commit request directs all the participating resources managers to record the effects of the operations of the transaction permanently. The rollback request makes the resource managers undo the effects of all operations on the transaction.

An alternative to programmatic demarcation is declarative demarcation. Component based transaction-processing systems such as Microsoft Transaction Server, and application servers based on the Enterprise Java Beans specification support declarative demarcation. In this technique, components are marked asmtransactional at the deployment time. This has two implications. Firstly, the responsibility of demarcation is shifted from the application to the container hosting the component. For this reason, this technique is also called as container managed demarcation. Secondly, the demarcation is postponed from application build time (static) to the component deployment time (dynamic).

Transaction Context and Propagation

Since multiple application components and resources participate in a transaction, it is necessary for the transaction manager to establish and maintain the state of the transaction as it occurs. This is usually done in the form of transaction context.

Transaction context is an association between the transactional operations on the resources, and the components invoking the operations. During the course of a transaction, all the threads participating in the transaction share the transaction context. Thus the transaction context logically envelops all the operations performed on transactional resources during a transaction. The underlying transaction manager usually maintains the transaction context transparently.

Resource Enlistment

Resource enlistment is the process by which resource managers inform the transaction manager of their participation in a transaction. This process enables the transaction manager to keep track of all the resources participating in a transaction. The transaction manager uses this

information to coordinate transactional work performed by the resource managers and to drive two-phase commit and recovery protocol.

At the end of a transaction (after a commit or rollback) the transaction manager delists the resources. Thereafter, association between the transaction and the resources does not hold.

Two-Phase Commit

This protocol between the transaction manager and all the resources enlisted for a transaction ensures that either all the resource managers commit the transaction or they all abort. In this protocol, when the application requests for committing thetransaction, the transaction manager issues a prepare request to all the resource managers involved. Each of these resources may in turn send a reply indicating whether it is ready for commit or not. Only when all the resource managers are ready for a commit, does the transaction manager issue a commit request to all the resource managers. Otherwise, the transaction manager issues a rollback request and the transaction will be rolled back. Transaction processing has always been complex and critical. However, transaction processing has caught the interest and attention of both developers and IT organizations simultaneously. This is not without reason. These recent technologies simplify distributed transaction management, and are fueled by two major developments:

Component Based Development: Based on the above interface centric paradigms, component based distributed application development has become a reality.

Object Orientation: The maturity of object-oriented programming assisted by design patterns and frameworks, made implementation of these technologies feasible

5.11 Summary

The HRIS database is the central repository where all employee and HR-related data is stored, managed, and accessed within a Human Resource Information System (HRIS). It is the backbone of HRIS operations, enabling accurate reporting, decision-making, and automation of HR processes.

5.12 Key words

Data Base

Data has motion, going from one location to another. It is more and more moving between systems, persons, departments, and organizations. This is essential, as it indicates that data is actually used, rather than just stored. In order to emphasize the actual use of data, there is need for information or knowledge

Human Resource Process

The Human Resource Process includes maintenance of personnel records, annual review and revision of employee handbook, audit of HR strategies,\ policies and procedures, implementation of employment/termination procedures, employee development program, performance management process, on-site support, employee retention programs, employee morale building, and compensation plan review.

Data Storage And Retrieval

A data storage and retrieval system separates information regarding the expertise of individuals into four files, which can be independently and separately accessed

Primary Storage

Primary storage relates to semiconductor memory chips and is used to store the data and programmes currently in use

Secondary Storage

Secondary storage is the nonvolatile memory that is stored externally to the computer. Three secondary storage media used with all sizes of computer are magnetic tapes, magnetic disks and optical technology

Data Warehouse for Storage

A data warehouse is a computer system designed for analyzing the historical data of an organisation, such as sales, salaries, or other information from day-to-day operations

5.13 Self assessment question

1. How accurately do I maintain employee records in the HRIS database?
2. How they identified and corrected errors or inconsistencies?
3. How effectively do I manage user access and permissions?
4. How do you ensure sensitive employee data is protected according to regulations (GDPR, labor laws)?
5. How you maintained proper audit trails for HR dat

5.14 Reference Books

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LESSON-6

DIGITAL TRANSFORMATION IN HRM

Objectives

To discuss the Business Models
To Study the Phases of Digital Road Mapping

Structure

6.1 Introduction
6.2 Business Models
6.3 Phases of Digital Road Mapping
6.4 Summary
6.5 Key words
6.6 Self Assessment questions
6.7 Reference Books

6.1 Introduction

The digital transformation of firms, industries, and society is advancing at an ever-increasing pace. Digital transformation refers to the integration, use, and exploitation of digital technologies to trigger major changes in value creation, appropriation, and delivery. In the past decade, there have been several calls that becoming more digital is imperative to stay future-proof. Finally, the COVID-19 pandemic and the resulting closures of businesses all around the world showed the need for digital infrastructure as online shops and digital businesses navigated comparatively smoothly through the crisis. In contrast, firms that just started on their digital venture had to adopt digital means of communicating and creating value overnight and often struggled in comparison to their more digital competitors. While another pandemic is hopefully decades away, the need to become digital is not going away anytime soon. Hence, digital transformation will remain a key point on the agenda for executives to guarantee that their businesses stay future-proof. Integrating digital technologies to create an online offering was used by many small to medium enterprises during the worldwide pandemic. From one day to the other, many small firms such as restaurants were cut off from any income stream and managed to switch towards online ordering systems to deliver food to their customers. While this new means of value creation often were not enough to replace the entire income stream, digital technology helped these firms to at least create some income despite being unable to open their doors. Aside from forced digital transformation, there are also more deliberate (digitalization) journeys about local firms. For example, the German company “Holzgespür” offers custom-made dining tables that can be ordered on an online website (Holzgespür, n.d). The company was founded by Julia Kasper, who created it as a branch of the already existing carpentry company of her family. The SME successfully integrated the website for custom-made tables within their existing local (non-digital). As part of the offering, the carpenters do use digital technology not only to get orders but also to connect with the customer and update them on the progress of their ordered products (Storn, n.d.). The new digital branch of the existing carpentry company accounts for a significant share of the income (roughly one- third) and is a prime example of how the integration of digital technology to existing SME companies can create new business opportunities. While it might be

debatable whether this counts as full-scale digital transformation, it shows the potential of integrating digital technologies to existing businesses and thus a potential pathway to future digital transformation efforts. What makes digital transformation both a big opportunity but also a high risk strategy is that it can change the course of the company. If successful, digital transformation can lead to fully new opportunities such as in the case of "Holzgespür". However, if unsuccessful, digital transformation can lead to a company's demise. Hence, executives nowadays are in jeopardy between transforming to become future-proof on the one hand and risking demise on the other hand. On the bright side, digital transformation is possible and with this book chapter, we try to equip businesses with the latest knowledge from academia, packaged in a way that is easy to grasp and helpful for business.

Aside from digital transformation, there are two other relevant and often overlapping concepts: digitization and digitalization (Verhoef et al., 2021). The first term digitization refers to the transformation of analog to digital information and serves as the first phase of digital change. To some degree, digitization reflects the basic necessity for digitalization and digital transformation. In practice, digitization can mean that paper forms are replaced by digital forms such as for employees registering their holiday days in a system.

Second, digitalization refers to changes in (isolated) processes that are becoming digital. Digitalization refers to the second phase of digital change and is for example used to streamline ordering processes for goods, including online shopping as an additional channel or streamline internal process management. Digitalization is often needed as an interim step towards digital transformation

The third and most pervasive phase of digital change is digital transformation. There are a lot of different and overlapping definitions from academics, businesses, consultants, and other interest groups. For the definition, we draw both on our published work (see Verhoef et al., 2021) and other recent advances from both academia (e.g. Hanelt, Bohnsack, Marz, & Antunes, 2020; Vial, 2019), but also through experience gained through the Groningen Digital Business Center (GDBC). Thus, for the working definition, we can merge a thorough academic perspective with the necessities for practical use from the business side. This way of defining digital transformation is unique to the way theGroningen Digital Business Center works and helps to tackle the broad meaning and implications it has for business. We define digital transformation as "a firm's change in the utilization of digital technologies to create new ways of value creation and appropriation and, thus, to develop a new digital business model" (Verhoef et al., 2021).

The three definitions together show a clear path on how companies can proceed. When regarded as three phases of digital change (Verhoef et al., 2021), each phase provides different chances and opportunities. While in the first phase, cost saving is the most prevalent objective, it also provides new opportunities to work with the digital data.

Moreover the second phase already allows for a wide range of improvements and potential new sources of value creation. In addition, the knowledge gained through these two digital phases allows companies to proceed with full scale digital transformation efforts. As a disclaimer, it must be said that these phases cannot be seen entirely as separate stages but that elements can also overlap and that it is possible (though unlikely) that stages might be skipped entirely.

While technology, as outlined above, plays an important role in digital transformation, it is by no means the sole cause of digital transformation (Verhoef et al., 2021; Vial, 2019). In other words, a company can acquire a range of new technologies, but without the ability to use them in new ways to create value, it is no digital transformation and likely the fastest way towards bankruptcy. While in the old economy (before 1990), the possession and control of unique resources such as machines were key to gain a competitive advantage there is a striking difference today. In the digital economy, most resources are readily and easily available for little to no cost. Even sophisticated AI and machine learning algorithms are freely available. For example, the self-driving mode from in Tesla cars is based to a great degree on open-source Python libraries such as PyTorch or TensorFlow (Sagar, 2019). A disclaimer, the training, and development of an AI is still extremely expensive and time-consuming, but the "technical" ingredients that make these new recipes (i.e., innovations) are readily available. With the right human capital (e.g. engineers and data scientists) as well as time a recreate the same technology. Thus, the importance of physical resources – in this case (digital) technology – decreases, while the importance of human capital that handles such technology increases. Thus, digital transformation is about the ability to use technology for value creation and not the technology itself.

What are digital business models?

For digital transformation, the important term to discuss is business model change. The term business model refers to the way how a business creates and delivers value to customers and subsequently converts payments to profit. In other words, a business model describes how the company makes money (Teece, 2018). In this sense, thinking about the business model is literally the most important task when thinking about digital transformation and becoming future-proof. Without a solid working business model, a company will sooner or later go bankrupt.In contrast to established business models, digital business models differ in several key areas. Many of the currently most successful business models would have been impossible to realize without having the right technology available. Imagine a paper shopping catalog trying to imitate the tens of thousands of items of Amazon. This catalog would have been so heavy that no customer would be able to browse through it in a reasonable time. Thus, digital technology (search functionality, virtual product space) is the key enabler of new possibilities to generate value. There are many different digital business models. While some such as platforms are prone to be applied by bigger companies (e.g. platforms), also SMEs must consider how to compete in a digital marketplace.

Not only that digital business models are more profitable, but they are also key for SMEs to defend themselves against bigger companies and to stay future-proof. To provide an overview of some of the most common digital business models, we outline below how these business models work, how profits are generated, and what is unique about them. Besides, we will provide specific examples of firms that operate such business models. This list does not cover every potential digital business model, and each model may not be suited for every company. Sometimes a combination of two, or an addition to the existing business model works best for established companies. Furthermore, it does not cover smaller level additions from digitalization such as webshops. Nonetheless, the list provides an example of how digital technology can be used to fuel the development of new business models

6.2 Business Models

1. The freemium model The freemium business model is characterized by the combination of a free service or product with the option to buy a premium version of the same product or

service by paying extra. Here, the company offers a product or service without charge, but customers can buy a premium version of the service for a fee. While the free part of the offering is aimed at getting customers to the website/platform/to the service, the company often does not earn money with those customers. Henceforth, once customers pay for additional features, the company can make a profit. Research from the video gaming industry demonstrates that the offering has to be of higher value than comparable premium products of competitors to be profitable (Rietvield, 2018). Distinctly for this digital business model is the fact that the marginal (distribution) costs to serve the next customer are close to zero. Once the offering is set, more customers can easily be added. The downside is that this business model relies on considerable market size or needs to operate in a market niche or segment that is big enough to sustain a company (e.g. in the video gaming industry a specific niche such as middle age strategy games).

Dropbox applies the fremium business model. The rudimentary service is for free, yet it allows customers to store additional data and greater sharing and accessing opportunities in the cloud when customers pay a subscription fee. For the free service, the storage space is strongly limited and does not allow the customer to put a lot of data in the cloud.

Thus, Dropbox offers different versions of its storage with increasing costs for more storage space. Another Mailchimp in the marketing automation business, which offers a rudimentary service for free but offers premium services with more functionality for a premium.

2. The “free” product or service There is a saying that nothing comes for free and especially with digital technologies, there are services that users are gonna pay for, one way or the other. In this business model, the firm offers a certain service or product without any charge. Also, there are “no hidden”\ costs because the entire service is offered without any charge to the customer, unlike the freemium model in which additional functions cost extra (see above). However, in this business model, the company earns money based on at least one of three bases. First, they generate value by using customer data. Second, the firm earns money through ads.

Third, they earn money through commission (e.g. affiliate marketing). Sometimes, those models are combined and through the available data more fine-grained offerings are available. There are some costs involved to set up a “free” service or product, but once established the marginal costs of adding additional customers tend towards zero meaning that these business models are extremely scalable.

Clear examples of the free product or service include the search engine Google or social networks such as Facebook, Instagram, or TikTok. In any case, they are offered for free but earn money through using customers’ data for advertising. On a smaller scale, web blogs often for niche topics are offered for free and can also earn a substantial amount of money once sufficiently enough users come across the website. For example, the dutch SME Elevar BV with its website 123tinki.nl provides a huge blog archive with nearly any information about dogs. While they do not earn money with the blog, the company provides a price comparison tool for any pet products, which is their main source of revenue. In other words, the “free” blog gets visitors on the page, and through affiliate marketing (providing a search tool), the company can earn money from commission.

3. Subscription or pay per use Today, manufacturers shift from the delivery of physical products to but allow customers to use them by paying for the use or availability to the product. Thus, for this business model, companies no longer offer the product but access to the product by charging a monthly fee and/or charge per-use. This model is rather similar to the rent/leasing business model. However, when renting or leasing an item, the contract duration is usually longer than in the subscription/pay per use business model (compare weeks against months or years). The company earns revenues through the service of providing a certain good or service. The upside of this business model is that it does not necessarily require unstable product sales but rather the creation of a stable customer base that purchases regularly. On the downside, a substantial customer base is needed, and enough products need to be available to sustain peak moments. Moreover, the transition towards subscription is time-consuming and costly (Chao, Kiermeier, Roche, Sane, 2017) Netflix uses this subscription model by charging a monthly fee that allows the user to conveniently access the entire film database at any moment. Carsharing providers also offer access to cars against a fee for the actual use. Moreover, even car companies are beginning to offer subscription models in addition to leasing and selling cars. On a smaller scale, the German startup/SME HelloFresh offers cooking boxes with changing recipes in a subscription model while the Dutch startup Swapfiets offers a bike against a monthly subscription fee. Thus, this business model is interesting for a wide range of companies that want to extend their current product offering.

4. Software/Something as a service (SaaS) Service-based business models rely on the idea that companies no longer provide a product but replace their product by providing a service that covers the need of their customers. The model's prominent use is in the realm of soft and sell a disk with a license once to their customer but instead offer their software as a solution that can be used against a fee. While there is some overlap to subscription models, often the SaaS business models are fully developed end-to-end solutions. In the software realm, this means that the SaaS software is accessed remotely and the customer does not need any installation or servers to host the software. In contrast to subscription models, the range of the solution is oftentimes bigger and more used within B2B contexts in contrast to the more customer-focused B2C subscription models. The general idea is to move away from products towards solving customers' problems. Rather than serving off-the-shelf physical products, providers instead offer more customizable services for or solutions to the customer.

Salesforce, a company that charges a monthly fee to allow users to access their full customer management application. Salesforce offers a full-service solution to potential customers. Another example involves IT hardware companies that moved towards offering solutions for example to move the data to the cloud and manage the cloud instead of selling physical server farms. Groningen-based Bossers & Cnossen is an example that transformed from selling and delivering physical products to providing full-service solutions for the clients.

5. Moving up or down the value chain Organizations can introduce new business models by altering the traditional roles of manufacturers, wholesalers, retailers, and customers. Instead of following the value chain and only selling to the next part, companies that follow this business model use technology to bypass or cut out parties of the value creation. In other words, organizations engage in vertical integration by entering a stage in which they were not active before.

Thus, a bigger part of the control and potential profit is concentrated at one company instead of being spread among different companies. While it might be debatable if cutting out the middleman is a business model in and by itself, but with the use of digital technology it was never easier for manufacturers to reach the end consumer without the need for the middleman. The business model provides potential revenue because already existing profit is combined with cost savings due to cutting out a party. On the downside, this strategy might be risky if the middleman possesses specific resources that cannot easily be build such as an extensive network of long-lasting relationships (Broekhuizen,\ Lampel, & Rietveld, 2013). Hence, while there is potential it does require time or might not even be viable to cut the middleman out.

One major benefit of bypassing parties like wholesalers and retailers through setting up an online shop and selling directly to the end consumer is the opportunity to offer cheaper prices because the middleman no longer needs to be paid. The company gains a bigger share of the profits because it no longer needs to share the profits with other parties. The potential downside is that money needs to be invested to get to the end customers (e.g. getting visible on Google). When organizations succeed, an additional benefit is that it gains more control over the customer experience and can establish close contact with the end customer.

6. The platform-based business model

Platform-based digital business models appear in different shades but at its core, platforms facilitate interaction between different parties such as consumers, producers, and/or third-party actors (Constantinides, Henfridsson, & Parker, 2018). In two-sided markets a platform connects distinct user types like demand and supply. Uber functions as an intermediary and connects buyers (i.e., those who need a ride) and suppliers (i.e., those who can give a ride). Moreover, the company might also create a platform for buyers and sellers and offer their own products (Amazon), or create a platform with its own products that also allows third-party services (Appstore). In all these cases, the connection between parties is made through a digital interface, like an app or a web portal, or a combination of both. The model can be beneficial cost-wise because often it does not require a large workforce to run the platform. However, investment costs can weigh heavy because a substantive share of the market must be covered to be profitable, and often price wars between competitors can easily kill margins and cause market exits (for example the price war between different food delivery platforms). Lastly, once established, the platform company generates revenue and profits by getting a fixed percentage of the payment for the service. Often these payments make up between 10% - 30% depending on the costs of the good, and the market power of the platform. Hence, the bigger the potential market and the more dominant the company is, the more profit is possible and the harder it is for incumbents and new entrants to fight against this model.

The classic examples for platforms include the large American companies such as Uber, Airbnb, or Amazon that rely to a great degree on venture capital. For that reason, it is oftentimes assumed that this business model is not suited for SME companies. However, also SMEs can create platforms. An example is the German website “materialrest24.de” which offers a platform for craftsmen to sell leftover materials (Storn, n.d.). Through this website, craftsmen can either sell material they have leftover or buy material in smaller quantities than usually at wholesale stores. While the craftsmen market might not appeal to American multinationals, it is a prime example of how digital technology can be used to create value by and for small to medium enterpr

steps

Much has been written on the use of roadmapping for organizational change in the management literature, covering aspects such as the development path of specific technologies (Alcantara & Martens, 2019), how to design and develop specific products (Münch, Trieflinger, & Lang 2019; Al-Ali & Phaal, 2019), and the strategic implications of such developments for the business model of the firm (Phaal, Farrukh, & Probert 2007; Reuver, Bouwman, & Haaker, 2013; Westerman, Bonnet & McAfee, 2014). Roadmapping has also been implemented across a wide range of societal transformations, for example defining organizational objectives and activities in the nano tech revolution (Martin, 2016), enhancing sustainable business practices (Ahmed & Sundaram 2012) and focusing on the transition to renewable energy (Amer & Daim 2010; Daim, Amer, & Brenden, 2012). Additionally, it has been implemented at different organizational scales, from the level of a specific organizational unit (Kim, Beckman, & Agogino, 2018), for the firm itself (Albright & Kappel, 2003), and even for entire global industries (Zheng & Kammen, 2014). Because of this broad implementation of the idea of roadmapping, when managers at an individual firm are faced with the challenge of managing their organization's digital transformation, it is not a simple task to find the appropriate approach and take the appropriate steps. Despite the extensive attention to roadmapping across disciplines, to our knowledge there is no accessible overview to aid organizations in roadmapping their digital transformation. In Figure 1, we synthesize the existing relevant roadmap methodologies into a simple step-by-step approach that individual organizations can easily apply to guide their own digital transformation.

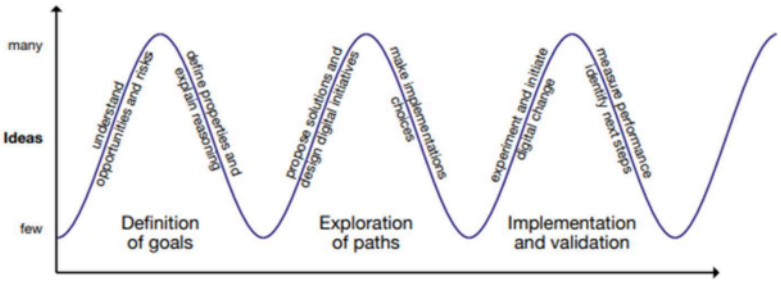

Figure 1: The phases of digital roadmapping

6.3 Phases of Digital Road Mapping

Phase 1: Definition of goals

Understand opportunities and risks: Explore the challenges that the digital economy brings to your organization, both in terms of new possibilities and potential difficulties. Your organization is not the first to undergo a digital transformation and, although each situation is different, there are many lessons to be learned from others' experiences. Define priorities and explain reasoning: Make choices about the most important goals, in terms of their relevance and impact on your organization, and how achievable they are in practice. Define the timescale within which they may be achieved, preferably in a stepwise, iterative manner. Explain the reasons why these specific goals have been prioritized to help others in your organization align their thinking with the same goals.

Phase 2: Exploration of paths Propose solutions and design digital initiatives: Creatively explore possible solutions to meet your stated goals, considering the technology, human resources, business processes and possible changes to your products or services. Make

implementation choices: Decide upon the designs and solutions that you will implement in the short term. These sprints are iterative and smaller, achievable implementation choices allow progress to be made without very high investment in time or budget.

Phase 3: Implementation and validation Phase 1: Definition of goals Experiment and initiate digital change: Now that you have made specific choices, the transformation can be put into practice. By considering the small steps forward to be a form of experimentation, your organization will learn and adapt as you gain experience in digital change. Be realistic and open about what you expect from employees and external partners. Measure performance and identify next steps: Keeping your stated goals in mind, assess the extent to which the objectives are being met and what needs to be improved in the next iteration. Be aware that the assessment of the performance of your digital transformation could include its impact on your employees, suppliers, customers, finances and on your position in the value chain.

Generally speaking, we can divide roadmapping into three main phases: definition of goals, exploration of paths, and implementation and validation. First, the definition of goals sets out what the organization wants to achieve and develops priorities that will guide different parts of the organization to work towards a unified objective.

This phase also entails coming to a clear understanding of the various pressures, expectations, risk and opportunities that digitalization presents to the organization, and then deciding on a set of SMART (specific, measurable, achievable, relevant and time-dependent) goals. Second, the exploration of different paths towards the defined goals allows an organization to compare and analyze a wide range of ideas and possibilities. This exploration covers a number of key areas of development within the organization, including human resources, organizational processes, and products or service innovation that may dramatically change what the organization does and the relationships it has with other organizations. Third, the implementation and validation of digitalization initiatives guides the organization towards reaching the defined goals by undertaking activities and changes in an interactive way to maximize their realized impact. These three phases are not carried out in a simplistic sequential fashion, but should be undertaken in short sprints (Al-Ali & Phaal, 2019). Using sprints in a connected and iterative fashion, organizations can speed up their digitalization capability development as they gain cumulative insights from one sprint to another. It is difficult to prescribe how long a sprint should last, as each digital transformation process is different, but typically the first phase of defining goals could be completed within a week while the third phase of implementation and validation will need longer to achieve. Within each sprint there is first a rapid diversification of ideas and potential choices, followed by a structured convergence towards a single choice based on predefined criteria. This iterative, three-phase approach has the benefit of encouraging progress and enabling decisionmaking, without requiring immediate large-scale investments or commitments to long-term, uncertain future scenarios. In this sense, it resembles the Agile approach to software development that prioritizes adaptive planning and flexible responses to changes in requirements. McGrath (2010) explains that this lean approach helps managers to deal with the high unpredictability of market responses, and speeds up a firm's learning processes with relatively low risks. Rather than following a planned approach making huge upfront investments ("large hockey sticks") with unlimited downside risks, organizations should rather develop a discovery approach and make a number of small-scale experiments ("small hockey sticks") to test their specific market assumptions (McGrath, 2010) (see Figure 2). The potential gains of a single planned approach may seem more attractive to begin with, but experience shows that the

accumulation of improvements through the discovery approach is both less risky and more profitable.

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Converging to define goals

To rationalize the goals, the organization should prioritize and make choices about what it wants to achieve, and why. The focus in this phase is very much on the organization itself, its strategy, processes, people, and products or services. The synthesis of external developments should lead to the identification and careful description of important objectives so that everybody in the organization has a shared understanding of the objectives and why they have been chosen. At the end of this analytical, convergent step, the organization has a short list of the top priority digitalization goals that can be achieved within a specified timeframe.

In our example of the medical center of general practitioners, the doctors can carry out a number of facilitated workshops where they and their key stakeholders discuss the long list from the divergent step, leading to the prioritization of the two most important goals: offering their clients the ability to share personal health information gathered via devices at home, and providing access to data to other health professionals in the region whilst adhering strictly to privacy regulations. Both of these goals may be iteratively met to differing degrees by smaller steps throughout the planned period of five years. So, for example, the ability for clients to share their personal health information could start in the first month by asking diabetes patients to type in their glucose levels to the center's

digital platform, but after a few years it may lead to an integration with a number of proprietary digital systems automatically uploading indicators from blood pressure, through sleep patterns and activity trackers.

Phase 2: Exploration of paths In the second phase, the organization proposes and sketches a range of digital solutions in order to explore different potential ways of achieving the prioritized goals set out in the previous phase. This creative step makes use of the understanding of opportunities and risks, and then narrows down the selection of digital design initiatives to a shortlist that can be implemented easily.

Diverging to sketch digital solutions and their organizational implications An organization needs to explore the key areas of development within the organization that are affected by the digital initiatives. Digital transformation may require different organizational qualities and place new demands on human resources, organizational processes, and new products/service development. At the end of this exploratory, divergent step, the organization should have a longlist of digital solutions, including the basic contours of their designs. The exact details on the most appropriate design will be developed in the third phase.

Continuing our example of the medical center of general practitioners, in this step to propose solutions and design digital initiatives the doctors may sketch possible solutions to facilitate the exchange of personal health information using medical devices. Doctors may need to be trained in communicating the benefits to the system and individuals in order to motivate clients to share personal information. Medical devices and data sharing infrastructure that protect the privacy of clients need to be found. Furthermore, changes to organizational systems and supportive staff may need to be designed to facilitate the interaction with clients in a trustworthy and secure way. Finally, an activity can be undertaken to explore solutions that provide feedback

to clients, display information in an understandable way, and promote the desired implications for client's treatments or lifestyles.

Converging to make implementation choices for the digital initiatives To rationalize the exploration of digital solutions and the consequences these may carry for organizations, the relevant managers need to make decisions on which of the designs will best meet the demands of the prioritized objectives, and which will be implementable considering the strategic fit of the new designs with existing products and processes, as well as the likely costs and uncertainties involved. Often, in practice, an organization may choose to link multiple projects in a stepwise manner to attain difficult-to- achieve outcomes in the longer term. In order to do this, they may prepare a sequence of digital projects and specify how they build upon each other. At the end of this analytical, convergent step, a single digital initiative, or a small set of related initiatives, has been chosen that is both implementable and that meets the defined objectives.

In our example of the medical center of general practitioners, the doctors may select a number of suppliers that offer products that meet the criteria for safe and secure use. A business case may be created on which to base choices about which solutions provide the right benefits within budgetary limitations. Furthermore, to facilitate adoption of such medical devices, implementation choices can be made about how to design the care process including the communication toward the patient, the internal operations, and the reimbursement process with insurers.

Phase 3: Implementation and validation

In this third and final phase, the organization adopts and inside-out approach and experiments with the digital initiative(s) designed in the previous phase. Through rapid experimentation through pilots that foster digital change, it is possible to learn about the viability of the design, adapt implementation where necessary and develop a clear understanding of the impact of the digitalization both within and beyond the organization's boundaries. Using this understanding, it can then narrow down and prioritize the next steps in the process of digital transformation.

Diverging to experiment and initiate digital change By implementing the small design steps in practice, the digital transformation process can be started. Following the principles of the agile software development process, the small steps may be seen as a form of experimentation and adaptive learning whereby it becomes possible to adapt to progressive insights, quickly adapt the planning and project requirements, and continually enhance the understanding of the problems to be solved. This may lead to the development of new knowledge that can be shared and internalized. At the end of this exploratory, divergent step, the organization should define specific metrics against which the desired outcomes will be measured and how the progress of projects can be monitored.

In our example, small experiments can be carried out in which multiple product solutions or client interfaces are tested. Metrics could capture the experiences of medical staff, clients and suppliers in these experiments, for example by noting the challenges they face or measuring their anxiety. Following this, adjustments can be made to the designs of the implementation choices, and the next design step can provide improvements to reduce or remove this anxiety. These small

steps in experimentation and adaptive learning can test different digital solutions, and the assumptions held by their designers, in practice

In order to be able to identify and monitor whether the digital solutions provide the\ intended benefits to the internal and external stakeholders, doctors can create a set of metrics. These may include metrics on the early detection of health problems, the degree to which clients experience greater control over their recovery process, and the extent to which they share relevant information in a timely fashion. Converging to measure performance and identify next steps

In the convergent stage, organizations should assess the degree to which they have attained the desired goals and what needs to be addressed in the next iteration. If progress is below expectations, measures should be initiated to overcome the deficiencies and a frank and open discussion with stakeholders can help the organization to benefit from the insights generated. The cost-benefit analysis needs to include a suitable breadth of indicators relating to all relevant organizational processes and the digital initiative's impact upon various stakeholders and the organization's market position. One main advantage of this validation step, and one main reason for adopting small, achievable steps in an iterative fashion, is that it provides convincing, and realistic, evidence of the benefits of digital transformation. At the end of this analytical, convergent step a well-developed conclusion can be derived that will foster support for the next iter tion of the digital transformation process.

6.4 **Summary**

This chapter embarked on a journey to investigate what digital transformation is, what its pitfalls are, and whether it is worth it. The goal of this chapter was not to provide a deep academic analysis but rather present recent academic insights comprehensively. Thereby, it makes rigorous and theory-driven academic research accessible for a broader public and aims to help managers make informed decisions about digital transformation. For all the main points raised illustrations and tables were prepared to convey the key points of our analysis. In the first section, the distinguishment of digital transformation into three phases of digital change is outlined. Namely, (1) digitization that characterizes the transformation from analog to digital information, (2) digitalization to describe the change to digital processes, and (3) digital transformation as full-scale business model transformation. Moreover, the necessity to gain knowledge through these phases and potential overlap is outlined. Subsequently, common digital business models are outlined and explained to provide more basis on how digital transforming the revenue model could look like. Lastly, the key challenges for digital transformation to undergo digital transformation are outlined. This provides a summary of why digital transformation are risky but also worthwhile to pursue. In conclusion, the chapter provides a short but comprehensive overview of key aspects of digital transformation. Especially the pitfalls and countermeasures might prove useful as they are the key aspects that inhibit value creation and appropriation from digital transformation. We hope that our chapter contributes to the success of digital transformation within your organization.

6.5 Key words

The freemium model The freemium business model is characterized by the combination of a free service or product with the option to buy a premium version of the same product or service by paying extra

The "free" product or service There is a saying that nothing comes for free and especially with digital technologies, there are services that users are gonna pay for, one way or the other. In this business model, the firm offers a certain service or product without any charge

The platform-based business model

Platform-based digital business models appear in different shades but at its core, platforms facilitate interaction between different parties such as consumers, producers, and/or third-party actors

Digitalization refers to the second phase of digital change and is for example used to streamline ordering processes for goods, including online shopping as an additional channel or streamline internal process management

6.6 Self Assessment questions

1. **Briefly Discuss the Phases of data base HRIS**
2. **Discuss the Phases of Digital Road Mappingh**

6.7 Reference Books

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LESSON -7

STRATEGIES FOR HR DIGITALIZATION

Objectives

To Study the Platform Models

To understand the search Engine

To know the social Media Platforms

Structure

7.1 Introduction
7.2 Platform Models
7.3 Search Engines
7.4 Social Media Platforms
7.5 Models based on Product and Content
7.6 E-Commerce Platforms
7.7 Metaverse
7.8 Models based on Product and Content
7.9 Subscription Models
7.10 Summary
7.11 Key words
7.l2 Self Assessment Question
7.13 Reference Books

7.1 Introduction

The advancement in digital technologies over the last decade has transformed the business landscape substantially. Digital technologies have created a new environment of opportunities for consumers as well as businesses, have changed the competitive landscape, levelling the playfield, creating new players and business models. The environment within which businesses strategize and create their business models have changed drastically in the past decade. The conventional environment consisting of the five Cs

– customers, collaborators, competitors, context, and the company – have new forms of institutions. Traditionally, a firm develops its business model by analyzing the environment within which it operates and making the aspiration decisions of how to segment the market and targeting the right segments with an appropriate positioning strategy.

The action plan, consisting of product, price, promotion, and distribution strategies, is developed in such a way that it aligns clearly with the target market. These strategies and tactics impact the business outcome in terms of impacting customer acquisition, retention, and margins and firm level metrics of sales, profits, growth rate, brand equity, and market position. Digitization has altered the environment, the strategic decisions and business models in significant ways (Kannan and Li, 2017)

igure 1: Evolving Framework for Digital Business Models

Figure 1 provides an overview of how digital technologies have changed the environment with the emergence of new forms of institutions. The environment (the block on the left Figure 1) illustrates these new forms of institutions. The block on the top shows the how digital technologies interact with the environment, creating these new institutions - multi- sided platforms such as social media platforms, e- commerce platforms, and search engine platforms along with ubiquitous connectivity provided by mobile devices and affording integration with offline channels leading to omnichannel options. The interactions with these forms of institutions is guided by the contexts within which markets operate– geographical, cultural, legal and privacy contexts. These combine to provide different options and opportunities for business models

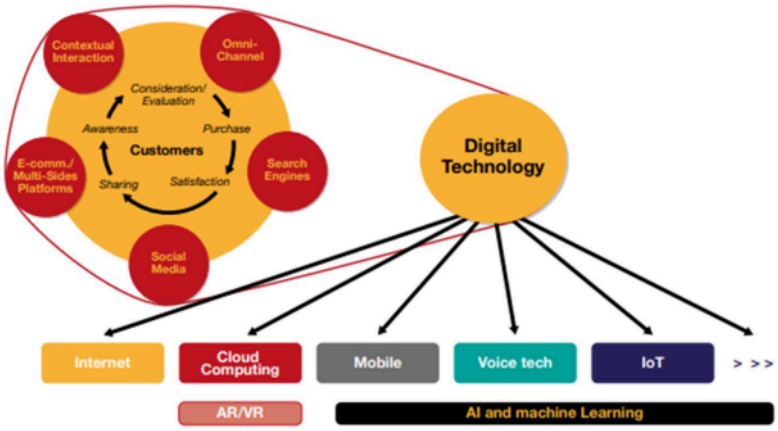

Figure 2: Digital Technologies and Digital Environment

Digital technologies are rapidly changing the environment within which customers interact on their paths to purchase. Digital technologies are reducing information asymmetries between customers and other players in the environment and providing customers with many alternative touch points on their customer journey (see Figure 2). This affects customers' information acquisition on quality and price, their search process, their expectations, and the resulting implication for firms. Digital technologies facilitate customer– customer interactions through online media – word- of- mouth, online reviews and ratings, and social media interactions – on social media, chat, and e- commerce platforms. These platforms act as collaboration enablers that

connect a firm to its market using digital technologies. Likewise, search engines act both as collaborators with firms and as platforms on which a firm competes with other firms in acquiring customers. Omnichannel options are facilitated by ubiquitous connectivity through network and Wi- Fi connections, mobile devices and watches, and the associated infrastructure such as 5G telecommunication provide customers with access to markets and information wherever they are, transcending contexts. It also provides firms with location- aware capabilities to track customers and reach them whenever and wherever they are.

Digital technologies and the digital environment have transformed the customer journey in an omnichannel setting. Customer awareness can arise from alternative sources – through\ search engine, social media, and e- commerce platforms, through word- of- mouth or direct- to-consumer messages, through offline or online or mobile devices – multiplying the channels through which consumers can consider, evaluate, and purchase products and services. Likewise, the environment also provides multiple options for firms to target and communicate with their potential customers. As newer technologies emerge – voice technologies, virtual reality and augmented reality, and the Internet of Things (IoT) – channels proliferate. All these provide opportunities to create new business models and strategies.

Digital technologies also increase the capabilities that a firm has in collecting, processing and using market and customer data and provide them with new business models based on personalized offerings enabled by AI and machine learning. They create newer forms of products combining them with services. This is especially applicable to content offerings.

Digital technologies also facilitate new pricing models such as freemium models and subscription models. They also facilitate newer forms of channel bundling and fulfillment.

All these lead to possibilities for significantly positive outcomes in terms of value creation for customers as well as value creation for firms. In the upcoming sections, we describe the various business models enabled by the digital technologies and digital environment.

7.2 Platform Models

A platform business model facilitates interactions across a large number of participants on a platform supported by a technology infrastructure that provides connectivity between participants. The interactions could be of many kinds – a short-term interaction like in a search engine where participants looking for information/products are connected to information providers and retailers or a longer-term interaction like on a B2B platform or social media where participants are connected on a long-term basis. Platforms create value by reducing search costs or transaction costs or both, specifically through network effects. The platform model is different from a traditional business model or a reseller.

A traditional business creates or manufactures products/services using raw material or other input and market it to customers. A reseller buys the products from manufacturers and sells it to customers. A platform, on the other hand, does not create the product/service but facilitates the connection between the interested parties. The platforms provide a governance structure, standards and protocols to facilitate the appropriate interactions and functioning of the platform. The success or failure of a platform may depend significantly on the governance structure (Hagiu 2014).

The digital environment has given rise many different forms of platforms ranging from search engines, social media platforms, e-commerce platforms to learning platforms. The type of participants could range from two (two-sided platforms) to many (multi-sided platforms). The platform could generate revenue by charging all the different types of participants or just one type of participant and providing free access to others. We discuss a few of the important ones below.

7.3 Search Engines

Search engines connect users who search for information to the sources of the information searched for. While search engines are free to use for users and for businesses which are connected to users through organic listings, they generate revenue through paid search for which businesses, wishing to attract potential customers searching for related terms to their websites, pay for the clicks for their sponsored ads. The search terms users use helps the businesses to target the right customers to attract. Businesses bid against each other to get top spots in response to users' search terms and a greater competition among businesses for sponsored ads increases the search engine's revenue. Companies like Google, in addition to being a two-sided platform for connecting users with businesses, also act as a multi-sided platform in helping businesses target users at various publisher sites, through display advertising. The publishers (websites) publish content that is relevant for users who visit the website to consume the content. Google targets these users on behalf of businesses, who pay for the display ads. The publishers are compensated for their ad space. Users are exposed to the ads that businesses want to shoe them. Of course, the whole display ecosystem consists of large number of players but this simplified description shows the power of multi-sided platform businesses.

7.4 Social Media Platforms

These platforms (e.g., Facebook, Instagram, TikTok, YouTube, Twitter) connect users to other users through social networks and the users consumer the content other users create. Given the significant visibility the platforms have into users' interests and preferences through the content they interact with, these platforms are able to target users precisely for the businesses who want to advertise to the users. This is also the key way they monetize the platforms. The biggest challenge for these platforms in recent times is the backlash with regard to the negative impact of social media on the users (especially young adults), creation of filter bubbles, and indiscriminate use of user data compromising their privacy check out and do shopping or hangout with friends. The stores will be able to provide 3-D representation of the items they sell and a user can get close to the item and view the details in 3-D. Users can attend live music shows (Stern 2021). Metaverse will enable the morphing of all types of platforms that we have discussed so far – social media, e-commerce platforms, search engines – and there is already intense competition among firms such as Meta (Facebook) and Microsoft to stake their claim in the virtual world.

7.5 Models based on Product and Content

The concept of product is undergoing a rapid transformation in the digital age. The augmentation of the core product with services is becoming increasingly digital, where the core value of the product is increased with value derived from digital enhancements. For example, automobiles with GPS systems, sensor-based self-driving technologies, self-monitoring and automatic ordering refrigerators, are basically traditional products that have been infused with

digital services to make them more than product – they morph into servicitized products with increased value proposition for customers (Vargo 2017).

In addition, the digitization of the products allow them to be networked with connectivity. This has important implications for new business models. First, the networking of products using online and mobile technologies is spawning a rental economy wherein the dormant value of owned-products is released through digital networking for rental options (e.g., Airbnb for houses and Uber for automobiles). Such products enable the platform\ models that we discussed in the previous section. Second, the products themselves become the entry for providing value enhancing services. For example, developments in Internet of Things (IoT), where products are infused with smart technologies enable communication with each other and the users and allow services to be provided to users on a continual basis. Another recent example is that of Peloton, which uses the product and connectivity to provide work-out services for customers at their homes. Third, products/ services themselves are morphing into services, especially in the domain of information products such as software, and content such as music, video and text, with online and mobile technologies playing a key role in delivery and fulfillment. This has provided opportunities to create product lines of various digital and traditional non- digital formats with interesting implications for bundling models.

The digital environment has also led to the rise of Direct-to-Consumer (DTC) models with Blue Apron, Hello Fresh, Dollar-Shave-Club being good examples of the non-digital such as open-source platforms. All are enaMany of the social media platforms have also evolved over time to multi-sided platforms where they not only support businesses to advertise on the platforms but also sell through the platform. For example, social media platforms such as Douyin in China and TikTok are increasingly support businesses to do live commerce (Gu et al 2021), where influencers on the media pitch products to their followers. Influencers can be seen as a different type of users, ones with large following, that bring in revenue not only for themselves and for the businesses whose products they pitch but also for the platforms too (Haenlien et al 2020). Social media and chat platforms are fast morphing into e-commerce platforms using the influencers in a significant way to make such transformations.

7.6 E-Commerce Platforms

When the digital environment opened up opportunities for e-tailing, a number of online retailers sprang up online – Amazon and Alibaba, to mention a few. As these online retailers became behemoth brands attracting millions of visitors to their websites, these online transitioned into e-commerce platforms, where smaller retailers can set up online shops and market to the millions of visitors within the walled garden. In addition to marketing their own products to the customers, these platforms allow other sellers on their platforms to market their wares to the customers. Some of these platforms such as Alibaba also serve as B2B platforms, allowing industrial buyers to identify suppliers and forge longer-term relationships with them. Essentially such platforms become marketplaces controlled by platform owners to facilitate transactions. Platforms like Alibaba have evolved into larger ecosystems encompassing many business as well as payment functions, hosting players in large multi- sided platform. As with social media platforms, e-commerce platforms are also experimenting with live commerce involving influencers to market to their customers.

There are many other platform models that bring two or more parties together for shortterm interactions – like eBay for peer-to-peer transactions, AirBnB for rental owners and renters, Uber and Lyft for connecting drivers with passengers, gaming platforms like Xbox and Twitch to connect game developers and game players, etc. All these platforms can be viewed as aggregation platforms by aggregating supply and demand so that the marketplace transactions become efficient as the network effects create significant value for either party to be on the platform. Other kinds of platforms mentioned in literature (Hermans 2021) as being different from the above types are "learning platforms" which bring participants together to share their insights over time and thus facilitate learning among the participants. This is enabled by the synergy of participants working together and realize the potential in growing their knowledge and improving their performance. These could be educational platforms or other kinds of platforms such as open-source platforms. All are enabled by the digital environment that is advancing day by day.

How do platforms become successful? If the platform can create of an entry barrier to prevent other platforms to muscle in to the same market, then the platforms can be successful. By the same token, establishing such entry barriers are not always easy, which is one reason platform businesses fail. It is also necessary to sustain the value created for participants over time. The governance structure, rules and protocols also play an important role in the success of the platforms. Over time the platforms also become indispensable for the participants, and this allows the platforms to extract value from the participants. For example, Amazon as a platform can increase the commission on the sales made by the smaller retailers on its platform. They can force the retailers to advertise and bid for keywords on their platform. Similarly, platforms such iPhone and Android have control on the specific apps that could be featured on their platforms and the specific commission they could charge on the revenue the apps make on their platforms.

Smaller retailers and apps with insignificant brand awareness do not any option other than to stay on the platforms. Platforms, therefore, can easily become monopolies with the control they have on the marketplaces they create. For the retailers, the only way to fight back the commoditization of the product categories by the platforms is to build their own brands and use alternate channels to reach the market. Hagiu and Wright (2021) outline strategies that retailers and firms can take to counter the power of the platforms. Reinartz et al (2019) show how retailers can adopt a platform model to compete in a crowded retail market and transform the value chain.

7.7 Metaverse

The latest development in platforms is the concept of metaverse, where virtual reality technology is used to immerse users in a virtual "meta" world. While the entry to the platform is through VR technology, the virtual world is also populated by other users through their avatars. Users can interact with other users like in a social media platform, exchange messages and content, form groups and communities focused on specific interests, all the while the platform owner can target the users with advertisement and messages from businesses. In addition, businesses can open storefronts in the metaverse (much like in Taobao or in a physical mall) and users can visit and make purchases.

Different platforms can be created by owners in the metaverse, but these walled gardens could also be connected so that users can migrate from one meta world to another. Metaverse is the virtual counterpart of the real world – so employees within an organization can have meetings

at the virtual location of the firm in a virtual conference room with users' avatars sitting in their chairs around the table. At the end of the meeting, Users can access to their main features to know that they want access to more. Their approach works because most social media users, even individuals, will have more than three social media profiles to manage. LinkedIn and Skype are other examples.

Freemium model helps to build brand awareness and provide a costless way for customers to sample and experience a new product or service. Free features are a potent marketing tool, which allows a firm to scale up and attract a user base without expending resources on costly ad campaigns or a traditional sales force. Finally, social networks and associated word-of-mouth are powerful drivers. Many services offer incentives for referring friends, which is more appealing when the product is free. The main objective is, of course, to convert free customers to paying customers. This assumes that there are customers who value using the service enough that they are willing to pay for additional or different functionality and willing to purchase the premium version in the presence of the free version.

If a company is unable to convert an adequate fraction of its free customers to paying customers, the freemium model is likely to fail. Some firms like Spotify monetize free customers through advertising. This can recoup some of the costs of providing free service. Mobile games monetize by selling add-on features like in-app purchases which can support such a model. The conversion rate (from free to premium upgrades) for most firms range between 2 – 5 percent. Spotify is an exception with 27%, but for other firms category. In the digital category, content – wcheck out and do shopping or hangout with friends. The stores will be able to provide 3-D representation of the items they sell and a user can get close to the item and view the details in 3-D. Users can attend live music shows (Stern 2021). Metaverse will enable the morphing of all types of platforms that we have discussed so far – social media, e-commerce platforms, search engines – and there is already intense competition among firms such as Meta (Facebook) and Microsoft to stake their claim in the virtual world.

7.8 Models based on Product and Content

The concept of product is undergoing a rapid transformation in the digital age. The augmentation of the core product with services is becoming increasingly digital, where the core value of the product is increased with value derived from digital enhancements.

For example, automobiles with GPS systems, sensor-based self-driving technologies, self-monitoring and automatic ordering refrigerators, are basically traditional products that have been infused with digital services to make them more than product – they morph into servicitized products with increased value proposition for customers (Vargo 2017).

In addition, the digitization of the products allow them to be networked with connectivity. This has important implications for new business models. First, the networking of products using online and mobile technologies is spawning a rental economy wherein the dormant value of owned-products is released through digital networking for rental options (e.g., Airbnb for houses and Uber for automobiles). Such products enable the platform models that we discussed in the previous section. Second, the products themselves become the entry for providing value enhancing services. For example, developments in Internet of Things (IoT), where products are infused with smart technologies enable communication with each other and the users and allow

services to be provided to users on a continual basis. Another recent example is that of Peloton, which uses the product and connectivity to provide work-out services for customers at their homes. Third, products/ services themselves are morphing into services, especially in the domain of information products such as software, and content such as music, video and text, with online and mobile technologies playing a key role in delivery and fulfillment. This has provided opportunities to create product lines of various digital and traditional non- digital formats with interesting implications for bundling models.

The digital environment has also led to the rise of Direct-to-Consumer (DTC) models with Blue Apron, Hello Fresh, Dollar-Shave-Club being good examples of the non-digital category. In the digital category, content – whether it is entertainment content, software or other kinds of information products – have led to the emergence of ad-supported content models (especially for news and other content), one of the most common form of digital business models. All these developments also provide opportunities for customizing and personalizing content/product and service offerings, by varying not only the core product/ service but also the augmented digital services. As new technologies come into play, this whole process becomes a continuous and dynamic one, just Augmented Reality and

Virtual Reality are transforming how retailing and home-gym services are delivered. The digitization of products and content also allow new forms of pricing models such as freemium and direct-to-consumer subscription models. We will focus on these next. Freemium Models

For firms selling content or a digital service online, it can be a challenge to acquire new customers. Potential customers may not know the features of the content or service or have the experience of using the content/service. For many such experience goods, their quality can be determined only after using or experiencing those goods. In such contexts, many firms contemplate using a freemium or a free trial model to acquire customers.

The “freemium” model is basically a product line of free version and a premium version. It is a pricing strategy by which a product or service is provided free of charge, then an enhanced version of service is offered for a price. A free trial on the other hand offers the priced full service for free for a limited amount of time so that customers can try the service and experience it. Examples include Hulu streaming service available for free for a period of 3 months or Netflix offering a free trial for a month. While the free version in a freemium is a lower-tier service with fewer functionality, the free trial model usually includes all features in the service/product for free but for a limited time. There could also be an in-between model like what NYTimes.com offers – one can read 20 free articles per month, but if one needs more articles within a month they have to sign up by paying.

The 20 twenty free articles could be anything and not limited to certain topics, but the quantity is limited. Popular examples of the freemium include Spotify, which has an ad-supported free service and a premium version with no ads and HootSuite, a popular social media management tool, offers free plans for individuals who want to manage up to three social profiles, and business plans for those who need more. HootSuite’s freemium approach is to allow users to get to know the benefits of using their platform with enough access to their main features to know that they want access to more. Their approach works because most social media users, even individuals, will have more than three social media profiles to manage. LinkedIn and Skype are

other examples. Freemium model helps to build brand awareness and provide a costless way for customers to sample and experience a new product or service. Free features are a potent marketing tool, which allows a firm to scale up and attract a user base without expending resources on costly ad campaigns or a traditional sales force. Finally, social networks and associated word-of-mouth are powerful drivers. Many services offer incentives for referring friends, which is more appealing when the product is free. The main objective is, of course, to convert free customers to paying customers. This assumes that there are customers who value using the service enough that they are willing to pay for additional or different functionality and willing to purchase the premium version in the presence of the free version.

If a company is unable to convert an adequate fraction of its free customers to paying customers, the freemium model is likely to fail. Some firms like Spotify monetize free customers through advertising. This can recoup some of the costs of providing free service.

Mobile games monetize by selling add-on features like in-app purchases which can support such a model. The conversion rate (from free to premium upgrades) for most firms range between 2 – 5 percent. Spotify is an exception with 27%, but for other firms
it is much lower. While a very low conversion rate can be bad, which may indicate that the premium version does not have much added value or the firm could be giving away too much value for free, a very high conversion rate may not be all positive, because it may indicate that the free offering is not attracting as much viral attention (Kumar 2014).

In the long-term, the best strategy is something that will attract a high volume of traffic and a moderate rate of conversion. When should freemium models be used? The most important aspect is that marginal cost of an additional user should be very low, ideally zero like in digital goods – like an extra copy of an e-book or movie. There has to be a significant differential between what is given for free and what is premium. The free option should be attractive enough to attract free users and the premium version should have enough additional value for users to upgrade. The premium version should also be priced appropriately – not too high for the additional value it provides. A firm can differentiate between the free option and premium option on many dimensions of features as well as usage and user characteristics. For example, free version could have a significant delay in response time which might be acceptable for a patient user but not for impatient user, who may want to upgrade to the premium with faster speed.

While firms have the option to use freemium or free trial models, the important question remains when they should go for free trial instead of freemium. If all features of the product/service need to be experienced to understand the value proposition of the premium offering, then the firm needs to offer free trial for a limited time with all features of the offering. Also, if providing free offering is costly over time, then free trial is a good option.

The online environment provides easy options to experiment with the freemium and free trial models. Li, Jain and Kannan (2019) show that free versions of free trials should be designed in a specific way to increase the sales of the premium version/ or the version that is being marketed. Thus, specific design of these offerings play an important role in the success of the freemium/free trial models. Gu, Kannan and Ma (2018) show that freemium models can benefit from having a product line of premium products – that is, in addition to the free version, the firm should have at least two premium versions. They show that by appropriately pricing these

premium lines, firms can activate either compromise effect or attraction effect which lead to increased sales of the premium versions, moving customers away from the free version. Finally, there have been instances where firms have moved away from the freemium model once they have acquired enough customers. Similarly, since the concept streaming has become well-known, many streaming services do not offer free trials anymore but provide customers to cancel their services at any time.

7.9 Subscription Models

With the popularity of direct-to-consumer (DTC) models, subscription pricing models have also become very popular. One of the advantages of the subscription pricing model is that payment is recurring and automatic and is useful to measure retention of the customers easily. Strictly speaking, subscription models by themselves do not increase retention, but since subscriptions are form of a contractual relationship, it is easy to identify how many customers you have and how many have churned as compared to a non-contractual setting. From that viewpoint, it helps to highlight the churn problems that you might be having and take corrective action to retain customers. More formally, subscription model is a pricing model where customer pays a regularly recurring amount in exchange for the use a product or service. Examples include streaming (Amazon Prime, Netflix), online news and content (WSJ.com , NYTimes.com), products shipped on a regular basis (Dollar Shave Club, Hello Fresh, etc.).

A well-implemented and well-run subscription model can have high retention rates. Firms can be quite selective in acquiring customers for subscription model by highlighting the continuing value of the business to the customers. Acquisition of customers is also forced to be more customer lifetime value-oriented and more towards acquiring the right customers with higher retention rates. Freemium or free trial models may help in such acquisition efforts. An added advantage of the subscription models is that investors and analysts love the model because of predictable revenue stream given the retention rates.

There are many factors that help retention in subscription models. One is easy payments using auto-pay services and auto-renewals, so that customers' credit card gets charged automatically. Sometimes customers do not come around to cancelling subscriptions due to pure inertia. Other times even when they want to cancel subscriptions, the firms make it very difficult for customers to cancel easily – information for cancelling the service is not easily accessible on the website or customers may have to call the callcenter to cancel. Then there is the sunk cost effect. That is, customers feel compelled to shop – because not doing so would be "wasting" the money they have already paid for the subscription Finally, there is the endowment effect. Once a consumer has access to and is receiving curated products, or can enjoy the convenience of replenishment, they are less likely to want to give those up.

In addition to the above, there are several other factors that impact retention in a subscription model. First, there is social influence – positive word of mouth within social networks and among members can have a positive impact on ongoing relationship and retention. Second, usage plays a critical role in subscription renewal – usage facilitates customers to derive the value from the product/service - this is one reason that Peloton\ would want its customers to exercise regularly and send customers nudges for it.

If they do not exercise, then they would see the subscription as a waste and cancel it.

Third, there are opportunities for learning customer preferences in the ongoing relationship. This can help in product/service personalization and thereby focus on increasing value for customers, which has a positive impact on retention. Subscription models have become so popular that they are being over-used by firms and are getting a backlash in recent times. First, they are overused as a locking mechanism.

As this comment from Scott Stein of CNET highlights, "Suddenly, or more than ever, we're subscribing to everything…We rent the world we live in." This, of course, makes customers waste a lot of money on things they really do not need or use on a regular basis.

Firms making it difficult to cancel subscriptions leads to customer ire and negative word of mouth. This has also attracted the attention of regulators. Finally, from the firms' viewpoint, subscription implementation can lead to increased costs in the interim till, if and when, the model stabilizes. Despite all these negatives, if a subscription model is conceived and designed well to provide value to both customers and the firms, it can contribute to the firm's value significantly. Amazon Prime is a good example and there are many such examples.

7.10 Summary

As digital technologies advance along with developments in artificial intelligence technologies, there are many opportunities for firms to find niches in the business landscape where they can differentiate themselves in creating value for customers. A good example is the online retailing industry, where personalization technologies are providing website of personalized website offerings for each customer using AI technologies, so that customers do not have to endlessly search for the products they prefer. Companies such as Stitch Fix and The Yes are pioneers in such business models.

The next frontier of digital business model lies at the confluence of emerging digital technologies and AI and machine learning techniques. The business models will also likely have a shorter life span as pace of development increases. We are indeed living in exciting times

7.11 Key words

Digital Technologies

Digital technologies are rapidly changing the environment within which customers interact on their paths to purchase. Digital technologies are reducing information asymmetries between customers and other players in the environment and providing customers with many alternative touch points on their customer journey

Search Engines

Search engines connect users who search for information to the sources of the information searched for. While search engines are free to use for users and for businesses which are connected to users through organic listings, they generate revenue through paid search for which businesses, wishing to attract potential customers searching for related terms to their websites, pay for the clicks for their sponsored ads

Social Media Platforms

These platforms (e.g., Facebook, Instagram, TikTok, YouTube, Twitter) connect users to other users through social networks and the users consumer the content other users create. Given

the significant visibility the platforms have into users' interests and preferences through the content they interact with, these platforms are able to target users precisely for the businesses who want to advertise to the users

E-Commerce Platforms

When the digital environment opened up opportunities for e-tailing, a number of online retailers sprang up online – Amazon and Alibaba, to mention a few

Metaverse

The latest development in platforms is the concept of metaverse, where virtual reality technology is used to immerse users in a virtual "meta" world

7.l2 Self Assessment Question

1. Briefly Explain the Platform Models

2. Describe the Search Engine

3. Critically Analyse the Social Media Platforms

7.13 Reference Books

1.Pearlson, K. E., Saunders, C. S., & Galletta, D. F. (Year). Managing and using information systems: A strategic approach (Edition). Publisher.

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LESSON-8

HR ROLE IN DIGITAL TRANSFORMATION

Objectives

To know the overview of HR technology
To Understand the Key components of HR transformation
To analyze the stages of HR Digital Transformation
To Describe the future of HR transformation

Structure

8.1 Introduction
8.2 Understanding HR transformation
8.3 Benefits of HR transformation
8.4 Key components of HR transformation
8.5 The Stages of HR Digital Transformation
8.6 Overview of HR technology
8.7 Benefits of HR Technology
8.8 HR functions
8.9 Best practices for implementing HR technology
8.10 The future of HR transformation
8.11 Embracing the future of HR transformation
8.12 Summary
8.13 Key words
8.14 Self Assessment questions
8.15 Reference Books

8.1 Introduction

With all the digital change that we are experiencing in today's world, the role of Human Resources (HR) is undergoing a profound transformation. But what is HR transformation?

With all the digital change that we are experiencing in today's world, the role of Human Resources (HR) is undergoing a profound transformation. But what is HR transformation?

At its core, HR transformation is the comprehensive process of reinventing and redesigning the HR function within an organization, driven by the goal of creating a more efficient, effective, and strategic department.

This transformation is not just about updating systems or automating processes. It's a fundamental shift in the HR role from administrative to strategic, from isolated to integrated and from traditional to innovative. It involves leveraging digital technologies, such as AI, data analytics, and cloud-based systems to enhance HR operations and deliver a more dynamic and engaging employee experience.

Let's explore further while we look at different strategies, the benefits of leveraging technology, and the future of HR transformation.

8.2 Understanding HR transformation

The need for HR transformation

It all stems from the evolving business landscape marked by technological advancements, changing workforce expectations, and increasing global competition.

Traditional HR practices, often siloed and process-driven, are becoming insufficient in addressing the dynamic needs of both organizations and employees. In this context, an HR transformation model is essential to adapt and stay relevant. It involves rethinking HR strategies to be more agile, data-driven, and employee-centric.

This shift is not just about embracing new technologies but also about fostering a culture that values continuous learning, adaptability, and innovation. An HR transformation roadmap is necessary to attract, develop, and retain talent in a competitive market and to ensure that HR plays a strategic role in driving business success.

8.3 Benefits of HR transformation

HR transformation offers a myriad of benefits that significantly contribute to the overall health and effectiveness of an organization:

Firstly, it enhances the employee experience, leading to increased engagement, satisfaction, and retention.

Digitally transformed HR processes are more efficient, reducing time spent on administrative tasks and allowing HR professionals to focus on strategic initiatives.

It also enables better talent acquisition and management through data-driven insights, leading to more informed decision-making.

Finally, it fosters a more inclusive and diverse workplace culture by leveraging technology to eliminate biases in recruitment and performance evaluations.

Overall, HR transformation aligns the HR function more closely with the organization's strategic goals, driving better business outcomes and fostering a more agile and resilient workforce.

8.4 Key components of HR transformation

HR transformation is underpinned by several key components that collectively drive its success:

Technology is at the forefront, with tools such as AI, machine learning, and cloud-based HR systems playing a crucial role in automating and streamlining processes.

Data analytics provide insights into workforce trends and behaviors, aiding in strategic decision-making.

Change management is essential, as transforming HR requires not just new tools but a shift in culture and mindset. This involves training and development to equip HR professionals and employees with the skills needed for a digital workplace.

A focus on employee experience is crucial, ensuring that the transformation leads to positive outcomes for the workforce.

Aligning HR strategy with business objectives ensures that the transformation is relevant and contributes to the organization's overall goals.

These components, when effectively integrated, create a robust foundation for a successful HR transformation.

8.5 The Stages of HR Digital Transformation

1. Assessment and Strategy Development
Evaluate Current Processes: Identify strengths and weaknesses.
Set Goals: Define objectives like efficiency and better employee experience.
Gap Analysis: Pinpoint technological and skill gaps.
Engage Stakeholders: Ensure alignment and buy-in.

2. Technology Selection and Implementation
Research Technologies: Explore HCM systems, ATS, and engagement platforms.
Vendor Evaluation: Assess scalability and integration capabilities.
Pilot Testing: Test technology in a controlled environment.
Full Implementation: Roll out technology organization-wide.

3. Process Redesign and Automation
Map Processes: Identify automation opportunities.
Redesign Workflows: Streamline processes for productivity.
Implement Automation: Use RPA for tasks like payroll and onboarding.

4. Data Integration and Analytics
Consolidate Data: Centralize HR data.
Leverage Analytics: Derive insights using AI.
Predictive Modeling: Forecast trends like turnover and recruitment needs.

5. Change Management and Training
Develop Strategy: Plan for a smooth transition.
Train Staff: Ensure comfort with new technologies.
Promote Continuous Learning: Keep the workforce updated.

6. Continuous Improvement and Innovation
Monitor Performance: Regularly assess new systems.
Gather Feedback: Adjust based on employee input.
Stay Current: Keep up with emerging technologies and trends.
Strategies for successful HR transformation

Conduct a needs assessment

A successful HR transformation begins with a thorough needs assessment. This process involves evaluating the current state of the HR function, identifying gaps in processes and technology, and understanding the specific needs of the organization and its workforce.

The assessment should include gathering insights from various stakeholders including HR staff, management, and employees to gain a comprehensive view of the existing challenges and opportunities.

By analyzing this data, organizations can pinpoint areas that require transformation and prioritize initiatives that align with their strategic objectives. This targeted approach ensures that the transformation efforts are focused and relevant, maximizing their impact and efficiency.

Develop a HR transformation roadmap

Once the needs are clearly identified, developing a detailed roadmap is the next critical step. This roadmap serves as a strategic plan, outlining the specific goals and objectives of the HR transformation. It should include short-term and long-term milestones, with clearly defined timelines and expected outcomes.

The roadmap must also consider the resources required, including budget, technology, and personnel. This structured plan helps in keeping the transformation process on track, ensuring that each step is executed systematically and efficiently.

Regular reviews and updates to the roadmap are essential to adapt to any changes or new requirements that emerge during the transformation journey.

Build a strong team

A strong HR transformation requires a dedicated and skilled team. This team should comprise individuals with diverse expertise, including HR professionals, technology experts, and change management specialists.

It's essential to involve individuals who are not only knowledgeable but also adaptable and open to new ideas. The team should also include champions from within the organization who can advocate for the transformation and help in driving it forward.

Investing in training and development for the team is important to equip them with the necessary skills and knowledge. A strong, collaborative team forms the backbone of the transformation process, driving initiatives and overcoming challenges effectively.

Communicate with stakeholders

Effective communication with all stakeholders is key throughout the HR transformation process. Regular updates should be provided to employees, management, and other relevant parties to keep them informed about the progress and changes.

Communication should not just be one-way; feedback from stakeholders should be actively sought and considered. This inclusive approach helps in building buy-in and support for the transformation.

Clear, transparent, and consistent communication helps in alleviating concerns, clarifying expectations, and ensuring that everyone is aligned with the goals and objectives of the transformation.

Implement change management practices

Change management is a critical component of HR transformation. It involves managing the people aspect of change to ensure a smooth transition. This includes preparing the workforce for new processes and systems through adequate training and support.

It's important to address resistance to change by understanding the concerns of employees and providing them with the necessary reassurance and information. Celebrating small wins and recognizing the contributions of individuals and teams can also foster a positive attitude towards the transformation.

Effective change management ensures that the transformation is not only technically successful but also embraced and sustained by the workforce.

Leveraging technology for HR transformation

8.6 Overview of HR technology

The landscape of HR technology encompasses a wide range of digital tools and platforms designed to automate, streamline, and enhance various HR processes. This technology revolutionizes how organizations manage recruitment, employee engagement, performance evaluation, payroll, and benefits administration, among other areas.

Modern HR technology often includes cloud-based systems, artificial intelligence, machine learning and advanced analytics. These technologies enable HR departments to move away from traditional, manual processes, allowing them to focus more on strategic tasks and decision-making.

The integration of these technologies into HR practices signifies a fundamental shift towards more efficient, data-driven, and employee-centric operations.

8.7 Benefits of HR Technology

Implementing HR technology offers numerous benefits that significantly improve the efficiency and effectiveness of HR functions.

Key benefits include:

Increased efficiency: Automation of repetitive and administrative tasks saves time and reduces errors, allowing HR staff to focus on more strategic initiatives.

Enhanced data-driven decision making: Advanced analytics provide valuable insights into workforce trends and behaviors, aiding in more informed and strategic decision-making.

Improved employee experience: Digital tools can streamline the employee experience, from onboarding to performance reviews, enhancing satisfaction and engagement.

Scalability and flexibility: Cloud-based HR solutions offer scalability and flexibility, easily adapting to the changing needs of the organization.

Better compliance management: HR technology helps in maintaining up-to-date compliance with labor laws and regulations, reducing the risk of non-compliance.

Examples of HR technology solutions

There are various types of HR technology solutions, each catering to different aspects of

8.8 HR functions

Applicant Tracking Systems (ATS): These systems streamline the recruitment process, from posting job openings to managing candidate applications.

Employee Engagement Platforms: Tools that facilitate continuous feedback, recognition, and engagement activities.

Learning Management Systems (LMS): Platforms for delivering, tracking, and managing training and development programs.

HR Information Systems (HRIS): Comprehensive systems that manage employee information, payroll, benefits administration, and more.

Performance Management Tools: Digital solutions for setting, tracking, and evaluating employee performance goals and appraisals.

8.9 Best practices for implementing HR technology

Successfully implementing HR technology requires a strategic and thoughtful approach:

Conduct a needs analysis: Understand the specific needs and challenges of your HR department to select the most appropriate technology solutions.

Involve stakeholders: Engage with key stakeholders, including HR staff, management, and employees, to gain insights and build support.

Choose the right vendor: Select a vendor whose product aligns with your organization's needs and offers reliable support and training.

Plan for integration and scalability: Ensure that the chosen technology integrates well with existing systems and can scale as the organization grows.

Provide training and support: Equip your team with the necessary training to effectively use the new technology and offer ongoing support to address any challenges.

Monitor and evaluate: Continuously monitor the effectiveness of the technology and make adjustments as needed to ensure it meets the evolving needs of the organization.

Leveraging technology in HR is a strategic move that can significantly enhance the effectiveness and impact of HR functions in the modern business environment.

8.10 The future of HR transformation

Emerging trends in HR digital transformation

The future of digital human resources transformation is shaped by several emerging trends that are revolutionizing the way HR functions within organizations:

AI and automation: The increased use of artificial intelligence and automation in HR processes, from recruitment to employee engagement, is a major trend. These technologies are streamlining operations and providing deeper insights into workforce management.

Employee experience focus: There is a growing emphasis on enhancing the overall employee experience, encompassing everything from workspace design to career development opportunities, aiming to improve engagement and retention.

Data-driven decision making: Leveraging big data analytics for strategic decision-making is becoming increasingly important. This involves analyzing large sets of data to identify patterns and trends that can inform HR strategies.

Personalization of HR services: Customized employee experiences, tailored to individual preferences and needs, are becoming more common, enabled by technology.

Remote and flexible work solutions: The rise of remote work and the need for flexible work arrangements are driving HR to adapt policies and practices to manage a distributed workforce effectively.

Focus on well-being and mental health: There's an increasing recognition of the importance of employee well-being and mental health, with HR playing a key role in developing supportive policies and resources.

Predictions for the future of HR transformation

Looking ahead, several predictions can be made about the future of HR and digital transformation:

Widespread adoption of AI and machine learning (ML): AI and ML will become more deeply integrated into HR functions, making processes even more efficient and providing more nuanced insights.

Greater emphasis on skills development: As the pace of change in the workforce accelerates, continuous learning and skills development will become even more integral to HR strategies.

Increased use of predictive analytics: Predictive analytics will play a larger role in HR, used for everything from predicting employee turnover to identifying future hiring needs.

More holistic employee wellness programs: Employee wellness programs will evolve to become more holistic, addressing physical, mental, and financial well-being.

Rise of the gig economy: HR will need to adapt to the increasing prevalence of the gig economy, developing strategies for effectively integrating and managing contingent workers.

Preparing for the future of HR transformation

To prepare for these future developments, organizations can take several steps:

Invest in technology: Stay abreast of technological advancements and invest in tools that can drive efficiency and provide valuable insights.

Focus on agility and adaptability: Develop an agile HR function that can quickly adapt to changing business needs and workforce dynamics.

Embrace data analytics: Build capabilities in data analytics to inform decision-making and improve HR strategies.

Develop a continuous learning culture: Foster a culture that values continuous learning and development, ensuring that the workforce can adapt to future changes.

Prioritize employee wellbeing: Focus on initiatives that support the overall well-being of employees, recognizing this as a key factor in engagement and productivity.

Plan for a diverse workforce: Develop policies and practices that accommodate a diverse range of work arrangements and types of workers.

By understanding these trends and predictions and preparing an HR transformation roadmap accordingly, HR can position itself as a strategic partner in driving organizational success in the future.

8.11 Embracing the future of HR transformation

As we've explored, HR digital transformation is an essential journey for modern organizations aiming to stay competitive and responsive in an ever-evolving business landscape.

The key points to remember are the growing importance of leveraging technology, especially AI and data analytics, to enhance HR functions. The shift towards prioritizing employee experience and well-being, the necessity of adapting to flexible and remote work models, and the increasing focus on continuous learning and development are pivotal trends shaping the future of HR.

The future of HR and digital transformation is not just about adopting new technologies but also about fostering a culture of adaptability, inclusivity, and forward-thinking. This evolution represents a significant opportunity for HR to move beyond traditional roles and contribute strategically to a successful organizational design.

For HR professionals and business leaders, it's time to embrace these changes proactively. Orgvue has developed a data-driven approach to help your organization continuously adapt strategies to meet evolving demands.

The journey of HR transformation is ongoing and staying ahead requires commitment, innovation, and a willingness to embrace change. By doing so, HR can effectively lead organizations into a prosperous and dynamic future

8.12 Summary

HR plays a strategic role in digital transformation by building a digital-ready workforce through hiring, reskilling, and upskilling while fostering a culture of innovation and agility. It redesigns organizational structures to align with digital goals and enhances employee experience by digitizing HR processes and tools. HR also leads change management efforts to guide employees through technological shifts and ensures ethical, compliant, and people-centric adoption of digital technologies.

8.13 Key words

Applicant Tracking Systems (ATS): These systems streamline the recruitment process, from posting job openings to managing candidate applications.

Employee Engagement Platforms: Tools that facilitate continuous feedback, recognition, and engagement activities.

Learning Management Systems (LMS): Platforms for delivering, tracking, and managing training and development programs.

HR Information Systems (HRIS): Comprehensive systems that manage employee information, payroll, benefits administration, and more.

Performance Management Tools: Digital solutions for setting, tracking, and evaluating employee performance goals and appraisals.

8.14 Self Assessment Questions

1. Briefly discuss the overview of HR technology
2. Describe the Overview of HR Technology
3. Analyse the stages of HR Digital Transformation

8.15 Reference Books

1.Pearlson, K. E., Saunders, C. S., & Galletta, D. F. (Year). Managing and using information systems: A strategic approach (Edition). Publisher.

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LESSON-9

DIGITAL TRANSFORMATION IN HR

Objectives

To Understand the Importance of technology in HR
To Know the Benefits of Technology in Human Resource Management
To Analyse the Cost Benefits Analysis
To Predictive Analytics for Talent Management

Structure

9.1 Introduction
9.2 Importance of Technology in HR
9.3 Benefits of Technology in Human Resource Management
9.4 Challenges and Considerations in Implementing HR Technology
9.5 Cost-Benefit Analysis
9.6 Future Trends in HR Technology
9.7 Artificial Intelligence and Machine Learning in HR
9.8 Predictive Analytics for Talent Management
9.9 Summary
9.10 Key words
9.11 Self Assessment questions
9.12 Reference Books

9.1 Introduction

Technology has evolved in HR, changing the way human resource management works. Moving away from paper-based systems to computerized databases, HR functions have become more efficient and effective. Cloud technology has made it possible for data to be accessed from anywhere at any time. Plus, AI has given HR processes a major boost. For instance, AI-powered chatbots screen candidates based on criteria and algorithms that analyze employee behavior to support decision-making. An organization even implemented an AI talent acquisition system that reduced manual effort by 70%.

It's clear that without tech, HR is outdated and useless.

9.2 Importance of Technology in HR

Integrating technology into HR management is key for streamlining processes and boosting productivity. Leveraging software and digital tools, organizations can automate tasks such as onboarding, payroll, and performance evaluations; freeing time for HR to focus on strategic initiatives.

Tech also lets HRs gather and analyze data; providing valuable insights into workforce trends and behavior. AI and machine learning allow HR to make data-driven decisions on talent, engagement, and retention. Predictive analytics can identify potential high performers or those at risk of leaving

Technology has also revolutionized the recruitment process. Job portals and social media platforms are popular for sourcing candidates, while applicant tracking systems help sift through resumes. Video interviews conducted via video conferencing are convenient and cost-effective.

One example of the importance of tech in HR is a multinational organization that implemented an automated performance system. Digitizing their process with a cloud-based platform eliminated manual paperwork and reduced overheads. This gave managers the ability to give timely feedback based on real-time data. The result: increased motivation and engagement, plus fairness in assessments.

9.3 Benefits of Technology in Human Resource Management

To streamline recruitment and hiring, enhance employee onboarding and training, automate administrative HR tasks, improve communication and collaboration, enhance performance management and feedback, and facilitate data-driven decision-making, explore the benefits of technology in human resource management.

Streamlining Recruitment and Hiring Processes

Technology has a major role in simplifying and speeding up recruitment and hiring. Cutting-edge software and platforms help companies manage job postings, applications, and candidate assessments all in one place.

Automating tedious tasks, such as resume screening, is a huge advantage of tech in recruitment. AI-powered algorithms assess candidate qualifications according to pre-set criteria. This saves time and ensures fairness.

Tech also allows recruiters to search a larger pool of potential candidates. Online job boards, career websites, and social media let organizations draw from diverse skill sets and find the perfect fit

Video interviewing is becoming more popular too. Geographical limitations are eliminated and initial interviews can be conducted without scheduling conflicts and travel expenses. All you need is a webcam and an internet connection!

There are plenty of success stories that show how technology has changed recruitment. Jane Doe, for example, was seeking a job in a competitive field. With an online portfolio platform, she showcased her qualifications and achievements. She successfully got her dream job thanks to this technological solution.

Employee onboarding and training have been given a tech update! HR managers no longer need to worry about awkward icebreakers or boring videos.

Enhancing Employee Onboarding and Training

Onboarding creates a positive initial impression, giving new hires a sense of belonging. Clear job expectations improve productivity and engagement. This reduces turnover rates, making transitions smoother. Training programs give employees specialized skills and industry knowledge. Ongoing development opportunities nurture talent, increasing retention rates. Training addresses skill gaps, ensuring employees stay relevant.

Moreover, onboarding and training benefit not only the individual but also the organization. It encourages continuous learning, adaptability, and innovation. By providing employees with the resources needed, companies create a motivated workforce committed to achieving goals.

Automating Administrative HR Tasks

Automating HR admin tasks has revolutionized how HR works. By using tech, repetitive and time-consuming activities such as data entry, payroll processing, and recordkeeping can be done quickly. This saves time and reduces errors.

It also means HR teams can focus on strategic company growth. Instead of dealing with mundane tasks, they can use their skills for talent acquisition, employee development, and innovation.

Plus, automation reduces the risk of compliance errors. By ensuring policies and procedures are executed and documented accurately, organizations can avoid legal implications. Automated tracking systems also make auditing and reporting easier.

One example of this is a leading tech company. Before they implemented HR management software, their HR department struggled with paperwork and manual data entry. But after, there were big improvements in efficiency and accuracy. The automated system not only removed manual work but also improved employee satisfaction, with self-service portals for leave applications and attendance tracking.

Improving Communication and Collaboration

Performance reviews are like horror movies; no one knows what's gonna happen next! Everyone hopes the outcome won't be a "bloodbath". With technology at the forefront of human resource management, improving communication and collaboration is now more efficient than ever. In today's hectic world, effective communication between employees and departments is essential for smooth operations and successful results.

Harnessing the power of technology in this area supplies a lot of advantages. Real-time communication is enabled via emails, messaging apps, and video conferencing. This eliminates the need for long back-and-forth conversations, allowing people to quickly connect and exchange ideas. This fosters collaboration and ensures that everyone is on the same page, leading to better decision-making and increased productivity.

Enhanced collaboration tools, such as cloud-based platforms, let employees work together on projects irrespective of their physical location. It offers real-time document sharing, editing, and version control – streamlining teamwork across departments or even continents. Through these tools, employees can collaborate seamlessly, share ideas effortlessly, and contribute to collective success.

Incorporating technology into human resource management also improves communication barriers among multicultural teams by providing translation services in real-time without needing external resources or language experts. Implementing web-based project management tools can increase transparency by displaying project progress updates in real time for all participants involved. Incorporating enterprise social media platforms permit employees to share insights

immediately across various departments. Utilizing virtual reality (VR) or augmented reality (AR) technology allows for immersive team meetings regardless of geographic location—significantly enhancing collaboration opportunities.

Organizations are able to experience enhanced communication and collaboration among employees, resulting in improved efficiency, innovation, and eventually, better overall performance when they embrace these suggestions. The benefits of technology in human resource management are clear and offer exciting chances for organizations to adopt the future of work.

Enhancing Performance Management and Feedback

Performance management and feedback are essential to increase organizational productivity and success. It helps align employee goals with company objectives, identify improvement areas, and support career growth. Plus, it gives managers a chance to give timely feedback and recognition, which motivates employees and lets them know their strengths and weaknesses.

In this digital age, technology has changed how performance management and feedback are conducted. With modern HR software, companies can streamline these processes by automating tasks such as goal-setting, tracking progress, and evaluating performance metrics. This saves time and reduces manual errors, guaranteeing an impartial appraisal.

Also, technology yields real-time data on employee performance from sources such as competency assessments and 360-degree feedback. This data gives a valuable understanding of individual strengths and development needs, so organizations can create customized training programs. Moreover, platforms like instant messaging and online collaboration tools facilitate continuous feedback loops, which eliminates drawn-out annual feedback sessions.

Aside from bettering performance management within the organization, technology also allows anonymous feedback. Employees can give honest opinions without any worry of retaliation or prejudice. This cultivates transparency and trust.

Facilitating Data-Driven Decision Making

Tech in HR is revolutionizing decision-making. Data-driven tactics enable HR pros to make informed choices based on facts, attaining more successful outcomes. By utilizing data, firms can pinpoint trends, discover patterns, and foresee scenarios accurately.

Technological advanceslet HR departments access and examine reams of employee data with ease. This involves data concerning performance appraisals, training records, attendance logs, and even skills. With such comprehensive data, HR professionals can gain key insights into their staff's advantages and weaknesses.

Data-driven decision-making also promotes fairness and transparency. When decisions are based on data rather than opinions or biases, employees feel secure they are being treated fairly. This boosts trust and employee involvement.

Moreover, tech facilitates real-time tracking of metrics like employee turnover rates, absenteeism rates, and recruitment costs. HR specialists can quickly recognize areas needing intervention or improvement by studying these metrics regularly. This proactive approach permits organizations to handle issues before they become major problems.

9.4 Challenges and Considerations in Implementing HR Technology

To address the challenges and considerations in implementing HR technology, learn about the integration with existing systems and processes, data privacy and security, change management and employee resistance, and cost-benefit analysis. Explore how each of these sub-sections offers solutions for a smooth and successful implementation of technology in human resource management.

Integration with Existing Systems and Processes

Integrating HR tech with existing systems and processes is complex. It means combining new software or tools with the pre-existing infrastructure. This process is key for organizations to gain the most from the tech.

Assessing compatibility between the new system and existing infrastructure is essential. Evaluate whether the software or tool can effectively integrate with other systems, like payroll, employee database, or performance management software. Also, consider scalability – the tech should handle future growth and changes within the organization.

Data security and privacy is another important factor to keep in mind. Organizations must protect sensitive employee info during the integration process. This could include implementing security measures and conducting risk assessments.

Good communication between IT teams, HR staff, and employees is vital. Everyone should understand the reason for integrating HR tech, and how it will affect their jobs. This helps smooth the transition by answering any worries or questions.

Company X offers an example of the importance of integrating HR tech. They had trouble combining their new HR management system with their payroll software. After investing time in resolving this, they succeeded in integrating both systems. This allowed them to streamline their HR processes and improve overall efficiency.

Data Privacy and Security

Data privacy and security are key when it comes to HR technology. The protection of sensitive employee info is crucial for avoiding data breaches and staying compliant with privacy laws. Cyber threats are always present, so organizations must prioritize strong security measures to keep out unauthorized access and data leaks.

Encryption, multi-factor authentication, and security audits are all essential practices to create a secure HR tech environment. Clear policies and procedures must be set up for data privacy and security. This includes who has access to sensitive data, employee training on confidential info, and regularly reviewing/updating security protocols.

Third-party vendors for HR tech solutions should be taken into consideration too. Thorough vetting of their security practices is essential, to make sure they have measures in place to protect employee data and abide by relevant regulations.

Change Management and Employee Resistance

Communication is the key when it comes to introducing new HR tech. Explain the benefits and address any worries. Training and support help employees understand the new system. Working out the root of resistance and strategies to alleviate it helps too. Change agents are good advocates for the new tech and feedback from employees is vital for success.

Data privacy, security, and technological advancements must be kept in check. Research by Gartner shows that 40% of organizations face resistance during tech implementation. HR tech might be costly, but it beats manual HR tasks.

9.5 Cost-Benefit Analysis

Conducting a Cost-Benefit Analysis? Consider both short-term and long-term effects.

Short-term costs could include software licenses, training and system implementation. Long-term benefits? Decreased hiring costs, employee satisfaction and data analysis for informed decisions.

Additionally, think about intangible benefits, like improved employee experience and reduced turnover rates. Positive work culture, better business outcomes. Consider potential risks and challenges too – system downtime or compatibility issues.

HR Tip: Involve HR professionals and finance teams when calculating costs and benefits. This helps predict returns on investment more accurately. Ready to change HR tech? Robots replace the need for awkward workplace conversations and provide an excuse to avoid small talk

9.6 Future Trends in HR Technology

To understand future HR technology trends, examine how technology is used in managing human resources. This includes artificial intelligence and machine learning in HR. It also involves predictive analytics for talent management.

Additionally, there are tools for remote work and virtual collaboration. Moreover, there are platforms for employee experience. Lastly, customization in HR technology is also a significant aspect to consider.

9.7 Artificial Intelligence and Machine Learning in HR

AI and machine learning are revolutionizing HR, changing the way organizations hire, manage, and develop workers. These cutting-edge technologies boost efficiency, improve decision-making, and enhance employee experiences.

AI and ML can automate tedious tasks, freeing up time and resources to focus on strategic initiatives like talent acquisition and management. Plus, AI-powered tools can spot patterns and trends in employee data, allowing organizations to make data-driven decisions that benefit the business.

Furthermore, AI can make the candidate selection process smoother. ML algorithms can quickly go through lots of resumes and pick out the best-fit candidates based on certain criteria. This is not only faster but also fairer.

Also, AI chatbots are becoming more and more popular in HR. These virtual assistants answer questions, guide employees, and provide personalized recommendations. They make processes faster and help employees feel more valued.

Finally, predictive analytics are being used for talent management—allowing algorithms to evaluate skills.

9.8 Predictive Analytics for Talent Management

Predictive analytics have transformed talent management. By examining large data sets, companies can estimate future performance, uncover potential employees, and make wise hiring decisions. This tech aids in simplifying HR duties, and guaranteeing organizations have the suitable people in the right places.

Moreover, predictive analytics can forecast broader talent trends. It can help decide which departments or teams have the highest turnover rates and spot probable causes of attrition. By spotting these trends early, HR experts can take proactive steps to keep top performers and lessen turnover dangers.

Furthermore, predictive analytics can support in succession planning by finding employees with the capacity to fill key leadership roles in the future. By obtaining data on their qualifications, experiences, and performance, firms can construct development plans suited to each individual's needs. This assists in creating a powerful stream of internal talent and guarantees smooth transitions when key positions become vacant.

As a demonstration of the power of predictive analytics in talent management, IBM's Watson Recruitment platform is a good example. Using machine learning algorithms, it evaluates past recruitment data and finds patterns of successful hires. By utilizing this tech, companies can refine their recruitment techniques by focusing on applicants who demonstrate similar characteristics as their top performers.

Working from home may be great, but in the office at least you have someone to point the finger at when the printer crashes.

Remote Work and Virtual Collaboration Tools

The idea of remote work and virtual collaboration tools is revolutionizing businesses. Technology advancements bring new ways to link teams from different places, allowing for smooth collaboration.

These systems are a must in the hustle and bustle of the business world. They let people work from any location, doing away with the need for physical offices. Communication becomes simple with video conferences, messaging apps, and project management software, helping with team effort and output.

These tools provide a variety of features to make collaboration easier. File sharing enables team members to swap documents and resources. Virtual whiteboards create an interactive area for brainstorming. Plus, multiple users can edit and comment on documents simultaneously with real-time alteration features.

Employee Experience Platforms also help businesses. It's like a dating app for job seekers and employers, pairing them up perfectly… until the honeymoon phase ends and it's time for the truth.

Employee Experience Platforms

Employee experience platforms are shaking up the way companies manage and boost their employees' journey. These platforms give a complete set of tools and features to simplify HR processes, promote teamwork, and let staff take control of their own progress.

These platforms allow firms to build individual experiences for their personnel by using automation, AI, and data analytics. HR departments can also get real-time feedback from employees, recognize problems, and make data-based decisions to boost worker happiness and involvement.

Employee experience platforms have a special capability – they can integrate with several HR systems and applications. This integration makes it possible to store all employee-related info in one place, eliminating manual data entry and reducing admin tasks. Plus, staff can access info like benefits, leave requests, and performance reviews from one interface.

Personalization and Customization in HR Technology

As technology advances, HR is also evolving. It incorporates personalization and customization. This helps with tailored experiences and solutions. With personalized tech, employees can access info that's relevant to them. Customization also lets companies adapt HR processes and workflows to fit their culture and goals.

Personalization and customization in HR tech have lots of benefits. It can increase engagement and satisfaction, leading to higher productivity. Customized processes streamline operations by focusing on what is essential.

9.9 Summary

Digital transformation means businesses should leverage personalized HR tech. A report from Deloitte says companies that do this are more likely to attract and keep top talent. By providing employees with tools tailored to their individual needs, they can create a supportive and empowering work environment.

9.10 Key words

Technology

Technology has a major role in simplifying and speeding up recruitment and hiring. Cutting-edge software and platforms help companies manage job postings, applications, and candidate assessments all in one place

Onboarding creates a positive initial impression, giving new hires a sense of belonging. Clear job expectations improve productivity and engagement. This reduces turnover rates, making transitions smoother

Video interviewing is becoming more popular too. Geographical limitations are eliminated and initial interviews can be conducted without scheduling conflicts and travel expenses. All you need is a webcam and an internet connection

Automating HR admin tasks has revolutionized how HR works. By using tech, repetitive and time-consuming activities such as data entry, payroll processing, and recordkeeping can be done quickly.

9.11 Self Assessment questions

1. Briefly Discuss the Importance of technology in HR
2. Describe the Benefits of Technology in Human Resource Management
3. Analyse the Cost Benefits Analysis
4. Outline Predictive Analytics for Talent Management

9.12 Reference Books

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LESSON-10

HR ANALYTICS

Objectives

The concept and importance of HR analytics
The variables pertinent to human resources planning and management
The significance of HR analytics in machine learning concerning the HR domain
Descriptive, prescriptive, predictive, and diagnostic analytics
Understanding talent analytics and HR role

Structure

10.1 Introduction
10.2 Evolutionary Process Of Human Capital Metrics
10.3 Descriptive analytics
10.4 Prescriptive analytics
10.5 Diagnostic analytics
10.6 Talent Sourcing
10.7 Importance of workforce planning
10.8 Markov chain
10.9 Job redesign
10.10 Analytics of employee training and development
10.11 Applications for HR Analytics
10.12 Summary
10.13 Key words
10.14 Self Assessment Questions
10.15 Reference Books

Structure

10.1 Introduction

With the constant changes organizations face, one of the most important aspects of running a successful business is attracting, recruiting, onboarding, developing, and retaining top talent.The HR expertise Management Life NCycle ensures that both the employee and the employer benefit from their collaboration. Let's take a closer look at every stage of the cycle of an employee's life to see how they can influence employee engagement.

Attraction

The first phase of thecycle is the attraction stage. A great employer brand can be built by passing through employee attraction. It raises the brand awareness of the organization. Providing lucrative compensation and benefits is found to be beneficial at this stage.

Recruitment

Identifying great talent quickly and hiring them before competitors is recruitment's crux. The following points may be taken into consideration here:

Maintaining several deep pockets of prospective candidates.

Assessing the candidate thoroughly: interview, performance during a group discussion, psychometric test, and personal background.

Onboarding

The following stage is employee onboarding. The onboarding period, which occurs after the employerhas recruited talent- employee's capability -, is crucial for acclimating the new hires to the organisational ambience. You want employees to feel confident that they made the right decision by joining your team.

When resources are assigned to work directly with the client on a project, Staff Augmentation Model, it is also critical to ensure that your clients have a robust onboarding process.

Development and Retention of career

Each employee needs a personalised career development plan that includes regular training. Managers and supervisors must work with employees to define and adjust such plans regularly. Engineers typically want to work in a setting where they can learn, so having online training platforms to help them improve their technical and soft skills is an important detail

Separation

An employee's life cycle ends at some point, whether for retirement, new employment, or personal reasons. Strategically, the separation process must be treated just as seriously as the onboarding process.

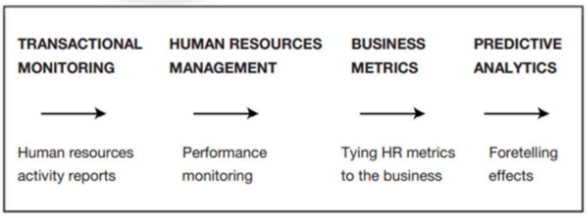
Starting on the first day, inform your new employee that leaving your company is a natural process that will benefit everyone. Having a good resource leave your organisation will always have an impact. Still, when the employee and the company manage it properly, it is easier to overcome and allows the employee to leave the door open for future opportunities at your organisation.

This model is considered one of the most effective modes to visualise and prepare for every stage of an employee's communications with their employer. It givesemployers the insight they need to make each stage of their employees' time with the company as successful as possible. The employer is more likely to attract and retain a fantastic team if the employeedoestheir best at each stage

10.1 Evolutionary Process Of Human Capital Metrics

If HR practitioners genuinelywish to be an integral part of any business, metrics, particularly predictive analytics, may help them get there.Metrics are the organisational management language. When we share any idiom and,for that matter, a mindset, we presume the foundation for a relationship. 2007 and 2008 Workforce Intelligence Reports research revealed the reasoning for a management model that ensures to improve communication between line managers and human resources professionals

Figure 1: Evolutionary journey of Predictive analytics



Transactional monitoring evolves to predictive analytics, increasing organizational potential to cater to future requirements. Figure1 depicts the evolutionary journey of human capital so we may understand the importance of each phase of evolution.

The five ways of measurement Before we get into the five different ways of measuring anything in any business, we must acknowledge the two facts.

1. Measurement is an activity targeted to find out something.

2. Every activity incurs an expense. The foundation of analytics cautions about the involvement of expense in it. Now, let us discuss the five different steps followed in analytics.

i. Recording one's work: Recording the work performed by the self, has the potential of creating supreme benefit for the organization by economizing in terms of money, time, increasing the chances of comparing the inputs and outputs, making the records available, accessible, and henc , believable. The closer HR decisions to the real\ time value of the organizations, the easier it becomes to increase the employee happiness.

We may see an improved hiring, remunerating, training, developing, retraining, and supporting as a result of better recording their own efforts and work decisions.

ii. Linking to goals of an organization in terms of quality (Q), innovation (I), productivity (P), and service (S). The QIPS takes care of the fundamental goals of an organization. It sets periodical targets for the employees which are reviewed by senior management time-to-time. The result of work with regard to following the QIPS impacts the organizational value in a long run.

iii. Comparison of results. Comparing business practices with industry bests is commonly termed as "benchmarking". Benchmarking enables organisations to create plans for how to improve or adapt specific best practices, typically to improve a few characteristics of the performance.

Benchmarking may be a one-time event, but it is often viewed as a discontinuous process. It enables organisations to strive to enhance the efficacy of their practices.

iv. Recognizing past behaviour and outcomes (Descriptive analytics): It represents the first true analysis level. It searches for and explains data relationships with providing negligible significance to the different trends. It is more exploratory and deductive than predictive. It allows u to visualizepast trends; however, extrapolating from the past into the future is risky, due to the volatile, quickly shifting markets currently and likely future.

v. Forecasting future probabilities (Prescriptive analytics): It connects what we 'know' with what we 'don't know'. It contrasts what happened during the recent past with what is likely to happen in the future. The patterns observed in descriptive analysis are given meaning in predictive analytics. Financial institutions use it to predict borrowers' credit worthiness. Insurance providers use it to forecast patterns of illness, disease history, life expectancy, and mortality. It can be used by human resources to make meaningful conclusions about the expected return on nvestments in hiring, training, and planning human capital.

The influence of analytics Riskydecision-making must be made in inevitable situations. Seldom the reasoning is completely clear. For example, under what market conditions should action be taken to retain mission-critical talent? Would we prefer compensation in terms of incentives, challenging assignments, work-life integration and balance, or quick advancement?

What kind of data do we possess to back up such an essential decision of the future? Who will be able to predict the action that will have the highest success rate if the strategically important population is huge and demographically scattered, and its technological advancements or customer expectations are changing? Indeed, depending on the past to forecast the future is the pinnacle of folly

10.3 Descriptive analytics

Descriptive analytics is an analysis process of deciphering historical data to further understand how a particular business has evolved. It helps to identify the facets of strength and flaws in an organization. In this decision makers use a range of past data, and benchmarking to obtain an all-encompassing performance trend on which a business decision can be taken. In its fundamental form, descriptive analytics answers the question: "What happened?"

Data is collected in two different ways for descriptive analytics. They are (a) data aggregation and (b) data mining. The former, data aggregation, is the process of gathering data from various sources, compiling it, and presenting it in a summarised form. Data mining is popularly defined as the process of looking for large sets of data for trends and patterns using computers and automation, and then turning those new inventions into business insights and future predictions. Data mining can be extended beyond searching or evaluating future probabilities and developing actionable analyses.

10.4 Prescriptive analytics

Prescriptive analytics is the kind of data analytics that seeks to answer the question, "What should we do to achieve this?" It entails using technology to assist businesses in making better decisions by analysing raw data. Prescriptive analytics considers information about potential situations or scenarios, current resources, past performance, and current performance before recommending a course of action or strategy. It can be used to make decisions on any time horizon, from the short to the long term. It is the inverse of descriptive analytics, which looks at decisions and outcomes after they have occurred.

Advantages

Prescriptive analytics can snip through the noise of current uncertainty and changing conditions. It can aid in the prevention of fraud, the reduction of risk, increased efficiency, the achievement of business objectives, and the creation of more loyal customers. When used correctly, it can assist organisations in making decisions based on highly analysed facts rather than instinctively jumping to uninformed conclusions.

Prescriptive analytics can simulate and display the probability of various outcomes, allowing organisations to understand better the level of risk and uncertainty they face than relying on averages. It allows organisations to understand the likelihood of worst-case scenarios better and plan accordingly.

Disadvantages

However, prescriptive analytics has its challenges. Organizations can only be effective if they know what questions to ask and how to respond to the answers. As a result, it is only effective if its inputs are correct. If the input assumptions are correct, the output results will be correct.

Measurement of Human Resource Planning Decisions

This type of data analytics is only appropriate for short-term problems. This means that businesses should avoid using prescriptive analytics to make longterm decisions. This is because it becomes less reliable as more time is required.

10.5 Diagnostic analytics

It is the method of assessing data to uncover the causes of trends and the relationships between variables. It can be viewed as a logical next step after identifying trends with descriptive analytics. Manual diagnostic analysis, algorithms, and statistical software can all be used (such as Microsoft Excel). Before diving into diagnostic analytics, there are several concepts to grasp: hypothesis testing, the distinction between correlation and causation, and diagnostic regression analysis.

Hypothesis testing

The statistical process of determining whether or not an assumption is known as hypothesis testing. A hypothesis to test can help to guide and focus our diagnostic analysis.

Correlation

When investigating relationships between variables, it's critical to understand the difference between correlation and causation. The directional movements of two or more variables are related when they are correlated. When two variables are positively correlated, it means that when one increases or decreases, so does the other. If two variables are negatively correlated, one variable rises while the other falls and vice-versa. The key to diagnostic analytics is to remember that just because two variables are correlated doesn't mean one caused the other. If an organisation has the resources to dedicate to running controlled experiments, it may be able to establish causation.

Diagnostic Regression Analysis

A few inter-variable relationships are apparent, while others necessitate more in-depth analysis, such as regression analysis, which can determine the bivariable interdependency (single linear regression) or three or more variables (multiple linear regression) (multiple regression). A mathematical equation expresses the relationship, which relates to the slope of a line that best fits the variables' relationship.

Predictive analytics Predictive analytics, a specialized part of advanced analytics that forecasts future outcomes by intertwining past data, statistical modelling, different data mining procedures, and deep machine learning. Firms use predictive analytics for identifying risks and opportunities by finding patterns in data.

Uses

Reduces employee and customer churn
Finding customers who are most likely to default on payments
Supporting data-based forecasting of sales
Setting optimal or minimal pricing

Tracking the timelines, the machines will need maintenance and replacement

10.6 Talent Sourcing

Workforce planning

Workforce planning is the process of analysing, forecasting, and planning workforce supply and demand. It is also known as strategic workplace planning. It entails reviewing current staff, examining current and future personnel needs, and identifying supply and demand gaps.

Individual planning is the focus of operational workforce planning in an effort to streamline daily employee operations. It is frequently useful in assisting managers in developing daily work schedules for employees as well as assisting employees in understanding their responsibilities and maintaining productivity throughout the workday. This model incorporates elements of talent management to aid in the equitable distribution of talent throughout theorganisation. This distribution may make it easier to identify potential staffing gaps within the organisation, as well as roles or processes that are no longer supporting the organization's success.

10.7 Importance of workforce planning

Workforce planning is critical to the organization's overall success and achieving long-term objectives. It is effective in providing a strategy for evaluating the current workforce, particularly in determining whether current employees have the necessary skills to meet the needs of the business. This enables organisations to easily identify potential gaps, assisting in successful hiring processes.

Organizations may be more adequately prepared for future challenges with workforce planning. They may need to be made aware of the limitations of their current staffing with this process, resulting in potential issues that could stymie an organization's efforts to implement a business strategy. However, a strong knowledge of the employee base and its capability to fulfil organisational needs may increase the efficiency of the hiring processes because hiring managers will know where to focus their efforts.

10.8 Markov chain

Markov chains, proposed by Andrey Markov, are a stochastic model that depicts a sequence of potential outcomes, with forecasts or probabilities for the subsequent state based exclusively on the prior event state, instead of on the states before. Alternatively , the probability that the n+1th steps will be x is determined solely by the nth steps and not by the complete sequence of steps prior n. This is recognised as the Markov Property or Memorylessness. Let us start investigating our Markov chain using a schematic representation. Figure 3 represents A two-state Markov procedure diagram (here, E and A). The arrows in this schematic representation start in the current state and refer to the future state, and the number related with the arrows symbolises the probability of the Markov chain changing states. For instance, if the Markov process is in state E, the probability of changing to state A is 0.7, while the probability of remaining in the same state is 0.3. Similarly, the likelihood of a process modifying to Estate is 0.4, and the likelihood of remaining in the same state is 0.6.

Job analysis

The method for determining the roles and responsibilities and nature of employment, in addition to the types of individuals who should be recruited to accomplish their aims, is known as job analysis. It contains guidelines for creating clear job descriptions, which are employed in recruitment and\ selection, remuneration, performance appraisal, and training. The process of studying, investigating, and collecting detailed information\about the work's components and operations is known as job analysis. It is the collection and analysis of task-related data.

Deciding the Job descriptions (JDs)

A job description (JD) is a written document that identifies the important job requirements, obligations, financial commitments, and skills required to carry out a specific role. A comprehensive job description will explain how accomplishment in the role is evaluated in order to be used in appraisal process.

Garry Dessler explains a JD as a list of job responsibilities, duties, reporting, working conditions, relationships, and supervisory responsibilities – one product of the job analysis.

The list of items need to be present in a JD are Job identification: This could consist of the job title, alternative titles, section, plant, facility where the job remains, job code number, etc.

ii) Job summary: A concise statement of the primary purposes of the job. If the job role needs to be improved, it may also include a concise definition as supplementary identification information.

iii) Duties to be performed: It is a brief summary of the employee's functions, including what is done, how it is done, why it is done, and how much time is to be devoted to each major duty. Job responsibilities are also described, such as those for managing funds, supervising other employees, training subordinates, and so on. This is the most important section of the job description, and it is also the most difficult to write.

iv) The extent to which supervision is given and received - How many employees and what jobs will be supervised? The nature and extent of supervision, that is, whether general or close supervision will be used.

v) Machines, tools, and equipment used - The trade names, types, and models of machines, tools, and equipment used, such as working on a lathe or drilling machine, are also mentioned. The raw materials to be used and other details are also provided.

vi) Working conditions - The conditions under which the job holder will work, such as noise; temperature; postures; illumination; working hours: day or night, overtime, rest durations, dirt; oil; location of the place of work, such as office, factory, inside, outside, underground, solitary, going, and so on.

vii) Relation to other jobs – Whether it is at the horizontal level or otherwise and details about the flow of work and procedures.

viii) Organizational relationship - The job's position or status within the organisation; its stance in the organizational hierarchy and vertical relationship; the jobs instantaneously either above or below it in the job hierarchy; responsibility and accountability to the degree of authority assigned, and so on.Involvement of hazards: Accident risk and health hazards such as nerve strain, eye strain, physical strain, acid, weather exposure, and so on are involved.

ix) Pay – Mode and payment method—hourly, daily, weekly, monthly, piece rate—range of pay from minimum to maximum, bonus and so on required to do the job well.

x) Promotion and training

xi) Required qualification of worker

xii) Comments – The job analyst can make his/her comment or additional remark concerning the job.

xiii) Almost all good organisations use standard printed forms for filling out the job description.

10.9 Job redesign

Job redesigning is the procedure of reorganising the components of a particular job, such as duties, obligations, and responsibilities, to make it more motivating and captivating for workers or staff. The procedure includes revising, analysing, modifying, reforming, and rearranging job-related information and dimensions in order to broaden the range of assessments and\ principle components to employees while also making them think like valuable assets toward the company. The prime objective of job redesign is to position the right individual in the right work while boosting employee satisfaction.

The five important stages of job redesign are:

i) job content revision

ii) analysis of job related information

iii) alteration of job elements

iv) JD reformation and specification

v) Reshuffling duties and responsibilities as per the new JD

Job evaluation

Job evaluation determines the worth of a job systematically. It compares jobs providing the rationale for pay structure. There are two prominent schemes to evaluate the jobs: analytical and non-analytical. A typical program of job evaluation follows the following steps:

i) to ascertain acceptance

ii) creation of a job evaluation committee

iii) jotting the jobs to be evaluated

iv) preparing a JD

v) selecting evaluation norms

vi) job classification

Talent Acquisition

measuring assessment accuracy

- detect the mismatch: whether good people are hired for wrong job
- Measurement of pre-hire quality
- Measurement of post-hire quality
- Comparison of the pre and post results

The factors mentioned above when selected and executed efficiently it results in, reduced time taken by an employee to become productive, increased sales and revenue, better review

results reported by the performance managers, an engaged employee, cultural fit, and low rate of turnover.

Performance predictor

Performance predictor has the following six characteristic features:• Cognitive ability: Mental ability of an individual to perform a range of mental processes.

• Conscientiousness: A tendency to do things apt to one's fullest potential irrespective of time.

• Growth mindset: A tendency to develop oneself by embracing feedback.

• Active learning: Skill to apply the learning to real-life situations.

• Creative problem-solving: Ability to solve complex problems with outof-the box thinking.

• Past performance track-record: Ensures comparability and knowledge translation.

Certain commonly observed factors tend to influence a job success that may prove to be detrimental for the organization are:

• First impressions

• Trick questions

• Personal affinity bias

• Past academic grades

Effectiveness of acquisition

Analysis of the effectiveness of an acquisitioncan be understood by

• cash flow forecasting

• determining the level of the discount rate to assess the projected cash flow

• valuation of the acquired company

• data analysis

10.10 Analytics of employee training and development

Analytics of employee training and development serves the following benefits:

i) it addresses the weaknesses of the organization by observing thedynamics of workforce closely. With the help of different metrics, analytics quantifies the result and attempts to indicate the requirements in an objective manner.

ii) It proves to be a boost to improve employee performance. Timely training and development support improves work productivity which in turn positively impacts employee morale. Individual employees become informed about the safety requirements and are able to carry out the regular tasks more safe and efficient.

iii) It boosts the reputation of the company. The brand value of the employer improves the competitive advantage. The avenues for updated training attracts new and fresh talent, further enhancing company's image and profile.

iv) Innovation comes as a by-product of training and development.

Why we need to keep an eye on training analytics? When developing or implementing training, there are numerous boxes to check. Is it expandable? Is the topic appropriate? Which platform should you choose? But there are also boxes to check once everything is done, such as determining whether training was successful. How can you quantify something that appears to be subjective?

Training is an investment in the success of your organisation. It boosts critical metrics such as employee satisfaction, retention, and productivity.However, not all training programmes are created equal. If you want to ensure that your employee development efforts are successful in all of these areas, you must first determine whether and how effective your training is.

Knowing how well your training programme is working allows you to make the link between learning and results. An investment in employee development is only worthwhile if it achieves its goals. Learning analytics can assist you in identifying areas for improvement and increasing training

ROI.

When you track how training is going regularly, you'll be able to see where it's falling short or where you're losing learner engagement. You'll be able to respond with content upgrades, allocate resources more effectively, and improve the learner experience to increase knowledge retention, for example. You can control outcomes if you know how the training is performing.

So, how do you gather and analyse the data that will help you solidify your results? The key is to establish beneficial learning objectives early on.

10.11 Applications for HR Analytics

Competency Acquisition Analytics Hiring the right talent is instrumental to a company's success with employees amounting to one of the biggest costs and greatest opportunities in most businesses. As a result, competency acquisition analytics can be used to determine whether or not you are acquiring the right talent for your company.

The first step is to identify the core competencies that are critical to youcompany's success. Then, you can map these competencies against existing talent, their current capabilities, and their growth potential. At this stage, any talent gaps can also be identified.

The HR team can determine whether existing resources can be trained to fill identified competency gaps, or if new talent with those competencies is required.

Recruitment Channel Analytics

Understanding where the best talent is coming from is just as important as hiring the right talent. Recruitment channel analytics is a process that assists in determining where an organization's best employees were recruited from, as well as which recruitment channels were most effective in hiring the right resources for the company.

This analysis includes gaining insights by drilling down into historical employee data, surveys, and feedback records, as well as evaluating key performance indicators (KPIs) such as return on investment and human capital value-added.

Classification analysis

The process of analysing historical data to identify patterns that help us predict which category a particular observation or data entity belongs to is known as classification analysis. In human resources, this analytical method can be used to examine the composition of a team as well as other context variables to determine how successful the team will be. Instead of forming teams solely based on experience and resource availability, organisations can use classification

analytics insights to understand how other factors such as leadership style, team dynamics and size, project duration, and so on impact a team's success rate. Knowing the success rate of a team ahead of time allows organisations to form the right teams for a project.

Attrition analysis

High attrition is a huge challenge for HR teams and a costly business expense. Job postings, recruiting, onboarding, and training are all significant costs associated with losing and replacing employees. This is a more significant issue if you're in a customer-facing business because customers prefer to work with people they're familiar with. One method for reducing attrition is to use advanced analytics and natural language processing (NLP) to mine employee reviews from job search websites such as Glassdoor, Indeed, and Comparably. This analysis assists you in measuring employee satisfaction with the brand and understanding the common factors that contribute to attrition.

Capacity analysis

One of the most significant business benefits of advanced analytics in HR is cost reduction. HR departments can use Capacity Analytics to:

- What the team's capacity is and how much of it is being used.
- What activities the team engages in while working.
- What processes, tools, and applications are used to complete the work, and how much do they cost the company?
- The team's operational efficiency helps determine whether it is overworked or underutilised.
- The ability to grow and prosper.

10.12 Summary

With data-backed evidence, organisations can concentrate on making the necessary improvements and planning for future initiatives. With the ability to answer critical organisational questions without guesswork, it's no surprise that many businesses that use HR analytics attribute performance improvements to HR initiatives. This data analysis method takes routinely collected HR data and correlates it to HR and organisational objectives. This provides quantifiable evidence of how HR initiatives contribute to the organization's goals and strategies.

10.13 Key words

Attraction

The first phase of thecycle is the attraction stage. A great employer brand can be built by passing through employee attraction

Recruitment

Identifying great talent quickly and hiring them before competitors is recruitment’s crux.

Onboarding

The following stage is employee onboarding. The onboarding period, which occurs after the employerhas recruited talent- employee’s capability

Separation

An employee's life cycle ends at some point, whether for retirement, new employment, or personal reasons.

Descriptive analytics

Descriptive analytics is an analysis process of deciphering historical data to further understand how a particular business has evolved

Prescriptive analytics

Prescriptive analytics is the kind of data analytics that seeks to answer the question, "What should we do to achieve this?" It entails using technology to assist businesses in making better decisions by analysing raw data.

10.14 Self Assessment Questions

1. Briefly describe the role of HR analytics in Amazon Web Services (AWS).

2. How HR analytics can be of help to the healthcare industry? Can you add a perspective to the scenario keeping in mind the situational demand aberrations due to COVID?

3. How can employee turnover be curbed by using analytics? Explain with an example.

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