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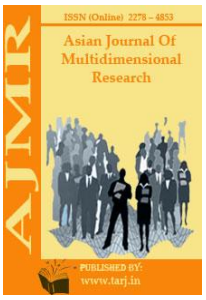

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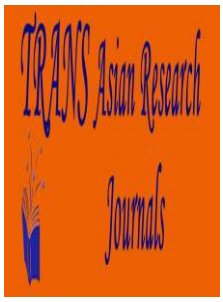

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SPECIAL ISSUE ON MANAGEMENT INFORMATION SYSTEM

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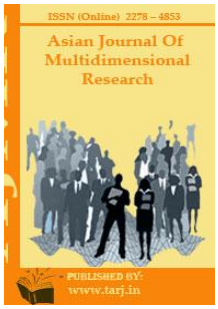

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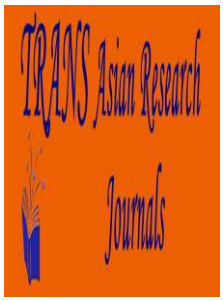

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AN ANALYSIS OF MANAGEMENT INFORMATION SYSTEM

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ABSTRACT:

Management Information Systems (MIS) play a crucial role in the effective functioning of organizations in today's rapidly evolving business landscape. This study provides an overview of the concept of Management Information Systems, its key components, and its significance in modern organizations. Management Information Systems encompass a set of technologies, processes, and strategies designed to facilitate the collection, storage, retrieval, and analysis of information for decision-making and operational purposes. These systems integrate various aspects of an organization, including people, technology, data, and processes, to enable efficient and effective management at all levels.Management information system is referred to as MIS. Reports produced by these systems are used by business managers at all levels of a company, from assistant managers to executives, to assess daily operations or issues that may occur, make choices, and monitor progress.

KEYWORDS: *Artificial Intelligence (Ai), Big Data, Business Intelligence, Cloud Computing, Cybersecurity, Decision Support Systems.*

INTRODUCTION

It describes the management and support of managerial choices inside an organization via the processing of information using computers and other intelligent technologies. The study of people, technology, organizations, and their interactions is known as management information systems. MIS specialists assist businesses in getting the most out of their investments in people, technology, and operational procedures. MIS is a people-focused industry with a focus on providing services using technology. A degree in MIS could be right for you if you're interested in technology and want to utilize it to make people's lives bettera computerized system created to provide management updates on the project's status and development in order to help them make decisions.

The term "management information system," sometimes known as "MIS," is made from of the phrases "management," "information," and "systems." It is simple to describe management information systems as systems that offer management with information by looking at these three terms. That one sentence summarizes up what a management information system is and what it should accomplish in general. Its importance and influence on the efficient functioning of a business, however, cannot be overstated. Every successful business uses these systems in some capacity because of this[1]–[3]. Because these systems operate with people, organizations,

technology, and connections between the people and organizations influencing the firm, they are crucial to the day-to-day operations of businesses.

MIS Relevance:

A formal way of gathering information in summary form is the management information system. It is a network set up inside a company to provide management information. It gives managers at all levels the organized and analytical information they need. It enables managers to make the best choice at the appropriate moment. As an example of MIS importance, consider;

1. Management information systems are constantly management-oriented, keep an eye on all management levels, and gather the required data.
2. Integrated describes how several components are truly connected to one another. For instance, a connection between several organizational departments.
3. Helpful for planning - Since every firm creates long- and short-term goals, management may easily plan with the aid of facts like sales & production, capital investments, stocks, etc.
4. An efficient management information system enables the management to keep things under control by letting them know when actual performance deviates from predetermined objectives.
5. It's crucial for boosting productivity.

Utilize all of the capabilities of your company's information system to get the most out of it. By processing data from corporate inputs to provide information that is valuable for managing your operations, information systems become important. You may either add additional data to make the information more accurate or utilize the information in innovative ways to boost the usefulness of the information system. Software systems are only one component of management information systems, which also encompass all business procedures and tools used to compile data from tactical or functional systems. The information is then provided in a timely and user-friendly way so that mid-level and upper-level managers may utilize it to make the best decisions. The whole system is set up to help the business achieve its strategic and tactical objectives.

The success of management in the current day is greatly dependent on information. Nothing happens without knowledge, and it is usually accepted that whomever has information also possesses power. It is a crucial resource required for the creation of other resources. At many management levels, appropriate information transmission is now necessary due to changing conditions and settings. A contemporary phenomenon is the creation and use of information management systems, which focus on the utilization of pertinent data to improve planning, decision-making, and outcomes. It's important to comprehend and value certain essential ideas before talking about this subject. The information idea, information management concept, information system concept, and management information concept are a few examples. Before the significance of MIS can be properly understood, these ideas must be thoroughly understood.

This article will try to investigate these ideas and connect them to organizational structures and procedures. The various levels of management as well as management functions will be

emphasized. Finally, an effort will be made to link those organizational functions and levels to the MIS. This strategy will aid in illustrating the value and impact of MIS in management. Information has a more nuanced and challenging meaning in the context of organizations than the typical use of this term would imply. Without a doubt, every civilization is an information society, and every company is an information company. Information is a fundamental resource, much like raw resources, cash, and human labor. Information, which often takes the form of letters and reports, may be seen as a commodity or as an studyidea.In essence, knowledge has therefore evolved into a crucial resource, much like energy, which is essential to the wellness of people and organizations in the contemporary world.

Technology is transforming how information is gathered, processed, stored, shared, and utilized, much like how energy and politics are evolving. Information should thus be effectively managed, just like any other resource in a business, to guarantee cost-effective utilization. It is a key component of effective management and, if handled well, should rank among the organization's human, material, and financial resources in significance. It is becoming more widely acknowledged in an organizational environment as a resource apart from the technologies used to manipulate it. This knowledge implies the additional understanding that information is the unifying factor that keeps an organization together. Information is a unique commodity, unlike the majority of tangible or consumer durable products. Since it is immaterial, enforcing custody is often difficult. For this straightforward explanation, it's often essential to emphasize the noteworthy distinctions between this resource and others while creating a management framework. You can identify its content either by the source or the form. Non-numeric data might be organized or unorganized. Internal information is that which is produced inside a company and, in most cases, is only valuable to and interesting to decision-makers within that company. It is possible to think of external information as that which was produced by someone else, i.e., outside the organization's walls, often by publishers in the form of books or journals, or by governments, external connections, and the like. Information experts define information in a surprising variety of ways. They were unable to come up with a definition that was accepted by everybody.

The meaning that a human conveys via, or extrapolates from, representations of facts and ideas using the accepted standards of the representations utilized is what Zorkoczy refers to as information. This term also incorporates the equally illusive and studyconcept of "meaning." Information is described by Stonecash as "simply symbols that convey meaning through their relative ordering, timing, shape, context, etc.... information is the raw material for decision-making for generating knowledge and powering the modern organization." Depending on whose side of the information profession a person belongs to, the idea of information has always had a variety of meanings to different information professionals. Elliss correctly points out that "the data processing manager might conceive it in terms of data, the records manager in terms of records and reports, the librarian or information scientist in terms of documents or other materials". Three main information universes that have historically been partitioned and separated are as follows. The first is the realm of libraries and archives in literature, where data has been preserved. The second is the world of records and information centers, where knowledge has been gathered and arranged but maybe not as thoroughly analyzed as in the world of literature.

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The data world of computers, telecommunications, and automated information systems is the third information domain, where information is often numerical or organized. The two defining factors "time frame" and "storage medium" separate the three groups. knowledge specialists can no longer argue that they are ignorant of general knowledge. "Records, words, data whatever you call it, it's still information" sums up the idea of a general commonality in terms of roles and views of information. In fact, Getz suggested coalescence as an inevitable outcome because of the recent rise in the generalization of the idea of information, the continuous development of computer-based information systems, and the merging of previously discrete information systems. He views the manager of an organization created as a consequence of the coalescence as a generalist with a strong grasp of technology but a greater awareness of the demands and circumstances of the business world.

He does have a predisposition in favor of management information system managers, however. Since he comes to the conclusion that either the MIS manager will take the initiative to lead this merger of the firm's data resources activities and make some sense of their management, or a manager outside of the MIS organization will do it for him, he believes they are the right professionals to play the role of information managers in the organization. The use of the word "information management" as a way to describe the activity or job position formed by any such coalescence in an organization may be best understood in the context of this coalescence. Information generated for decision-making is known as management information. It might be organized or unorganized.

Information management has been described as the ability of the entire organization to produce, maintain, retrieve, and immediately make the appropriate information available for use in decision-making in the best media at the lowest possible cost. In a similar vein, Best characterizes information management as the economical, efficient, and effective coordination of the generation, supervision, archiving, retrieval, and distribution of information from both internal and external sources in order to enhance organizational performance. This definition is limited in scope in that it does not address how to manage the properties of information itself, regardless of the media used for storage, the tools used to analyze it, or the system that uses it. Therefore, managing information in a company utilizing current information technology is the primary concern with information management.

DISCUSSION

The urge for computer aid in addressing more complicated issues, problems that were previously thought to only be within the purview of man's intuitive and judgmental processes, especially in organizations, is growing as a result of the fast advancement of computer technology. Organizations that are forward-thinking and dynamic are getting more and more interested in information systems. It is essential to design processes for the construction, administration, and use of databases in companies due to the necessity for accessible, rapid, and affordable access. Management information and information systems, in particular those that are connected to an organization's efficient decision-making processes, or MIS, are seen as important organizational resources. A system for receiving data or information as a raw material and producing information as a product via one or more transmutation processes is known as an information

system. The following functional components are included in it and relate to the organization and its environments[4]–[6]:

Perception is the initial entry of data into an organization, whether it was generated or captured; recording is the actual physical capture of data; processing is the transformation of the data according to the "specific" needs of the organization; transmission is the flow of information within an information system; storage is the assumption of some anticipated future use; retrieval is the search for recorded data; and presentation is reporting and communication. And except inasmuch as the information system makes decisions that pertain to itself, the inclusion of decision-making is problematic. Although some may have a valid point in objecting to the inclusion of the last point, it must be noted that there are relationships between information system processes and decision-making that are close enough to call into question whether decision-making should be included in the information function elements that are specifically created for an organization. Regardless of how one views an information system, it is often anticipated to provide not just a confrontation between the user and information but also the interaction necessary for pertinent and timely decision-making. Its primary objective is to provide consumers' informational demands.

Information systems are approached in an organizational context, demonstrating that they are a "living and open" subsystem inside an organizational system. Information systems have been characterized in a variety of ways by academics interested in information work and information practitioners, but they all share the same fundamental concepts of people, information technology, and processes that facilitate the development, use, and transfer of information. Information practitioners need to comprehend the fundamental ideas that underlie information systems, even if they are thought of as part of an applied field. A group of individuals, processes, a data base, hardware, and software that gathers, processes, stores, and communicates data for operational level transaction processing and information to support management decision making are considered to make up an adequate definition of information systems by Duff and Assad.

It is possible to infer from the above definition that: an information system can be manual or computer-based; information systems have existed in organizations and always will; information systems are intended to support both the management and core operations of an organization; and a distinction appears to be made between data for transaction processing purposes and information for other purposes. The aforementioned characteristics might be regarded as important characteristics or crucial components when creating an information system idea for an organizational setting. Information retrieval system, question-answering system, database system, management information system, and decision support system are some of the most important computer-based information systems that Salton emphasized in order to better grasp the information system idea. The management information system is the main topic of this article. Thus, it is important to underline that MIS is a component of information systems.

The creation of MIS is a method that businesses may use to make use of computer power. There is no one definition of MIS that is recognized worldwide, and those that do reflect the focus and maybe the preconceptions of their creators. The phrase "management information system" might, however, be understood as a database management system developed specifically to meet the demands of managers or other decision-makers in an organization. MIS is a system that uses

formalized procedures to give management at all levels in all functions the pertinent information they need based on data from both internal and external sources so they can decide on time and effectively how to plan, direct, and control the activities for which they are accountable. The focus in the definition above is on the applications of the information, as can be seen. The key components of "management" are planning, leading, and controlling.

In essence, the main purpose of MIS is to transform data into information and provide that information to the user. It should be mentioned that MIS exist in organizations to assist them in achieving goals, planning and controlling their operations, coping with uncertainty, and adjusting to change or even instigating change. The last question that one may pose is: What management tasks does MIS support, and what are the different decision levels at which management information can be applied? The significance of MIS in management may be understood by a detailed response to this question. However, it is essential that we explore organizational procedures and structures before we look at managerial roles.

Processes and structures in organizations

It is important to note at this point that the information system's operations take place within the confines of the organizational structure and that the MIS aims to support those goals. Information professionals should thus have a good understanding of what organizations are, their structures, and the elements that affect their techniques and operations. Although there isn't a single description of what an organization is, Kempner's is certainly an intriguing one. According to him, an organization is a pattern of interactions between many individuals carrying out a variety of complicated duties and relating to one another in order to define and achieve mutually beneficial goals. The organizational chart, as well as official norms and processes, serve as representations of the formal organization, while the social interactions, interpersonal connections, and any unconventional methods of carrying out business reflect the informal organization. Because people have a way of changing standardized, official procedures"cutting through the red tape" and "beating the bureaucracy" are common phrases used to describe this processand because the relationships depicted in formal organizational charts are not always the key relationships, the development of effective MIS is dependent on recognition of the organization within an organization. The varied impacts on organizational design should consequently be understood by information system designers.

Levels and roles of management

It is important to remember that the value of any information comes from the decisions made by management as a consequence of utilising it. It follows that in order to provide useful and relevant information, information professionals need to be aware of the kinds of activities and responsibilities management must carry out. Planning, decision-making, organization and coordination, leadership and motivation, and control are the five categories into which the managerial tasks may be divided. It goes without saying that the focus placed on each area differs from manager to manager and is particularly influenced by the manager's position within the business. A manager at the operational or transactional level, like a transport supervisor, will have quite different information needs than a manager at the tactical level, like a sales or accounts manager, or at the strategic level, like a managing director or board of directors.

Structured, formal MIS may even be counterproductive at the top levels, when informal MIS and external influences are more significant.

The level of functional authority a manager has inside an organization also influences the duties he or she must complete and, therefore, the information that manager needs to do those responsibilities. Specialists, managers, and employees in the different divisions and components of the business exert functional authority. The personnel department, which is functionally responsible for several personnel and labor relations operations across the board of the whole business, may be the most typical illustration of this. Even though each of the five functional domains that make up management need pertinent information, the organization's MIS is heavily reliant on three in particular: planning, decision making, and control[7]–[10].

The nature of planning and decision-making, as well as the methods that are accessible. The main management activities of planning and decision-making, while clearly the types of planning and decision-making will differ across levels, are duties that occur at every level of management. Making decisions on what has to be done and how are called planning. Plans, which are predefined courses of action reflecting organizational goals, are produced through the planning process and are then put into effect by choices and deeds. Effective planning and decision-making are thus inseparably connected since without choices and implementation, planning is a pointless activity. The sorts of choices made at the different levels of the company must be understood by MIS designers in order to give the right information. H.A. Simon's distinction between programmed and non-programmed decision making is an important one. choices that are regular, repeatable, and for which the decision-making rules are known are called programmed choices. The nature of the issue and the decision rules are complicated and poorly understood in contrast with non-programmed choices, which are innovative and unstructured. These succinct explanations lead to the conclusion that drastically different data and processes are needed for the various decision kinds, which has clear implications for MIS design.

Changes in decision-making practices are necessary for information to be valuable, and as a consequence, MIS must have a decision emphasis. This implies that MIS must be developed with consideration for the different decision-making processes, decision-making styles, relationships between decision-makers and the organization, organizational nature, organizational environment, and other factors. Effective MIS design is mostly dependent on managers and information professionals accepting and comprehending this approach.

CONCLUSION

In conclusion, Modern enterprises need the use of management information systems. Effective decision-making, strategic planning, and operational management are built on top of them. An organization's efficiency, productivity, and competitive edge may be dramatically increased with the correct mix of technology, procedures, and people resources (or MIS). But maintaining and executing a productive management information system might be difficult. Organizations must safeguard data privacy, security, and accuracy while taking the rapidly changing technology world into account. Additionally, MIS needs qualified employees who can run the system, keep it up to date, and understand and analyze the data it produces.

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THE IMPORTANCE OF MIS TO MANAGEMENT

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ABSTRACT:

Management Information Systems (MIS) have become indispensable tools for effective decision-making and strategic management in organizations. The importance of MIS to management by discussing its role in providing accurate and timely information, facilitating data-driven decision-making, improving operational efficiency, and enabling effective resource allocation.Management Information Systems serve as a vital source of information for managers at all levels of an organization. By integrating data from various sources and transforming it into meaningful information, MIS provides managers with accurate and up-to-date insights into the organization's performance, operations, and market trends. This information enables managers to make informed decisions based on facts and figures rather than relying on intuition or guesswork.

KEYWORDS: *Performance Measurement, Quality Control, Risk Management, System Integration, User Interface, Virtualization, Workflow Automation.*

INTRODUCTION

Except for the smallest businesses, management seldom ever gets to personally witness operations. They make an effort to use information from both formal sources, such as the organization's MIS, and informal sources, such as face-to-face interactions, phone calls, social connections, and so on, in order to make choices, establish plans, and manage operations. An integrated user-machine system that provides information to assist operations, management, and decision-making tasks in an organization is often thought of as a management information system. In actuality, a MIS is a unique system helpful for administration inside a business. When it comes to getting accurate, high-quality information from its source to its consumers, MIS is a quick and accessible conveyor belt. Therefore, a thoroughly planned, developed, and implemented database serves as the brain of an efficient MIS. Its level relates to judgments that are adaptive. In practice, MIS has the following characteristics: an information focus, created for managers in an organization; structured information flow; integration of data processing tasks by business function, such as production of MIS, personnel MIS, and so on; and inquiry and report generation, typically with a database[1]–[3].

Over time, the MIS era has added a new level of necessary management information. There has been a lot of work creating methods and software for data management as a result of the growing interest in MIS. It should be highlighted, nevertheless, that the current emphasis in MIS is on the

applications that are made of the information rather than how it is processed. The management of information as a resource is prioritized above intermediate processing, which is crucial. The pace of change is quickening, and the environment is becoming more complicated.Managers want relevant information, which is data that deepens their understanding and lessens ambiguity. As a result, the manager may use it for what it was designed for. No management can do their job efficiently without pertinent information. To the well-known adage, "Management get things done through people," it would be a useful addition to say that management get things done via people by employing pertinent data gathered from MIS. The claim that MIS is the backbone of management is not hyperbole. Let's examine the effects that management information systems may have in two distinct contexts: an organization and a library.

The internal performance of an organization's resources has a significant impact on its ability to execute effectively. The following examples from the management information system's human resource component should be sufficient to show how it is used to track the performance of resources. The output performance of an organization is closely correlated with the commitment and effectiveness of its human resources. A high staff turnover rate that is tracked by the management information system and recognized as happening in a certain department or in a specific group of employees may be a sign that the employer is not performing as expected. Additionally, a high turnover rate among administrative employees may be a sign that management policies do not provide chances for training, personal growth, or career advancement. Corrective actions may be implemented after identifying instances of subpar human resource management, which will enhance the organization's output performance.

MIS serves as the glue that holds the many organizational components of a library together and with the goal of serving its patrons in a library environment. It offers the information required for model information, validation, and implementation as well as for a library's everyday activities. Ideally, it offers data on the efficiency of library operations and services, on the populations of users and non-users, on interactions between libraries and users, and on other pertinent topics. As a result, the function of MIS in the library is similar to that of MIS in other organizations. It especially assists in the production of data that will allow library management to have an overview of their performance and to activate machinery for better and more effective user services when appropriate.

DISCUSSION

Problems with MIS

There is a ton of data from multiple polls performed in industrialized nations, especially in the UK and the USA that current MIS, often employing cutting-edge computer technology, have had very little success in giving management the information it needs. Following are some of the causes that were found:

1. Absence of management engagement in the MIS's design.
2. Computer system's narrow or unsuitable concentration.
3. Excessive focus on low-level data processing applications, especially in the field of accounting.

4. Information experts' inadequate understanding of management's actual information needs and organizational issues.
5. Lack of backing from upper management.

An MIS must be created and run in a way that takes organizational, behavioral, and technological considerations into account. In order to produce more efficient MIS, management must be well-informed enough to contribute effectively to system design, and information professionals must become more cognizant of managerial roles and demands. Information professionals often lack the management knowledge necessary to create relevant information for the managers they support since management does not always know what information they need. Developing relevant and useful information systems would be made much easier with improved communication between management and information professionals and a greater understanding of MIS concepts by both groups. However, it should be highlighted that there isn't a straightforward set of prerequisites that, when fulfilled, would result in the ideal MIS. In order for the design, implementation, and operation of the MIS to be the product of educated judgments and judgement rather than random creation without consideration for actual organizational needs, it is necessary to be aware of and comprehend important concepts and functions.

The computer is not absolutely necessary, but it may be quite beneficial, thus the answer to this question is no. The study of MIS focuses on the supply and use of information that is pertinent to the user, not the usage of computers. Computers and IT play a significant and expanding role in MIS, but care must be taken while using the technology. Computers excel in quick computations, manipulation, storage, and retrieval but struggle with unforeseen demands, qualitative analysis, and situations that call for true judgment. While it is true that computers may be utilized most effectively for information processing, efforts have been made to explore MIS, its issues, and its significance in an organizational environment. MIS is the lifeblood of every company, one might say. Prior to making judgments, the public and private sectors must be dedicated to finding out formal or structured information. Through computer simulations and gaming methodologies, management issues will get detailed solutions. Managers of today must exercise caution because they risk being provided with studyinformation that is just tangentially relevant rather than real data that is genuinely helpful. If a strong and effective MIS unit is established, this issue may be avoided.

Nature and Scope of MIS:

The idea behind management information systems (MIS) is interdisciplinary in nature, which means it has taken ideas from many different fields like accounting, computers, organizations, management, operations research, and behavioral sciences, among others. MIS is neither a pure science nor an art; it is instead acknowledged as a combination of both. Information systems are logical systems that are focused on Information system (MIS) really includes both physical and information systems. Physical system, on the other hand, is the process itself and is concerned with the content or "what" is happening. The question of whether MIS is more management- or computer-oriented has generated a lot of discussion. MIS should be seen more as a management topic than a computer subject, despite the fact that both sides have their supporters. This is due to

the obvious fact that computers are only tools in the hands of managers. Computers are used because of their precision, speed, and ability to process enormous amounts of data. Today, MIS is used at all levels and in all functional areas of all business enterprises. MIS is designed to meet the information demands of managers in an organization, therefore both structured and unstructured types of information that may be acquired from both internal and external sources of the company are under its purview. Additionally, the reach of MIS has grown significantly with the development of communication technologies[4]–[6].

MIS organization:

By taking a closer look at the actual parts of the information system used by a business, the structure of MIS may be understood. An organizational information system's physical component might include hardware, software, databases, manual processes, and operational personnel. The following sentences provide a succinct summary of these elements:

Hardware

Hardware describes the actual physical data processing tools and auxiliary devices, such as the computer's CPU, monitor, keyboard, printer, disks, tapes, and other peripherals.

Software

The word "software" refers broadly to the set of instructions or programs that govern how hardware operates. System software and application software are the two main categories of software.

Database

All of the information used by application software is included in the database. Files are where data is kept. Physical components also include formal operating procedures, such as manuals, that are necessary to run a system. Information systems are operated by personnel such as computer operators, computer programmers, system analysts, system managers, etc. The information system's physical inputs and outputs, which take the shape of printouts, reports, etc.

MIS - Information Classification:

Various categories may be used to classify information:

According to Characteristic

According to Anthony's taxonomy of management, there are three main categories for information utilized in corporate decision-making:

Strategic Information: Strategic information is concerned with long-term policy choices that outline a company's goals and assess their degree of achievement. Strategic information includes things like buying a new facility, a new product, diversifying your firm, etc. Information required to exercise control over corporate resources, such as budgeting, quality assurance, service levels, inventory levels, productivity levels, etc., is referred to as tactical information.

Operational Information: Operational information refers to information at the plant or company level and is utilized to guarantee the correct execution of certain operational duties as

intended or planned. This category includes various operator-specific, machine-specific, and shift-specific tasks for quality control inspections.

Application-Based Classification

Information uses may be grouped into many categories, including:

Planning Data: These are the data required to develop uniform standards and requirements inside an organization. Any activity's strategic, tactical, and operational planning makes use of this information. Examples of this data include design and timing criteria.

Control Information: Using a feedback system, this information is required to establish control over all company actions. This data is used to manage the type, usage, and accomplishment of critical system processes. When this information shows a departure from the accepted norms, the system should provide a choice or an action that leads to control. Information about information is what is referred to as knowledge. Knowledge information is gathered through historical material and research studies and is gained via experience and learning.

Organizational information: Organizational information examines the setting and culture of an organization in the context of its goals. According to Karl Weick's Organizational Information Theory, by carefully gathering, controlling, and using this information, an organization may lessen its ambiguity or uncertainty. Every employee in the company uses this information, which includes payroll and personnel information.

Information that is functional or operational: This data relates to a certain operation. For instance, daily schedules at a manufacturing facility that refer to the precise allotment of tasks to workers or equipment. The duty schedule of different employees would be it in a service-oriented firm. Most of this data is kept within the company.

Database information: Database information refers to vast amounts of data that may be used in a variety of ways. Databases are created by storing, retrieving, and managing this information. Information about suppliers or material specifications, for instance, is saved for many users. Varied circumstances lend varied interpretations to the idea that information is the message. As a result, the ideas of constraint, communication, control, data, shape, education, knowledge, meaning, and understanding, as well as mental stimulus, pattern, perception, representation, and entropy are all tightly tied to the idea of information.

Different Information System Types:

1. System for Transaction Processing
2. System for Management Information (MIS)
3. System for Decision Support (DSS)
4. System for Executive Support (ESS)
5. Office Automation System, or OAS

TPS are used largely for applications involving structured operational and, to a lesser extent, managerial control. Applications for semi-structured management control employ MIS.

Additionally, there are overlaps between operational and strategic planning. When making unstructured decisions, whether at the operational, managerial, or strategic planning levels, DSS are predominantly employed. Applications involving organized management and strategic planning are the main uses of ESS. Underlying all of this activity is the employment of OAS as a communication and office correspondence facilitator. Organizations often have three levels: operational, intermediate, and higher. Users at each level have different information needs. To that goal, each level of an organization is supported by a variety of information systems. At this level, users utilize organized decision-making. This indicates that they have set out norms that serve as a guide for their decision-making. For instance, if a shop sells goods on credit and has a credit policy with a defined borrowing cap. Based only on the most recent credit data obtained from the system, the salesperson may determine whether or not to provide credit to a client.

Level of Tactical Management

The majority of people working at this organizational level are middle-level managers, department heads, supervisors, etc. Typically, users at this level supervise users at the operational management level in their daily tasks. Decisions are made semi-structuredly by tactical users. The choices are based in part on predetermined standards and subjective judgments. For instance, a tactical manager may decide to create an exception and boost the credit limit for a certain client after reviewing the customer's credit limit and payment history. The choice is somewhat predetermined in that the tactical manager must utilize the available data to determine a payment history that is advantageous to the business and an acceptable rise percentage[7]–[10].

Level of Strategic Management

The highest position in an organization is this one. At this level, users make ad hoc judgments. Senior level managers are concerned with the organization's long-term strategy. When making unstructured judgments, they are guided by data from tactical managers and the outside world.

System for Processing Transactions

Systems for processing transactions are used by organizations to keep track of daily business activities. Users at the operational management level utilize them. A transaction processing system's primary goal is to provide routine answers to issues such;

1. How are printers now sold?
2. How much stock do we currently have?
3. What balance is owed for John Doe?

The TPS system quickly responds to the queries above by keeping track of daily company transactions. Operational managers make repetitive, highly organized choices. The transaction processing system generates very comprehensive information. Banks that provide loans, for instance, demand that a person's employer have a memorandum of agreement with the bank. The only thing the operational staff has to do when a borrower whose employer has an MoU with the bank applies for a loan is to check the given documentation. The papers for the loan application are processed if they satisfy the standards. The customer is recommended to meet with tactical

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management officials to discuss the potential of signing an MoU if they do not satisfy the standards.

1. Systems that handle transactions include.
2. Systems at points of sale track daily sales.
3. Payroll systems: managing loans, processing employee salaries, etc.
4. Systems for stock control and monitoring inventory levels.
5. Flight booking management systems for airlines.
6. Administration Information System.

Tactical managers employ management information systems to keep track of the organization's present performance level. A management information system receives its input from a transaction processing system's output. The tactical managers utilize the reports that the MIS system generates to monitor, regulate, and forecast future performance by routinely analyzing the data using algorithms that aggregate, compare, and summarize the findings. For instance, data from a point-of-sale system may be utilized to examine patterns in the sales of both successful and unsuccessful items. Future inventory orders may be made using this information, increasing orders for goods that are doing well and decreasing orders for those that are not performing well.

CONCLUSION

In conclusion, it is impossible to exaggerate the value of management information systems. MIS improves operational efficiency, supports data-driven decision-making, equips managers with accurate and timely information, and permits efficient resource allocation. Organizations that successfully use MIS have a strategic edge in a competitive business environment because they can react rapidly, make wise choices, and optimize their operations to be successful. A key component of management is the efficient allocation of resources, and MIS is crucial in this process. MIS assists managers in resource allocation and operational efficiency optimization by offering insights into resource use, demand trends, and cost analyses. MIS gives managers the data they need to make educated choices and optimum resource use, whether it is for managing inventories, allocating budgetary resources, or planning human resource needs.

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AN OVERVIEW ON DECISION SUPPORT SYSTEM

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ABSTRACT:

Decision Support Systems (DSS) have emerged as valuable tools to aid decision-making processes in complex and dynamic organizational environments. This studyprovides an overview of Decision Support Systems, their key components, and their significance in supporting decision-making at various levels within organizations.Decision Support Systems are computer-based information systems designed to assist decision-makers in solving complex problems and making informed decisions. These systems combine data, analytical models, and user-friendly interfaces to provide decision-makers with relevant information and insights, helping them evaluate alternative courses of action and understand the potential outcomes.Bank loan management systems are used to assess the borrower's creditworthiness and forecast the possibility that the loan will be repaid. Senior management uses decision support tools to make complex choices. Both internal and external systems provide input to decision support systems.

KEYWORDS: *Algorithm, Artificial Intelligence (AI), Business Intelligence, Data Mining, Data Visualization, Decision Analysis, Expert Systems.*

INTRODUCTION

Systems for financial planning provide managers the ability to assess different strategies for reaching objectives. Finding the best method to accomplish the goal is the aim. For instance, the formula Total Sales minus is used to determine a company's net profit. Senior executives will be able to make adjustments to the values for total sales, cost of products, etc. using a financial planning system to examine the impact of decisions on net profit and choose the best course of action[1]–[3]. Decision support systems are very interactive and employ complex mathematical models and statistical approaches to deliver answers. Decision support systems' primary goal is to provide unique, ever-changing challenges with answers. Decision support systems provide answers to problems like:

1. How would doubling the factory's output lot affect workers' performance?
2. How will a new rival entering the market affect our sales?

Strategies for artificial intelligence in the workplace

To find patterns in massive amounts of data, artificial intelligence systems imitate human skill. Artificial intelligence algorithms are used by organizations like Amazon, Facebook, Google, and others to find the data that is most relevant to you. Facebook often predicts individuals who you

may know or attended school with extremely well. They create predictions about potential acquaintances based on the information you and your friends provide them about each other. Amazon also makes recommendations for things you should purchase based on the services you are now receiving using artificial intelligence algorithms. In addition, Google makes use of artificial intelligence to provide you with the most relevant search results depending on your location and your activities with Google.Because they can provide their clients value, these strategies have substantially aided in the development of these businesses.

Online Analytical Processing

Online analytical processing is used to query, evaluate, and create information that may be displayed in many ways utilizing numerous dimensions from multi-dimensional data. Consider a business that offers laptops, desktop computers, and mobile devices. They have A, B, C, and D as their four branches. OLAP may be used to compare actual sales to expected sales by displaying the total sales of each product across all regions. Each piece of data, such as the product, sales volume, and sales value, represents a unique dimension. Regardless of the scale of the datasets being utilized, the basic goal of OLAP systems is to respond to ad hoc queries as quickly as feasible.

Systems of Information for Competitive Advantage

There are eight ways to gain a competitive advantage, according to Management Information Systems by Effy Oz: cutting costs, increasing barriers to market entry, establishing high switching costs, developing new products or services, differentiating products or services, enhancing products or services, and forming alliances. Locking in suppliers or customers Competitive advantage is attained when one specific company performs more effectively and/or efficiently than the others in the same category in any industry or business endeavor. This competitive advantage need not apply to the whole industry; it may just apply to certain subsets. When a company does any one task, procedure, function, etc. more effectively and/or efficiently than its competitors in that industry sector, or in certain circumstances the whole industry, it has earned a competitive advantage.

To the authors' knowledge, W.R. V. Grove, King, and E.H. Information technology, according to Hufnagel, is employed strategically by businesses to boost their competitive edge at a time when uncertainty is on the rise. The notion that information technology may enhance, facilitate, and improve company performance by helping to optimize corporate resources. Numerous empirical research, recognized and supported this theory. The authors Rackoff, Wiseman, and Ullrich have identified a number of elements that guarantee computerization of firms' competitive advantages. As follows:

1. Modification, differentiation, or adjustments that either strengthen market rivalry and diminish competitive advantages while making the firm stand out with its goods and services;
2. Decreasing consumer expenditure, raising competition costs, and modifying and adapting supplier costs;

3. A firm introducing cutting-edge goods or services that alter how business is conducted in the sector;
4. Enhancing growth and development via volume expansion, regional expansion, and harmony with suppliers and clients;
5. Numerous marketing deals, mergers, and alliances in many forms.

Since the business environment is ever-changing and developing, companies themselves also change often, and as they expand and develop, different firms will have different information demands. A computer system must simultaneously support development, growth, and change. According to the authors' conclusions, which have already been reported, companies invest in computer technology because they think it will make them more competitive. Other writers Urwiller and Florick made the observation that improvements in information technology, which are now an essential component of organizational strategy and planning processes, are the first need to establish competitive differentiation as a consequence of computerization. Information technology is not only feasible, but also a simplified organization and a means of gaining an advantage over competitors. Information technology is used in business operations to establish competitive differentiation, which leads to a new method of doing business and the electronic delivery of goods and services. As a result, information technology is essential to supporting the company by generating competitive advantage and providing services and goods that consumers value more than those of the competitors. Operational excellence, significant business branch activities, organizational change, and decision-making are all made possible by this technology. How does information technology enable operational perfection? How can we achieve operational perfection utilizing internal transaction processing systems that use customer self-service?

DISCUSSION

Information Systems Applications in Business

Any software or collection of computer programs used by business users to carry out different business operations is referred to as business software or a business application. These business programs are used to boost efficiency, gauge productivity, and carry out other essential company operations precisely. Technology has a significant impact on how businesses operate. Regardless of the size of your business, technology delivers both concrete and studyadvantages that can help you generate revenue and deliver the outcomes your consumers want. Technology infrastructure has an impact on a company's culture, productivity, and relationships. Office software packages, for instance, may comprise tools for word processing, spreadsheets, databases, presentations, and email. Applications for producing and modifying pictures are included in graphics suites like Adobe Creative Suite, whereas Sony Audio Master Suite is used for audio creation, etc[4]–[6].

E-Commerce:

E-commerce, often known as electronic commerce, is a contemporary business practice that caters to the needs of corporate enterprises. It is generally understood to refer to the process of purchasing or selling products or services through an electronic network, such the Internet. E-commerce, also known as electronic commerce, is a contemporary business practice that aims to

meet the needs of companies, suppliers, and clients by lowering costs, enhancing product quality, and accelerating delivery times. The following methods of electronic commercial information sharing are referred to as "ecommerce":

1. Digital Data Exchange
2. Digital Mail
3. Bulletin boards online
4. Digital Funds Transfer
5. Additional network-based innovations
6. Specifications of e-commerce

E-commerce makes it possible to make non-cash payments via credit cards, debit cards, smart cards, electronic money transfers through bank websites, and other systems. Service availability is available around-the-clock because to e-commerce, which automates how businesses operate and how they serve their clients. It is accessible everywhere and at any time. E-commerce broadens the audience for company advertisements that promote their goods and services. It aids in better product/service marketing management. Increased Sales Without the need for human participation, orders for the items may be created anytime, anywhere, via e-commerce. It significantly increases current sales volumes.

1. **Support:** To better serve consumers, e-commerce offers a number of options to provide pre- and post-sale help.
2. **Inventory Management:** Inventory management is automated by e-commerce. When necessary, reports are immediately created. Management of the product inventory becomes incredibly effective and simple to maintain.
3. E-commerce offers methods for more rapid, effective, and dependable connection with consumers and partners.

According to the B2B business model, a website sells its goods to an intermediary buyer who then distributes them to the ultimate consumer. For instance, a wholesaler may purchase a product from a company's website and, after getting the consignment, sell it to the ultimate consumer who visits one of the company's retail locations.

From business to consumer

The B2C business concept involves selling goods directly to customers via websites. The items are accessible to customers through the website. The client may choose a product and order it. The business organization will then ship the product(s) to the consumer after receiving a notice from the website through email.

Customer to Customer

By placing their information on the internet, users of a C2C business model website may sell or rent out their assets, such as homes, automobiles, motorbikes, etc. The customer may or may not

be charged for the website's services. By reading the message or advertising on the internet, another buyer may decide to purchase the product from the first client.

From Consumer to Business

In this paradigm, a customer goes to a website that lists many commercial entities offering a certain service. The customer enters an approximate price for the service they wish to purchase. As an example, consider comparing the interest rates of personal loans and auto loans offered online by several institutions. A company contacts the client and offers its services after meeting the consumer's needs within the allotted budget.

Enterprise to Government

A subset of the B2B model is the B2G model. Governments utilize these websites to trade and share information with other commercial companies. These websites provide a platform for companies to submit government application forms and are recognized by the government. Governments contact businesses using websites that follow the B2G paradigm. These websites allow users to submit applications and participate in auctions. Governments reach citizens generally by using G2C model websites. Such websites facilitate the sale of any kind of commodities, including automobiles and machines. A similar website offers other services including the ability to register birth, marriage, or death certificates. G2C websites' primary goal is to shorten the typical turnaround time for responding to public requests for different government services. Three main categories may be used to categorize the benefits of e-commerce:

1. Benefits for Organizations.
2. Benefits for Consumers.
3. Benefits to Society.
4. Benefits for Organizations.

Organizations may use e-commerce to grow their business to domestic and worldwide markets with a little financial outlay. A company may simply find additional clients, the greatest suppliers, and reliable business partners all around the world.By digitizing the information, e-commerce enables businesses to lower the cost of producing, distributing, retrieving, and managing paper-based information.

1. E-commerce helps the company's brand image.
2. E-commerce enables businesses to provide superior client services.
3. E-commerce facilitates the streamlining, acceleration, and efficiency of business operations.
4. Paperwork is reduced through e-commerce.

Organizational productivity is raised through e-commerce. It facilitates supply management of the "pull" kind. With "pull" supply management, a business procedure begins when a client request is received and just-in-time production is used. It offers help around-the-clock. Customers may make inquiries about a product or service and place orders from any location at

any time. E-commerce applications provide customers greater alternatives and faster product delivery. Users of e-commerce applications have additional possibilities to compare and choose the more affordable and superior solutions. Before making a final purchase, a consumer may post review remarks about a product, examine what others are purchasing, or read the review comments of other customers. Virtual auction alternatives are available via e-commerce. It offers information that is easily accessible. Instead,then having to wait days or weeks, a consumer may see the pertinent comprehensive information immediately. Due to increased rivalry brought on by e-commerce, businesses often offer significant discounts to consumers.

Benefits to Society

Customers don't have to go far to purchase a product, resulting in reduced vehicle traffic and less air pollution. E-commerce aids in product cost reduction, enabling purchase by those with fewer means. Rural communities may now access services and goods that would otherwise be unavailable to them thanks to e-commerce. E-commerce enables the government to provide public services including healthcare, education, and social services more effectively and at lower cost. Two main categories may be used to categorize the drawbacks of e-commerce:

1. Technical drawbacks
2. Negative non-technical effects

Technical Drawbacks

Lack of system security, dependability, or standards may result from a subpar e-commerce implementation. The field of software development is still developing and changing quickly. Network bandwidth could be a problem in many nations. The vendor may want certain web servers or other software, distinguishing the e-commerce environment from network servers. It may sometimes be challenging to connect an e-commerce program or website with pre-existing programs or databases. Compatibility problems between software and hardware may arise because certain e-commerce applications may not work with a particular operating system or other element.

Negative non-technical effects

Initial cost: Building an internal e-commerce platform may be highly expensive. Due to errors and inexperience, an e-Commerce application launch might be delayed. Users may not trust the website since it is an unidentified, faceless vendor. It is challenging to persuade traditional customers to convert from physical to online/virtual retailers because of this distrust. It is challenging to guarantee the security or privacy of internet transactions. The inability to touch or feel items while purchasing online is a disadvantage.Applications for e-commerce are continuously developing and expanding quickly.Many prospective clients, such as those who reside in far-flung communities, find internet connection to be difficult and still expensive.

Decision-making tools

Decision support systems are interactive software-based tools designed to assist managers in making decisions by providing access to vast amounts of data produced by various related information systems involved in organizational business processes, such as transaction

processing systems and office automation systems. DSS employs the analytical models to utilize the summary data, exceptions, patterns, and trends. An aid to decision-making, a decision support system does not always provide a decision. To identify issues, find solutions, and make judgments, the decision-makers assemble relevant information from raw data, papers, personal expertise, and/or business models[7]–[10]. Assistance with semi-structured and unstructured challenges for decision-makers. Providing assistance to managers at all management levels, from top executives to line managers. Less structured issues may need for the participation of several people from various organizational levels and departments.

1. Support for sequential or interconnected choices.
2. Support for creativity, design, decision-making, and execution.
3. Support for a range of decision-making procedures and approaches.

DSS classification

The DSS may be categorized in a variety of ways. The following is how Hoi Apple and Whinstone categorize DSS:

1. **Text-oriented DSS:** It includes information that is text-based and may influence decisions. It enables the electronic creation, editing, and viewing of documents.
2. **Database-oriented DSS:** A key component of this system, the database comprises well-organized and well-structured data.
3. **Spreadsheet-oriented DSS**: It includes data in spread sheets that enable users to generate, examine, and amend procedural knowledge. It also gives the system instructions on how to carry out independent tasks. Excel and Lotus 1-2-3 are the two most often used tools.
4. **Solver Oriented DSS:** This DSS is built around a solver, which is an algorithm or process created to run a certain set of computations and a specific kind of program.
5. **Rules-oriented DSS:** It abides by certain protocols that have been made into rules.
6. **Rules-oriented DSS:** Rules-oriented DSS adopts procedures. The example is the export system.
7. **Compound DSS:** It is created by combining two or more of the five previously mentioned structures.

Status Inquiry System: It aids in operational, management-level, or middle-level management choices, such as setting daily schedules for work to be assigned to machines or operators to be assigned to machines. Data analysis systems employ formulas or algorithms to do comparative analyses, such as cash flow analysis, inventory analysis, etc. Data is examined and an information report is produced by the information analysis system. Examples include market analysis, accounts receivable systems, and sales analysis.

Accounting System: It maintains track of financial and accounting-related data, such as final accounts, accounts receivables, and accounts payables, which monitor the key facets of the

company.Model-based systems establish broad operating or management recommendations by using simulation or optimization models, which are seldom employed for decision-making.

CONCLUSION

In conclusion, Organizations looking to enhance their decision-making processes should invest in decision support systems. DSS help decision-makers analyze complicated issues, weigh options, and reach well-informed choices by utilizing data, models, and user-friendly interfaces. DSS contribute to improved decision outcomes, enhanced organizational efficiency, and a competitive advantage in today's changing corporate environment by having the capacity to give timely and quantitative information. However, there are obstacles to overcome in order to successfully develop and use decision support systems. Organizations are responsible for guaranteeing the correctness and dependability of analytical models as well as the availability and quality of pertinent data. Additionally, user education and assistance are essential to maximizing the advantages of DSS since decision-makers need to know how to use the tool correctly and analyze the insights it generates.

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BUSINESS INTELLIGENCE SYSTEM

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ABSTRACT:

Business Intelligence Systems (BIS) have become essential tools for organizations seeking to transform raw data into actionable insights for strategic decision-making. This studyprovides an overview of Business Intelligence Systems, their components, and their significance in enabling organizations to gain a competitive advantage through data-driven decision-making.Business Intelligence Systems encompass a set of technologies, processes, and methodologies that gather, analyze, and present large volumes of data to support decision-making at various levels within an organization. These systems integrate data from multiple sources, including internal databases, external repositories, and online platforms, and employ analytical techniques to extract valuable insights.

KEYWORDS: *Big Data, Dashboard, Data Mining, Data Visualization, Decision Support, Dimensional Modeling.*

INTRODUCTION

With the development of technology and applications like data warehouses, executive information systems, and online analytical processing, the phrase "business intelligence" emerged from decision support systems. A business intelligence system is essentially a tool for extracting patterns from operational data[1]–[3]..

BIS characteristics

1. To construct it, facts and information must be collected for use in making decisions.
2. It is a synthesis of abilities, procedures, methods, tools, programs, and practices.
3. Along with the reporting tools, it includes background information
4. It combines a number of ideas and strategies that are supported by fact-based systems.
5. It is a development of either the Executive Information System or the Executive Support System.
6. It gathers, combines, saves, analyzes, and makes available business data.
7. It is a setting where business users may get accurate, timely, consistent, secure, intelligible information.

8. It offers commercial insights that help make choices that are better, quicker, and more relevant.

A knowledge management system consists of a variety of procedures used in an organization to locate, produce, depict, disseminate, and facilitate the adoption of insight and experience. Such understandings and knowledge are embodied in people or are integrated into organizational procedures and practices. The business challenge and the intended business value should come first. Determine the method to use in order to provide this value and solve the KM issue. Consider the system you need in terms of people and processes. Consider the kind of technological infrastructure needed to support the processes and people last. Implement systems and procedures while using effective change management and incremental staged release.

Management of Information Resources

Information Systems Planning

The phrase "information management" refers to a variety of internal organizational methods and procedures for producing and using company information. In large multinational corporations, information systems planning is essential to creating and carrying out effective strategic strategies. Market uncertainty in the present business environment forces businesses to create effective, proactive initiatives in order to achieve a competitive edge. Based on careful research of the involved firm, the strategy formula is focused on the operations and goals of the organization. Information system planning's goals are the situations and places in the future that the organization hopes to get to in order to accomplish its objective. Within an organization, decision-making is directed and constrained by its policies, which serve as a basic set of guidelines. A number of chances to obtain a competitive edge and modify information systems for the benefit of the company are made possible by information technology.

Information system planning is a major problem that top corporate leaders are now facing. Information management planning primarily entails identifying the stage of IS in the organization, identifying the applications of organizational information systems, evaluating each of these applications based on established evaluation criteria, allocating a priority ranking to each application, and figuring out the best IS architecture to support the applications with the highest priority. Theoretical information systems planning literature offers two difficult ideas of successful planning in a chaotic environment. One thinks that formal, thorough planning approaches will help firms succeed more. The other asserts that companies will succeed better in such a setting if they take an informal, gradual approach.

Information system acquisition

A top-level plan called an acquisition strategy places emphasis on identifying and controlling risks in order to achieve success. Integration across several systems, spanning various business or organizational divisions, is required by business needs for supporting work activities. The procurement of information systems may depend on internal development or modification or external sourcing. Because of how advanced the IT sector is now, businesses often purchase their information systems and services from specialist suppliers.

Given the advantages they provide and the substantial expenditures associated with them, information systems are a significant company asset. As a result, while purchasing information systems and services to support business ambitions, firms must make long-term plans. Firms must be receptive to new possibilities at the same time. The identification of critical applications and the determination of project priorities are done on the basis of long-term company strategies as well as the needs of different people, ranging from data workers to top management. For instance, certain projects may need to be completed right away to comply with a new government reporting requirement or to work with a new customer's information system. Due to their strategic importance or better anticipated benefits, other initiatives could be assigned a higher priority. A particular information system must be purchased after the necessity for it has been determined. Usually, this is done within the framework of the company's current information systems architecture. The procurement of information systems may depend on internal development or modification or external sourcing. Because of how advanced the IT sector is now, businesses often purchase their information systems and services from specialist suppliers. Information systems experts' main responsibilities include adapting programs to the demands of their employers and integrating applications to build a cohesive firm-wide system architecture. Typically, internal development only applies to smaller apps. Some more individualized apps could even be created by the users themselves.

Purchasing from outside sources

The main methods for obtaining an information system from outside the company are several. **Outsourcing:** Outsourcing involves moving the main technical and operational elements of the company, such data centers and telecommunications[4]–[7].

Software: A specialist business with long-term contracts for its services.

Offshoring: Offshore outsourcing, a subset of business process outsourcing, is the practice of moving IT-related work from the United States and other industrialized nations to nations with more stable governments and cheaper labor or tax rates. A way of offering information technology services known as "cloud computing" uses web-based tools and applications to access resources from the Internet rather than a direct server connection.

Internet: A network of specialized servers and routers that allows one computer to be connected to any other computer worldwide.

Software-as-a-Service (SaaS): SaaS is a software licensing model where access to the program is made available through a subscription and the software is stored on external servers as opposed to internal servers.

Open Source: Software whose original source code is made publicly accessible and which users are allowed to redistribute and modify as they see fit.

Information system implementation

A management information system's design may appear to management to be an expensive project; however, the cost of successfully bringing the MIS online is frequently comparable to that of its design. The implementation of the MIS is said to be complete when decision-makers

consistently use its outputs. There are four main ways to put the MIS into practice when the design is finished. Only the present system is turned off when the new system has been installed and tested in tandem with the existing one. Due to associated fees and personal expenses, this strategy is costly. The system is mostly debugged when it becomes the primary information system, which is one of its major benefits. To shorten the implementation period, several actions should be carried out simultaneously. Software development and employee training may happen simultaneously, as well as with other implementation operations.

Planning the implementation is the first phase in the process. The planning and the action to carry out the plan should be tightly related, according to some analysts, who also incorporate the planning of the implementation with the system design. Not the final, but the first stage in management is planning. The strategy for implementation will be greatly influenced by the MIS design and the pressing requirement for the system at the time the design is finished. Establishing connections between tasks during the planning of the implementation activities The order of performance for simple projects may just be written down in text. A network diagram or Gantt chart may help see the plan and schedule much more clearly. A network diagram must be included in any excellent plan for big projects since there are many concurrent and sequential operations that are interconnected.

Create a Schedule

The system designers estimate the intervals between the events in the program network to create the schedule. Calculating the critical route is possible. The end date is decided upon after the beginning date has been specified.

Scheduled Cost for Tasks and Time

Each task's estimated cost is determined as part of the plan, and the rate of expenditures should then be budgeted. Weekly meetings may be used to report progress and maintain control. The finance staff must ensure that report formats enable them to highlight the link between cost and technical development as well as between cost and time. Installation of a new system to replace an existing one can need significant facility revisions, including whole new offices, computer rooms, etc. The MIS project manager is required to provide preliminary floor plans and estimates for any spaces they believe may be needed. After that, the management creates cost projections. Planning for space must take into account the mobility of people and equipment while work is being done, as well as the space that will be occupied by people and equipment. A significant investment in favorable working conditions will pay for itself many times over.

DISCUSSION

The management often designates a project manager to oversee the implementation after the implementation responsibilities have been established. The system is their system, and the MIS's goal is to enhance both the quantity and quality of their inputs. The top management should ensure that all of the individuals who will run the system are actively involved in the implementation process, including middle managers, systems experts, and computer programmers.

Creating installation and test procedures

The next duty is to establish or get ready the processes for execution after coordinating the people for implementation. The project manager contacts the main players in the project to prepare more elaborate system installation procedures as they already have the network plan for moving forward with the implementation. The steps to be taken for assessing and choosing hardware must be made clear. It is necessary to create procedures for implementing the MIS in phases or running it concurrently. Testing each component of the whole system as it is installed is a significant component in implementing the MIS.

Creating the operational staff training program

The development of a program takes administration and support into consideration. Training operational people in their new responsibilities is required once the program has been developed. They must have a complete grasp of the new MIS's characteristics and functions. They must get familiar with its workings. They must get acceptance for changes since they must deal with many changes at work. The seminars should be created to provide the different levels of staff a knowledge of the whole MIS since they will only be dealing with a tiny portion of it. The kind of the needed hardware must be considered while developing the software, whether internally or via a contract. During the comprehensive design stage, the system designers and programmers give the flow diagrams and block diagrams. As the implementation stage moves forward, some adjustment may be needed.

The most common barrier to a MIS installation is this acquisition. The design phase is the time to begin these duties. Choosing whether to purchase or rent the gear will be necessary. The consideration of capital expenditures is only one of several variables that went into this choice. Others include use, prestige, etc. For the systems initial testing and functioning, real data must be gathered and recorded throughout the installation phase. This calls for the data's format, storage form, and format, as well as notes to show when the data were saved. The term "master file" is often used to refer to the group of data utilized in normal activities. Each file item's responsibility for file maintenance should likewise be delegated. It is the responsibility of information system designers and storage and retrieval specialists to create files or databases. Computer experts are responsible for converting file requirements into computer programs.

A salesman must complete the paperwork detailing the day's activity in order to regulate the marketing. The form makes ensuring the correct data is provided for computer storage. Forms are necessary for sending data at intermediate stages as well as for input and output. Tests should be performed in accordance with the test standards and method as the whole system is installed. Component tests, subsystem tests, and acceptance tests for the whole system make up an installation stage test. Equipment, new software, new data gathering techniques, work practices, and reporting formats are examples of components. Problems that arise during component testing may force revisions to the design. Subsystems might be examined when more components are fitted. Testing a system vs testing a component has distinct differences[8]–[10]. System tests call for the validation of various inputs, intricate logic schemes, and temporal characteristics of several pieces.

The term "cutover" refers to the moment when a new system or component replaces an older one. This entails testing out old documents, old forms, and ancient machinery. The debugging

tests necessary for the switchover to the new system might take many months. The production of written explanations of the MIS's scope, purpose, information flow components, and operational processes is referred to as documentation. Troubleshooting, replacing subsystems, interacting with other systems, educating new operational employees, and reviewing and improving the system all need documentation. A review of each design stage and the overall system performance should be done once the MIS has been running well for a short while. Evaluation shouldn't be postponed after the system analysts have mostly finished the debugging. The more time that passes, the harder it will be for the designer to recall crucial information. Both the client and the designers should evaluate the product.

The line managers are responsible for the system's control and upkeep. Control of the systems refers to the system functioning as it was intended to. Sometimes, well-meaning users or operators could make illegal, unapproved, or undocumented modifications to the system in an effort to make it better. Control and maintenance are tightly intertwined. Maintenance is the constant process that maintains the MIS operating at its most productive and cost-effective levels. Reduced design mistakes, reduced errors caused by environmental changes, and improved system scope and services are the goals of maintenance.

CONCLUSION

In conclusion, for businesses looking to use data as a strategic advantage, business intelligence systems are essential. Decision-makers are given the tools they need by BIS to make educated choices, improve performance, and gain a competitive advantage. These insights are drawn from large volumes of data and are actionable. Business intelligence systems serve a crucial role in helping firms manage the complexity of the contemporary business environment by having the capacity to convert data into information. However, it takes considerable planning and attention to create and maintain an efficient business intelligence system. Organizations must maintain data privacy, security, and quality while adhering to all applicable laws. In order to properly extract, convert, analyze, and display data, they must also invest in infrastructure, tools, and qualified staff.

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EVALUATION OF INFORMATION SYSTEMS: A REVIEW STUDY

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ABSTRACT:

The evaluation of information systems (IS) is a critical process for organizations to assess the effectiveness, efficiency, and overall value of their information technology investments. This studyprovides an overview of the evaluation of information systems, its objectives, methods, and the significance of conducting thorough evaluations in organizations.The evaluation of information systems aims to determine the extent to which IS align with organizational goals, meet user needs, and deliver expected benefits. This evaluation process involves assessing various aspects of IS, including technical performance, user satisfaction, system reliability, security, and financial implications.

KEYWORDS: *Accuracy, Adoption, Audit, Compliance, Cost-Effectiveness, Data Integrity.*

INTRODUCTION

The management control process, in which businesses identify or assess the quality or value of their information systems, includes evaluation of MIS as a key component. To put it another way, MIS assessment is the process of assessing the effectiveness of corporate information systems. Different methods may be used in an organization to assess MIS. The methods used for MIS assessment provide many ways to assess the success of system goals. Technical or quality assurance reviews are focused on evaluating the technical soundness of an information system.

1. **Compliance Audits:** Compliance audits, also known as application control reviews, determine if the system's inputs, outputs, processing, security, and access controls are adequate and comprehensive.
2. **Review of Budget Performance:** The assessment of MIS budget performance focuses on ensuring that the development or operation of MIS is carried out within the parameters of a set budget expenditure level.
3. **Measuring the Productivity of MIS workers**: The productivity of MIS workers is often used to gauge their capacity [1]–[3].
4. **Evaluation of Computer Performance:** The production capacity of the computer hardware is often assessed in terms of performance efficiency and production bottlenecks.
5. **Service Level Monitoring:** Based on the agreements made between the MIS user people, service level monitoring evaluates the information and assistance given to the user.

6. Surveying user attitudes is a technique used in operational assessment. Operational factors deal with the usability of the output and the sufficiency of the input data.
7. **Evaluation conducted after installation:** This evaluation often focuses on determining if the system satisfies the criteria.Cost-benefit analysis is sometimes referred to as economic analysis. The research calculates the system's financial impact on organizational performance.

Assessment of Performance

1. Effectiveness: This speaks to the standard of the systems' outputs. Effectiveness refers to doing the correct thing in the appropriate way to get the intended outcome. If an information system's output is of high quality and the production process is proper, it is considered to be effective. Efficiency, or the utilization of system resources to produce outcomes, is a measure of the resources needed to obtain the output. Being effective suggests that the system is running properly.

Product-Based MIS Evaluation

The assessment may be referred to as an efficacy evaluation since the product or output from the system is the main emphasis of the product-based evaluation. The following model may be used to evaluate the efficacy of MIS output.

Model Organization

1. Timeliness
2. Relevance
3. Accuracy
4. Completeness
5. Adequacy
6. Explicitness
7. Exception-based

Cost-Benefit Analysis of MIS

Cost/benefit analysis involves a detailed investigation of different anticipated expenditures, anticipated advantages from the system, and anticipated savings, if any. It is an economic assessment of the system in which the expenses associated with creating, putting into place, and maintaining the system must be balanced against the advantages that may be anticipated from it. In other words, cost/benefit analysis establishes the businesses' level of cost-effectiveness.

Cost Components

Initial Development Cost refers to the expenses related to creating an information system. Project planning costs, feasibility study costs, design costs, communication costs, implementation costs, etc. are only a few examples of development cost components.

1. **Capital Cost:** It is a one-time expense as well. It is the price paid for purchasing buildings and related equipment, such as hardware.
2. **Annual Operating Cost:** This is the expense related to keeping the system up and running. It comprises human costs, overhead costs, consumables costs, and maintenance costs for computers and other equipment.
3. **Cost and Benefit Identification:** Some costs and advantages are simpler to identify than others.
4. **Classification of Cost and Benefits:** It's important to consider the different cost and benefit categories when doing a cost/benefit analysis. These categories might be constant or changeable, direct or indirect, and tangible or immaterial.

Assessment Models

The financial worth of each expense and benefit is evaluated once the different costs and advantages have been recognized and categorized. The costs and advantages as estimated may be evaluated by a system analyst/user manager. The company may decide whether or not its information systems are successful and efficient based on the findings from the assessment process. System maintenance may be defined as the act of tracking, analyzing, and altering current information systems to make necessary or desired changes. System maintenance is a continuous process that includes a broad range of tasks, such as fixing code and design flaws, updating test results and documentation, and improving user assistance. For convenience, maintenance may be divided into three categories, namely:

i) **Corrective Maintenance:** This sort of maintenance entails fixing programming mistakes that may have gotten into the system as a result of poor design or incorrect presumptions. Therefore, processing or performance issues are fixed during corrective maintenance.

ii) **Adaptive Maintenance:** This process involves changing program functionalities to allow the information system to meet the user's information demands. Organizational changes, such as the following, may make this sort of upkeep necessary:

a) Modification of organizational practices,

b) Modifications to organizational objectives, targets, rules, etc.

d) Formal changes,

d) A change in managers' information requirements.

e) Modifications to system controls, security requirements, etc.

iii) **Perfective Maintenance:** Improving the functionality of an information system via perfective maintenance entails updating or adding new applications. This form of maintenance is carried out to address the extra demands of the user, which may be brought on by changes within or outside the business. The majority of external changes are environmental changes, which might make the information system useless and inefficient in the absence of system maintenance. Among these environmental modifications are:

a) Modifications to governmental regulations, legislation, etc.

b) The state of the economy and the marketplace, and

(c) Modern technology.

Control and Security:

Organizations nowadays rely more and more on technology and information systems. However, thanks in large part to networked computing, these systems are exposed to a wide range of possible risks. As a result, management is seriously concerned about IS control and security. The following are some of the main dangers to information systems:

1. Data handling, entry, transmission, or programming error
2. Equipment failures
3. Intentional or unintentional harm to computer resources
4. Damage caused by a virus
5. Theft of tools and/or software

A global view of cybercrime

The use of a computer as a tool to achieve illicit goals, such as committing fraud, trafficking in child pornography and stolen intellectual property, stealing identities, or invading privacy, is known as cybercrime, sometimes known as computer crime. The relevance of cybercrime, particularly over the Internet, has increased as the computer has taken center stage in business, entertainment, and government. Cybercrime, which includes anything from electronic cracking to denial-of-service assaults, is a phrase used to generally define criminal conduct in which computers or computer networks are a tool, a target, or a venue of illegal activity. It may also refer to conventional crimes when the illegal action is made possible by computers or networks. The scope of technologically enabled crime is always changing, both due to technical advancement and due to how society interacts with new technologies[4]–[6].

DISCUSSION

The beginning of cybercrime

Since computers have been around since 3500 BC in India, China, and Japan, it is thought that the first cybercrime was committed around the year 1820. With Charles Babbage's analytical engine, the modern computer had its start. In order to automate accounting and payroll processes, banks and other financial organizations were among the first large-scale computer users in the private sector. As a result, computer fraud combined. One of the earliest instances of computer fraud to be mentioned concerned the US-based equity-funding Corporation, and the deception was straightforward. The thefts are successful because auditors and authorities did not request actual documents and instead considered computer printouts as conclusive proof of procedures. Approximately 64,000 out of the 97,000 policies that the business claimed to have issued turned out to be fake when the fraud was exposed, resulting in an estimated loss of close to 1 billion pounds. Therefore, as technology developed, there were more instances of cybercrime. As a

result of victims failing to notice many of these crimes, there are no trustworthy and accurate data on the losses that victims suffer. As a result, the war on digital crime started. From the beginning, a number of people were actively involved in the battle against computer crime. Donn B. Parker, a researcher from the United States who began working on computer crime and security studies in the early 1970s, is widely regarded as the father and inventor of the field of computer crimes. He worked as a Senior Computer Security Consultant at SRI International and was the primary author of Computer Crime - Criminal Justice Resource guidebook, the first fundamental federal law enforcement guidebook in the USA. This document evolved into an encyclopedia that was widely used by law enforcement outside of the US.

The bottom line upfront, looking at cyberthreats from a global viewpoint, is as follows: There are many distinct actors on the danger spectrum, each with their own goals, drives, and skills. The biggest, most persistent danger in the cyberspace continues to come from nation-states and their agents. Foreign terrorist groups undoubtedly have the will and motive, but luckily, they still lack the capacity to launch prolonged cyberattacks. Yet other entities, such as "hacktivists," may also have significant skills and abilities. When their particular interests or primary concerns are thought to be at stake, these people can be a powerful disruptive force, whether acting alone or loosely in concert, essentially as a leaderless movement. Their goal is often to make their targets seem as bad as possible while also drawing attention to their cause. In a worst-case scenario involving any threat vector, kinetic and cyberattacks would be combined, with the cyber component acting as a force multiplier to boost the lethality or effect of the physical assault. Finally, the main targets of cyberattacks and cybercrimes are banking and financial services.

Global Cyberlaws

The IT Act 2000 makes an effort to update antiquated legislation and provide countermeasures for cybercrime. These rules are necessary so that individuals may use their credit cards to make purchases online without worrying about fraud. The Act provides the crucial legal foundation required to prevent information from being denied legal effect, validity, or enforceability simply because it exists as electronic records. The Act aims to provide government agencies the authority to accept filing, generating, and retaining official documents in the digital format in light of the increase in transactions and communications conducted via electronic records. A legal framework for the digital signature-based authentication and provenance of electronic documents and communications has also been suggested by the Act.

The IT Act 2000 and its provisions have several advantages from the standpoint of e-commerce in India. First and foremost, these laws would have an impact on e-businesses by making email a legitimate and legal method of communication in our nation that can be properly documented and authorized in a court of law. With the help of the legal framework the Act provides, businesses will soon be permitted to conduct internet trade. In the Act, digital signatures have been granted legitimacy and authorization. The Act makes it possible for corporate entities to engage in the business of acting as Certifying Authorities for the issuance of Digital Signature Certificates. The Act now enables the government to publish notifications online, launching e-governance.

The Act authorizes the corporations to submit any forms, applications, or other documents in electronic form using any electronic form that may be defined by the relevant Government to any office, authority, body, or agency owned or managed by that government. The crucial security considerations that are so essential to the success of electronic transactions are also covered by the IT Act. The notion of secure digital signatures, which would need to have gone through a system of a security process as determined by the Government at a later time, has been given a legal meaning by the Act. A legislative remedy is now available to corporations under the IT Act of 2000 in the event that someone hacks into their computer systems or network and damages them or copies their data.

Object of the Act

The purpose of this Act is to set up the legal framework for online shopping in India. Additionally, the cyber regulations significantly affect India's new economy and e-businesses. Therefore, it's critical to comprehend the IT Act of 2000's many views and what it has to offer. The Information Technology Act of 2000 also intends to provide the legal framework necessary to give all electronic records and other actions conducted through electronic means legal sanctity. According to the Act, a contract acceptance may, unless otherwise agreed, be conveyed using electronic means of communication and shall have full legal force and effect.

Planning For Enterprise Resources

Regardless of their size and power, Enterprise Resource Planning is a program that is designed for enterprises from a variety of industrial sectors. Almost every functional area of a company activity, including the purchase of products and services, sale and distribution, finance, accounting, human resources, manufacturing, production planning, logistics, and warehouse management, is supported and integrated by the ERP package.

Functioning Sectors

A corporation may use ERP, or enterprise resource planning software, to gather, store, manage, and evaluate data from a variety of functional areas, like as

1. Accounting for financial transactions and information.
2. Information relating to employees of a company is dealt with by human resources.
3. Customer relationship management (CRM) focuses on identifying and maintaining customer relationships and enables the use of customer experience to assess knowledge databases.
4. Order placing, delivery, shipping, and billing are all included under sales and distribution.
5. Products are stored and shipped via logistics and warehouse management.
6. Production and production planning activities fall under the category of manufacturing and material management.
7. Storage, management, and control of supplies are all aspects of supply change management.
8. Business intelligence translates data into information after analysis.

It is much simpler to merge all the data and processing software modules and hardware into one sizable unit that is simpler to access and manage since computers have become so complicated and pervasive in businesses. ERP, or enterprise resource planning, is the term used for this. Typically, ERP systems employ a single database throughout the whole organization to hold different kinds of data for various automated tasks. ERP systems were initially exclusively used by significant manufacturers. These days, they are advantageous to businesses of all kinds, including those that are extremely little.

Understanding ERP Systems: A Foundation

Early on in the development process, specialized process areas such were the focus of integrated solutions.The integrated system was referred to as Material Requirement Planning. Manufacturing Resource Planning was the integrated system's name, but none of the integrated systems offered a comprehensive solution for an organization's main business process areas. The acronym ERP was initially adopted by the Gartner Group in the early 1990s. ERP systems had all the essential business tasks covered by the middle of the 1990s[7]–[10]. Early ERP systems were primarily concerned with automating back-office tasks that did not immediately influence consumers or the wider public. Later, e-business systems and front office operations like customer relationship management were connected.

Describe ERP software

Early versions of ERP software were utilized for computer integrated manufacturing and manufacturing resource planning in the manufacturing sector in the 1990s. Regardless of the industrial sector a corporation is in, ERP has expanded to include all of its essential operations. As a consequence, organizations in the public and commercial sectors today employ ERP systems in varying degrees. ERP solutions often have a modular structure and share crucial business data that is stored in one or more centralized database repositories.

Financial and business planning tasks that would previously have been handled by several smaller independent apps are generally handled by ERP systems. Product lifecycle management, supply chain management, warehouse management, customer relationship management, sales order processing, online sales, financials, human resources, and decision support system are a few examples of modules found in ERP systems. Keeping in mind the real complexity and quirks of each unique firm, ERP systems might prove to be complicated and challenging to customize. There is often a lack of corporate policy to preserve the integrity of the data in the ERP systems and the methods in which it is utilized, and many businesses do not appropriately engage in regular training for the associated IT workers.

Business procedures often need to be redesigned to work with the new ERP system, which might cause issues with people and processes. Additionally, ERP systems may be highly costly. This has given birth to a fresh breed of less expensive, simpler ERP systems for smaller businesses, and several well-known ERP suppliers now provide managed ERP services through the internet. In the case of a security breach, the fact that ERP systems centralize data in one location may raise the risk of losing critical data.

CONCLUSION

In conclusion, to determine the efficacy, efficiency, and value of their IT investments, enterprises must evaluate their information systems. Organizations may learn more about system performance, user happiness, security threats, and financial ramifications by using systematic assessment methodologies. Organizations may make educated choices, increase system performance, improve user experience, and match IT investments with business objectives by using assessment results. Organizations may constantly enhance their information systems by conducting regular reviews, ensuring that they are responsive to changing business demands and technology developments.

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AN OVERVIEW ON POPULAR ERP VENDORS

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ABSTRACT:

Enterprise Resource Planning (ERP) systems are widely adopted by organizations to integrate and manage their core business processes. This studyprovides an overview of popular ERP vendors in the market, highlighting their key features, industry focus, and the factors that contribute to their popularity.The ERP market offers a range of vendors with diverse offerings tailored to meet the specific needs of different industries and organizations. Some of the popular ERP vendors include SAP, Oracle, Microsoft Dynamics, and Infor. These vendors have established themselves as market leaders due to their robust functionalities, scalability, and wide adoption across various sectors.The Microsoft Dynamics ERP package consists of Microsoft Dynamics NAV and Microsoft Dynamics SL, both of which are SME ERP platforms, as well as Microsoft Dynamics AX, a tool for accounting, finance, HR, and CRM. The Oracle e-Business Suite, a modular ERP platform, consists of several different components, such as Oracle CRM, Oracle Financials, Oracle Logistics, Oracle Order Management, and Oracle Warehouse Management Systems.

KEYWORDS: *Epicor, Microsoft Dynamics, Netsuite, Oracle ERP Cloud, Plex Systems.*

INTRODUCTION

Microsoft Dynamics

The Oracle database is used by the program. For many UK organizations, Sage Line 500 and Sage 1000 are the go-to ERP systems. The Sage Line 500 and Sage 1000 Suites, which were designed from the start with the UK mid-market in mind, provide users access to a wide variety of features, including business intelligence, payroll, and CRM. Intentia International and SAP Business One Lawson united in 2006 to provide mid-market businesses with an alternative to bigger ERP solutions. Lawson S3 and Lawson M3 are the vendor's ERP software products. Implementing ERP software may enhance productivity, boost efficiency, save costs, and simplify procedures, among numerous other benefits[1]–[3].

1. **Competition:** ERP software costs a significant investment, but the alternative not making the investment has an even greater cost. While some firms want to continue using time-tested techniques, others look for technological options. Manufacturers cannot afford to delay an ERP deployment while their rivals do so and begin to profit from the many advantages we'll discuss.

2. **Efficiency:** An ERP system removes tedious tasks and drastically decreases the requirement for data entry by hand. In addition to streamlining corporate operations, the technology will make data collection for businesses simpler and more effective across all departments.

3. **Forecasting:** The tools required to produce more precise projections are provided by enterprise resource planning software to your users, particularly managers. Businesses may produce more accurate estimates and predictions because ERP has the most precise information imaginable.

4. **Cooperation:** Nobody wants to manage a firm alone, with each department operating independently of the others. The firm depends heavily and often on departmental collaboration. There is no reason why departments can't cooperate as the data put into ERP systems is consolidated and consistent. The software also affects practically every facet of a firm, thereby promoting cross-departmental cooperation.

5. Scalability: Were you aware of this? Structured ERP systems enable the gradual expansion of the originally established solution by allowing the inclusion of additional users and services. Enterprise resource planning software need to be able to support expansion when your company is prepared to expand or requires extra resources.

6. **Integrated Information:** There won't be any more problems with data being dispersed across several databases; everything will be kept in one place. The ERP system may be integrated with other platforms, such as your CRM software, to maintain data consistency, accuracy, and uniqueness. Recognize your clientele, their orders, and your stock in one location.

7. **Cost savings:** ERP software lowers administrative and operational expenses by providing a single source of reliable, real-time information. It enables proactive operations management for manufacturers, avoids delays and interruptions, clears information bottlenecks, and hastens user decision-making. If you've selected the best vendor who can match your objectives and the ideal solution for your company, you're sure to see a significant return on investment.

8. **Simplified Procedures:** As a manufacturing expands, so do its internal workings. Manufacturing software streamlines cross-departmental company activities and gives users reliable, real-time information. ERP improves operations like manufacturing, order fulfillment, and delivery while assisting users in navigating complicated procedures and avoiding data re-entry. Efficacious, streamlined procedures everywhere.

9. **Mobility:** Having access to a centralized database from everywhere you work is a benefit of ERP systems like Workwise ERP software. With the help of our mobile-friendly solution and application, you may work from home or the office.

10. **Reporting:** ERP software makes it simpler and more customized to produce reports. Your business can more readily react to complicated data requirements if it has increased reporting capabilities. Users may run reports alone without requiring assistance from IT, freeing them their time for other tasks.

11. **Productivity:** Work more efficiently and productively. Does it seem too wonderful to be true? Not with ERP software, however. Users may focus on more important projects and

activities since duplicate operations are automated. Since the solution was created to be user-friendly, they will likewise be able to operate more effectively.

12. **Regulatory Compliance:** How efficiently ERP software integrates with regulatory compliance in the manufacturing business is an advantage that sometimes goes overlooked. Powerful ERP systems will follow industry rules and track changes in compliance.

13**. Flexibility:** The most up-to-date ERP software solutions are dependable, adaptable, and customizable. They may be customized to meet the particular demands of a company and are not a one-size-fits-all solution. You won't need to purchase a new solution if your demands alter or your firm expands since ERP systems can also adapt to the constantly changing needs of a growing business.

14. **Customer service:** Using an enterprise system, particularly one as well-equipped as Work Wise ERP, makes it simpler to provide high-quality customer service. Through quicker, more precise access to clients' information and history, sales and customer service personnel may communicate with consumers more effectively and foster stronger relationships with them. Additionally, you'll have access to contact center software and marketing automation, ensuring that you communicate with your consumers regularly.

15. **Security:** When you have an enterprise resource planning system in place, data security is not a concern. Data security, accuracy, and consistency will all be enhanced by a new system thanks to built-in tools and firewalls. Managers of the solution may also tighten data restrictions, enabling you to create software that is as secure as you wish.

DISCUSSION

The challenges of implementing ERP system

ERP systems are attracting a great deal of attention from company owners due to the growth of e-commerce and the desire to be more productive. An organization may operate a synchronized configuration that links all the business activities thanks to an ERP system.By conserving resources and adapting to a constantly changing business environment, it helps a firm acquire a competitive edge. But before putting an ERP system in place, there are various difficulties to consider.

ERP Suppliers

To increase production in this cutthroat climate, the ideal product must be chosen. Over 500 ERP programs are available on the market. One should be aware of the vendor's prior projects, industry vertical, and expertise while choosing the ideal ERP program for a corporation. In every ERP installation, senior management are essential. Their participation is very essential to a project's success. Any kind of ignorance might result in poor judgments and slowed down processes. Adequate Training Employee discontent after the adoption of an ERP system is frequent. The productivity of processes might suffer greatly as a result. Prior to implementation, special training and inspiration are particularly beneficial. The teams would have some time to get used to the program as a result[4]–[6].

Time to Implement

Many businesses are unaware of how long the ERP installation process takes. An ERP system must be tailored to a specific firm in order to manage the procedures exactly as the company requires them since it is highly standard and is introduced in stages. Employers that wish to successfully use the ERP system must allocate their finest personnel. Companies often hire both internal staff and outside aid, although internal personnel are preferable.

Implementation Cost:

The overall cost of implementing an ERP is much higher than the start-up expenditures. The cost of customisation determines the overall price. The cost of final implementation will increase as customisation increases. Despite receiving training, several staff have been seen to depart the company following the introduction of the ERP system. This has a significant impact on a company's pace of growth. To test an ERP system is to be thrilled by its performance and determine if it meets your requirements, not to determine whether it is operating smoothly or not. System testing has to be improved, since it may need expensive unforeseen updates. An ERP system requires ongoing maintenance expenses. It has the capacity to destabilize an organization if handled carelessly. It needs periodic maintenance, which raises the ongoing expense.

Purchasing internal hardware

It may be incredibly annoying and unproductive to work on a sluggish system. ERP solutions demand ample storage and fast processing speeds. Low internal hardware investment may lead to a variety of software problems.Due to competitive considerations including an increase in mergers and internationally hostile competitors, ERP has become more well-known. Customer happiness and staff productivity may both be raised by a well-planned and managed ERP system. With the least number of resources, it may effectively raise business profitability.

The historical development of ERP modules

Simply based on the name, Enterprise Resource Planning System (ERP) is a system or piece of software used to coordinate all of an organization's resources. ERP systems allow for the management and tracking of everything, including employee paychecks and the arrival of each individual screw into the business. ERP is cross-functional software that supports all organizational business operations. Through a centralized application, ERP assists organizations in managing the business activities of many departments and functions. By carefully reviewing the information offered by ERP, we can make all the important judgments. There are several companies offering conventional ERP systems or cloud-based ERP solutions on the market. Even if implementation platforms and technologies vary, all ERP systems have the same fundamental and common components. The necessary components are combined and a customized ERP system is created based on the needs of the firm. Each of the aforementioned components is tailored to handle certain organizational business operations. Let's go through each module's introduction one by one.

Human Resource Module

The HR team uses the Human Resource Module to manage human resources effectively. The HR module aids in managing personnel information and keeping track of records such as performance evaluations, job descriptions, skill matrices, and time and attendance monitoring.

Payroll System, a crucial submodule of the HR module that aids in managing wages, payment reports, etc. Additionally, monitoring of travel expenses & reimbursements is an option. ERP may also handle the tracking of employee training.

Inventory Module

To keep track of the supply of things, utilize the inventory module. Items may be recognized by their distinctive serial numbers. With the use of such special numbers, the inventory system can track down an item's present position inside the company. For instance, if you bought 100 hard drives, you may use the inventory system to keep track of how many are installed, where they are placed, how many are left, etc. Functionalities like inventory management, master units, stock usage reports, etc. are included in the inventory module.

Sales Module: Typical sales operations include analyzing and resolving sales questions and inquiries, creating quotes, accepting orders, creating bills with the appropriate taxes, sending out deliveries of goods or services, and monitoring pending sales orders. The sales module of the ERP oversees all of these sales transactions. CRM module may use Sales module's assistance to create future opportunities and generate leads.

Purchase Module: As its name suggests, purchase modules handle all the procedures involved in acquiring the goods or raw materials that a firm needs. The purchase module includes features like supplier/vendor listing, supplier & item linking, sending quotation requests to vendors, receiving & recording quotations, quotation analysis, preparation of purchase orders, tracking of purchase items, preparation of GRNs & updating stocks, as well as various reports. For stock updates, the Purchase module is coupled with the Inventory module and the Engineering/production module.

Finance & Accounting Module: The finance module controls all monetary inflows and outflows. All account-related activities, including as expenditures, balance sheets, account ledgers, budgeting, bank statements, payment receipts, and tax management, are tracked by this module. The work of financial reporting is simple with this ERP module. In the Finance module, all financial information needed for company operations is accessible with a single click.

Customer Relationship Management Module: CRM department helps to improve customer service & build strong relationships with customers, which in turn helps to increase sales performance. The CRM module contains all the client information that has been saved. The CRM module assists in managing and tracking specific customer data, such as communication history, conversations, meetings, details of the transactions the client has made, contract term, etc. To improve sales prospects, the CRM module may be connected with the sales module.

Engineering/Production module: The manufacturing sector benefits greatly from the production module in terms of product delivery. This module includes features including daily production progress tracking, machine scheduling, raw material utilization, preparation, production forecasts, and actual production reporting.

Supply Chain Management: The SCM module controls the movement of goods from producer to consumer and from consumer to manufacturer. Manufacturers, Super Stockiest, Stockiest, distributors, retailers, etc. are typical positions involved. SCM includes processes including

shipping and transportation monitoring, demand and supply management, and sales returns and replacements. Many SMBs nowadays struggle with automating their processes. ERP is a huge benefit for these businesses. ERP may effectively simplify an organization's business processes. The modules described above may assist you in selecting and tailoring ERP modules to your organization's needs.

ERP's Brief History

Although Gartner first used the word ERP in 1990, its origins go back to the 1960s. The idea was then used to describe inventory management and control in the industrial industry. Programs were developed by software programmers to track inventories, balance accounts, and provide progress reports. Production process scheduling methods known as Material Requirements Planning emerged from this by the 1970s. MRP became known as MRP-II or industrial Resource Planning in the 1980s as it expanded to include additional industrial processes. The foundation for ERP as we know it today was laid by these systems by 1990, which went beyond inventory management and other operational procedures to include additional back-office tasks like accounting and human resources.

ERP now handles "front-office" tasks including sales force automation, marketing automation, and e-commerce in addition to business information. Companies across a wide variety of sectors, from wholesale distribution to e-commerce, employ ERP solutions as a result of these technological breakthroughs in products and the success stories generated by these systems. The "e" in ERP stands for "enterprise," although high-growth and mid-size businesses are now quickly using ERP systems. This rise has been aided by software-as-a-service (or "cloud computing") solutions. ERP software is becoming more reasonably priced and simpler to use and maintain thanks to cloud-based alternatives. Perhaps more crucially, cloud ERP makes real-time reporting and business intelligence (BI) possible, making them useful to executives and workers who want to look inside the company.

Because of this, businesses of all sizes and in a variety of sectors are switching to cloud ERP solutions. In fact, Forrester forecasts that use of SaaS-based ERP would increase by 21% year through 2015. When you pause to think about the advantages of ERP, it's simple to see why it's become so well-liked and why its usage will keep expanding so quickly[7]–[10].

Marketing and Sales

The guidance of tasks and operations involved in the distribution of products and services is made easier by sales management. Marketing management, according to Philip Kotler, is the analysis, planning, execution, and control of programs created to cause desirable exchanges with target markets with the aim of accomplishing organizational goals. It largely focuses on creating the organization's product in accordance with the demands and preferences of the target market and employing effective pricing, communication, and distribution to educate, inspire, and serve the market.

After carefully examining and projecting market conditions, sales or marketing management is concerned with formulating a specific strategy and carrying it out in order to meet the organization's goals. Additionally, their sales strategies depend more on the wants and needs of

the target market's customers. The organization must pay attention to the appropriate price, effective advertising and sales promotion, discriminating distribution, and exciting the customer via the greatest services in order to accomplish this goal. In conclusion, marketing management may be summed up as the process of overseeing marketing initiatives in order to achieve organizational goals and objectives. It includes the preparation, execution, and management of marketing initiatives or campaigns.

CONCLUSION

In conclusion, Popular ERP providers like SAP, Oracle, Microsoft Dynamics, and Infor have built a solid reputation thanks to their broad adoption across many industries, powerful functionality, and industry-specific products. To suit the changing demands of enterprises, these providers continue to develop and improve their ERP systems. For firms looking to deploy an ERP system that is in line with their business objectives and needs, understanding the features and areas of emphasis of various ERP providers is essential. Before choosing an ERP provider, it is crucial for enterprises to carefully assess their needs, finances, and industry-specific requirements. During the vendor selection process, elements including installation costs, continuing maintenance and support, simplicity of interaction with current systems, and scalability should be taken into account.

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SALES ORDER PROCESS MANAGEMENT IN ERP

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ABSTRACT:

Sales Order Process Management is a critical component of Enterprise Resource Planning (ERP) systems that streamlines and automates the sales order fulfillment process within an organization. This studyprovides an overview of the sales order process management in ERP, its key stages, benefits, and its significance in enhancing efficiency and customer satisfaction.The sales order process management in ERP involves a series of interconnected steps from order creation to order fulfillment. These steps typically include order entry, order validation, inventory availability check, pricing determination, credit verification, order confirmation, picking, packing, shipping, and invoicing. ERP systems integrate these steps, allowing for seamless communication and data sharing across departments involved in the sales order process, such as sales, inventory, finance, and logistics.

KEYWORDS: *Billing, Customer Relationship Management (Crm), Inventory Management, Order Entry, Pricing, Product Catalog.*

INTRODUCTION

A sales order is a formal agreement between a company and the person being sold to about the delivery of goods or the rendering of services. The dates of conveyance, item quantities, and specified charges are all included. Each sales order that is fulfilled on time helps to build your reputation as a reliable brand. Traditional business applications struggle to handle the load as the volume of sales orders begins to climb. Delivering orders on schedule is a fundamental duty you owe to your clients. Aside from that, the order fulfillment procedure should be seamless, giving clients a fun reason to do business with you. An systematic order management procedure demonstrates your operational effectiveness, reduces the amount of inventory needed, and saves time and money. All of this is feasible with the use of an ERP system.

Aspects of ERP

A typical order starts with the sales team creating the client's purchase order using data variables such as the customer number, product number, order quantity, delivery dates, etc. Order entry is made when this information has been processed by an ERP order management system. This triggers a series of automatic actions that enable monitoring and management of the order process[1]–[3]. The order is announced to every department inside the company so that they may all work together in real time to complete it as soon as possible. The most crucial aspect of order

management is order processing. Resource allocation starts as soon as a sales order is created, buying raw materials out of inventories.

The order is then well-guided through the ERP system to the end of the assembly line as it moves into production. The order then travels to the shipping and packing section. It is being prepared for packaging here, with a customer label and bar code on top. Finally, an automatic invoice is created when the sales order is prepared for delivery to clients, accounting for freight costs and taxes. Because every department can monitor the status of an order in real-time and plan their work appropriately, the whole process is automated.A centralized order entry is built so that all business units may monitor orders for which several business units are providing service. Employees are freed from the burden of over communicating, which wastes time.

Additionally, it avoids needless uncertainty about the sales order. Customers and suppliers may also keep track on the status of an order in addition to your workers. The ability to prioritize orders in accordance with production assembly, delivery timetable, and urgent orders is another feature of ERP.

Processing of customer data

Customers have a wide range of requirements, desires, and expectations. Address, client-specific terms and conditions, price, credit limit, and other information about the consumer may be included. ERP software can, however, entirely address these inconsistencies. When processing sales orders, every detail is handled precisely.

Data analytics

You may analyze data and produce reports using an order management system to monitor how efficiently a firm processes order. You may use it to find organizational faults that contributed to the delay in sales orders. These problems might have to do with order backlogs, order returns, defective assembly lines, product packing, or workforce efficiency. This makes it possible for you to recommend process enhancements and fix bugs. Your sales, finance, inventory, and manufacturing departments are all integrated by your ERP system. It assists in keeping track of payment and delivery status, managing sales returns, and maintaining inventory levels.

ERP - Sales and marketing

With the help of the ERP sales and marketing module, sales force operations including client visits, costs, and competition analysis may be automated. After shipments are completed, it's common to need to collect payments from clients. Executives can get in touch with clients, follow up on each and every sales invoice, and collect payments for those invoices thanks to an ERP sales and marketing module. Setting goals for marketing staff enables management to keep track of their progress toward those goals. The marketing department's operation is improved by this element of the ERP software, which also makes sure employees aren't wasting time. A strong sales and marketing module will also include tools for tracking lost orders and pinpointing the causes of such losses. In the modern world, franchises and business partners are quite frequent. The most recent ERP software will link marketing staff members to their franchisees and business partners, allowing them to track and monitor their performance. The sales and marketing module of the ERP will enable the creation of reports that monitor sales trends over

various time frames, dig down for the consolidated data, enable sales forecasting, and provide an overview of the company's sales and marketing operations. An effective sales and marketing ERP module is a key component of ERP software.

ERP sales and marketing

ERP software may be utilized for sales and marketing purposes depending on a variety of criteria. Enterprise resource planning, or ERP, is a tool used by businesses to predict and plan their future objectives for how they wish to build their business. They may use it to identify areas that need improvement and approaches to achieve future development. Actual measurable facts may be utilized in sales and marketing using ERP to identify areas that are successful for the business and use those facts they have to their advantage. Knowing these details can help sales and marketing with ERP expand. Facilities management, sales, and marketing may all be integrated with ERP to help a business determine what resources it presently has and what it needs. A corporation will be able to have a current awareness of where the company growth and losses reside when it learns this via the usage of sales and marketing with ERP.

ERP is a very helpful tool to have since without this data and software, hours of research would be required, which would be highly expensive for both the business and the customer. ERP resolves this issue. The business will quickly and automatically know if sales are dropping. The key actually is the emphasis on real-time; when sales are higher, they will also know right away and can utilize the facts in front of them to continue to prosper. A company's resources, particularly those devoted to facilities management, may not always be abundant, which is yet another factor that makes ERP so beneficial. Making important financial choices about supplies, contracted labor, and general maintenance that may or may not be required is made much simpler if one is familiar with the specifics of sales and marketing with ERP. Additionally, ERP software is real-time, allowing the business to decide on these demands on a daily basis.

DISCUSSION

ERP enables general planning for businesses that use sales and marketing. Resources for facilities management might be planned out for a month, a year, or whatever the customer thinks the organization will need. There is a lot of promise for the business, the customer, and the specific areas in which they choose to develop when planning and ERP usage are combined. Success for the customer and business will come from using such methods in conjunction with ERP. With ERP, the areas for improvement in sales and marketing will be obvious. The company's everyday operations will be improved by the current information. Future planning is possible and will almost surely result in success for the customer. A wise choice regarding how to increase sales and the resources required to do so may be made by utilizing the information that ERP gives. All of these projections would have to be made manually without ERP software, which would have cost time, money, and energy. It is obvious that ERP software will ultimately be advantageous to the customer, business, and its affiliates.

ERP systems for customer relationship management

In many aspects, enterprise resource planning and customer relationship management are comparable since both are used to raise a company's total profitability. These systems may be

entirely integrated in certain regions, while they overlap in others. CRM often includes customer service, marketing automation, and sales force automation as separate categories. The other four pillars of ERP are financial accounting, distribution or supply chain management, manufacturing, and human resources/payroll. CRM is one of these five pillars. ERP is powerful software that affects every facet of business operations. You may buy a single suite or create your own by combining several components from various providers [4]–[6]. CRM is a tool used by the sales, marketing, and business development teams to manage client contacts.

CRM software often contains

1. Lead management, email marketing, and campaign management comprise marketing integration.
2. Contact management, pipeline analysis, sales forecasting, and more in sales force automation
3. Ticketing, knowledge management systems, self-service, and live chat are all examples of customer service and support.
4. Field service management includes dispatching, billing, and other functions.
5. Automation of contact centers: call monitoring, call routing, CTI, and IVR
6. Ticketing, IT asset management, self-service, and other aspects of help desk automation
7. Management of contacts and leads, partner relationships, and finances for market expansion are all examples of channel management.

Most ERPs will include some CRM-related features. Meeting with team leaders and stakeholders can help you determine what you need. It could be time to look into a new CRM system if you get the feeling that everyone is content with the HR and accounting systems already in place but could use assistance with the sales and marketing processes. On the other hand, a new ERP can be required if you perceive a general discontent with the current procedures. You may be certain that most contemporary systems are built to interact with external CRMs if you discover that your ERP solution is missing more comprehensive customer relationship applications. CRM enables businesses to deliver services based on client requests. Having all of your company's data saved in one place is one of CRM's advantages. The CRM software may also automatically send emails to distinct clients who have been designated by the salesperson. CRM is often used to maintain a business's connection with its customers.

ERP systems' financial modules

An ERP finance module is a piece of software that compiles financial information and creates ledgers, trail balance information, overall balance sheets, and quarterly financial statements, among other reports. The bottom line is what counts in the end for every firm, no matter how big or little. This bottom line is made up of financial metrics. If your company doesn't have a reliable system in place for gathering and analyzing financial data, there's a danger that your statistics might suffer.

An ERP finance module is a piece of software that compiles financial information and creates ledgers, trail balance information, overall balance sheets, and quarterly financial statements,

among other reports. The deployment of an ERP financial module benefits all types of businesses, both small and big. Many ERP software solutions are built around the finance module. Financial information from several functional departments may be gathered by it, and it can provide useful financial reports including the general ledger, trail balance, balance sheet, and quarterly financial statements. All entries linked to accounts and their effects on the whole system will be handled by this module of the ERP software. where the money comes from and how it is used. Here, the entire money coming in and going out will be shown. As a result, management will be able to make crucial financial decisions, such as budgeting. At any moment, they might learn about the financial situation of the organization. several significant financial reports, such as. This module covers a variety of topics, including trial balance, trading account, profit and loss account, balance sheet, debtors balance, creditors balance, cash/bank fund position, and much more.

Ledger General

Your accounting system's core is the General Ledger module, which offers flexibility to satisfy the present and long-term needs of financial management for businesses of all shapes and sizes. It offers a comprehensive feature set designed to meet your most demanding budgeting and processing requirements. The secret to increasing the effectiveness and accuracy of your financial data is General Ledger's complete integration with all modules.

Security G/L: Based on segment validation in G/L Security settings, businesses may use the G/L Security module to restrict which individuals can access or see certain general ledger accounts.

Consolidations of G/L: You may move and integrate General Ledger account and transaction data across various business and branch office locations using G/L Consolidations. Additionally, it is made to let holding corporations and subsidiaries to function independently of one another's networks and accounting databases. Your business may choose the amount of information to consolidate using the feature set provided by G/L Consolidations, which also offers a thorough audit trail.

Intercompany Dealings

By automatically splitting transactions over two or more firms, the Intercompany Transactions module enables you to record General Ledger and Accounts Payable transactions that have an impact on many organizations. Additionally, because to its inherent flexibility, intercompany loan account entries are automatically generated in accordance with user-defined relationships known as routes. The effort involved in intercompany accounting is greatly simplified by Intercompany Transactions[7]–[10]. In contrast to journal-based systems, the Accounting Module is entirely transaction-based. This suggests that the majority of accounting tasks are managed via pertinent transactions in other Modules, saving a significant amount of time. From vouchers to the balance sheet and profit and loss account, the module has every feature needed by any accounting department.

Enterprise Applications for Achieving Operational Excellence and Customer Closeness. The third section looks at the fundamental business applications of information systems that help with decision-making and operational excellence today. Enterprise applications, systems for

managing the supply chain, customer relationships, and knowledge, e-commerce apps, and business intelligence systems are some of these applications. This section provides solutions to queries like how might enterprise apps enhance corporate performance? How do companies utilize e-commerce to grow their markets? How can systems enhance judgment and assist businesses in making better use of their knowledge assets? When NVIDIA created the graphics processing unit in 1999, it changed the course of technology. Today's products include video gaming consoles, cellphones, ts, vehicle infotainment systems, and supercomputers, all of which use Nvidia technology. The corporation, which has its headquarters in Santa Clara, California, employs 7,000 people in 20 different countries and had $3.5 billion in sales in 2011.

Because the consumer electronics market accounts for a large portion of Nvidia's chip production, forecasting customer demand effectively and adjusting inventory levels appropriately is one of the company's most difficult tasks. Consumer trends are prone to abrupt swings in one direction or the other. Nvidia may be left with thousands of extra processors for such systems if, for instance, demand for a video game console suddenly declines, which would be a big loss for the business. The production planners at Nvidia's foundries, which are mostly in Asia, must anticipate how much material the business will require and how much manufacturing time to arrange since Nvidia's chips are made long before they are delivered to consumers. Nvidia's planners independently evaluated the quantity of Nvidia chips that their clients would need. Using these projections, Nvidia would plan adequate capacity at the company's foundries and order enough material in advance to satisfy what it believed to be the appropriate amount of demand. Based on high-level projections, business divisions would meet with Nvidia's finance department to negotiate the amount of chips to be manufactured. The real manufacturing team at Nvidia, the chip operations team, was never given the projections and was only able to examine the inventory that was already on hand. The production department at Nvidia used spreadsheets to generate illustrative inventory forecasts, but these spreadsheets did not permit planners to drill down, sort data by product, contrast various types of inventory, or view data by business segment, and the data for these spreadsheets had to be gathered from a variety of systems.

When Nvidia moved from its old manufacturing method to a 40 nanometer technology, management was given a wake-up call. The business was compelled to maintain inventory as a result of the outdated production method and for clients who weren't ready to make the switch. The current system was found to be incapable of managing the complexity of two distinct sets of inventory, balancing supply and demand for both new and existing products, or estimating how long it would take for customers to switch to the 40 nanometer method. In the end, Nvidia had simply too much inventory, and when it began to reduce it, its suppliers were unprepared. Nvidia established a supply chain steering group to analyze its supply chain procedures in order to solve these issues. The steering group advised Nvidia to switch to a more modern inventory forecasting system instead of continuing to use its spreadsheet-based method. Software from SAP turned out to be the obvious option. Nvidia's SAP advanced planning and optimization system houses the majority of its data. Using SAP BusinessObjects Web Intelligence, Nvidia created a bespoke interface on top of their APO system for its new inventory forecasting solution. With an easy-to-use Web-based interface, SAP BusinessObjects Web Intelligence is a tool for evaluating business data and producing ad hoc reports.

The use of SAP BusinessObjects Dashboards to build cutting-edge supply and demand dashboards where executives could quickly view detailed inventory data was another component of the solution. These dashboards enable Nvidia executives to run calculations with or without inventory reserves, dive down into specifics at the product level, and execute both forward- and backward-looking calculations. Easily understood charts and s are used to display the information. These solutions enable Nvidia to monitor six months' worth of current inventory as well as estimate inventory levels for the next four quarters based on projected demand. Compared to the company's previous spreadsheet-based estimates, which had a 5 percent mistake rate, the error rate has been decreased to 3 percent or less. By lowering its forecasting mistakes, the corporation, which has $500 million in inventory, is able to save $25 million.

In addition to increasing accuracy, the new system's dashboards have also enabled Nvidia executives and planners create and approve forecasts more quickly. The new method has cut the time needed to create a quarterly forecast from 140 hours to only 30 hours. The best part is that all of Nvidia's inventory information is centralized and available to all of the company's many business units. Instead of using several models, Nvidia now uses a standardized forecasting system, and management can obviously make better judgments. The introductory graphic highlights crucial issues brought up by this case and this. Nvidia provides goods to the consumer electronics sector, where demand is very unstable and consumer preferences change quickly. To complete orders, the firm needs a very considerable lead time in manufacturing. Spreadsheet-based planning was employed by Nvidia, however it was very manual and lacked accuracy.

The management of Nvidia recognized the need for more effective forecasting tools and formed a supply chain steering group to provide recommendations. By utilizing SAP BusinessObjects Web Intelligence and BusinessObjects Dashboards to examine data that had previously been gathered in its SAP Advanced Planning and Optimization system, the firm was able to develop a far more precise inventory forecasting system. These technologies have substantially facilitated access to and analysis of production data for forecasting and inventory planning for Nvidia's management, greatly enhancing both decision-making and operational effectiveness.

CONCLUSION

In conclusion, the sales order fulfillment process may be automated and optimized with the help of sales order process management in ERP. By simplifying order input, inventory management, pricing, credit verification, and order fulfillment, it increases efficiency, accuracy, and customer happiness. Organizations may optimize their sales order processes from beginning to finish by using ERP systems, which improves operational performance and improves client experiences. However, to correspond with organizational goals and industry-specific procedures, the implementation of sales order process management in ERP requires careful planning and modification. Workflows must be defined and configured, rules for order validation, pricing, and credit verification must be established, and other systems like customer relationship management (CRM) and logistical systems must be integrated. To guarantee effective system acceptance and use, adequate user training and change management techniques are also essential.

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AN ANALYSIS OF ENTERPRISE SYSTEMS

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ABSTRACT:

Enterprise systems, also known as enterprise resource planning (ERP) systems, are comprehensive and integrated software solutions that facilitate the management and coordination of core business processes across an organization. This studyprovides an overview of enterprise systems, their key components, benefits, and their significance in enabling organizations to streamline operations, enhance decision-making, and improve overall efficiency.Enterprise systems encompass a suite of interconnected modules that cover various functional areas, including finance, human resources, supply chain management, customer relationship management, and manufacturing. These modules share a common database, allowing for real-time data visibility and seamless communication across departments and business functions.

KEYWORDS: *Enterprise Architecture, Enterprise Resource Planning (Erp), Information Systems, Integration, Legacy Systems.*

INTRODUCTION

Companies all across the world are becoming more interconnected, both internally and with other businesses. If you own a company, you'll need to be ready to respond quickly when a client puts a large order or a supplier's shipment is delayed. If you're in charge of a large organization, you could also be interested in learning how these events have affected every aspect of it as well as how it is doing at any given moment. The integration needed to make this feasible is provided by enterprise systems. Let's examine their operation and what they can provide the company.

Enterprise Systems: What are They?

Imagine having to manage a company using data from dozens, maybe hundreds, of different databases and systems that were all incompatible with one another. Imagine your firm has ten distinct primary product lines, each created in a different factory and controlled by a different and incompatible set of manufacturing, storage, and distribution systems. At the very least, it would be challenging to really comprehend what is occurring in the firm as a whole since your decisions would often be reliant on manual, hard-copy reports that were frequently out of date. When placing an order, sales representatives may not be able to determine if the requested products are in stock, and manufacturing could find it difficult to utilize sales data to plan for additional production. You now understand why businesses want a unique enterprise system to combine information[1]–[3].

It introduced enterprise systems, sometimes referred to as enterprise resource planning systems, which are built on a collection of connected software modules and a shared central database. In order to make the data available for applications that support nearly all of an organization's internal business activities, the database gathers information from numerous divisions and departments within a company as well as from a large number of key business processes in manufacturing and production, finance and accounting, sales and marketing, and human resources. When fresh data is input by one business process, other business processes may access it right away.

The system validates the customer's credit limit, schedules the shipment, chooses the optimal delivery path, and reserves the required products from inventory, for instance, if a sales person makes an order for tire rims. If inventory stock is inadequate to fulfill the request, the system schedules the production of additional rims while obtaining the necessary supplies from vendors. Forecasts for sales and production are promptly updated. The revenue and expense information from the order is immediately updated in the general ledger and corporate cash levels. Anyone with access to the system may check the status of a specific order at any time. Management always had access to information about how the company was running. Additionally, the system may provide data for management evaluations of product cost and profitability on an enterprise-wide scale.

Enterprise Software

Thousands of preset business processes that represent best practices are the foundation of enterprise software. Companies utilizing this software would have to first decide which system's features they wanted to utilize before mapping their internal business procedures to the program's preset procedures. A company would utilize the configurations offered by the software developer to customize a specific feature of the system to how it does business. These might be used by the company, for instance, to decide whether it wishes to measure revenue by product line, region, or distribution channel. Companies may rebuild portions of the enterprise software to support their business processes if it does not support how the firm does business. Enterprise software is particularly complicated, however, and a great deal of modification might compromise the system's information and process integration, which are its key advantages. Companies must adapt their working practices to match the business processes specified by enterprise software if they want to get the most out of it.

Tasty Baking Company assessed its current business processes and then translated them into the business processes included in the SAP ERP software it had chosen in order to construct a new enterprise system. Tasty Baking Company purposefully planned for modifying less than 5% of the system, and made very few modifications to the SAP program itself, to guarantee it got the most out of the enterprise software. It made the most of the tools and capabilities that were already included in the SAP program. More than 3,000 configurations are available for SAP's business software. Leading providers of enterprise software include Microsoft, IBM, Infor Global Solutions, SAP, and Oracle. For small and medium-sized organizations, there are versions of corporate software packages that are also available as on-demand, cloud-based software services.

Value Of Enterprise Systems To Business

Enterprise systems provide value through improving operational effectiveness and by giving managers access to data about the whole company to aid in decision-making. Enterprise systems have been employed by large businesses with several operational units in various regions to impose industry-wide uniformity in data and business operations. Coca-Cola, for example, used a SAP enterprise system to synchronize and standardize crucial business procedures across 200 nations. The absence of uniform, corporate-wide business procedures impeded the corporation from using its global purchasing power to negotiate lower raw material costs and from responding quickly to market developments. Enterprise systems assist businesses in quickly responding to information or product requests from customers. Manufacturing is better informed about producing only what customers have ordered, obtaining precisely the right amount of components or raw materials to fill actual orders, staging production, and minimizing the amount of time that components or finished products are in inventory because the system integrates order, manufacturing, and delivery data.

The founding structure of Alcoa was based on lines of business, each of which had its own set of information systems. Alcoa is the largest manufacturer of aluminum and aluminum products in the world, with operations spread over 31 countries and more than 200 sites. Numerous of these systems were ineffective and redundant. Compared to comparable businesses in its sector, Alcoa had significantly higher execution costs and longer cycle times for its finance and requisition-to-pay operations. The business was unable to function as a single global entity. After installing Oracle's business software, Alcoa got rid of a lot of unnecessary procedures and systems. By confirming the receipt of the commodities and creating payment receipts automatically, the enterprise system assisted Alcoa in reducing the time from requisition to pay cycle. Alcoa's processing of accounts payable transactions decreased by 89%. Alcoa was able to consolidate its finance and procurement operations, which enabled the business to save over 20% of its global expenses.

DISCUSSION

Enterprise systems provide a wealth of useful data that may enhance management decision-making. Corporate headquarters has access to the most recent sales, inventory, and production data and makes use of this data to estimate sales and output more precisely. Enterprise software contains analytical capabilities for assessing overall organizational performance utilizing data gathered by the system. The whole organization accepts uniform defined definitions and formats for enterprise system data. Performance metrics are the same across the organization. Enterprise systems make it simple for senior management to assess the performance of any organizational unit at any time, identify the most and least profitable items, and estimate expenses for the whole business. Alcoa's enterprise system, for instance, has functionality for global human resources management that quantifies the costs associated with providing services to employees across the entire organization as well as the efficiency of hiring, rewarding, and training new employees.

Systems for Supply Chain Management

There is a good probability that you will only have a few suppliers if you run a small business that produces or sells a limited number of goods or services. Using a phone and fax machine, you

may schedule the orders and delivery from your suppliers. However, you will have hundreds of suppliers, and each of your suppliers will have their own set of suppliers if you run a company that produces increasingly complicated goods and services. Suddenly, you find yourself in a position where, in order to create your goods and services, you must coordinate the operations of hundreds or even thousands of other businesses. We discussed supply chain management systems in section 2 as a solution to the issues of supply chain complexity and size.

Source Chain

The supply chain of a company is a web of businesses and institutions responsible for acquiring raw materials, processing those resources into intermediate and completed goods, and delivering those goods to clients. In order to deliver products and services from the point of origin to consumption, it connects suppliers, production facilities, distribution centers, retail establishments, and customers. Materials, data, and payments go back and forth via the supply chain. As items progress through the supply chain, they change from being raw materials to intermediate products to completed products. The completed goods are sent to distribution hubs, where they are then distributed to stores and consumers. Returns go from the customer back to the seller in the other way.

Take the supply chain for Nike shoes as an example. Nike creates, markets, and distributes shoes, socks, sportswear, and accessories all over the globe. Contract manufacturers with factories in China, Thailand, Indonesia, Brazil, and other nations are its main suppliers. These businesses create Nike's completed goods. Sneakers aren't made from scratch by Nike's contracted vendors. They purchase the laces, eyelets, uppers, and soles from different sources and put them together to create completed shoes. These suppliers have their own suppliers in turn. For instance, the manufacturers of soles may find suppliers of synthetic rubber, chemicals to melt the rubber for molding, and molds to pour the material into. Thread, colors, and plastic lace points are all sourced by providers of laces.

The mechanisms for managing relationships with them are part of the upstream segment of the supply chain, along with the company's suppliers, suppliers' suppliers, and suppliers' suppliers. The organizations and procedures used to distribute and deliver goods to clients make up the downstream component. Companies that engage in manufacturing, like the contract manufacturers of sneakers for Nike, also oversee their own internal supply chains for managing materials and inventory and converting the materials, components, and services provided by their suppliers into finished products or intermediate products for their clients. It solely displays the upstream supply chain for shoe soles and the supply chain for two contract makers of sneakers. With their own set of tools, each Nike contract factory produces completed shoes, socks, and sports wear in the hundreds. The Nike supply chain would really include thousands of firms in the upstream area. The downstream part of Nike's supply chain is enormous and intricate due to the company's extensive network of distributors and the thousands of retail locations where its sneakers are sold[4]–[6].

Systems for information and supply chain management

Inaccurate or delayed information leads to supply chain inefficiencies including component shortages, underused plant capacity, excessive finished products inventories, or high

transportation costs. For instance, manufacturers could retain too many components on hand because they are unsure of the precise timing of their upcoming shipments from their suppliers. Because suppliers lack exact knowledge on demand, they may order too few raw materials. The operational expenditures incurred by a corporation are wasted by these supply chain inefficiencies to the extent of 25%. A very effective just-in-time approach might be implemented if a manufacturer had full knowledge of the precise number of units of a product consumers needed, when they wanted them, and when those units could be produced. Finished items would be transported as they left the manufacturing line, and components would arrive precisely when they were required.

However, there are always unknowns in a supply chain, such as unclear product demand, delayed supplier shipments, faulty components or raw materials, or malfunctions in the manufacturing process. Manufacturers sometimes cope with these uncertainties and unanticipated occurrences by retaining more material or goods in inventory than they believe they may ultimately require in order to please consumers. The safety stock serves as a buffer for the supply chain's lack of adaptability. Low fill rates are also expensive since there may be missed sales as a result of canceled orders, even while extra inventory is expensive. The bullwhip effect, which occurs when information regarding a product's demand is skewed as it moves from one organization to the next throughout the supply chain, is a common issue in supply chain management. Distribution companies, manufacturers, suppliers, secondary suppliers, and tertiary suppliers may all stockpile inventory in response to a slight increase in demand, ensuring that they have enough on hand "just in case." These changes ripple throughout the supply chain, amplifying what began as a small deviation from planned orders, leading to excess inventory, production, warehousing, and shipping costs. For instance, Procter & Gamble discovered that due to such inaccurate information, it had overly large inventories of its Pampers disposable diapers at different locations throughout its supply chain. Although consumer spending in shops was often low, distributor orders would rise when P&G ran strong price reductions. Along the supply chain, Pampers and its component parts collected in storage facilities to satisfy fictitious demand. P&G improved its marketing, sales, and supply chain procedures and employed more precise demand forecasts to solve this issue.

When every link in the supply chain has precise and current information, the bullwhip may be controlled by lowering uncertainty about demand and supply. All supply chain participants would have more exact knowledge of how to modify their sourcing, production, and distribution plans if they shared dynamic information about inventory levels, timetables, predictions, and shipments. Information from supply chain management systems is the sort that enables supply chain participants to make better scheduling and buying choices. Moving farther downstream in the supply chain might result in modest changes in demand for a product being exaggerated by inaccurate information. Distributors, producers, and suppliers may end up with too much inventory due to little variations in retail sales.

Software for supply chain management

Software for supply chains may either assist companies in planning their supply chains or in carrying out the phases of the supply chain. Supply chain planning tools provide the company the ability to model its current supply chain, create product demand projections, and create the best

sourcing and production strategies. By establishing inventory levels for raw materials, intermediate products, and finished goods, figuring out where to store finished goods, and choosing the most effective mode of transportation for product delivery, these systems assist businesses in making better decisions.

A major client placing a larger-than-usual order or changing it abruptly, for instance, might have a significant effect on the whole supply chain. It could be necessary to place an order with suppliers for more raw materials or a different combination of raw materials. Job scheduling in manufacturing may need to alter. A shipping company could need to postpone delivery. Production and distribution plans are adjusted as needed using supply chain planning software. The appropriate supply chain participants exchange information regarding changes so that their activities may be coordinated. Demand planning, which calculates how much goods a company needs to produce to meet all of its customers' wants, is one of the most crucial—and challenging—functions of supply chain planning. Oracle, SAP, and JDA Software all provide supply chain management services.

Systems for managing the flow of merchandise through warehouses and distribution centers guarantee that merchandise is delivered to the appropriate places as quickly as possible. They keep tabs on the physical condition of the items, the administration of the materials, the operations of the warehouse and transportation, and the financial data involving all parties. Examples include the Warehouse Management System used by Haworth Incorporated and the Oracle Transportation Management system used by Land O'Lakes. Haworth is a renowned producer and designer of office furniture in the globe, with distribution facilities spread across four states. The movement of completed items from Haworth's distribution hubs to its clients is monitored and managed by the WMS. The WMS coordinates the flow of items depending on immediate circumstances for space, equipment, inventory, and employees while acting on shipping plans for client orders. In the interactive session on organizations, it is discussed how DP World uses RFID technology to improve the effectiveness of the supply chains of its clients. The delivery of customers' containers is made easier, quicker, and more efficiently thanks to DP World's usage of RFID-enabled scanning and tracking technology. This improves customer satisfaction.

The Internet and Global Supply Chains

The inability to easily transfer information across various internal supply chain systems for buying, materials management, production, and distribution impeded supply chain coordination before the invention of the Internet. Additionally, it was challenging to communicate data with outside supply chain partners since their systems—those of suppliers, distributors, or logistics companies—were built on different technology platforms and industry standards. Some of this integration is provided through enterprise and supply chain management systems that have been augmented with Internet technologies. DP World has every cause to be pleased with its success in rising to the top tier of global terminal operators. DP World currently has 60 terminals spread across 6 continents, and 11 more are being built. More than 30,000 professionals from across the globe are employed by the company to assist clients in some of the world's most vibrant economies. By offering top-notch, cutting-edge services to effectively handle container, bulk, and other terminal cargo, DP World has chosen a customer-centric strategy to improve the

supply chains of its clients. To effectively serve its clients, the company makes significant investments in terminal infrastructure, technology, and personnel[7]–[10].

Like other international port and terminal operators, DP World supports shippers in addressing the often difficult and expensive difficulties of managing the supply chain. Traffic congestion at port entrance points is one of the common issues faced in container terminal operations. This backlog is often brought on by the delays caused by drawn-out processes and paper-based logistics. DP World has responded by introducing a variety of IT-based solutions to improve terminal capacity utilization. These solutions include two-way digital radio communications, electronic customs discharge of goods, electronic data interchange reporting, and the sophisticated "e-token" booking system. To increase container turnover, DP World management opted to take things a step further and implement "just in time" loading and unloading practices. It was discovered that using Radio Frequency Identification technology to speed up truck movements via port entry gates was an efficient method. At its port facilities in Dubai and Australia, DP World now employs RFID-enabled automatic gate systems. The implementation of an automated gate system, in accordance with Mohammed Al Muallem, managing director of DP World UAE, will not only assist to remove traffic congestion but also a number of time-consuming processes, boosting productivity at the ports and enhancing customer satisfaction. In turn, this will speed up the transportation of products. DP World spent many months conducting proof-of-concept trials with a number of rival RFID providers prior to the RFID implementation. DP World mandated that 99.5% of all tags be correctly read due to the challenging climatic conditions at the ports, which posed a significant problem for several companies. Identec technologies, a world leader in active wireless tracking technologies, was chosen by DP World as their RFID provider after comprehensive testing and review.

The State of the World's Supply Chains

The production, distribution, and delivery of products and services around the globe is carried out via a network of interrelated organizations, procedures, and resources known as the global supply chain landscape. It includes the movement of components, completed goods, and raw materials across several nations and continents. The following are some salient features and developments in the global supply chain landscape:

Globalization: Over time, the environment of the supply chain has grown more international. Companies produce their goods in one area using components and raw resources sourced from many nations, then sell them in international markets. Modernizations in trade agreements, communication, and transportation have made globalization easier to achieve.

Outsourcing and Offshoring: In order to save money, many businesses offshore supply chain operations like manufacturing. As a result, nations like China, India, and Mexico have become important industrial centres. Offshoring has made supply chains more complicated, necessitating efficient management and collaboration across several locations. Just-in-Time (JIT) manufacturing and lean concepts have become more popular in the supply chain environment. These strategies put a heavy emphasis on cutting waste, lowering inventory levels, and boosting productivity. To guarantee timely delivery of materials and components, JIT methods need strong cooperation between suppliers and customers.

Technology and digitalization: The environment of the supply chain has changed as a result of technological advancements. Manufacturing, warehousing, and logistics have become more efficient and accurate because to automation, robots, and artificial intelligence (AI). Real-time visibility, data analytics, and predictive capabilities have been made possible by digitalization, enabling businesses to make better choices and manage their supply chain processes.

Sustainability and ethical conduct: The supply chain landscape is placing more and more focus on sustainability and ethical conduct. Companies are becoming more and more concerned with social responsibility, ethical sourcing, and environmental effect. Reducing carbon emissions, enforcing fair labor standards, and guaranteeing ethical raw material procurement are all examples of sustainable supply chain strategies.

Supply Chain Resilience: The significance of supply chain resilience has been brought to light by recent interruptions including the COVID-19 pandemic, trade disputes, and natural catastrophes. Businesses are increasingly putting their attention on creating robust supply chains by diversifying their suppliers, enhancing visibility, and putting risk management techniques into place to lessen future disruptions.

E-commerce and omni-channel distribution: The development of e-commerce has had a profound effect on the nature of the supply chain. Nowadays, businesses must handle both offline and online retail channels, often using omni-channel distribution strategies. This calls for effective inventory management, adaptable alternatives for fulfillment, and seamless fusion of online and offline activities.

Environment of Regulation and Trade: The regulatory and trade environment has a significant impact on how the global supply chain is shaped. Trade agreements, taxes, and rules all have an influence on where products are produced and how they are shipped. Regulator changes may create uncertainty and difficulties for businesses involved in the global supply chain. These are a few of the major traits and developments in the global supply chain landscape. It is a dynamic, developing field that need ongoing adaptation to meet the shifting requirements and difficulties of a global economy.

CONCLUSION

In conclusion, Enterprise systems are all-encompassing software packages that provide enterprises the ability to manage and integrate fundamental business operations across functional domains. Enterprise systems improve operational efficiency, decision-making, and customer happiness by offering a consolidated platform, real-time data visibility, and process automation. Enterprise system implementation requires careful planning and customization to meet organizational needs, but the advantages in terms of improved productivity, efficiency, and agility make it a worthwhile investment for businesses looking to improve their operations and gain a competitive advantage.

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AN OVERVIEW ON GLOBAL SUPPLY CHAINS

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ABSTRACT:

Global supply chains have become an integral part of the modern business landscape, enabling organizations to source materials, produce goods, and distribute products on a global scale. This studyprovides an overview of global supply chains, their characteristics, challenges, and their significance in driving global trade, economic growth, and organizational competitiveness.Global supply chains encompass the network of interconnected organizations, suppliers, manufacturers, distributors, and service providers involved in the production, assembly, and delivery of goods and services across different countries and regions. They involve complex logistics, transportation, and coordination activities to ensure the timely and efficient flow of materials, information, and products across borders.

KEYWORDS: *Customs Compliance, Distribution Network, Global Logistics, Inventory Management, Lean Manufacturing, Logistics Optimization.*

INTRODUCTION

Depending on your viewpoint, these phrases might elicit a broad range of contradictory feelings. Global supply chains are advantageous to customers from one point of view because, according to the rule of comparative advantage, everyone will have access to cheaper products and services. Producers have a ton of opportunity because to global supply networks, which provide them access to a large market. From a different angle, international supply chains have a lot of negative effects on the economy. It may lead to a shift of more employment to cheaper labor markets abroad. A further worry is that if these occupations go elsewhere, the skills required for them might ultimately vanish as well. Other issues include a potential rise in supply chain hazards and complexity as a result of the ability to now buy items from far-off places. Concern also exists around the length of time it takes to get these things.

Let's first describe the global supply chain, which is the network of suppliers, manufacturers, warehouses, distribution centers, and retailers that allows raw materials to be bought, converted, and supplied to clients, before we discuss either viewpoint. People all throughout the globe have come to embrace the idea that globalization and global supply chains are here to stay, whether they are viewed positively or negatively. This idea was succinctly expressed by British MP Clare Short, who said, "People have accused me of supporting globalization. To say that I support the sun rising in the morning is the same as making this claim[1]–[3].

A natural consequence is that firms in one nation will rely on organizations from other countries, either to provide material or to promote their goods, assuming that global supply chains are here to stay. What are organizations doing to capitalize on these codependences and form alliances that will improve their ability to compete in the market is a logical question to pose. What are the most pressing issues? The capacity of a party to manufacture a good at a lower cost than another party is referred to in economics as the law of comparative advantage. What does this mean for the chief executive officer and her staff, especially the global supply chain manager? Do these concerns address ways to foster cooperation with organizations in other parts of the world? if so, in which areas? In order to respond to these queries, it is necessary to evaluate the main problems relating to international supply chains.

One of these problems is the restrictive definition and operationalization of supply networks, and specifically global supply chains, that has mostly been done from the viewpoint of academics and practitioners in North America and Western Europe. Such a viewpoint disregards potentially opposing viewpoints held by individuals in other parts of the globe. These historically rooted, ethnocentric North American and European attitudes result from the past 500 years of economic development. However, the planet is becoming more and more "flat," at least when seen regionally. Organizations risk their own success by ignoring regional distinctiveness. This book's objective is to enlighten decision-makers about supply chains in every part of the globe, highlight their distinctive qualities, and assist them in making better informed choices. In order to understand the nature of modern global supply networks, it is instructive to talk about how supply chains have changed through time. Following talks on strategies and techniques CEOs and their teams may use to improve the competitive position of their firms will be facilitated by these insights.

Supply Chain Evolution: A Trip through Time

Supply chains are not a new phenomenon. Although the phrase "supply chain" was probably certainly not prevalent until late in the 20th century, they have been there for many millennia. However, throughout time, supply networks have gone through a number of phase transitions that were often powered by technical advancements that rendered certain supply chain techniques that were in use at the time of these advancements outdated or ineffective. It is useful to look at how top companies and even whole nations responded to these developments to increase their market dominance.

DISCUSSION

Supply Chains through Circa 1750: Trading Supply Chains trade supply chains, which are networks of trade partners involved in carrying products from one area to another, often without altering the items at intermediate locations, are the best way to describe supply chains up until around 1750. For instance, the Phoenicians engaged in frequent commerce with Egypt more than 4500 years ago. They developed networks of trade alliances with their neighbors, purchasing gold and other goods from the Nile Valley and sending wine, olive oil, and cedar. In the beginning, much of the manufacturing was done locally by one person or a very small group using resources that were readily accessible. The items were first exclusively sold locally, but as transportation became more reliable, commerce between farther-off locations began to flourish.

The Original Long-Distance Travelers

The oldest long-distance commerce, according to many historians, took place between Mesopotamia and the Indus Valley in Pakistan during the fourth and third millennia BC. Additionally, there is evidence that China and India had established marine links even before this period. The majority of commodities were moved by water since there were no adequate roadways. For instance, the Egyptians imported spices from East Africa and Arabia through trading routes along the Red Sea. Cities developed by exploiting these waterways to import and export things by sea to distant nations as they formed in fertile basins along river borders. Land-based trading routes first appeared about 1000 BC. India and the East were connected to the Mediterranean through camel-powered caravan routes. Now, commercial channels for goods extended all the way to Scandinavia and Ireland from the Mediterranean.

The Incense, Spice, and Silk Routes

The name "Silk Road," first used in 1877 by German geographer Ferdinand von Richthofen, referred to a network of connected trade routes that connected Asia and Europe across a distance of more than 4,000 miles over the Afro-Eurasian continent. During the Han Dynasty, trade along the Silk Road flourished. The Silk Road contributed significantly to the economic growth of China, India, Persia, and Arabia throughout its lengthy existence, which lasted far into the 15th century. For a few reasons, the title "Silk Road" is a little deceptive. First of all, it was a network of roads that passed via many oasis villages in Central Asia rather than a single route. Second, a variety of other items were exchanged in addition to silk, which was the main commodity. Ivory, precious metals, and gold were all transported by caravans traveling in the direction of the East. Furs, ceramics, jade, lacquer, and bronze artefacts were among the items being sent in the other way. Goods often went through numerous hands.

Despite the Silk Road's network of routes, such trade supply chains were often linear in the sense that products and resources were transported straight from the point of production to the location of the buyer. The Incense Route was a network of significant ancient land and sea trade routes that connected the Mediterranean ports to India and beyond, passing via the Levant-Mashriq area, Egypt, eastern Africa, and Arabia. Arab traders, who utilized camel caravans to carry frankincense and myrrh, mostly dominated the Incense Route, which was prosperous from around 600 BC to AD 100. These very valuable scents came from plants that grew in southern Arabia, Ethiopia, and The Mashriq and the Levant refer to roughly the same geographical and cultural area. Levantine area encompasses the contemporary states of Lebanon, Syria, Jordan, Israel, Cyprus, sections of southern Turkey, and portions of Iraq. Israel, Jordan, Lebanon, Syria, Iraq, and Kuwait are all part of the Mashriq area.

There was little commerce between the Americas and the rest of the globe until the Spanish Treasure Fleet began operations in the middle of the 1500s. The Silk Road, Incense Route, and Spice Route linked the East with Europe. The Spanish Empire used a convoy system called the Spanish Treasure Fleet, also known as the Plate Fleet due to the Spanish word for silver, from the middle of the 1500s until about 1800 to transport goods from the Spanish colonies in the Americas to Spain, including silver, gold, wood, metal, precious stones, spices, silk, sugar, and tobacco. The reverse route was used to transfer equipment and military troops. Despite the fact

that the Incense Route and the Plate Fleet were mostly under the hands of the Arabs and the Spanish, respectively, commercial supply networks did not generally have any dominating organizations in charge of them. The East India Company, which was founded in 1600, was no exception. Beginning as a trade firm, this organization was drawn to the riches of the Indian subcontinent, particularly the wealth produced by the textile industry in the state of Bengal. However, it proceeded to enforce its textile trade interests and eventually began to exert territorial authority over the majority of the Indian subcontinent in the 1700s. Up until this point, China and India dominated the commercial supply chains. These two nations were among the richest in the world in 1700, with a combined GDP that, when converted to an international currency, represented 46.74 percent of the global GDP.

This scenario was significantly altered by the Company's business tactics and the English Industrial Revolution. The expansion of the textile industry in Manchester, England, in the 17th century served as the impetus for the Industrial Revolution, which helped move the hub of supply chain activity from Asia to Europe. The Industrial Revolution also brought about a shift from supply networks for commerce to supply chains for industry. Before the Industrial Revolution, products were made by hand or using crude equipment. This was how craftspeople produced things. In rural settings, goods were often produced using locally accessible raw resources. Typically, one person or a small group of people worked on a product until it was finished and prepared for delivery to a consumer. Craft production persisted for a time, and things were still made and consumed. An economic fictitious currency based on PPP and the typical global commodities prices for relatively limited geographic areas. However, industrialization was starting to pique the same kind of curiosity as agricultural advances created by individuals like Jethro Tull, who is credited with inventing the horse hoe and the seed drill. Although the exact start of the Industrial Revolution is difficult to pin down, historians generally agree that it began in England in the 18th century, was sparked by a number of technical and social advances, and expanded gradually to the rest of Europe. The steam engine's use in the development of power-driven machines as well as in the quick development of transportation was what made it possible for the Industrial Revolution, which was characterized by the application of power-driven equipment to manufacturing[4]–[6].

Even though early 1800s supply chains were still essentially commercial supply chains, incorporating networks of trading partners, the inclination of craftspeople to reject industrialisation was waning by the middle of the century. The items were not altered or processed by these trade partners in intermediary sites. Manufacturing supply networks were not yet common at this time; they were waiting for a few significant developments that happened at the beginning of the 19th century. The development of railways, steamships, and the use of electricity were not among these events.

Canals, Rivers, Steamboats, and Railroads

Because the United States had a continental economy, the Industrial Revolution did not impact it as soon as it did England and the rest of Europe. Economic expansion was severely constrained by slow transportation. Wagons could barely move 20 miles per day;therefore, the early 19th century turnpike development had a little impact. The 1825 completion of the Erie Canal increased travel times. The canal linked farmers in the Midwest with the East Coast and the

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Great Lakes with New York City. Canal boats provided a means of transportation, but they were comparatively sluggish and could not run when the canals were frozen over. This situation was improved by the construction of railways.

The railways, which connected the Atlantic coast with the Great Lakes in 1850, Chicago in 1853, and the western bank of the Mississippi in 1856, were the first "big business" in the United States. Railroads reduced the cost of transportation, widened the market, and reduced price differences between far-off markets. For instance, wholesale wheat costs in Cincinnati were only 70% of those in New York in the late 1840s, but a decade later, when New York prices fell, they were at 95%. The lowering of wheat costs made it more affordable for a bigger population to live comfortably on the East Coast. Farmers in the Midwest also profited since they could now serve that wider market.

Because it marked the construction of a continuous railroad line running from the Atlantic to the Pacific Ocean, 1869 was a crucial year for the development of American railroads. Soon, railroads were transporting a variety of goods throughout the continental United States, including spices, fruits, cattle, sheep, and minerals, as well as tea, silk, and handicrafts from China, India, and Japan. The railways were the first substantial industry in the United States, much as they were in the United Kingdom, but in a different capacity. Due to its small size, the United Kingdom did not see the same significant reductions in transportation costs that the United States did once railways were built. However, railroads were extremely important in its colony, India, where the British built a sizable rail infrastructure to move raw materials, troops, and agricultural products throughout the Indian subcontinent as well as to transport the products of Britain's industrial revolution to the hinterland.

At the beginning of the 19th century, steam-powered ships became more common. Steam-driven ships were less impacted by weather than sailing ships and could cover the oceans more quickly. In the United States, steam-powered ships with paddlewheels started to supplant sailing ships. The first steamship to cross the Atlantic in 1843 was also used in the Great Lakes and other seas. By the 1850s, steamships often sailed across the North Atlantic. Governments paid ship owners significant sums of money to transport letters and cargo across the ocean because steam-driven ships crossed it more quickly. It took 43 days for word of Hans Christian Andersen's first collection of fairy tales to reach America in 1835. News from Europe was reaching Americans in less than 20 years, in only 14 days.

Industrialization was well-established in northern America and most of Europe by the middle of the nineteenth century. In 1870, the U.S. GDP increased from 0.14 percent of the global GDP to 8.93 percent, expanding quickly even as industrial supply networks in Europe and the US continued to expand. The globe kept rapidly contracting as new modes of transportation and communication accelerated daily life. With a combined GDP of less than 30% in 1870, the once-dominant economies of the globe, India and China, were no longer in the lead. According to the discussion in Chapter 4 on South Asia, the Company accelerated this change, essentially moving money from the British colonies to the United Kingdom. As a result, the GDP of the United Kingdom increased significantly from 2.88 percent in 1700 to 9.10 percent in 1870, while the GDPs of China and India were contracting.

The Era of Mass Production: Tools to Save Our Lives

During the age of mass production, supply networks in manufacturing grew in popularity. Eli Whitney's discovery of interchangeability had a significant influence on mass production since it made it feasible to manufacture product components in one place and move them to another for assembly. The development of industrial supply chains, however, was significantly influenced by two occasions that happened in the early 1900s. The Wright brothers' momentous flight, which launched the era of flying, was the first; Henry Ford's introduction of the moving assembly line was the second. Foster said that the Wright brothers' historic flight on December 17, 1903 only spanned 120 feet, or less than half the length of a football field. The Wright brothers had a significant role in altering public perceptions of transportation and travel times if they had launched their aircraft at the rear of the Boeing 747's economy class. Even famous science fiction writer Jules Verne, who published Around the World in Eighty Days in 1873, surely had no clue how far the world would come in only 50 years.

Henry Ford was developing his production and assembly processes to revolutionize how the world would see manufacturing at the same time as the Wright brothers were revolutionizing how people saw travel. By fully using mass manufacturing, Henry Ford returned the gains to the client. Before he started his business, cars cost more than $1,000. Ford reduced manufacturing costs by concentrating on eliminating waste at every stage of the process. He returned the majority of the cost savings to his clients. The American manufacturing sector, and the car sector in particular, had sustained growth during the first half of the 20th century and into the 1970s. At that time, demand was far higher than supply, and consumers were eager to purchase whatever that manufacturers had to offer. Although it was seen as a "golden era" for American business, this time was really troubled in a variety of ways. For instance, General Motors headed a cartel of the main three auto manufacturers. However, since they can afford to be, cartels, like their more integrated relatives' monopolies, tend to become inefficient and ineffectual.

These issues were made worse by mass manufacturing techniques, which led to an overabundance of completed automobiles and inventories for work-in-progress in the plants. The substantial WIP inventory served as a buffer for any production delays that may otherwise have been brought on by quality issues, and it also lowered the urgency with which these issues needed to be fixed to prevent future occurrences. Furthermore, quality issues were often not discovered until after the product had been sold. In other words, the American car sector really needed to be shaken up. The energy crisis in the 1970s caused imports from Japan, which caused this upheaval. Because they first focused on creating tiny and subcompact automobiles with outstanding fuel efficiency, Japanese automakers were able to attain such a high level of success. They were able to enter the American market with these smaller automobiles thanks to the oil crisis. Additionally, these manufacturers were able to produce cars at cheap costs by embracing the just-in-time production management concept, which was pioneered by individuals like Taiichi Ohno, who had a significant role in the creation of the well-known Toyota manufacturing system. These JIT production management methods—also known as lean production or just Leanbecame the standard for manufacturing procedures all around the globe.

Lean manufacturing was more adaptable than conventional techniques that produced goods in huge quantities. As a result, the system's inventory needed to provide this flexibility was

substantially lower. Due to public perceptions that Japanese automobiles were of far higher quality than American-made cars, they also gained popularity on the U.S. market. Henry Ford's obsession with detail served as a model for many of the Lean principles ingrained in Japanese production techniques, but the Japanese automakers expanded on his ideals. For instance, Henry Ford sold his customers cars in a single color to cut down on setup time when switching paint shades. Ford's concepts were modified by the Japanese in order to diversify their product offers. Lean manufacturing methods had replaced conventional batch production methods all around the globe by the end of the 1980s. Although Lean was first exclusively used in the vehicle manufacturing sector, other sectors, like the electronics sector, quickly adopted it to increase efficiency. Prior to this, cross-border communication between businesses mainly consisted on point-to-point connections between two users or end devices. Such communication was conducted through the phone, telegraph, or telex machines, or it was done on paper and often sent by snail mail. Even email communication has its limitations. These limitations were lifted in 1990 with the launch of the World Wide Web, which greatly improved international communication.

Supply Chains: Global IT-Enabled Supply Chains from 1990 to the Present.The administration and coordination of operations within a worldwide supply chain are referred to as being "IT-enabled" or "globally IT-enabled" in this context. IT is essential for improving the responsiveness, efficiency, and visibility of supply chains across several regions. Here are a few crucial components of international supply networks supported by IT:

Supply Chain Visibility: IT solutions make it possible to see inventory levels, manufacturing status, and shipment tracking in real-time for all phases of the supply chain. By improving control and coordination over their global supply chain activities, firms may increase efficiency and responsiveness[7]–[10].

Demand Planning and Forecasting: To increase the accuracy of demand planning, IT-enabled supply chains use data analytics and forecasting algorithms. Companies may synchronize inventory levels, manufacturing plans, and logistical operations to meet expected demand by examining historical data, market trends, and consumer insights. IT technologies make precise and timely inventory management possible across international supply chains. Businesses may keep track of inventory levels, keep track of product movements, and automate replenishment procedures by using technologies like barcode scanning, RFID, and warehouse management systems (WMS).IT systems provide seamless communication and cooperation with suppliers across geographical boundaries. See also: Supplier Collaboration and Management. The use of web-based portals, EDI, and supplier relationship management (SRM) systems streamlines communication, order placing, and performance monitoring, resulting in better partnerships and more effective supplier management.

Distribution and Warehouse Management: IT technologies that streamline logistics and warehouse operations include transportation management systems (TMS) and warehouse management systems (WMS). These technologies speed up order fulfillment and save transportation costs by automating tasks like order picking, packaging, and shipping routing.

Global commerce Compliance: IT solutions help businesses get around the convoluted rules and processes of international commerce. They streamline trade paperwork management, compliance checks, and documentation management for documents, assuring compliance with legal requirements and reducing delays or fines related to cross-border shipments. IT-enabled supply chains improve risk management skills by offering resources for risk assessment, risk mitigation, and scenario preparation. To lessen the effects of risks like natural catastrophes, geopolitical uncertainty, or supplier interruptions, businesses should detect probable disruptions, assess their impact, and develop contingency plans.

Integration with e-commerce: IT solutions allow for easy integration of supply chain activities with online shopping carts. This connection makes it easier for businesses to handle both conventional and e-commerce distribution channels by facilitating order processing, inventory synchronization, and fulfillment automation for online sales channels. IT-enabled supply chains use data analytics to acquire insights into supply chain performance parameters including on-time delivery, order accuracy, and inventory turnover. These analytics help data-driven decision-making across the global supply chain, identify bottlenecks, and allow ongoing improvement initiatives.

Global supply chain management operations are more effective, visible, and agile when IT is used to empower supply chains. It specifically released the Internet's potential, causing a new phase change from industrial supply networks to global IT-enabled supply chains. The Internet and the Web are sometimes wrongly thought to be interchangeable, yet the Internet exists for many years before the Web. In the 1960s, the Internet was first created to enable point-to-point communication between mainframe computers and computer terminals. Soon after, the Internet was improved to provide point-to-point connections between computers, and finally, in the early 1980s, it made it easier to communicate across networks of computers. Despite being designed initially for use by the U.S. Department of Defense, research institutions, and universities soon had access to the Internet as well.

Internet service providers were able to provide commercial enterprises access to the Internet in 1990 as a result of the emergence of the Web. Some use limitations originally applied to commercial traffic, but by 1995, these limits had been lifted. The price of real-time international communications, which had previously been barely affordable, became immaterial with the elimination of these limits. Global reach between suppliers and customers—both inside and beyond organizations—is increasingly what defines the IT-enabled supply chain. Now that the end user's true demand can be ascertained, businesses throughout the supply chain may plan their operations appropriately. The time it takes businesses to meet consumer demand has been drastically reduced because to cutting-edge management strategies like Lean. Similar reductions in the amount of time items spend in travel and storage have been made possible by advances in logistics. In fields as varied as aerospace, supermarket retailing, garment manufacturing, automotive manufacturing, and healthcare, supply chain participants are increasingly ready to forego arms-length connections in favor of long-term collaborations.

CONCLUSION

In conclusion, the way businesses do business and compete on a worldwide scale has been completely transformed by global supply chains. They provide businesses the ability to reach international markets, streamline processes, and take use of specialist resources. However, managing global supply chains calls for overcoming a number of obstacles and putting into place efficient risk management plans. Businesses who can successfully negotiate the complexity of global supply chains stand to earn large competitive advantages and have a positive impact on the sustainability and prosperity of the global economy. Additionally, attempts to promote sustainability and corporate social responsibility rely heavily on global supply networks. In their supply chain operations, businesses are putting more and more emphasis on social impact, environmental sustainability, and ethical sourcing. Organizations may implement sustainable practices, advance fair labor standards, and lessen environmental effects throughout their worldwide operations by using global supply networks.

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A FUNDAMENTAL STUDY ON SUPPLY CHAIN COMPLEXITY

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ABSTRACT:

Supply chain complexity has emerged as a critical challenge for organizations operating in today's global business environment. This studyprovides an overview of supply chain complexity, its causes, impacts, and the strategies organizations can employ to effectively manage and navigate the complexities of modern supply chains.Supply chain complexity refers to the intricacies and interdependencies that arise from the multitude of factors affecting supply chain operations. These factors include global sourcing, multiple stakeholders, diverse product portfolios, volatile demand patterns, regulatory requirements, technological advancements, and geopolitical uncertainties. The complexity is further amplified by the need for organizations to balance cost efficiency, responsiveness, sustainability, and customer expectations.

KEYWORDS: *Demand Volatility, Globalization, Inventory Management, Lead Time Variability, Logistics Network.*

INTRODUCTION

IT-enabled supply chain has not yet delivered to its full potential despite the anticipated advantages for a variety of reasons. In the customer-centric business environment that defines the IT-enabled supply chain era, production capacity frequently exceeds customer demand, in contrast to the production-centric era that predominated for much of the 20th century in which the demand for goods and services frequently outstripped production capacity. Managers are fully aware of the very competitive environment they work in in today's global corporate world. Better goods are in high demand, and consumers want them now more than ever. In a world where product life cycles are becoming shorter, businesses must adapt to these consumer needs in order to stay competitive.

Supply chain management has regressed in many of these businesses. These firms are wasting some of the advantages that new technology and methods may provide. First, think about the advantages that the Internet and IT advancements may provide. Organizations can now see both customer demand and the flow of items across the supply chain thanks to the Internet. The Internet has, however, turned out to be a double-edged sword for these businesses since it has made it simple for consumers who are price conscious to compare rates for any product or service. As a result, the majority of these goods and services have undergone some level of commoditization, which has had several unfavorable effects, one of which is how organizations have reacted to it[1]–[3]. Many organizations have turned to cost-cutting measures to fulfill Wall

Street expectations on gross margins and quarterly profit and loss reporting as a result of rising worldwide competition for their goods and services. Costs must undoubtedly be kept in check, but if they become the deciding factor in decisions, the supply chain or the system for delivering products may become less effective. If all repercussions are not thoroughly examined, it might result in a paradoxical scenario where expenses actually rise.

For instance, through outsourcing or offshoring activities, many firms seek labor and material arbitrage in an effort to reduce costs. A case study is used to show the difficulties firms in the twenty-first century encounter when they try to minimize expenses via offshore.

Going Home: When Offshoring Goes Wrong

Consumer electronics company Alpha Systems Corporation is based in Knoxville, Tennessee. The creator of ASC earned a degree in both business and agriculture from the University of Tennessee. He merged his passions for business and animals to establish a firm that specialized in pet confinement devices. His preference was to develop and market novel items, therefore he outsourced the sourcing, manufacturing, and logistics. Early on, he procured goods from contract electronics producers in the Southeast and Midwest of the United States, and he mostly distributed them via local sales channels. He started using a nationwide third-party logistics company to transport his completed items from the manufacturers to a distribution facility in Indianapolis, Indiana, as his company developed and his market region increased. Additionally, the 3PL handled client order fulfillment from the location in Indianapolis.

ASC steadily increased its employees as it expanded in order to plan and oversee the growing complexity of the supply chain. Like many other electronics organizations, this team started to consider purchasing goods from contract electronics manufacturers in China as they looked for methods to lower supply chain costs and increase profit margins. By the middle of the 2000s, the company had outsourced almost all of its product production and sourcing to Chinese vendors. Offshoring and outsourcing are two names describing the act of hiring a company or individual to carry out a certain task. Offshoring is a unique kind of outsourcing when the work is carried out elsewhere.

ASC was first mesmerized by the sharp drop in its cost of products sold brought on by this new buying structure. It quickly discovered, however, that there was a drawback to this design. Average completed products inventory increased significantly, and inventory turns also decreased. The Indianapolis facility's cycle times from the Chinese manufacturers increased to an average of 140 days, while customer KPIs including product availability decreased. Worse even, the COGS savings were significantly reduced as gasoline costs increased over the last several years, manufacturing labor rates in China continuously increased, and more inventory was added to reduce the possibility of order interruption or delay. In conclusion, ASC learned that outsourcing came with a variety of unintended expenses and dangers. The company started looking at alternatives to Chinese sourcing because of the shifting cost and risk structures. Organizations often function in a cost-driven environment when they prioritize cost-cutting above improving customer experience. In such a setting, they often make poor judgments and use poor tactics.

The apparent response is that these companies simply did not do their research, concentrating on short-term cost savings without taking into account all unforeseen expenses when trying to calculate the total cost of ownership for choices on outsourcing. Obviously, the majority of businesses include transportation expenses into TCO estimates. Many businesses additionally include in port fees, customs taxes, and tariffs, as well as quality expenses like inspection fees and disposal costs per cargo and schedule noncompliance costs like lost revenue and rushed shipments. The price of increased pipeline inventory is often taken into account by these entities. A few businesses explore the more complicated expenses associated with supplier qualification costs and risk, including currency, supply, and intellectual property issues.

However, only a relatively tiny portion of these businesses take into account some of the difficult-to-calculate expenses, such the cost of lead time and the cost of flexibility, two factors that may significantly harm a business' ability to compete. The adage "distance matters" takes on a whole new meaning in light of these two expenses. Businesses that are aware of these expenses are more likely to concentrate on near-shoring and maybe even in-shoring their procurement. The TCO model makes it obvious that, despite the fact that fundamental changes are flattening the globe, distance still counts. Offshoring's recent surge is probably over. A better understanding of the need of conducting an accurate TCO analysis and assuming a broad perspective with regard to their global supply chain exists among organizations.

DISCUSSION

As the case study makes apparent, outsourcing often lengthens the supply chain in terms of longer time delays as well as perhaps more supply chain nodes. The complexity of the supply chain increases as a consequence. Costs associated with complex supply chains are often either hidden or, in the words of American statistician According to Edwards Deming4, these factors are "unknown and unknowable." Among them are the following: Because these goods will now be responsible for paying the overhead expenses that were previously covered by the outsourced product, the decision-making process cannot disregard the effect of outsourcing on production costs for the products that are still produced in-house.

Even if the company keeps some stock of the outsourced goods, there might be a reduction in response. The loss of responsiveness may be brought on by the extra time required for shipping the good, not to mention potential delays in customs clearance if these goods are imported from outside. Additionally, this technique increases the organization's reliance on long-term projections and makes it more susceptible to irrational demand cycles. There is a genuine risk that the organization won't be able to produce the product internally down the road, should the need arise. This is because it is no longer directly engaged in producing the product. This scenario is comparable to what happens to your body's muscles when they go unused. In order to keep these hidden costs as low as possible while also making them more predictable, managers of such complicated supply chains must now manage service providers more skillfully.

Multiple linkages in complex global supply networks might lead to certain unforeseen consequences. Members of the supply chain, for instance, may not be aware of how their partners downstream utilize their goods. One time, a chip maker assumed its shipment was going to DVD players, but the forwarding agency utilized the chip instead in digital photo frames. The

buyers could have profited from this mistake as they received a DVD chip for the price of a digital picture frame chip, assuming that the chip operated properly on the digital picture frame. The difference in manufacture costs between the chips for digital picture frames and DVD players, however, had to be borne by the supply chain. Such a lack of clarityand the associated expensesoverrides the improved visibility offered by the Internet and supports the claim that certain supply chains are devolving.

Numerous difficulties are presented by the activities' intricate interconnection in the IT-enabled global supply chain. Several businesses located in several countries must coordinate their various inputs and outputs in order to manage a global supply chain. It is incorrect to simply send orders up the supply chain and depend on upstream providers to carry them out efficiently. This kind of fulfillment is impossible due to the temporal delays and distortions. In order to coordinate their efforts and provide products and services in a timely and effective manner, vendors, brokers, original equipment manufacturers, transportation providers, warehouses, and consumers require the correct sort of information. The technique of reverse logistics has received more attention as a result of the requirement to handle such intricate global supply chains efficiently.

In recent years, supply chain management has received a lot of managerial attention, but the majority of that emphasis is concentrated on the forward supply chain, or the management of the procedures and activities involved in delivering goods to consumers. However, sometimes products go backward in the supply chain, from the place of consumption or usage to the producer. Both these backward supply chain operations and the forward supply chain activities need to be controlled. Product recovery, reverse logistics, refurbishment/remanufacturing, product reuse and recycling, and remarketing into secondary markets are examples of reverse supply chain operations.

Consumer returns might include buyer's remorse, Internet "try-on" returns, product recalls, faulty or warranty problems, or environmental returns. Goods in the reverse supply chain can be classified as consumer-generated returns or industrial returns, and they can arise for a number of causes. Unsold retail merchandise, leased products returned to vendors, faulty or warranty problems, reusable packaging returned for reuse, and product recalls are just a few examples of industrial returns. Reverse supply chains have received more attention recently maybe as a result of increased concern about the environmental effects of things going to landfills. Reverse supply chain activities have economic benefits as well, such as lowering costs by reusing products or ensuring the newest styles occupy valuable retail shelf space. The European Union, for instance, has increased pressure on businesses to recover and reuse products and to minimize hazardous substances in products. The strategic significance of controlling reverse supply chains is also receiving more attention due to the shortage of natural resources. Businesses with supply chain skills aimed on recapturing and reprocessing parts and materials from the market are projected to gain a substantial competitive edge as both renewable and nonrenewable resources come under growing strain on a global scale[4]–[6].

Regardless of whether the global IT-enabled supply chain has developed or devolved, certain nations that were successful in the trade supply chain period but struggled in the manufacturing supply chain age are now making a comeback. A significant movement in supply chain activity from Asia to Europe coincided with the phase transition from trade to manufacturing supply

chains, which ultimately resulted in the United States being the most dominant participant in this market by 1970. The complete circle movement of the center of supply chain activity from the United States and Europe back to Asia is now being convincingly shown by the phase transition from manufacturing supply networks to global IT-enabled supply chains. Data for seven of the top ten nations with the largest manufacturing production in 2010, expressed in billions of dollars, are shown in Table 1.2. The information for the other three top-ten nations, South Korea, France, and Brazil, is not included in this.

China, as in 1.2, surpassed the US in industrial production in 2010. The manufacturing outputs of India and the United Kingdom diverged in the same year. Japan threatened to surpass the US in manufacturing production in 1995, but it has since retreated. However, in 2010, the three Asian nations' combined manufacturing production outpaced that of the United States, Italy, and Germany, the two European nations with the greatest industrial output. In a white paper released by the Australian government, it is predicted that "Asia is set to overtake the combined economic output of Europe and North America within the decade to 2020."

The return of power to Asia may be attributed to a number of possible factors. On the one hand, there is no debate that Y2K and other technological developments made it possible for emerging nations like China and India to join the world's industrial and service supply chains. When the Web was created for commercial use, for instance, in the 1990s, India lacked the means to build an IT infrastructure and could not afford to purchase the necessary bandwidth. However, both in the developed and the developing countries, computers and computer communication were becoming more common and inexpensive. The United States, in particular, was spending extensively in IT infrastructure, basically establishing broadband access via satellites and underwater cables.

As a result, in an ironic turn of events, just as the UK's investment in rail infrastructure in the later half of the 19th century worked to drain wealth from the Indian economy, U.S. investment in IT infrastructure contributed to reenergize the Indian economy. The offshore phenomenon helped the Chinese economy grow even as outsourcing gathered steam. A growing number of businesses in the West began to take advantage of labor cost arbitrage by sourcing their products' production from China, where labor is more affordable. It should be noted, however, that despite the possibility that the most recent phase transition in supply chains—from manufacturing supply chains to IT-enabled supply chains—will result in a return of economic power to Asia, this transition does not pose a threat to the developed world. Instead, it offers fantastic chances since it has expanded the market to potentially 3 billion additional consumers worldwide, providing a once-in-a-lifetime chance for businesses everywhere.

The World Is Flat, a best-selling book by author, writer, and New York Times columnist Thomas L. Friedman8, was inspired by the emerging countries' quick rise, particularly that of China and India, in the early years of the twenty-first century. Friedman's book's title was influenced by a conversation he had with the CEO of the Indian software company Infosys, who said that such technology advancements were leveling the playing field. The major ideas of Friedman's book are that a number of things, including deregulation and the growth of the Internet, have conspired to "flatten" the globe, bringing challenges and possibilities to developed countries like the United States in the twenty-first century. In his list of ten "forces" that have flattened the globe,

Friedman cites events including the collapse of the Berlin Wall in 1989, the launch of Netscape Navigator in 1995, outsourcing, and offshore as well as the dismantling of other impediments to free-market capitalism.

Although Friedman's view of the world in the twenty-first century originally received a lot of support and praise, it has also come under some scrutiny and criticism. Critics contend that the earth is far from flat and that regional variances are considerably greater than is usually believed. It seems that the critique of the flatness of the globe is unwarranted. It's possible to argue that Friedman sees a continuous process wherein the globe is becoming more and more flat. He so implicitly admits the uncertainty around the idea of whether the earth is flat or is becoming flat, despite the fact that the title of his book is written in the present tense. The long-term potential and difficulties that the globalization of the globe presents to the United States are significant, he says.

Adherents of globalization

Both supporters and opponents of globalization exist. The proponents of globalization contend that it has various positive effects on both society and the global economy. Here are some influential organizations that often promote globalization. The World Trade Organization (WTO) and several other states and international organizations are in favor of globalization. They think that expanding markets, lowering trade barriers, and encouraging global collaboration may result in increased economic activity, the creation of jobs, and the eradication of poverty.

Multinational Corporations (MNCs):

MNCs play a significant role in the globalization movement. They gain from increased access to markets, global access to people and resources, and scale-based cost savings. MNCs contend that increasing profitability results from their capacity to operate more profitably and compete worldwide.Globalization is often supported by proponents of free markets and capitalism. They contend that open trade fosters innovation, efficiency, and competitiveness. Globalization, according to proponents of the free market, encourages specialization, where nations concentrate on providing commodities and services in which they have a comparative advantage, which boosts total economic growth.

1. **Consumers:** Globalization has increased consumer options by making a broad variety of items from across the globe accessible. Access to a wide variety of items at affordable rates benefits consumers and may raise their level of life.
2. **Developing Nations:** A lot of developing nations see globalization as a chance to advance their economies and fight poverty. These nations may gain access to new markets, technology transfer, and employment prospects by taking part in international commerce and luring FDI.
3. **Global Social Movements:** Some global social movements, such those that advocate fair trade, environmental sustainability, and human rights, are in favor of globalization as a strategy to deal with global issues. They contend that cross-border collaboration and the dissemination of ideas, beliefs, and best practices may be made easier by globalization.

4. **Technological Innovators:** The development of communication and technology is intimately related to globalization. By gaining access to global markets, working with international partners, and using technology developments to produce new goods and services, technological innovators and entrepreneurs' profit from globalization.

Although these groups usually favor globalization, it's crucial to keep in mind that there are different viewpoints within each category, and not all people or organizations within these categories may have the same opinions on all aspects of globalization. Additionally, opponents of globalization express worries about how it will affect employment, wealth disparity, cultural homogeneity, and environmental sustainability. The main critique of Friedman's book appears to be that there are many more distinctions between nations than is often recognized. In a Wall Street Journal article titled "The Retreat of Globalization,"9 the authors assert that despite "popular wisdom that trade and investment continue apace across national borders," it has not exactly worked out that way and that "globalization is now showing signs of retreat." The article also implies that investors are exhibiting "increasing home-country bias" in light of global weaknesses.

Author Pankaj Ghemawat is one of the most outspoken opponents of Friedman's book and contends that globalization has been oversold. "Differences between countries are larger than generally acknowledged," writes Ghemawat10 in his book Redefining Global Strategy. "While it is, of course, important to take advantage of similarities across borders, it is also critical to address differences." Effective cross-border initiatives in the short and medium term will take into account both, or what I refer to as semiglobalization, as fact.

Ghemawat elaborates on the subject of semi globalization in a subsequent book titled World 3.0. He emphasizes, from the standpoint of the supply chain, an issue covered in more detail later in this chapter—namely, that distance matters and will continue to matter. Friedman and his supporters, according to Ghemawat, symbolize "World 2.0"—a kind of united world with global markets, global integration, and global standards. World 3.0, on the other hand, is a world that symbolizes semi-global markets, a world where distance counts and where various standards will endure across areas, leading to the creation of techniques to get around or take advantage of disparities[7]–[10].

Contrary to common assumption, Ghemawat's ideas are supported by a variety of facts that demonstrate how restricted globalization really is. One of the most shocking figures he provides is that just 1% of snail mail, 2% of phone traffic, and 17–18% of Internet traffic cross international boundaries. "The globalization glass is more empty than full," he claims. John Maynard Keynes, a well-known economist, is quoted by the speaker to succinctly sum up his position: "Ideas, knowledge, art, hospitality, travelthese are the things which should, by their nature, be worldwide. However, wherever it is reasonable and generally practicable, let items be made at home.

Get Started with Additive Manufacturing

Keynes' advice to allow items to be handcrafted may very well be enforced on global supply networks by a new innovation called additive manufacturing. Additive manufacturing, often known as 3D printing, is a method for creating a three-dimensional item from a digital model

that may be almost any form. With additive manufacturing, items are made using a sequential layering process, as opposed to traditional manufacturing, which uses a "subtractive" technique to form objects by removing material from them.

Few technological fields have advanced as quickly as additive manufacturing, a process that holds out a wide range of advantages. For instance, it claims to enable the production of topologically optimized goods with reduced weight and raw material requirements compared to conventional manufacturing processes. Many of the conventional economies of scale in production might be eliminated by additive manufacturing. The technique permits flexible production and genuine mass customisation since designs can be modified fast. Even while additive manufacturing is now mostly used to produce nonmetal items and is currently a somewhat lengthy process due to technology, it is only a matter of time until additive manufacturing methods allow for more expedited creation of metal components. For instance, the NASA Marshall Space Flight Center in Huntsville, Alabama, has "printed" nickel alloy rocket engine components using the selective laser melting production process.

Thus, additive manufacturing may have a significant impact on global supply chain management, particularly on logistics and inventory control. Costs associated with logistics and shipping will be minimized by producing goods on demand close to the point of need. An environmentally conscious buyer would also be drawn to the less carbon impact. While low-cost nation sourcing has resulted in complicated worldwide supply networks, it is possible that, if additive manufacturing continues to gain popularity at its present rate, global supply chains may quickly change into simpler regional supply chains. It's possible that additive manufacturing may serve as the impetus for an upcoming "industrial revolution for the digital age.

CONCLUSION

In conclusion, Organizations face considerable hurdles as a result of supply chain complexity, but proactive management techniques may assist to lessen these effects. Organizations may manage risk and negotiate the complexity of contemporary supply chains by improving visibility, collaboration, network design, demand forecasting, talent development, and risk management. This enables them to create agile, responsive, and resilient supply chain operations. In today's dynamic and linked corporate environment, efficiently managing supply chain complexity is essential to enhancing operational efficiency, cutting costs, and satisfying customer expectations.The effects of additive manufacturing, however, go well beyond manufacturing since it enables businesses to produce the same component at many facilities that are near to their clients with no need for production tooling. Custom manufacturing companies would be more likely to transport raw materials than completed items.

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ECONOMIC COLD WAR OR GLOBAL REINCARNATION

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ABSTRACT:

The global geopolitical landscape is witnessing a transformation marked by escalating tensions between major economic powers, leading some experts to speculate about the emergence of an "Economic Cold War" or a "Global Reincarnation." This studyexplores the concept of an Economic Cold War or Global Reincarnation, its key drivers, potential impacts, and the implications for global trade, economic cooperation, and geopolitical stability.An Economic Cold War or Global Reincarnation refers to a scenario where major economic powers engage in intense competition, rivalries, and protectionist measures, reminiscent of the political and ideological Cold War between the United States and the Soviet Union. In this context, the competition centers around economic dominance, technological superiority, and control over key industries and markets.

KEYWORDS: *Bilateral Trade, Economic Competition, Geopolitics, Global Economic Alliances, Globalization, International Relations.*

INTRODUCTION

Quinlan13's book The Last Economic Superpower chronicles the growth of globalization after the Bretton Woods system fell apart in 1971 when President Nixon removed the connection between the dollar and gold. Globalization, which was sparked by the opening of international capital markets, surged in terms of cross-border commerce and investment up to the 2008 financial crisis. The relative decline of the U.S. economy, its transformation from a creditor nation to the largest debtor nation in the middle of the 1980s, the waning influence of Europe and Japan, the rise of China and India, and the emergence of new power brokers like Brazil, China, Turkey, and India are all topics covered by Quinlan. Quinlan offers two forecasts for the US and global economy.

In the first scenario, wealthy industrialized countries cling to their old system, which is unacceptable to the poorer emerging nations and causes tensions to rise, rather than adapting to a new global environment and accepting a smaller position in the world. Global regulation replaces deregulation as a consequence of rising nationalism and xenophobia throughout the globe, resulting in an economic cold war between rich and developing countries. The second scenario acknowledges how the "West and the Rest" are mutually interdependent, leading to a path of collaboration rather than rivalry. It talks about a worldwide rebirth that involves shared global leadership with various qualities that stand in for the Chinese, Indians, Brazilians, Egyptians, and

many others. Even while it's unclear if scenario one, scenario two, or anything in between will play out in the future, it is obvious that there is a chance for globalization to be recast and reenergized[1]–[3].

It is uncertain which scenario—assuming that it is one of the two suggested—will win out. It is evident that, regardless of how flat the globe really is and how much it is flattening, Friedman's and Ghemawat's books illustrate some of the difficulties that businesses dealing with globalization in the twenty-first century must overcome. These difficulties manifest as a rise in supply chain complexity, which is exacerbated by the improper use of offshore and outsourcing, two of Friedman's ten "flattening" causes.It is not intended by the debate that follows that offshore and outsourcing are bad ideas. It is intended to emphasize that such operations must be seen from a more organized, comprehensive standpoint. This book backs up the idea that there is a worldwide f In July 1944, the Bretton Woods system was founded, providing a framework for currency exchange on a global scale. In order to stabilize exchange rates, member nations agreed to peg their currencies to the dollar. The duty of addressing short-term payment imbalances was given to the IMF.

Global supply chains will fragment into a number of demand and supply "pods" where local manufacturing and procurement activities will serve the key demand centers of the region, at least for a significant portion of their production needs. It goes without saying that certain affordable "commodities" will continue to be bought from places with cheap labor costs all over the world. The tendency, though, seems to be more toward regional activity. Finding the regional venues for such offshore or outsourcing activities then becomes the question. Should businesses start producing and sourcing from domestic facilities again? If so, are the infrastructure and talent still there? The tax environment and overall expenses are they competitive? The pages that follow answer these queries. Organizations find it simpler to admit that they did not do a comprehensive TCO study than to confront a more serious issue—that they cannot effectively manage a global supply chain. Going worldwide adds expense, complexity, and risk, as was discussed before. The management of these three factors may be quite difficult. Despite reasonably accurate cost estimates for the whole supply chain, organizations may struggle to effectively manage supply chain complexity.

Even worse, these corporations could not be aware of or unprepared for regional peculiarities, including cultural ones that exist in the country where the offshore operation is taking place. These organizations may not completely comprehend how the new global playing field operates. They may not be equipped to handle the laws and ordinances of the nation in which they want to carry out such offshore business. Even companies with significant outsourcing expertise could discover that this is a continuous process. The tale of the second decade of the twenty-first century is one of changing cost curves that are making the geographical choices for production, supply chains, and procurement from the previous fifteen years outdated. Is near-shoring a means of reducing risk?

DISCUSSION

The answer to this topic depends on whether the places under consideration display notable cultural or economic distinctions, even if this debate supports the idea that supply chains are

becoming more regionalized. Distances have a substantial impact on supply chain lead times and delays, but when items are near-shored or in-sourced, they may still face some of the same difficulties as when they are offshored to distant places. Therefore, whether in near-shore areas or at far offshore locations, all companies would benefit from having a greater grasp of regional variances. This book's identification and explanation of such geographical variations is one of its main goals. The topics covered in the following section are some of those on the minds of managers of global supply chains. While doing this, various issues of locating the areas where managers might profit from shared cooperation, collaborations, or investment are highlighted. In the last part, a framework is provided to assist managers in evaluating the relative strengths, weaknesses, opportunities, and dangers of various geographic areas from the viewpoint of the global supply chain.

Using Global Supply Chains: A Balanced Approach

An annual "supply chain top 25" list recognizing the top companies that excel at global supply chain management and showcasing their best practices is published by Gartner, Inc., a major provider of IT research and consulting services. Based on the practices of these top 25 firms, Gartner highlighted three key themes in its 2012 report: increased supply chain risk management and resilience, supply chain simplification, and a move toward multilocal operations.

The third trend, multilocal operations, is concerned with how these companies are reevaluating their production and sourcing networks and rebalancing their supply network strategies. This multilocal trend supports this book's position on regional procurement and manufacturing, as noted earlier at several points in this chapter, more specifically, "they are shifting from a centralized model, where these functions support global markets, to a regionalized approach, where capabilities are placed locally, but architected globally." According to the Gartner analysis, a variety of variables, including tax and government incentives, wage growth in certain emerging nations like China, and an ever-increasing need to be responsive to local markets, are what are causing this trend toward multilocal operations. In terms of salaries, the paper points out that even within growing countries, firms are moving capacity in response to regional pay and logistical cost differentials.

Supply Chain Tradeoffs: A Solution Is Possible

Customers are served through supply networks. The need to balance supply chain expenses with customer service is therefore the main choice the CEO and her team must make. The fact that choices impacting supply chain management are often made as part of corporate strategy without giving enough consideration to how such decisions may be executed by the supply chain managers makes it particularly difficult for them to walk this tightrope. For instance, while developing business strategy, the issue of managing global logistics is considered as a matter of detail that may ultimately be compensated for, depending on the profit margins emerging from the strategic planning process. However, the reality is that logistics-related expenses are often quite high and may significantly reduce profit margins. A 5 percent error in estimating logistics costs in a $3 billion organization can cause a profit margin erosion of more than $275 million, which is not small change. From 2000 to 2009, logistics-driven costs accounted for an average of 9.22 percent of the GDP for the United States.14 Assuming that this percentage is representative

of the share of logistics costs for an enterprise, this amount of money is not insignificant. The potential loss in profit margin would be substantially larger if additional supply chain expenditures such order processing, materials procurement and inventories, supply chain planning, supply chain finance, and information management were taken into account.

Finding the Missing Chord: The EPIC Structure

Supply chain strategy decisions are often of a structural type, requiring choices on where to situate a manufacturing site, a manufacturing facility, or a retail center. For instance, closing down—or at least reducing—the quantity of content from an old source is sometimes accompanied by a choice to source from a new place. If the new site does not live up to expectations, such choices cannot be readily reversed. Thankfully, company plans today often emphasize the strategic significance of the supply chain management process considerably more. However, creating an effective supply network presents major difficulties, particularly in the context of global supply chains. The manager aiming to establish an effective supply chain must balance a variety of often competing goals. The management faces challenges

1. Increasing customer demands for product excellence and support
2. Supply chain partners working together to integrate supply and demand
3. The possibility of supply chain interruptions
4. Governmental laws and regulations in the supply chain's participating nations
5. Environment-related issues

The first three issues are prevalent in domestic as well as international supply chains, with the latter two arguably being more pertinent. Environmental issues are now often disregarded, despite the fact that a study by McKinsey in November 201015 on the difficulties encountered by supply chain managers indicated that they represent a rapidly expanding difficulty. Environmental issues were cited as the top difficulty by more than 21% of respondents, almost doubling from a study done three years before. As was already said, structural choices often affect supply chain management. The assessment of their supply chain strategies and the identification of the strengths, weaknesses, opportunities, and dangers of the various geographical areas may be helpful to managers of global supply networks. The next section provides an explanation of this framework, which is known as the EPIC framework. This framework offers a method for evaluating a region's supply chain preparedness from the perspectives of economy, politics, infrastructure, and competence.

Finding the Missing Chord: The EPIC Structure

The EPIC framework's goals are to define, clarify, and identify the features of the conceptual aspects of the global supply chain model in ten different areas of the globe. The new framework gauges and evaluates the degree of a geographic area's supply chain activity maturity. In terms of the production and consumption of products and services, the economy component evaluates each region's wealth and resources. The political environment is evaluated in terms of how effectively it supports supply chain operations in the politics dimension. The infrastructure component assesses the transportation networks, power and energy accessibility, and IT

infrastructure that are now in place as well as those that are planned. The Competence component assesses the workforce's proficiency, logistics' proficiency, and the efficiency of customs and security clearances[4]–[6]. In turn, each of the four dimensions is evaluated using a specific set of factors. Based on information collected from several data sources, each of these characteristics is evaluated using a mix of quantitative and qualitative ratings. The EPIC framework for analyzing global supply networks is covered in greater depth in the next chapter.

Finally, a few words

It was the best of times, it was the worst of times, said Charles Dickens in the opening line of his book The Tale of Two Cities, which could seem too bleak in the context of global supply networks. Without a question, there have been occasions when supply chain management has regressed, generally as a result of some shortsighted cost-based choices that unnecessarily sent jobs offshore and increased supply chain complexity. However, as new information and management techniques emerge, there are many reasons to be positive about the future of global supply chains. With the help of the EPIC framework, which is covered in greater depth in the next chapter, this book offers a methodical, organized way to evaluating global supply chains.

The current topic may be summed up as follows:

From trade supply chains through industrial supply chains to the present era of globally IT-enabled supply networks, supply chains have gone through a number of phase changes throughout history. These changes have been made possible by advances in technology, including interchangeability, better transportation, mechanization, telecommunications, and the Internet. The global economic center of gravity began to shift from Asia to Europe in the middle of the 18th century as a consequence of these technical and technological advancements. The balance of economic power is, however, either shifting back to Asia or leveling across the Americas, Europe, and Asia, according to current patterns. As obstacles to free-market capitalism are taken down, internet use increases, and there is a greater movement of products across borders, the globe is becoming flatter. The leveling of the playing field's severity might be questioned, however. Furthermore, it is yet unclear if the flattening trend may change direction.Companies in one nation will rely more and more on companies in other countries to either provide material or promote their goods as global supply chains expand. Therefore, organizations should set themselves up to benefit from these codependences in order to strengthen their position as market leaders. Which geographical areas of the globe should they pay particular attention to while developing such relationships is the issue.

Active RFID tags from Identec Solutions are placed to the back chassis of trucks that go through port terminals. An RFID scanner that is built into an automated gate system reads the truck's specific tag ID number as it approaches the gate. An optical character recognition device at the gate checks to see whether the vehicle is hauling a container, recognizes the container's ID number, and reads the truck's license plate number as a backup. The system makes use of the information provided to automatically generate a ticket for the driver that indicates which lane the truck should go into in order to load or unload the container. In order to pick up and deliver containers efficiently, the system may also automatically detect if the vehicle is on time. The

RFID tag is scanned once again when the vehicle exits the gate, and the driver is given a receipt for the successful transaction.

With the use of RFID, DP World has been able to improve the efficiency of container handoffs, hasten vehicle entrance and departure via terminal gates, and boost fuel economy. According to Victoria Rose, regional office project coordinator at DP World Sydney, RFID will increase gate efficiency by simplifying procedures, eliminating lineups and congestion around gates, and improving truck management. It would also reduce the number of trucks on public highways. By facilitating easier, quicker, and more effective delivery of customers' containers at terminal gates, Identec's RFID-based system has also allowed DP World to raise customer satisfaction levels. The decrease in manual data entry mistakes and the removal of time-consuming paper transactions and manual gate inspections are examples of DP World's customer-centric approach to providing outstanding customer service. Additionally, the technology enables trans- port corporations to enhance profits, save expenses, and save time.

Because RFID provides more accurate information on incoming and outgoing truck movements via the ports, DP World has been able to increase security. The technology, for instance, may automatically determine if a vehicle has a reservation and whether it is permitted to enter the port. In order to better improve supply chain flow, DP World will think about extending the usage of RFID-enabled scanning and tracking technologies. In the future, Rose hopes that DP World will concentrate on examining how it is utilized in the yard and the potential applications for the data collected. A manager checks if inventory and production capacities meet demand for the company's goods using a Web interface to access suppliers' systems. Online forecast collaboration between business partners is made possible by supply chain management software over the web. To keep track of the progress of clients' orders, sales staff consult the production and logistics schedules of suppliers.

Global issues with supply chains

More and more businesses are expanding internationally, outsourcing production processes, buying suppliers from other nations, and making sales overseas. Their supply networks span several nations and areas. The management of a global supply chain comes with new difficulties and problems. Global supply networks sometimes include partners from many different nations and cover wider geographic and temporal distances than domestic supply chains. Performance expectations may differ from one country or area to another. Supply chain management may need to take into account cultural variations and international government restrictions. The management of a variety of facets of a company's worldwide supply chains, including as sourcing, transportation, communications, and foreign financing, is made easier by the Internet. For instance, the modern garment business primarily depends on contract manufacturers in China and other nations with cheap wages. The Web is increasingly being used by apparel firms to manage their manufacturing and worldwide supply chain challenges[7], [8].

In addition to contract manufacturing, globalization has prompted companies like UPS Supply Chain Solutions and Schneider Logistics Services to outsource warehouse management, transportation management, and associated operations. These logistics companies provide Web-based tools so that their clients may see their worldwide supply chains more clearly. Customers

may use a secure website to check on inventories and shipments, which helps them manage their international supply chains more successfully. From Push to Pull Manufacturing and Effective Customer Response: Demand-Driven Supply Chains Supply chain management solutions provide effective customer responsiveness in addition to cost reduction, allowing the operation of the firm to be more influenced by consumer demand.

Earlier push-based models were used to power supply chain management systems. In a push-based strategy, items are "pushed" to consumers according to production master schedules that are based on projections or educated estimates about product demand. Supply chain management more readily adopts a pull-based paradigm as a result of the increased information flows made feasible by Web-based technologies. A pull-based supply chain model, sometimes referred to as a demand-driven or build-to-order model, is one in which real consumer orders or purchases set off supply chain activities. As transactions progress through the supply chain from retailers to distributors to manufacturers and finally to suppliers, they are made to create and deliver just what consumers have bought. The only items that flow back down the supply chain to the store are those needed to complete these orders[9], [10].

CONCLUSION

In conclusion, although it is hypothetical, the current geopolitical environment and economic rivalry among major nations provide difficulties and uncertainties for the world economy. These include the possibility of an Economic Cold War or a Global Reincarnation. To navigate this changing environment and make sure that economic rivalries do not turn into full-scale war or impede global growth, it is crucial to strike a balance between competition and cooperation, boost communication, and promote ethical economic practices. To manage conflicts and keep the world economy stable, international institutions should be strengthened, inclusive trade agreements should be encouraged, and responsible technology progress should be promoted.Concurrent supply chains, where information travels in several ways concurrently among supply chain network members, are a step up from sequential supply chains, where information and goods flow sequentially from business to company. This is made feasible by the Internet and Internet technology. Schedule or order changes may be quickly accommodated by complex supply networks involving manufacturers, logistics providers, outsourced manufacturers, retailers, and distributors. In the end, the supply chain might benefit from the development of a "digital logistics nervous system" thanks to the Internet.

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BUSINESS VALUE OF SUPPLY CHAIN MANAGEMENT SYSTEMS

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ABSTRACT:

Supply chain management systems (SCMS) have become indispensable tools for organizations seeking to optimize their supply chain operations and drive business value. This studyprovides an overview of the business value of supply chain management systems, including the benefits they offer, the key functionalities they provide, and their significance in enhancing operational efficiency, customer satisfaction, and overall organizational performance.Supply chain management systems enable organizations to streamline and integrate their supply chain processes, from procurement and production to inventory management and distribution. These systems provide a centralized platform for managing and monitoring the entire supply chain, facilitating real-time visibility, collaboration, and decision-making.

KEYWORDS: *Cost Reduction, Customer Satisfaction, Demand Forecasting, Supply Chain Management.*

INTRODUCTION

You recently saw how companies may use supply chain management systems to organize their internal and external supply chains, as well as provide management more precise data on what to create, store, and transfer. Companies may better match supply and demand, lower inventory levels, enhance delivery services, accelerate product time to market, and make better use of their resources by putting in place a networked and integrated supply chain management system. For many organizations, overall supply chain costs account for the majority of operational costs; in other sectors, this percentage may even reach 75%. Profitability of the company is significantly impacted by lowering supply chain expenses.

The new supply chain, which is fueled by the Internet, functions as a nervous system for digital logistics. In order for complete networks of supply chain partners to rapidly modify inventory, orders, and capacities, it allows multidirectional communication across businesses, networks of businesses, and e-marketplaces. Systems for supply chain management not only save costs but also boost revenues. When a buyer wants to buy a product but it is not readily accessible, they often attempt to buy it from someone else. The ability of the company to have the proper product accessible for client purchases at the appropriate moment is improved by more accurate supply chain management.

Systems for Managing Customer Relationships

It's likely that you've heard expressions like "the customer is always right" or "the customer comes first." These words are more relevant than ever now. Companies are learning that their greatest lasting competitive strength may be their connections with their consumers since competitive advantage based on an inventive new product or service is sometimes extremely fleeting. Some claim that client connections are a company's most important asset and that the foundation of competitiveness has changed from who sells the most goods and services to who "owns" the customer[1]–[3].

What Is Customer Relationship Management?

What sorts of data would you need to create and maintain enduring connections with clients? You would want to know precisely who your consumers are, how to reach them, if they are expensive to sell to and provide with services, what sorts of goods and services they are interested in, and how much money they spend with your business. If you could, you would like to treat your business as if it were a small-town shop, getting to know each of your clients well. And you would like to provide your loyal consumers a distinctive feeling. Small-enterprise owners and managers have the opportunity to get to know their clients personally and in-person when they run a neighborhood company. But it is hard to "know your customer" in this intimate sense in a big corporation that operates on a metropolitan, regional, national, or even worldwide scale. There are too many consumers and too many varied methods for customers to connect with these types of firms. Integrating data from all of these sources and managing the increasing number of clients is very challenging. Large businesses often have highly segmented sales, service, and marketing operations, and these divisions seldom exchange crucial consumer information. A customer's account with the business may be used to keep and arrange certain information about that client. The items that were bought may be used to arrange more data on the same client. A unified picture of a client throughout the organization cannot be created by combining all of this data.

Customer relationship management solutions may be useful in this situation. Systems for managing customer relationships, collect and combine customer data from different parts of the company, consolidate the data, do data analysis, and then disseminate the findings to various systems and customer contact points across the firm. A customer contact point is a way to communicate with them, including a phone call, email, customer care desk, regular mail, Facebook post, Twitter post, website, wireless device, or physical shop. A single corporate picture of customers is provided by well-designed CRM systems, which is helpful for enhancing both sales and customer care. What is the lifetime worth of a certain client to the company? May be answered with the help of good CRM systems, which provide data and analytical tools. Who are the customers we value the most? Selling to a new client might cost up to six times more than selling to an existing one. Who are our most lucrative clients? What do these professional clients wish to purchase? The answers to these questions help businesses attract new clients, better serve and assist current clients, more accurately tailor their offers to client preferences, and give continuous benefits to keep profit clients.

Computer Software for Managing Customers

Commercial CRM software solutions range from specialized tools that handle a narrow range of tasks, like customizing Web pages for particular customers, to expansive enterprise applications that record a wide range of customer interactions, analyze them using sophisticated reporting tools, and integrate with other key enterprise applications, like supply chain management and enterprise systems. Partner relationship management and employee relationship management features are included in more complete CRM programs. PRM improves communication between a business and its selling partners by using many of the same data, tools, and processes as customer relationship management. PRM enables distributors and retailers to sell to clients directly on behalf of a corporation that doesn't sell to them directly. It enables lead generation, pricing, promotions, order configurations, and availability to be integrated, giving a firm and its selling partners the capacity to exchange information and disseminate leads and data about consumers. It also gives a company the ability to evaluate the success of its partners so that it can ensure that its top partners get the assistance they need to complete more deals.

DISCUSSION

Setting goals, managing employee performance, paying employees based on performance, and providing training are all topics that are covered by ERM software and are strongly tied to CRM. Microsoft Dynamics CRM, Oracle, SAP, Salesforce.com, and other leading CRM application software providers are among the suppliers. Software and internet tools for sales, customer care, and marketing are often provided by customer relationship management systems. We provide a quick overview of some of these talents.

Automation of Sales Forces

By concentrating sales efforts on the most lucrative clients, those who are strong prospects for sales and services, sales force automation modules in CRM systems assist sales employees in increasing their productivity. CRM systems include information on sales prospects and contacts, product details, product configuration options, and sales quotation creation options. Such software may compile data on a specific customer's prior purchases to assist the salesperson in making tailored suggestions. Sales, marketing, and delivery teams may quickly exchange customer and prospect information thanks to CRM software. It improves the effectiveness of each salesperson in lowering the cost of each sale as well as the cost of attracting new clients and keeping existing ones. CRM software also provides features for team selling, managing territories, and projecting sales.

Consumer Assistance

CRM systems' customer service modules provide data and resources to enable contact centers, help desks, and customer support workers work more effectively. They are equipped to manage and allocate customer service requests. One such feature is a telephone line for appointments or advice. When a client dials a conventional phone number, the system sends the call to the appropriate service agent, who enters the customer's information just once. Any service agent may manage the client relationship once the customer's data are in the system. contact centers can handle more calls per day and shorten the length of each contact with better access to reliable

and accurate client information. As a result, contact centers and customer service departments increase productivity, cut down on transaction time, and provide better service at a lesser cost. Because they spend less time on the phone explaining their issues to customer care agents, customers are happy. CRM systems may also include web-based self-service options, allowing consumers to ask questions and get individualized support information as well as the ability to call customer service representatives for further help.

Marketing

CRM systems help direct-marketing campaigns by enabling the collection of prospect and customer data, the provision of product and service information, the qualification of leads for targeted marketing, the scheduling and management of direct-marketing mailings and emails, among other features. Tools for evaluating marketing and customer data, finding profitable and unprofitable clients, creating goods and services that cater to particular client wants and interests, and spotting cross-selling possibilities are also included in marketing modules.

Customers may manage and assess marketing campaigns across a variety of channels, such as e-mail, direct mail, phone, the Web, and wireless communications, using customer relationship management software from a single location. Cross-selling is the practice of promoting clients on adjacent goods. CRM technologies aid businesses in managing and carrying out marketing initiatives at all phases, from planning to gauge their level of success. CRM software may mimic a best practice for boosting client loyalty via customer care. By giving long-term professional customers preferred attention, direct customer service gives businesses the chance to boost customer retention. In order to assist contact centers route each customer's service request to agents who can best meet that customer's requirements, CRM software may award each customer a score based on that person's worth and loyalty to the business. The technology would automatically provide the customer support representative a thorough profile of that person, which would include that person's worth and loyalty scores. The customer care representative would utilize this information to offer the consumer special deals or other services in an effort to keep them doing business with the firm. In our Learning Tracks, you may get further details on other best-practice business procedures in CRM systems. The main CRM software systems integrate customer data from several sources to assist corporate activities in sales, service, and marketing. Support is provided for CRM's analytical and operational components. This flow chart illustrates how customer relationship management software might mimic a best practice for fostering client loyalty via customer service. CRM software aids businesses in locating high-value clients for special consideration.

CRM Operating and Analytical

Both the operational and analytical components of customer relationship management are supported by each of the tools we just discussed. Customer-facing software such as sales force automation, contact center and customer care assistance, and marketing automation are all examples of operational CRM. software that evaluate customer data produced by operational CRM software are referred to as analytical CRM, and they may give insights for enhancing company performance[4]–[6].

Data from operational CRM systems, customer contact points, and other sources constitute the foundation for analytical CRM applications. This data is structured in data warehouses or analytic platforms for use in online analytical processing, data mining, and other data analysis methods. Customer information gathered by the company may be supplemented with information from other sources, such as demographic information or customer lists obtained from other businesses for direct-marketing campaigns. These data are examined in order to spot professional and unprofi clients, establish purchasing patterns, and develop segmentation for targeted advertising. The lifetime worth of a client to a business is another significant outcome of analytical CRM. Customer lifetime value is calculated by comparing the income generated by a particular customer with the costs associated with obtaining and maintaining that client as well as the anticipated length of the customer and business relationship.

Customer Relationship Management Systems' Business Value

Increased customer satisfaction, fewer direct marketing expenses, more efficient marketing, and lower costs for client acquisition and retention are just a few advantages that companies with strong customer relationship management systems experience. CRM system data identifies the most profitable clients and market groups for targeted marketing and cross-selling, which boosts sales income. As sales, service, and marketing more effectively address consumer demands, customer turnover is decreased. The number of customers that cease using or buying goods or services from a business is measured by the churn rate. It is a crucial sign of the expansion or contraction of a company's consumer base.

New Opportunities and Difficulties in Entrepreneurship Applications

Due to the effectiveness of enterprise systems, supply chain management systems, and customer relationship management systems in attaining operational excellence and improving decision-making, many businesses have deployed them. However, they are difficult to put into practice precisely because of how strong they are in altering how the organization functions. Let's quickly go over some of these issues as well as brand-new strategies for getting value out of these systems.

Troubles with Enterprise Applications

Enterprise systems and systems for supply chain management and customer relationship management are particularly tempting due to the promises of significant reductions in inventory costs, order-to-delivery times, as well as more efficient customer response and improved product and customer profitability. You must, however, understand precisely how your company needs alter in order to utilize these tools efficiently if you are to get this benefit. Complex software components that are costly to build and acquire are used in enterprise applications. A large-scale enterprise system, SCM system, or CRM system deployment may take a Fortune 500 organization many years to complete. An typical big system implementation using SAP or Oracle software costs about $100,000 in total, including software, database tools, consulting fees, staff expenses, training, and maybe hardware costs. An enterprise system based on software from a "Tier II" vendor like Epicor or Lawson typically costs $3.5 million to install for a mid-sized business. Changes to the project's scope and more customization work increase the price and delays of execution. Enterprise applications need fundamental changes to the way the

organization is run in addition to significant technology advancements. In order to use the program, businesses must make significant adjustments to their operational procedures. New responsibilities and work duties must be accepted by employees. They must learn how to carry out a new set of tasks and comprehend how the data they input into the system may impact other areas of the business.

Multiple firms must exchange information and business operations in order to use supply chain management systems. To design a system that best serves the supply chain as a whole, each system member may need to alter some of its procedures and the way it utilizes information. Because they underestimated the amount of organizational change needed, several businesses first implementing enterprise apps had severe operational issues and losses. For instance, Kmart had difficulties while putting items on shop shelves when it initially used supply chain management software from i2 Technologies. The promotion-driven business strategy used by Kmart, which caused rapid downward swings in product demand, did not operate well with the i2 software. When Overstock.com switched from a custom system to an Oracle enterprise system, the order tracking system was unavailable for a whole week. The firm hurried the software's implementation and neglected to properly align its accounts receivable system with the Oracle software's procedure for documenting consumer refunds. These issues amounted to a $14.5 million deficit in the third quarter of that year. Enterprise applications can bring up "switching costs," since it is highly expensive to move vendors after you've adopted an enterprise application from a single vendor (such as SAP, Oracle, or another), and your company depends on that vendor to improve its product and maintain your installation.

Organization-wide definitions of data serve as the foundation for enterprise applications. You must comprehend precisely how your company utilizes its data as well as how a customer relationship management (CRM), supply chain management (SCM), or enterprise system will arrange the data. Data cleaning is frequently necessary for CRM systems. Enterprise software providers are addressing these issues by providing condensed versions of their software, "fast-start" initiatives for small and medium-sized firms, and best-practice recommendations for bigger organizations. The Interactive Session on Technology explains how this issue is also addressed by on-demand and cloud-based applications. By limiting adaptations, businesses adopting enterprise apps may also save time and money. An ERP system with more than 6,400 adaptations, for instance, was maintained by Kennametal, a $2 billion metal-cutting tool firm in Pennsylvania, over the course of 13 years at a cost of $10 million. The firm is currently altering its business operations to fit the program's requirements and replacing it with a "plain vanilla," non-customized version of SAP enterprise software.

Applications for next-generation enterprises

By being more adaptable, Web-enabled, and able to integrate with other systems, corporate application suppliers are now able to provide customers with more value. Supply chain management systems, customer relationship management systems, and standalone business systems are becoming obsolete. To make their customer relationship management, supply chain management, and enterprise systems closely interact with one another and connect to systems of customers and suppliers, the major enterprise software vendors have developed what they refer to as enterprise solutions, enterprise suites, or e-business suites. Examples of software that today

makes use of Web services and service-oriented design include SAP Business Suite, Oracle e-Business Suite, and Microsoft Dynamics suite.

Next-generation business applications from SAP may connect its own applications with Web services created by unaffiliated software providers and use SOA standards. Business process management and SOA features are also included in Oracle's Fusion middleware solutions. These technologies may be used by businesses to build platforms for brand-new or enhanced business procedures that incorporate data from many applications. Open source and on-demand solutions, as well as greater functionality accessible on mobile platforms, are also features of next-generation corporate apps. Compiere, Apache Open for Business, and Openbravo are examples of open source products that lack the functionality and support offered by commercial enterprise application software but are appealing to businesses like small manufacturers due to the lack of software licensing fees and usage-based pricing. SAP now provides cloud-based variations of its Business One OnDemand and Business By Design corporate software solutions for small and medium-sized enterprises in a few different nations. Smaller suppliers like NetSuite and Plex Online are beginning to provide software as a service and cloud-based variations of corporate systems. Some of the cloud-based CRM solutions are described in the Interactive Session on Technology. As time goes on, more businesses will decide to operate all or a portion of their enterprise applications on the cloud as required.

Business intelligence and social CRM

Vendors of CRM software are improving their solutions to benefit from social networking tools. These social improvements aid businesses in quickening the identification of novel concepts, enhancing teamwork, and deepening client relationships. By allowing its users to share and debate fresh ideas, Salesforce Idea Exchange, for instance, allows subscribers to tap into the "wisdom of crowds". This technology was used by Dell Computer to encourage users to submit and vote on ideas for new features and concepts for Dell products. 2 spoke about Salesforce Chatter, which lets users establish profiles akin to Facebook and get real-time news feeds about colleagues, projects, and clients. To work together on projects, users may create groups and leave messages on one other's accounts.

Customers may often get customer support services quicker and at a lesser cost when employees communicate with them using social networking sites like Facebook and Twitter rather than over the phone or through email. Active social media users increasingly want and anticipate company responses to their queries and grievances on this platform. A company may link customer connections and dialogues from social networking sites to CRM processes with the use of social CRM software. In order to integrate data from social networks into their CRM software, the top CRM suppliers now provide such capabilities. Technology is being included into Salesforce.com and Oracle CRM solutions to watch, monitor, and analyze social media activity on Facebook, LinkedIn, Twitter, YouTube, and other websites[7].

A firm that aids businesses like Dell, GE, Kodak, and UPS in monitoring, analyzing, and participating in hundreds of millions of social media discussions, was recently bought by Salesforce. These features have been included in Salesforce's software lineup. Buzzient, a company that offers solutions for connecting social media with business applications, has

improved Oracle's CRM products. The Buzzient platform automatically gathers data from a vast array of web sources in real time and analyzes the information in accordance with user preferences. Buzzient provides this data to CRM systems so that businesses may find sales leads and spot customer service problems. Business Intelligence in Enterprise Applications to assist managers make sense of the vast volumes of data produced by these systems, enterprise application manufacturers have included business intelligence functions. There are also tools for interactive dashboards, what-if analysis, flexible reporting, ad hoc analysis, and data visualization. Vendors are beginning to incorporate analytics inside the context of the program itself, eliminating the need for users to exit an application and open separate reporting and analytics tools. They also provide complimentary standalone analytics tools, including Oracle Business Intelligence Enterprise Edition and SAP Business Objects.

Management of Customer Relationships Moves to the Cloud

The undisputed worldwide leader in cloud-based customer relationship management solutions and the most popular enterprise-scale software as a service. Through a connected computer or a mobile device with access to the Internet, users may access Salesforce apps from any location. For small sales and marketing teams, monthly subscriptions for the condensed Group edition start at only $15 per person, while prices for major organizations range from $65 to $250 per user. Salesforce serves more than 100,000 clients. The on-demand concept is particularly attractive to small firms since it doesn't need extensive up-front hardware and software expenditures or time-consuming corporate computer system implementations. A producer of sustainable tiles with 37 employees, Fireclay Tile, implemented Salesforce and experienced several advantages. The organization was able to double its number of new sales leads thanks to Salesforce's e-mail and Web-to-lead features. .Based on the lead type and sales process stage, a task function automatically produces relevant tasks. Order confirmations, follow-up customer satisfaction surveys, and delivery alerts are all automated by the system. By offering top-notch customer service, Fireclay is able to effectively compete with major flooring manufacturers and other makers of bespoke tiles thanks to Salesforce's social features. The business keeps customer profiles on Salesforce.com so that its sales, support, and production teams have comprehensive customer information. Large businesses, however, are also drawn to Salesforce.com. In order to create reports on more than 50 beverage brands and to evaluate sales performance against targets in real time, Dr. Pepper Snapple Group selected Salesforce CRM to replace an outdated Excel application. More than 10,000 accounts are currently tracked by the system, and automatic reports and dashboards keep track of important performance metrics, sales calls, and volume. Starbucks, Pitney Bowes, Kimberly-Clark, and The Wall Street Journal are a few of the other significant corporate CRM customers of Salesforce.

Established on-premise enterprise software providers like Oracle have expanded into cloud software services, not to be surpassed. Pricing for each user begins at $70 a month. The CRM on Demand solution from Oracle includes a wide range of features, such as interactive dashboards and incorporated forecasting and analytics tools. These resources enable subscribers to respond to inquiries like "How effective are your sales efforts?"or "How much do your consumers typically spend?"A centralized CRM system was developed by GRT Hotels & Resorts, a well-known hotel chain in South India with 10 hotels, using Oracle CRM on Demand. The technology

enables all of the group's hotels to exchange consumer information, such as preferences for rooms and rates, and to develop coordinated marketing initiatives that do away with unnecessary pricing rivalry between the company's hotels. The CRM system, according to GRT, has enhanced productivity by around 25% by making customer behavior data accessible for sales forecasting and by generating more focused marketing campaigns. In order to spot underperformers, managers might keep track of the number of client calls that workers field each month about reservations and other basic hotel information. According to GRT Management, adopting a monthly fee-based hosted CRM solution is 65 percent less expensive than having to buy and operate its own CRM software. Furthermore, Oracle's centralized, secure Web-based CRM platform makes sure that private information, such promotion plans, cannot be taken by GRT workers when they leave the company[8]–[10].

The market for cloud-based applications is being penetrated by established corporate software providers like Oracle, while startups like SugarCRM have found success—even with bigger businesses. As an example, consider Thomas Cook France, a division of the global Thomas Cook Group Travel plc. Theodore Cook

France, the second-largest travel agency in France, employs 1,700 workers and offers leisure vacation packages for parties of 15 passengers. By offering an exceptional client experience, the business is able to separate apart from rivals and Internet travel providers. The majority of Thomas Cook France's calls and other customer contacts were being recorded on paper by hand, which resulted in fragmented and duplicated customer data that management was unable to utilize to assess agent efficiency and revenue potential. Monthly fees for SugarCRM users vary from $30 to $100. Thomas Cook France discovered SugarCRM to be a flexible, user-friendly solution that could be maintained without a sizable internal information systems workforce. Within 15 days, Thomas Cook got its SugarCRM system up and running with the assistance of Synolia specialists. Cook's agents may manage-

Age is the leader in system integration and imports. The system supports team and role-based access as well as the addition of documents to contracts. Thomas Cook France also uses the CRM software to drive immediate business actions and assess high-level business concerns via dashboards, FAQ modules, and high-level outbound e-mail marketing campaigns. Cloud computing can have limitations, and not all businesses get benefits that size. A lot of businesses are worried about keeping security and data under control. Although cloud computing firms are equipped to deal with these problems, service level agreements and availability guarantees are not always accessible. Although CRM suppliers have gone to great lengths to solve these problems, businesses who manage their CRM applications using a cloud infrastructure have no assurances that their data will always be accessible or even that the provider will still be there in the future.

CONCLUSION

In conclusion, Supply chain management solutions boost operational effectiveness, boost customer happiness, and boost overall organizational performance, providing significant commercial value. SCMS assist firms in reducing costs, boosting customer loyalty, and gaining a competitive advantage by simplifying processes, maximizing resources, and allowing data-

driven decision-making. The strategic use of SCMS is crucial for optimizing business value and unlocking the full potential of supply chain management as firms traverse complex and changing supply chain environments. Careful planning, system integration, and change management activities are necessary for SCMS implementation. To use the system successfully, organizations must customize workflows, connect it with their own supply chain procedures, and educate staff. To maintain smooth data flow and optimize the advantages of SCMS, integration with other business systems, such as enterprise resource planning (ERP) and customer relationship management (CRM), is essential.

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E-COMMERCE: DIGITAL MARKETS, DIGITAL GOODS

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ABSTRACT:

E-commerce has revolutionized the way businesses operate and consumers engage in buying and selling goods and services. This studyexplores the concept of e-commerce, specifically focusing on digital markets and digital goods, and their impact on the global economy, consumer behavior, and business models.Digital markets refer to online platforms where buyers and sellers interact to exchange goods, services, and information. These markets have significantly expanded with the rise of the internet and technological advancements. They offer a wide range of products and services, ranging from physical goods such as electronics and clothing to digital goods like software, e-books, music, and streaming services.

KEYWORDS: *Digital Markets, Digital Products,E-Commerce, Management.*

INTRODUCTION

Groupon is a company that provides customers with daily bargains from nearby retailers. The caveat is that a number of individuals must buy the special voucher. You'll need to contact your buddies to pay for the coupon if you're serious about using the 50% off coupon for that Italian restaurant in your neighborhood. The offer becomes available to everyone as soon as the required quantity of vouchers has been sold. The majority of Groupon offers save the consumer 50% off the retail cost of a product or service provided by a nearby business. For instance, a $50 hairstyle is available for $25. Thousands of prospective clients within driving distance of the shop get the Groupon offer through email. The offer is finalized and the consumer gets a Groupon via email if enough individuals join up and purchase the Groupon using their computers or cellphones. After Groupon deducts 50% of the sales, the seller is left with $12.50. In other words, the businessman receives a 75 percent discount! The retailer gets just $12.50 in payment for hair styling as opposed to $50.

Who gains here? The cost of the customer's hairstyling is cut in half. A significant portion of the Groupon's face value goes to Groupon. The shop owner has a lot of customers. Although businesses may lose money on these one-time deals, they want to encourage repeat business, devoted clients, and a bigger clientele. Additionally, the bargains are transient, sometimes valid for only one day. The idea is to gain money on all other days when standard rates are in force, even if you lose money on one day. It is a cost of acquiring new customers[1]–[3]. Groupon was established in 2008 by Andrew Mason and rose quickly to fame before going public in June 2011. Groupon had over 83 million consumers at that point, was active in 43 countries, and had

sold over 70 million Groupons. But like many social networking sites, Groupon has had trouble turning a profit. On $1.6 billion in sales, it lost $254 million in 2011. The cost of acquiring customers is the highest. Groupon spent $768 million on marketing in 2011—clear evidence that the company thinks acquiring new consumers is worthwhile. Whether Groupon's business model can endure over the long term is the issue. The tens of millions of emails that Groupon sends to users informing them of deals are poorly targeted, there are fewer Groupons sold per customer, and the revenue per Groupon has been declining, according to critics. Additionally, the conversion rate of customers into subscribers is slowing down.

Scale, according to the corporation, is the answer: grow quickly and build a strong brand so that rivals can never attract customers. If it grows quickly enough and attracts enough customers, Groupon might yet become profitable. In the first half of 2012, Groupon went on an acquisition binge, buying businesses including Uptake, Hyperpublic, Adku, and FeeFighters, which it hopes would improve its position in the small- and medium-sized company sector.

Nobody is certain that this company plan will be successful. Many businesses claim that the Groupon bargains are not generating more repeat business. Instead, only the most price-sensitive clients come through the door, and when the prices return to normal, they never come back. Around the world, rivals are mushrooming, including Google Offers and AmazonLocal. Due to its reputation and size, Groupon may be able to get beyond some of the obstacles it encounters. However, investors will want a return, and Groupon's greatest hurdle in the coming years will be demonstrating any kind of profit. The introductory graphic highlights crucial issues brought up by this case and this. How to build a professional company that can benefit from Internet technology and social networking tools in the face of strong rivals is the business problem that Groupon is now confronting. The management of Groupon made the decision to build its business strategy on social media and localization. To build a "critical mass" of prospective clients for a local product or service, the company asks customers to sign up their friends and acquaintances for discount coupons. Participating businesses join up with the hope of gaining a lot of new clients. However, Groupon faces fierce competition, participating businesses don't always gain, and it's not obvious if the company's business model is sustainable and profitable.

DISCUSSION

E-Commerce Today

E-commerce is the practice of doing business via the Web and the Internet. Formally speaking, e-commerce refers to commercial transactions that are facilitated by technology that take place between and among businesses and people. This mostly refers to transactions that take place online and on the web. Crossing organizational or individual borders to trade value in exchange for goods and services is referred to as a commercial transaction. E-commerce started in 1995 with the launch of Netscape, one of the earliest Internet portals. com, which promoted the notion that the Web might be used as a new medium for advertising and commerce, received the first advertisements from significant businesses. Nobody could have predicted at the time that e-commerce retail sales, which doubled and tripled in the early years, would eventually follow an exponential growth path. E-commerce expanded at double-digit rates up until the 2008–2009 crisis, when it slowed to

The early years of e-commerce saw very quick development, which led to a market bubble in e-commerce stocks, mirroring the history of numerous technical advancements like the telephone, radio, and television. The "dot-com" bubble burst, as do all bubbles. During this process, many e-commerce businesses collapsed. However, the outcomes have been more favorable for many other companies, like Amazon, eBay, Expedia, and Google, with skyrocketing sales, improved business models that generate profits, and growing stock prices. E-commerce sales resumed strong growth in 2006, and they have been the fastest-growing segment of retail trade in the US, Europe, and Asia. With 150 million consumers making purchases and 34 million browsing and collecting information but not making purchases, online consumer sales increased to an estimated $362 billion in 2012, an increase of more than 15% over 2010.

An estimated 158 million adult Americans live in the U.S. Internet users access the web. A total of 87 million people get news, 114 million send emails, and 114 million utilize search engines. A social network is used by 93 million people, online banking is used by 46 million people, online video is watched by 54 million people, and Wikipedia is used by 33 million people. B2B e-commerce now accounts for more than $4.1 trillion in global business-to-business transactions and partner cooperation. The revolution in e-commerce is still in progress. As more goods and services go online and more homes migrate to broadband telecommunications, people and companies will utilize the Internet for commerce more often. E-commerce will have a significant impact on other sectors, such as travel bookings, music and entertainment, news, software, education, and finance. These fresh e-commerce trends are highlighted in 10.1.

What Makes E-Commerce Different

Why has e-commerce exploded in popularity? The peculiar features of the Internet and the Web hold the key to the solution. Simply said, compared to other technological revolutions like radio, television, and the telephone, the Internet and e-commerce technologies are considerably more sophisticated and potent. The special characteristics of the Internet and the Web as a business medium are described in 10.2. Let's examine each of these distinctive qualities in further detail.

Ubiquity

In conventional commerce, a marketplace is a real-world location where you go to do business, like a retail shop. E-commerce is omnipresent, which means that it is always accessible almost anywhere. It makes it easy to use cellphones to purchase from a PC, at home, at work, or even from a moving vehicle. The ultimate product is referred to as a marketspace, which is a marketplace that has been expanded beyond conventional bounds and is not tied to a specific place in time or space. From the perspective of the consumer, ubiquity lowers transaction costs, or the expenses associated with engaging in a market. You no longer need to spend time or money going to a market in order to do business, and buying anything now just requires a little amount of thought.

Global Coverage

E-commerce technology makes it possible for business transactions to traverse international and cultural borders far more easily and cheaply than is possible with conventional trade. The potential market size for online retailers is hence nearly equivalent to the size of the global

internet population. Contrarily, the majority of traditional trade is local or regional and includes independent local businesses or multinational corporations with regional outlets. Richness in radio and television. It is possible to send text, audio, and video communications.

1. A single marketing message and customer experience combines video, audio, and text marketing messaging.
2. Interactivity. Through user contact, the technology functions.
3. Density of information. The technology improves information quality while lowering expenses.
4. Personalization/Customization. The use of technology makes it possible to send groups and individuals individually tailored communications.
5. Social media. Social networking and content creation are supported by technology.
6. Customers participate in a conversation that dynamically tailors the experience to each person and includes them as a partner in the process of getting products to market.

Costs associated with information processing, storage, and transmission significantly decrease, while currency, accuracy, and timeliness significantly increase. Information becomes more accessible, affordable, and precise.Based on individual traits, goods and services are customized and marketing messages are personalized.For example, social networks and newspapers are primarily local and regional institutions with limited but potent national networks that can draw a national audience but not easily cross national boundaries to a global audience thanks to new Internet social and business models that enable user content creation and distribution[4]–[6].

Universal Guidelines

The fact that the technical standards of the Internet and, by extension, the technical standards for conducting e-commerce are universal standards is a startlingly unique aspect of e-commerce technology. They let any computer to connect with any other computer, regardless of the technological platform each is on, and are used by every country in the globe. The majority of conventional trade technology, however, vary from country to country. For instance, regional variations in mobile phone technology and television and radio standards. The cost that merchants must spend only to get their products on the market has been significantly reduced by the universal technological standards of the Internet and e-commerce. At the same time, customers' search costs—the effort needed to identify good products—are reduced by universal standards.

Richness

The complexity and substance of a communication are referred to as an information richness. Traditional marketplaces, national sales teams, and local retail establishments are rich in diversity because they may provide individualized, in-person service and use audible and visual signals to close deals. Traditional marketplaces are effective venues for selling or doing business because of their wealth. Before the advent of the Web, there was a trade-off between reach and richness: the more people you could reach, the less rich your message was. The Web makes it feasible to send several individuals rich communications that include text, audio, and video.

Interactivity

E-commerce technologies are interactive, allowing for two-way contact between the merchant and the customer, unlike any commercial technology of the 20th century—possibly with the exception of the telephone. For instance, television is not permitted to engage viewers in conversation or ask them questions, nor is it permitted to ask them to fill out forms with their personal data. On an e-commerce website, however, all of these actions are available. An internet business may interact with a customer in ways that are akin to face-to-face interactions, but on a huge, international scale.

Knowledge Density

The quantity and quality of information that is readily accessible to all market actors, including consumers and retailers, has significantly increased thanks to the Internet and the Web. E-commerce technologies significantly improve the currency, accuracy, and timeliness of information while lowering the costs associated with information gathering, storage, processing, and transmission. Prices and expenses are clearer in e-commerce marketplaces because of the information density. Price transparency refers to how easily customers can learn about the range of prices in a market; cost transparency relates to how easily consumers can learn about the real costs that retailers incur when purchasing goods. Additionally, there are benefits for business owners. Online retailers have significantly more information about customers than they had in the past. In order to engage in price discrimination—selling the same products, or nearly the same things—to certain targeted groups at different rates—merchants may segment the market into groups that are willing to pay varying prices. For instance, an online retailer may learn that a customer has a keen interest in costly, exotic holidays and may then offer the customer high-end vacation packages at a premium price, knowing that the customer is prepared to spend more for such a trip. The same vacation package may also be offered at a lesser cost to a customer who is more budget conscious by the online retailer. Merchants may distinguish their goods based on price, brand, and quality by using information density.

Personalization/Customization

E-commerce technology enable personalization: Businesses may target their marketing messages to particular people by tailoring the message to a person's name, interests, and previous purchases in addition to their clickstream activity. The technology also enables customisation, which modifies the product or service offered in accordance with a user's preferences or previous actions. The interactive nature of e-commerce technology allows for the collection of a wealth of customer data at the time of purchase. Online retailers may keep and utilize a lot of data about customers' previous purchases and behavior because to the growth in information density. As a consequence, personalisation and customisation levels are reached that are unimaginable using conventional commerce technology. By choosing a channel, you can influence what you see on television, but you cannot alter the content of the station you have selected. The Wall Street Journal Online, in contrast, provides you the option to choose the categories of news articles you wish to view first and offers you the chance to get alerts when certain events take place.

User-Generated Content and Social Networking in Social Technology. The Internet and e-commerce technologies have developed to be much more social than earlier ones because to the

ability of users to produce and share material with their close friends in the form of text, videos, music, or images. Users may build new social networks and enhance current ones using various communication methods. The broadcast model is used by all prior mass media in modern history, including the printing press, where information is produced centrally by professionals and viewers are gathered in a small geographic area to consume a standardized product. The modern Internet and e-commerce enable consumers to plan their own content consumption as well as produce and distribute material on a big scale. A distinctive many-to-many paradigm of mass communication is made available through the Internet.

Digital markets and digital goods in a global marketplace are key concepts in e-commerce.The cost and dissemination of information affect company location, timing, and revenue models in certain ways. The Internet has created a digital marketplace where millions of individuals may directly, quickly, and for no cost trade enormous volumes of information. As a consequence, the Internet has altered how businesses operate and expanded their worldwide reach. Asymmetry in information is lessened via the Internet. When one party in a transaction possesses more information important to the transaction than the other side, there is an information imbalance. Their comparative negotiating power may be determined using such knowledge. Digital markets are believed to be more "transparent" than conventional markets in that suppliers and customers may "see" the prices being charged for items.

For instance, there was a considerable knowledge imbalance between vehicle dealers and buyers before to the development of online auto selling sites. Only the car dealers were aware of the manufacturers' costs, making it difficult for customers to compare rates. Profit margins for auto dealers were reliant on this informational imbalance. Three-fourths of American vehicle purchasers utilize the Internet to compare prices since there are a plethora of websites available now that provide competitive pricing information. Thus, the information asymmetry around a vehicle purchase has decreased thanks to the Web. The Internet has also made it easier for companies looking to buy from other companies to get better deals and conditions and to decrease information asymmetries.

Because they function with lower search and transaction costs, lower menu costs, more price discrimination, and the capacity to modify pricing dynamically depending on market circumstances, digital marketplaces are particularly flexible and efficient. In dynamic pricing, a product's price changes in response to the customer's demand characteristics or the seller's supply condition. For instance, online merchants like Amazon and Walmart adjust their pricing for a variety of goods depending on the time of day, consumer demand, and users' previous visits to their websites. Depending on the kind of goods or service being offered, these new digital marketplaces may lower switching costs or raise switching costs, and they may result in a longer wait in satisfaction. You can't instantly consume a product, like garments bought online, unlike at a real store.

There are several options on digital platforms to sell directly to customers without using middlemen like wholesalers or retail stores. Costs associated with purchase transactions may be considerably reduced by removing intermediaries from the distribution route. A product may need to be priced as high as 135 percent over its initial manufacturing cost in order to cover all the costs involved in a typical distribution route. Companies are able to increase profits while

maintaining lower pricing by selling directly to customers or lowering the number of middlemen. Disintermediation refers to the elimination of entities or organizational levels in a value chain that are in charge of intermediate processes. Disintermediation has an impact on the services market. Because travel agencies are no longer used as middlemen, airlines and hotels that operate their own online reservation systems make more money per ticket[7]–[10].

Electronic Goods

Sales of digital items have significantly increased thanks to the online digital market. Products that can be distributed over a digital network are referred to as digital products. Purely digital items may express, store, distribute, and be sold as music tracks, video, Hollywood movies, software, newspapers, magazines, and books. All of these goods are now offered as digital downloads or streaming, while sales of their physical equivalents are declining. The marginal cost of generating a new unit of digital products is often close to $0. However, since there aren't many additional expenses associated with inventory and distribution, the cost of creating the initial first unit is rather high; in fact, it is almost equal to the entire cost of the product. Delivery costs via the Internet are quite cheap, marketing expenses often stay the same, and price may vary greatly. We see the effects of the Internet on the market for these types of digital products every day, and they are nothing short of revolutionary. Bookstores, music shops, music labels, film studios, and other companies that rely on the selling of tangible goods may see a decline in revenue or perhaps the demise of their companies. Hard copy subscriptions to newspapers and periodicals are falling, although internet reading and subscriptions are rising.

Total record label industry revenues are expected to have decreased by 61 percent from $14 billion in 1999 to $5.4 billion in 2012, mostly as a result of the reduction in CD album sales and the rise of digital music services. On the bright side, since its launch in 2001, the Apple iTunes Store has sold 16 billion songs at a price of 99 cents apiece, giving the industry access to a digital distribution model that has helped it recover some of the money it had previously lost to digital music channels. Since the introduction of iTunes, the amount of illicit downloading has decreased by half, and in 2012, genuine online music sales are expected to total $4 billion. Illegal downloading will decrease further as cloud streaming services grow. In that sense, record labels were spared from extinction by Apple and other Internet distributors. For the first time in 2012, more than half of all music sales came from digital sources. However, the revenue generated by a single-track download or stream only amounts to roughly 32 cents for music companies.

Hollywood has not seen the same kind of disruption from digital distribution platforms, in part because it is more difficult to download full-length, high-quality pirated films. Hollywood has negotiated expensive distribution arrangements with Netflix, Google, Amazon, and Apple in an effort to escape the same fate as the music business. These agreements do not, however, fully make up for the loss in DVD sales, which decreased by 50% between 2006 and 2012, but this is quickly changing as online distributors like Netflix are compelled to spend billions on premium Hollywood material. For the first time ever, customers will watch more movies online in 2012 and spend more money doing so than they will on DVDs or other associated tangible goods. Similar to television, the popularity of smartphones and tablets seems to be contributing to an increase in the desire for Hollywood feature films. Moreover, the unexpected return of music videos, spearheaded by the website VEVO, is luring millions of younger viewers to their

devices, such as smartphones and tablets. As internet connections extended throughout the nation in 2010, online movies saw a major boom. The number of movies seen doubled in 2011 alone. One-third of the adult Internet audience, or around 60 million users, are anticipated to watch movies online in 2012. Online movie watching is expanding more quickly than all other forms of video. There is no question that the Internet is becoming into a movie distribution method that competes with cable television, even if this quick expansion won't last indefinitely.

CONCLUSION

In conclusion, E-commerce, particularly digital marketplaces and commodities, has altered consumer behavior, company strategies, and the global economy. Online platforms have created new possibilities for both consumers and companies due to its accessibility, ease, and worldwide reach. To guarantee the continuous development and sustainability of e-commerce in the digital age, it is essential to solve issues relating to security, privacy, and equal access. The expansion of e-commerce is, however, accompanied with difficulties and worries. To retain confidence and safeguard customers in digital marketplaces, concerns including internet security, data privacy, intellectual property rights, and counterfeit goods must be addressed. Additionally, the advantages of e-commerce may be restricted for certain people and geographical areas due to discrepancies brought about by the digital divide and access to technology.

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E-COMMERCE: BUSINESS AND TECHNOLOGY

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ABSTRACT:

E-commerce, the buying and selling of goods and services online, has become a fundamental aspect of modern business. This study explores the interplay between business and technology in the context of e-commerce, examining the key factors that drive its success, the technologies that underpin e-commerce operations, and the implications for businesses and consumers in an increasingly digital marketplace.The success of e-commerce hinges on several key business factors. First and foremost is the ability to provide a seamless and user-friendly online shopping experience. Businesses must invest in intuitive website design, efficient navigation, and secure payment gateways to build trust and facilitate transactions. Additionally, competitive pricing, personalized recommendations, and effective customer service are crucial for attracting and retaining customers in a highly competitive e-commerce landscape.

KEYWORDS: *Business Models, Cloud Computing, Customer Experience,E-Commerce, Management.*

INTRODUCTION

From a few adverts on early Web sites in 1995 to over 9% of all retail sales in 2012, e-commerce has grown significantly and surpassed the mail order catalog industry. E-commerce is an intriguing fusion of new information technology and commercial structures. The sorts of e-commerce should be understood first, and then the e-commerce business and revenue models should be described. We'll also talk about emerging technologies that enable businesses to connect with the anticipated 2 billion more internet users globally in addition to the 184 million Americans.

E-commerce types

Electronic commerce transactions may be categorized in a variety of ways, one of which is by the types of parties involved. Business-to-consumer, business-to-business, and consumer-to-consumer e-commerce are the three main subcategories of electronic commerce. Electronic commerce between businesses and consumers entails selling goods and services to specific customers. B2C e-commerce is shown by BarnesandNoble.com, which offers music, software, and books to individual customers. Electronic commerce between firms includes the selling of products and services. A B2B e-commerce example is the website for buying and selling chemicals and polymers from ChemConnect. Electronic commerce between consumers is done by consumers selling to other customers. For instance, users may sell their products to other

customers by auctioning them off to the highest bidder or for a set amount on eBay, the enormous Web auction site. The most popular marketplace for people to purchase and sell directly to one another is Craigslist[1]–[3].

The platforms utilized by the parties to an electronic commerce transaction may also be used to categorize such transactions. The majority of e-commerce transactions up until recently were conducted on a personal computer linked to the Internet via wired networks. There are now other wireless mobile alternatives, including smartphones, tablets like the iPad, and e-readers like the Kindle that use cellular networks as well as smartphones and tiny laptops that use Wi-Fi wireless networks. Mobile commerce, often known as m-commerce, is the use of portable wireless devices to make purchases of products and services from any place. M-commerce technology enables both business-to-business and business-to-consumer e-commerce transactions.

E-Commerce Business Models

New business models have been able to emerge as a result of the above discussed changes in the economics of information, whereas older company models have been destroyed. One of the most significant Internet business models to arise is described in 10.5. All utilize the Internet in some capacity to enhance the value of already-existing goods and services or to provide the groundwork for brand-new ones.

Portal

Portals are entry points to the Web, and they are often referred to as websites that users have set as their home pages. Even though few people use Google or Bing as their home page, search engines like these are included in some definitions of portals. Integrated packages of information and services, including news, e-mail, instant messaging, maps, calendars, shopping, music downloads, video streaming, and more are available on portals like Yahoo, Facebook, MSN, and AOL. Portals were largely used as "gateways" to the Internet at first. However, the portal business model now offers consumers a destination site where they may begin their Web searches and remain to read news, discover entertainment, socialize, and be exposed to advertising. The main ways that portals make money are through drawing in extremely sizable audiences, charging advertisers for ad placement, collecting referral fees from visitors who are directed to other websites, and charging for premium services. Portals are thought to have brought in $8.5 billion in 2012 alone. Despite the fact that there are hundreds of portal/search engine websites, due to their strong brand awareness, the top four portals get more than 95% of all Internet portal traffic.

E-Tailer

Online retailers, often known as e-tailers, exist in various shapes and sizes, from the enormous Amazon, which had sales of more than $48 billion in 2011, to little neighborhood shops with websites. An e-tailer is comparable to a regular brick and mortar business, with the exception that clients may check their inventory and make orders by just connecting to the Internet. Online shopping will bring in roughly $224 billion in total sales in 2012. E-tailers' value proposition is to provide 24/7 convenient, affordable shopping with a wide range of options for customers. Some online retailers, or "bricks-and-clicks," like Walmart.com and Staples.com, are divisions or

subsidiaries of already-existing physical shops and provide the same goods. Others, though, are solely connected to the virtual world and don't have any connections to real places. This sort of online retailer includes Amazon, BlueNile.com, and Drugstore.com, among others. There are a number of other e-tailer types, including online malls, online versions of direct mail catalogs, and manufacturer-direct online sales.

Content Creator

While e-commerce first served as a platform for retail goods sales, it has evolved into a worldwide content channel. The term "content" is used in a wide sense to refer to all types of intellectual property. Any form of human expression that can be saved on a digital medium, like the Web, or placed into a physical medium like text, CDs, or DVDs is referred to as intellectual property. Online information material is distributed by content providers, including text, digital video, music, photographs, and artwork. The value proposition of online content providers is that customers can easily locate a large variety of material online and affordably buy it to play or see on various computers or cellphones. Providers don't necessarily have to be the ones who came up with the material; they're more likely to be Internet-based distributors of it. In contrast, Apple does not produce or commission new music; instead, it sells music songs via its iTunes Store. New methods of delivering digital material, such as podcasting and mobile streaming, have been made possible by the iTunes Store's extraordinary success and Apple's Internet-connected gadgets, such as the iPhone, iPod, and iPad. By using the Internet to distribute audio or video broadcasts, podcasting enables subscribers to download the broadcasts to their computers or portable music players. The technique of distributing music and video files known as streaming sends a steady stream of material to a user's device without first being saved there. The entire income from downloads, streaming, and subscription media is predicted to be $19 billion in 2012. Estimates vary. With a projected 20 percent annual growth rate, they are the e-commerce market category that is expanding the quickest.

DISCUSSION

Financial Broker

Transaction brokers are websites that conduct transactions for customers that are typically done in person, over the phone, or by mail. Financial services and travel services are the two sectors that use this concept the most. The main value propositions of an online transaction broker are time and money savings, as well as the availability of a vast selection of financial goods and vacation deals in one place. Online stock brokers and booking services for trips have far lower costs than their conventional counterparts.

Market Maker

Market builders provide a virtual space where consumers and sellers can interact, exhibit their goods, look for them, and negotiate pricing. The advantage of online market makers is that they provide a platform where vendors can conveniently showcase their goods and where customers can make direct purchases from vendors. Online auction sites like Priceline and eBay are excellent illustrations of the market creator business model. Another example is the Amazon Merchants platform, which enables retailers to open online storefronts and provide fixed-priced

products to customers. This reminds me of open-air marketplaces where the market creator runs a place where vendors and customers may interact. In 2012, online market makers will bring in roughly $18 billion.

Providing Services

Online service providers provide services as opposed to online retailers that sell goods. Online services are proliferating like never before. A service provider business model is used by Web 2.0 apps, photo-sharing websites, and online services for data backup and storage. Software is increasingly available as an online service that you subscribe to rather than a physical product that you buy from a merchant, or as an app that you download. It is no longer a tangible product with a CD in a box. With products like Google Apps, Google Sites, Gmail, and online data storage services, Google has been at the forefront of the development of online software services.

Local Service Provider

Community providers are websites that set up an online environment where people with related interests can interact, share interests, photos, and videos, connect with others who share those interests, get information related to those interests, and even act out fantasies by assuming online personas known as avatars. Users may find community-building resources and services on social networking sites like Facebook, Google+, Tumblr, LinkedIn, and Twitter as well as several specialized websites like Doostang and Sportsvite. The fastest-growing websites recently have been social networking sites, which often see audiences double in a single year. They are having trouble turning a profit, however.

Models for e-commerce revenue

The revenue model of a company outlines how it will generate profits, generate revenue, and provide a higher return on investment. Although many alternative e-commerce revenue models have been created, the majority of businesses depend on one or a combination of the following six income sources: affiliate, transaction fee, free/freemium, subscription, sales, and advertising.

Model for Advertising Revenue

According to the advertising revenue model, a website makes money by bringing in plenty of visitors who can see advertisements. The most popular income strategy in e-commerce is advertising, and it can be argued that without advertising, the Web would provide a very different experience than it does now. Because advertisers cover the expenses of production and distribution in exchange for the right to expose users to advertisements, content on the Web, including news, videos, and views, is "free" to visitors. In 2012, businesses will invest an estimated $166 billion in advertising, $39.5 billion of which will be spent online. In the last five years, marketers have boosted their internet spending while decreasing their expenditures on media outlets like radio and newspapers. Online advertising will account for nearly 30% of all advertising in the United States in 2012, growing at a rate of 15%. Along with an increase in internet advertising earnings, television advertising has also increased[4]–[6].

Advertisement And Marketing Based on Location

The first extensive location-based mobile marketing solution in the nation was introduced by the UK-based mobile carrier O2 in October 2010. The idea of focused marketing is seen as being an essential component of every organization. The company's mobile marketing subsidiary, O2 Media, currently exploits client information to provide tailored marketing to businesses. For instance, a theme park's iPhone app that catered to families with kids had remarkable success, with around 30% of the target audience ultimately downloading the app. Age, gender, hobbies, and other demographics are the standard marketing goals. By focusing on the right people at the right time, while they are in the appropriate place to make a purchase, location-based marketing may go farther.

Here is how the O_2 system works. By submitting their age, gender, and hobbies, O_2 subscribers may opt into the system. Customers get an SMS message with discounts or other special offers when they are close to a store that fits their profile. As of O_2's start, it only offered discounts to retailers that sold L'Oréal hair products and Starbucks coffee, but O_2 Media was optimistic that new partners would join. The service is based on a technology known as "geo-fencing," which is supplied to O_2 by a business with headquarters in California by the name of Placecast. Three major store kinds participated in an experiment that Placecast ran in 2009 under the moniker ShopAlerts: AmericanSonic, Eagle Outfitters, and North Face. Although there could be some overlap in the three shops' prospective clients, a lot of individuals will fall into one group but not the other two. Through targeted marketing, less relevant marketing communications end up in "junk mail" since clients only get SMS messages that they are likely to find relevant. The majority of consumers read the alerts right away, and 65 percent of Shop Alerts users who made purchases as a consequence of getting the SMS message, according to Placecast's analysis on those users.

Frequency: The risk is that the client will get a deluge of messages as they go up and down the street since the SMS is triggered by the user entering the geo-fenced region. One message every 48 hours and three messages every week were the communication limits for the Placecast American experiment. One message per day is the maximum frequency allowed by the O2 protocol.

Devices: Any mobile phone may use the O2 plan. An app is not required, and it has no impact on the battery life of the device. As one would anticipate, O2 and its partners were excited about the project. O2 Media's managing director, Shaun Gregory, claims that this is a cutting-edge and effective technique to simultaneously reach a wide audience because of the enormous market potential. L'Oréal's head of CRM, Hal Kimber, said the opportunity was extremely exciting and that the company would learn a lot that it could use to future projects.

The prospective customer's usage of texting must be taken into account when using text alerts for marketing. A marketing research firm that examines internet activity, comScore, performed a poll in October 2010 and discovered significant regional variations in mobile usage. Users of mobile phones from Japan, the US, and Europe were included in the poll. The researchers discovered that whereas 66.8% of Americans exchanged SMS messages to one another, more than 80% of respondents in the European group did so. However, the was just 40.1 percent in Japan. Of course, a lack of passion for messaging does not automatically indicate a dislike of receiving commercial texts.

It seems that location-based mobile advertising, a more complex method of modifying the advertising that a user gets while using an application, is more important in Japan than Placecast's opt-in technique. For instance, banner ads are often shown to users of iPhone or Android apps. Japan's location-based advertising industry is dominated by AdLocal, and such technology may ensure that the advertising that users see is based not only on who they are but also on where they are. Advertisers use a wizard to build their own advertisements, after which they choose the places and times at which they should appear. The success of this kind of clever marketing seems to have a good chance of spreading to the United States and Europe.

Websites that have a huge audience or that have a very specific, distinct audience and are able to hold users' attention might charge more for advertising. For instance, Yahoo gets almost all of its money from display advertisements and a smaller amount from search engine text ads. In 2012, Facebook will place a third of the trillion-display advertising across all websites. More than any other portal site, Facebook users spend more than 8 hours every week on the platform.

Model for Sales Revenue

In the sales revenue model, businesses generate income by offering consumers products, services, or information. Companies with sales revenue models include Amazon, LLBean, and Gap.com. Charges for downloading whole files, such music tracks or books, as well as for downloading music and/or video streams, are how content providers generate money. Micropayment acceptance has been enhanced and advanced by Apple. Micropayment systems provide content producers an affordable way to handle large numbers of very tiny financial transactions. Apple's iTunes Store, which has more than 250 million credit consumers who routinely buy individual music files for 99 cents, is the biggest micropayment system on the Internet. More information about micropayment and other e-commerce payment systems may be found on MyMISlab's Learning Track.

Model for Subscription Revenue

A website that offers content or services charges a monthly fee for ongoing access to any or all of its offerings under the subscription business model. This revenue model is often used by content producers. For instance, only members to the online edition of Consumer Reports, who have the option of paying a $5.95 monthly subscription fee or a $26.00 yearly charge, have access to premium information, such as in-depth ratings, reviews, and recommendations. With more than 25 million customers as of September 2012, Netflix is one of the most popular subscription services. With more than 1 million online subscribers, The Wall Street Journal is the most widely read subscription newspaper online. The material must be seen as having significant added value, be unique, and be difficult to duplicate in order for the subscription model to be effective. A number of businesses, such as Microsoft's Xboxlive, Match.com and eHarmony, Ancestry.com and Genealogy.com, and others, effectively provide content or services online through membership. com, as well as Pandora.com.

Free or Freemium Business Model

In the free/freemium revenue model, businesses provide free or inexpensive basic services or content while charging more for more sophisticated or unique features. Google, for instance,

provides free apps but charges for premium services. The paid radio service Pandora provides both a free service with restricted playback and advertising and a premium service with limitless playback. In addition to providing users with unlimited storage, high-definition video storage and playing, and independence from display advertising, the Flickr photo-sharing site now sells a $24.95 "premium" plan. This package is designed to allow users to share images with friends and family. The plan is to use free services to draw extremely sizable audiences before convincing some of these people to subscribe to premium services. The conversion of "freeloaders" into paying consumers is one issue with this strategy. "Free" may serve as a potent metaphor for wasting money[7]–[10].

Transaction Fee Model for Revenue

A fee is paid by a corporation under the transaction fee revenue model in exchange for facilitating or carrying out a transaction. As an example, eBay offers an online auction marketplace and charges a modest transaction fee to sellers who are successful in selling their goods there. Every time an online stockbroker like E*Trade transacts a stock trade on behalf of a client, it is paid transaction fees. The fact that the user is not immediately aware of the full cost of utilizing the platform contributes to the transaction revenue model's widespread acceptability.

Model for Affiliate Revenue

In the affiliate income model, websites promote users to other websites in exchange for a commission or a share of the sales proceeds. For instance, MyPoints generates revenue by introducing businesses to new clients by providing members with exclusive discounts. Members who take advantage of a promotion and make a purchase get "points" they may exchange for free goods and services as well as a referral fee from MyPoints. Community review websites like Epinions and Yelp generate a large portion of their money by sending prospective consumers to online stores. By including the Amazon logo on their blogs, affiliates who work for Amazon encourage customers to visit the retailer's website. Display advertising are often included in affiliate programs and posted on personal blogs. Some bloggers accept direct payments from manufacturers in exchange for their positive product reviews and referrals to their online stores. Others obtain complimentary things.

Social networking and crowdsourcing wisdom

Web 2.0 online services, as we discussed in 7, are one of the e-commerce income segments that is expanding the quickest. Social networking, or online gathering places where individuals may meet their friends and friends of their friends, is the most well-liked Web 2.0 service. Over 93 million Americans use the Internet daily, with many of them using social networking sites like Facebook, Google+, Tumblr, MySpace, LinkedIn, and many more. Through their shared professional or personal connections, social networking sites enable users to find new acquaintances, sales leads, and job-hunting advice from their peers. While LinkedIn focuses on professional networking for jobs, Google+, MySpace, Facebook, and Friendster are popular among those who are mainly interested in growing their connections.

The Cleverness of Crowds

Businesses may now promote and advertise their goods in new ways by building websites with hundreds or even millions of users who can engage. In a phenomenon known as "the wisdom of crowds," some contend that many individuals may make better judgements than one person or even a small committee of experts regarding a variety of subjects or items. Even if this is obviously not always the case, amazing things may nonetheless happen. According to the wisdom of crowds notion in marketing, businesses should speak with thousands of consumers in order to build relationships with them and get a deeper understanding of how their goods and services are used and valued. Building trust with your consumers by actively seeking their feedback will show them that you value their opinions and that you are in need of their counsel.

Crowdsourcing is a method that allows businesses to actively assist in addressing specific business challenges rather than just asking for input. For instance, in 2006, Netflix sponsored a competition in which it offered a $1 million prize to the individual or team that could devise a way to increase by 10% its forecast of the movies that users would enjoy, as compared to their actual preferences. By 2009, 5,169 teams from 186 different countries had submitted 44,014 submissions to Netflix. The winning team enhanced a crucial aspect of Netflix's operations: a recommender system that suggests new movies to watch based on customers' specific prior movie preferences and the preferences of millions of other customers who are similar to them. BMW started a crowdsourcing initiative in 2012 to recruit users' help in creating an urban car for the year 2025. One of the most well-known e-commerce crowd financing websites, Kickstarter.com, allows users to support start-up businesses.Here, you can wager on particular outcomes for events like football games, horse races, and whether the Dow Jones will rise or fall in a single day. An academic market devoted to elections is called Iowa Electronic Markets. On the results of regional and presidential elections, you may wager. The biggest prediction market in the US is Intrade.com, where consumers may purchase or sell shares in forecasts.

CONCLUSION

In conclusion, the way products and services are purchased and sold has changed as a result of the convergence of business and technology in e-commerce. It has altered corporate strategies, given power to the people, and widened the market. Businesses must emphasize customer experience, properly integrate technology, and adapt to the changing digital environment in order to successfully deploy e-commerce. Businesses need to be adaptable as e-commerce develops, adopt new technology, and provide value to clients in the always shifting digital market. It lessens the requirement for actual store space, allowing for overhead expenditure reductions. E-commerce does, however, present several difficulties, like managing logistics, guaranteeing cybersecurity, and adjusting to changing customer expectations.Prediction markets are another way for businesses to benefit from the knowledge of the masses. In peer-to-peer betting markets called prediction markets, players place bets on certain outcomes of events like quarterly sales of a new product, product designs, or political elections. Betfair, which was established in 2000, is the largest commercial prediction market in the world.

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SOCIAL E-COMMERCE AND SOCIAL NETWORK MARKETING

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ABSTRACT:

Social e-commerce and social network marketing have emerged as powerful forces in the digital landscape, leveraging the influence of social media platforms to facilitate online shopping experiences and drive business growth. This studyexplores the concepts of social e-commerce and social network marketing, their impact on consumer behavior and business strategies, and the opportunities and challenges they present in the evolving digital marketplace.Social e-commerce refers to the integration of social media and e-commerce, where online shopping experiences are seamlessly integrated into social media platforms. Social media platforms such as Facebook, Instagram, and Pinterest have introduced features that allow businesses to showcase and sell products directly to users within their social feeds. This convergence of social media and e-commerce offers convenience, social proof, and personalized recommendations, transforming the way consumers discover, evaluate, and purchase products.

KEYWORDS: *Business Models, Customer Experience, E-Commerce, Management, Social Network Marketing.*

INTRODUCTION

No sector has been more impacted than marketing and marketing communications, despite the fact that e-commerce and the Internet have transformed whole industries and made new business models possible. Using techniques like search engine marketing, data mining, recommender systems, and targeted e-mail, marketers may now reach millions of prospective consumers at prices far lower than those of conventional media. Internet-based long tail marketing is possible. Before the Internet, it was exceedingly costly to reach a broad audience, so marketers had to concentrate on selling the most customers on hot commodities like hit music, Hollywood movies, books, or vehicles. In contrast, the Internet enables marketers to locate new clients on a budget for goods when demand is little. For instance, the Internet enables the profitable sale of independent music to relatively niche markets. Almost every product is always in demand to some extent. A professional company may be created by stringing together many such long tail sales. The Internet also offers brand-new, often rapid, and spontaneous opportunities to learn more about consumers, modify product offerings, and boost customer value[1]–[3].

To improve the performance of banner, rich media, and video advertisements, several e-commerce marketing companies use behavioral targeting strategies. In order to understand a person's interests and intents and provide them with ads that are specifically matched to their behavior, behavioral targeting involves following a person's clickstream across hundreds of

websites. Supporters contend that a more thorough grasp of the client results in more effective marketing, more sales, and higher revenues. Unfortunately, the behavioral targeting of millions of Web users also results in the unauthorized violation of privacy. Consumers are less likely to make purchases when they are dissatisfied with their Web experience.

Two layers of behavioral targeting are used: on individual websites and on multiple ad networks that monitor visitors across tens of thousands of websites. Every website gathers information about user browsing activities and stores it in a database. They have capabilities to track users' previous web visits, the URLs they navigate to after leaving a site, the operating system they use, information about their browsers, and even certain location data. Additionally, they keep track of the precise pages seen on a certain website, the length of time spent on each page, the different page types visited, and the purchases made by visitors. Companies use this data on client interests and behavior to evaluate and create detailed profiles of both current and future customers. The majority of large Web sites also have a large number of tracking scripts on their home pages that monitor your clickstream activity around the Internet by following you from site to site and retarget adverts to you by displaying the same ads on many websites. Google's DoubleClick, Yahoo's RightMedia, and AOL's Ad Network are the top three internet advertising networks. Publishers with space to sell and advertisers looking to promote online are represented by ad networks. Information on millions of online buyers acts as the grease for this machine, enabling marketers to accurately target the demographics and persons they want with their adverts.

By using this data, businesses can better understand how well their website is performing, develop distinctive personalized Web pages that display content or advertisements for goods or services that are particularly interesting to each user, enhance the customer experience, and add value by getting to know their customers better. Marketers may replicate some of the advantages of utilizing individual salespeople at far lower costs by personalizing the Web pages that are shown to each consumer. For instance, ladies will see a Chevrolet banner ad from General Motors that emphasizes safety and usefulness, while males will see other advertising that emphasize power and toughness.

What if you are a large national advertising agency aiming to reach millions of people on behalf of several clients? What if you were a major international manufacturer looking to connect with prospective customers? Working with each of the millions of Web sites would be impossible. This issue is resolved by advertising networks, which assemble a network of thousands of the busiest websites, analyze user activity throughout the whole network, create user profiles for each user, and then sell these profiles to advertisers. Popular websites download a large number of Web tracking cookies, bugs, and beacons, which transmit anonymous user online activity data to distant servers. Are you looking for young, unmarried, college-educated customers in the Northeast who are between the ages of 18 and 34 who are interested in buying a European car? Not an issue. As they go from one website to another, advertising networks may locate and deliver hundreds of thousands of individuals who meet this description, exposing them to adverts for European autos. According to various estimates, behaviorally tailored advertisements are typically 10 times more likely to elicit a customer reaction than a randomly selected banner or video advertisement. The same technique is used by so-called advertising exchanges to instantly

auction access to customers with extremely detailed profiles to marketers. About 20% of online display advertisements in 2012 are targeted; the remaining 80% are dependent on the context of the pages that customers visit, the estimated demographics of visitors, or so-called "blast and scatter" advertising, which is scattered at random across any available page with only a few targeting factors, like the time of day or season.

DISCUSSION

The concept of the digital social graph serves as the foundation for social e-commerce. All key online social relationships are mapped out in the digital social graph. The concept of a "social network" used to represent offline contacts and the social graph are interchangeable. By sketching lines from yourself to the ten individuals you know the most closely, you may create a map of your own social network. Make distinctions between these individuals if they are acquainted. Ask these ten friends to list and then circle the ten individuals who are closest to them if you want to be ambitious. This activity results in the creation of a rough map of your social network. Imagine for a moment if everyone online did the same and uploaded the findings to a sizable database on a website. In the end, you would have Facebook or a website similar to it. The term "the social graph" refers to the aggregate of all these private social networks.

You are just six connections away from any other individual on earth, according to the small world idea. The size of the social network established would be 31 billion individuals if you added 100 names from your personal address book to a list and emailed it to your friends, who then added 50 additional names of their friends, and so on, six times. Therefore, the social graph is a collection of millions of individual social graphs. We are all connected to one another more tightly than we ever imagined, making it really a small world. In the end, you'll discover that you have a big number of direct friends and family as well as an even wider universe of indirect friends and relatives. Theoretically, finding another person anywhere on earth requires six linkages for any one person.

This idea is crucial to e-commerce because it illustrates how interconnected individuals are: the goods and services you choose to purchase will affect the decisions of your friends, who will then impact your choices. The consequence is apparent if you're a marketer looking to establish and develop a brand: Take advantage of the fact that individuals are involved in social networks, have similar interests and beliefs, and interact with and influence one another. As a marketer, you should focus on the social networks and personal networks of consumers rather than the millions of isolated individuals viewing a TV program.

Social media is one of the branding and marketing channels that has had the highest growth in 2012 and 2013. Social media marketing costs are now significantly lower than those for television, magazines, and even newspapers, but this will soon change. In the offline world, social networks are groups of individuals who actively engage with one another over time. Online social networks are Web sites that allow users to connect with one another, develop group and individual relationships, and share interests, beliefs, and ideas. Examples of such sites include Facebook, MySpace, LinkedIn, Twitter, Tumblr, and Google+, as well as dozens of others with social components. People create online personas with text and images that reflect how they want other people to see them, and they then ask their friends to connect to those

personas. Through email linkages and word-of-mouth, the network expands. The Facebook "Like" button, which enables users to let their friends know they enjoy a product, service, or piece of information, is one of the most pervasive visual elements on websites in 2012. An estimated 1.5 billion Likes are processed by Facebook annually.

While Facebook, with 150 million U.S. visits per month, gets the majority of the public attention paid to social networking, the other top four social networks, with the exception of MySpace, are expanding extremely quickly. Twitter grew by 13% in 2012 for recommendations on buying goods, services, and content, while LinkedIn increased by 58% to reach 40 million monthly visitors. While Google may assist you in finding things, social search can assist you in determining the quality of items by letting you hear what your friends or their friends have to say about them. For instance, in 2012, Amazon's social recommender system could utilize your Facebook social profile to recommend purchases to 37 million individuals, while the social blogging platform Tumblr saw a 166 percent increase in monthly users to 27 million. In comparison, MySpace has been dwindling but still brought in 28 million visits per month in 2012. In the United States, social networking websites accounted for roughly 20% of all online time, up from 8% in 2007, according to ComScore. Social network apps for smartphones are the ones that are expanding the quickest; roughly 30% of smartphone users frequent social networks on their devices.

In 2012, mobile devices accounted for 50 percent of all Facebook visitors. Marketers cannot ignore these massive audiences, which are larger than those of radio and television. 72% of Americans in the U.S. Sixty-six percent of Fortune 500 corporations had a Facebook page, 62 percent had a YouTube channel, and 28 percent had a company blog. Over $3 billion, or roughly 9% of all internet marketing budgets, will be spent by marketers on social network marketing in 2012. Social media marketing is still in its infancy, and businesses are experimenting in search of a successful recipe. Social connections and client sentiment may be difficult to regulate, which creates additional difficulties for businesses trying to safeguard their brands. The Interactive Session on Management gives particular examples of how businesses use Facebook and Twitter for social media marketing.

New Efficiencies and Relationships in B2B E-Commerce

Business-to-business trading encompasses a vast market. B2B e-commerce is thought to have contributed around $4.1 trillion of the estimated $16 trillion in B2B trade that took place in the United States in 2012. B2B e-commerce is anticipated to reach $5.6 trillion in the US by 2016. Trade between businesses is a complicated process that requires a lot of human interaction, which uses up a lot of resources. According to some businesses, administrative overhead for each corporate purchase order for support items is at least $100. Processing paper, approving purchase choices, utilizing the phone and fax to look up items and make purchases, setting up shipment, and receiving the goods are all examples of administrative overhead. This adds up to billions of dollars being spent yearly throughout the economy on procurement procedures that might potentially be automated. Literally trillions of dollars could be freed up for more productive uses, consumer prices could potentially decrease, productivity could rise, and the economic wealth of the country would increase if even a small portion of inter-firm trade was automated and a small portion of the entire procurement process was assisted by the Internet. This is what B2B e-

commerce promises. Designing and putting into practice innovative Internet-based B2B solutions, as well as modifying current procurement habits and procedures, is the challenge of B2B e-commerce.

Electronic business-to-business transactions are those that take place between businesses. These transactions are increasingly being carried out using a range of other Internet-enabled means. Approximately 80% of B2B e-commerce conducted online still relies on proprietary electronic data exchange platforms. Electronic data interchange permits the computer-to-computer transmission of common documents including invoices, bills of lading, shipping schedules, and purchase orders between two firms. Through a network, transactions are automatically sent from one information system to another, doing away with the need to print, handle, and enter data at either end. The structure and information fields of electronic documents for each major industry in the United States and most of the rest of the world are defined by EDI standards[4]–[6].

Initially, EDI automated the interchange of paperwork like invoices, shipment notifications, and purchase orders. Although EDI is still widely used for document automation, it is also used by businesses that participate in continuous manufacturing and just-in-time inventory replenishment. Suppliers have online access to a portion of the production and delivery schedules of the buying business, and they automatically dispatch materials and products to achieve predetermined objectives without assistance from purchasing agents at the firm. Even while many businesses still utilize private networks for EDI, they are becoming more and more Web-enabled as a result of how flexible and affordable Internet technology makes connecting to other businesses. Businesses are able to expand their network of trade partners and use digital technology to a larger variety of endeavors.

Consider the procurement process. In addition to buying products and materials, procurement also include sourcing, haggling with suppliers, paying for products, and arranging for deliveries. Today, companies may utilize the Internet to find the lowest-cost suppliers, browse online catalogs of suppliers' items, bargain with suppliers, place orders, pay suppliers, and arrange for delivery. They're not only restricted to companies connected by conventional EDI networks.The Internet and Web technologies allow companies to build new electronic storefronts for selling to other companies that include interactive elements and multimedia visual presentations comparable to those seen in B2C commerce. As an alternative, companies may employ Internet technology to build extranets or electronic markets where they can connect with other companies to conduct business-to-business transactions. Businesses utilize EDI to automate transactions for continuous inventory replenishment and B2B e-commerce. Purchasing companies may get information regarding shipments directly from suppliers. The buying companies may utilize EDI to send payment information to suppliers as well as production and inventory needs.

A major company often uses a secure website to connect to its suppliers and other important business partners in private industrial networks. The network is controlled by the buyer and enables the company to share product design and development, marketing, production scheduling, inventory management, and unstructured communication, including graphics and e-mail, with selected suppliers, distributors, and other business partners. A private exchange is another name for a private industrial network. VW Group Supply is one instance of a company

that connects the Volkswagen Group with its suppliers. 90% of Volkswagen's worldwide buying, including all automotive and parts components, is handled by VW Group Supply.

Net marketplaces, also known as e-hubs, provide several distinct buyers and sellers access to a single, digital marketplace based on Internet technology. They may function as independent middlemen between buyers and suppliers or are owned by the industry. Online markets make money through transactions including purchases and sales as well as other services offered to customers. Participants in online markets have two options for setting pricing: they may utilize preset prices or conduct online negotiations, auctions, or requests for quotes. Internet marketplaces may be categorized in a wide variety of ways and with various sorts. Direct and indirect commodities are sold on different Internet marketplaces. An example of a direct good is sheet steel, which is utilized in the construction of vehicle bodies. All other things, such as office supplies or items for maintenance and repair, that are not directly related to the manufacturing process are referred to as indirect goods. While some online marketplaces offer contractual buying based on long-term agreements with selected suppliers, others support spot purchasing, which refers to the short-term acquisition of items based on urgent requirements, often from a variety of providers.

Others serve horizontal markets for products and services that are available in many different sectors, such as office supplies or transportation, while others serve vertical markets for specialized industries, such as autos, telephones, or machine tools. Exostar is a prime example of a company-owned online market place that places a strong emphasis on long-term contractual partnerships and the provision of networks and computing platforms that are used by many companies, thereby minimizing supply chain inefficiencies. In order to link these businesses with their suppliers and promote cooperation, BAE Systems, Boeing, Lockheed Martin, Raytheon, and Rolls-Royce plc developed this industry-sponsored online marketplace. Exostar's sourcing, e-procurement, and collaboration technologies are used by more than 70,000 trade partners in the government, military, and commercial sectors for both direct and indirect commodities.

Exchanges are privately held third-party online markets that link thousands of providers and buyers for on-the-spot transactions. With a focus on direct inputs, several exchanges provide vertical markets for a specific sector, such as food, electronics, or industrial equipment. Among buyers and sellers in the paper sectors from more than 75 different countries, Go2Paper, for instance, facilitates a spot market for paper, board, and kraft. In the early years of e-commerce, exchanges were many, but many have since collapsed. Due to the exchanges' encouragement of price-cutting competition and lack of any long-term ties with customers or other benefits, suppliers were unwilling to engage. Because they need contracts and consideration of factors like delivery speed, customization, and product quality, many necessary direct purchases cannot be made on the spot. Instead, they must take into account these factors.

Mobile E-Commerce and the Mobile Digital Platform

Count the number of individuals using their BlackBerrys or iPhones as you walk down the street in any large city. You'll see your fellow passengers reading an online newspaper, watching a video on their phone, or reading a book on their Kindle whether you're traveling by rail or air. In

five years, the vast majority of Internet users in the US will utilize mobile devices as their main method of Internet access. M-commerce is flourishing.

Around $30 billion in annual revenues were generated by retail goods and services, apps, advertising, music, videos, ringtones, applications, movies, television, and location-based services like local restaurant locators and traffic updates in 2012, making up about 10% of all e-commerce. However, m-commerce, which is expected to reach $150 billion in 2016, is the fastest-growing kind of e-commerce, with certain regions rising at a pace of 50% or more annually. Over 855 million people in China and 242 million people in the United States were predicted to be mobile phone users in 2012. Retail sales at the top Mobile 400 firms, including Amazon and eBay, sales of Apple and Android applications, and sales of digital content music, TV programs, and movies are the key drivers of growth in mobile e-commerce. Location-based services and mobile advertising are not included in these projections. For services that are time-sensitive, appealing to consumers on the go, or that complete a job more effectively than other ways, m-commerce apps have exploded in popularity. A few instances are described in the sections that follow[7]–[10].

Services and Applications Based on Location

Geosocial, geo-informational, and geo-advertising services are examples of location-based services. The utilization of location-based services by smartphone users is 74%. Map services with GPS functionality that are accessible on smartphones are what connects these activities and serves as the basis for mobile commerce. You may find out where your pals are meeting up using a geosocial service. Geoinformation services may tell you the price of a home you are considering, as well as information on special exhibits at a museum you are passing, while geoadvertising services can direct you to the closest Italian restaurant. An example of a geoinformation service is Wikitude.me. For smartphones with a built-in GPS and compass that can pinpoint your exact position and the direction the phone is oriented, Wikitude.me offers a specialized kind of browser. The browser overlays information about the points of interest you are viewing and displays it on your smartphone screen, superimposed on a map or a photo that you just took, using data from over 800,000 points of interest available on Wikipedia as well as thousands of other local sites. For instance, from a tour bus, people may use their smartphone cameras to point out mountains, and the names and heights of those mountains will be shown on the screen. In order to share material with other users, Wikitude.me also gives users the option to geotag the environment around them.

Geosocial services include Foursquare, Gowalla, Loopt, and future products from Facebook and Google. By "checking in" to the service and declaring your presence at a restaurant or other location, geosocial services enable you to find friends or be discovered by your friends. Your pals are informed right away. The use of geosocial services by smartphone owners is about 20%. Because Facebook and Google+ have expanded into geosocial services and made them into extensions of their bigger social networks, the appeal of niche websites like Foursquare has decreased. In 2012, 5 million people used Loopt. Although the site posts advertising depending on user location, it does not sell user information to marketers. The goal of Loopt is to interact with advertising on a walking level. With 22 million registered users, foursquare offers a comparable location-based social networking service where users may connect with friends and

update their position. Checking in at certain venues earns you points. Users may choose to have their check-ins published on their Facebook, Twitter, or both accounts. Users may also get badges for checking into places with certain categories, often, or at specific times. The merchant platform is used by more than 500,000 neighborhood businesses globally for marketing. The economic basis for mobile commerce is geoadvertising, which links customers to nearby businesses. In 2012, mobile advertising will total $2.6 billion. Users get advertisements from geomarketing depending on their GPS whereabouts. Google and Apple get location data from smartphones. When these customers are nearby, retailers purchase access to them. For instance, the cosmetics company Kiehl Stores broadcast notifications and special deals to consumers who were within 100 yards of their store.

Additional Mobile Commerce Services

Customers may now manage their accounts from their mobile devices thanks to services being offered by banks and credit card firms. Customers of JPMorgan Chase and Bank of America may check account balances, make transfers, and pay bills using their mobile devices. At least 134 million individuals are thought to bank online on a monthly basis. Although the mobile advertising industry is still tiny, it is expanding quickly as more businesses look for methods to make use of new databases of location-specific data. The two biggest providers of mobile display advertising are Millenial Media and Google's AdMob platforms, respectively. Facebook is far behind in fourth place but is catching up quickly. When a mobile phone user is within a certain range of an advertiser's closest store, Alcatel-Lucent's new service, which will be run by Placecast, will identify them and inform them of the location and phone number of the outlet as well as maybe providing a link to a coupon or other promotion. Hyatt, FedEx, and Avis Rent A Car are just a few of Placecast's customers.

Yahoo runs advertisements for brands including Pepsi, Procter & Gamble, Hilton, Nissan, and Intel on its mobile home page. While Microsoft provides banner and text advertising on its MSN Mobile page in the United States, Google is showing advertisements related to cell phone queries by users of the mobile version of its search engine. Games, movies, and other mobile apps all have ads. With the help of the smartphone app Shopkick, companies like Best Buy, Macy's, and the Sports Authority can give out discounts to customers as they enter. The Shopkick app detects when a user enters a partner retail location and awards "kickbucks," a new virtual currency that can be exchanged for Facebook credits, iTunes Gift Cards, travel vouchers, DVDs, or quick cash-back benefits at any of the partner businesses. Today, 55% of online merchants have m-commerce Web sitessimplified versions of their websites that allow customers to place orders using mobile devices. Among the businesses having applications for mobile commerce sales are the clothing stores Lilly Pulitzer and Armani Exchange, Home Depot, Amazon, Walmart, and 1-800 Flowers.Live TV shows from networks like MSNBC and Fox Sports are available on MobiTV, a service provided by Verizon Wireless, AT&T Wireless, and other mobile carriers. Short films are now being made by movie studios specifically for mobile devices. Mobile versions of user-generated content are also emerging. There are mobile versions of social networking websites like Facebook, MySpace, YouTube, and others. With over 5 million daily users apiece, Words with Friends, FarmVille, and CityVille lead the top 10 most downloaded Facebook games in 2012.

CONCLUSION

In conclusion, social network marketing and social e-commerce have changed how customers find and interact with companies, while also opening up new channels for company expansion. Convenience, personalisation, and social validation are offered by the fusion of social media with e-commerce, which influences customer behavior and purchasing choices. Businesses must use social media platforms, create specialized social network marketing strategies, and put a high priority on consumer involvement and authenticity if they want to prosper in this environment. Social network marketing and social e-commerce will become more important as social media and e-commerce develop, helping to shape the digital market.Ts and smartphones have become as popular entertainment platforms. Digital games, movies, TV episodes, music, and ringtones are available for download and streaming on smartphones like the iPhone and Android-based devices. Customers of the main cellular providers' internet services may stream on-demand video content, news content, and weather updates.

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BUILDING THE WEB SITE: IN-HOUSE VERSUS OUTSOURCING

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ABSTRACT:

Building a website is a critical decision for businesses seeking an online presence. One of the key considerations is whether to develop the website in-house or outsource the project to a professional web development agency. This studyexplores the pros and cons of in-house website development versus outsourcing, taking into account factors such as cost, expertise, control, time, and quality.In-house website development involves utilizing the company's internal resources, including IT teams and designers, to build and maintain the website. This approach offers several advantages. Firstly, it allows for greater control and customization, as the development team has a deep understanding of the company's objectives and requirements. In-house development also provides more flexibility in terms of making changes, updates, and additions to the website.

KEYWORDS: *Customization, Development Team, Expertise, Flexibility, Maintenance Support, Management.*

INTRODUCTION

A thorough grasp of business, technology, and social concerns is necessary for creating a successful online presence, as is a methodical approach. An e-commerce presence in 2012 may include a Facebook business page, a Twitter company feed, and smartphone applications where clients may access your services in addition to a company website. It might be challenging to plan and implement all of these varied consumer settings. Students should study publications that are specifically dedicated to this topic since a full discussion of the subject is beyond the scope of this work. Having a clear grasp of your company goals and knowing how to choose the appropriate technology to meet those objectives are the two most significant managerial issues in creating a successful online presence.

The Site-Building Puzzle's Pieces

Assume you are the manager of a medium-sized company that manufactures industrial components and has eight operations in Europe, Asia, and North America. This company employs around 10,000 people globally. You have a year and a $1 million budget from senior management to create an online store. This website's main function will be to sell to and provide support for the company's 20,000 clients, the majority of whom are local small machine and metal fabrication firms. How do you begin? You must first be aware of the primary areas where choices will need to be made. To construct and operate a successful e-commerce site, you will

need to assemble a team of people with the necessary skill sets on the organizational and human resource fronts. The major choices about technology, site design, and social and information policies that will be implemented at your site will be made by this team. If you want to prevent the calamities that have happened at certain businesses, the whole site creation process has to be carefully handled[1]–[3].

You will also need to decide on the hardware, software, and telecoms infrastructure for your website. Your technology selections should be influenced by consumer needs. Your clients will want technology that allows them to swiftly and simply locate what they're looking for, examine it, buy it, and then get it from your warehouses. You must carefully think through the layout of your website. You must consider a project strategy after you have determined the major decision areas.

Information Needs, Business Objectives, and System Functionality

When developing your website, you must consider the following question: "What do we want the e-commerce site to do for our business?" The main thing to take away from this is that technology should be driven by business choices, not the other way around. By doing this, you can be confident that your technological platform and your company are compatible. We'll presume that in order to accomplish your strategic goals, you've picked a company model and developed a business plan. But how can you turn your ideas, business plans, and strategies into a functional e-commerce site? Following the identification of the precise business goals for your website in your planning, you must create a list of system functionality and information needs. Simply said, business goals are qualities you want your website to possess. You'll need certain information system capabilities, or system functions, to accomplish your company goals. The information pieces that a system must create in order to accomplish the business goals are known as the information requirements for a system.

DISCUSSION

Building and maintaining websites may be done in a variety of ways. Your willingness to spend money determines a lot of things. Options include developing everything yourself or outsourcing the construction of the full website to a third party. Another choice you must make is whether to host the website on your company's servers in-house or to a third-party web host provider. While some suppliers will develop or host your website, others will design, create, and host your website.

The Construction Decision

There are many alternatives available if you decide to design your own website. You should utilize a pre-made template to build the Web site unless you are quite proficient. For instance, Yahoo! Merchant Solutions, Amazon Stores, and eBay all provide templates that only need text, images, and other information to be entered. They also offer the necessary infrastructure to support the Web site after it has been built. This is the cheapest and most straightforward option, but you will be restricted to the "look and feel" and functionality offered by the infrastructure and template. You could choose to develop the site yourself if you have any computer building knowledge. There are many different tools available, from those that allow you to construct

everything entirely "from scratch," like Adobe Dreamweaver, Adobe InDesign, and Microsoft Expression, to top-tier prepackaged site-building solutions that can develop complex sites specifically tailored to your requirements.

There are some hazards associated with choosing to design your own website. Development costs are considerable, as are the risks of performing poorly, due to the complexity of services like shopping carts, credit card verification and processing, inventory management, and order processing. Your workforce may have a lengthy, challenging learning curve, delaying your entrance into the market. You will be recreating what other specialist organizations have previously developed. Your attempts may not succeed. On the plus side, you may be able to create a website that performs precisely what you want and develop the internal expertise to quickly modify the website as needed by a changing business climate.

If you choose more costly site-building packages, you will be buying cutting-edge, well tested software. You could arrive at the market sooner. However, in order to make an informed choice, you will need to thoroughly assess a wide range of software programs, which may take a lot of time. To make the packages meet your company's demands, you may need to employ extra outside specialists and make the necessary alterations. Costs quickly increase as alterations multiply. A $4,000 package might quickly turn into a $40,000–$60,000 development effort due to all the necessary code modifications.

The Choice of Hosting

Let's now examine the choice of hosting. The majority of companies choose to outsource hosting and pay a firm to host their website; as a result, the hosting company is in charge of making sure the site is "live" or accessible, every day of the year. The firm may avoid dealing with the technical aspects of establishing and maintaining a Web server, telecommunications lines, or specialist employees by agreeing to a monthly cost. With a co-location deal, your business buys or rents a web server but places it in the physical space of a vendor. The vendor looks after the facility, the telephone lines, and the equipment. Hosting your website in virtualized computing facilities is far less costly in the era of cloud computing. Instead of buying the server in this scenario, you rent its features from a cloud computing facility like Rackspace. Depending on the size of the website, bandwidth, storage, and support needs, cloud hosting costs may vary from $4.95 per month to several hundred thousand dollars per month. By establishing massive "server farms" that are strategically placed around the nation and the world, very big providers are able to realize significant economies of scale. This indicates that the price of basic hosting has decreased by roughly 50% annually, keeping pace with the decline in server costs.

Web site spending

Simple websites may be created and hosted for $5,000 or less the first year. It costs several million dollars a year to develop and maintain the Web sites of major companies with high degrees of interactivity and integration to corporate systems. For instance, Bluefly, an online retailer of cheap designer clothing for both men and women, committed more than $5.3 million on the redesign of its website. Bluefly reported $88 million in online sales in 2011 and is seeing a 10% yearly revenue growth. Its annual budget for e-commerce technology is around $8 million, or nearly 10% of its overall sales. Since 2000, the cost of hardware, software, and

communications has generally decreased precipitously, making it viable for extremely tiny businesses to establish somewhat complex websites. The expenditures of system upkeep and content generation have increased to account for more than half of average Web site budgets at the same time. Both providing material and running efficient 24/7 operations need a lot of work.

Dot-Co business website

Spreadsheet download, formatting, and mathematical abilities in software Business statement analysis in spreadsheets Choose only one online retailer, such as Ashford, Buy.com, Yahoo, or Priceline. Examine the company's website pages that outline its goals and organizational structure. Use the Internet to look for articles that discuss the firm. then go to www., which is the website of the Securities and Exchange Commission. Access the company's 10-K form, which includes income statements and balance sheets, at sec.gov. Only the parts of the 10-K form containing the specific financial statements you need to review should be chosen, and these sections should then be downloaded into your spreadsheet. Make three-year summaries of the company's income statements and balance sheets in a simple spreadsheet.

Is the business a dot-com success, a tenuous operation, or a dud? What facts serve as the foundation for your decision? Why? Consider the company's three-year trends in revenues, costs of sales, gross margins, operating expenditures, and net margins in particular while responding to these questions.

Your knowledge of commercial Internet services for hosting an e-commerce website for a small start-up business will grow as a result of this assignment. You are looking at services for hosting small company Internet storefronts because you want to build up a website to sell towels, linens, ceramics, and other items from Portugal. Your website should be able to process safe credit card payments. You initially want to show 40 distinct goods' pictures and information. Compare the selection, capabilities, and prices of the e-commerce hosting services that Yahoo! Small Business, GoDaddy, and Comcast Business Class provide to small companies by visiting their websites. Examine their e-commerce website creation options as well. Compare these services and choose the one you would use if you were to open a real online business. Write a succinct report outlining your decision and outlining the advantages and disadvantages of each.

Managing Information

Researchers and pharmaceutical firms are continuously looking for new medications that will cure cancer and other critical diseases more effectively. This technique was mostly based on trial and error until recently[4]–[6]. Drugs that treat diseases often operate by addressing a protein that is causing the sickness and is interfering negatively with other molecules in the body. By attaching to the protein and either restoring good connections or making up for harmful ones, the medication may block these interactions. It has been said that a medication binding to a protein is similar to a key fitting into a lock. Drug producers would comb through soil-based natural molecules, colors, and industrial chemicals, as well as unsuccessful compounds from past drug research attempts, in the classic drug discovery process, seeking for the "keys" while disregarding the "locks." They would examine the effects of their samples on sick cells. One sometimes succeeded, as with penicillin, but for the vast majority of attempts, this was not the case.

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Pharmaceutical firms built massive libraries of prospective chemicals in an effort to speed up the process. Robots were then used to swiftly evaluate hundreds of thousands of samples to determine which ones were effective. Machines would mix and match basic building components to produce hundreds of compounds every day. Robots would then dispense little amounts of each chemical into tiny vials holding samples of a disease-related biological component, such the protein that initiates cholesterol creation. When the material and chemical generated the intended reaction, it was considered a "hit". Too much was dependent on luck. When a novel medicine was discovered by researchers that really worked, they often spent years wondering why it worked. Very few useful drugs were found in this fashion; they did not comprehend the "key" or the "lock."

Former Merck & Company scientist Joshua Boger made the decision to experiment with a novel strategy termed structure-based design. He established Vertex Pharmaceuticals in 1989 with the goal of understanding out how a "lock" appeared in order to provide the proper disease-fighting "key." Proteins flee when X-rays try to take their photos, therefore scientists must first crystallize the proteins and attempt to identify their structure by analysing the patterns left by the X-rays deflecting around them. It would not be simple to discover the shape of a "lock" in this way. Powerful computers that can analyze thousands of interference patterns are needed for this job. The next step is for scientists to develop a tailored chemical that fits that specific "lock."

be extensively created, produced, and digested by the body at the proper pace. In order to quickly scan vast database libraries of chemical structures and discover the most promising possibilities, powerful computers assist in evaluating the structures and attributes of molecules that are most likely to attach to that target. Structure-based design was useful in the development of the medicine Xalkori, a therapy for a rare and resistant kind of lung cancer. Researchers at the biotech company Sugen under the direction of Dr. Jean Cui were working to stop the development of cancer tumors by inhibiting a protein called c-Met. The researchers discovered a naturally occurring molecule that bonded to c-Met, but at that time the molecule lacked qualities that would make it a useful medication, such as avoiding fast metabolism in the body. By crystallizing the c-Met protein and attaching one of the prospective drug molecules to it, other researchers utilizing structure-based design were able to determine the protein's structure and how the "key" of the prototype drug molecule fit into the protein's "lock."

Using this knowledge, Dr. Cui was able to create a brand-new molecule with the ability to connect to c-Met and possess characteristics suitable for a medication. Colleagues modeled compounds digitally on computers and created compounds in test tubes for additional investigation using Cui's drawing of what she believed the medication design should resemble. Animal experiments conducted in February 2003 revealed that the chemical might halt tumor development. Following Pfizer's acquisition of Sugen and Pharmacia, the molecule was further improved such that Xalkori could be tested on people. In the summer of 2011, the FDA approved Xalkori.

The experience of the medical researchers involved in drug development reported in this article illustrates how technology may help businesses operate better by making it easier to acquire and use knowledge. In all spheres of business, including medical research, success and survival depend on facilitating access to information, enhancing its quality and currency, and using it to

enhance company operations. The introductory graphic highlights crucial issues brought up by this case and this. Because the process of discovering new pharmaceuticals is so laborious and difficult, pharmaceutical firms face several difficulties. The earlier techniques relied too much on trial and error and were not particularly precise or successful. Thanks to the development of new methods for visualizing and creating novel pharmaceuticals as well as the use of powerful computers and information technology, this is starting to change.

By employing a novel method, drug researchers that use structure-based design may now see and simulate interesting molecules at the molecular level. Powerful computers for molecular structure analysis, databases that organize information about particular molecules and compounds, and software for visualizing and modeling molecules all contribute to the creation and dissemination of new knowledge. Drug researchers and pharmaceutical corporations have a far more precise and efficient procedure for creating effective pharmaceuticals and for understanding how these drugs really operate because to enhanced mechanisms for gathering and creating information.

The Landscape of Knowledge Management

One of the fastest expanding sectors of business and governmental software investment is knowledge management and collaboration solutions. In the domains of economics, management, and information systems, research on knowledge and knowledge management has grown tremendously during the last ten years. Collaboration and knowledge management are strongly intertwined. Knowledge that cannot be shared and transmitted to others is practically worthless. When knowledge is disseminated throughout the organization, it becomes valuable and usable. The main technologies for collaboration and social business have previously been covered. In this article, we'll concentrate on knowledge management systems while keeping in mind how crucial it is to communicate and share information. We live in an information economy where the creation and dissemination of knowledge and information is the primary source of income and success. Knowledge and information workers make up the biggest single section of the labor force in the United States, making up an estimated 37% of the workforce. The knowledge and information industries provide around 45 percent of the US gross domestic product.

As managers become aware that their company's capacity to develop and manage knowledge is a key component of its value, knowledge management has emerged as a key topic at many global businesses. Studies have shown that knowledge, along with brands, reputations, and distinctive business processes, is one of the intangible assets that significantly contribute to a company's stock market value. Though the effects of knowledge-based investments are difficult to quantify, well-executed knowledge-based initiatives have been known to provide tremendous returns on investment.

Important Knowledge Dimensions

The differences between information, knowledge, wisdom, and data are significant. According to 1, data is a flow of events or transactions that are recorded by an organization's systems and are primarily relevant for transactional purposes. A company must invest resources to categorize data into categories of comprehension, such as monthly, daily, regional, or store-based reports of total sales, in order to transform data into knowledge that is usable. An organization must invest

more resources to identify the patterns, laws, and environments in which the knowledge operates. Finally, wisdom is defined as the individual and societal experience of using knowledge to solve problems. Knowing when, where, and how to use information is part of wisdom.

Knowledge is a quality that the company has both individually and collectively. In people's minds, knowledge is a cognitive, and sometimes even a physiological, experience. Additionally, it is communicated in lectures, kept in libraries and archives, and maintained by businesses as staff know-how and business procedures. Explicit knowledge is information that has been documented, while tacit knowledge is knowledge that exists in workers' thoughts but has not been recorded. Email, voicemail, graphics, unstructured papers, and structured documents may all contain knowledge. Most people agree that knowledge has a home, either in people's thoughts or in certain corporate processes. Knowledge is "sticky" and not readily transferred or applied to all situations. Finally, it is believed that knowledge is contextual and situational. For instance, you need to be aware of both the right time and the right way to complete an operation.

We can see that knowledge is a unique kind of business asset, distinct from things like buildings and financial assets, that knowledge is a complicated phenomenon, and that the process of managing knowledge has numerous facets. We may also agree that an organization's top two or three strengths—its knowledge-based core competencies—are important organizational assets. One of the main sources of profit and competitive advantage that cannot be readily acquired by rival businesses in the market is knowing how to execute things effectively and efficiently in ways that other companies cannot copy[7]–[10].

For instance, having a distinct build-to-order manufacturing method is a kind of expertise and maybe a unique asset that other businesses find difficult to duplicate. With information, businesses may utilize limited resources more effectively and efficiently. Without knowledge, businesses utilize resources less efficiently and less effectively over time, eventually failing.

Organizational Learning and information Management Organizations use a number of organizational learning techniques to produce and acquire information, just as people do. Organizations build experience via data collecting, thorough evaluation of planned actions, trial and error, and feedback from customers and the environment at large. Learning organizations change their behavior to reflect that learning by developing new business procedures and altering managerial decision-making patterns. Organizational learning is the term for this process of transformation. It is possible to argue that organizations that have effective learning mechanisms will last longer than those that cannot quickly recognize and adjust to their circumstances.

CONCLUSION

In conclusion, Weighing the benefits and drawbacks of each option is necessary when deciding whether to construct a website internally or hire a third party. Before choosing one strategy over the other, firms must carefully consider their capabilities, knowledge, control needs, and financial limits. Regardless of the strategy used, the ultimate purpose is to develop a useful, aesthetically pleasing, and user-friendly website that supports the goals of the company while enhancing online visibility and client experience. Outsourcing could be a more sensible choice for small enterprises with limited financial resources and technical competence. Larger businesses with established IT departments may prefer the control and customization that in-

house development provides. Whatever strategy is selected, it is essential for effective website construction and maintenance to carefully analyze the business needs, prices, available resources, and time restrictions.

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THE KNOWLEDGE MANAGEMENT VALUE CHAIN

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ABSTRACT:

Knowledge management (KM) is a strategic process that focuses on effectively capturing, organizing, and leveraging knowledge within organizations to drive innovation, enhance decision-making, and improve overall performance. The knowledge management value chain is a framework that illustrates the various stages and activities involved in creating value from knowledge. This studyexplores the components of the knowledge management value chain and highlights its significance in enabling organizations to effectively harness their intellectual capital.The knowledge management value chain consists of five key stages: knowledge acquisition, knowledge storage and organization, knowledge dissemination, knowledge application, and knowledge evaluation. In the knowledge acquisition stage, organizations gather knowledge from various sources, including internal expertise, external research, and customer insights. This stage involves processes such as data collection, knowledge mapping, and expertise identification.

KEYWORDS: *Acquisition, Capture, Creation, Dissemination, Evaluation, Innovation, Knowledge Assets.*

INTRODUCTION

In order to produce, preserve, transmit, and utilize information inside an organization, a series of business procedures known as knowledge management were established. The capacity of the company to learn from its surroundings and apply information into its business operations is increased through knowledge management. The collection of organizational and managerial capital that is necessary to reap the benefits of investments in information technologies is what we refer to when we talk about business practices, culture, and behavior. To optimize the return on investment in knowledge management initiatives, supporting values, processes, and behavioral patterns must be established, much as with other investments in information systems [1]–[3].

Information Acquisition

Depending on the kind of information an organization seeks, they might obtain it in a variety of methods. Building corporate archives of papers, reports, presentations, and best practices was the goal of the earliest knowledge management systems. Unstructured documents are now included in these attempts. In other instances, companies build online expert networks so that staff

members may "find the expert" inside the firm who is individually competent.In other instances, businesses must generate new knowledge by identifying patterns in their company data or by using knowledge workstations where engineers may do so. This describes these numerous endeavors in detail. Data from the company's transaction processing systems, which keep track of sales, payments, inventory, customers, and other crucial information, as well as data from outside sources like news feeds, industry reports, legal opinions, scientific research, and government statistics, are also necessary for a coherent and organized knowledge system.

Knowledge Retention

Documents, patterns, and expert rules must be saved after they are found so that staff members may access and utilize them later. Usually, knowledge storage entails building a database. Large databases with the capacity to store collections of documents are document management systems, which digitize, index, and tag documents in accordance with a logical framework. Expert systems aid businesses in maintaining acquired knowledge by integrating it into organizational procedures and culture. Each of these is covered further in this section and the one that follows. Management must promote the creation of corporate-wide standards for indexing documents, support the development of planned knowledge storage systems, and recognize and reward workers who take the effort to update and store information correctly. For instance, it would encourage salespeople to add prospect names to a common corporate database so that all salespeople may recognize each one and check the information that has been accumulated about them[4]–[6].

DISCUSSION

Knowledge Dissemination

The range of collaboration tools for sharing calendars, papers, data, and images has expanded thanks to the development of portals, e-mail, instant messaging, wikis, social business tools, and search engines. There seems to be an abundance of information and wisdom thanks to modern technologies. How do managers and workers find the information and knowledge that is really critical to their choices and work in the midst of a sea of information and knowledge? In this situation, managers may concentrate their attention on the crucial knowledge and information with the use of training programs, informal networks, and shared management experience communicated via a supportive culture.

Informational Application

Regardless of the knowledge management system in question, information that is not shared and applied to the real-world issues that managers and businesses face does not provide value to the company. Organizational knowledge must be integrated into management decision-making processes on a regular basis and placed in decision support systems in order to provide a return on investment. The business processes and critical application systems of a company, such as enterprise applications for managing critical internal business processes and connections with clients and suppliers, must ultimately include new information. Management helps this process along by developing new business strategies, goods and services, and markets for the company based on fresh information[7]–[9].

Collaboration, Communities of Practice, and Workplace Environments in the Building of Organizational and Management Capital. In addition to the actions we've just discussed, managers may support knowledge acquisition by creating new organizational roles and responsibilities, such as chief knowledge officer executive positions, specialized staff positions, and communities of practice. Communities of practice are unofficial social groups made up of experts and workers from inside and outside the company who engage in similar professional activities and pursuits. These communities engage in self- and group-education, conferences, online newsletters, and daily sharing of experiences and methods for resolving particular workplace issues. Numerous businesses, including IBM and the U.S. The World Bank and the Federal Highway Administration have supported the growth of thousands of online communities of practice. Software platforms that facilitate cooperation and communication are very important to these communities of practice. By directing community members to helpful materials, setting up document repositories, and filtering content for newcomers, COPs may make it simpler for individuals to reuse knowledge. Members of the COPs serve as facilitators, promoting contributions and dialogue. By connecting new hires with subject matter experts and giving them access to the accepted practices and resources of a community, COPs may help shorten the learning curve for new hires. Finally, COPs may serve as a breeding ground for novel approaches, methods, and ways of thinking.

Knowledge Management System Types

Enterprise-wide knowledge management systems, knowledge work systems, and intelligent approaches are the three main categories of knowledge management systems. Systems for managing knowledge throughout the whole organization are used to gather, store, disseminate, and use digital material and knowledge. These systems have the ability to locate employee experience inside the company, store both organized and unstructured data, and conduct information searches. They also include auxiliary technologies like learning management systems, search engines, portals, and tools for collaboration and social business. Information work systems including computer-aided design, visualization, simulation, and virtual reality systems have been developed as a result of the development of potent networked workstations and software to help engineers and scientists in the discovery of new information. Systems created specifically for engineers, scientists, and other knowledge workers tasked with generating new information for a business are known as knowledge work systems. A wide range of intelligent technologies, including as data mining, expert systems, neural networks, fuzzy logic, genetic algorithms, and intelligent agents, are also included in knowledge management. These methods have a variety of goals, from focusing on knowledge discovery to condensing information into rules for a computer program to finding the best solutions to issues.

Systems for Enterprise-Wide Knowledge Management

Companies must manage at least three different types of knowledge. The company has some knowledge that is stored in structured text documents. Semi structured information, such that found in e-mail, voice mail, chat room conversations, movies, digital photos, brochures, or bulletin board posts, is also necessary for decision-makers. In still other situations, the knowledge is held in the minds of the employees and is neither formal nor digitized in any way.

Most of this information is tacit knowledge, which is seldom recorded in writing. All three forms of knowledge are addressed by enterprise-wide knowledge management systems.

Content Management Systems forEnterprises

Businesses now must organize and manage knowledge assets that are both organized and semi structured. Structured knowledge is explicit information that may be found in formal papers and regulations that organizations have developed through monitoring experts and their decision-making techniques. However, analysts estimate that at least 80% of a company's business material is semi-structured or unstructured, including data found in emails, messages, memoranda, proposals, graphics, electronic slide shows, and even movies made in various forms and kept in many places. Organizations may manage both sorts of information with the use of enterprise content management solutions. They are able to collect, store, retrieve, distribute, and preserve information, which enables businesses to make better business choices and procedures. These systems enable the collection and organization of semi structured information, including e-mail, as well as corporate archives for papers, reports, presentations, and best practices. Users of major business content management systems may also connect through email, chat/instant messaging, discussion groups, and videoconferencing, as well as access other information sources like news feeds and research. They are beginning to use wikis, blogs, and other business social networking platforms. Leading providers of enterprise content management software include Oracle Corporation, EMC, IBM, and Open Text Corporation.

The largest gold producer in the world, Barrick Gold, with headquarters in Toronto, employs Open Text capabilities for enterprise content management and to enable communities of practice. The business, which has 20,000 people globally and 26 active mines, was generating and storing data all over the place. Barrick required a method to consolidate this organizational know-how, facilitate access to vital corporate data, and guarantee that best practices are recorded and disseminated. A central repository for papers pertaining to policies, processes, standards, guidelines, novel concepts, and best practices, Barrick's Knowledge Center has the ability to identify the most recent version of any document. Administrators are aware of all site visitors and the documents they are viewing. Wikis, blogs, and forums are among the social networking features included in the content management system to assist communities of practice in sharing information.

The development of a suitable classification system, or taxonomy, to arrange information into useful categories and make it accessible, is a major challenge in knowledge management. Each knowledge item must be "tagged," or classed, once the categories for categorizing knowledge have been generated in order for them to be readily retrieved. The ability to tag, interface with corporate databases and content repositories, and build company knowledge portals that provide a single point of access to information resources are all features of enterprise content management systems. The storage and management of unstructured digital data, such as photographs, graphic pictures, video, and audio information, is a particular concern for businesses in the publishing, advertising, broadcasting, and entertainment industries. To avoid duplication of effort and deviation from a consistent brand image, Coca-Cola, for instance, must maintain track of all prior creations of the Coca-Cola brand pictures at all of the company's

global offices. Systems for managing digital assets assist businesses in categorizing, storing, and distributing these digital things.

Truth Network Systems

Information network systems deal with the issue that emerges when the necessary information is not stored in a digital document but rather is kept in the memory of certain corporate specialists. Knowledge network systems provide an online directory of business experts and their biographies, together with information about their work history, current projects, publications, and academic credentials. Employers may easily identify the right specialist inside their organization by using search tools. The AskMe feature of Hivemine's knowledge network platforms includes libraries of expert-generated material. The top business content management, social networking, and collaboration software systems come with some knowledge networking features. Employers need to find methods to monitor employee learning, manage it, and better incorporate it into their knowledge management and other internal corporate systems. A learning management system offers resources for managing, delivering, monitoring, and evaluating many forms of employee learning and development.

Multiple learning formats are supported by modern LMS, including CD-ROM, downloadable videos, online courses, live teaching in-person or online, and group learning via discussion boards and chat sessions. The LMS streamlines mixed-media training, automates course selection and administration, compiles and distributes learning materials, and evaluates learning efficacy. For customers including Procter & Gamble, Colgate-Palmolive, and Delta Airlines, CVM Solutions, LLC offers training on managing suppliers using Digitec's Knowledge Direct learning management system. Online course content can be accessed through Knowledge Direct, which also offers hands-free administration features like student registration and assessment tools, built-in Help and Contact Support, automatic e-mail triggers to remind users of courses or deadlines, automatic e-mail acknowledgement of course completions, and Web-based reporting for courses accessed. Each client business receives a corporate-branded login from Knowledge Direct, and CVM is able to designate and assign a company administrator with access to the student reporting tool for that organization.

Information Work Systems

The enterprise-wide knowledge systems we just discussed provide a variety of capabilities that many, if not all, employees and organizations in a company may utilize. In order to support knowledge workers in the creation of new knowledge and the effective integration of that information into the company, organizations also provide them with specialized systems.

Skilled Employees and Skilled Work

Researchers, designers, architects, scientists, and engineers are examples of knowledge workers, which we mentioned in Chapter 1, who mainly produce knowledge and information for the company. Knowledge workers often get recurring requests to use independent judgment as part of their jobs, are well educated, and belong to professional organizations. For instance, knowledge workers come up with new items or how to enhance ones that already exist. Three crucial tasks that knowledge workers carry out are crucial to the business and the managers that

work there: Maintaining knowledge of developments in technology, science, social philosophy, and the arts for the company, and acting as internal advisors about their areas of expertise, changes now occurring, and opportunities

Work Systems Knowledge Requirements

Office technologies, such as word processors, voice mail, e-mail, videoconferencing, and scheduling programs, are used by the majority of knowledge workers and are intended to boost workplace efficiency. Knowledge workers, however, also need highly specialized knowledge work systems with strong visuals, analytical tools, communications, and document management capabilities. These systems need to be powerful enough to process sophisticated visuals or difficult computations needed by knowledge workers like scientists, product designers, and financial analysts. These solutions also need to provide the worker with rapid and simple access to external databases since knowledge workers are so focused on knowledge in the outside world. They often include intuitive user interfaces that let users carry out required operations without having to invest a lot of effort in learning how to utilize the system. Given the high pay of knowledge employees, it would be costly to waste their time. Knowledge workstations are often created and optimized for the particular jobs that need to be carried out; as an example, a design engineer needs a different workstation configuration than a financial analyst. For three-dimensional CAD systems, design engineers need graphics with sufficient processing capability. However, access to several external databases and sizable databases for effectively storing and retrieving vast quantities of financial data is what financial analysts are increasingly interested in.

Knowledge Work Systems Examples

The three main applications for knowledge work are financial workstations, virtual reality simulation and modeling systems, and CAD systems. Using computers and advanced graphics software, computer-aided design automates the production and editing of designs. Using a more conventional physical design technique, each design alteration necessitates the creation of a mold and the physical testing of a proto-type. It is an extremely costly and time-consuming operation that must be done several times. Near the conclusion of the design phase, the designer only needs to create a physical prototype when using a CAD workstation since the design can be quickly tested and modified on the computer. A significant amount of time and money is saved while generating a manufacturing process with far fewer issues thanks to the capacity of CAD software to offer design requirements for the tooling and production processes. Some of these advantages are shown in the Interactive Session on Technology, which also demonstrates how they may be a source of competitive advantage. Data for 3-D printing, also known as additive manufacturing, which employs machines to build solid items, layer by layer, from specifications in a digital file, may be provided by CAD systems. Currently, 3-D printing is utilized to create prototypes, tiny objects like jewelry and hip implants, as well as aircraft components. It may eventually be used to fabricate components on-demand for vehicles and military hardware.

Virtual reality systems are capable of far more advanced visualization, rendering, and simulation than traditional CAD systems. They produce computer-generated simulations that are so convincingly realistic that viewers virtually think they are taking part in real-world situations using interactive graphics software. Depending on the application, the user dons specialized

clothes, headgear, and other equipment in various virtual reality systems. The gear has won Firewire international prizes and recognition because it incorporates sensors that track a wearer's motions and instantly communicate and recycle extra expanded polystyrene foam. But it's not sufficient. Firewire made the decision to start producing bespoke surfboards rather than simply the standard off-the-rack sizes in order to keep one step ahead of the competition. The strength and adaptability of Firewire's materials were important selling points for the average surfer. The ability to attract top-tier competitive surfers as clients drives the larger surfboard business as well, but bespoke boards constructed to a surfer's requirements are essential in the elite surfboard market.

Traditional surfboard design and construction was done by hand by expert craftsmen known as shapers, but Firewire began handling part of this labor using computer-aided designs transmitted to cutting facilities. The shaper received a board that was 85 to 90 percent finished from the company's computer-aided manufacturing process, allowing the artisan to finish the customization and lamination process. Price, who was appointed CEO of Firewire, claims that there are 29 labor- and time-intensive procedures involved in the manufacture of a surfboard. Initially, it was difficult to provide customized CAD to the typical customer because of the complex production process. Only elite, competitive consumers may order customized boards. Customization could not be made available to a larger market without taxing Firewire's CAD system. Additionally, to order the majority of bespoke boards, a sheet of paper with the proposed alterations' different measurements had to be filled out. There was no way to visualize these changes or evaluate how they would influence the volume of the board, which has a direct effect on buoyancy, maneuverability, and performance.

In order to feed the CAD process, link it with its computer numerical control production process, and enable customers to experiment with pre-existing designs, Firewire required a system. Introducing ShapeLogic Design-to-Order Live! For NX, which offers a web-based user interface, an online customization system, and sophisticated 3-D CAD tools. In order to create its own Firewire Surfboards' Custom Board Design system, which enables customers to quickly alter board dimensions of existing models within design parameters, Firewire began collaborating with the ShapeLogic NX program in 2009. Any registered client may choose a typical Firewire model and alter the board's length, midpoint width, nose width, tail width, and thickness using drag-and-drop tools, so long as the modifications don't compromise the design integrity of the board. Along with a 3-D CAD document format file of the customized board, CBD creates an accurate three-dimensional model of the stock model that served as the basis for the design. The board's measurements and volume are documented in the PDF file. Before making an order, a buyer may alter the model from all directions and contrast the customized board with the standard board to get a complete understanding of the design. When a consumer orders a bespoke board via the system, CBD creates an exact solid CAD model of the board, which is then sent straight to the Firewire factory where it is used to operate CNC machines to make the board. By combining these technologies, a board that is 97 percent finished is produced, reducing the amount of time needed for production, the cost to the customer, and the finishing process. Once a surfer has built the board of his or her desires, it may be repeatedly manufactured to those precise specs, unlike the previous CAD aided, 10 to 15 percent hand-

finished boards. With this level of accuracy, neither the perfect handcrafted board nor a shaper-finished board can be duplicated[10].

CONCLUSION

In conclusion, the knowledge management value chain offers businesses a thorough structure for managing their knowledge assets. Organizations may use their intellectual capital to spur innovation, boost performance, and achieve a competitive advantage by proactively obtaining, organizing, distributing, implementing, and evaluating information. For businesses looking to develop a knowledge-driven culture and maximize the value of their knowledge assets, the knowledge management value chain is a valuable instrument. Organizations may profit in a number of ways from knowledge management value chain implementation. It improves decision-making based on accurate and current information, fosters cooperation and knowledge sharing, avoids duplication of effort, and boosts organizational learning. Additionally, it helps businesses to take advantage of fresh possibilities, react rapidly to market developments, and promote an innovative culture.

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ORGANIZATIONAL INTELLIGENCE: CASE-BASED REASONING

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ABSTRACT:

Organizational intelligence is a concept that focuses on the ability of an organization to collect, process, and utilize information and knowledge to make informed decisions and drive performance. Case-based reasoning (CBR) is a specific approach within organizational intelligence that involves solving new problems or making decisions based on past experiences and similar cases. This studyexplores the application of case-based reasoning in organizational intelligence, its benefits, challenges, and implications for organizational decision-making and learning.Case-based reasoning involves the retrieval and adaptation of relevant past cases to solve new problems or make decisions. Organizations can build a case library or knowledge repository that contains documented experiences, best practices, and lessons learned. When faced with a new situation, the organization can search for similar cases and extract relevant information to guide decision-making and problem-solving processes.

KEYWORDS: *Decision Support, Expert Systems, Machine Learning, Pattern Recognition, Problem-Solving.*

INTRODUCTION

Organizations may employ a variety of intelligent strategies provided by artificial intelligence and database technology to gather individual and group information and expand their knowledge base. For the purpose of collecting tacit knowledge, expert systems, case-based reasoning, and fuzzy logic are used. For knowledge discovery, data mining and neural networks are utilized. They are able to identify hidden patterns, groups, and behaviors in huge data sets that cannot be found by managers working alone or only via experience. Solutions to situations that are too big and complicated for anyone to independently investigate are produced by genetic algorithms. Intelligent agents may automate repetitive operations to assist businesses in finding and filtering information for use in supply chain management, electronic commerce, and other processes.

Data mining, as we discussed in section 6, enables firms to extract previously untapped information from massive databases, giving managers fresh perspective for enhancing operational efficiency. We give a thorough overview of data mining for management decision support in since it has emerged as a crucial tool for management decision making. The other intelligent methods covered in this section are based on artificial intelligence, which is a field of study that involves computer-based systems that try to mimic human behavior. Such systems would have the capacity to acquire new languages, carry out physical activities, use a perceptual

apparatus, and imitate human knowledge and judgment. Despite the fact that AI applications lack the depth, complexity, originality, and generality of human intelligence, they are crucial to modern information management[1]–[3].

Recovering Knowledge: Skilled Systems

An intelligent method for collecting tacit knowledge in a very narrow and constrained area of human skill is to use expert systems. These systems save the knowledge of knowledgeable workers as a set of rules in a software system that other employees inside the company may utilize. The expert system's set of rules increases the firm's memory, or stored learning. Expert systems lack the depth of comprehension and grasp of fundamental concepts possessed by a human expert. They often carry out extremely restricted activities that may be completed by experts in a few minutes or hours, such as evaluating whether to approve credit for a loan or diagnosing a faulty gadget. An expert system cannot tackle problems that are too complex for human specialists to handle in the same amount of time. Expert systems, however, may assist enterprises by capturing human experience in certain fields and enabling them to make superior judgments with fewer personnel. Expert systems are now often employed in business for making discrete, highly organized decisions.

Work of Expert Systems

A computer-processable model or representation of human knowledge is required. Expert systems represent human knowledge as a body of rules known as the knowledge base. Depending on how difficult the issue is, expert systems may contain 200 or even thousands of these rules. Compared to a conventional software program, these rules are far more interwoven and layered. There are certain guidelines that must be observed by an expert system. The system may take into account several rules at once, the number of possible outcomes is known in advance and is constrained, the rules are interrelated, and there are various ways to arrive at the same result. The guidelines shown apply to easy credit-granting expert systems.

The way an inference engine operates is by looking through the rules and "firing" the ones that are prompted by user-gathered and -entertained information. In a standard software program, a set of rules is essentially equivalent to a sequence of nested IF statements; however, in an expert system, the size of the statements and level of nesting are significantly larger. The inference engine is the method used to search the knowledge base. Both forward chaining and reverse chaining are frequently used methods. Forward chaining involves the inference engine searching the rule base after starting with the information supplied by the user. The plan is to execute the rule's action when a condition is met, or to fire it. If the user inputs a client's name with an income more than $100,000, the engine will fire all rules sequentially from left to right, starting on the left. The rule base will be passed again and new rules will trigger if the user later submits data showing that the same customer owns real estate. Until no more rules can be fired, processing continues.Backward chaining is a method of searching the rule base where the user is questioned about a set of facts up front to test a hypothesis before the hypothesis is either verified or refuted. Ask yourself, "Should we add this person to the prospect database?" in our example. Start on the right side. If a sales representative contacts the customer, a term insurance

policy is issued, or a financial advisor meets the client, it is clear that the individual should be added to the database.

Successful examples of expert systems

Expert systems provide enterprises a wide range of advantages, including better judgments, fewer mistakes, lower costs, less time spent on training, and higher standards of quality and service. For its countrywide freight-trucking operation, Con-Way Transportation developed an expert system called Line-haul to automate and optimize planning of overnight shipment routes. The dispatcher assigns drivers, vehicles, and trailers to move 50,000 shipments of heavy freight each night across 25 states and Canada. The expert system records the business principles that dispatchers adhere to. Line-haul takes information from an Oracle database that contains information on daily client shipping orders, available drivers, vehicles, trailer space, and weight. It works on a Sun computing platform. 95 percent of daily freight shipments have optimal route plans created by the expert system, which crunches the figures using 100,000 lines of C++ code and hundreds of rules. Con-Way dispatchers make adjustments to the expert system's suggested routing plan and provide the final routing instructions to the field staff in charge of loading the trailers for their nocturnal trips. By decreasing the number of drivers, loading more freight per trailer, and minimizing damage from rehandling, Con-Way was able to recover its $3 million investment in the system within two years. The technology lessens the exhausting overnight chores that dispatchers must do.

Expert systems may help businesses if their limits are clearly recognized, despite the fact that they lack the robust and broad intelligence of humans. Expert systems can only be used to address certain types of issues. Almost all effective expert systems deal with classification issues in constrained fields of knowledge when there are few potential outcomes and they are all known in advance. Expert systems are far less helpful for handling the kind of unstructured issues that managers often run across.Numerous expert systems need significant, costly, and time-consuming development efforts. It could be less costly to hire or teach more experts than to create an expert system. An expert system often functions in a constantly changing environment, which forces the expert system to adapt as well. Some expert systems, particularly those that are big, are so complicated that the maintenance expenses eventually catch up to the construction expenditures.

DISCUSSION

Although companies also have a collective body of knowledge and skill that they have accumulated through time, expert systems typically capture the tacit knowledge of individual experts. Case-based reasoning may be used to record and preserve this organizational knowledge. instance-based reasoning involves storing descriptions of previous experiences of human experts as cases in a database for subsequent retrieval when the user comes across a new instance with a set of related criteria. The system looks through all of the stored examples for the one that fits the new problem's characteristics closest, then it applies the previous case's answers to the new situation. Successful solutions are associated with the new case, and both are kept in the knowledge base alongside the other cases. Additionally, unsuccessful solutions and justifications for why they failed are added to the case database.

Expert systems operate by putting a collection of IF-THEN-ELSE rules that have been taken from human experts to use. In contrast, case-based reasoning exposes information as a collection of instances that users are always adding to and improving. situation-based reasoning may be seen in customer support or diagnostic systems in medicine, where users can access old examples with traits that are comparable to the present situation. Based on the instance that matches the problem or diagnosis the best, the algorithm makes a recommendation.

Chaotic Logic Systems

Most individuals don't think in terms of exact numbers or the conventional IF-THEN principles. Humans have a propensity to classify things loosely using rules that might signify many different things to different people. For instance, either a guy or a woman may be educated or powerful. A company's size may range from huge to medium to tiny. You might have a warm, cool, cold, or hot temperature. A variety of values are represented by these categories. A rule-based technique called fuzzy logic may express this imprecision by formulating rules that rely on approximative or arbitrary values. It may verbally describe a certain phenomenon or process and then translate that description into a tiny set of adaptable rules. When there is language uncertainty, businesses may utilize fuzzy logic to develop software systems that collect tacit knowledge.Let's have a look at how fuzzy logic might represent varied temperatures in a computer program that automatically regulates room temperature. Although the temperature is most obviously cool between around 60 degrees and 67 degrees, the phrases are vaguely defined such that, for example, cool means between 45 degrees and 70 degrees. Keep in mind that cool overlaps with cold or typical. Using this reasoning, the programmer would create equally vague definitions for humidity and other elements like exterior wind and temperature in order to regulate the room's atmosphere. One of the rules can be, "Raise the heat and humidity in the room if the temperature is cool or cold and the humidity is low while the outdoor wind is high and the outdoor temperature is low."

The logic of the thermostat used to regulate the room temperature contains the membership functions for the input named temperature. Language-based phrases like "warm" may be transformed into numbers by the use of membership functions. The computer would weightedly integrate the membership function values and adjust the temperature and humidity according to all the regulations. Fuzzy logic offers answers to issues that call for knowledge but are difficult to express in the form of clear IF-THEN rules. Fuzzy logic controls are used by the Sendai subway system in Japan to accelerate so smoothly that standing passengers are not required to hang on. By implementing control algorithms in fuzzy logic, Mitsubishi Heavy Industries in Tokyo was able to lower the electricity usage of their air conditioners by 20%. Fuzzy logic is the sole thing that makes the autofocus feature in cameras feasible. In these situations, fuzzy logic is advantageous for consumer electronics and engineering applications because it enables increasing changes in inputs to result in gradual changes in outputs rather than discontinuous ones[4]–[6]. Fuzzy logic has been shown to be helpful by management for organizational control and decision-making. A Wall Street company developed a system that chooses businesses for prospective purchase using terms that stock traders are familiar with. To identify potential fraud in medical claims made by healthcare providers anywhere in the United States, a fuzzy logic system has been created.

Computer Learning

The topic of machine learning focuses on how computer programs may perform better without explicit programming. Why does this qualify as education? A computer that learns is one that, like a person, is able to identify patterns in data and alter its behavior in response to those patterns, experience, or past knowledge. For instance, a robot automobile driver should be able to detect the presence of other vehicles and objects and adjust their conduct. A self-teaching, self-improving computer software is not a novel concept; it has been discussed in the context of artificial intelligence at least since the 1970s. However, before the 1990s, machine learning wasn't particularly good at creating helpful tools or resolving intriguing business issues. Due to improvements in the design of algorithms, databases, and robotics, as well as the expansion in computer power accessible to scientists and businesses and its declining cost over the last 10 years, machine learning has seen significant development. Machine learning has found the Internet and the huge data made accessible on it to be highly effective testing and proving grounds.

Though we often use machine learning, we are unaware of it. Every Google search is handled using algorithms that, in a matter of milliseconds, rank the billions of Web sites according to your query and modify the results in response to any modifications you make to your search. The search results also change based on previous searches and clicked objects. Every time you make a purchase on Amazon, the site's recommender engine will make recommendations for further things you may be interested in based on trends in your past purchasing, online activity, and the purchases of people who have "similar" buying habits to you. Every time you visit Netflix, a recommender system will suggest films based on a similar set of criteria that you may find interesting.

Cognitive Networks

In order to solve difficult, poorly understood situations for which a lot of data has been gathered, neural networks are utilized. In vast volumes of data that would be too complex and challenging for a person to examine, they discover patterns and linkages. Neural networks use hardware and software that parallel the processing processes to uncover this knowledge. Between the major branches, there are more than 1,000 shipping contracts every day, along with 2,000 to 2,500 bills of lading. The firm owns and dedicates 170 heavy duty, medium, and light vehicles of different sorts for its door-to-door courier services, which run across the Kingdom and cover more than 45 sites, since the inception of its new division of Express transportation in 2003. Therefore, without a strong computerized system, it was impossible to manage and oversee the many daily job alternatives and orders connected to these activities at a faultless level of service. The system required the capability in order to provide information to the whole company as well as particular organizational divisions.

The system is composed of about 270 Windows XP PCs linked to a cluster of Dell servers running Windows 2003. Clients utilize SQL Anywhere, while the database management system used as the system's backbone is Sybase Adaptive server. The client's branches and the server at corporate headquarters are replicated. Data from the branches is transferred to the server during replication, aggregated to produce the most recent database version, and then delivered back to

the branches. This implies that any customer may deal with any branch at any time since every branch has access to the most updated client list, availability of vehicles, and shipping contracts. When a client visits a branch to ship his automobile to a location that is inside the shipping zones, the business process begins, and the branch then initiates a shipping agreement. An aggregated version of the database for all branches is accessible at HQ and is then delivered back to all branches as the database is transmitted from the branch to HQ every 30 minutes. Upon the truck's arrival, the recipient branch will enter a receipt into the system, after which an SMS message is prepared and delivered to the client, who then goes to the destination branch to pick up the automobile.

The shipping information system employed by Albassami keeps track of all sender data, including the delivered vehicle, the truck's identification number, the sender and receiving branches, and it also sends the client an SMS message to confirm the delivery of the vehicle. The system also keeps track of customer data and maintenance data. In order to improve business performance and provide better customer service, data from car repair facilities is linked with that of the transportation service. The system also makes it possible for top management and head sectors to get standard data regarding the productivity of each branch. This allows for the precise identification of demands for various areas and, as a consequence, effective budget allocation. Additionally, the system's use of the output from the cars' tracking data allowed for a better audit of all drivers' conduct. Effective performance management produced acceptable employee evaluations and, as a consequence, devoted workers. The shipping system facilitates all business operations, and the management team has been able to sustain the company's performance and position as the leader in the Kingdom by using the information drawn from the central database to make wise investment and operational choices.

A neural network with more than one billion connections that can recognize cats was recently developed by a Google research team under the direction of computer scientist Andrew Y. Ng from Stanford University and Google fellow Jeff Dean. A network of 16,000 processors was deployed, and each one was given a random picture thumbnail that had been taken from a library of 10 million YouTube films. Without assistance from humans throughout the learning phase, the neural network system learned itself to detect cats. Google thinks this neural network will be useful for machine translation, voice recognition, and picture search. The creators of neural networks assert that they do not program solutions or strive to solve particular issues, in contrast to expert systems that attempt to mimic or imitate a human expert's method of problem-solving. Instead, neural network designers want to include a generic learning capacity into the hardware to give it intelligence. The expert system, on the other hand, is very specialized to a particular issue and is difficult to retrain.

In medical, research, and business, neural network applications address issues with pattern categorization, prediction, financial analysis, control, and optimization. Neural network applications are utilized in medicine to do pathological picture pattern recognition, diagnose epilepsy and Alzheimer's illness in patients, and screen individuals for coronary artery disease. The financial sector makes use of neural networks to find patterns in massive data sets that might be used to forecast stock performance, corporate bond ratings, or business bankruptcy. By keeping an eye on all Visa transactions for any abrupt changes in cardholders' purchasing habits,

Visa International employs a neural network to assist identify credit card fraud. Neural networks have a lot of baffling features. In contrast to expert systems, which often provide justifications for their conclusions, neural networks can struggle to explain how they came to a certain conclusion. Additionally, they can't always promise the greatest answer, that a solution will always be found, or that it will always be entirely definite. They are quite sensitive, so if their training includes too little or too much data, they could not perform effectively. Neural networks are best employed in today's applications as supplements to human decision-makers rather than as a replacement for them.

Gene-based algorithms

By analyzing a very large number of potential solutions to a given issue, genetic algorithms are beneficial for determining the best option. They are built on evolutionary biology-inspired concepts including inheritance, mutation, selection, and crossover. Information is represented by a genetic algorithm as a string of 0s and 1s. The evolutionary algorithm looks through a population of randomly produced binary digit strings to find the string that best represents the problem's ideal solution. The poorest answers are eliminated as they change and mix, while the best ones are kept and continue to generate better ideas. Each string represents one of the problem's variables. Applying a fitness test, one ranks the population's strings according to how desirable it is for them to be potential solutions. The algorithm then generates the next generation of strings, which consists of strings that passed the fitness test as well as offspring strings formed from mating pairs of strings, and assesses their fitness. Up until a conclusion is achieved, the procedure is continued.

With hundreds or thousands of variables or formulae, dynamic, and complicated issues may be solved using genetic algorithms. The issue must allow for the genetic representation of the spectrum of potential solutions as well as the establishment of criteria for judging fitness. Genetic algorithms speed up the process since they can swiftly compare a large number of potential solutions to determine which is best. In order to improve the design of jet turbine aircraft engines, for instance, General Electric engineers changed up to 100 variables for each design update. The production-scheduling models in the supply chain management software from i2 Technologies that include hundreds of millions of data regarding client orders, material and resource availability, manufacturing and distribution capabilities, and delivery dates are optimized using genetic algorithms.

Informative Agents

Businesses may search through massive volumes of data using intelligent agent technology to find and use the information they deem valuable. Intelligent agents are computer programs that carry out specialized activities for a single user, business process, or software application without any direct human involvement. To complete activities or make choices on behalf of the user, the agent leverages a built-in or learned knowledge base. Examples include removing spam email, booking appointments, or navigating across linked networks to get the cheapest flight to California. In today's operating systems, application software, e-mail systems, mobile computing software, and network tools, there are several intelligent agent applications. For instance, the wizards included in Microsoft Office software products have the ability to foresee when users

need help and may teach users how to do different tasks, such formatting papers or making graphs. 10 explains how shoppers may use intelligent agent shopping bots to identify the things they desire and help them compare costs and other characteristics.

Although some intelligent entities are designed to adhere to a straightforward set of rules, others are capable of adapting their behavior based on their experiences. An example is Siri, a software on Apple's iOS platform for the iPhone and iPad. Siri is a smart personal assistant that utilizes speech recognition technology to respond to queries, provide advice, and carry out tasks. The program can identify local restaurants, buy movie tickets, obtain directions, schedule appointments, and send messages as well as adapt to the user's tastes over time and customize results. Natural speech is understood by Siri, and if additional information is required to perform a job, it will prompt the user with a question. The user's device does not locally process voice input for Siri. Users must be linked to Wi-Fi or a 3G connection since it delivers orders through a distant server. Many complicated events may be described as networks of autonomous agents that interact in accordance with simple principles. Applications for agent-based modeling have been created to simulate consumer, stock market, and supply chain behavior as well as to forecast the spread of diseases[7]–[10].

In response to shifting market circumstances, Procter & Gamble employed agent-based modeling to enhance coordination amongst various supply chain participants. It simulated a complicated supply chain as a network of semiautonomous "agents" that stood in for various supply chain elements including vehicles, factories, distributors, and retail establishments. The corporation uses simulations using the agents to do what-if studies on inventory levels, in-store stockouts, and transportation costs. Each agent's behavior is designed to obey rules that mirror real behavior, such as "order an item when it is out of stock." P&G revealed that trucks should often be sent before being completely loaded using intelligent agent models. The simulation revealed that retail shop stockouts would happen less often, lowering the number of missed sales, which would more than make up for the increased distribution costs even if transportation costs would be higher utilizing partly loaded vehicles. P&G has saved $300 million a year by using agent-based modeling, which cost them less than 1% of that total.

AI hybrid systems

To use the greatest aspects of these technologies, genetic algorithms, fuzzy logic, neural networks, and expert systems may be integrated into a single application. They are referred to as hybrid AI systems. Business hybrid applications are expanding. Hybrid AI is beginning to be used in items including household appliances, manufacturing gear, and office equipment in Japan, according to Hitachi, Mitsubishi, Ricoh, Sanyo, and other companies. A "neurofuzzy" washing machine created by Matsushita combines fuzzy logic and neural networks. A neurofuzzy system being developed by Nikko Securities will predict the ratings of convertible bonds.

CONCLUSION

In conclusion, using case-based reasoning, companies may draw on their combined knowledge and experience to make wise judgments and find solutions. This is an important organizational intelligence strategy. It encourages organizational learning, information exchange, and decision-

making under challenging circumstances. The value of case-based reasoning may be used by businesses by establishing efficient knowledge management systems, developing a learning culture, and integrating it with other decision-making techniques, despite limitations in terms of case selection, representation, and possible bias. Organizations may increase their organizational intelligence, general performance, and capacity for adaptation in a business environment that is undergoing fast change by using case-based reasoning.

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EXPLORING THE IMPACT OF DECISION MAKING

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ABSTRACT:

Effective decision-making is a critical aspect of organizational success. Enhancing decision-making processes involves adopting strategies, tools, and approaches that enable individuals and organizations to make more informed, timely, and effective decisions. This studyexplores various factors and techniques that contribute to enhancing decision-making, including data-driven decision-making, collaborative decision-making, and decision support systems.Data-driven decision-making emphasizes the use of reliable and relevant data to inform decision-making processes. By collecting, analyzing, and interpreting data, organizations can gain valuable insights and reduce reliance on intuition or subjective judgment. This approach involves leveraging technology, such as analytics and business intelligence tools, to extract meaningful information from vast amounts of data. Data-driven decision-making enables organizations to make evidence-based decisions, identify patterns and trends, and anticipate potential risks or opportunities.

KEYWORDS: *Analytical Thinking, Artificial Intelligence (Ai), Big Data, Cognitive Biases, Critical Thinking, Data-Driven, Decision Analysis, Decision Support Systems.*

INTRODUCTION

The American movie Moneyball, featuring Brad Pitt as Billy Beane, the controversial general manager of the Oakland Athletics, debuted in cinemas on September 23, 2011. The popular book by Michael Lewis, on which the movie was based, detailed how Beane guided the underdog A's to 103 victories in 2002 despite having one of the smallest budgets in Major League Baseball. In the next eight seasons, the A's reached the playoffs five times under Beane's leadership. The New York Yankees had the highest payroll before the start of the 2002 baseball season, at $126 million. The Oakland A's and Tampa Bay Devil Rays had the lowest payrolls, at around $41 million apiece. Due to these differences, only the most financially successful clubs could afford the top players. Poor clubs, like the A's, were unable to compete since they could only afford the goods that "better" teams turned down. Until Billy Beane and Moneyball hit the scene, that is. He carefully examined the information. The conventional thinking in baseball maintained that the key components to success were well-known, very athletic batters and talented young pitchers. Advanced statistical analysis of player and team data was employed by Beane and his assistant general manager Paul DePodesta to disprove that claim. Batting averages, runs batted in, and stolen bases are examples of common metrics for forecasting wins, losses, and player

performance. These measures date back to the early years of baseball and the statistics that were accessible at that time. These measures, along with their gut instinct, were employed by baseball talent scouts to assess potential players for their clubs.

A other set of indicators, such as the percentage of time a batter was on base or the amount of pitches an opponent's pitcher was required to throw, were determined to be more accurate predictors of a team's chances of winning a game by Beane and DePodesta. As a result, Beane went in search of players that fit these requirements but were not selected or rejected by the well-funded clubs. He was solely concerned with the stats and didn't care whether a player was overweight or seemed to be beyond his prime. By using sophisticated analytics to uncover information about each player's worth and contribution to team performance that other, wealthier clubs had missed, Beane was able to produce a consistently successful squad[1]–[3]. Baseball was fundamentally changed by Beane and his data-driven strategy. The Boston Red Sox harnessed the skills of baseball statistician Bill James and replicated Beane's method after seeing the A's incredible success in 2002, but with more money. They won the World Series two years later.

The A's no longer possess the competitive advantage they once had when they were the only club using sabermetrics since all of the big league teams do so in some capacity. Although Beane hasn't led the As to the postseason since 2006, he is still in great demand as a lecturer for business management seminars. Why is clear to see. Moneyball isn't only about baseball; it's also about discovering ways to utilize statistics as a strategic advantage, particularly in situations when resources are limited and creativity is crucial. The introductory graphic highlights crucial issues brought up by this case and this. Early theories of decision-making that used the incorrect measures to forecast team success restrained managers of big-league baseball clubs. Because they couldn't afford the most highly talented players, teams with little budgets, like the Oakland A's, became trapped in a rut and lost out against teams with larger budgets. To create a more accurate set of criteria for performance prediction, Beane and Paul DePodesta conducted advanced statistical analysis of player and game data. Individual player ability is obviously crucial, but Beane demonstrated that a club with less talented players could still succeed if it concentrated on hitters with high on-base percentages and pitchers with a lot of ground balls. Because he paid attention to the statistics, Beane was able to create a squad that performed at a high level far more affordably than its rivals. Here are some issues to consider: Moneyball, according to some, isn't actually about baseball. What repercussions may be drawn from this assertion? What business lessons may be drawn from Moneyball? What if every company operated like Moneyball?

DISCUSSION

Decision Making and Information Systems

Traditionally, only management could make decisions in corporations. Since information technologies make information accessible to lower levels of the firm, lower-level workers are now in charge of making some of these choices. But what exactly do we mean by better judgment? How are decisions made in corporations and other organizations? Let's look more closely.

Value Of Better Decision Making for Business

What does the company gain from improved decision-making? What is the monetary worth of better judgment? Tries to quantify the financial benefit of better decision-making for a small U.S. manufacturing company with 140 people and an annual sale of $280 million. The company has identified certain crucial choices where additional system investments might raise the standard of decision-making. The gives specific estimations of the yearly value that will result from better decision-making in several business domains. At all levels of the company, choices are made, some of which are frequent, regular, and many. Even though the benefit of enhancing even one choice could be negligible, enhancing hundreds of thousands of "small" decisions over the course of a year can have a significant impact on the organization.

Possible Decisions

Each of these levels is responsible for making various sorts of judgments and has varying information needs for decision support. Structured, semi structured, and unstructured decisions are all categorized. Decisions and information needs vary for senior managers, middle managers, operational managers, and workers. Unstructured choices are ones in which the solution to the issue requires the decision maker to use judgment, assessment, and insight. There is no established or widely accepted process for making any of these judgments since they are all unique, significant, and out of the ordinary.

Contrarily, structured choices have a set technique for managing them so that they don't need to be handled uniquely each time. They are repetitive and regular. Many judgments are semi structured, where only a portion of the issue has a clear-cut solution offered by an approved technique, and they include characteristics of both sorts of decisions. Structured choices tend to be more frequent at lower organizational levels, while unstructured issues tend to be more prominent at higher levels of the company. Senior executives must make a variety of unstructured decisions, such as choosing which markets to join or setting the company's 5- or 10-year objectives. Providing a response to the query "Should we enter a new market?" would require access to news, official documents, opinions from the business community, and high-level evaluations of company performance. Senior managers would also need to apply their own judgment and consult with other managers in order to come up with the optimal solution, however.

Middle management must make judgments in more organized situations, but their choices may also include unstructured elements. "Why is the reported order fulfillment report showing a decline over the past six months at a distribution center in Minneapolis? " May be a typical middle-level management choice. This middle manager will request a report on order activity and operational effectiveness at the Minneapolis distribution center from the company's enterprise system or distribution management system. This is the organized portion of the choice. However, before coming up with a conclusion, this middle manager will need to speak with staff members and obtain additional unstructured data from outside sources regarding regional economic circumstances or sales patterns.

Generally speaking, operational managers and lower-level staff make more organized choices. For instance, a supervisor on an assembly line must determine if an employee who is paid hourly

is eligible for overtime pay. When an employee clocks in for more than eight hours on a given day, the supervisor will usually provide them overtime compensation for the additional time. A sales account representative often has to decide whether to provide consumers credit by examining the company's customer database, which includes credit information. The account representative would award the client credit to make a transaction if they complied with the company's predetermined conditions for credit. In both cases, the judgments are regularly made hundreds of times per day in most major organizations and are highly organized. The payroll and accounts receivable systems for the company already have the solution preprogrammed.

The Process of Making Decisions

A choice requires many steps to be made. The four steps of decision-making that Simon identified are intelligence, design, choice, and execution. Discovering, recognizing, and comprehending the issues facing the organization—why they are there, where they are, and what impact they are having on the business—represent intelligence. Finding and examining potential solutions to the issue is part of design. The act of selecting involves considering several possible solutions.

Making the selected alternative function while continuing to assess how well the solution is functioning are both aspects of implementation. In order to increase sales, for instance, a sales management team may elect to offer the sales force a greater commission for closing more deals. If this does not result in a boost in sales, management would need to look at whether the issue is the result of subpar product design, bad customer assistance, or a variety of other factors necessitating a new approach.

Decision-Making by Managers in The Real World

This book's central thesis is that using systems to assist decision-making results in better managerial and staff decision-making, above-average returns on investment for the company, and ultimately improved profitability. Information technologies, however, are unable to enhance every kind of decision made inside a business. To understand why this is the case, let's look at the function of managers and decision-making in businesses.

Managing Positions

In companies, managers perform important functions. Making judgments, producing reports, attending meetings, and planning birthday celebrations are just a few of their duties. By comparing traditional and modern models of management conduct, we may better comprehend managerial duties and responsibilities. For more than 70 years, starting in the 1920s, the classical model of management—which outlines what managers do—was generally accepted as true. The five traditional duties of managers—planning, organizing, coordinating, determining, and controlling—were initially defined by Henri Fayol and other early authors. For a very long time, and even now, this explanation of managerial activities predominated management theory[4]–[6]. The traditional model of management defines formal managerial tasks, but it does not specifically address what managers really do when they plan, make decisions, and supervise the work of others. We must consult the work of modern behavioral scientists who have seen managers in action on a regular basis for this. According to behavioral models, managers' real

conduct is less structured, informal, introspective, reactive, and well-organized than the classical model would have us think.

According to observers, managerial conduct really contains five characteristics that are quite different from the traditional definition. First of all, managers work very hard and continuously. According to research, managers accomplish more than 600 distinct tasks every day without stopping. The majority of management operations take less than nine minutes, and just 10% of them continue more than an hour. This is due to the fragmented nature of managerial activities. Third, managers favor timely, precise, and on-demand information. Fourth, they choose verbal communication over written communication because verbal communication is more flexible, requires less work, and results in a quicker response. Fifth, managers place a great value on keeping up a broad and intricate network of connections that serves as an unofficial information system and aids in the accomplishment of their own personal agendas and short- and long-term objectives.

Henry Mintzberg discovered that managers' routine conduct might be divided into ten managing functions after analyzing it. The duties that managers are expected to carry out inside an organization are known as managerial roles. These management functions, according to Mintzberg, may be divided into three groups: interpersonal, informational, and decisional. When managers represent their firms to the public and carry out symbolic tasks in their interpersonal roles, such as awarding employees, they are acting as the leaders of the company. In their role as leaders, managers work to inspire, guide, and assist staff members. Within each of these levels, managers function as liaisons between the members of the management team and different organizational levels. Managers extend their time and provide favors in exchange for anything in return.

Informative Positions: Managers serve as the information hubs of their businesses, gathering the most pertinent, current information and relaying it to those who need to be informed. Managers serve as spokespersons and information providers for their companies.

Decisive Positions: Decisions are made by managers. By starting new sorts of operations, handling organizational disruptions, allocating resources to staff members who need them, and mediating disputes between opposing groups, they play the function of entrepreneurs in their decision-making roles.

Making Decisions in the Real World

We can clearly see that not all management functions benefit from information systems. Additionally, investments in information technology may not necessarily yield favorable outcomes in management jobs where information systems may enhance judgments. Information quality, management controls, and organizational culture are the primary factors.

Administration filters: Despite having access to timely, correct information, some managers nonetheless make poor choices. To make sense of the world around them, managers filter the information they take in via a number of filters. Managers pay selective attention, concentrate on specific issues and solutions, and suffer from a range of biases that cause them to ignore information that does not fit with their preconceived notions. As an example, Wall Street

companies like Bear Stearns and Lehman Brothers collapsed in 2008 as a result of underestimating the risk associated with their investments in sophisticated mortgage instruments, many of which were based on subprime loans that were more likely to fail. Their and other financial institutions' computer models for managing risk were predicated on unduly pessimistic notions and overly simplified information about what can go wrong. Management sought to ensure that their companies' cash wasn't completely locked up as a safety net against defaults on hazardous investments, prohibiting them from using it to produce money. Therefore, it was urged for the creators of these risk management systems to quantify risks in a manner that minimized their significance. Additionally, several trading desks oversimplified the data they kept on the mortgage securities so that they seemed to be straightforward bonds with ratings that were higher than those supported by their underlying components.

Organizations are bureaucracies with a restricted capacity for taking decisive action. Businesses must adapt new business models as surroundings evolve. Strong forces inside organizations oppose policies that would need significant change in order to survive. A firm's decisions often don't reflect the greatest answer to the issue, but rather a balance of the firm's many interest groups. According to research on business restructuring, firms routinely attribute poor performance to outside factors beyond their control, such as economic conditions, foreign competition, and rising prices, rather than senior or middle management for poor business judgment. This is because firms tend to ignore poor performance until it poses a threat of outside takeovers.

Automated Decision Making at High Velocity

Today, managers and other people no longer play a significant role in many organizational decisions. For instance, Google must choose which URLs to show after receiving your search query in roughly a half a second on average. Even while Google indexes more than 50 billion Web pages, not every query that comes in is searched across the full database. Other search engines operate in a similar manner. Over $450 million was invested by the New York Stock Exchange in 2010 and 2011 to create a trading platform that can carry out incoming orders in under 50 milliseconds. In less than 30 milliseconds, high frequency traders at computerized stock exchanges complete their transactions. The category of highly automated, structured judgments is expanding quickly. Computer algorithms that accurately outline the procedures to be taken to create a result, very huge databases, very fast processors, and software designed for the purpose are what enable this form of automated high-speed decision making. Because people make decisions too slowly in these circumstances, humans are removed from the decision-making process.

Additionally, it implies that firms in these regions make choices more quickly than what managers can see or supervise. The Dow Jones Industrial Average dropped more than 600 points in a couple of minutes on May 6, 2010, before recovering later that day. This event is known as the "Flash Crash" that affected the U.S. financial markets. The shares of several businesses, notably Procter & Gamble, sold for pennies as a result of a massive surge of sell orders that flooded the stock market within a few seconds and were mostly driven by high-speed automated trading systems. Computerized trading systems have seen a number of similar failures in recent years, including one on August 1, 2012, when a software flaw led Knight Capital to submit

millions of incorrect deals in less than an hour. Nearly 150 equities had extraordinary increases and decreases as a result of the trading blunder, which cost Knight $440 million in losses.

In high-velocity decision contexts, how does the Simon framework of intelligence-design-choice-implementation function? The software's algorithms essentially capture the intellect, design, choosing, and execution components of the decision-making process. The issue has already been recognized, a technique for finding a solution has been devised, a set of acceptable solutions has been determined, and the solution has been put into place by the people who built the program. It goes without saying that because humans are not involved in the process, considerable care must be taken to guarantee that the systems are functioning properly to prevent serious damage to both organizations and people. And even then, it is advisable to take further precautions to monitor these systems' behavior, control their operation, and, if necessary, switch them off.

Enterprise Business Intelligence

It gave you an introduction to the many kinds of systems used to aid in management decision-making. A business intelligence and business analytics infrastructure that provides the data and the analytical tools for supporting decision-making is the cornerstone of all of these decision support systems. We aim to respond to the following queries in this section:

1. What are business analytics and business intelligence?
2. Who develops the technology and software for corporate analytics and intelligence?
3. What kind of people utilize business intelligence?
4. What kind of analytical instruments are included in a BI/BA suite?
5. How are these tools used by managers?
6. Which businesses have utilized these tools, as examples?
7. What management techniques are used for BI/BA capability development?

Why Is Business Intelligence Important?

When we conceive of people as intelligent creatures, we often think of their capacity to take in information from their surroundings, comprehend its relevance and meaning, and then respond accordingly. Can the same be said for corporate entities? All groups, including commercial corporations, do indeed take in information from their environs, try to comprehend what the information means, and then try to act on the information, therefore the answer seems to be a qualified "yes." Like people, some corporate entities do this task effectively while others perform it badly. Hardware, software, and information technology experts refer to the infrastructure for storing, integrating, reporting, and analyzing data from the business environment, including big data, as "business intelligence." The foundation infrastructure gathers, preserves, and makes accessible to management pertinent data. Consider databases, data warehouses, data marts, Hadoop, and the analytical platforms we covered in Section 6 of this guide. Another vendor-defined term, "business analytics," focuses more on the methods and tools used for data analysis and comprehension. Consider data mining, statistics, models, and online analytical processing—

all of which we covered in 6[7]–[10]. If we boil it down to its core components, business intelligence and analytics are about combining all the information streams produced by a company into a single, coherent enterprise-wide set of data, and then using modeling, statistical analysis, and data mining tools to make sense of all these data so managers can make better decisions and better plans, or at the very least know quickly when their companies are not on track to meet planned goals.

Hallmark Cards is one firm that makes use of business analytics. More than 3,000 Hallmark Gold Crown locations in the United States might see a rise in sales because to the company's usage of the SAS Analytics software. Hallmark sought to improve relationships with devoted customers. The company figured out how to appeal to different customer categories during holidays and special events as well as change promotions on the fly using data mining and predictive modeling. Hallmark is able to identify the client groups that are most impacted by direct mail, the segments that should be contacted through email, and the particular messages to send to each group. Business intelligence has contributed to a 5–10% increase in Hallmark's sales to its loyalty program participants. According to the Interactive Session on Organizations, the Cincinnati Zoo is another company that has profited from business intelligence.

CONCLUSION

In conclusion, improving decision-making is essential for firms looking to get better results, perform better, and maintain their competitiveness. Organizations may make better, more informed judgments by adopting data-driven decision-making, encouraging collaboration, and leveraging decision support technologies. The ability to make decisions is further improved by fostering a culture of decision-making that values critical thinking, education, and continual progress. In order for implementation to be successful, problems with data, teamwork, technology, and culture must be resolved. Organizations may ultimately improve decision-making to gain a competitive edge, adapt to changing contexts, and accomplish their strategic goals.

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BUSINESS INTELLIGENCE VENDORS: A COMPREHENSIVE REVIEW

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ABSTRACT:

Business intelligence (BI) vendors play a crucial role in providing organizations with the tools, technologies, and platforms to harness data and gain valuable insights for informed decision-making. This studyexplores the landscape of BI vendors, highlighting the key features, capabilities, and considerations when selecting a BI vendor for an organization's specific needs.BI vendors offer a range of products and solutions designed to collect, analyze, and visualize data to support decision-making processes. These solutions typically include data integration, data warehousing, data analytics, reporting, and dashboarding functionalities. BI vendors strive to provide user-friendly interfaces and intuitive tools that enable business users to explore and understand data without relying heavily on IT support.

KEYWORDS: *Microsoft Power BI, Microstrategy, Oracle Analytics Cloud, Tableau.*

INTRODUCTION

It's critical to keep in mind that business intelligence and analytics are products defined by software developers and consulting organizations. They are made up of hardware and software packages that are generally offered by major system manufacturers to extremely large Fortune 500 companies. Oracle, SAP, IBM, Microsoft, and SAS are the top five sellers of these goods. Aimed for small to medium-sized businesses, Microsoft's offerings are built on employee-familiar desktop technologies, Microsoft SharePoint collaboration capabilities, and Microsoft SQL Server database software. The International Data Corporation estimates that the worldwide market for business intelligence and analytics will grow to $50.7 billion by 2016 from $35.1 billion in 2012. As a result, one of the biggest and fastest expanding categories of the U.S. software industry is business intelligence and business analytics[1]–[3].

The Environment for Business Intelligence

A description of the technology, software, and administration capabilities that the main suppliers have to offer and that businesses have been building over time. This business intelligence ecosystem consists of the following six components:

1. **Information about the business world:** Businesses must manage massive data, as well as organized and unstructured data from several sources. In order for the data to be examined and utilized by human decision-makers, they must be combined and arranged.

2. **Infrastructure for business intelligence:** Business intelligence is built on a strong database system that collects all the necessary data to run the company. The information might be kept in transactional databases, coupled with other data, and integrated into a corporate data warehouse, or a network of linked data marts.

Analysis aids Cincinnati Zoo's understanding of its visitors.

The Cincinnati Zoo & Botanical Garden, which was established in 1873, is the second-oldest zoo in the United States and one of the top zoological institutions in the world. It is also one of the most visited attractions in the country, a top-rated zoo by Zagat, and a top-rated zoo for kids by Parents Magazine. More than 500 animal species and 3,000 plant types may be found on the 71-acre grounds of the zoo. This zoo receives over 1.3 million visitors annually.Although Hamilton County partially funds the Zoo's operations, more than two-thirds of its $26 million yearly budget is generated via fundraising activities, with the remaining funds coming from entrance fees, food sales, and donations. The top management team of the Zoo started a thorough examination of its processes in order to boost income and enhance performance. The assessment discovered that management knew little about what was really occurring in the Zoo on a daily basis, except than how many people visited the Zoo daily and how much money it made overall.

Who will be visiting the zoo? When do they usually appear? What do they purchase and do they do? Management was clueless. The Zoo's four revenue streams—admissions, membership, shop, and food service—each had a unique point-of-sale system, and the $4 million-per-year food service division still used manual cash registers. Just to grasp daily sales totals, management had to pore through paper receipts. In an effort to utilize the data for demographic and geographic study, the Zoo had created a spreadsheet that gathered the zip codes of visitors. The information would be very useful for marketing if it could be paired with information on visitor activities at the Zoo, such as which attractions they visited, what they ate and drank, and what they purchased at the gift shops.

However, in order to do this, the Zoo had to modify its information systems to place a stronger emphasis on analytics and data management. A single platform—Galaxy POS from Gateway Ticketing Systems—replaced the Zoo's four outdated point-of-sale systems. Then, in order to offer real-time analytics and reporting, it hired IBM and BrightStar Partners to construct a consolidated data warehouse and put IBM Cognos Business Intelligence into use. Like many outdoor attractions, the Zoo's revenue is heavily influenced by the weather. Rainy days saw a substantial drop in visitors, leaving the Zoo often overworked and overstocked. Sales of specific goods, like ice cream and bottled water, are expected to increase in very hot weather, and the Zoo may eventually run out of these supplies.

The Zoo's business intelligence system now receives weather prediction information from the website of the National Oceanic and Atmospheric Administration in the United States. The Zoo can arrange its work schedule and inventory more precisely by comparing the most recent projections to historical attendance and sales figures for comparable weather circumstances. The Zoo's technology collects and analyzes visitor data when they scan their membership cards at the entry, exit, attractions, restaurants, and shops, or use the Loyalty Rewards card, to identify use and spending trends down to the individual customer level. The Zoo may utilize this data to

categorize visitors based on their purchasing and visiting patterns, and then precisely target marketing and promotions for each consumer category[4]–[6].

One group of customers the Zoo discovered included those who just paid the entry fee while they were there. If each of these visitors paid $20 on their subsequent trip to the zoo, the zoo would receive an additional $260,000, or around 1% of its overall budget. This sort of visitor would be given a discount for certain of the Zoo's eateries and gift stores thanks to a direct mail marketing campaign that the Zoo developed using information on its customers. Programs for focused marketing and customer appreciation are often used to reward devoted consumers. The Zoo is able to more accurately target campaigns to smaller groups of individuals instead of sending a special offer to its whole mailing list, increasing its odds of finding the people who were most likely to react to its mailings. The Zoo was able to reduce its yearly marketing spend by $40,000 thanks to more focused promotion.

After 3 p.m. every day, management noticed that food sales often decline considerably and began shutting several of the Zoo's food shops. However, a more thorough data study revealed that the last hour before the Zoo shuts saw a significant increase in soft-serve ice cream sales. Because of this, the soft-serve ice cream stands in the Zoo are open all day. Six different brands are offered in the Beer Hut concession at the Zoo, and they are regularly changed dependent on seasonality and sales volume. In order to ensure that inventory matches demand, management can now quickly determine which beer is selling best, on what day, and at what hour. Until recently, it took 7 to 14 days to get this information, necessitating the employment of temporary personnel to go through registration tapes. Sales have increased dramatically as a result of the Zoo's improved operational decision-making. The Zoo saw a rise in food sales of 30.7 percent and an increase in retail sales of 5.9 percent six months after implementing its business intelligence system.

DISCUSSION

Business Intelligence and Analytics Capabilities

Decision makers are promised accurate, virtually real-time information from business intelligence and analytics, and the analytical tools aid in their rapid comprehension and response. The capacity to execute linear forecasting, what-if scenario analysis, and data analysis utilizing common statistical methods are all examples of forecasts, scenarios, and models. In order to accomplish these goals, BI systems provide six analytical functionalities:

1. **Production reports:** These are pre-built reports based on standards unique to the industry.
2. **Reports with parameters:** Users insert several parameters as in a pivot to filter data and identify parameter effects. For instance, you may input a location and a time of day to see how a product's sales change over time.
3. **By time and place.** If you were Starbucks, you may see that consumers in the East purchase the majority of their coffee in the morning whereas those in the Northwest purchase coffee all day long. This discovery can result in various marketing and advertising strategies in each area.

4. Scorecards and dashboards are visual tools for displaying user-defined performance metrics.
5. **Ad hoc query, search, and report creation**: These features enable users to build custom reports from queries and searches.
6. Drill down: This refers to the capacity to go from a broad overview to a more in-depth perspective.

Who Utilizes Business Analytics and Business Intelligence?

We have already discussed the many information constituencies in corporate organizations, including senior managers, middle managers, analysts, and operational staff. The same is true for BI and BA system architecture. Casual users who primarily depend on production reports make up more than 80% of the BI audience. Senior executives often use BI to keep an eye on business activity using visual interfaces like scorecards and dashboards. The likelihood of middle managers and analysts submitting queries and slicing and dicing the data along several dimensions is substantially higher. Customers, suppliers, and operational staff will mostly be seeing prefabricated reports[7]–[9].

Reports on Production

Pre-packaged production reports are a BI tool suite's most frequently utilized output. The capacity to predict future events and behaviors, such as the likelihood that a consumer will accept an offer to buy a product, is a key feature of business intelligence analytics. In order to forecast future trends and behavior patterns, predictive analytics uses statistical analysis, data mining methods, historical data, and assumptions about future situations. There are recognized variables that can be monitored to forecast future behavior. An insurance firm, for instance, may utilize factors like age, gender, and driving history as Casual users consume BI output, while intense power users provide reports, fresh analysis, models, and projections. FedEx has been utilizing predictive analytics to create models that forecast consumer behavior, which customers are most likely to migrate to rivals, how much income will be produced by new storefront or drop-box sites, and how consumers will react to pricing adjustments and new services. The predictive analytics system at FedEx has a 65 to 90% accuracy rate.

Numerous business intelligence systems for sales, marketing, finance, fraud detection, and healthcare now include predictive analytics. The financial services sector uses credit scoring, which is one of the most well-known applications. In order to assess your chances of making future credit payments on time, scoring algorithms analyze your credit history, loan application, and purchase data when you apply for a new credit card. To determine which clients are most profitable, which are most likely to cancel their account, and which new services and plans will be most effective in keeping consumers, telecommunications corporations utilize predictive analytics. The patients who are most likely to incur significant expenditures are those who are identified via data analysis by health care insurance.

In order to forecast the effectiveness of direct marketing initiatives, several businesses use predictive analytics. Companies may reduce their marketing and sales expenses by identifying consumers who are less likely to reply and avoiding them in favor of customers who are more

likely to respond. For instance, The Body Shop plc's U.S. business identified clients who were more likely to make catalog purchases using predictive analytics and its database of catalog, Web, and retail store customers. The firm used the data to create a more focused and accurate mailing list for its catalogs, increasing the response rate for mailings and catalog sales.

Massive Data Analysis

To encourage sales and assist them decide what products to carry, many online merchants have the ability to provide visitors to their websites with individualized online product suggestions. However, the majority of these product suggestions are based on the habits of patrons in comparable demographics, such as those with incomes under $50,000 or who are between the ages of 18 and 25. Some companies are already beginning to analyze the enormous amounts of online and offline client data they gather, as well as social media data, to personalize these suggestions.

Big data from client transactions and social media feeds is being analyzed by well-known online retailers like Walmart, Netflix, and eBay to provide in-the-moment tailored buying experiences. Higher client spending and customer retention rates are the results of these initiatives. Using Hunch.com, which it purchased in 2011, eBay provides consumers with personalized suggestions based on their unique combination of preferences. A sizable database that Hunch has compiled contains information from user purchases, social networks, and signals from around the Web. Hunch may utilize the data analysis to build a "taste graph" that connects consumers with their expected affinity for certain goods, services, websites, and other people. This data is then used to provide tailored suggestions. The Hunch "taste graph" predicts connections between around 500 million persons, 200 million things, and 30 billion objects and people. Hunch converted each person's tastes into a more manageable "taste fingerprint" taken from the bigger taste graph in order to provide reliable predictions in almost real-time.

With the use of prediction technology from Hunch.com, eBay is able to propose products that may not be evident for customers to buy from its online marketplace. For instance, Hunch may suggest microscopes that are particularly helpful for coin examination to a coin collector buying on eBay. If Hunch's customer profiles assist eBay merchants in making wiser choices about the products they provide, the copy they use to describe their inventory, and maybe even the advertising they employ to promote their eBay listings, Hunch may become a valuable tool for them as well. Geographic Information Systems, Visual Analytics, and Data Visualization

Data visualization and visual analytics tools provide data in a way that makes it easier for users to detect patterns and correlations that would be difficult to identify if the data were given as typical lists of text or numbers. Richly detailed graphs, charts, dashboards, and maps are used to display data. When information is graphically presented, people may filter it and generate their own conclusions, which increases their level of engagement. A unique class of technologies called geographic information systems may assist decision-makers in visualizing issues that call for understanding the geographic distribution of people or other resources. GIS software connects location information to map points, lines, and regions. For modifying the data and automatically updating business situations, certain GIS offer modeling features. State and

municipal governments may use GIS to determine how quickly they will respond to crises such as natural disasters, or to assist banks decide where to put new branches or ATMs.

For instance, First Citizens Bank, situated in Columbia, South Carolina, utilizes GIS software from MapInfo to choose which areas to concentrate on for maintaining clients and which to concentrate on for obtaining new customers. The bank may also use MapInfo to dig down into specifics at the level of each branch and set unique objectives for each one. Each branch is able to determine which method will result in the largest income opportunities: mining its database of current clients or acquiring new ones. For the purpose of locating crucial steelhead trout habitat on American soil, the U.S. National Marine Fisheries Service developed a GIS. Pacific Coast. Areas in red indicate essential habitat. Steelhead trout are found in regions that are pink-hued and dotted-yellow in locations where the species is threatened. For the company, there are two main adoption methods for BI and BA capabilities: single-stop integrated solutions vs various best-of-breed vendor solutions. The hardware companies aim to market integrated hardware/software solutions to your business, which often only work with their gear. The software companies push businesses to use "best of breed" software that operates on whatever system they choose; this practice is known as "one-stop shopping." In this approach, you choose the finest database and data warehouse solution from whatever vendor you think is the best, as well as the best business intelligence and analytics package.

The first option runs the danger of having your company rely only on one vendor for its whole hardware and software solution, placing your company at the mercy of its ability to set prices. The benefit of working with a single vendor that can produce on a worldwide scale is another benefit. The second option provides more freedom and independence but runs the risk of having trouble integrating the program with both the hardware platform and other applications. Although companies often claim that their software is "compatible" with other software, integrating software from several suppliers may be exceedingly challenging. Microsoft places a strong emphasis on improving its widely used desktop operating system and user interface as well as creating server applications that interact with Microsoft local area networks. However, for this plan to be successful, data from hardware and software created by many suppliers must effortlessly transfer into Microsoft workstations. For Fortune 500 companies in need of a worldwide networking solution, this may not be sufficient. All BI and BA systems tie the business into a set of providers, and switching is quite expensive no matter which method your company chooses. It is quite tough to switch after you have trained thousands of staff all over the globe to use a certain set of tools. Adopting these systems is equivalent to bringing in a new partner.

The market is very competitive and prone to exaggeration. In order to produce business intelligence solutions, one BI vendor asserts that they "bring together a portfolio of services, software, hardware, and partner technologies." As a manager, you will need to critically assess such claims, comprehend precisely how these systems could improve your business, and decide whether the costs are justified given the potential benefits of connecting intelligence across your organization.

Businesses with intelligence structures

A contemporary commercial company is made up of many diverse constituents. We previously identified three levels of management: lower supervisory management, middle management, and senior management. Each of these management groups has specific duties and information and business intelligence requirements, with decisions becoming less structured as one moves up the management hierarchy.

Decision Support for Middle and Operational Management

Operational and middle management are often tasked with keeping an eye on the operation of critical business functions, such as machine downtime on the manufacturing floor, daily or even hourly sales at franchise food outlets, and daily website traffic. The majority of their choices are very organised. Middle managers generally employ management information systems to aid in this kind of decision-making, and its main output is a collection of regular production reports built on data that has been taken from and summarized by the company's underlying transaction processing systems. Middle managers are increasingly getting these reports online via the corporate site, where they can interactively query the data to see why things are occurring. Managers use exception reports, which only emphasize unusual circumstances, such as when workers have spent more than allowed under a dental care plan’s expenditure cap, in order to save even more time during analysis.

Assistance with Semi structured Decisions

Some managers are "super users" and skilled business analysts who wish to design their own reports and employ more complex analytics and models to look for trends in data, simulate alternative business scenarios, or test certain assumptions. For this group of users, the BI delivery platform that can enable semi structured decision making is called a decision-support system. Using mathematical or analytical models to conduct what-if or other types of analysis, DSS depend more on modeling than MIS. Working backward from known or assumed circumstances, "what-if" analysis enables the user to modify certain variables to test findings and forecast consequences in the event that those values change. In the past, spreadsheets and tiny standalone databases were used for a large portion of this modeling. Large business BI systems now have these features, enabling them to analyze data from massive corporate databases. Tools for intense modeling are part of BI analytics, some of which we previously covered. These tools assist Progressive Insurance in choosing the ideal clients for its offerings. Progressive creates tiny groupings of clients, or "cells," such as motorcycle riders aged 30 or older with college degrees, good credit ratings, and no accidents using data from the insurance sector that is freely accessible. Progressive does a regression analysis for each "cell" to determine the variables that are most strongly connected with the insurance losses that are typical for this group. It then establishes prices for each cell and runs simulations to see whether the pricing structure would result in a profit for the business. Because of these analytical methods, Progressive is able to successfully cover clients in conventionally high-risk groups that other insurers would have refused[10].

CONCLUSION

In conclusion, for enterprises wishing to use their data for informed decision-making, choosing the correct BI provider is essential. Vendors should be carefully assessed by organizations based

on criteria including interoperability, analytical capability, data visualization, security, data governance, cost, and sector knowledge. Organizations may maximize the value of their data assets and provide their stakeholders with useful insights for making strategic decisions and attaining business goals by collaborating with a trustworthy and appropriate BI provider. Organizations might also gain from assessing the vendor's experience and industry-specific knowledge. Knowing a vendor's past performance, client base, and success stories in related sectors may provide important information about the vendor's capacity to handle certain business difficulties and needs.

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DECISION SUPPORT FOR SENIOR MANAGEMENT: BALANCED SCORECARD AND ENTERPRISE PERFORMANCE MANAGEMENT

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ABSTRACT:

Senior management plays a critical role in guiding organizations towards achieving their strategic objectives and ensuring long-term success. Decision support tools such as the Balanced Scorecard (BSC) and Enterprise Performance Management (EPM) methods offer valuable frameworks and methodologies for senior management to make informed decisions and effectively monitor and improve organizational performance. This studyexplores the concepts of the Balanced Scorecard and Enterprise Performance Management, highlighting their significance in supporting decision-making at the senior management level.The Balanced Scorecard is a strategic management framework that translates an organization's vision and strategy into a set of performance metrics across four key perspectives: financial, customer, internal processes, and learning and growth. It provides a balanced view of organizational performance, moving beyond financial metrics to incorporate non-financial indicators that capture critical aspects of the business. The BSC enables senior management to monitor performance, identify areas for improvement, and align day-to-day operations with the organization's strategic objectives.

KEYWORDS: *Alignment, Balanced Scorecard, Benchmarking, Business Objectives, Data Analysis, Decision-Making Processes, Key Performance Indicators.*

INTRODUCTION

The goal of executive support systems, which were first mentioned in chapter two, is to assist C-level senior managers in concentrating on the really crucial performance data that impacts the overall profitability and success of the company. The development of ESS involves two steps. The first thing you'll need is a process for determining precisely what "the really important performance information" is for a particular business that executives require, and the second thing you'll need to do is create mechanisms that can quickly get this information to the appropriate recipients[1]–[3]. The balanced scorecard technique is now the most popular approach for helping business leaders grasp the truly crucial data they require. The balanced score card is a framework for putting a company's strategy plan into practice by emphasizing quantifiable results across four performance dimensions: financial, business process, customer, and learning and development.

Key performance indicatorsmeasures suggested by top management for determining how effectively the company is functioning along each given dimensionare used to assess performance on each dimension. For instance, the typical time needed to deliver a delivery to a client is a crucial sign of how successfully an online retail company is fulfilling its customer performance goals. If your organization is a bank, one KPI for measuring business process performance is the time needed to complete a simple task, like opening a new client account.

It is believed that the balanced scorecard framework is "balanced" because it forces managers to pay attention to factors other than simply financial success. According to this perspective, managers should concentrate on the things they have control over today, such as business process effectiveness, customer happiness, and staff development, since financial success is the history of the past and the outcome of previous acts. The next stage after consultants and senior executives have created a scorecard is to automate the information flow to executives and other managers for each of the KPIs. These skills are detailed, and there are literally hundreds of consulting and software companies that provide them. These systems are often referred to as ESS after they have been put into place.

Business performance management is a common management technique that is similarly connected. BPM aims to methodically transform a firm's strategies into operational goals. It was first established by an industry organization in 2004. Once the objectives and goals have been established, a set of KPIs is created to track the targets' development. The performance of the company is then evaluated using data from its enterprise database systems. The same concepts as the balanced scorecard are used by BPM, but it has a greater strategic flavor. Current enterprise apps within the company provide corporate data for modern ESS. Senior executives may also access news services, financial market databases, economic statistics, and any other external data they need using ESS. If managers want more in-depth views of the data, ESS also provide a lot of drill-down options.

Senior executives can analyze competitor activity, assess shifting market circumstances, evaluate organizational performance, and see opportunities and challenges using well-designed ESS. These tools are also used by workers at lower levels of the corporate hierarchy to track and assess company performance in their respective jurisdictions. These and other business intelligence systems need "actionable" information, which is information that is both easily accessible and usable for decision-making. Employee productivity and company performance will suffer if users have trouble recognizing crucial data in the reports they receive. Colgate-Palmolive addressed this issue and assisted its managers in making more data-driven, practical choices in the Interactive Session on Management[4]–[6].

DISCUSSION

Group Decision-Support Systems

The DSS we just discussed places a lot of emphasis on individual decision-making. To assist group and organizational decision making, a distinct category of systems called group decision-support systems has been created. This is because so much work is done in groups inside organizations. A group of decision-makers working collaboratively in the same place or at various places may solve unstructured issues with the help of a GDSS, which is an interactive

computer-based system. The previously in this text mentioned collaboration systems and Web-based tools for videoconferencing and electronic meetings enable certain group decision processes, but their main emphasis is on communication. However, the GDSS offers technology and techniques specifically designed for collaborative decision-making.

Group decision-making is facilitated in GDSS-guided meetings by using specialized hardware and software in conference rooms. The hardware consists of Colgate-Palmolive Company, the second-largest manufacturer of consumer goods in the world, whose goods are sold in more over 200 nations and territories. In 2011, the business earned $16.734 billion and employed 38,600 people globally. With more than three-quarters of its revenues coming from countries other than the United States in recent years, Colgate has been keeping people happy and clean all around the globe.

Colgate's ability to export its brands outside to Latin America, Europe, and Asia has been the key to the company's continuous development and stability over the last 20 years. Latin America, Europe, Asia, and North America were formerly the four geographic divisions used by Colgate to categorize the globe. There were distinct information systems in each area. This patchwork approach mostly succeeded as long as the areas did not need to exchange resources or information. All of this changed as international operations grew increasingly integrated and top management was required to actively monitor and coordinate these activities. Colgate had been using SAP since the early 1990s, but to service its various geographic locations, it was using five distinct ERP systems. Data discrepancies between various geographic areas and between data utilized at the corporate level and data used by a specific region or business unit emerged over time. The data were in continual flux. For instance, the orders and shipping figures varied each time a sales report was performed. Colgate intended to increase the amount of data that could be used to inform business decisions and to ensure that all of its managers and business divisions used the same data set globally.

Colgate decided to employ SAP's analytical, reporting, and data warehousing solution, SAP NetWeaver Business Warehouse, to create a single global data repository as the answer to this issue. The warehouse receives data from Colgate's regional ERP systems, which are then processed and standardized for enterprise-wide reporting and analysis. This reduces data variations across the company. A daily HTML exhibiting a number of financial and operational data for the day in comparison to the preceding month and quarter is one of the outputs of the warehouse for top management. All Colgate areas and business units have access to the exact same data that the executives have. To have an effect on business benefits, however, not enough workers were using the data in their decision-making. The warehouse's reporting and analytical capabilities were easy for Colgate's power users to utilize, and they approved of the system's matrix reports.

On the other hand, Colgate's senior managers and other casual users did not feel comfortable running ad hoc reports or digging through the layers of data to address the concerns the data raised. They had little time to devote to creating reports, and the warehouse created generic reports for them that lacked drill-down and navigational features. Users could only grasp the data by carefully examining the numbers on the since there was no color coding for the. Senior management at Colgate eventually started asking for quicker and more streamlined access to the

warehouse data, along with other occasional users. They want reports that were simpler to run and allowed for a quicker interpretation of the data. Customizable, real-time dashboards that could be utilized to more readily drive performance improvement were desired by senior management.

Then, to increase user perception and acceptance and speed up data loading, Colgate's information systems professionals used SAP NetWeaver BW Accelerator. They also used SAP BusinessObjects Web Intelligence to create bespoke reports. Business analysts and non-technical business people may ask unplanned questions about their data using SAP BusinessObjects Web Intelligence's robust, user-friendly interface. Casual business users may generate dynamic reports that dig, slice, and arrange information according to their requirements by using simple drag-and-drop procedures to access data sources. Users of cutting-edge visualization tools may concentrate on certain regions of interest when viewing two- and three-dimensional charts using these tools. Colgate began using SAP's BusinessObjects capabilities to develop intuitive dashboards, and it produced dashboard prototypes for management to assess in a timely manner. Production data was added to the dashboards once management gave their approval for the design. Senior management at Colgate are now using the dashboards to keep a close eye on the company.

To ensure the effectiveness of the dashboards, employee training was crucial. For Colgate's 65 business intelligence professionals, members of the global information systems development team built customized courses and led the classroom instruction. People who potentially serve as resources for creating the reporting tools were identified throughout the training. When news of the possibilities of the dashboards spread, Colgate's power users also registered for the courses. Better reporting systems that can accommodate various user types have significantly increased the usage of business intelligence at Colgate. Colgate's SAP systems are now used daily by roughly 4000 people, but this number is anticipated to rise to 15,000 to 20,000 users with the addition of computer and networking hardware, overhead projectors, and display panels. The ideas presented at a decision-making meeting are gathered, recorded, ranked, edited, and stored using specialized electronic meeting software. The more complex GDSS use trained facilitator and support personnel. The meeting is helped to plan and conduct by the facilitator, who also chooses the software tools[7][8].

Each participant receives a customized desktop PC that is under their exclusive control thanks to an advanced GDSS. Up until the time when participants are prepared to disclose information, no one will be able to observe what they do on their computers. Their input is sent via a network to a central server, which then archives the meeting's output and makes it accessible to everyone on the meeting network. Additionally, data may be shown on a big screen in the conference room. Because everyone may participate concurrently rather than one at a time using GDSS, meeting sizes can be expanded while productivity increases. By guaranteeing contributors' anonymity, a GDSS fosters a collaborative environment so that participants may concentrate on analyzing the ideas without worrying about being personally attacked or having their ideas rejected based on the contributor. GDSS software products provide systematic ways for gathering, analyzing, and archiving meeting outcomes so that those who weren't there may find the information they need

afterwards. The efficacy of GDSS relies on the group, the situation, and how effectively a meeting is organized and run.

Information Systems for Buildings

MoneyGram may not be familiar to PayPal users, yet millions of people worldwide. This service is used by people all around the world to transfer money quickly. One of the biggest money transfer companies in the world, MoneyGram has its headquarters in Dallas and has 256,000 partner agents across the globe, from cigarette shops in Paris to Walmart, where clients may send and receive money. MoneyGram had $1.3 billion in sales in 2011. Being ability to transfer money instantly between two locations across the globe is crucial for a worldwide money transfer organization. This is accomplished by MoneyGram via an automated money management system. Each day, the system processes hundreds of thousands of money transfer transactions and makes sure that all retail outlets, banks, and other MoneyGram agents are paid their due commissions and financial settlements.

Even though it has seen double-digit growth for several years, MoneyGram's operations were inefficient. The business had out-of-date systems that made it necessary to compute payments and close the accounts each month by hand, using spreadsheets. For a while, the technologies sufficed, but ultimately their complexity and inability to scale limited MoneyGram's capacity to meet market needs, provide new products, and support the sales staff. Additionally, the absence of a single data repository made it difficult to develop reports, assess market potential, and identify system bottlenecks. The company's senior management made the decision to review several unnecessary legacy systems and business procedures at MoneyGram. The executive vice president of operations and technology, controller, and treasurer, as well as other senior business and technological executives, were brought together. They came to the conclusion that MoneyGram needed to alter some of its crucial business procedures in addition to modernizing its technology.

Managers at MoneyGram changed the cultural expectations of their team members to increase their understanding of the business procedures used by the organization and how to make them better. Instead of focusing on their own job responsibilities, employees were required to comprehend each stage in the business processes they were a part of. The organization showed workers how business processes were changing using a variety of Webinars and other tools. To do this, MoneyGram established a specific group of administrators known as global process owners, or GPOs. Each GPO is in charge of carrying out a certain operation, including cash management, client onboarding, or processing of credit. GPOs were asked to describe the condition of their present processes, how different processes interacted with one another, and how they thought they might be made better. They were entrusted with acquiring performance data to assess that improvement and with defining how the effectiveness of their method might be measured. GPOs are still used by MoneyGram in its operations, along with subprocess owners who are in charge of managing day-to-day issues and activities. MoneyGram has transitioned from its former walled divisions to closely-knit cross-functional work groups with a long-term perspective on what's best for the company thanks to this new process orientation.

MoneyGram chose Oracle's E-Business Suite with the Oracle Incentive Compensation module as the technology to support its new worldwide procedures. Enterprise resource planning, customer relationship management, and supply chain management applications employing Oracle's relational database management system are all included in the Oracle E-Business Suite. Designing, managing, and assessing variable compensation plans are all automated via the Oracle Incentive Compensation module. The company's management thought that the Oracle software could handle the modification work necessary to interface with the back-office and proprietary agent procedures utilized by the firm as well as other specific business needs. The Oracle system has online tools for generating, maintaining, and displaying customer data.

In September 2012, MoneyGram began adopting Oracle E-Business Suite. Most of MoneyGram's back-office activities were expedited by the new software and business procedures, which also made it simpler to handle more client transactions, settle accounts with agents and billers, and update the company's general ledger. The addition of new partners may happen considerably more quickly. MoneyGram's present and future offerings depend on commissions to be profitable. For the purpose of computing the fees of its partner agents throughout the globe, MoneyGram must keep track of a wide variety of various schemes. MoneyGram had to handle several hundred commission plans using spreadsheets and manual procedures since its old technology was unable to automate many of the commission programs. With the help of Oracle Incentive Compensation, MoneyGram developed a configurable commission model that automates more than 90% of its non-standard incentive programs.

The Oracle installation has reduced the planning time for new regional innovations by around 40% compared to the previous. The launch of new products will seamlessly connect with MoneyGram's internal operations to ensure that all new transactions are accurately documented and accounted for. Instead of creating new software, MoneyGram may now manipulate existing settings using the new Oracle system to manipulate the processes. MoneyGram is less likely to launch a product that must first be operated using manual procedures. Employees at MoneyGram can provide better service to consumers and the agents handling the money transfers thanks to a centrally stored enterprise-wide data repository. Data that is centrally located are current and accessible. Reports now take 80 percent less time to produce than they did 40 hours and three workers before. These employees may focus more on report analysis and less on report creation.

Consolidating more than 40 MoneyGram legacy IT systems into a single, enterprise-wide Oracle E-business Suite deployment would save the company millions of dollars in costs. Without needing to recruit more workers, the organization can now manage more transactions. According to the corporation, it will take the Oracle software a year to pay for itself.

MoneyGram's experience serves as an example of some of the stages needed to develop new information systems. It included reviewing the organization's issues with its current information systems, determining the information needs, choosing the right technology, and restructuring business procedures and job roles. Management was required to supervise the system-building effort and assess costs and benefits. A process of deliberate organizational transformation was reflected by the new information system. The opening case draws attention to crucial issues brought up in this case and this. The inability of MoneyGram to introduce new products and compensation schemes for new partner agents in order to continue its worldwide expansion was

delayed by out-of-date information systems and ineffective manual procedures, which increased expenses.

The company's management made the decision to replace 40 out-of-date legacy systems with a comprehensive software suite that could support global operations, new financial products, and the back-office accounting of compensation and payment transfers with a great deal less manual labor. The approach required adjustments to organizational culture, operational procedures, and job roles in addition to the use of new technologies. Training and education of the workforce were crucial. MoneyGram is in a far better position to grow internationally, bring on additional partner agents, and enable new financial products and payment plans as a result of the new technology. Consider the following: What are the benefits and drawbacks of utilizing an enterprise-wide software suite like Oracle E-Business Suite in a multinational organization like MoneyGram? How much did the new system alter MoneyGram's operations?One kind of deliberate organizational change is the creation of a new information system. More than only new technology and software are introduced with a new information system. Changes in occupations, abilities, management, and organizations are also included. We reorganize the organization when we create a new information system. System developers need to be aware of how their work will impact both the company as a whole and particular business processes.

Development of Systems and Organizational Change

Information technology may encourage organizational transformation in a variety of ways, from subtle to profound. Automation, rationalization, business process redesign, and paradigm changes are the four types of structural organizational transformation that information technology enables. Each has distinct dangers and benefits. Automation is the most prevalent kind of IT-enabled organizational transformation. Information technology's first uses focused helping workers do their responsibilities more quickly and effectively. Early automation may be seen in the computation of paychecks and payroll registers, the immediate availability of client deposit records to bank tellers, and the creation of a national reservation system for ticket agents.

Automation and rationalization are the two most prevalent types of organizational transformation. These somewhat slow-moving and slowly-changing methods provide minimal risk but small rewards. Faster and more extensive change, including redesign and paradigm changes, has significant benefits but also a high failure rate. Rationalization of processes is a more profound organizational shift that emerges swiftly from early automation. Automation often uncovers new production bottlenecks and makes the current set-up of practices and organizations excruciatingly laborious. The simplification of standard operating procedures is known as rationalization of processes. As an example, MoneyGram's method for managing international money transfers is successful not just because it leverages computer technology, but also because the corporation simplified its back-office business procedures. There are fewer manual steps needed.

Programs for achieving a succession of ongoing quality improvements in goods, services, and operations, such total quality management and six sigma, often find rationalization of methods. With total quality management, achieving quality becomes everyone's duty within a company, regardless of role or department. TQM is derived on ideas created by American quality

specialists like W. Edwards Deming and Joseph Juran, although the Japanese are credited with popularizing it. Six sigma is a particular quality metric that equals 3.4 errors for every million chances. Most businesses use six sigma as a benchmark to guide continuing quality improvement initiatives even if they can't attain this level of excellence. Company process redesign, which involves analyzing, streamlining, and redesigning company processes, is a more effective sort of organizational change. Workflows are reorganized via business process redesign, which combines processes to reduce waste and get rid of laborious, paper-intensive operations. It is far more ambitious than rationalizing processes and calls for a fresh understanding of how the process should be structured.

Ford Motor Company's invoice less processing, which resulted in a 75% headcount reduction in the 500-person North American Accounts Payable unit, is an often-cited example of business process transformation. Previously, the majority of the time spent by accounts payable clerks was spent reconciling differences between invoices, receipts, and purchase orders. Ford revamped their accounts payable procedure so that the buying division puts a purchase order into an online database that can be reviewed by the receiving division whenever the requested products arrive. A check for accounts payable is automatically generated and sent to the vendor if the received products match the purchase order. Vendors are not required to provide invoices.

Only some areas of a firm may rationalize processes and alter business processes. By altering the way an organization does business or even the nature of the company, new information technologies may eventually have an impact on the design of the whole organization. For instance, Schneider National, a long-haul trucking and transportation company, modified its business model using modern information technology. Schneider established a new company to handle logistics for other businesses. A paradigm shift is a more drastic sort of corporate transformation. A paradigm shift entails reconsidering the nature of the organization and the company.

Redesign Of Business Processes

Many companies nowadays are attempting to employ information technology to enhance their business operations, much as MoneyGram, which was discussed in the opening instance. Some of these systems call for gradual changes to business operations, while others need more thorough overhauls. Organizations are using business process management to cope with these developments. To examine current processes, create new processes, and enhance existing processes, business process management offers a number of tools and approaches. BPM is an ongoing activity since process improvement requires constant adjustment.

How using the Internet may be used to revamp the process of buying books. A consumer uses his or her computer to visit an online bookshop through the Internet. He or she finds the book's description in the bookstore's online catalog. If the book is offered, the consumer purchases it online, enters their credit card and shipping information, and the book is then sent to their house. The consumer chooses another online retailer and does a new search for the book if the first one does not have it in stock. This method is far simpler to complete than buying a book in a physical shop since it involves fewer stages, takes less work from the consumer, and uses fewer

salespeople to assist customers. As a result, the new procedure is significantly more effective and time-saving.

It is necessary to demonstrate how the new process design improves customer value and/or time and cost efficiency. As a baseline, management first calculates the time and expense of the current process. In our scenario, if a book is in stock but has to be found by sales personnel, the time needed to buy it from a physical bookshop might vary from 15 minutes to 30 minutes. The procedure could take longer if the book has to be ordered from another source. After the new process has been carefully modeled and examined, it must be converted into a fresh set of protocols and working guidelines. To support the redesigned process, it could be necessary to create new information systems or improvements to already existing systems. The corporate organization adopts the new procedure and accompanying systems. As the company implements this approach, issues are discovered and dealt with. Employees involved in the process may suggest modifications. Continuous measurement is necessary once a process has been put into place and optimized. Why? Processes may degrade over time when staff members revert to outdated practices, or they may stop working effectively if the company goes through significant changes.

Even while many business process changes are gradual and continuing, sometimes more drastic change is required. This kind of extreme, far-reaching transformation is shown by our example of a physical bookshop changing the book purchase procedure so that it may be completed online. Redesigning business processes effectively may significantly increase productivity and efficiency and even alter how a company is managed. In other cases, it causes a "paradigm shift" that modifies the business's very character. When Amazon threatened established brick-and-mortar bookshops with its online shopping strategy, this really occurred in the book retailing industry. Amazon and other online booksellers have achieved tremendous efficiency, cost savings, and a whole new way of doing business by fundamentally reimagining the way books may be bought and sold. BPM presents difficulties. According to executives, company culture is the biggest impediment to changing business processes successfully. Employees dislike strange habits and often make an effort to oppose change. This is particularly true for initiatives that call for significant and far-reaching organizational changes. Companies that are dedicated to comprehensive process improvement require a sound change management plan since managing change is neither easy nor obvious.

CONCLUSION

In conclusion, Senior management may use decision support tools like the Balanced Scorecard and enterprise performance management techniques to monitor performance, make choices, and promote organizational success. Senior executives may connect strategic goals with operational operations, monitor progress, and make improvements to performance by using these frameworks and approaches. Senior management support, a strong performance assessment system, and a culture of responsibility and continuous improvement are all necessary for the effective adoption of these technologies. Utilizing the advantages of the EPM and Balanced Scorecard methodologies equips senior management to promote organizational excellence and provide long-lasting effects.

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TOOLS FOR BUSINESS PROCESS MANAGEMENT

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ABSTRACT:

Business Process Management (BPM) is a discipline that focuses on optimizing and managing organizational processes to improve efficiency, effectiveness, and agility. Various tools and technologies are available to support BPM initiatives and facilitate process modeling, analysis, automation, monitoring, and optimization. This studyexplores the key tools used in Business Process Management, highlighting their functionalities and benefits in enabling organizations to streamline and enhance their processes.Process modeling tools are essential for documenting and visualizing business processes. These tools provide graphical representations, such as flowcharts or process diagrams, to depict the sequence of activities, decision points, and interactions within a process. They enable stakeholders to understand and communicate the structure and flow of processes, facilitating analysis and improvement efforts.

KEYWORDS: *Business Process Modeling, Collaboration Software, Customer Relationship Management (Crm) Systems, Data Analytics, Process Automation.*

INTRODUCTION

Over 100 software companies, including IBM, Oracle, and TIBCO, provide solutions for different BPM-related tasks. These technologies serve organizations in a number of ways, including helping them identify and catalog processes that need improvement, model and enforce business rules for carrying out processes, and integrate current systems to enable new or redesigned processes. Additionally, analytics are offered by BPM software solutions for determining if process performance has improved and for calculating the effect of process changes on important business performance metrics. Some BPM solutions employ software to interact with all of the systems a business uses for a certain process in order to find problem areas while documenting and monitoring business processes to assist businesses in identifying inefficiencies. AIC, a Canadian mutual fund business, employed Sajus BPM monitoring software to look for irregularities in its procedure for updating accounts after each customer transaction. Sajus is an expert in goal-based process management, which is concerned with identifying the root causes of organizational issues via process monitoring before implementing tools to remedy those issues[1]–[3].

Another class of tools enforce business standards and automate specific portions of business processes so that staff members carry out those tasks more consistently and effectively. For instance, American National Insurance Company, which provides investment services as well as

life, health, property, and casualty insurance, uses Pega BPM workflow software to synchronize customer support procedures across four business units. To help customer support agents navigate a single view of a client's information that was kept in many systems, the program developed rules. The enhanced method raised the workload capacity of customer care representatives by 192% by removing the requirement to switch between many apps at once to address client and agent demands.

A third class of tools aids organizations in integrating their current systems to assist process enhancements. They automatically oversee business-wide operations, gather information from many sources and databases, and produce transactions in a number of connected systems. For instance, the Star Alliance of 15 airlines, which includes United and Lufthansa, utilized BPM to integrate its current systems and build standard procedures that were used by all of its members. One project combined 90 distinct business processes from nine airlines and 27 old systems to develop a new service for frequent flyers on member airlines. The BPM software provided airline management with a new business process model that demonstrated how to communicate data across the different systems by documenting how each airline handled frequent flyer information. The Interactive Session on Organizations gives an example of a corporation that used business process management to gain a competitive advantage. Burton Snowboards discovered that several of its business procedures had become obsolete, as is typical of any firm that quickly grows from a tiny operation to a well-known brand on a worldwide scale. Burton has worked hard to strengthen these procedures and transform their flaws into assets.

Overview of Systems Development

The development of new information systems results from a procedure for resolving organizational issues. A new information system is created to address an issue or group of problems that the company believes it is currently experiencing. The issue might be that management and staff are aware that the organization is not operating as well as it could or that it needs to seize fresh possibilities to improve performance. Systems development refers to the processes involved in creating an information system that addresses a business issue or opportunity.

Small Business Processes Help Burton Snowboards Speed Ahead

We often picture snow-covered slopes, acrobatic jumps, and high-flying amusement when we hear the word "snowboarding." We seldom consider how to make corporate processes more efficient. But for Burton Snowboards, snowboarding is a business. a market leader and industry innovator. Burton is a company that develops, manufactures, and sells snowboarding gear, apparel, and associated accessories. Burton was established in 1977 by Jake Burton Carpenter and has its headquarters in Burlington, Vermont. Burton is a multinational company with operations in Japan, Austria, and the United States. It now serves clients in 27 different countries. In spite of an increasing number of rivals, Burton still dominates the U.S. snowboarding industry, controlling over 40% of it at its height. Burton now has a new set of challenges as it continues to grow into a worldwide corporation, including enhancing its systems for inventory, supply chain, buying, and customer support.

Burton has a challenging dilemma when it comes to stocking and managing inventory since seasonal fluctuations and product line upgrades greatly influence inventory adjustments. Customers' comments are taken seriously by Burton, and the company will act rapidly to address their demands. For instance, Burton's manufacturing line must be capable of making this alteration fast and efficiently if a rider tries a jacket and suggests moving a zipper. A competitive need is being adaptable and active. A SUSE Linux enterprise server, an Oracle database, common hardware, and SAP enterprise software have all been deployed and are being maintained by Burton. That is a considerable distance from a lone Vermont woodworking business. Burton's information systems were a patchwork of underused, inconsistently installed software before these changes. The business had to manually assign products to orders and consumers. Burton originally used SAP in 1997 to start modernizing its IT environment, and the business has been using SAP ever since. However, Burton needed to improve its system. Burton received assistance from SAP analysts in identifying the top five transactions that were crucial to its business operations and required system improvement. In order to improve the efficiency of its business processes, Burton had to uncover too complex procedures, backlogs, and design flaws. The available-to-promise procedure, for instance, was taking several hours to finish. In order to provide its retail clients and dealers more exact information regarding the availability of items not presently in stock, Burton intended to hasten this process. This procedure currently takes 20 minutes to complete.

DISCUSSION

The handling of overdue purchase orders in the procure-to-pay process, which entails all the steps from buying goods from a supplier to paying the supplier, the order-to-cash process, the electronic data inter-change inventory feed extract transaction, and other processes were also in need of improvement. Using EDI technology, Burton's several warehouses automatically transmit inventory data to one another. Each day, hundreds of transactions take place at each warehouse as thousands of products are moved from one to the next. Burton discovered that the inventory reporting procedure was ineffective and that it was difficult for suppliers and customers to get the most recent information about which goods were in stock at which warehouse.

Burton and SAP collaborated to enhance supply chain effectiveness and warehouse communication. A management dashboard created with SAP's assistance demonstrates how efficiently a crucial process is operating at a certain moment. The dashboard's data assists Burton's key users in identifying gaps, irregularities, or other areas that need closer monitoring. All of these procedure updates were particularly helpful during Burton's "reorder" season. Long before winter arrives, Burton's dealers arrange orders to supply their shops. As customers begin purchasing the goods, the retailers place fresh orders with Burton to either restock their inventory or purchase new goods. They may now access more up-to-date information about product availability and process orders more quickly.

Analysis Of Systems

Systems analysis is the study of an issue that a business uses an information system to try to solve. It entails describing the issue, pinpointing the root causes, outlining the remedy, and

stating the information needs that a system solution must satisfy. The systems analyst draws out a road map of the current structure and systems, detailing the main data owners and users as well as the hardware and software already in use. The systems analyst then goes into depth about the issues with current systems. The analyst may determine the issue areas and goals a solution will pursue by looking into paperwork, work routines, and system operations as well as by interviewing important system users and witnessing system activities. The answer often entails developing a brand-new information system or upgrading an already existing one.

To ascertain if that solution is practical or reachable from a financial, technological, and organizational aspect, the systems analysis also involves a feasibility assessment. The proposed system's estimated return on investment, if the technology required for it is readily accessible and manageable by the firm's information systems professionals, and whether the organization can handle the changes the system would bring about are all factors considered in the feasibility study. The systems analysis method often identifies a number of potential alternatives that the business might consider and evaluates their viability. A written systems proposal report outlines the costs and advantages of each option, as well as their pros and cons. Management must decide which combination of costs, advantages, technological characteristics, and organizational implications constitutes the best option.Identifying the precise information needs that must be satisfied by the selected system solution is perhaps the systems analyst's most difficult responsibility. The most fundamental aspect of a new system's information requirements is identifying who, where, when, and how requires what information. The process of developing a thorough description of the tasks that the new system must carry out is known as requirements analysis. It meticulously outlines the goals of the new or changed system. A major factor in system failure and expensive system development costs is poor requirements analysis. A system that is built on the incorrect set of criteria will either need to be abandoned due to poor performance or will need significant changes. Some issues may be resolved without the use of an information system; instead, management must be changed, employees must get more training, or already-existing organizational processes must be improved. Systems analysis may still be necessary to identify the issue and find the best solution if the issue is information-related[4]–[6].

Design of Systems

Systems design demonstrates how the system will achieve this goal, whereas systems analysis outlines what a system should accomplish to satisfy information needs. An information system's design is its overarching framework or model. It comprises of all the parameters that give the system its shape and structure, much as a building or house's plan. The systems designer specifies the components of the system that will carry out the functions found via systems analysis. All of the administrative, organizational, and technical elements of the system solution should be included in these requirements. Information systems may be designed in a variety of ways, much like homes or other structures. Each design is a one-of-a-kind synthesis of all technological and organizational elements. The simplicity and effectiveness with which a design satisfies user needs within a particular set of technical, organizational, budgetary, and temporal restrictions distinguishes it from competing designs.

The Function of Consumers

The whole system-building process is driven by the user information needs. To guarantee that the system represents their business goals and information demands, not the prejudices of the technical personnel, users must have enough authority over the design process. Working on the design improves user comprehension and system acceptance.

Finishing The Process of Systems Development

The subsequent stages of the systems development process convert the solution criteria created during systems analysis and design into an information system that is completely functional. Programming, testing, conversion, production, and maintenance make up these last processes.

Programming

System requirements that were created during the design stage are converted into software program code during the programming step. Many businesses no longer develop new systems from scratch nowadays. Instead, they buy the software that satisfies the demands of a new system from outside sources, such as software packages from a commercial software vendor, software services from an application service provider, or outsourcing companies that create specialized software for their clients.

Testing

To determine if the system generates the desired outcomes, extensive and exhaustive testing must be done. Will the system achieve the required outcomes under known circumstances? is a question that testing resolves."In systems project planning, the time required to respond to this issue has historically been underestimated. Testing takes time because test data must be meticulously generated, findings must be examined, and system changes must be made. In certain cases, the system may need to have some components redone. There are significant hazards involved with skipping this stage.

Unit testing, system testing, and acceptance testing are the three categories of activities that make up testing an information system. Unit testing, often known as program testing, involves individually evaluating each program in the system. Although this aim is theoretically attainable, it is usually recognized that the point of such testing is to ensure that programs are error-free. Instead,then concentrating on identifying all the methods to make a program fail, testing should be seen as a tool to detect flaws in programs. Problems may be resolved after they have been identified. System testing examines the overall efficiency of the information system. It looks for inconsistencies between how the system really operates and how it was intended, as well as whether separate parts will work together as intended. Performance times, file storage capacity, management of peak loads, restart and recovery capability, and manual processes are some of the areas that are looked at.

The system's readiness for deployment in a production environment is officially confirmed via acceptance testing. Users access system testing, and management examines them. The new system is officially approved for installation when everyone is certain that it satisfies their criteria. A systematic test strategy is developed by the systems development team in

collaboration with users. All of the preparations for the tests we just mentioned are included in the test plan. The process of switching from the old system to the new one is known as conversion. The parallel strategy, the straight cutover strategy, the pilot study strategy, and the phased approach strategy are the four basic conversion approaches that may be used.

The old system and its possible successor are used concurrently for a while until everyone is certain that the new one functions properly. The previous system may still be utilized as a backup in the case of mistakes or processing outages, making this the safest conversion method. This strategy, however, is quite costly, and running the additional system can call for more personnel or resources. It is essential to include the numerous conditions to be evaluated, the prerequisites for each condition examined, and the anticipated outcomes when creating a test plan. Information systems experts and end users must both contribute to test strategies. On a designated day, the new system completely replaces the old system using the direct cutover technique. It is a highly hazardous strategy that can end up costing more than operating two systems concurrently if major issues with the new system are discovered. No alternative system exists to fall back on. The cost of corrections, interruptions, and dislocations might be quite high. The new technology is only made available to a small portion of the business, such as a single department or operational unit, as part of the pilot study plan. When the pilot version is finished and functioning well, it is simultaneously or gradually deployed across the remainder of the company.

The new system is introduced gradually using a phased approach plan, either by organizational units or by functions. A new payroll system can start with hourly employees who are paid weekly then six months later include salaried staff if, for instance, the system is introduced by function. If the system is implemented organizational unit by organizational unit, corporate headquarters may be converted first, followed four months later by outlying operational units. End users must be educated to utilize the new system before switching from the old one. During the conversion period, comprehensive documentation that explains the system's functionality from both a technical and end-user perspective is prepared for use in training and day-to-day operations. This phase of the systems development process is crucial since improper training and documentation may lead to system failure.

Production and Upkeep

The system is referred to as being in production after the new one has been set up and the conversion is finished. The system will be evaluated by users and technical experts at this stage to see how well it has achieved its original goals and to see if any tweaks or alterations are necessary. A formal postimplementation audit document may sometimes be created. The system has to be maintained while it is in use in order to fix mistakes, satisfy requirements, or increase processing efficiency once it has been fine-tuned. Maintenance is the process of making adjustments to a production system's hardware, software, documentation, or processes in order to fix problems, conform to new specifications, or increase processing effectiveness.

Debugging or fixing urgent production issues takes up around 20% of the time spent on maintenance. Another 20% are worried about updates to system software, hardware, reports, files, or data. However, user improvements, better documentation, and system component

recoding for increased processing speed make about 60% of all maintenance labor. By using better systems analysis and design techniques, the amount of effort in the third category of maintenance difficulties might be greatly decreased. Alternative modeling and system design approaches exist. The most prevalent are object-oriented development and structured approaches.

Since the 1970s, information systems have been documented, analyzed, and designed using structured approaches. The term "structured" describes the procedures as being step-by-step with each stage building on the one before it. Top-down structured approaches go from the most studyto the most particular degree of detail—from the general to the specific. Process-oriented structured development methodologies place a strong emphasis on modeling the processes—that is, the actions—that gather, store, change, and distribute data as it moves through a system. These techniques isolate processes from data. Every time someone wishes to perform an action on a specific piece of data, a new programming method has to be defined. The data that the software sends to the processes for action.

The data flow diagram is the main tool for displaying a system's component activities and the data flow between them. The data flow diagram provides a logical visual representation of information flow by segmenting a system into manageable-sized modules. It is a straightforward data flow diagram for a mail-in university course registration system that precisely defines the operations or transformations that take place inside each module as well as the interfaces that connect them. The rounded boxes depict procedures that show how data is transformed. The square box is a representation of an external entity, or an information source or recipient, who is not a part of the model-building system. Data stores, which may be either human or automated inventories of data, are represented by the open rectangles. The transfer of data between processes, external entities, and data repositories is shown by the arrows, which stand for data flows. They include data packets, and next to each arrow is a list of the name or content of each data flow[7]–[10].

Students must submit registration forms together with their names, ID numbers, and the course numbers they desire to enroll in, as shown by this data flow diagram. In step one, the system checks the university's course file to make sure each chosen course is still active. The file separates available courses from ones that have been postponed, canceled, or filled. The decisions made by Process 1.0 determine which of the student's choices may be accepted or rejected. Process The student is enrolled in the courses for which they have been accepted by 2.0. It recalculates the class size and changes the student's name and identification number in the university's course file. The course number is shown as closed if the allowed number of students has been met. Additionally, Process 2.0 refreshes the university's student master file with details about new students and address changes. Then, Process 3.0 sends a confirmation of registration letter to each student applicant detailing the courses for which he or she is enrolled and highlighting the course choices that were not possible to complete. The diagrams may be used to represent both lower-level details and higher-level processes. A complicated process may be decomposed into progressively more detailed steps using tiered data flow diagrams. A high-level data flow diagram may be used to separate a whole system into smaller systems. With the use of second-level data flow diagrams, each subsystem may be further broken down into lower-level subsystems, and so on until the lowest level of detail is achieved.

A data dictionary is an additional tool for structured analysis that provides details on both individual data items and data groups within a system. In order for systems architects to fully grasp the types of data that data flows and data storage include; the data dictionary describes their contents. The transformation taking place at the lowest level of the data flow diagrams is described by process specifications. They describe each process's reasoning. Software design is represented using hierarchical structure charts in structured approach. The top-down structure chart demonstrates each level of design, how it relates to other levels, and where it fits into the overall design framework. A program or system's principal function is initially taken into account in the design process. This function is then divided into subfunctions, and each subfunction is then broken down further until the lowest level of detail is achieved.

CONCLUSION

In conclusion, in order for firms to efficiently simplify, optimize, and manage their processes, business process management solutions are essential. Organizations may understand, visualize, automate, and constantly improve their processes by using tools for process modeling, analysis, automation, monitoring, and optimization. Utilizing these technologies helps businesses increase operational effectiveness, customer happiness, and agility, which helps them gain a competitive edge and experience long-term success. However, putting BPM tools into practice calls for careful planning that takes organizational preparedness, process complexity, and technological compatibility into account. To promote broad acceptance, organizations must make sure the tools they choose are compatible with their BPM objectives, interact with current systems, and have user-friendly interfaces.

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OBJECT-ORIENTED DEVELOPMENT: A REVIEW STUDY

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ABSTRACT:

Object-Oriented Development (OOD) is a software development approach that emphasizes the design and implementation of software systems based on the concepts of objects and classes. This studyexplores the principles, benefits, and challenges associated with Object-Oriented Development, highlighting its significance in building modular, reusable, and maintainable software applications.OOD revolves around the concept of objects, which represent real-world entities or abstractions. Objects encapsulate data and behavior, allowing for modular and independent units of functionality. These objects are organized into classes, which define the common properties and behaviors of a group of objects. Inheritance enables the creation of hierarchical relationships between classes, facilitating code reuse and promoting the concept of polymorphism.

KEYWORDS: *Encapsulation, Inheritance, Message Passing, Modularity.*

INTRODUCTION

Structured approaches work well for modeling business processes, but they struggle with modeling data. Additionally, they consider data and processes as conceptually distinct entities, even if this separation would appear odd in the actual world. Both analysis and design employ several modeling paradigms. These problems are addressed by object-oriented development. The object is the fundamental building block of systems analysis and design in object-oriented programming. This structural diagram offers a comprehensive perspective of the complete payroll system by displaying the highest or most studylevel of design. Data and the particular methods used to that data are combined into an object. Only the actions, or methods, linked to an object may access and modify data that is contained inside it. Programs deliver a message to an object asking it to do an action that is already incorporated in it, as opposed to giving data to procedures. The system is represented in the model as a set of items and the connections between them. Objects must cooperate with one another in order for the system to function since processing functionality is housed inside objects rather than in distinct software applications[1]–[3].

Class and inheritance are the cornerstones of object-oriented modeling. A class of things, or broad groupings of related objects, share certain characteristics. Classes of objects may add variables and behaviors specific to each item while still inheriting the structure and behavior of a more generic class. Instead of beginning from scratch each time, new classes of objects are

formed by selecting an existing class and defining how it varies from the current class. We can see how class and inheritance function in this example, which demonstrates the links between classes in regards to workers and their compensation. The superclass, or common ancestor, of the other three classes is called Employee. Subclasses of Employee include Temporary, Hourly, and Salaried. The top compartment of each box has the name of the class, the middle compartment contains the characteristics for each class, and the bottom compartment contains the list of actions. Each subclass stores characteristics that are unique to that particular kind of employee, whereas the Employee superclass stores features that are shared by all workers. For instance, hourly wages and overtime rates are specific to hourly workers. A generalization route from the subclass to the superclass is shown by a solid line, indicating that the traits shared by the subclasses Salaried, Hourly, and Temporary may be generalized to the superclass Employee.

Compared to conventional organized development, object-oriented development is more gradual and iterative. Systems builders provide the functional requirements of the system during analysis, outlining its most crucial features and what the suggested system must do. The system's user interactions are examined in order to identify objects, which might be both data and processes. During the object-oriented design phase, the actions and interactions of the objects are described. Classes are collections of related objects that are organized into hierarchies where a subclass inherits the properties and functions of its superclass. The information system is constructed by turning the design into computer code, adding new classes that were developed during the object-oriented design phase, and reusing classes that are already present in a library of reusable software objects. The establishment of an object-originated database may also be part of the implementation process. The final system must undergo extensive testing and evaluation. Reusable objects have the potential to cut down on the time and expense associated with producing software by allowing businesses to utilize previously generated software objects as building blocks for subsequent applications. Utilizing some already-existing elements, altering others, and introducing a few fresh ones allows for the creation of new systems. Object-oriented frameworks have been created to provide reusable, partially completed programs that the company may further modify into full applications[4]–[6].

DISCUSSION

Computer-Aided Software Engineering

Computer-aided software engineering, also known as computer-aided systems engineering, offers software tools to automate the approaches we just mentioned, hence minimizing the developer's need to do repetitive tasks. CASE technologies also make it easier to organize team development activities and provide comprehensive documentation. Accessing one other's files to check or edit one another's work allows team members to readily share their work. The right application of the technologies may also result in modest productivity gains.

With the aid of CASE tools, you may automatically create charts and diagrams, as well as code generators, report generators, data dictionaries, comprehensive reporting capabilities, analysis and validation tools, and documentation generators. CASE tools often aim to boost output and quality via

1. Establishing a uniform development process and design discipline

2. Enhancing dialogue between consumers and technical experts
3. Using a design repository to quickly access, organize, and correlate design components
4. Automating laborious and prone to mistake analytical and design processes
5. Automating the creation, testing, and deployment of code

Design diagrams and specification validation functionalities are available in CASE tools. CASE technologies help iterative design by automating changes and revisions and offering prototype resources. All of the information defined by the analysts during the project is kept in a CASE information repository. The repository contains entity-relationship diagrams, data definitions, process requirements, screen and report formats, notes and comments, and test results. It also contains data flow diagrams and structure charts. CASE tools need organizational discipline to be utilized well. Every participant in a development project is required to follow a development process as well as a shared set of naming conventions and standards. The finest CASE tools impose common practices and standards, which may deter people from using them in circumstances where there is a lack of corporate discipline.

Advanced Systems-Building Methods

Systems vary in terms of their technical complexity, scale, and the organizational issues they are intended to address. To address these disparities, a variety of systems-building strategies have been created. The conventional systems life cycle, prototyping, application software packages, end-user development, and outsourcing are the other approaches that are covered in this section.

Life Cycle of Traditional Systems

The earliest technique for creating information systems is called the systems life cycle. The life cycle methodology divides system development into distinct phases and uses a phased approach to system construction. Although there are differing views among systems development experts on how to divide the phases of systems development, they essentially match to those we have just discussed. A formal division of labor between end users and information systems experts is maintained by the systems life cycle approach. End users are only allowed to provide information needs and approve the technical staff's work; the majority of the systems analysis, design, and implementation work is done by technical professionals like systems analysts and programmers. The life cycle also stresses formal requirements and documentation;therefore, a systems project will produce a lot of papers.

Large sophisticated systems that need a systematic and comprehensive requirements analysis, established specifications, and stringent controls over the system-building process are still built using the systems life cycle. The systems life cycle method, however, may be expensive, time-consuming, and rigid. The systems life cycle is primarily a "waterfall" strategy, where duties in one stage are finished before work for the next stage starts, despite the fact that systems designers may switch between phases as needed. Activities may be repeated, but if requirements or specifications need to be changed, a lot of new papers must be created and the process must be redone. This promotes specification freezing rather early in the development process. Since

many tiny desktop systems have a tendency to be less organized and more customized, the life cycle method is also not ideal for them[7]–[9].

Prototyping

Building an experimental solution quickly and affordably for end customers to assess is known as prototyping. Users that engage with the prototype may better understand their information needs. The final system may be built using the prototype that the users approved. The prototype is a functioning model of an information system or a component of the system, however it is just supposed to be a rough sketch. The prototype will be significantly improved when it is put into use until it perfectly satisfies user requirements. The prototype may be transformed into a polished production system once the design is complete. Iterative systems development refers to the process of creating a preliminary design, testing it, improving it, and attempting it again. This is possible because the actions needed to create a system may be performed again. Compared to the traditional life cycle, prototyping is openly iterative and actively encourages modifications to system design. It has been stated that prototyping substitutes deliberate iteration for unplanned rework, with each version more properly reflecting user needs.

Prototyping Procedures

Step 1: Determine the fundamental needs of the user. Only enough time is spent with the user by the systems designer to identify their fundamental information demands.

Step 2: Create a first prototype. The systems designer uses technologies for swiftly producing software to quickly produce a functioning prototype.

Use the prototype in step three. Users are urged to interact with the system to assess how well the prototype satisfies their requirements and to provide recommendations for its improvement.

Step 4 is to improve and revise the prototype. The system developer takes note of any adjustments the user wants and adjusts the prototype as necessary. The cycle then goes back to Step 3 once the prototype has been altered. Repeat steps 3 and 4 until the user is pleased.

The accepted prototype next turns into an operational prototype and provides the final application parameters after no more iterations are necessary. Sometimes the system's production version is based on the prototype. The benefits and drawbacks of prototyping is most helpful when there is some ambiguity about requirements or design solutions. It is often used to create the user interface for information systems. Prototyping fosters active end-user participation across the whole systems development life cycle, which increases the likelihood that the resulting systems will meet user needs. Rapid prototyping, however, may omit crucial system development processes. If the finished prototype functions relatively well, management may not see the necessity for redesigning, reprogramming, or doing exhaustive testing and documentation to create a polished production system. Some of these hurriedly built systems could find it difficult to handle a big number of users or a lot of data in a production setting.

Development for End-Users

Some information system types may be created by end users with little to no official support from technical experts. End-user development is the term for this occurrence. This is made

feasible by a collection of software tools referred to as fourth-generation languages. Fourth-generation languages are software tools that let people build software programs or make reports with little to no technical support. Some of these fourth-generation technologies also increase the productivity of expert programmers.

Fourth-generation programming languages often have less procedural behavior than traditional programming languages. The series of actions, or processes that instruct the computer on what to do and how to accomplish it must be specified in procedural languages. Nonprocedural languages need simply describe what has to be done; they are not required to provide specific instructions on how to do the job. PC software tools, query languages, report generators, graphics languages, application generators, application software packages, and extremely high-level programming languages are the seven categories of fourth-generation languages. The chart displays the tools in order of their usability for non-programmers. The majority of PC software tools and query languages are more likely to be used by end users. Query languages are software tools that instantly respond online to non-predefined information queries, such as "Who are the best sales representatives? Query languages are often linked to database management systems and data management tools.

Overall, systems produced by end users may be finished more quickly than those developed via the traditional systems life cycle. Giving users the freedom to define their own business requirements enhances requirements gathering and often results in greater user engagement and system satisfaction. Fourth-generation tools, however, are still unable to completely replace traditional tools for certain commercial applications because they are unable to manage the processing of many transactions or applications that need a great deal of procedural logic and updating.

Because end-user computing takes place outside of conventional methods for information systems management and control, it also presents hazards to organizations. Rapid system development without a structured development approach might lead to insufficient testing and documentation. Systems outside of the typical information systems department might make it difficult to maintain control over data. Management should regulate the development of end-user applications by requiring cost justification of end-user information system projects and by establishing hardware, software, and quality standards for user-developed applications in order to assist organizations in maximizing the benefits of end-user application development.

Outsourcing and Application Software Packages

Today's software is often bought from outside sources rather than being created in-house. The software might be rented from a software service provider, purchased from a commercial vendor, or produced specifically for a company by an external outsourcing company. Many systems throughout the course of the last few decades have been constructed using application software packages as a base. Many programs, such as payroll, accounts receivable, general ledger, or inventory management, are used by all business companies. A generalized system will satisfy the needs of numerous companies for such universal functions and regular procedures that do not vary much over time.

The majority of an organization's needs may be met by a software package, eliminating the need for the firm to develop custom software. Utilizing the prewritten, predesigned, and pretested software packages from the bundle allows the business to save time and money. The majority of the system's continuing maintenance and support is provided by package suppliers, including improvements to keep the system abreast of new business and technological advancements. Many packages come with the ability to be customized if an organization has certain needs that the bundle does not cover. A software package may be customized using customization features to match the specific needs of an organization without compromising the bundled program's integrity. Additional programming and modification work may become very costly and time-consuming if a lot of customization is necessary, negating many of the benefits of software packages.

Systems analysis includes a package assessment effort when a system is designed utilizing an application software package. The capabilities offered by the package, flexibility, user-friendliness, hardware and software resources, database needs, installation and maintenance efforts, documentation, vendor quality, and pricing are the most crucial evaluation factors. A Request for Proposal, which is a comprehensive set of queries sent to packaged-software providers, is often the basis of the package assessment process. The company no longer has complete control over the systems design process after a software package is chosen. The design effort will instead focus on attempting to shape user needs to fit the package's characteristics rather than explicitly adjusting the system design specifications to account for user requirements. If the needs of the organization clash with how the package functions and the package cannot be altered, the company will have to modify its processes to fit the package.

Outsourcing

A company may hire an outside company that specializes in offering these services to create or run information systems if it doesn't want to utilize its own resources for the task. One kind of outsourcing is the use of cloud computing and software as a service provider, which we discussed in number 5. Companies who subscribe to the service utilize the computer hardware and software it offers as the technological foundation for their own systems. An organization may contract with an outside vendor to design and develop the software for its system, but that vendor would run the system on its own computers. This is another example of outsourcing. The outsourcing provider may be local or international. The main reason for domestic outsourcing is because outsourcing companies have assets, resources, and capabilities that their customers do not. A very big organization could need to hire an extra 30 to 50 individuals with specialized knowledge of supply chain management software, licensed from a vendor, in order to implement a new supply chain management system. It makes more logical and is often less costly to outsource this job for a year rather than engage permanent new staff, the majority of whom would require substantial training in the software package, and then release them once the new system is constructed.

When it comes to outsourcing to other countries, cost is usually the deciding factor. A talented programmer in Russia or India makes between $10,000 and $20,000 USD annually, vs $73,000 for a similar programmer in the United States. The cost and complexity of coordinating the work of international teams in distant places have been significantly lowered by the Internet and low-

cost communications technologies. Numerous offshore outsourcing companies provide world-class technological resources and expertise in addition to cost reductions. Some of these benefits have lately been diminished by wage inflation abroad, and some jobs have relocated back here. Nevertheless, there is a very good probability that you will collaborate with international teams or offshore outsourcers at some time in your career. If your business takes the time to weigh all the risks and make sure outsourcing is suitable for its unique requirements, it will have the greatest chance of success. Any company that outsources its applications must have a complete understanding of the project, including its needs, implementation strategy, expected outcomes, cost factors, and performance indicators.

Many businesses undervalue the costs of finding and vetting information technology service providers, switching to a new vendor, upgrading in-house software development processes to match those of outsourcing providers, and keeping track of vendors to ensure they are carrying out their contractual obligations. Companies will need to set aside resources for project management, contract negotiations, managing travel expenditures, and documenting needs. According to experts, it might take anywhere between three months and a full year to completely shift work to an offshore partner and ensure that the vendor is well-versed in your industry. Dealing with cultural differences that reduce productivity and handling human resources concerns, such firing or moving local staff, add extra expenses to outsourcing to other countries. Some of the projected advantages of outsourcing are undermined by all of these unanticipated expenses. Companies should exercise extra caution when hiring an outsourcer to create or manage applications that provide them a competitive edge.

90% of General Motors Corporation's IT services, including those for its data centers and application development, were outsourced. The business recently made the decision to handle just 10% of its IT infrastructure externally, moving 90% of it in-house. Cost-cutting is crucial, but GM's principal motivation for reducing outsourcing is to regain control over its information systems, which the corporation says were holding it back from acting swiftly on business possibilities. By bringing information systems in-house, GM will find it simpler to reduce the number of IT applications on its long list by at least 40%, switch to a more standardized platform, finish cutting-edge IT projects more quickly, and gain better control over customer and production data, which had been spread across too many different systems. The carmaker will operate four software development centers and combine 23 data centers from across the globe into just two, both in Michigan.

Development of Applications for The Digital Firm

In the context of the digital company, companies must be able to swiftly add, modify, and retire their technological capabilities in order to take advantage of new opportunities, such as the need to provide apps for mobile platforms. Businesses are beginning to use quicker, more informal development processes that provide quick answers. Businesses are increasingly relying on fast-cycle methodologies like rapid application development, joint application design, agile development, and reusable standardized software components that can be assembled into a comprehensive set of services for e-commerce and e-business in addition to software packages and outside service providers.

Development of Applications Quickly

Systems developers are able to develop functional systems considerably more quickly than they could with conventional systems-building techniques and software tools because to the use of object-oriented software tools, reusable software, prototyping, and fourth-generation language tools. This approach of developing functional systems in a little amount of time is known as fast application development. Iterative prototyping of important system components, the automation of program code creation, tight collaboration between end users and information systems experts, and the use of visual programming and other tools for creating graphical user interfaces are all possible components of RAD. Frequently, prebuilt components may be used to build simple systems. The process need not be sequential; important stages of development might take place concurrently.

Joint application design is a method that is sometimes used to hasten the creation of information needs and the creation of the first systems design. JAD hosts an interactive session where information systems experts and end users may talk on the design of the system. JAD workshops may greatly speed up the design process and include users at a high level when properly planned and managed.By dividing a major project into a number of smaller subprojects that are finished in a certain amount of time utilizing iteration and constant feedback, agile development focuses on the quick delivery of functional software. A team works on each mini-project as if it were a full project, which includes planning, requirements analysis, design, coding, testing, and documentation. The next iteration will see improvements or the inclusion of additional features as developers understand the needs. This makes it possible for the project to modify more rapidly and lowers overall risk. Agile approaches emphasize face-to-face contact over written documentation, promoting collaboration and prompt and efficient decision-making.

Development Based on Components and Web Services

Some of the advantages of object-oriented development for creating systems that can adapt to quickly changing business contexts, including Web applications, have previously been discussed. Software components for common operations, such as a graphical user interface or the ability to place orders online, have been created as groupings of objects to speed up the construction of software. These components may be merged to form complex commercial applications. Component-based development is a method of developing software that allows the assembly and integration of pre-existing software components to create a system. These software components are increasingly emerging from cloud services. By integrating commercially available components for shopping carts, user authentication, search engines, and catalogs with software for their own particular business needs, businesses are utilizing component-based development to construct own e-commerce solutions.

Service-Oriented Computing and Web Services

Web services have the ability to carry out a number of tasks on their own and may also work with other web services to carry out more complicated tasks like purchasing, ordering things, or checking credit. Web services are software components that enable communication and data sharing across operating systems, programming languages, and client devices, which may

significantly reduce system development costs while generating new potential for business cooperation[10]–[12].

CONCLUSION

A potent strategy for creating modular, reusable, and maintainable software systems is object-oriented development. Using the ideas of objects, classes, inheritance, and polymorphism, programmers may build extensible, adaptable systems that can be extended to meet new needs. OOD has many advantages, but it also requires careful planning and a firm grasp of object-oriented ideas. The full potential of Object-Oriented Development may be realized by developers by using object-oriented tools and languages in the right way to build scalable and resilient software applications.Extensible Markup Language and other open protocols and standards were used to create Web services, which were described as loosely connected, reusable software components that allow applications to interact with one another without the need for specialized development. Web services may be used as tools for developing new information system applications or improving current systems, in addition to facilitating internal and external integration of systems. These software services claim to be more affordable and simpler to integrate than proprietary components since they rely on a common set of standards.

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EXPLORING THE MOBILE APPLICATION DEVELOPMENT PROCESS

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ABSTRACT:

Mobile application development is a rapidly growing field driven by the increasing use of smartphones and mobile devices. This studyexplores the process, challenges, and considerations involved in developing mobile applications, highlighting the significance of mobile app development in today's digital landscape.Mobile application development encompasses the creation of software applications specifically designed to run on mobile devices such as smartphones and tablets. The process involves several stages, including ideation, design, development, testing, and deployment. Developers utilize various programming languages, frameworks, and development environments to create mobile apps compatible with different operating systems like iOS and Android.

KEYWORDS: *Agile Development, Android, App Store Optimization (Aso), Cross-Platform Development, Debugging, Hybrid Apps.*

INTRODUCTION

The process of creating apps for mobile platforms differs greatly from that of creating software for PCs and their considerably bigger displays. Mobile devices are considerably simpler to use with fingers and multitouch gestures than with keyboards and typing due to their smaller size. Mobile applications should not attempt to handle too many jobs, they should be built for usability, and they should be optimized for the precise duties they are to execute. In comparison to using a desktop or laptop PC, utilizing a mobile device requires a fundamentally different user experience. Saving resources is a primary goal, including bandwidth, screen space, memory, processing, data input, and user gestures. It is challenging for the user to browse a complete Web site designed for the desktop when it is reduced to fit on a smartphone screen. To discover pertinent information, the user must continuously scroll and zoom in and out. As a result, businesses often construct numerous mobile sites to cater to the demands of smartphones, tablets, and desktop browsers in addition to designing Web sites expressly for mobile interfaces. This translates into having at least three websites, each with its own content, upkeep, and expenses. Because your browser sends this information to the server when you log on, Web sites currently know what device you are using. The server will offer the relevant screen based on this information.

The issue of having three separate websites may be solved by using responsive web design. Whether a visitor is using a desktop, tablet, or smartphone, responsive web design allows

websites to dynamically adapt layouts to suit their visitor's screen resolution. The design is optimized for various viewing contexts using a combination of flexible grids and layouts, flexible images, and media queries in this method. The website dynamically adjusts the resolution and picture size when the user moves from a laptop to an iPad, iPhone, or Android handheld. As a result, each new gadget no longer requires its own design and development labor. With responsive design, users will have access to a single source of material that is organized to be simple to read and navigate with the least amount of resizing, panning, and scrolling across a wide variety of devices and browsers[1]–[3]. Mobile applications are primarily available on the iPhone/iPad, Android, and Windows Phone operating systems. For example, Apple's iOS SDK for the iPhone/iPad offers tools for building, testing, and deploying apps in the target platform environment. Each platform for mobile applications includes an integrated development environment (IDE). These software development kits are used by larger businesses or company owners with programming knowledge to build applications from the ground up. App development may also be outsourced to specialist app development companies, which can cost up to $20,000 to design, create, and maintain a single app. For tiny enterprises that cannot afford to hire highly compensated programmers, several companies, like Red Foundry, provide app templates. The Interactive Session on Technology details several businesses' approaches to overcoming the difficulties in mobile development.

What Does It Take To Go Mobile?

That question is being asked by almost all businesses nowadays. There will be one mobile device for every person on the planet by 2015, and by 2013, more people will use their mobile phones than PCs to access the internet. Since 2010, the average number of Web searches conducted on mobile devices has more than doubled. Customers demand—and even expect—to be able to get information or complete a transaction using a mobile device of their choosing whenever, wherever, and at any time. Therefore, a business needs some type of mobile presence if it wants to keep in touch with its clients.

There are unique difficulties in creating mobile websites or mobile applications. The user experience on a mobile device and a PC are fundamentally unlike. Mobile devices provide unique capabilities, such as location-based services, that allow businesses to engage with consumers in novel and important ways. Businesses must be able to use these advantages while providing users with an adequate experience on a tiny screen. A company may require a distinct version of an application to operate on each of the numerous mobile platforms available: iPhone, Android, Windows Phone, and potentially BlackBerry. A website or desktop program cannot simply be transferred to a smartphone or tablet. It uses a distinct approach to system development. It's critical to comprehend how, why, and where clients utilize mobile devices as well as how these mobile engagements and behaviors alter company relationships. Customers who utilize apps, for instance, complete more transactions on their own and use their phones less? Do they use mobile devices for product research and buying more or less frequently?

The parent company of companies like UGG Australia, Teva, and Simple Shoes, Deckers Outdoor Corporation, spent a lot of time researching the mobile habits of its clients. To determine how customers will interact with its brand via mobile channels, it examined how consumers use their mobile devices for brand research and buying. According to Decker's

customer studies, a smooth interaction is crucial for customers using mobile devices within a Deckers shop. The client wants to be able to see a product on their mobile device and see the same information they would see in-store, as well as some extra information, such user reviews.

More than just choosing mobile devices, operating systems, and applications is involved in a mobile strategy. It also entails changes to organizational procedures, personnel dynamics, and client interactions. Mobile technology may improve operations by streamlining them and making them more convenient, a smartphone and send it to the bank automatically. The customer's account receives the funds right away. This technique does away with the time and money necessary to handle paper checks, as well as the need to send the check and wait three days for the deposit to be processed. Through this mobile app, USAA Federal Savings Bank handled deposits of $6.4 billion in 2011.

In addition, the mobile app shows loan and credit card balances, shopping options, information about homeowners' and auto insurance policies, Home Circle and Auto Circle purchasing options, retirement products and information, ATM and taxi locators, and a communities feature that lets users see what other people are saying about USAA on social media sites like Twitter, Facebook, and YouTube. After passing a "For Sale" sign while driving past, a real estate business may wish to direct mobile customers to an entirely other website. In order to quickly grab the lead and maintain a quick load time, the realtor may wish to enhance the mobile interface to contain particular listing and contact information. The conversions may not be as great if the mobile site is just a more user-friendly version of the desktop site.

DISCUSSION

One of the leading U.S. new home builders, Ryland Homes, already has a traditional website, but it also wanted to be able to interact with clients using mobile technology. In order to generate sales leads, the firm updated its mobile website in March 2011. This allowed prospective clients to identify the company's locations, see its goods, sign up for the company's newsletter, and contact immediately. The site is now easier to read and can fit on a smartphone or tablet screen without pinching and zooming, thanks to work by Ryland's development team. It developed numerous versions of the site that were suited for various smartphone or t models used by consumers using jQuery Mobile software and responsive Web design. To boost the likelihood of closing a deal, Ryland concentrated on features like location-based driving instructions to adjacent villages, clickable phone numbers, and quick online registrations. Based on the user's location and the location of their mobile device, the website displays adjacent communities in order of distance.

What are the essential steps in the systems development process?

Systems analysis, systems design, programming, testing, conversion, production, and maintenance are the primary components of system development. The study and analysis of system flaws, as well as the spotting of needs for their resolution, constitute systems analysis. Systems design outlines an information system solution’s requirement and demonstrates how its organizational and technological elements work together.

Main techniques for system modeling and design?

Structured methods and object-oriented development are the two main approaches for modeling and building information systems. Structured approaches concentrate on modeling the data and the processes independently. The main tool for structured analysis is the data flow diagram, and the main tool for structured software design representation is the structure chart. A system is modeled by object-oriented programming as a group of objects that include operations and data. Class and inheritance are the cornerstones of object-oriented modeling.

Alternate strategies for information system construction?

The systems life cycle, which mandates that information systems be built in formal phases, is the earliest approach for creating systems. The steps must be carried out in order and have clear results; each must have official approval before moving on to the next. Although it is quite restrictive and expensive, the systems life cycle is appropriate for big projects that need precise requirements and strict management control over each step of systems creation. Building an experimental solution quickly and affordably for end customers to use and assess is known as prototyping. End-user engagement in system development and design iteration are encouraged via prototyping until precise requirements are obtained. Rapid prototyping may produce systems that have not been well tested, documented, or are technically unfit for use in a production context.

The amount of planning, programming, testing, installation, and maintenance effort needed to create a system is decreased by using a software package. If a company lacks the internal information systems personnel or financial resources to design a system from scratch, application software packages might be useful. Packages may need major revisions to match the specific needs of a company, which may significantly increase development costs. End-user development is the process through which end users create information systems, either alone or with little help from information systems experts. Fourth-generation software tools may be used to quickly and casually generate end-user-developed systems. End-user development, however, may result in the creation of information systems that do not necessarily adhere to quality assurance requirements and that are difficult to regulate using conventional techniques. In order to create a company's information systems, an external vendor is used rather than the internal information systems team. With the use of outsourcing, businesses may create apps without having to hire internal information systems workers. However, businesses run the danger of ceding too much power to outside providers and losing control over their information systems. Hidden expenses are another aspect of outsourcing, particularly when the job is moved abroad.

New strategies for system development in the age of the digital firm?

To speed up the systems development process, businesses are resorting to quick application design, collaborative application design, agile development, and reusable software components. To create systems extremely quickly, RAD makes use of object-oriented software, visual programming, prototyping, and fourth-generation technologies. Using iteration and constant feedback, agile development divides a major project into a number of tiny subprojects that are finished quickly. By organizing items into collections of software components that may be joined to construct sizable commercial applications, component-based development speeds up the creation of applications. Through a consistent plug-and-play architecture, web services provide a

set of standards that allow enterprises to connect their systems regardless of the technological platform they are using. The creation of mobile applications must include usability, simplicity, and the need to optimize tasks for small displays[4]–[6].

Database design, querying, reporting, and form creation are software talents. Sales lead and customer analysis are business skills. You must do a systems analysis for this assignment, then use database software to build a system solution. In Portland, Oregon, Ace Auto Dealers specializes in selling new Subaru cars. Additionally, to being recognized as an authorized dealer on the Subaru website and other significant auto-buying websites, the business runs advertisements in neighborhood newspapers. The business benefits from having a positive local reputation and name recognition. Ace feels that it does not know enough about its clients. It is difficult to identify which customers have made auto purchases or which customer interaction points have generated the most sales leads or real sales so that it may concentrate more of its advertising and marketing efforts on the channels that bring in the most money. Do customers learn about Ace via newspaper advertisements, word-of-mouth, or the Internet? Describe Ace's issue in full, along with a system fix that may be carried out using PC database management software. After that, create a simple system solution using database software. You may learn more about Ace and its information needs in MyMISLab to assist you in creating the solution.

In charge of projects

More than 830,000 independent distributors distribute the more than 200 anti-aging personal care and nutritional supplement items offered by Nu Skin Enterprises, an American direct selling and multilevel marketing business. 52 overseas markets have been added to the company's activities since its founding in Provo, Utah, in 1984. The amount of revenue each year has surpassed $1 billion. The business strategy of Nu Skin mixes multilevel marketing and direct selling. Each distributor offers items to prospective consumers directly and has the ability to find and educate clients to work as distributors. Distributors get compensation from the retail markup on the goods they may individually sell as well as a cut of the sales of the distributors they have attracted. Nu Skin must, without a doubt, pay great attention to its management of people if it hopes to succeed.

Nu Skin has approximately 6,000 workers across 28 nations, but up until recently, it lacked a unified HR system to manage employee data and provide HR reports to other areas of the company. Instead, it permitted local operational units to utilize their own systems or handled personnel locally using manual methods. Nu Skin had to get in touch with the area and personally collect the data in order to gather personnel information at the corporate level. All of this took a lot of time, and the business truly needed more automated and standardized HR procedures. A cross-functional project team made up of representatives from human resources and the information systems department carried out a detailed two-year examination of information requirements before deciding to install a centralized HR system at Nu Skin. It began implementing the organizational management and people administration modules while recommending SAP ERP Human Capital Management.

The project team's members were chosen for their complementary backgrounds in human resources. Several SAP business analysts, a team of senior systems engineers, a programmer

analyst, a technical business analyst, and an HR information systems analyst made up the team. The team was assisted by IT Business Integration executives Amy Camara and Jay Barney, Vice President of Human Resources David Daines, and others. The project team contacted outside consultants from Symphony Consulting to help them assess the information needs from multiple Nu Skin offices. The capacity of consultants to provide on-site training as well as their abilities and personalities to complement the team were factors in their hiring. Because of how dispersed geographically Nu Skin's users were, it was not practicable for them to get off-site training for the new system. During implementation, the consultants were tasked with providing on-site staff training.

The organization took care to prioritize "people" above technology at every stage of the project. Who should be included on the project team? Which consultants need to be hired? What business and cultural needs need to be taken care of? The project team visited different Nu Skin locations in each of the company's markets to learn more about the data that was gathered there, the tools and reports that were used to analyze it, and the future goals of each location. The project team became more aware of regional variations in information needs and company culture as a result of these face-to-face encounters. The discussions also helped end users feel more invested in the project and confident that the project team was committed to ensuring that the new system worked for their advantage.

For each worldwide location, the project team adopted a staggered implementation strategy. Nu Skin implemented the SAP ERP HCM global functionality in 2011. Benefits appeared right away. In the past, the Nu Skin HR department had to ask the local operating unit for the data, which may take weeks, if the finance department required a report on the number of full-time workers in a certain market. It was necessary to manually collect the necessary information from the various areas and transmit the report to the various departments in order to compile a report on whether workers departed the firm or transferred to another department. These days, the system automatically generates and disseminates all of these reports.

When Nu Skin's HR system was put into place, management became aware of this. The new system required a shift in HR business procedures throughout the whole organization, backed by new software. Nu Skin was able to complete this project successfully because of management's strong understanding of the importance of organizational "people" concerns, particularly in a worldwide corporation with so many regional and cultural variations. The introductory graphic highlights crucial issues brought up by this case and this. Due to the fact that all HR procedures at Nu Skin were manual, the company sorely wanted to automate them. The project team that the management correctly chose contained personnel with both business and technical competence. The team spent a lot of time and effort determining the best software solution and gathering user information needs. Success was further enhanced by staged system rollout and personnel training at each site.

Project Management's Importance

The failure rate for information systems initiatives is relatively high. Information systems initiatives either take much longer and cost far more to implement than initially planned in almost every firm, or the finished system is ineffective. whenever a message Companies may not

get any return on their information system investment if the system does not perform as expected or is too expensive to construct, and it may not be able to address the issues for which it was designed. The creation of a new system requires careful planning and management, and the manner a project is carried out is perhaps the most significant determinant of its result. It is crucial to have some understanding of how to manage information systems initiatives and the factors that determine whether they are successful or unsuccessful.

Projects that go awry and system failure

How poorly handled are projects? The time and money needed to deliver the whole system promised in the system plan are typically 50% underestimated for private sector projects. Numerous projects are finished but lack key functionality. Only 32% of all technology investments were finished on schedule, on budget, and with all the features and capabilities that were initially planned, according to the Standish Group consultancy, which tracks IT project success rates. One in six of the 1,471 IT projects analyzed had an average cost overrun of 200 percent and a schedule overrun of over 70 percent, according to big worldwide research published in the Harvard Business Review. The average cost overrun was determined to be 27%. In the range of 30 to 40 percent of all software projects, there are "runaway" projects, which go much above their initial budget and schedule forecasts and don't operate as expected.

The systems created by unsuccessful information initiatives are often not utilized as planned or are not used at all. In order for these systems to function, users often have to create parallel manual systems. The system's actual design may fall short of capturing crucial business needs or enhancing organizational effectiveness. Information may not be sent fast enough to be useful, it could be presented in a way that makes it difficult to understand and utilize, or it might reflect the incorrect kinds of data. Non-technical business customers may find the system's interface to be too difficult and discouraging. A system's user interface might be poorly designed. Users interact with the user interface, which is a component of the system. An online input form or data entry screen, for instance, can be so awkwardly set up that nobody wants to provide data or ask for information. System outputs could be presented in a way that is too challenging to understand.

If web pages are busy and poorly organized, users have trouble finding the information they need, or it takes too long for the page to load and show on the user's computer, visitors may become less inclined to explore further.Furthermore, the system's data could be very inaccurate or inconsistent. There may be inaccurate or ambiguous information in certain categories, or the information may not be effectively structured for business needs. The lack of access to information needed for a particular business function may be caused by inadequate data. Some of the issues we just discussed are shown in the Interactive Session on Management. As you read this case, attempt to ascertain the reasons why this project failed and how project management contributed to the result.

Goals for Project Management

A project is a deliberate set of associated tasks intended to accomplish a certain business goal. The creation of new information systems, the improvement of current systems, or the update or replacement of the company's information technology infrastructure are all examples of

information systems initiatives[7]–[10].Project management is the process of using information, skills, tools, and procedures to complete tasks within predetermined budgets and timelines. Planning the work, evaluating risk, estimating the resources needed to complete the work, organizing the work, acquiring human and material resources, assigning tasks, directing activities, controlling project execution, reporting progress, and analyzing the results are some of the project management activities. The five main factors that project management for information systems must address are scope, time, money, quality, and risk.

More than 1 million people are served by Austin Energy, which manages power, water, and waste disposal for the City of Austin, Texas, and neighboring counties. It is a publicly traded firm that serves as a division of the municipal government and annually distributes its earnings back to the neighborhood. Since 1976, the business has donated $1.5 billion in dividends to Austin, helping to pay for amenities like fire, police, emergency medical services, parks, and libraries. Despite having one of the biggest renewable energy projects in the nation, Austin Energy's outdated billing systems were not compatible with smart meters and other contemporary gadgets. Additionally, it lacked more recent customer service features like the possibility for customers to choose the day of the month they like to pay their bills. Austin Energy hired IBM in 2009 to build a centralized billing system and manage it for five years in order to upgrade the billing system and update its information systems with current energy saving techniques. Austin and IBM reached an agreement for IBM to receive $55 million from Austin, of which $38 million would be used to construct and implement a new billing system and $17 million to run it for five years after its installation. The new billing system was intended to manage garbage, recycling, water, and energy. Austin was certain that a successful installation would ultimately provide savings that would cover its costs.

The initiative has been at best a letdown so far. Early in 2011, the system was intended to go online, however it is still not completely functional. Thousands of invoices had mistaken as a result of software issues. Another 35,000 consumers got erroneous invoices, while more than 65,000 never received a bill at all. One company owed Austin Energy $3,000 but was instead charged $300,000. Austin Energy was able to locate the impacted accounts and work with customers one-on-one to resolve the issues, but the business was unable to manage the influx of consumer complaints about the new system, and its customer service staff was in risk of being overwhelmed. Instability problems, says Larry Weiss, manager of Austin Energy. ..Persistent system issues prohibited the firm from invoicing apartment dwellers for water, balancing its accounts, and issuing audit reports, all of which had major and expensive effects on our business and our clients. Austin City was losing money because it couldn't properly charge for utilities.

Austin Energy representatives blame IBM directly for the project's problems. In an interview, Austin Energy CIO Alan Claypool said, "We have yet to reach a s system we are extremely disap- pointed and continue to have serious concerns about the quality of service we have received from IBM to date." He also said in a message from September 2011 that IBM was making the same mistakes over and over as it tried to implement the system. The project was delayed by 37 hours as a result of two different IBM faults, one of which was the same kind of mistake that the same team had made in December 2010. "We remain deeply disappointed in the delays and what appears to be ad hoc approaches to project management," said Claypool.

With an emphasis on system availability, the business now intends to put clauses in contracts with IBM in the future that protect against such occurrences. Austin is also withholding $3.8 million in payments that are now due to IBM until the system reaches baseline performance requirements. Claypool and other Austin Energy executives have approached IBM representatives directly on multiple occasions, starting with the project managers for the billing system and working their way up to the then-CEO Sam Palmisano. Claypool initially sent a letter to Marc Lautenbach, who oversaw IBM's North American Global Business Services division and was in charge of the billing system project. He said that in order to access their accounts or resolve invoicing issues, thousands of users needed personal help. Frank Kern later took over Lautenbach's position as head of global business, and in a letter to Austin, he laid out a five-step strategy to address the billing system's issues.

To ensure that system issues are assigned to the appropriate individuals, implement best-practice processes to ensure project success, work more closely with third-party vendors like Oracle, and identify gaps outside the project's scope and recommend solutions were all parts of Kern's plan. Since then, Kern has retired, and Claypool again wrote to IBM to inform them that nothing had changed from when the five-step plan was first created for Austin Energy's billing system. Officials from Austin Energy disagreed with IBM's recommendation to install more potent servers to assist solve the issue since doing so would require the utility to spend more than initially budgeted for the project. Despite all of the errors, Austin Energy is still optimistic that the issue may be resolved successfully and amicably. A number of years ago, Austin Energy and IBM entered into a contract to work together to create an inventory management system for the city. Although there were issues with that system as well, they were nothing compared to the mess with the billing system. Additionally, Austin Energy argues that IBM's mistakes have cost the firm $8 million since the project's inception. Given that Austin Energy has already spent so much in IBM's project development, switching providers may only make problems worse. When contacted for response, IBM merely offered the statement that it is collaborating with Austin Energy to fix the billing system's problems.

Similar initiatives like this one have been successfully handled by IBM in the past. Oracle databases, IBM WebSphere middleware, and Tivoli administration tools make up the IBM billing system. There hasn't been a single underlying cause of the system's issues. It has been difficult to get the 73 distinct interfaces on the new billing system, which is complicated, to communicate with one another in an efficient manner. Customers have been unable to use the system's web interface, and staff members at Austin Energy have said that they have experienced it as "alpha testers," meaning that they have run across errors and problems that shouldn't have made it into a live version. One in four Austin clients have had issues with IBM's technology. Some clients' accounts were terminated, and they were only able to restore them after many phone calls. Austin Energy's problems with the billing system came just as company was getting ready to implement its first rate rise in 17 years, which was unfortunate. The corporation has forced to reconsider its goals in the aftermath of the PR catastrophe caused by the flawed billing system.

The majoritybut not allof the billing system flaws have been resolved as of February 2012. Claypool remained optimistic that Austin Energy will be able to work together with IBM and

complete the project. Claypool said that IBM had responded, but he thought it had been too "incremental.We would want a quicker answer. Austin Energy's future outsourcing agreements will include stricter sanctions for vendor failures, including the issue of system availability. The scope of a project determines what work is and is not included. For instance, the scope of a project for a new order processing system could not involve any modifications to associated accounts receivable, manufacturing, distribution, or inventory management systems, but rather new modules for entering orders and sending them to production and accounting. Project management should guarantee that the scope of a project does not stray from what was initially planned and should outline all the work necessary to execute a project properly.

Time is the length of time necessary to finish the job. The time needed to finish the main parts of a project is often determined by project management. Each of these elements is further divided into tasks and activities. The goal of project management is to estimate how long it will take to finish each activity and create a timeline for doing so. Cost is calculated by multiplying the time needed to finish a project by the price of the human resources needed to execute the project. The price of workspace, software, and hardware are all included in the cost of information systems projects. A project budget is created, and continuing project costs are tracked by project management. Quality is a measure of how well a project's final product meets the goals set forth by management. The effectiveness of information systems initiatives is often measured by how well they facilitate decision-making and organizational performance. The new system's output's correctness, timeliness, and usability are also taken into account when determining quality. Risk describes possible issues that might jeopardize a project's success. By raising time and expense, diminishing the quality of project outputs, or preventing the project from being finished entirely, these possible issues may prohibit a project from reaching its goals.

Chopper Projects

Usually, businesses are given a wide range of projects to complete in order to solve issues and boost performance. System initiatives have significantly more ideas than resources to complete them. From this group, businesses must choose the initiatives that provide the most potential for success. Obviously, choosing a project should be based on the company's overall business plan. How should managers decide amongst the available options?

Information Systems Project Management Structure

The corporate strategy planning group and the information system steering committee are at the top of this organization. The corporate strategy planning team is in charge of creating the company's strategic plan, which could need the creation of new systems. This group often has devised objective metrics of business success and favors IT initiatives that can significantly raise one or more key performance indicators. The company's board of directors examines and discusses these performance metrics. The top management team in charge of system development and maintenance is the information systems steering committee. It is made up of department leaders from the information systems and end-user divisions. The steering committee evaluates and approves system plans for all divisions, works to coordinate and integrate systems, and on occasion becomes involved in choosing particular information systems initiatives. The

key performance indicators chosen by the board of directors and upper-level management are likewise well known to this group.

CONCLUSION

In the digital ecosystem, mobile application development is essential for allowing organizations and people to provide cutting-edge, user-centric experiences on mobile devices. Developers may design mobile applications that satisfy user demands and provide value in a variety of fields, including communication, entertainment, productivity, and e-commerce, by carefully considering user experience, device capabilities, security, and cross-platform compatibility. Mobile app development will remain a vital and dynamic industry as mobile technology develops, fostering innovation and changing how people engage with digital services and information.The project team is managed by a project management team made up of end-user managers and information systems managers who are in charge of managing a number of distinct information systems projects. The individual systems project is wholly under the direct control of the project team. It includes of application programmers, systems analysts, experts from the appropriate end-user business domains, and maybe database professionals. The precise characteristics of the system solution determine the project team's size and skill mix.

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IMPLEMENTATION OF INFORMATION SYSTEMS WITHIN ORGANIZATIONS

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ABSTRACT:

The successful implementation of information systems within organizations relies on the strategic alignment between systems projects and the business plan. This studyexplores the significance of linking systems projects to the business plan, highlighting the benefits, challenges, and strategies for achieving this alignment.The business plan serves as a roadmap outlining an organization's goals, strategies, and tactics for achieving success. It provides a clear vision of the organization's direction and priorities. On the other hand, systems projects involve the development, implementation, and management of information systems to support organizational processes and objectives.

KEYWORDS: Alignment, Business Objectives, Change Management, Cost-Benefit Analysis, Feasibility Study, Project Prioritization.

INTRODUCTION

Organizations must create an information systems strategy that supports their entire business plan and incorporates strategic systems into top-level planning in order to identify the information systems initiatives that will provide the most commercial value. The plan acts as a road map, outlining the reasoning, the existing systems and situation, any new developments to be taken into consideration, the management strategy, the execution plan, and the budget. The strategy outlines the organizational objectives and how information technology will help those objectives be achieved. The study demonstrates how particular systems initiatives will be used to accomplish broad objectives. It specifies precise goal dates and milestones that may be used afterwards to gauge the success of the plan in terms of the number of objectives that were actually accomplished within the time range given in the plan. The plan outlines the important management choices related to the purchase of hardware, communications, the centralization or decentralization of power, data, and hardware, as well as the necessary organizational transformation. Recruiting attempts, changes to business processes, and adjustments to authority, structure, or management practices are all examples of organizational changes that are often discussed[1]–[3].

Businesses will need to inventory and record all of its IT infrastructure components and information system applications in order to prepare efficiently. Managers should aim to identify the decision improvements that would offer the most value to the company for initiatives whose

benefits require enhanced decision-making. The value of more accurate and timely information on the decision's result should then be measured using a set of metrics that they should create.

Information Needs and Key Performance Measurements

The company must have a thorough grasp of both its short- and long-term information requirements before it can create a successful information systems strategy. a strategic approach to key success, strategic analysis, or information needs factors asserts that a select few key performance indicators of managers define the information needs of a business. The industry, the company, the management, and the overall environment all influence KPIs. For an automotive company, KPIs can include labor expenses, unit production costs, factory productivity, the rate of rework and errors, customer brand recognition surveys, J.D. Power quality rankings, employee job satisfaction surveys, and health costs. The primary purpose of new information systems should be to provide data that aids the company in achieving these objectives suggested by key performance indicators.

Portfolio Analysis

Portfolio analysis may be used to assess different system projects once strategic assessments have established the general direction of systems development. The organization's information systems projects, assets, infrastructure, outsourcing agreements, and licenses are all inventoried as part of the portfolio analysis. This information systems investment portfolio may be thought of as having a certain risk and reward profile for the company, much like a financial portfolio. Each information systems project has its own unique mix of advantages and disadvantages. By balancing the risk and return from their system investments, businesses would strive to increase the return on their portfolios of IT assets. Information-intensive enterprises should have a few high-risk, high-benefit initiatives to keep up with technology, even if there is no perfect profile for all businesses. Businesses in non-information-intensive sectors should concentrate on high-profit, low-risk initiatives.

Naturally, solutions with a high benefit and minimal danger are the most ideal. These guarantee minimal risks and quick rewards. Second, it is important to investigate high-benefit, high-risk systems, avoid low-benefit, high-risk systems at all costs, and review low-benefit, low-risk systems in case they may be rebuilt and replaced with higher-benefit systems. Using portfolio analysis, managers may balance riskier, higher-return initiatives with safer, lower-reward ones to create the ideal combination of investment risk and reward for their companies. Businesses that integrate portfolio analysis with business strategy have been shown to have greater IT asset returns, better IT investment alignment with corporate goals, and better organization-wide coordination of IT spending.

Survey Models

A scoring model is helpful for choosing projects when various factors need to be taken into account. It weighs the individual components of a system before calculating the weighted sums. Two different business resource planning systems must be chosen by the company. The decision-makers' evaluation standards are listed in the first column. The decision-making panel often has long conversations to determine these criteria. The agreement on the evaluation criteria is often

more significant than the score when using a scoring model. This specific organization places the most emphasis on having the ability to execute sales orders and manage inventory and storage. The weights that decision-makers assigned to the decision criteria's second column. The percentage of needs for each function that each alternative ERP system can supply is shown in columns 3 and 5. The proportion of criteria satisfied for each function multiplied by the weight associated with that function yields each vendor's score. The ERP System B gets the best overall rating. Using the scoring model involves making several qualitative judgements, as is the case with all "objective" methods. Experts that comprehend the problems and the technology are needed for this concept. To determine how sensitive the result is to justifiable changes in criteria, it is customary to cycle through the scoring model numerous times while altering the criteria and weights. Instead of serving as the ultimate arbiters of system selection, scoring models are most often employed to validate, justify, and support judgments.A system project must be a wise investment for the company even if it advances the strategic objectives of the company and satisfies user information demands. The question of return on invested capital fundamentally drives the value of systems from a financial standpoint. Does a certain information system investment generate enough profits to cover its costs?

Performance and Costs of Information Systems

At some of the most typical system expenses and advantages. It is possible to quantify and evaluate tangible advantages. Although they can't be measured right away, intangible advantages like improved decision-making or more effective customer service may eventually translate into quantitative results. The concept of total cost of ownership is intended to identify and measure the components of information technology expenditures beyond the initial cost of purchasing and installing hardware and software. Transaction and clerical systems that replace labor and save space always produce more measurable, tangible benefits than management information systems, decision-support systems, and computer-supported collaborative work systems. However, since benefits, cost categories including complexity costs, and "soft" and strategic aspects are often not included, TCO analysis only gives a portion of the information required to assess an information technology investment.

DISCUSSION

Budgeting for Information Systems Capital Projects

You must assess all of a project's expenses and all of its advantages in order to estimate its benefits. A project that has more expenses than benefits should obviously be abandoned. However, even if the advantages exceed the disadvantages, more financial analysis is necessary to see if the project offers a satisfactory return on the firm's capital investment. One method for determining the worth of funding long-term capital investment projects is capital budgeting models. Measures of cash flows into and out of the company are the foundation of capital budgeting techniques; capital projects are the sources of such cash flows. Hardware, software, and human costs result in an immediate cash outflow, which is the investment cost for information systems initiatives. The investment may result in more financial losses in future years, but they will be offset by cash inflows from the investment. Cash inflows may be achieved by increasing sales of existing items or cutting expenditures associated with operations and

manufacturing. The difference between cash inflows and withdrawals is used to determine an investment's financial value. Once the cash flows have been calculated, a variety of additional techniques are available for evaluating various projects and choosing which investment to make. The payback technique, the accounting rate of return on investment, net present value, and the internal rate of return are the four main capital budgeting approaches for assessing IT projects. The Learning Tracks for this provide further information on how these capital budgeting methods are used to support information system investments.

Models for Real Options Pricing

Some information systems initiatives, particularly investments in IT infrastructure, are quite unpredictable. They have large upfront expenses and uncertain future income sources. Assume, for example, that a business is thinking about investing $20 million to modernize its IT infrastructure, which includes its hardware, software, data management tools, and networking technologies. If the company had access to this updated infrastructure, it would have the technological capabilities to react to opportunities and issues more quickly. Not all of the advantages of making this investment can be predicted in advance, even if its expenses can be determined. It could be too late to invest in the infrastructure if the company waits a few years until the income potential is more apparent. Managers may find it advantageous to assess information technology expenditures using real options pricing models in certain circumstances.

The idea of options valuation, which is a notion adapted from the financial sector, is used in real options pricing models. Essentially, an option is the freedom to take action at a later time without being required to. A common financial option is a call option, which gives the buyer the right to acquire the underlying asset at a preset price on or before a certain date. Let's say, for example, that on April 25, 2012, you could pay $17.09 for a call option that would allow you to acquire a share of Procter & Gamble common stock for $50 per share at a later date. Options have a set expiry date, and the deadline for this call option is January 17, 2014. You would not exercise the option, and its value would decrease to zero on the strike date if the price of P&G common stock did not increase over $50 per share by the end of business on January 17, 2014. However, if the price of P&G stock increased to, say, $100 per share, you could buy the shares at the $50 strike price and keep the $50 profit per share after paying the option premium. The stock option gives the owner the chance to profit from an opportunity's upside potential while reducing the negative risk.

In a manner similar to stock options, ROPMs value information systems projects whereby an initial investment in technology creates the rightbut not the obligationto benefit from further development and deployment of the technology, so long as management retains the flexibility to cancel, defer, restart, or expand the project. through using tiny pilot projects or prototypes, managers may test the waters before making a larger investment in an IT project and learn more about the risks involved. This is made possible through ROPMs. This model's main drawback is that it is difficult to estimate all the important factors that influence option value, such as expected cash flows from the underlying asset and changes in the cost of implementation. Information technology platform option value models are now being created.

Problems with Financial Models

The conventional emphasis on an information system's financial and technical components tends to ignore the social and organizational aspects of information systems, which might alter the investment's real costs and benefits. The cost of end user training, the effect that users' learning curves for new systems have on productivity, or the time managers must spend overseeing new system-related changes are all costs that many companies' information systems investment decisions fail to adequately account for. Benefits like improved staff learning and expertise or more rapid choices from a new technology may also go unnoticed in a standard financial study[4]–[6].

Project Risk Management

In this, we outline the particular risks that information systems projects face and demonstrate how to successfully manage them. Systems vary greatly in terms of their size, scope, degree of complexity, organizational structure, and technological elements. Some systems development projects have a much greater amount of risk than others, making it more probable that they may cause the issues we have previously mentioned or experience delays. Project size, project structure, and the amount of technical competence possessed by the project team and information systems employees all have an impact on project risk.

Project scope. The risk increases with the magnitude of the project, as measured by the amount of money invested, the size of the implementation team, the amount of time allotted for implementation, and the number of organizational units impacted. Due to its complexity and controllability, very large-scale systems projects have a failure rate that is 50–75% greater than that of other projects. Both technical characteristics, such as the quantity of program code, duration of the project, and budget, as well as organizational characteristics, such as how many units and groups use the system and how much it affects business processes, all add to the complexity of large-scale systems projects. Additionally, there aren't many trustworthy methods for determining how long and how much it will cost to construct large information systems. Different projects need different levels of organization. Their specifications are unambiguous and basic, making it simple to describe outputs and processes. Users nearly seldom change their opinions since they are very certain of what they want and what the system should accomplish. Such projects have a far lower risk than those with very fluid, frequently changing needs, outputs that are difficult to change because of users' shifting opinions, or users who can't agree on what they want. If the project team and the information system employees lack the necessary technical skills, the project risk increases. The project is likely to run into technical issues or take longer to finish due to the requirement to learn new skills if the team is not acquainted with the hardware, system software, application software, or database management system planned for the project. Although the complexity of the technology is one risk factor for information systems projects, the other risks are primarily organizational in nature and deal with the complexity of the information requirements, the project's scope, and the extent to which the new information system will affect the organization.

Change Management and the Implementation Concept

An information system's introduction or modification may significantly affect organizational and behavioral dynamics. New authority and power structures often result from changes to how

information is defined, accessible, and utilized to manage the organization's resources. An otherwise effective system may fail as a result of this internal organizational change, which creates disagreement and resistance. A significant portion of information systems initiatives fail because the organizational transformation process that accompanied system development was not adequately handled. Careful change management is necessary for successful system development.

The Implementation Concept

You must look at the implementation process in order to handle organizational change associated with the introduction of a new information system efficiently. The term "implementation" describes all organizational operations geared toward a new formation system's acceptance, administration, and routinization. The systems analyst serves as a change agent throughout the implementation phase. The analyst redefines the configurations, interactions, job functions, and power relationships of diverse organizational groupings in addition to creating technological solutions. The analyst is in charge of ensuring that all parties embrace the changes brought about by a new system and is the driving force behind the whole change process. The change agent interacts with consumers, resolves conflicts between divergent interest groups, and makes sure the organizational adaptation to such changes is successful.

The Function of Consumers

High user involvement and management support are often beneficial for system deployment. There are several advantages to including users in the creation and management of information systems. First, users have greater influence over the result and have more possibilities to shape the system to meet their objectives and business needs if they are actively engaged in the design of the system. Second, since they actively participated in the modification process, they are more likely to respond favorably to the finished system. Better solutions are produced by incorporating user knowledge and skills. It has historically been difficult to establish information systems due to the interaction between users and information systems experts. Users and experts in information systems often come from diverse backgrounds and have distinct goals. The communication gap between users and designers is what this is called. These distinctions result in varying organizational allegiances, problem-solving techniques, and languages.

For instance, experts in information systems often approach problems from a very technical, or machine, perspective. They seek for sophisticated and beautiful technological solutions that maximize hardware and software efficiency at the price of user friendliness or organizational effectiveness. Users like solutions that are focused on resolving organizational issues or commercial difficulties. The views of the two groups often diverge to the point that they seem to talk in separate languages. The common worries of technical experts and end users surrounding the creation of a new information system. One of the main causes of user requirements not being successfully integrated into information systems and users leaving the implementation process is poor communication between end users and designers. When there is a significant divide between users and technical experts and when these groups continue to have divergent objectives, systems development initiatives are at a very high risk of failing. Users are often discouraged from the project under these circumstances and leave. Users come to the conclusion

that it is preferable to leave the whole project in the hands of the information experts alone since they are unable to understand what the technicians are saying.

Support and dedication from management

It is more probable that users and the technical information services employees would see an information systems project favorably if it has the support and commitment of management at all levels. Both groups will think that their involvement in the development process will be given more significance and attention. For the time and effort, they put into execution, they will get praise and compensation. Additionally, management support guarantees that a systems project will obtain enough cash and resources to be effective. Additionally, managerial support is necessary for all organizational realignments, changes in work habits and processes, and implementation of new systems. A manager's subordinates are more inclined to regard a new system as a priority if they see it as important. Challenges of Change Management in Enterprise Applications, Mergers and Acquisitions, and Business Process Reengineering

It is not surprising to find a very high failure rate among enterprise application and business process reengineering projects given the difficulties of innovation and implementation. These initiatives frequently call for significant organizational change and may necessitate the replacement of outdated technologies and legacy systems that are deeply ingrained in numerous interconnected business processes. According to several research, 70 percent of all business process reengineering efforts fall short of their objectives. Similar to this, even after three years of effort, a significant portion of corporate programs are not completely built or do not match the needs of their customers.

Poor implementation and change management techniques that failed to address workers' worries about change have ruined several enterprise application and reengineering initiatives. Reengineering has faced greater threats than the challenges businesses faced in visualizing and designing ground-breaking changes to business processes, including dealing with fear and anxiety throughout the organization, getting past key managers' resistance, and changing job functions, career paths, and recruitment procedures. All enterprise applications need intense business process transformation and closer cooperation across various functional divisions. The failure rate for projects involving mergers and acquisitions is comparable. The organizational traits of merging organizations and their IT systems have a significant impact on mergers and acquisitions. Combining the information systems of two distinct businesses often necessitates significant organizational transformation and difficult system management tasks. If the integration process is poorly managed, businesses may end up with a jumbled collection of inherited legacy systems that were assembled by combining the systems of one company after another. Without a successful systems integration, the expected merger advantages cannot be achieved, or worse, the combined organization would be unable to efficiently carry out its business activities.

Management of Risk Factors

For certain types of implementation issues, several project managements, requirements collecting, and planning methodologies have been established. Additionally, plans have been made for managing the organizational change process and making sure users take on the proper

responsibilities throughout the implementation phase. Not every component of implementation can be readily planned or controlled. However, preparing for probable implementation issues and using the right corrective measures may boost the likelihood that the system will work. Identifying the kind and degree of risk that the project is facing is the first step in managing project risk. Then, implementers may manage each project using the resources and risk-management techniques appropriate to its degree of risk[7]–[10].

Technical Complexity Management

Internal integration solutions are useful for projects that need people to understand difficult or sophisticated technologies. The ability to effectively manage such projects' technological complexity will determine how successful they are. Project managers need to have extensive administrative and technical skills. They must be able to foresee issues and foster effective working relationships within a team that is mostly technical. Team members should have extensive experience, and the team leader should have a solid technical and project management background. There should be regular team meetings. Outside sources should be used to acquire any necessary technical experience or abilities that are not already present inside the company.

Tools for Formal Planning and Control

The effective use of formal planning tools and formal control tools for recording and observing project plans is advantageous for large projects. Gantt charts and PERT charts are the two most used ways to record project plans. The start and end dates of each project activity are listed on a Gantt chart. The Gantt chart graphically depicts the schedule, length, and human resource needs of various activities in a development project. Each job is shown as a horizontal bar with a length that corresponds to the time needed to finish it. Although Gantt charts illustrate the start and finish dates of project activities, they do not highlight task dependencies, how one work is impacted if another is behind schedule, or the proper sequence for tasks. PERT charts are helpful in this situation. PERT, a U.S.-developed approach, stands for Program Evaluation and Review Technique. To oversee the Polaris submarine missile development in the 1950s, the Navy. The visual representation of project tasks and their connections is a PERT chart. The PERT chart displays the particular tasks that make up a project as well as the tasks that must be finished before a particular task may begin.

Increasing User Participation and Dispelling User Resistance

Users must be actively involved at every level of projects with a lack of significant structure and a large number of unclear needs. Users must be inspired to support one of the many potential design choices and to stick with a single design. Tools for external integration provide a means of connecting the implementation team's efforts to users at all organizational levels. Users might take on leadership positions, become active members of the project team, and be in charge of installation and training, for example. The implementation team may show its responsiveness to users by swiftly responding to inquiries, taking user comments into account, and displaying a readiness to assist. This Gantt chart displays the task, person-days, initials of each accountable individual, start and end dates for each task, and other pertinent information. A skilled manager may effectively manage a project with the help of the resource summary, which gives them the

total person-days for each month and for each employee working on it. This project is an example of data administration.

User resistance to organizational change may not be resolved by participation in implementation efforts alone. The system may have varied effects on various users. Some users could embrace a new system because it brings about changes, they see as advantageous to them, while others might object because they think the changes are harmful to their interests. Users may decide not to utilize a system if it is optional, but if it is required, resistance will manifest in higher mistake rates, disruptions, turnover, and even sabotage. As a result, the implementation strategy must not only promote user engagement and participation, but also deal with the problem of counter implementation. A intentional plan to obstruct the adoption of a new information system or innovation inside an organization is known as counter implementation. User engagement, user education and training, management directives and policies, as well as greater rewards for cooperative users, are strategies to deal with user resistance. The end-user interface may be enhanced to make the new system more user-friendly. If organizational issues are resolved before deploying the new system, users will be more cooperative. Some of these problems are seen in action during the Interactive Session on Organizations. The enterprise applications of Westinghouse Electric Company were re-implemented as part of a broad systems modernization exercise. Try to identify how Westinghouse handled the risks and difficulties of this project as you read this case.

CONCLUSION

In conclusion, Information systems must be successfully implemented, and this requires tying systems initiatives to the business strategy. Organizations may optimize economic value, improve competitiveness, and align projects with their strategic goals by achieving this alignment. To address the difficulties involved in coordinating technological endeavors with the changing nature of the business environment, however, continual communication, cooperation, and project management techniques are needed. When accomplished successfully, this alignment may promote development, innovation, and corporate success. Organizations should implement strategies like regular communication and collaboration between IT and business units, continuous monitoring and reevaluation of project priorities, and the establishment of clear metrics and indicators to measure project success and alignment with strategic objectives to achieve the alignment between systems projects and the business plan.

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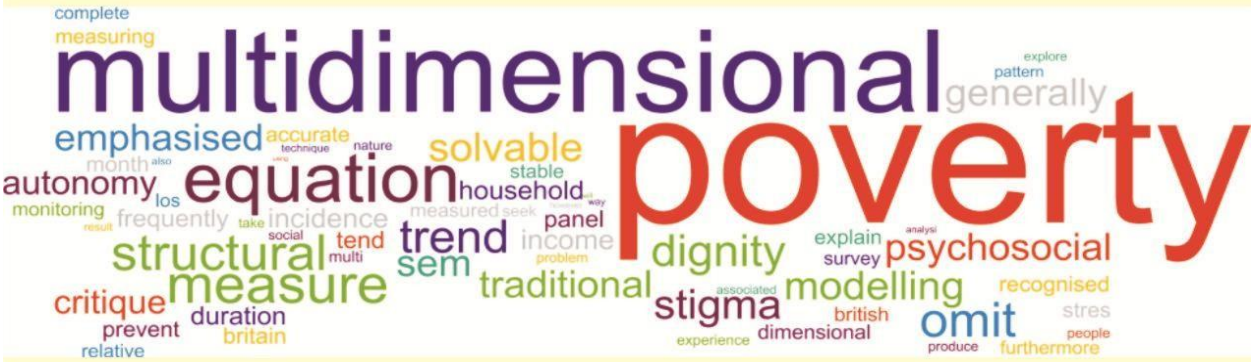

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