“Information System”

An introduction: -

Information systems are among the most important things taught to students in the business sector, and they can be defined according to their components or according to their role. According to its components, it is defined as a system of hardware, software, and networks that people build and use to collect, configure, and distribute data. As for its role, it is defined as related components that work together to gather information, processing, and storage; To assist in decision-making, coordination, control, and analysis within the organization.

Information systems consist of five different components that work together; Hardware, software, data, people, and process components; To add a certain value to the organization, and here is a breakdown of each of them: -

Hardware: It is the physical physical part of the components of information systems, such as computers, keyboards, disk drives, and devices, iPads.

Software: It is a set of instructions written by programmers to control hardware, and it is divided into two categories:

Operating systems: such as the Windows operating system for a computer, and the Android operating system, for mobile phones.

Applications: such as Excel, and various games.

Data: It is what is collected and organized in the database, and used as an effective tool for making and making decisions in the organization.

People: They are the human forces associated with information systems, and people are considered essential elements in the system, starting from Help-Desk Workers, to Systems Analysts, to Programmers, to the Chief Information Officer.

Process: A sequential set of steps that are applied to the data; To achieve the required final output, highly competitive institutions that aspire to outperform their competitors are interested in this part.

Despite the great importance of information systems, they have faced many problems even in developed countries that use advanced equipment, such as: The United Kingdom and the United States of America, and many studies have been conducted to find out the causes leading to these problems, including: -

-the failure to involve management in the process of designing a system Administrative information.

-use of low-level data processing applications; Especially in the field of accounting.

-The inability of management information professionals to assess information requirements, or to solve existing organizational problems.

TPS: -

What is a transaction processing system?

-A TBS is a software that ensures the completion of a business transaction and also keeps track of transactions. An online transaction processing system (OTPS) is an equivalent system that online merchants use for e-commerce.

-The TPS ensures that each transaction is successful by storing, sending and receiving information via a database. It supplements the business point of sale system (POS), which is the unit that reads credit cards, prints receipts and accepts and stores cash.

-For example, if a customer purchases a book from a shop, they might pay with a credit card. A TPS takes the customer's card information, communicates with their bank and approves or declines the purchase based on their account balance.

-Through batch processing, a TPS interprets sets, or batches, of data by grouping items based on similarities. Batch processing can create a time delay because it reviews several sets of data simultaneously, requiring more computing power.

Inputs: -

An input is an original request for a product or payment that an outside party sends to a company's TPS. If your company uses batch processing, its TPS stores groups of inputs and then processes them at a later time. In comparison, if your company uses a real-time system, it processes each input as it arrives.

Inputs typically include: Invoices, Bills, Coupons, Custom, orders.

Processing system: -

The processing system reads each input and creates a useful output, such as a receipt. This element can help you define the input data and what the output should be. Based on the kind of TPS your company is using, processing times can vary.

Storage: -

-The storage component of TPS refers to where a company keeps its input and output data. Some companies store these documents in a database. The storage component ensures the organization, security and accessibility of every document for later use.

-For example, if a vendor would like to confirm that your company has paid an invoice, you can check your system's storage to find the invoice and determine if you delivered a payment.

Outputs: -

-TPS outputs are documents the system generates once it completes processing all inputs, such as receipts the company stores in its records. These documents can help validate a sale or transaction

-For example, if a vendor sends your company an invoice, you can pay the invoice and send the vendor confirmation of your payment. Then, you can amend the original invoice and mark it as "paid" in the company's TPS.

level in the company: -

Transaction processing systems (TPS) are the basic business systems that serve the operational level of the organization. A transaction processing system is a computerized system that performs and records the daily routine transactions necessary to conduct business.

MIS: -

-It is a computer-based system that makes information available to users who have similar needs. Users usually have a formal organizational entity, the establishment or any sub-unit of it, describing information about what happened in the past, what is happening now, and what could happen in the future.

- Management information systems also evoke information about the organization's past, and collect information about its present, especially with regard to the organization's activities to support and support management in making the most appropriate decision among a group of available options. The value of financial expenses incurred by employees, in addition to freeing them from routine work and boredom, and motivating them morally. This type of computer science branch can benefit organizations’ departments, both internally and externally, by providing them with the necessary information and distributing it at all levels.

Inputs: -

- The MIS system analyzes the input with routine algorithms i.e. Aggregate, compare and summarize the results produced in reports that tactical managers use to monitor, control and predict future performance.

- It is a set of objective facts that are not interconnected in their essence, and can be polarized and collected by research, recording and observation, or it can be described as the raw material for information before any processing is performed on it.

- Individuals, and is considered the basic element in management information systems, and complements the role of other elements, as it is considered the user and operator of these other elements.

Processing system: -

-Information systems simplify complex processes—the centralization of operations achieves this.

- Process control creates continuous reports and allows managers to observe real-time productivity and progress. For example, in manufacturing, product managers use it to analyze products’ quality and consistency.

Outputs: -

- provide real time information on ongoing events without any delay.

- provide organized and relevant information for all levels of management: strategic, operational, and tactical.

- aim at extreme flexibility in data storage and retrieval.

-be able to collect, organize, manipulate, and update large amount of raw data of both related and unrelated nature, coming from various internal and external sources at different periods of time.

DSS: -

- Computer-based information systems seek to facilitate interaction between the human element and information technology, and decision support systems aim through the interaction of the human element with information technology to provide the necessary support to rationalize the decision-making process, as DSS is to support administrative decision-makers in the case of semi-structured decisions, as well The system provides managers with informational tools (tables, graphics, models, and simulations) that help solve semi-structured and unstructured problems. DSS is a computer-based information system that collects data and models in an effort to solve semi-structured problems with user involvement, and includes a knowledge base system that supports decision-making activities. Decision support systems are not tasked with making decisions for managers, as they are not a substitute for them, but provide them with a set of facilities that generate information that they feel they need when they make a decision.

-A decision support system (DSS) is a computerized system that gathers and analyzes data, synthesizing it to produce comprehensive information reports.

-A decision support system differs from an ordinary operations application; whose function is just to collect data.

-Decision support systems allow for more informed decision-making, timely problem-solving, and improved efficiency in dealing with issues or operations, planning, and even management.

Inputs: -

- Inputs are the factors, numbers, and characters that are to analyze.  User and knowledge expertise are inputs requiring manual analysis by the user.  Outputs are transformed data in which DSS “decisions” are generated.  And the decisions are the results generated by the DSS based on user criteria.

- Inputs are the factors, numbers, and characters that are to analyze. User and knowledge expertise are inputs requiring manual analysis by the user. Outputs are transformed data in which DSS “decisions” are generated. And the decisions are the results generated by the DSS based on user criteria.

Outputs: -

-A DSS may be used to project a company's revenue over the upcoming six months based on new assumptions about product sales. Due to a large number of factors that surround projected revenue figures, this is not a straightforward calculation that can be done manually. However, a DSS can integrate all the multiple variables and generate an outcome and alternate outcomes, all based on the company's past product sales data and current variables.

- The primary purpose of using a DSS is to present information to the customer in an easy-to-understand way. A DSS system is beneficial because it can be programmed to generate many types of reports, all based on user specifications. For example, the DSS can generate information and output its information graphically, as in a bar chart that represents projected revenue or as a written report.

level in the company: -

The DSS can be employed by operations management and other planning departments in an organization to compile information and data and synthesize it into actionable intelligence. In fact, these systems are primarily used by mid- to upper-level management

ESS: -

An Executive Support System (ESS) is software that allows users to transform enterprise data into quickly accessible and executive-level reports, such as those used by billing, accounting and staffing departments. An ESS enhances decision making for executives. ESS is also known as Executive Information System (EIS).

Some of the advantages of ESS are:

1.Improved personal efficiency 2. Increased organizational control

3.Competitive advantage over competitors 4. Automation of the managerial processes

Inputs: -

-Input data entry devices allow executives to enter, verify, and update data immediately. The CPU (central processing unit) is the center point because it controls the other computer system components. Data Storage Files are for saving useful business information, and it allows for easy historical information lookup. Output Devices are visual or permanent records for the executive to save or read. Executive Information System products for networked work stations are becoming more easily available, because companies offer local area networks. Running EIS with these systems require less support and also save tons of money.

Outputs: -

An ESS facilitates access to organized enterprise and departmental data while providing analysis utilities and performance assessment predictors. An ESS provides potential outcomes and quick statistical data that are applied to decision making processes.

-Ultimately, ESS reporting tools and results are contingent on developer and industry application. For example, Cambridge Systematics, Inc. built an ESS that is integrated with the investment plan for the Ministry of Transportation in Canada. This ESS version includes features that contrast the version used by Medical Information Technology, Inc. (MEDITECH).

level in the company: -

Executive support systems (ESS) are computer-based systems that provide top managers with the capability to attain easy access to internal and external information which is relevant to strategic decision making and other executive responsibilities. The terms “executive support system” and “executive information systems” (EIS) are often used interchangeably, although executive support system typically refers to a system with a broader set of capabilities.

CRM: -

-Customer relationship management (CRM) is a technology for managing all your company’s relationships and interactions with customers and potential customers. The goal is simple: Improve business relationships to grow your business. A CRM system helps companies stay connected to customers, streamline processes, and improve profitability.

-When people talk about CRM, they are usually referring to a CRM system, a tool that helps with contact management, sales management, agent productivity, and more. CRM tools can now be used to manage customer relationships across the entire customer lifecycle, spanning marketing, sales, digital commerce, and customer service interactions.

A CRM solution helps you focus on your organization’s relationships with individual people — including customers, service users, colleagues, or suppliers — throughout your lifecycle with them, including finding new customers, winning their business, and providing support and additional services throughout the relationship.

Inputs: -

- A CRM tool lets you store customer and prospect contact information, identify sales opportunities, record service issues, and manage marketing campaigns, all in one central location — and make information about every customer interaction available to anyone at your company who might need it.

-With visibility and easy access to data, it's easier to collaborate and increase productivity. Everyone in your company can see how customers have been communicated with, what they’ve bought, when they last purchased, what they paid, and so much more. CRM can help companies of all sizes drive business growth, and it can be especially beneficial to a small business, where teams often need to find ways to do more with less.

Outputs: -

- A CRM system can give you a clear overview of your customers. You can see everything in one place — a simple, customizable dashboard that can tell you a customer’s previous history with you, the status of their orders, any outstanding customer service issues, and more. You can even choose to include information from their public social media activity — their likes and dislikes, what they are saying and sharing about you or your competitors. Marketers can use a CRM solution to manage and optimize campaigns and lead journeys with a data-driven approach, and better understand the pipeline of sales or prospects coming in, making forecasting simpler and more accurate. You’ll have clear visibility of every opportunity or lead, showing you a clear path from inquiries to sales. Some of the biggest gains in productivity and in making a whole-company shift to customer-centricity can come from moving beyond CRM as just a sales and marketing tool, and embedding it in your business — from finance to customer services and supply chain management. This helps to ensure that customer needs are at the forefront of business process and innovation cycles.

level in the company: -

-A CRM system gives everyone — from sales, customer service, business development, recruiting, marketing, or any other line of business — a better way to manage the external interactions and relationships that drive success.

SCM: -

-Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace.

-And one of the advantages Supply Chain Management :

-Supply chain management (SCM) is the centralized management of the flow of goods and services and includes all processes that transform raw materials into final products.

-By managing the supply chain, companies can cut excess costs and deliver products to the consumer faster and more efficiently.

-Good supply chain management keeps companies out of the headlines and away from expensive recalls and lawsuits.

-The five most critical elements of SCM are developing a strategy, sourcing raw materials, production, distribution, and returns.

-A supply chain manager is tasked with controlling and reducing costs and avoiding supply shortages.

Inputs: -

-Supply chain management oversees and optimizes the processes of acquiring inputs from suppliers (purchasing), converting those inputs into a finished product (production), and delivering those products or outputs – to customers (fulfillment).

Outputs: -

-Supply chain management (SCM) is oversight and control of all the activities required for a company to convert raw materials into finished products that are then sold to end-users.

-SCM provides centralized control for the planning, design, manufacturing, inventory, and distribution phases required to produce and sell a company's products.

-A goal of supply chain management is to improve efficiency by coordinating the efforts of the various entities in the supply chain. This can result in a company achieving a competitive advantage over its rivals and enhancing the quality of the products it produces, both of which can lead to increased sales and revenue.

level in the company: -

-It is important to create a productive supply chain that will work on all three levels. Beginning with strategic planning and ending with the management of daily operational tasks, the effectiveness at each of these levels ensures a smooth and highly efficient supply chain.

KMS: -

-A knowledge management system (KMS) is a tool used by companies to help organize documentation, frequently asked questions, and other information into easily accessible formats for both internal and external customers.

-Using knowledge management software can help keep documentation up to date, assist customers in finding their own answers, and manage knowledge access and permissions across user groups. It’s a tool that’s valuable to both small businesses that are just starting out and global enterprises that need to distribute knowledge to a wide variety of audiences.

-Knowledge management is the process of identifying, gathering, storing, evaluating, and sharing all of the valuable information organizations create in their day-to-day operations. It involves capturing answers to frequently (and not so frequently) asked questions and documenting them in an easy-to-understand format across multiple file types, like step-by-step written articles, videos, or images. A KMS makes knowledge sharing a whole lot easier by having an answer ready and easily accessible to share.

Inputs: -

-By definition, a Knowledge Management System (KMS) is a system for applying and using knowledge management principles to typically enable employees and customers to create, share and find relevant information quickly. A Knowledge Management System is a valuable tool for any business operating in our data-driven digital world, particularly those that sell products and/or provide services.

Outputs: -

-A knowledge management system helps you identify out-of-date articles and update them with new information. This provides a big advantage over a file folder of documents. Where folders can become unwieldy and messy, a KMS will keep your valuable information organized. Out-of-date information can mislead customers and lose your company business, so it’s important to get that taken care of quickly.

-Knowledge management includes the collection, analysis, dissemination, and general management of all information that is possessed by an organization. A Knowledge Management System carries out these functions and follows best practices to deliver optimal results for the organization using it in an efficient and effective manner.

level in the company: -

-At the highest level, a knowledge management process is the way in which a business manages knowledge, from its creation through to its organization methodology, to how it then continues to make sure it’s shared out.

ERP: -

-Enterprise resource planning (ERP) is a platform companies use to manage and integrate the essential parts of their businesses. Many ERP software applications are critical to companies because they help them implement resource planning by integrating all the processes needed to run their companies with a single system.

-Enterprise resource planning (ERP) is a type of software system that helps organizations automate and manage core business processes for optimal performance. ERP software coordinates the flow of data between a company’s business processes, providing a single source of truth and streamlining operations across the enterprise. It’s capable of linking a company’s financials, supply chain, operations, commerce, reporting, manufacturing, and human resources activities on one platform.

-Most companies have a finance and operational system in place, but siloed systems can’t go beyond everyday business processes or help with future business growth. As companies expand and their needs change, their systems should keep up with them. In this article, you’ll learn what ERP is and why having software in place that keeps up with your needs can help run a more agile and efficient business.

Inputs: -

-An ERP system solves this problem by compiling information in a central database to grant managers and employees cross-departmental visibility. It also eliminates the problems that come with conflicting sources of data and empowers them to analyze various scenarios, discover process improvements and generate major efficiency gains. That translates to cost savings and better productivity as people spend less time digging for needed data.

Outputs: -

-Enterprise Output Management software or ERP Output Management software is a technology which allows an organization to efficiently design and deliver documents, data or reports from their back end business systems.

-Most ERP systems have constraints on the design and final delivery of documents - this type of solution allows the flexibility to transmit the right document in the right way.

level in the company: -

-An ERP system empowers mid-level management to run their daily tasks efficiently by providing information readily and often summarized effectively for them to make decisions. It allows them to monitor the performance of staff, access budgets, accounts, and company spend whenever necessary

Management information systems (MIS): -

-It is one of the branches of computer science, and this branch aims to integrate more than one science into one science, which is information technology, computer science, and management. To carry out various activities and businesses through a set of accounting tasks, and thus support the decision-making process. Management information systems also evoke information about the organization's past, and collect information about its present, especially with regard to the organization's activities to support and support management in making the most appropriate decision among a group of available options. The value of financial expenses incurred by employees, in addition to freeing them from routine work and boredom, and motivating them morally. This type of computer science branch can benefit organizations’ departments, both internally and externally, by providing them with the necessary information and distributing it at all levels.

- Management information systems depend on five main elements to be able to provide the administration with the information it requires to perform the administrative process efficiently and effectively, namely: -

- Hardware: It is the technological and technical equipment necessary to contain the decision support process in the organization, and to enable individuals to perform procedures regarding data using special software.

-Software: is a package of integrated computer operations and procedures that are used to find a solution to a mathematical problem, a statistical operation, edit and correct a formula, or perform an operation.

-Data: It is a set of objective facts that are not interconnected in their essence, and can be attracted and collected by research, recording and observation, or it can be described as the raw material for information before any processing is performed on it.

-Procedures: including the software design process and documentation.

-Individuals: and is considered the basic element in management information systems, and complements the role of other elements, as it is considered the user and operator of these other elements.

- The importance of management information systems: -

-provide information to management and configure it in a timely manner; To help and motivate her to make the right and effective decision.

- Exploiting sources of information and its resources within the organization and tightening control over all incoming information.

- Making the right decisions within the organization, and linking all parties to the organization that supply and produce information with each other.

- Sending the information needed by the administrative levels and providing them with it when the levels need it, with the aim of exercising the functions of the administrative process.

- Facilitate the process of sharing and exchanging information between administrative levels through networks within the organization and at the global level.

- Enabling administrative levels to store, save and enter information within the scope of processing and retrieval operations in a timely manner, based on the SDI technology.

- Early detection of gaps and deviations in operations and functions and their evaluation by providing accurate information about how they perform.

- Facilitating the process of predicting and planning the future efficiently and effectively, by relying on probabilities that are subject to several studies, while making sure to find alternative suggestions to the already existing ones in the event of a defect being discovered.

- Providing administrative levels with reports in various forms in a timely manner. Completion of administrative operations at a high speed, efficiency and effectiveness, relying on the least possible number of manpower.

- Enabling the organization to have a high ability to exploit computer capabilities in accomplishing its tasks.

- Analysis of data, information and systems within the framework of the organization.

- Enable organizations to enter the competition market and support and strengthen their competitive position.

- Raise the level of efficiency and effectiveness. Getting rid of administrative corruption, and eliminating it completely, by relying on computers to complete tasks.

- Improving the production process and raising its levels. Contribute to saving time and effort.

-Give strategic tasks more time by reducing the time needed to take care of routine work.

-Management Information Systems Standards: -

- Management information systems depend on a set of standards in order to carry out their work as required, namely:

-Accuracy: This criterion is essential in essential information systems. In view of the complete reliance on it in the decision-making process, as it requires the validity and credibility of data and information.

-The novelty of information, which is obtaining information from its sources, at the time it is needed by a certain administrative level, provided that it is recent.

- Complementarity, this criterion requires that an abundance of information be placed in the hands of the decision-maker on a specific issue.

- Briefness and clarity. This criterion requires providing certain information that is directly related to the issue in question, and not distracting the decision-maker by providing him with unnecessary information.

- Correlation and relevance. This criterion aims to support the systems analyst in performing his work by providing information that is interrelated with each other and is appropriate to the issue to be analyzed and accomplished.

- Availability of information, and requires easy access to information and not complicate it.

-Features of management information systems:

- Giving a general picture about the organization or institution.

-Play the role of communication and carry out the planning process.

-Providing a quantity of customer data, and expressing feedback that can provide assistance and aid to the organization in completing procedures and actions.

- Carrying out direct marketing and promotional activities

-Management information systems give the organization a competitive advantage that enables it to carry out activities efficiently and effectively with the least time, effort and cost.

# Conclusion: -

- Digital transformation is the integration of digital technology into all areas of a business, fundamentally changing how you operate and deliver value to customers. It's also a cultural change that requires organizations to continually challenge the status quo, experiment, and get comfortable with failure.

- Digital transformation is imperative for all businesses, from the small to the enterprise. That message comes through loud and clear from seemingly every keynote, panel discussion, article, or study related to how businesses can remain competitive and relevant as the world becomes increasingly digital. What's not clear to many business leaders is what digital transformation means. Is it just a catchy way to say moving to the cloud? What are the specific steps we need to take? Do we need to design new jobs to help us create a framework for digital transformation, or hire a consulting service? What parts of our business strategy need to change? Is it really worth it?

- there are four main pillars of information system digital transformation. These pillars aim to empower the SMEs' employees, engage their customers in the digital transformation process, optimize the system operations, and transform the product into the digital form that matches the customers' and users' needs. Using these four systems of intelligence helps SMEs to move their information system toward the business intelligence model (Raymond et al., 2020).

-The information system's primary role for digital transformation is to build a robust ERP model. ERP is defined as the ability to deliver an integrated suite of business applications. ERP tools share a typical process and data model, covering broad and deep operational end-to-end processes, such as those found in finance, human resources (HR), distribution, manufacturing, service and the supply chain.

-Building a robust ERP is not the only concern of information systems for digital transformation. More functions and tasks should be implemented when making an intelligent information system that can work in this complex environment.

Answering these questions leads us to a well-planned automated information system to control the working procedures inside the digital transformation environments. An example can be used to answer the first question, “Why do we need to transform”? shows the dramatic increase in the count of digital photos compared to analog images (Lucas and Goh, 2009; Chania’s et al., 2019).

Dependently, the market value of the Kodak Company lost most of its value, and many other companies that provide digital photo tools increased their market values.

-Another example of showing the urgent need for digital transformation in all directions is market size growth, as summarized in Figure 4 (Kemp, 2020). This figure compares two years (2019 and 2020) in terms of the total population's growth percentage, the unique mobile phone users, the Internet users and the active social media users. These statistics actually can be considered a shred of substantial evidence that the whole world moves toward the full digital transformation procedures. The SMEs in Egypt must keep pace with the recent changes of the times.

-Moving to the second question that aims to identify the main procedure of transferring the information systems from their traditional form to the modern digital transformation platform, a few factors must be taken into consideration. First, the information system's internal components are the main focus and the first step of the digital transformation process. These components include the hardware, the software, and the people inside the system. An organized plan must be developed to move these components toward the recent technology in the market, such as smart devices, intelligent software tools, and big data analytics methods. The processes and the procedures inside the system, as well as the information reports, must be considered. This step is called process development. It represents a significant challenge in the digital transformation process due to the enormous amount of data generated by millions of uses in different formats known as big data. According to Forbes, 97.2% of companies today invest in big data and artificial intelligence (AI) to drive growth and development. Despite this, many organizations struggle to use data on a strategic and tactical level effectively. According to Gartner, 87% of organizations have low business intelligence and analytics maturity, meaning they're mainly relying on spreadsheet-based management systems while lacking data guidance and support. This management system is the third factor of the information systems digitizing process.

# Sources: -

-Mawdoo3.

- ORACLE NETSUITE.

-Guru.

-Proficient.LT.

-Investopedia.

- Activate.