

Management Information Systems

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Abstract: With the advancement of technology, more and more people are using tech as a part of their businesses to make them more profitable and more efficient. One of the most common and useful ways to do this is through Management Information Systems (MIS). Management Information Systems (MIS) are made up of many different types of systems that cover many different aspects of running a business, but, in a nutshell, it takes information stores it analyzes it and uses it.

1. INTRODUCTION

Management Information Systems, or otherwise shortened to MIS, is a set of systems, usually organized in a streamlined process, that helps managers and other decision-making entities make educated decisions on the way the company at hand should proceed. It does that by providing routine reports at regular intervals that show the company at hand's past, present, and projected data, such as human resource management, manufacturing, finance and accounting, consumer behaviors, and inventory management. While it started as something exclusive to super-computers that are rare to find, it has now become available to just about anyone with a computer or even a powerful laptop. This made more and more people want to try MIS, so more businesses started to incorporate it in their day to day work. Now, most small businesses rely on MIS to survive or even thrive. In short, the biggest benefactors of the new meteoric rise of the Management Information Systems are the small businesses because it clarifies what the next step in the company's life is by managing the overwhelming overflow of information a person in a company could face in any given day. With all that in mind, how do the MIS do all those miraculous things listed previously? Well, they just use databases. Databases are centralized integrated collections of data resources. It is simply a bank of all the information that a company or business has and needs. Now, after knowing what MIS do and how they do it, one needs to know the types of MIS out there, and they are Management Information System (MIS), Marketing Information System (MIS or MkIS), Office Automation System (OAS), Decision Support System (DSS), Executive Information System (EIS), Enterprise Resource Planning (ERP), Expert Systems, Transaction Processing Systems (TPS), and Knowledge Management System (KMS). Each of them has its own functions, and each of them has their own field that they specifically tackle, but that will be discussed later on in the body and not right now in the introduction. To summarize the points presented in this introduction, MISs are a set of systems that helps companies and businesses alike through their collection, organization, and analyzation of given data or information, and this is done by databases or data banks, and there are many unique types of MISs that have different functions.

2. BODY

It is now clear that MISs are not just one application or one operating system but rather a huge interlocking network of other, smaller applications that have unique features and functions but work in tandem with each other under the umbrella of MISs. There is a staggering amount of those smaller systems, but the most commonly used ones are Management Information System (MIS), Marketing Information System (MIS or MkIS), Office Automation System (OAS), Decision Support System (DSS), Executive Information System (EIS), Enterprise Resource Planning (ERP), Expert Systems, Transaction Processing Systems (TPS), and Knowledge Management System (KSM). Now that we know what the types of MISs are, what does each one do? Well, first of all, a Management Information System (MIS) is just that: a way or system for small businesses and companies to manage information. This could be as simple as any spreadsheet that has the companies information, sales, customers, and things like that, or this could get as complicated as a huge data file with automated data filling mechanisms. The only criterium for an MIS to be an MIS is for it to be intended as a way to manage and organize data and other types of information. Onto the Marketing Information System (MIS or MkIS), though it is similar in name to MIS, it has completely different functionality and use. It is a way for marketers to automatically organize their data on customer bases so that they know what to market to who. Basically, it shows marketers what a certain individual will most likely want to buy using prior information that has been given by the marketers themselves.

Office Automation System (OAS) is up next, and it is a system that really helped all the companies and small businesses out there alike because it automated a multitude of different complicated tasks that used to need many different branches of a company and used to even need outside experts. These tasks were divided into many different types, and these types are electronic communication, electronic collaboration, office management, electronic publishing, and image processing. At the heart of all this is the LAN or Local Area Network. In The Local Area Network lets users transfer data, mail, images, and voice through networks and to anywhere else from there, that destination can be located within the boundaries of the Local Area Network, or it could be located in a far away land on other countries and/or continents, through a connecting network. Office Automation Systems (OAS) make office work more productive. Onto Decision Support Systems (DSS), these systems are applications that serve to help with making decisions. It achieves this by using the data that is given by the user from whatever company and is in the database to present it in a more digestible and easy to understand way. By doing this, Decision Support Systems help decision-makers go down the right path. It usually uses graphs to portray this, and these graphs are most commonly accompanied by an AI (Artificial Intelligence) that helps business decision-makers, or in this case business executives, make their decisions even further. Executive Information Systems (EIS) are just a subset of Decision Support Systems (DSS), and its purpose is summed up pretty well by Techopedia when they said "EIS data is available company- or enterprise-wide, facilitated by personal computers and workstations on local area networks (LANs). Employees can access company data to help decision-making in their individual workplaces, departments, divisions, etc.. This allows employees to provide pertinent information and ideas both above and below their company level." We proceed to Enterprise Resource Planning (ERP). It was put perfectly by Investopedia "Enterprise resource planning (ERP) is a process used by companies to manage and integrate the important parts of their businesses. Many ERP software applications are important to companies because they help them implement resource planning by integrating all of the processes needed to run their companies with a single system. An ERP software system can also integrate planning, purchasing inventory, sales, marketing, finance, human resources, and more." Quickly we go to Expert Systems, sadly without an abbreviation, is a piece of AI that makes decisions that emulate the decisions of an expert in any given profession. Because of these huge expectations, Expert Systems require a lot of time and effort from both Information Technology or IT specialists that make the coding that is required for the actual running of the systems and the field experts themselves to make sure that the Expert Systems are making the right decisions and are looking for the correct things. Transaction Processing Systems (TPS) is a collection of systems that specialize in collecting, modifying, and retrieving transaction data. In this context, "transaction data" includes anything where a company makes contact with another party, such as a customer, a different company, or a consumer in general, and finally, Knowledge Management Systems (KMS) are up next. A knowledge management system (KMS) is a system for applying and using knowledge management principles. These include data-driven objectives around business productivity, a competitive business model, business intelligence analysis and more. A knowledge management system is made up of different software modules served by a central user interface. Some of these features can allow for data mining on customer input and histories, along with the provision or sharing of electronic documents. Knowledge management systems can help with staff training and orientation, support better sales, or help business leaders to make critical decisions, and now that we have briefly covered all of the Management Information System (MIS) subjects, we shall move on to a deeper dive into each and every one of them, until they are all thoroughly explained.

First of all, since Management Information Systems (MIS) have already covered in the introduction, Marketing Information Systems (MIS or MkIS) will be the first system covered. As mentioned earlier, Marketing Information Systems (MIS or MkIS) are made for marketers so that they can organize and collect marketing information like data about any individual marketer's customer bases, but it is not something that can just work on its own. It needs some human intervention or anything of the like. Specifically, though, Marketing Information Systems (MIS or MkIS) require three unique and different things, and these three things are information that is acquired through any type of market intelligence, information from operating data, and an information library that can be acquired through a wide array of ways. All a Marketing Information System (MIS or MkIS) does is take all this information and string it together. As Economic Discussion says "What a [Marketing Information System] MkIS does is to bring together data from these sources, usually into a computerised database. By structuring it appropriately this allows the interrogation and linking of the data. It is important for the systems to be designed by marketers, not computer people, as the form of the output is critical to good decisions." Now that the three things that are needed to make the Marketing Information Systems (MIS or MkIS) work have been established, let's dive into each one further. First and foremost, information that is acquired through any type of market intelligence is all the data that is available from any of the vast amounts of external sources out there, and this data can be gotten through formal means or informal means. That does not mess with the output. Onto

the information that comes from operating data. This information is all about operating information, so basically things like accounts and production. It is usually different from marketing information as it is collected for very different reasons. Nevertheless, there is likely to be some marketing relevance in this data and that must input into the Marketing Information System (MIS or MkIS). Information for operating data can manifest itself in many different ways, and, once again, Economic Discussions gives many amazing examples of said manifestations when they write "It could perhaps contain the details of car production, 2-door versus 4-door, or various engine sizes ordered. Certainly[,] sales information drawn from invoices is very important and yet this needs to be presented in a way that might categorize customers by relevant market segment or might show products purchased in as much detail as possible. It could take the form of a sophisticated customer database, such as that used by major service companies for mail order or airline reservations." Finally, an information library comes next. An information library is a collection of formal studies or projects that are valid and up to date. Research surveys carried out by trade associations or by associated companies and other types of reports all fall under the umbrella of an information library. All these types of information are crucial for a Marketing Information System (MIS or MkIS) to work because if a Marketing Information System (MIS or MkIS) is lacking in reliable information that is available all times it cannot possibly be able to function and serve its purpose in helping marketers in their marketing endeavors. Marketing Information Systems (MIS or MkIS) might work in tandem with Decision Support Systems (DSS) to give the best outcome possible, and this is a common occurrence in the world of Management Information Systems (MIS) because even though each subset of MIS is unique and has a different set of function, they still cross over and work together to produce optimal results, and this teamwork is what makes Management Information Systems (MIS) the future of business and the future of management.

Second of all, we have Office Automation Systems (OAS). As mentioned earlier, Office Automation Systems (OAS) are one of the if not the most helpful Management Information system (MIS) out there because of its help in automation tasks that would have normally required many hours of labor and a lot of expertise to accomplish. At the core of Office Automation Systems (OAS) is the LAN or Local Area Network. Office Automation Systems (OAS) have helped in electronic publishing, electronic communication, electronic collaboration, image processing, and office management. They have helped in electronic publishing through in many different ways. Word processing software, such as Microsoft Word, Corel Word-Perfect, allows users to create, revise, edit, print, and store documents of all kinds. Desktop publishing software, such as Adobe Pagemaker, Corel VENTURA, Microsoft Publisher, on the other hand, enables users to integrate text, images, photographs, and graphics to produce high-quality printable output. Desktop publishing software is used on a microcomputer with a mouse, scanner, and printer to create professional-looking publications. These may be newsletters, brochures, magazines, or books. Onto electronic communication. Electronic communication includes e-mail, fax, voicemail, and video conferencing. Encyclopedia.com does an immaculate job of explaining each one of those types of electronic communication thoroughly. For example, when speaking of e-mail, they said "E-mail is software that allows users, via their computer keyboards, to create, send, and receive messages and files to or from anywhere in the world. Most e-mail systems let the user do other sophisticated tasks such as filter, prioritize, or file messages," and when they speak on fax they said "A facsimile or facsimile transmission machine (FAX) scans a document containing both text and graphics and sends it as electronic signals over ordinary telephone lines to a receiving fax machine. This receiving fax recreates the image on paper," and when speaking on voicemail, they said "Voice mail is a sophisticated telephone answering machine. It digitizes incoming voice messages and stores them on disk. When the recipient is ready to listen, the message is converted from its digitized version back to audio, or sound," and they finish with video conferencing when they said "Desktop videoconferencing is one of the fastest-growing forms of videoconferencing. Desktop videoconferencing requires a network and a desktop computer with special application software (e.g., CUSeeMe) as well as a small camera installed on top of the monitor. Images of a computer user from the desktop computer are captured and sent across the network to the other computers and users that are participating in the conference. This type of videoconferencing simulates face-to-face meetings of individuals." While electric communication is most likely the most useful aspect of Office Automation Systems (OAS), electric collaboration is still a very useful thing to have. Electronic collaboration is made possible through electronic meetings and collaborative work systems and teleconferencing. Electronic meetings and collaborative work systems allow teams of coworkers to use networks of microcomputers to share information, update schedules and plans, and cooperate on projects regardless of geographic distance. Special software called groupware is needed to allow two or more people to edit or otherwise work on the same files simultaneously, so we can see that electronic collaboration is one of the most helpful things when it comes to Office Automation Systems (OAS), but that does not take away from the fact that Image processing office management is still helpful too. Office Automation Systems (OAS) are one of if not the most useful and functional Management Information

Systems (MIS) out there, and they are one of the few MISs that can stand alone without the help of others. This and many other reasons make this a very viable option and some times a necessity for all entrepreneurs and small business owners.

Decision Support Systems (DSS) are one of the most versatile Management Information Systems (MIS) out there. They are used by almost anybody who wants to get ahead in the entrepreneurship game, but they are mostly used by anybody who wants to take a gander at the buying and selling game. Decision Support Systems (DSS) are support systems that help in making any type of judgment by analyzing data, compiling all the useful information from that data, and presenting that information in a comprehensive way. There are many types of information that Decision Support Systems (DSS) present, but the most common information used includes target or projected revenue, sales figures or past ones from different time periods, and other inventory- or operations-related data. Decision Support Systems (DSS) could be used by operations management and other planning departments in an organization to make the information useable and helpful. In fact, these systems are primarily used by mid- to upper-level management. For example, a company might want to project its gross margins over the next year based on new assumptions about product sales. This cannot be done manually because of the sheer amount of factors you have to take into account, but a Decision Support System (DSS) can do that and produce a projected outcome and can even produce some alternate outcomes too, so in this hypothetical case, Decision Support Systems (DSS) would have helped make data and information as a whole simpler and more understandable by the layman, and even the high-level executive can and will benefit from this simplification of intricately complicated data because rather than spend time trying to decipher a huge amount of information that could, in the end, turn out to be impossible to decipher manually, this said executive could just put all of his available data in our Decision Support System (DSS) and from there it can get automatically made into understandable information, and then he could focus his entire efforts on making informed decisions based upon all the information that is presented in the Decision Support System (DSS). Decision Support Systems (DSS) are also not just limited to one, singular form of conveying information. It can display information as graphs or as written reports. It can also display this information in many other ways, but these two, with the former in particular, are the most common and usually the easiest ways. As technology continues to advance, data analysis is no longer limited to large, bulky supercomputers. Since a Decision Support System (DSS) is essentially an application, it can be loaded and used on most functioning computer systems, whether on desktops, laptops, PC's, and anything in between. Certain Decision Support System (DSS) applications are also available even through mobile devices. This flexibility makes Decision Support Systems (DSS) accessible by anyone who's willing to put the time and work into it. Like mentioned earlier, it can be used by most people because of its flexibility, but it just requires a certain level of expertise to make sure it works properly and gives applicable data, but other than that, it is very easy to use. Decision Support Systems (DSS) also work in tandem with many if not most of the other Management Information Systems (MIS) and helps them in excelling at what they are supposed to do.

Onto the Enterprise Resource Planning (ERP). Enterprise Resource Planning (ERP) is Management Information Systems (MIS) that, as the name implies, manages resources like planning, purchasing inventory, sales, marketing, finance, human resources, and more. Enterprise Resource Planning (ERP) helps with sticking all other Management Information Systems (MIS) together and making sure they can be optimized. It is similar to a hub where you can enter it and access all other independent systems from other departments. As Investopedia put it "You can think of an enterprise resource planning system as the glue that binds together the different computer systems for a large organization. Without an [Enterprise Resource Planning] ERP application, each department would have its system optimized for its specific tasks. With [Enterprise Resource Planning] ERP software, each department still has its system, but all of the systems can be accessed through one application with one interface." Enterprise Resource Planning (ERP) also helps with communication. This is how it optimizes work throughout the departments. It allows all the departments' Management Information Systems (MIS) to interact and exchange information that may prove to be useful for each other in a very easy and simple way. Enterprise Resource Planning (ERP) also helps a company or a firm become more mindful of what activities it is undergoing as Investopedia stated "[Enterprise Resource Planning] ERP applications can help a corporation become more self-aware by linking information about the production, finance, distribution, and human resources together. Because it connects different technologies used by each part of a business, an [Enterprise Resource Planning] ERP application can eliminate costly duplicate and incompatible technology. The process often integrates accounts payable, stock control systems, order-monitoring systems, and customer databases into one system." While Enterprise Resource Planning (ERP) can be very helpful in organizing any company and making it act as one singular unit, it can only do that by having a smart, optimized, and compatible integration. If the Enterprise Resource Planning (ERP) is not optimized or is not well integrated, the application will be all but useless, so correct integration and clever organization is key in making sure that

Enterprise Resource Planning (ERP) is functioning fully, and if that is done, a company is bound to only increase in value and flourish immensely.

An Expert System is defined as an interactive and reliable computer-based decision-making system that uses both facts and heuristics to solve complex decision-making problems. It is considered at the highest level of human intelligence and expertise. It is a computer application that solves the most complex issues in a specific domain. It can be applied in many different domains and fields. For example, investors can use it to decide when to buy and sell, and marketers can use it to decide when and how to market any given product, and doctors can use it to see how good a patient's health is and decide how to go about medicating him or her, etc. The expert system can resolve many issues which generally would require a human expert. It is based on knowledge acquired from an expert. It is also capable of expressing and reasoning about some domain of knowledge. Expert systems were the predecessor of the current day artificial intelligence, deep learning, and machine learning systems. There are three different components that go into making an expert system, and those components are a user interface, an inference engine, and a knowledge base. The user interface is the most crucial part of the expert system. This component takes the user's query in a readable form and passes it to the inference engine. After that, it displays the results to the user. In other words, it's an interface that helps the user communicate with the expert system. The inference engine is the brain of the expert system. The inference engine contains rules to solve a specific problem. It takes and uses the knowledge found in the Knowledge Base. It selects facts and rules to apply when trying to answer the user's query. It provides reasoning about the information in the knowledge base. It also helps in deducting the problem to find the solution. This component is also helpful for formulating conclusions. The knowledge base is a repository of facts. It stores all the knowledge about the problem domain. It is like a large container of knowledge which is obtained from different experts of a specific field. Thus we can say that the success of the Expert System mainly depends on the highly accurate and precise knowledge, so we can see that using Management Information Systems (MIS) and expert systems, in particular, can put out a level of performance equal to or even greater than an expert in most fields.

Transaction Processing Systems (TPS) are responsible for retrieving, recording, analyzing, and modifying data that has to do with the transactions or interactions any company has. It usually deals in very literal and clear data, unlike many other Management Information Systems (MIS), so that makes it an extremely good choice of MIS for things like accounting records. Transaction Processing Systems (TPS) help with accounting because if a company makes a sale or takes out a loan by any chance, that company will need to record it, and this is where Transaction Processing Systems (TPS) come in. It easily retrieves the data and records it for later use. Because Transaction Processing Systems (TPS) are very practical, there is not much to write about, but that does not take away from the fact that they are very useful and can be the backbone of a company and its Management Information Systems (MIS).

Finally, the last Management Information System (MIS) that we will talk about in this essay, Knowledge Management Systems (KMS) are used by companies to help organize documentation, frequently asked questions and other information into easily accessible formats for both internal and external customers. They help with making the business model more customer friendly, whether it be on a website or in other avenues of business. It involves making it so that things that would be easy to answer or solve but tedious and always reoccurring, like frequently asked questions, could be answered once and displayed openly to all customers, and like Freshdesk says "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, like step by step written articles, videos or images. If we had to reinvent the wheel every time we wanted to drive across town, we wouldn't be getting in our cars very often. So, why do we feel the need to reinvent knowledge every time we run into the same issues within our businesses? Wouldn't it be a lot easier to already have an answer ready to share? But if you just store all of that knowledge in a chaotic word document, no one will be able to find it or update it. Knowledge management is like the catalog system at the library which helps you find exactly the right shelf and the right book to answer your question (and even keeps a record of when it was last checked out!). Managing knowledge effectively means that accurate answers to common questions are easily accessible to both customer support agents and customers. Your team can act consistently with confidence, armed with answers from colleagues who have been there before. There's no need to reinvent the wheel with every customer question." And that is about it.

3. CONCLUSION

So, all in all, management information systems (MIS) are tools that help businesses thrive in the current ecosystem of technology. It encompasses most facets of running a successful business. There are many types of MISs, but the most

important ones are Marketing Information System (MIS or MkIS), Office Automation System (OAS), Decision Support System (DSS), Executive Information System (EIS), Enterprise Resource Planning (ERP), Expert Systems, Transaction Processing Systems (TPS), and Knowledge Management System (KSM). They all have their own purposes and goals to achieve, but when put together, they make an amazing system that makes running a business as easy as it can get.

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