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* Management Information Systems (MIS): Definition and How It Works

Management Information System, commonly referred to as MIS is a phrase consisting of three words: management, information and systems. Looking at these three words, it’s easy to define Management Information Systems as systems that provide information to management.

That is the simple definition of MIS that generally sums up what a Management Information System is, and what it should do. However, its role and impact on the smooth operation of a company can never be overemphasized. That is the reason why every successful company makes use of these systems in one way or another.

The reason why Management Information Systems are very important in the day to day operation of companies is because these systems work with people, organizations, technology and relationships among the people and organizations affecting the company.

This means that when properly implemented, Management Information Systems will help achieve a high level of efficiency in a company’s management operations.



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This explains why [MIS degrees are in high demand globally](https://www.harding.edu/academics/colleges-departments/business-admin/management-information-systems) since the graduates have practical knowledge that will help them develop more efficient solutions thanks to their systems perspective of business processes developed in their training in Management Information Systems.

In the decade between 2014 and 2024, the US Bureau of Labor Statistics predicts that MIS professionals, and specifically database administrators, should expect [the highest job growth](http://www.bls.gov/ooh/computer-and-information-technology/database-administrators.htm#tab-1) when compared to all the other occupations.

In this guide, we explore 1) the **history**of Management Information Systems, 2) **types of information systems**, 3) **components** of Management Information Systems, 4) **its role in business**, 5) common **advantages and disadvantages of using MIS**, and 6) **tips for effeccctively applying MIS in your business**.

HISTORY OF MANAGEMENT INFORMATION SYSTEMS

Owing to the strong link between Management Information Systems and technology, the history of these systems goes hand in hand with the history of computing technology.

With that said, we will split the evolution of MIS into five eras. Let’s take a closer look at what changes were effected in each of these eras.

**First Era: Computing on Mainframe and Minicomputers**

This was the era before 1965 when computing was done on large mainframe computers located in large special rooms designed specifically for the computers. This included special temperature control to ensure that the machines always operated in optimum conditions.

These computers were operated by teams of technicians and hence the cost of operating them was quite high. As a result, [most of the computing was done on a time-sharing basis](http://jonpeddie.com/back-pages/comments/from-sharing-to-virtualizing-in-just-under-60-years/) to meet the high costs of owning and operating these mainframes. The dominant supplier of hardware and software in this era was [IBM](https://www.cleverism.com/company/ibm/).

With time, technology advanced and towards the end of this era, minicomputers were introduced. The minicomputers were significantly smaller and cheaper, hence large companies could afford to own these and do their computing in-house. However, the minicomputers were still very expensive when compared to today’s standards.

**Second Era: Personal Computers**

This era began in 1965 and was mainly as a result of the introduction of the microprocessor. This meant that companies could now afford cheaper personal computers, which provided access to computing power that would have cost exorbitant amounts of money just one decade before.

By mid 1980s, personal computers were becoming much more affordable hence they were made available to the mass markets. The predominant ones at this time were the Apple I and Apple II, and the IBM personal computer, commonly referred to as PC. The PC was friendlier to businesses, which explains why it rose to popularity in those early days.

During this era, Management Information Systems started making way into businesses thanks to the development of a spreadsheet application known as VisiCalc (short for “visible calculator”). This application was released originally for the Apple II, but a PC version was also made for the IBM PC when it was produced.

This application is considered by many the factor that turned the microcomputer from an expensive gadget for scientists and enthusiasts to an all-important business tool thus paving way for the modern Management Information Systems. Following the success of the VisiCalc, more powerful spreadsheet applications like the Lotus 1-2-3 and Microsoft’s Multiplan and later Excel.

Follow this **interview with the developers of VisiCalc**.

**Third Era: Client/Server Networks**

With the widening use of computing in business and advances in technology, more needs came from the business community to ensure a more efficient interaction with information. Since companies were able to computing thanks to reduced costs of computers, better ways had to be sought for making the most out of this computing power.

One of the most prominent needs that arose was the need for employees within organizations to share computer information with other employees. The solution was provided by client/server networks that went a long way in enhancing the management information systems we have today.

One big step in this era was the [development of intranets](http://www.intranetconnections.com/blog/the-history-and-evolution-of-intranet-software/) which were static websites that gave employees access to information that was stored in a central location. This made it possible to work faster and more efficiently because more people could access information on a server as long as their computers were on a common network.

**Fourth Era: Enterprise Computing**

The fourth era was an improvement of the third era that saw to it that different departments in companies had even better access to information. The main improvement was the introduction of high speed enterprise networks that enabled faster access to information.

This provided a better and more complete management structure since decision making was easier thanks to the better access of information from different parts of the company. Essentially, the applications used by departments in the company were consolidated and woven together into a single platform that was accessible from the company network.

High-speed networks were also added into the mix to increase the efficiency of the platform. This meant that business operations such as finance, accounting, sales, marketing, inventory and even human resource management could be harmonized to ensure cooperation and efficiency throughout the entire company.

Although the applications used by different departments differed and measures of access control were introduced to limit access to sensitive company information, this era gave top management officials a complete view of the current standing of the entire business.

**Fifth Era: Cloud Computing**

This is the current era that employs the latest networking technology to further enhance information processing and access by business officials and management executives. The added element in this era is the fact that the networking technology adds a level of mobility to the systems.

This means that irrespective of your location, the configuration that you are using or the hardware that’s available, you will still be able to use business applications and access data stored in company servers. With the improvement of cellphone networks to provide high speed mobile data access and the increase in popularity of Wi-Fi networks, managers have ready access to the Management Information System around the clock hence better decisions can be made faster.

This era frees management from the chains of office-bound computers with local network access. With the rise in popularity of mobile devices such as laptops, smartphones and tablet computers, great levels of mobility are achieved while still improving on efficiency.

This also calls for a change in management style since the workers will be generally more informed due to the ability to produce and consume more information about the business, giving rise to what’s now known as the [knowledge worker](http://www.forschungsnetzwerk.at/downloadpub/knowledge_workers_the_biggest_challenge.pdf). Knowledge workers are more empowered and hence more productive naturally.

This means that the [command-and-control](http://www.forbes.com/sites/lizryan/2016/02/26/command-and-control-management-is-for-dinosaurs/#57cf840157e5) method of management will no longer be the most effective management style for this worker. As a result, employee autonomy is gradually becoming more and more inevitable.

**A beginner’s guide to cloud computing**.

[slideshare id=44803904&doc=cloud101editeddeckfinal-150217155954-conversion-gate02&w=710&h=400]

TYPES OF INFORMATION SYSTEMS

Management Information Systems is one out of several information systems that are used in business. To better understand Management Information Systems, let’s look at the different types of information systems available in business.

* **Transaction Processing Systems.**These systems have been designed to collect, process and store transactions that occur in the day to day operations of a company. The system can also be used to cancel or modify transactions done in the past if the need arises. One property of this system that enables them to work effectively is the ability to accurately record multiple transactions even if the different transactions take place simultaneously. They are built to be able to handle large volumes of transactions. Examples include stock control systems, payroll systems, order processing systems etc.
* **Decision Support Systems.**These systems help decision makers to make the best decisions by generating statistical projections from analyzed data. Although it does not eliminate the need for the manager’s judgment, it significantly improves the quality of the decision by offering forecasts that help determine the best course of action. These systems compile information from several sources for purposes of aiding in decision making. Examples of these systems include computer supported cooperative work, group decision support systems, logistics systems and financial planning systems.
* **Executive Information Systems.**Also known as Executive Support System, this is a tool used for reporting enterprise-wide data to top executives. These systems provide quick and easy to use reports that are presented in graphical displays that are easy to compare. They can be taken as specialized decision support systems because they provide information necessary to help improve the quality of decisions. Owing to the high expectations from such a system, these systems need to be highly individualized hence they are usually custom made for specific clients. They are also customizable to fit the specific needs of the clients.
* **Management Information Systems.**These systems make use of information technology to help managers ensure a smooth and efficient running of the organization. Information collected by these systems is structured so that the managers can easily evaluate the company’s current performance vis-à-vis previous outputs. Some of the common types of Management Information Systems include process control systems, human resource management systems, sales and marketing systems, inventory control systems, office automation systems, enterprise resource planning systems, accounting and finance systems and management reporting systems.

COMPONENTS OF MANAGEMENT INFORMATION SYSTEMS

To effectively deliver the information needed to decision makers, Management Information Systems need to have the necessary components to collect, process, store and retrieve the information whenever it is needed.

To achieve this, these systems use the following four components:

1. **Information System.**This is a combination of software, hardware, personnel and infrastructure. This component helps in the collection of data that is stored in the MIS. The hardware includes computers, scanners, printers and network devices. The software elements include the company’s enterprise software and any other software that is used in the running of the company’s network. This component makes it possible for employees to interact with the system and thus information can be collected
2. **Database Management System.**This component is primarily made up of computer programs that help in the storage and retrieval of data. Of course, it also includes the actual physical databases where the information is stored after it has been captured. There are several different database management systems that can be used in Management Information Systems. The suitability of the systems will depend on the amount of data that will need to be processed and stored in the system. There are small database management systems that can comfortably work on personal computers and there are huge ones that will need larger and more complex machines like mainframe computers. Learn more about [database technologies](https://www.cleverism.com/holistic-view-database-technologies-dbms/).
3. **Intelligence System.**This component is concerned with processing of the data collected and presenting it in a manner that is easy to comprehend. Everything from the processing of the data to the displaying of the data is designed to give top executives an easy time as they try to make decisions concerning the business. It is sometimes referred to as business intelligence which stores human knowledge and uses the logic to formulate quick solutions for future problems where patterns match.
4. **Research System.**This component is concerned with identifying the main management problems in the organization and coming up with alternative decisions that could have sufficed in a particular situation. This helps ensure that all the possible options are analyzed and the best decision made. The best decision is not always the most obvious one. This component of Management Information systems ensures that the best decision is reached even in those instances.

ROLE OF MANAGEMENT INFORMATION SYSTEMS IN BUSINESS

The main role of Management Information Systems is to report on business operations with the purpose of supporting decision making. This is to ensure that the organization is managed in a better and more efficient way so that it can be able to achieve full potential thus gain competitive advantage.

Let’s look at some of the other roles played by Management Information Systems in an organization.

* **To provide information readily to company decision makers.** Regardless of whether it is a marketing, financial or operational issue, managers need quick access to information so that they can make good decisions that will have a positive impact on the company’s performance. Management Information Systems enhance this by strategically storing vast amounts of information about the company in a central location that can be easily accessed by managers over a network. This means that managers from different departments have access to the same information hence they will be able to make decisions that collectively help solve the company’s problems in the quickest way.
* **Management Information Systems also help in data collection.** Data from everyday operations in the company is collected and brought together with data from sources outside the organization. This enables a healthy and functional relationship between distributors, retail outlets and any other members of the supply chain. It also helps keep good track of performance since production and sales numbers will be recorded and stored in a central database that can be accessed by all members of the MIS. Access to this information also helps ensure that problems are detected early and decisions are made quickly using the latest information.
* **To promote collaboration in the workplace.** In any large company, there are many situations that call for input from several individuals or departments before decisions can be made. Without an efficient communication channel, these decisions can take a very long time. Even with good communication channels, if the [different stakeholders](https://www.cleverism.com/ultimate-guide-to-stakeholder-management/) don’t have access to all the available data, the process would hit a number of snags before it’s complete. Management Information Systems ensure that all the members of the decision-making group have access to all the data that’s required to make the decision even if they are working from different physical locations.
* **To run possible scenarios in different business environments.** Before making a decision that will affect the overall standing of the business, a lot of precaution must be taken. There is a need to check and verify that the company will not suffer after making a decision. Management Information Systems enable executives to run what-if scenarios so that they can see how some of the important metrics in the business will be affected by a given decision. The data is presented in easy to understand reports and graphs that make interpretation easy. For example, a human resource manager will be able to tell what will happen to the revenue, production, sales and even profit after reducing the number of workers in a manufacturing department. Another example would be the effect of a price change on profitability. Once executives have been able to see whether or not the decision will be beneficial to the company, it is easier to make good decisions that will not leave the company in chaos.
* **Management Information systems give accurate projections of the company’s standing in the short and long term.** Most of the decisions made by top executives in companies have an effect on the company strategies. As a result, some of them may need some modifications done on the company goals or strategies. Most Management Information Systems come with trend analysis features that will enable you to project the performance of a business with the current configuration and how they will be affected once you have implemented any changes that you are considering. The Management Information Systems that don’t have the trend analysis feature will still provide you with enough information to accurately carry out the analysis using external tools.
* **Management Information Systems help track the implementation of particular decisions in a company.**Before making a decision, executives use these systems to make projections of the expectations from the particular decision. If they decide to go ahead with the changes, there will be a need to keep monitoring the performance to see if you are on track to achieving the desired results. Management Information Systems give detailed reports and recommendations so that the evaluation of the goals moves smoothly and effectively. You get data that shows if your decisions have had the desired effect. If not, you will be able to take the necessary corrective measures early so that you can get back on track.
* **To improve on the company’s reporting.** One of the reasons why Management Information Systems are favored by large companies is the effectiveness of the reporting features. The decisions can be made quickly because the information is presented in an easy to understand format. The fact that the system is accessible by people from different parts of the organization makes it an effective reporting and communication tool. Findings can be shared among colleagues with all the necessary supplementary data. It is also possible to create brief executive summaries that sum up the whole situation for review by senior company executives in situations that need their approval.

ADVANTAGES OF MANAGEMENT INFORMATION SYSTEMS

There are many benefits that come with applying Management Information Systems. Some of these benefits help make work easier for management while the rest of them help the organization as a whole.

Let’s take a closer look and see what you stand to gain from having a MIS.

* **All stakeholders in the company have access to one single database that holds all the data that will be needed in day to day operations.** If the MIS is used for [project management](https://www.cleverism.com/everything-about-project-management/), the contractor, client and consultant will be able to achieve a high level of transparency hence it will be easy to develop trust. Operations will also be smoother because information will always be readily available and data collection methods like forms or questionnaires will be standardized.
* **Employees and other stakeholders in the organization will be able to spend more time doing productive tasks.** This is because a big chunk of their time is saved thanks to the more efficient information system. This time would have otherwise been spent setting up or retrieving traditional information recording systems such as forms and files. As a result, the company is able to save on manpower costs, while at the same time producing more output in a fixed time span will now be spent productively.
* **Another benefit of Management Information Systems is that they bring the power of data processing tools that help significantly improve the quality of decisions made in the company.** A majority of Management Information Systems have built-in data processing tools that are able to draw conclusions based on the inputs received from the different sources. This helps make better plans for material management, manpower allocation and even the overall execution of the project.
* **Owing to the flexibility that is brought by the use of mobile devices such as tablet computers and smartphones, Management Information Systems ensure that employees have easier and closer interaction with information about the progress of any process within the organization**. This also ensures a higher degree of accuracy in data collection since it will be possible to record the progress in smaller milestones throughout the day on mobile devices as opposed to recording once at the end of the day. As a result, management is able to get a better idea of the progress due to the availability of the latest information.
* **Inputs and modifications in these systems are logged and the authors noted.** The time when the change has been made is also recorded for future reference. This means that the company is able to achieve a higher degree of accountability since all the actions can always be tracked back to the particular individuals who initiated them. This also means that the best performing employees can also be easily identified since information such as production numbers per shift and sales reports are always available and well presented in the system.
* **Management Information Systems help reduce the amount of paperwork** that departments have to deal with thanks to the central database that’s accessible from the company network. This means that in addition to making processes simpler and faster, the company is able to go paperless while at the same time reducing its carbon footprint. The bills also go down since the need for items like plain papers, ink and toner cartridges will be reduced significantly. Transportation costs are also reduced since there will be no need for shipping documents back and forth for approval and signatures. Shelf space will be saved and used for other tasks. Company wastes will also be reduced when the company goes paperless.
* **Reports make it easy for companies to easily identify their strengths and weaknesses in carrying out various tasks.** Management Information Systems provide revenue reports, performance reports for employees, expenses tracking reports and many others. When companies use these reports, they are able to improve their operations.
* **From a top executive perspective, Management Information Systems help give an overall impression of where the company stands financially.** These systems can also give overall status reports for specific projects within the organization. This enables top executives and managers to easily tell if the company is on track towards achieving its goals.
* **Most Management Information Systems provide a channel for customers to collect and store vital data and feedback from customers.** With this data, companies can easily adjust their products and marketing campaigns to better suit the needs of the customers hence improving on sales.
* **With management information systems, a company gains competitive advantage.** This is because operations are faster and smoother and thus results are achieved faster and more efficiently. Customers will be happy with the service delivery because they will be getting the answers that they seek faster and employees will be motivated because most of the tasks will become easier with better access to data.
* **MIS helps eliminate redundant roles.** When information is stored efficiently, it’s possible to identify parts of a system that are unnecessary. This means that any efforts that were duplicated are eliminated hence the company is able to better use the available resources.

CHALLENGES WHEN APPLYING MANAGEMENT INFORMATION SYSTEMS IN BUSINESS

Even with the numerous benefits, there are a number of challenges that companies are likely to face when applying Management Information Systems in their businesses.

* **The first challenge is in the cost of equipment.** For a big company to successfully incorporate a Management Information system, there is a need to purchase devices that the employees and management executives will be using to interact with the system. These devices include servers, tablets, laptops and desktop computers. In addition, the company needs to invest in a good network that will connect these devices in order for the system to work effectively.
* **Training of the workforce** can also become a problem when applying Management Information Systems in a company. Without a proper understanding of how the system works, it can be hard to reap the full benefits of using it. This therefore makes it necessary for the company to ensure that employees and their managers are well trained on how to use the system. This can be an expensive and time consuming exercise.
* **The systems are expensive to purchase**. Owing to the unique needs of each organization, Management Information Systems have to be customized for each company. This means that there has to be [brainstorming sessions](https://www.cleverism.com/brainstorming-techniques-for-idea-generation/) where the vendors sit with management officials seeking to understand the needs before they can develop the system. As a result, the cost of the system goes up, thus taking it out of reach for small and medium companies.
* **Many companies end up purchasing systems that lack the features they need most**. As mentioned earlier, each company has its own unique needs when it comes to Management Information Systems. When you purchase a system that is not meant for your company, you will have better access to data that doesn’t help improve your operations. As a result, you will not be able to get the best return on investment.
* **There is also a need for trained personnel to keep the system in good working order at all times**. Like any other system, management information systems need proper maintenance in order for them to produce the best results. This means that you will need to add specialized personnel for system maintenance in your company. Without these people, using the system will be a challenge since errors will go unresolved and this will result in inefficiencies in the operations.
* **Management Information Systems are heavily affected by large changes in the company**. This means that before you make any change in the way you run the company, there will be a need to consider the impact of the changes on the information system. Sometimes, it becomes impossible to make some changes without changing the Management Information Systems hence having the system in place ends up being a limitation. However, most small changes should easily be incorporated in a good MIS.
* **Management Information Systems will result in the loss of employment for a number of employees in a company**. People like office messengers and traditional registry clerks will need to be reduced or eliminated after the system has been incorporated since some of these tasks will be automatically done on the system. These employees will not be happy about the changes and this can easily result in lawsuits or other problems with trade unions when large numbers of employees are retrenched.

TIPS FOR EFFECTIVELY APPLYING MANAGEMENT INFORMATION SYSTEMS IN A BUSINESS

Even with the challenges, it goes without saying that installing a Management Information System is the way to go for businesses to perform better.

This means that companies should find a way of working around the challenges. Here are a number of tips that will help ensure a successful and smooth transition.

**Know your needs from the outset**

This is the first step towards getting an effective system. Before you even start looking for a vendor, it’s important to first ensure that you know exactly what type of system you want for your company. Make a portfolio score card that is in line with the goals that you have as a company.

This score card should define the objectives and the [key performance indicators](https://www.cleverism.com/how-to-choose-best-suitable-kpis-for-your-business/) that you will be using to evaluate your success as a company. This is what you will go with to the vendors.

**Evaluate a number of vendors**

Once you have established what you need, it’s time to talk to a number of vendors in the market.

Find out about their costs for the system and any additional benefits that you will get when you purchase the system from them. Some of the things to look out for include support, installation, updates and training of employees on how to use the system.

The vendor to choose is the one who offers the system that you need and at the same time, one who will give you the best after sales service to ensure that you have an easy time using the system.

**Train your employees well**

Don’t assume that your employees will figure out how to use the system once it is in place. Remember, the quality of the decisions made by management from using the MIS will be determined to a large extent by the data that has been captured by employees.

This means that you need to put all the necessary measures in place to ensure that these employees do a good job.

**Invest in reliable devices across your company**

Investing in enough devices improves the accessibility of the system. This ensures that more data is tracked and as a result, more of it is accessible to management.

Better accessibility also reduces the time taken for data to be entered in the system and as a result making it available faster.

**Get a system that only has the features that you need**

Instead of investing in a complicated system that is expensive to [run and tracks large volumes of data](https://www.cleverism.com/what-is-big-data-understanding-large-amount-data/) that you don’t need, you should go for something that addresses the immediate needs of your company’s management.

This way, you will not have to pay too much for the system and at the same time, you will not take your workforce through a complicated and unnecessary training process. You will also reduce the chances of errors arising in the use of the system since the features and functions will be easy to understand.

**Make sure that you choose a system that is adaptable to changes**

The system that you choose should be able to adapt to changes in the company. With time, you might need to change the personnel handling different tasks in the system or the reports that you will need the system to generate.

It is important to ensure that the system is able to handle these small but frequent changes easily without having to contact the developer. If there will be a need to contact the developer, like in the event of large changes, you should discuss this early before you make the decision to purchase the system.

However, most small changes should be effected in-house.

**Be prepared for the changes**

Incorporating a Management Information System in your business is a big step that will result in many changes in your operations. Be prepared for these changes and prepare your workforce for them.

You will need to train your employees, move some of them from one department to another or [even adjusting job descriptions](https://www.cleverism.com/key-concepts-to-writing-a-winning-job-description/) to eliminate redundancy in tasks.