**Choice of Information Technology**

**Six Major Types of Information Systems**

Now that we have dealt with the basics, let's look at the six primary types of information systems. Although information systems are not limited to this list, typical businesses and organizations have the following six, each system supporting a different organizational level.

For starters, we have the transaction processing systems (TPS) at the operational level. Next are the office automation systems (OAS) and knowledge work systems (KWS), both working at the knowledge level. Next, the management level has the management information systems (MIS) and decision support systems (DSS), and we conclude with the executive support systems (ESS) at the strategic level. Let’s explore the different types of information systems more in-depth.

1. Transaction Processing System (TPS)

Transaction processing is essential to helping businesses perform daily operations. Transactions are defined as any activity or event that affects the company, and include things like deposits, withdrawals, shipping, billing customers, order entry, and placing orders. TPS supports these business transactions.

2. Office Automation System (OAS)

OAS consists of computers, communication-related technology, and the personnel assigned to perform the official tasks. The OAS covers office transactions and supports official activity at every level in the organization. The official activities are subdivided into managerial and clerical activities.

Office automation systems include the following applications:

* Email: The email application also covers file attachments such as audio, video, and documents.
* Voice Mail: This application records and stores phone messages into the system’s memory and can be retrieved anytime.
* Word Processing: Word processing covers the creation of documents, including memos, reports, letters, and anything else that’s printable electronically. The created text can be copied, edited, and stored via word processing commands, and checked for grammar and spelling, line and word counting, and headers and footers.

3. Knowledge Work System (KWS)

The KWS is a specialized system that expedites knowledge creation and ensures that the business's technical skills and knowledge are correctly applied. The Knowledge Work System aids workers in creating and disseminating new information using graphics, communication, and document management tools. Here are some examples of KWS:

* Computer-Aided Design Systems (CAD): [CAD](https://www.simplilearn.com/autocad-interview-questions-article) systems automate design creation and revision via computers and graphics software, especially in the manufacturing and tooling processes.
* Financial Workstations: These systems pull and combine data from many different internal and external sources, covering research reports, market data, and management data. Financial workstations can rapidly analyze huge amounts of financial data and trading situations.
* [Virtual Reality](https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-virtual-reality) Systems: These systems take the CAD system to the next level, using interactive graphics utilities to create realistic computer-generated simulations. VR systems are typically found in scientific, educational, and business circles.

## 4. Management Information System (MIS)

Middle managers handle much of the administrative chores for day-to-day routines and performance monitoring, ensuring that all the work is aligned with the organization's needs. That's why MIS is such a valuable tool. Management Information Systems are specially designed to help middle managers and supervisors make decisions, plan, and control the workflow. The MIS pulls transactional data from various Transactional Processing Systems, compiles the information, and presents it in reports and displays.

Additionally, these reports can be produced monthly, quarterly, or annually, although MIS can have more immediate reports (e.g., hourly, daily).

## 5. Decision Support System (DSS)

The DSS is a management-level, interactive computer-based information system that helps managers to make decisions. The Decision Support System specifically gives middle managers the information necessary to make informed, [intelligent decisions.](https://www.simplilearn.com/decision-intelligence-article)

Decision Support Systems use different decision models to analyze or summarize large pieces of data into an easy-to-use form that makes it easier for managers to compare and analyze information. Often, these summaries come in the form of charts and tables.

## 6. Executive Support System (ESS)

The ESS is like the MIS but for executive-level decision-making.  The decisions involve company-wide matters, so the stakes are higher. Consequently, they demand more insight and judgment.

The ESS provides greater telecommunication, better computing capabilities, and more efficient display options than the DSS. Executives use ESS to make effective decisions through summarized internal data taken from DSS and MIS and external sources. In addition, executive support systems help monitor performances, track competitors, spot opportunities, and forecast future trends.

**Applications of Management information system**

### Information/Data Storage

Although companies need good information to create better goods and services, they must also have a reliable, cost-effective system to store the information that allows rapid data access when required. In addition, a sound information system helps businesses keep logs of essential activities and store valuable assets such as communication records, revision histories, activity logs, operational data, and other relevant documents.

By storing information in an organized manner, businesses understand why problems and roadblocks occur and how to solve them.

### Rolling Out New Products and Services

Although there is an ever-increasing demand for new goods and services, any business that wants to stay competitive needs information to make better decisions and consequently offer better products. Information systems help analyze independent processes and organize the company's work activities. So, an information system allows a business to better understand how it can design, create, and sell services or products that people want.

### Simplified Decision Making

It’s challenging enough to [make decisions](https://www.simplilearn.com/art-of-decision-making-article), let alone consistently making the exact, right decisions. There are no guarantees that an organization’s decisions will work. However, information systems help take some of the pain out of the process by offering information rapidly and easily.

### Improving Employee Behaviors and Attitudes

Information systems can be effectively employed to improve communication between employers and employees. An efficient information system empowers employees by making relevant information more accessible, helping them become a part of the decision-making process. This empowerment boosts motivation and increases commitment to the project or assignment.

Here are some broad categories that highlight types of information system applications:

* Communication. Information system applications allow rapid data sharing on a global scale.
* Education. Information systems help make remote learning easier (particularly useful during pandemics) and make people more comfortable with tech advancements such as smartphones, tablets, and other network devices.
* Employment. The advent of information systems has directly resulted in creating new positions such as [data analyzers](https://www.simplilearn.com/what-does-a-data-analyst-do-article) and [cyber-security experts.](https://www.simplilearn.com/tips-for-a-successful-cyber-security-career-article)
* Finance. Information systems make the transfer of funds more manageable and more secure.
* Healthcare. Thanks to information systems, healthcare providers can access vital medical records faster.
* Security. Information systems make it easier to employ [data safeguards](https://www.simplilearn.com/steps-to-eliminate-cyber-security-threat-article) to reduce the likelihood of a [data breach](https://www.simplilearn.com/2-billion-bits-of-info-exposed-inside-a-record-breaking-data-leak-article) or malware.

**Sets of data**

Many organizations record and store information related to their operations. They do so because they can use the information to analyze internal processes to find areas of improvement, key performance indicators (KPIs) for their organization and ways to maximize efficiency in processes that the organization already improved. Examples of the data an organization may store include:

Employee production units: These are measures of how well an employee contributes to an organization. This metric can be different for every organization.

Profit margins: This is the amount of money an organization makes compared to its expenses. This can vary from one organization to another.

Machinery downtime and uptime: The time a unit of production machinery spends being repaired or running, respectively.

Click-through rates: This is an online metric used to see the number of people who access an organization's web pages.

**Decision support system.**

**What is a decision support system (DSS)?**

A decision support system (DSS) is a computer program application used to improve a company's decision-making capabilities. It analyzes large amounts of data and presents an organization with the best possible options available.

Decision support systems bring together data and knowledge from different areas and sources to provide users with information beyond the usual reports and summaries. This is intended to help people make informed decisions.

Typical information a decision support application might gather and present include the following:

* comparative sales figures between one week and the next;
* projected revenue figures based on new product sales assumptions; and
* the consequences of different decisions.

A decision support system is an informational application as opposed to an operational application. Informational applications provide users with relevant information based on a variety of data sources to support better-informed decision-making. Operational applications, by contrast, record the details of business transactions, including the data required for the decision-support needs of a business.

## Decision support system components

A typical DSS consists of three different parts: knowledge database, [software](https://www.techtarget.com/searchapparchitecture/definition/software) and [user interface](https://www.techtarget.com/searchapparchitecture/definition/user-interface-UI).

[**Knowledge base**](https://www.techtarget.com/whatis/definition/knowledge-base)**.** A knowledge base is an integral part of a decision support system [database](https://www.techtarget.com/searchdatamanagement/definition/database), containing information from both internal and external sources. It is a library of information related to particular subjects and is the part of a DSS that stores information used by the system's reasoning engine to determine a course of action.

**Software system.**The software system is composed of model management systems. A [model is a simulation](https://www.techtarget.com/whatis/definition/modeling-and-simulation-MS) of a real-world system with the goal of understanding how the system works and how it can be improved. Organizations use models to predict how outcomes will change with different adjustments to the system.

For example, models can be helpful for understanding systems that are too complicated, too expensive or too dangerous to fully explore in real life. That's the idea behind computer simulations used for scientific research, engineering tests, weather forecasting and many other applications.

Models can also be used to represent and explore systems that don't yet exist, like a proposed new technology, a planned factory or a business's [supply chain](https://www.techtarget.com/whatis/definition/supply-chain). Businesses also use models to predict the outcomes of different changes to a system -- such as policies, risks and regulations -- to help make business decisions.

**User interface.**The user interface enables easy system navigation. The primary goal of the decision support system's user interface is to make it easy for the user to manipulate the data that is stored on it. Businesses can use the interface to evaluate the effectiveness of DSS transactions for the end users. DSS interfaces include simple windows, complex menu-driven interfaces and command-line interfaces.

## Intelligent decision support system (IDSS)

Users can also bake artificial intelligence ([AI](https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence)) into decision support systems. Called intelligent decision support systems (IDSS), the AI mines and processes large amounts of data to get insights and make recommendations for better decision-making. It does this by analyzing multiple sources of data and identifying patterns, trends and associations to emulate human decision-making capabilities.

Designed to act similar to a human consultant, an IDSS gathers and analyzes data to support decision-makers by identifying and troubleshooting issues, and providing and evaluating possible solutions. The AI component of the DSS emulates human capabilities as closely as possible, while more efficiently processing and analyzing information as a computer system.

The IDSS may include advanced capabilities such as a knowledge base, [machine learning](https://www.techtarget.com/searchenterpriseai/definition/machine-learning-ML), [data mining](https://searchsqlserver.techtarget.com/definition/data-mining) and a user interface. Examples of IDSS implementations include flexible or [smart manufacturing](https://internetofthingsagenda.techtarget.com/definition/smart-manufacturing-SM) systems, intelligent marketing decision support systems and medical diagnostic systems.

## Types of decision support systems

Decision support systems can be broken down into categories, each based on their primary sources of information.

### Data-driven DSS

A data-driven DSS is a computer program that makes decisions based on data from internal databases or external databases. Typically, a data-driven DSS uses data mining techniques to discern trends and patterns, enabling it to predict future events. Businesses often use data-driven DSSes to help make decisions about inventory, sales and other business processes. Some are used to help make decisions in the public sector, such as predicting the likelihood of future criminal behavior.

### Model-driven DSS

Built on an underlying decision model, model-driven decision support systems are customized according to a predefined set of user requirements to help analyze different scenarios that meet these requirements. For example, a model-driven DSS may assist with scheduling or developing financial statements.

### Communication-driven and group DSS

A communication-driven and group decision support system uses a variety of communication tools -- such as email, instant messaging or voice chat -- to allow more than one person to work on the same task. The goal behind this type of DSS is to increase collaboration between the users and the system and to improve the overall efficiency and effectiveness of the system.

### Knowledge-driven DSS

In this type of decision support system, the data that drives the system resides in a knowledge base that is continuously updated and maintained by a [knowledge management](https://www.techtarget.com/searchcontentmanagement/definition/knowledge-management-KM) system. A knowledge-driven DSS provides information to users that is consistent with a company's business processes and knowledge.

### Document-driven DSS

A document-driven DSS is a type of [information management system](https://www.techtarget.com/searchdatacenter/definition/IMS-Information-Management-System) that uses documents to retrieve data. Document-driven DSSes enable users to search webpages or databases, or find specific search terms. Examples of documents accessed by a document-driven DSS include policies and procedures, meeting minutes and corporate records.

**Decision support system examples**

Organizations use decision support systems in several different contexts, including the following:

* **GPS routing.** GPS route planning is an example of a typical DSS. It compares different routes, taking into account factors such as distance, driving time and cost. The GPS navigating system also enables users to choose alternative routes, displaying them on a map and providing step-by-step instructions.
* **ERP dashboards.**ERP ([enterprise resource planning](https://www.techtarget.com/searcherp/definition/ERP-enterprise-resource-planning)) dashboards can use a decision support system to visualize changes in production and business processes, monitor current business performance against set goals and identify areas for improvement. ERP dashboards let business owners see a snapshot of their company's most important numbers and metrics.
* **Clinical decision support system.** A clinical decision support system ([CDSS](https://www.techtarget.com/searchhealthit/definition/clinical-decision-support-system-CDSS)) is a software program that uses advanced decision-making algorithms to help physicians make the best medical decisions. Healthcare professionals often use these to interpret patient records and test results, and to calculate the best treatment plan. CDSS in healthcare can help providers identify abnormalities during specific tests, as well as monitor patients after certain procedures to determine if they are having any adverse reactions.