

Digital Firms Horizon

Sailing into the Tapestry of Technological Transformation

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Introduction:

In an era defined by rapid technological advancements, businesses are navigating a complex web of digital tools and systems to enhance efficiency, decision-making processes, and overall competitiveness.

Our focus today revolves around the digital firm and the integral components that shape its digital backbone.

We will delve into the realms of Transaction Processing Systems (TPS), Management Information Systems (MIS), Decision Support Systems (DSS), Executive Support Systems (ESS), Enterprise Applications, Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), and Knowledge Management Systems (KMS).

In this interconnected digital ecosystem, these components synergistically contribute to the transformation of traditional firms into agile, responsive, and data-driven entities.

As we embark on this exploration, we aim to unravel the profound impact of these systems on organizational dynamics, offering insights into how they foster innovation, streamline operations, and drive strategic decision-making.

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DIGITAL FIRM

The phrase is frequently linked to the idea of "digital transformation," in which businesses use technology to drastically alter how they function and provide value.

A company is considered to be digitally enabled and automated **when nearly all of its major commercial contacts with suppliers, customers, and staff are conducted online.**

The notion of a "digital firm" entails more than just implementing digital tools; to fully leverage the potential afforded by the digital age, business processes and models must be fundamentally transformed.

Important traits of a digital company are as follows:

- **Digital Technology Integration:** This entails optimizing procedures, boosting productivity, and enhancing decision-making through the use of digital tools, platforms, and apps.
- **Decision Making Based on Data:** They gather, examine, and make use of data from multiple sources to obtain an understanding of consumer behavior, market trends, and internal business processes.
- **Client-First Priority:** client experience is a top priority for digital businesses, which use technology to react fast to client needs
- **Online Cooperation:** Digital enterprises use digital communication tools to enable virtual cooperation between partners, employees, and other stakeholders.
- **Adaptable and Agile:** They embrace process agility, which enables them to react quickly to changes in the market and new opportunities.
- **Online Presence and E-Commerce:** They use the internet to sell goods and services online, connect with clients through a variety of digital channels, and reach a worldwide audience.
- **Robotics and Automation:** This may result in various business processes operating more accurately, efficiently, and at a lower cost.
- **Cloud Computing:** They can manage IT infrastructure, install apps, and store and process data without having to make significant upfront investments.

Digital businesses are adaptable and useful in a range of sectors and industries. Digital technology use is not restricted to any one kind of business; rather, it can be advantageous to many different kinds of enterprises.

A digital firm is distinguished by the strategic application of digital technologies to improve decision-making, change operations, and generate value for all parties involved. This continuous digital transformation is a reaction to how business is changing in the digital age and how long-term success depends on innovation, adaptability, and a customer-centric mindset.

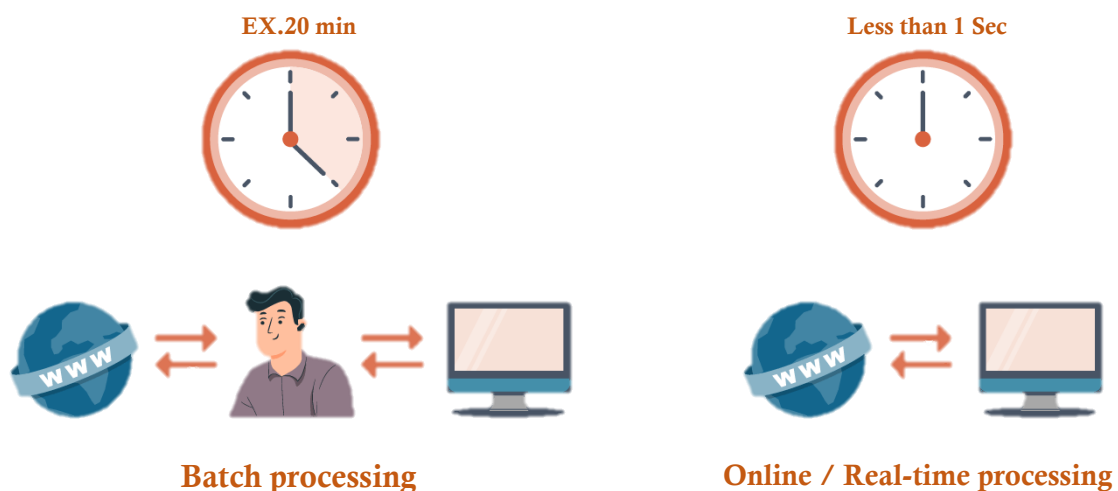
Transaction Processing System (TPS)

A Transaction Processing System is referred to as "TPS". Used by a lower-level supervisor.

This kind of information system **manages and processes commercial transactions instantly**. Because TPS makes sure that **daily transactional data is accurately and efficiently collected, processed, and stored**, it plays a crucial role in organizations.

Essential traits and features of transaction processing systems:

- **Real-Time Processing:** Transactions are processed as soon as they happen.
- **High Transaction Volume:** This could involve financial transactions, inventory management, sales transactions, and other types of transactions.
- **Data Accuracy:** Reduce the possibility of data errors.
- **Concurrent Processing:** Can manage several transactions at once. Guarantee that conflicts between multiple transactions that may be happening at the same time in a busy organization are avoided.
- **The Atomic Nature:** Data consistency is guaranteed in this way. TPS treats a transaction as a single, indivisible unit. Either everything that happens or nothing happens.
- **Online Transaction Processing (OLTP):** OLTP and TPS are frequently used interchangeably. Enable users to enter transactions and get instant feedback.
- **Database Administration:** Transactional data is stored and retrieved via databases. These databases are set up to facilitate quick and easy information retrieval and transaction processing.
- **Control and Security:** This covers encryption, access controls, and user authentication.
- **TPS Case Studies:** Retail point-of-sale systems, order processing systems, banking transaction systems, and airline reservation systems are a few common examples of TPS.
- **Online versus Batch Processing:** Although online transaction processing is commonly linked with TPS, batch processing is another possibility in certain systems, where transactions are gathered and handled in batches at predetermined times.



In many systems, there's often a combination of both online and batch-processing components to leverage the advantages of each approach.

	Online processing	Batch processing
Timing of Processing	Immediate processing of transactions as they occur.	Processing occurs at a scheduled time, usually in batches.
User Interaction	Involves real-time user interaction.	Typically, no user interaction during processing.
Response Time	Provides immediate feedback and results.	Results are generated after the completion of the batch processing.
Example Systems	Online banking, and reservation systems.	Payroll processing, billing systems.

Transaction processing system components:

Each TPS has four major components that help it function:

- **Inputs:** An input is an original request for a product or payment that an outside party sends to a company's TPS. Inputs typically include: Invoices - Bills - Coupons - Custom orders.
- **The system for processing:** Every input is read by the processing system, which then produces a useful output, like a receipt. You can specify the input data and the desired output with the aid of this element.
- **Storage:** The location of an organization's input and output data is referred to as the storage component of TPS. These documents are kept in databases by certain businesses. Every document is organized, secure, and easily accessible for future use thanks to the storage component.
- **Outputs:** Once all inputs have been processed, the system generates TPS outputs, which include receipts that the business keeps on file. These records are for official purposes, and they can aid in the validation of a sale or transaction.

TPS advantages:



Faster transaction



Increased economy of scale



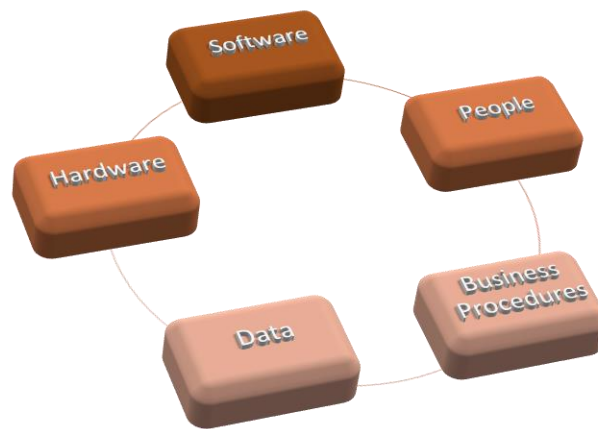
Improved reliability



Automated management

Management Information System (MIS)

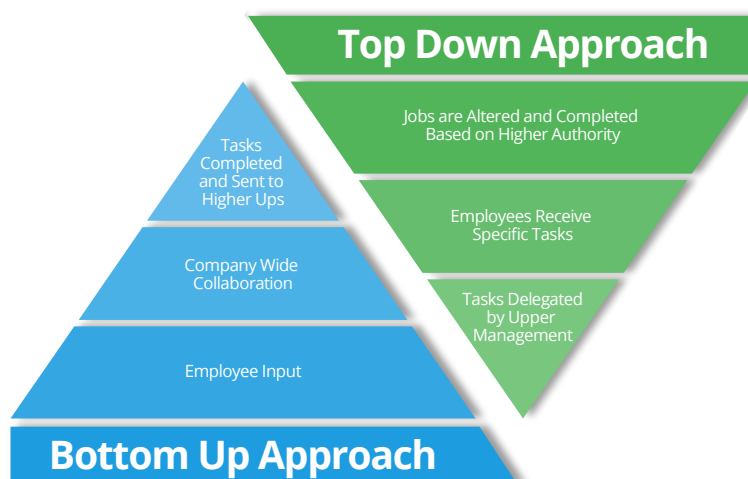
It refers to the use of technology, people, and processes to gather, store, analyze, and disseminate information to support managerial decision-making and organizational operations. Used by upper and mid-level management.



- components of MIS -

Types of MIS:

- **Top-down Approach:** In this method, the entire system is partitioned into a hierarchy of subsystems. This approach also defines the strategic and tactical decisions and the necessary decisions to operate the various key activities of MIS development. Many of them, strategies, goals, and plans are recognized by top management executives and conveyed to the administrative management levels.
- **Bottom-up Approach:** As its name implies, this approach mainly starts with the leaf-level or bottom-most management and proceeds progressively to the upper management levels. After recognizing the primary transactions, the needed file requirements and information processing programs are developed for each life stream system which is then moved towards data integration that is stored in different files of the information system. A bottom-up approach is functional to identify the various factors understand the difficult situations and formulate strategies to deal with them.



- **Integrative Approach:** In the integrative approach, subsystems of a system are integrated in such a way that the objective of the system can be fulfilled.

The benefits of a management information system:

- **Enhances the productivity of employees:** The employees in a company will become more productive as they won't have to spend time gathering the information that management demands. A well-structured management information system will collect all the necessary data without any additional input from the workers.
- **Leads to better decision-making in the company:** When a Management Information System is used to analyze a situation, it provides all the necessary information about that situation and then expects you to make the decision. It also offers some form of recommendations that give insight into the decisions to take.
- **Encourages smoother communications between departments in an organization:** When employees, heads of department, and managers are sharing the same information, there will be better communication across all levels of departments in the organization; and as a result, they will be able to pinpoint problem areas and agree on mutually useful solutions.
- **Helps to achieve a higher level of efficiency:** With a functional management information system, managers can get the necessary data that will help them identify the strengths and weaknesses of an organization. This will consequently help to achieve a higher level of efficiency within the company.
- **Boosts an organization's competitive advantage:** A standard MIS will help managers run a more efficient business, leading to the reduction and elimination of weaknesses and areas that are non-performing. At the end of the day, the company will experience an increase in its competitive advantage over other industry rivals.
- **Provides more customer data:** A management information system will reveal additional information about the customers and with this useful information about the customer needs, the management is better positioned to improve customer service and deliver highly effective promotional and marketing campaigns.

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.

The DSS can either be completely computerized or powered by humans. In some cases, it may combine both.

A decision support system gathers and analyzes data, synthesizing it to produce comprehensive information reports.

Components

- **Data Management:** This involves gathering, storing, and organizing relevant data from various sources. It may include historical data, real-time information, external databases, etc.
- **Modeling and Analysis Tools:** DSSs use various models, algorithms, and analytical techniques to process data and generate insights. These tools can include statistical analysis, optimization algorithms, forecasting models, and simulation methods.
- **User Interface:** The user interface allows decision-makers to interact with the DSS. It presents data, visualizations, and results in a user-friendly manner, enabling users to input parameters, run analyses, and interpret outcomes.
- **Database Management System (DBMS):** A DBMS manages the storage and retrieval of data for the DSS. It ensures data integrity, security, and efficient access to the required information.
- **Knowledge Base:** This component stores domain-specific knowledge, rules, and guidelines for decision-making. It helps the DSS understand the context and constraints of the problem.
- **Communication and Collaboration Tools:** DSSs often support communication and collaboration among team members. They enable the sharing of information, analysis results, and scenarios, facilitating group decision-making.

Types

- **Model-Driven DSS:** These systems use **mathematical** and **analytical models** to support decision-making. They rely on **data inputs** and **algorithms** to generate predictions, simulations, and optimization solutions.
- **Data-Driven DSS:** These DSSs focus on **data analysis** and **visualization** to aid decisions. They help users explore patterns, trends, and relationships in data through charts, graphs, and reports. Business intelligence and data visualization tools fall into this category.
- **Document-Driven DSS:** These DSSs manage and provide access to **textual information** relevant to decision-making. They can organize documents, reports, and research papers, making them easily accessible to users.
- **Knowledge-Driven DSS:** These systems incorporate **expert knowledge** and **rules** to support decisions. They can answer queries, provide advice, and offer recommendations based on predefined rules and expertise. Medical diagnosis systems and legal advisory systems are examples.

Applications

- **Business Management:** DSS aids in strategic planning, resource allocation, and performance analysis for businesses.

- **Healthcare:** DSS supports medical professionals in diagnosis, treatment planning, and patient management.
- **Finance:** DSS is used for financial forecasting, risk assessment, portfolio management, and investment analysis.
- **Supply Chain Management:** DSS assists inventory management, demand forecasting, and logistics optimization.

Advantages

- **Informed Decision-Making:** DSS provides timely and relevant information to decision-makers, enabling them to make well-informed choices based on accurate data and analyses.
- **Complex Problem Solving:** DSS can handle complex problems by employing sophisticated models, algorithms, and simulations that may be challenging to solve manually.
- **Scenario Analysis:** DSS allows users to evaluate various scenarios and their potential outcomes, helping decision-makers understand the implications of different choices.
- **Collaboration:** DSS facilitates collaboration among decision-makers, enabling them to share insights, analyses, and scenarios for more effective group decisions.

Disadvantages

- **Complex Implementation:** Developing and implementing a DSS requires skilled professionals, resources, and integration with existing systems.
- **Cost:** Building and maintaining a DSS can incur significant costs, including software development, hardware, training, and ongoing support.
- **User Expertise:** Effective use of DSS may require users to have a certain level of technical and analytical expertise, which could be a barrier for some individuals.

Executive Support System (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).



Advantages:

- Enhances personal thinking.
- Easy to use for upper-level executives.
- Better reporting system.
- Improve office automation.

Disadvantages:

- System dependent.
- Limited functionality.
- Information overloaded.

level: It is for top-level management.

Enterprise Applications

An enterprise application (EA) is a large software system platform typically designed to operate in a corporate environment such as a business or government. Enterprise application software integrates computer systems that run all phases of a company's operations. They enable cooperative workflows and reduce the complexity of large projects.

Enterprise apps range from simple content management systems to larger management software that automates business processes. The software companies that make these products include many of the world's best-known brands, such as IBM and Microsoft.

With the advent of enterprise application development, businesses can now develop custom apps that cater to their exact needs. For many companies that use them, enterprise software is mission-critical. Any software system failure would have a terrible impact on their business.

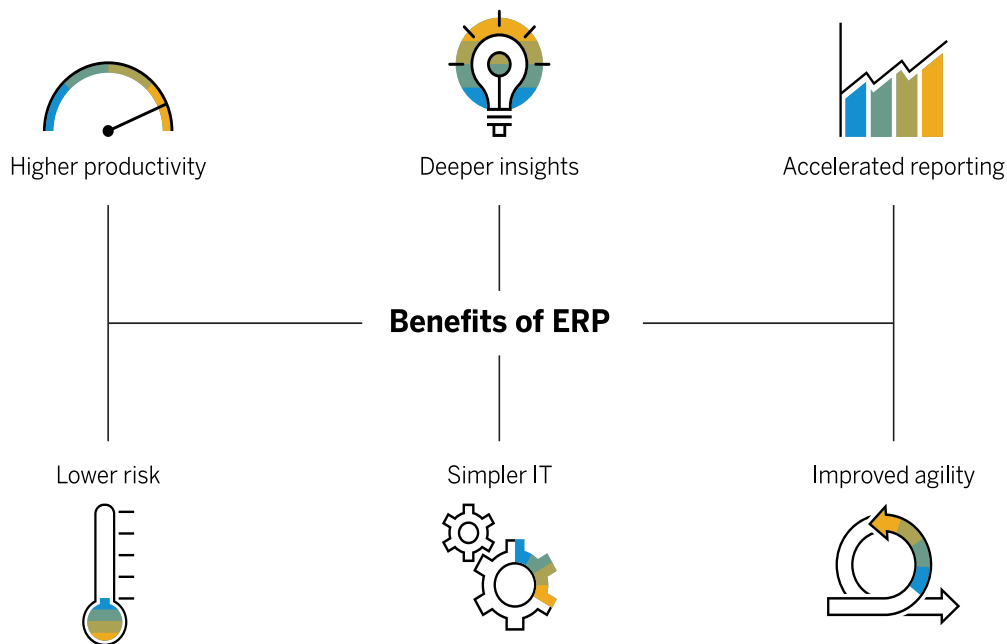
What is an enterprise application example?

Organizations that adopt enterprise apps have seen a significant improvement in their processes and productivity. To better explain what an enterprise application is, let's look at some examples you may be familiar with:

- Accounting and Billing Systems
- Customer Relationship Management (CRM)
- Point-of-Sale Software (POS)
- Supply Chain Management (SCM)
- Enterprise Resource Planning (ERP)
- Business Intelligence Systems
- Human Resource (HR) Systems

Enterprise resources planning (ERP)

Enterprise resource planning (ERP) is a software system that helps you run your entire business, supporting automation and processes in finance, human resources, manufacturing, supply chain, services, procurement, and more. ERP helps to efficiently manage all these processes in an integrated system. It is often referred to as the system of record of the organization. ERP system to provide a single source of truth across the business.



-Benefits of ERP-

Inputs: All the unorganized information from different areas of the company.

Outputs: Organize all information in one centralized database, and make it sharable for all departments.

Open-Source Software (OSS): The term 'open source' refers to software whose source code is freely available to the public. The Open-Source Initiative (OSI) describes it as software that can be freely used, changed, and shared (in modified or unmodified form) by anyone.

Closed-source software (proprietary software): The key difference between open and closed source is the accessibility of the source code. In the case of closed-source software, the source code is not publicly available.



Types of ERP:

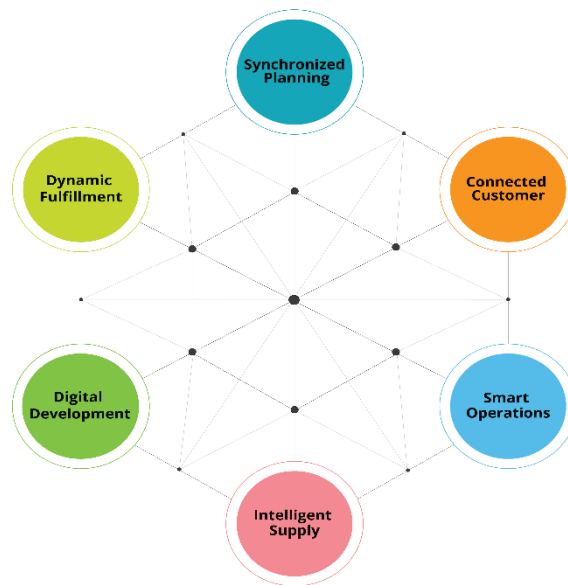
SAP Enterprise and Oracle are designed to service the needs of large complex businesses that have many departments, a global presence, and often complicated operational structures.

	SAP Business One Professional	Oracle Fusion Cloud ERP
Accounting	Standard features such as accounts payable (A/P), accounts receivable (A/R) and fixed asset management	Standard and advanced features covering accounts payable to asset management retirement and amortization
Budgeting	Basic budgeting features for managing and executing general planning	Advanced tools including asset lifecycle management in addition to standard budgeting features
Pricing	Straightforward pricing tools to manage product pricing	Pricing tools can match market, currency, and exchange rate and calculate profit margins, rebates and discounts
Human Resources (HR)	Well-designed employee portal, payroll and e-recruiting functionality to help with both retention and employee turnover	Good reporting capabilities including visual representations
CRM	Integrates marketing, sales and finance to create a whole story of customers to help with contextual sales	Good marketing support
AI and ML	HANA computing platform is basis of all SAP offerings and AI digital assistant "CoPilot" makes data accessible	AI tools like Digital Assistant are built into all parts of Oracle software and use natural language to sort databases

Supply chain management (SCM)

Supply chain management (SCM) is the process of managing the flow of goods and services to and from a business, including every step involved in turning raw materials and components into final products and getting them to the ultimate customer. Effective SCM can help streamline a company's activities to eliminate waste, maximize customer value, and gain a competitive advantage in the marketplace.

supply chain management provides multiple opportunities for companies to improve their profit margins and is especially important for businesses with large and international operations.



-components of SCM-

The five major components of SCM are:



SCM is a complex field that requires a deep understanding of the various components and how they interact with each other.

Types of Supply Chain Models:

- **Continuous flow model:** The continuous flow model relies on a manufacturer producing the same good over and over and expecting customer demand will show little variation.
- **Agile model:** This model prioritizes flexibility, as a company may have a specific need at any given moment and must be prepared to pivot accordingly.
- **Fast model:** This model emphasizes the quick turnover of a product with a short life cycle. Using a fast chain model, a company strives to capitalize on a trend, quickly produce goods, and ensure the product is fully sold before the trend ends.
- **Flexible model:** The flexible model works best for companies affected by seasonality .
- **Efficient model:** This includes utilizing equipment and machinery in the most ideal ways in addition to managing inventory and processing orders most efficiently.
- **Custom model:** If any model above doesn't suit a company's needs, it can always turn toward a custom model. This is often the case for highly specialized industries with high technical requirements, such as an automobile manufacturer.

Customer Relationship Management (CRM)

Businesses can utilize this type of software platform as a central location to coordinate and expedite their marketing, sales, and customer service operations. For companies looking to save consumer data and monitor customer interactions, this is the preferred option.






Kinds of CRM systems:

- = **On-premise CRMs:** These CRMs are often developed on the business's premises. All of its servers and other infrastructure are physically housed on the company's campus, and access to them is restricted to those areas.
- = **Cloud-based CRMs:** Since they can be accessed from anywhere in the globe using any browser, cloud-based CRMs are the most sought-after type. This makes it possible to deploy systems more quickly and use the platform more creatively.
- = **CRMs tailored to a particular industry:** The industry verticals that benefit most from them include real estate, healthcare, insurance, financial services, media agencies, hospitality, and more.

Characteristics of make up an effective CRM system



Figures relating to a CRM system:

-  **300%** Improvement in lead conversion rates
-  **41%** Revenue increase per salesperson
-  **27%** Improvement in customer retention
-  **24%** Decreased sales cycle
-  **23%** Decreased sales and marketing costs

knowledge management systems (KMS)

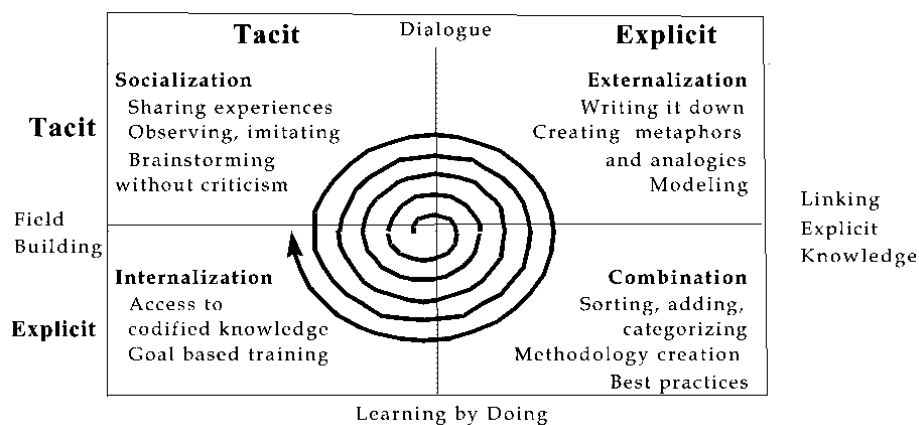
Businesses can utilize knowledge management systems (KMSs) to help arrange documentation, FAQs, and other information into formats that are simple to access for both internal and external clients.

Various Types of Information:

= **Tacit Knowledge:** The knowledge, skills, and abilities that a person retains is known as implicit knowledge. One acquires such a skill via perspective and life experience. It is the information that would be most difficult to write, explain, or present in a tangible form if it were to be investigated.

= **Explicit Knowledge:** Can be written down and is easily obtainable, it is the most basic type of knowledge and is also the easiest to transmit. Explicit knowledge is the result of organized, prearranged, structured and interpreted data. This kind of knowledge is easily expressed, recorded, transferred, and, most importantly, stored within the knowledge management ecosystem.

= **Implicit Knowledge:** The application of explicit knowledge is known as implicit knowledge. There are numerous examples of this kind of information throughout your organization. Implicit knowledge includes the best techniques and abilities that are task-transferable.



Knowledge management system advantages:



Arranges data and provide access to it from a single source of truth



Maintains current information



Increases the effectiveness of self-service features and diverts support tickets



Enables agents to exchange and apply knowledge and insights



Increases client satisfaction and gives clients the self-help tools they need



Gives clients more thorough assistance

Conclusion:

In conclusion, our journey through the digital landscape of the modern firm has unveiled a rich tapestry of technologies and systems that redefine the way organizations operate and thrive.

The symbiotic relationship between Transaction Processing Systems, Management Information Systems, Decision Support Systems, Executive Support Systems, Enterprise Applications, Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management, and Knowledge Management Systems is the backbone of the digital firm.

The transformative power of these systems is evident in their ability to enhance operational efficiency, provide timely and informed decision support, foster collaboration, and ultimately elevate the customer experience.

As we stand at the crossroads of the digital age, organizations must embrace these technologies judiciously, recognizing that their seamless integration is not just a technological evolution but a strategic imperative for sustained success in an ever-evolving business landscape. The journey toward digital excellence is ongoing, and as researchers, practitioners, and leaders, let us continue to explore, innovate, and adapt to the dynamic forces that shape the future of the digital firm.

		Business Intelligence (BI)		
	TPS	MIS	DSS	ESS
Descr- iption	<ul style="list-style-type: none">Record completed business transactions (record daily routine).Track the flow of transactions through the organization.Monitor the status of internal operations. such as ... Sales order entry - Hotel reservations – Payroll - Employee record-keeping - Shipping.	<ul style="list-style-type: none">provides routine information to managers and decision-makers.Not highly analytical.Used to monitor and control the business and predict future performance.	<ul style="list-style-type: none">used to support problem-specific decision-making.Unique and rapidly changing using advanced analytical models.Use sophisticated analytics and models to analyze data.	<ul style="list-style-type: none">dashboards delivered via portals using many sources of internal and external information.They address non-routine decisions requiring judgment, evaluation, and insightWeb interface to present integrated personalized business content.
Level	1 st line	Middle management	Super-user managers	senior management
Input	Daily transactions	The basic transaction data from TPS	<ul style="list-style-type: none">Use internal information from TPS and MIS.Use external sources, such as current stock prices and product prices of competitors.	<ul style="list-style-type: none">external events, such as (new tax laws – competitors)internal MIS and DSS.
Output	<ul style="list-style-type: none">Simple reports summaries to describe the daily flow of transactions.Answer routine questions : (how many parts are in inventory? - What happened to Mr. Smith’s payment?)Main provider to other systems.	<ul style="list-style-type: none">regular schedule.Simple routines (summaries – comparisons).	<ul style="list-style-type: none">-depends on what if method-Try to answer questions such as these: (What would the impact on production schedules if we were to double sales in the month of December? - What would happen to our return on investment if a factory schedule were delayed for six months?)	<ul style="list-style-type: none">Filter, compress, and track critical data displaying the data of greatest importance to senior managers.Provide data in the form of (Graphs – Charts – Dashboards).

Resources:

[/https://mailchimp.com](https://mailchimp.com)

[/https://www.oracle.com](https://www.oracle.com)

[/https://www.zoho.com](https://www.zoho.com)

[/https://www.freshworks.com](https://www.freshworks.com)

[/https://www.monocubed.com](https://www.monocubed.com)

<https://www.sap.com/mena/index.html>

[/https://www.investopedia.com](https://www.investopedia.com)

[/https://www.apty.io](https://www.apty.io)

[/https://www.oracle.com](https://www.oracle.com)

<https://eg.indeed.com/?r=us>

[/https://www.guru99.com](https://www.guru99.com)

[/https://www.includehelp.com](https://www.includehelp.com)

[/https://www.techfunnel.com](https://www.techfunnel.com)

[/https://www.forbes.com/advisor](https://www.forbes.com/advisor)

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<https://www.geeksforgeeks.org/difference-between-dss-and-ess/>

<https://community.fs.com/article/network-os-comparison-open-source-os-or-proprietary-os.html>