Information Systems

And Different Types of Support Systems in Information Systems

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BSCS-1

Data and Information

The term "information" is **ambiguous**.[1] At its core, **"information"** can be seen as a collection of **data** that has been processed, structured, or presented in a way that makes it meaningful to a recipient.

There are three principal uses of the word information, as according to **Buckland**'s book about Information and Information Systems:

- **Information-as-process**, what someone knows is changed when he or she is informed.
- **Information-as-knowledge**, information is also used to denote that which is imparted in information-as-process.
- **Information-as-thing**, information is also used attributively for objects, such as **data** and **documents**, that are referred to as information because they are regarded as being **informative**.
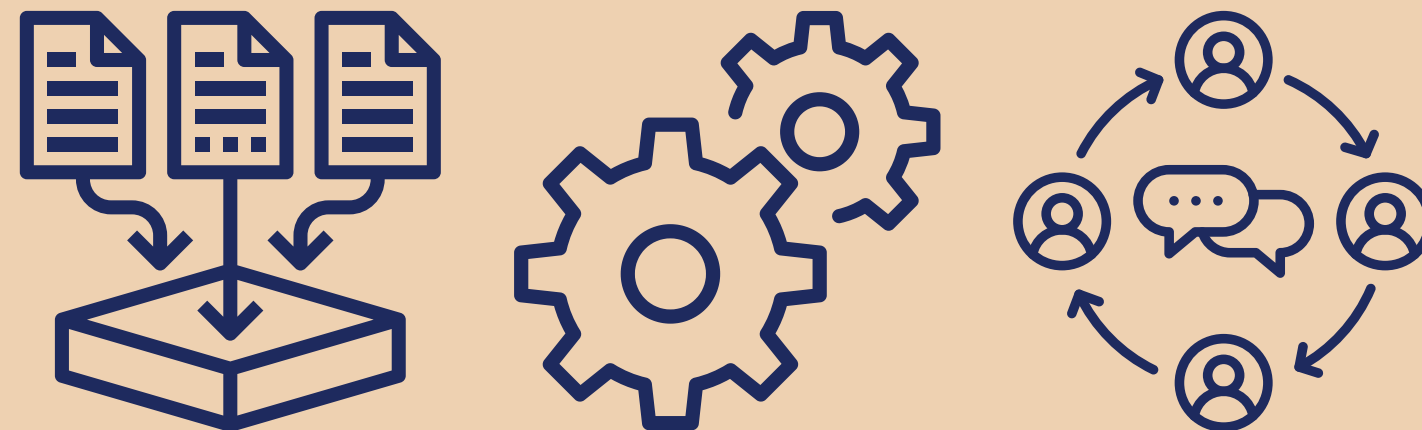
1 (Buckland, 1991)

Definitions of Information

Information as process

Information transforms an individual's **understanding** or **knowledge**. It involves the act of **becoming informed**, where what a person knows is altered. Essentially, information represents the act of conveying knowledge—either through telling or being told. This process is about the exchange and communication of information.[2]

Information as knowledge

Information is the **understanding** or **insights** that individuals gain from processing and interpreting information. It highlights that information is not just raw data or facts but becomes valuable when it is comprehended and integrated into one's existing framework of understanding.[3]

Information as thing

Information is considered as a **tangible** or **concrete entity**. In this context, information is viewed as a physical or digital object that can be **stored, retrieved,** and **transferred**. This could include documents, files, books, databases, or any material form where information is recorded.[4]

2 Kosciejew, M. (2017).
3 Burns et al., 2020)
4 (Landauer, 1999)

Information Systems

Information Systems are a coordinated set of components and resources that **collect, process, store,** and **distribute information**. These systems typically include hardware, software, data, people, and procedures. They are designed to **support decision-making, coordination, control, analysis**, and visualization in an organization or enterprise. A book defines **Information Systems (IS)** as systems that collects, processes, stores, analyzes and disseminates information for a specific purpose.[6]

Components of Information Systems

According to an article by **(Roch et al., 2022)**,[7] there are 4 components of Information Systems:

- **Technology**
- **People**
- **Process**
- **Data**
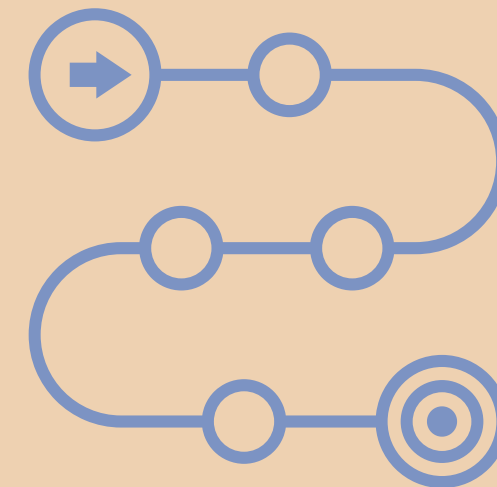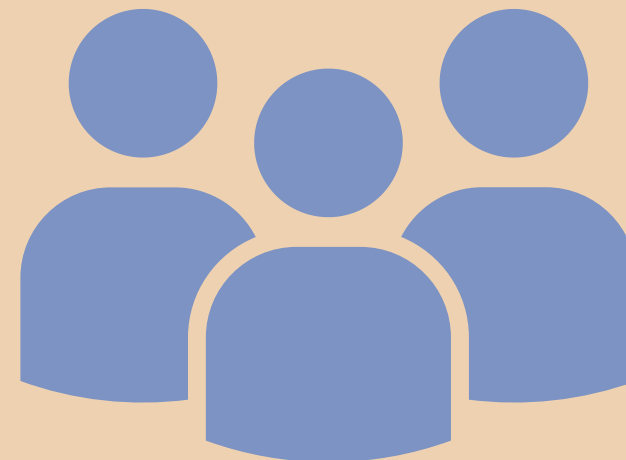
6 Zwass, V. (2024, August 14)
7 (Roch et al., 2022)
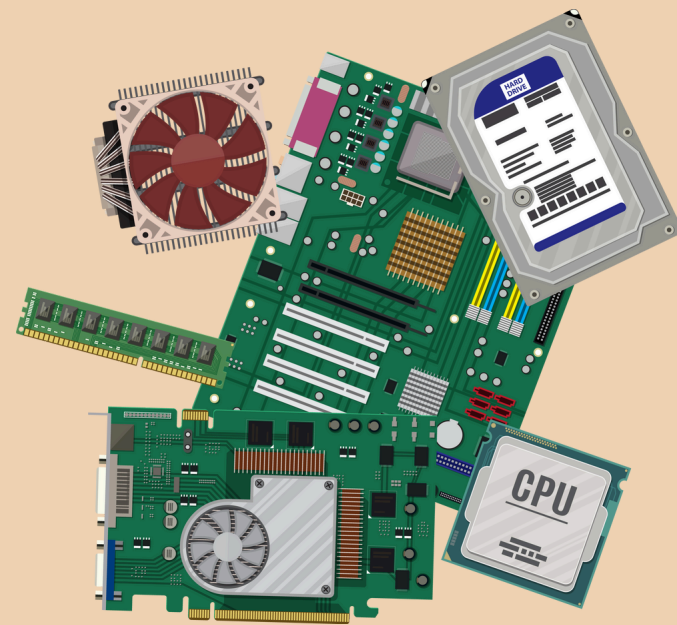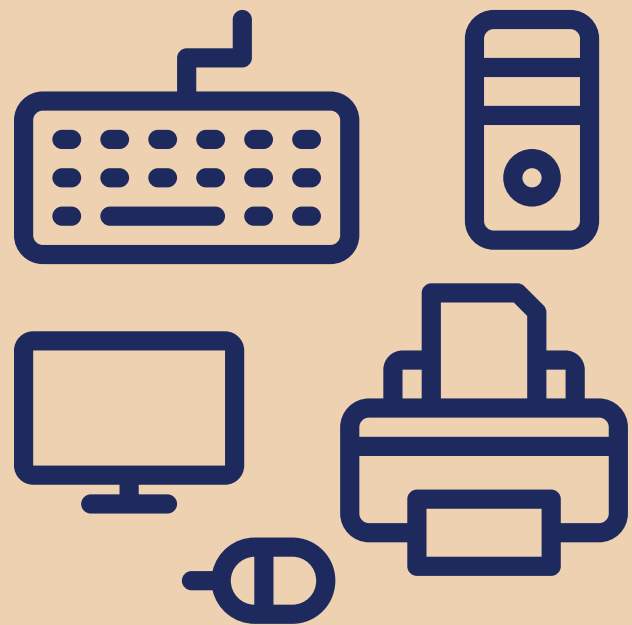
Technology
Components of Information Systems

- **Hardware:** The physical devices and equipment used to input, process, store, and output information. This includes computers, servers, and peripherals.
- **Software:** The programs and applications that run on the hardware and enable users to perform specific tasks. This includes operating systems, application software, and databases.
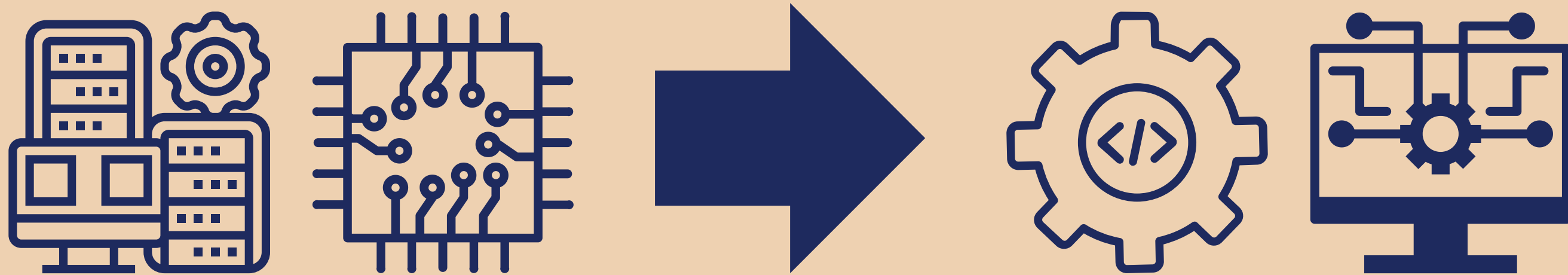
Technology
Hardware

- Hardware represents the physical components of an information system. Some can be seen or touched easily, while others reside inside a device that can only be seen by opening up the device's case. **Keyboards, mice, pens, disk drives, iPads, printers, and flash drives** are all visible examples. **Computer chips, motherboards, and internal memory chips** are the hardware that resides inside a computer case and not usually visible from the outside.[8]

8 (Pham et al., 2022)

Technology
Software

- Software is a set of instructions that tell the hardware what to do. Software is not tangible – it **cannot be touched**. Programmers create software programs by following a specific process to enter a list of instructions that tell the hardware what to do. There are several categories of software, with the two main categories being operating-system and application software. [8]

8 (Pham et al., 2022)

People

Components of Information Systems

The users who interact with the information system, including those who design, develop, manage, and use the system. This group encompasses IT professionals, end-users, and anyone involved in the information system's operation.

- **System Designers and Developers**
- **IT Administrators and Support Staff**
- **End-Users**
- **Managers and Decision-Makers**
- **Data Analysts and Scientists**
- **Stakeholders**

Process
Components of Information Systems

The procedures and rules that govern how data is collected, processed, and utilized. This includes workflows, methodologies, and protocols that ensure the effective functioning of the information system.

- **Data Collection**
- **Data Processing**
- **Data Storage**
- **Data Retrieval**
- **Data Analysis**
- **Information Dissemination**
- **Feedback and Improvement**
- **Security and Compliance**
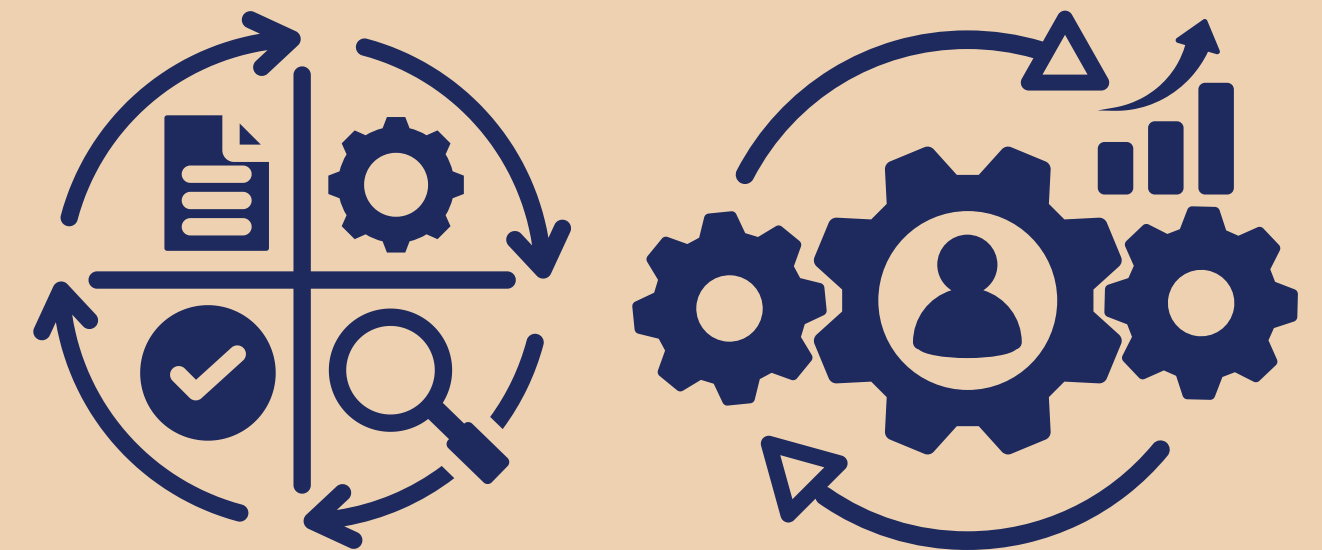
Data
Components of Information Systems

- Data in an information system refers to **raw facts** and **figures** collected from various sources, which are then processed to generate meaningful information.[9] It can be structured (organized in a predefined format), unstructured (lacking a specific format), or semi-structured (partially organized). **Data management** involves methods for collection, storage, retrieval, and ensuring data quality, such as accuracy and completeness. Security measures, including encryption and access controls, protect data from unauthorized access and breaches. Effective data analysis helps in understanding trends, predicting future outcomes, and making informed decisions.

9 (Lukyanenko, 2024)
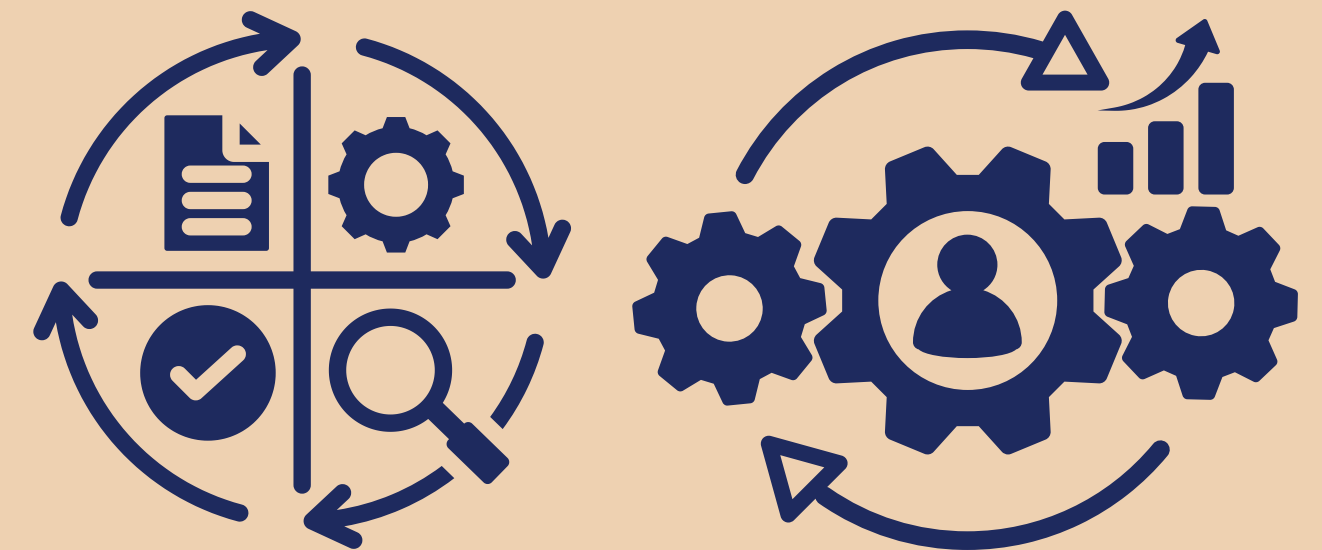
Different Types of Support Systems in Information Systems

There are different types [10] of support systems in information systems, Mainly, it includes:

- Transaction Processing System
- Operations Support System
- Management Support Systems
  - Decision Support System
  - Management Information System
  - Executive Information Systems

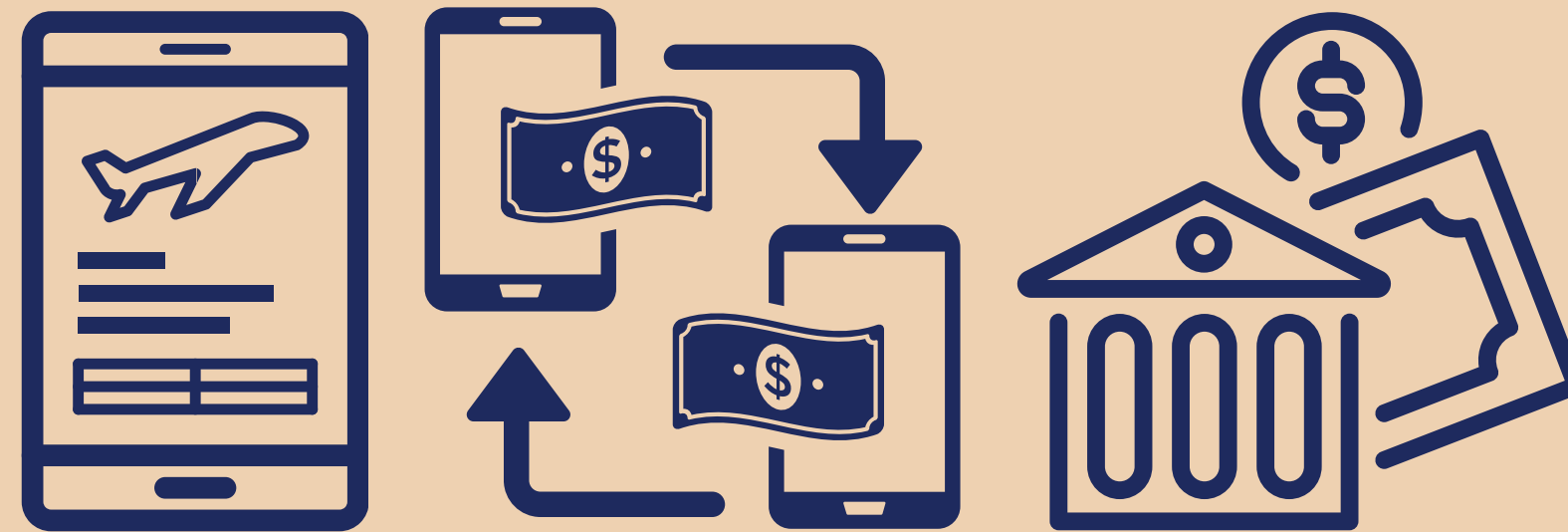**Operations Support System**

Management Support System

Decision Support System

10 (Publisher, 2016)

Transaction Processing System

Different Types of Support Systems in Information Systems

A **Transaction Processing System (TPS)** is a type of information system designed to handle and manage the routine transactions of an organization.[11] These systems are crucial for day-to-day operations, ensuring that transactions are processed efficiently, accurately, and in real-time or near-real-time. TPS are foundational to business operations, supporting tasks such as order processing, payroll, and inventory management.

- **e.g. airline reservation systems, electronic transfer of funds, bank account processing systems.**

11 (Katen, 2012)

Operations Support Systems

Different Types of Support Systems in Information Systems

An **Operational Support System (OSS)** is a type of software used by telecommunications and IT service providers to manage and support their network operations. OSS systems handle tasks such as network inventory management, fault management, configuration management, and performance monitoring.[12] Essentially, they help ensure that networks run smoothly by tracking and managing the various components and services within the network infrastructure. OSS is crucial for maintaining service quality and efficiency, as it provides the tools needed for monitoring, troubleshooting, and optimizing network performance.

12 (Kirvan, 2023)

Management Support System

Different Types of Support Systems in Information Systems

A **Management Support System (MSS)** refers to a category of information systems designed to assist managers in decision-making, planning, and control within an organization.[13] These systems provide relevant data, tools, and analytical capabilities to support effective management and strategic decision-making.

Three of the major systems under MSS:
- *Management Information System*
- *Decision Support System*
- *Executive Information System*

13 (Clark et al., 2007)

Management Support System

Different Types of Support Systems in Information Systems

- **Decision Support Systems (DSS):** These systems help managers make decisions by providing access to relevant data, models, and analytical tools. DSS often include data analysis capabilities and scenario modeling to support complex decision-making processes.

- **Executive Information Systems (EIS):** EIS provide top executives with easy access to key performance indicators (KPIs) and other critical data, often through dashboards and visualization tools. They are designed to offer high-level summaries and insights to support strategic decisions.

- **Management Information Systems (MIS):** MIS focus on providing routine reports and information to managers to support operational and tactical decision-making. These systems often handle day-to-day data and reporting needs.

13 (Clark et al., 2007)

Management Information System

Different Types of Support Systems in Information Systems

ISMIS, also known as Integrated School **Management Information System**, is one example of a Management Information System under Management Support Systems.
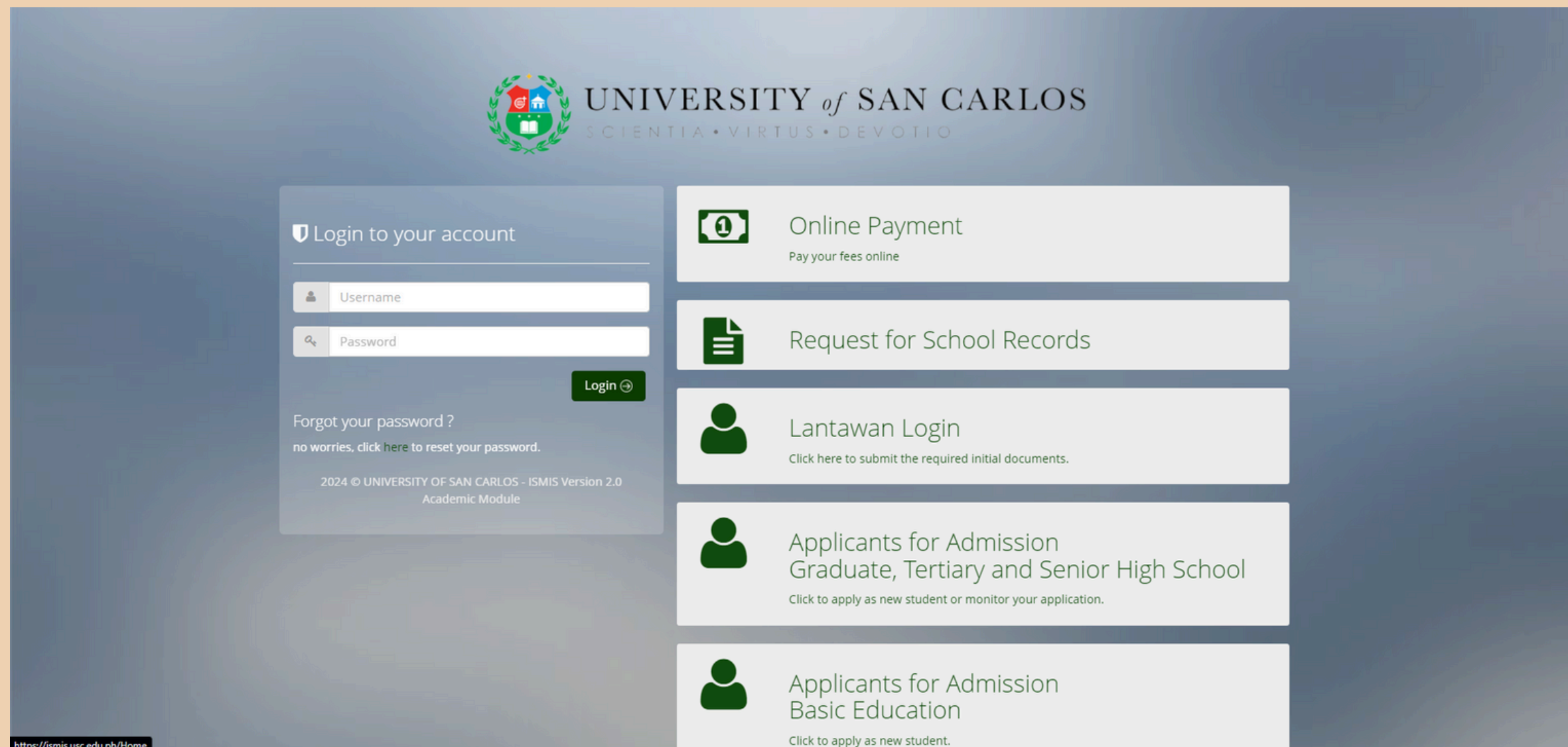
Analysis

Information, Data, and Information Systems are closely related to each other. Information Systems are the systems that help organize, analyze, and distribute information in order to help certain individuals, especially from the IT and Business side to make informed decisions, to create awareness and control for their organization or enterprise. Information is ambiguous, but it is simply a collection of data that has been processed, structured and delivered in some kind of way; but most notably through Information Systems. There are 4 components to Information Systems, mainly, they are: Technology, People, Process and Data. With these 4 components, they make up a complete structure of an Information System. The technology is there to help automate tasks and make processes more efficient. The people are the ones using said technology, and using that technology is called the process. Lastly, we raw feed data into the technology, which is then analyzed, structured and converted into a more meaningful and organized collection of data. With this, we are efficiently applying the concept of Information Systems in order to aid us in understanding raw collections of data in making informed decisions and strategies. Common types of information systems are Transaction Processing System (TPS), Operation Support System (OSS), and Management Support Systems (MSS). TPS deals with routine transactions in an organization. These may include bank transactions, payment transactions, airline transactions and other transactions. Operation Support Systems help especially Telecommunication networks and IT infrastructures in networking, configuring and and performance monitoring. Lastly, Management Support Systems can be broken down into Decision-support systems, Executive Information Systems and Management Information Systems. Decision-support systems contain analytical tools that help aid making informed decisions. Executive Information Systems provide executive-level personnel with performance analytics through dashboards and other tools. Lastly, Management Information Systems focus on providing day-to-day reports for operational and tactical decision making, similar to that of a Decision support system.

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