**Prak-Shastri 2nd**

**Computer Science**

**Unit: 3rd**

# Business Data Processing

**Introduction to Business Data Processing**

Business data processing is the collection, management, and analysis of data used to support the operations of a business. It involves the use of computer systems and software to automate and streamline various business processes, such as accounting, inventory management, customer relationship management, and decision-making.

The goal of business data processing is to improve the efficiency and effectiveness of a business by providing accurate and timely information. This information is used to support a wide range of business activities, such as strategic planning, marketing, and customer service.

There are several key components of business data processing, including:

1. Data input: This refers to the process of collecting and entering data into the system. This can be done manually or through the use of automated methods, such as data scraping or electronic data interchange (EDI).

2. Data storage: This refers to the process of storing data in a secure and organized manner. This can be done using databases, data warehouses, or cloud-based storage solutions.

3. Data processing: This refers to the process of manipulating, analyzing, and transforming data. This can be done using a variety of software tools, such as spreadsheets, statistical analysis software, or programming languages like Python, R, SQL.

4. Data output: This refers to the process of presenting data in a meaningful and useful format. This can be done using reports, dashboards, or other visualization tools.

5. Data security: This refers to the process of protecting data from unauthorized access, use, disclosure, disruption, modification, or destruction. This can be done using a variety of security measures, such as encryption, firewalls, and intrusion detection systems.

Business data processing enables businesses to make better decisions and improve their operations by providing them with accurate and actionable information.

**Management functions, Levels of management**

Management functions are the essential activities that are performed by managers in order to achieve the goals of an organization. The primary management functions are:

1. Planning: This involves setting goals and objectives for the organization, and developing strategies and plans to achieve them.

2. Organizing: This involves structuring the organization, allocating resources, and establishing policies and procedures.

3. Staffing: This involves recruiting, hiring, and training employees, as well as managing their performance.

4. Directing: This involves leading and motivating employees to achieve the goals of the organization.

5. Controlling: This involves monitoring and evaluating the performance of the organization, and making necessary adjustments to ensure that goals are being met.

The levels of management refer to the different hierarchical levels in an organization, each of which has a different scope of responsibility and authority. The levels of management are:

1. Top management: This includes the highest-level executives, such as the CEO, COO, and CFO, who are responsible for overall strategy and direction of the organization.

2. Middle management: This includes department heads, division managers, and other managers who are responsible for implementing the plans and policies set by top management.

3.  Lower management: This includes supervisors, team leaders, and front-line managers who are responsible for day-to-day operations and managing the work of front-line employees.

Each level of management has a different role to play in achieving the goals of the organization, and they work together to ensure the smooth running of the organization.

**Information requirements for planning, coordination, and control for various levels in Business, Industry, and Government.**

Information requirements for planning, coordination, and control vary depending on the level of management and the type of organization. In general, however, managers at all levels need access to accurate and relevant information in order to make informed decisions and effectively manage the operations of the organization.

For top management, this may include financial information, such as income statements and balance sheets, as well as industry trends and market research. They also need information on the company's strategic plans, performance metrics and key performance indicators (KPIs) to evaluate the progress of the company and make adjustments as necessary.

Middle management, needs information on the performance of specific departments, such as sales, production or logistics, as well as information on the performance of specific projects. They also need information on the implementation of plans and policies set by top management, and feedback on the effectiveness of those plans and policies.

Lower management needs operational information, such as production schedules, inventory levels, and customer orders, as well as information on the performance of front-line employees. They also need information on the implementation of policies and procedures set by middle management, and feedback on the effectiveness of those policies and procedures.

In Industry, similar information is needed but on a larger scale, with emphasis on the production process and cost control.

In Government, information requirements for planning, coordination, and control vary depending on the level of government and the specific agency. For example, a national government may require information on GDP, inflation, unemployment, and other macroeconomic indicators, while a local government may require information on population demographics, infrastructure, and public services.

The information requirements for planning, coordination, and control at various levels in business, industry, and government include financial, operational, and strategic data that help managers to make informed decisions and effectively manage the operations of their organization.

**Large volumes of data and data handling implicit**

Large volumes of data, also known as big data, pose significant challenges for data handling and management. The sheer volume of data makes it difficult to store, process, and analyze using traditional methods. Some of the implicit challenges associated with handling large volumes of data include:

1. Storage: Storing large volumes of data requires significant amounts of storage space and can be expensive. Additionally, traditional storage methods may not be able to handle the volume and velocity of big data.

2. Processing: Traditional data processing methods may not be able to handle the large volumes of data in a timely manner, leading to delays in decision making and analysis.

3. Analysis: Analyzing large volumes of data can be difficult and time-consuming, especially when using traditional methods such as spreadsheets and SQL databases.

4. Security: Protecting large volumes of data can be difficult, and there is an increased risk of data breaches and unauthorized access.

5. Data Quality: Large volumes of data often include a high degree of variability, incompleteness, and inconsistencies, which can make it difficult to achieve high data quality.

To handle large volumes of data, organizations are increasingly turning to advanced technologies such as distributed storage and processing systems, such as Hadoop and Spark, and big data analysis tools like Apache Storm, Apache Flink, and Apache Kafka.

Organizations are also turning to machine learning and artificial intelligence to help with the analysis of big data. These technologies can be used to automatically identify patterns and trends in large volumes of data, making it easier to make decisions and predictions based on that data.

handling large volumes of data requires advanced technologies, specialized skills, and a strategic approach to data management. It is important for organizations to have a clear

understanding of their data requirements and to implement appropriate solutions to manage and analyze big data effectively.

**identification of relevant data.**

Identifying relevant data is a crucial step in managing large volumes of data. Relevant data is the data that is needed to make informed decisions, solve problems, and achieve business objectives. Identifying relevant data involves understanding the specific information needs of the organization and its stakeholders, as well as the context in which the data will be used.

There are several ways to identify relevant data:

1. Define the business objectives: Understanding the overall goals of the organization helps to identify the data that is needed to achieve those goals.

2. Identify key performance indicators (KPIs): Determining the critical metrics that are used to measure the performance of the organization helps to identify the data that is needed to track those metrics.

3. Understand the data sources: Knowing where the data is located and how it is collected helps to identify the data that is needed.

4. Understand the data users: Knowing who will use the data and how it will be used helps to identify the data that is needed.

5. Use data profiling and data discovery tools: These tools can automatically scan large volumes of data and identify patterns and trends, which can help to identify relevant data.

6. Use data governance and data management best practices: Having a clear data governance and management strategy in place helps to ensure that the right data is being collected, stored, and used.

Once relevant data is identified, it is important to ensure that the data is accurate, complete, and consistent. This requires data validation, data cleaning, and data standardization processes. Additionally, relevant data should be stored in a secure and accessible location, and be backed up regularly.

Identifying relevant data is a crucial step in managing large volumes of data. It involves understanding the specific information needs of the organization, understanding the context in which the data will be used, and implementing appropriate data management best practices.

**Classification of data elements by function and by source, primary and secondary.**

Classifying data elements by function and by the source is an important step in managing large volumes of data. This process helps to organize and understand the data, making it easier to use and analyze.

1. Classifying data by function: This involves grouping data elements based on their intended use or purpose. Common functional categories include financial data, sales data, customer data, and operational data. This helps to ensure that data is used in the appropriate context and that the right data is being used to support specific business objectives.

2. Classifying data by source: This involves grouping data elements based on where they originated. Common sources of data include internal systems, external vendors, and third-party data providers. This helps to understand the data's quality, reliability, and completeness and ensures that the data is being used in the appropriate context.

3. Classifying data as primary and secondary: Primary data is the data that is collected directly from the source and is unique to the organization. This data is often used for decision-making and is considered to be the most reliable. Secondary data is data that is already available and has been collected by other sources. This data is often used for research and analysis and is considered to be less reliable.

Classifying data in this way helps to ensure that the right data is being used for the right purposes. It also helps to identify any gaps in data collection and to prioritize data collection efforts. Additionally, it can help to identify any inconsistencies or inaccuracies in the data and to ensure that the data is being used in the appropriate context.

Classifying data elements by function and by source, primary and secondary, is an important step in managing large volumes of data. It helps to organize and understand the data, making it easier to use and analyze and helps to ensure that the right data is being used for the right purposes.

**Historical data for reference and analysis.**

Historical data is a valuable resource for reference and analysis. It refers to data that has been collected over a period of time and can provide insights and context for current and future decisions. Historical data can be used for a variety of purposes such as:

1. Trend analysis: Historical data can be used to identify trends and patterns in business performance, customer behavior, and market conditions. This information can be used to predict future trends and make informed decisions.

2. Benchmarking: Historical data can be used to compare current performance to previous performance. This helps to identify areas of strength and weakness and to set realistic goals and targets.

3. Performance measurement: Historical data can be used to measure the effectiveness of business strategies and tactics. This helps to identify what works and what doesn't and to make adjustments accordingly.

4. Compliance: Historical data can be used to demonstrate compliance with regulations and laws. This includes data related to safety, finance, and environmental regulations.

5. Research: Historical data can be used to conduct research on various topics such as customer behavior, market trends, and industry standards.

6. Audit: Historical data can be used as evidence in an audit, to show that an organization has followed financial and legal regulations.

Historical data is accurate, complete, and consistent. This requires data validation, data cleaning, and data standardization processes. Additionally, historical data should be stored in a secure and accessible location, and be backed up regularly.

Historical data is a valuable resource for reference and analysis. It provides insights and context for current and future decisions and can be used for a variety of purposes such as trend analysis, benchmarking, performance measurement, compliance, research, and audit.

**Need or ensure accurate, reliable, and timely processing of data.**

Ensuring accurate, reliable, and timely processing of data is essential for making informed business decisions. The following are some key ways to achieve this:

1. Data validation: Data validation is the process of checking data for accuracy and completeness. This includes checks for missing data, incorrect data, and data that falls outside of acceptable ranges. Data validation helps to ensure that the data is accurate and complete before it is used for analysis or decision-making.

2. Data cleaning: Data cleaning is the process of removing or correcting inaccuracies in the data. This includes checks for duplicate data, inconsistent data, and data

that is missing or incomplete. Data cleaning helps to ensure that the data is consistent and reliable.

3. Data standardization: Data standardization is the process of ensuring that data is consistent and follows a specific format. This includes checks for consistent data types, consistent data structures, and consistent data names. Data standardization helps to ensure that data can be easily integrated and used for analysis.

4. Data security: Data security is the process of protecting data from unauthorized access, use, disclosure, disruption, modification, or destruction. This includes implementing measures such as encryption, access controls, and backups to ensure the data is safe and secure.

5. Data Governance: Data governance is the process of ensuring that data is properly managed throughout its lifecycle. This includes implementing policies and procedures for data management, as well as designating roles and responsibilities for data management.

6. Real-time data processing: Real-time data processing is the process of analyzing and responding to data as it is generated. This enables organizations to respond quickly to changes in the data and make timely decisions.

7. Automation: Automation can be used to streamline data processing, reducing the need for manual data entry and reducing the risk of errors. Automation can also be used to schedule data processing, ensuring that data is processed in a timely manner.

ensuring accurate, reliable, and timely processing of data is essential for making informed business decisions. This requires implementing data validation, data cleaning, data standardization, data security, data governance, real-time data processing, and automation to help ensure data is accurate, reliable, and timely.

**Basic tasks in business data processing, data origination, capture, sorting, merging, calculating, summarizing**

Business data processing includes a variety of tasks that are used to collect, organize, analyze, and disseminate data. The following are some basic tasks that are commonly performed in business data processing:

1. Data origination: Data origination is the process of creating or collecting data. This can include data entry, data collection from external sources, or data generation through processes such as surveys or experiments.

2. Data capture: Data capture is the process of acquiring data from various sources. This can include data entry, data scanning, or data import from external sources.

3. Data sorting: Data sorting is the process of organizing data into a specific order. This can include sorting data by date, by customer name, or by-product.

4. Data merging: Data merging is the process of combining data from multiple sources into a single dataset. This can include combining data from different spreadsheets or databases, or data from different systems.

5. Data calculating: Data calculating is the process of performing mathematical operations on data. This can include calculating totals, averages, or other summary statistics.

6. Data summarizing: Data summarizing is the process of creating a condensed version of data. This can include creating pivot tables, creating charts, or creating reports.

7. Data reporting: Data reporting is the process of presenting data in a clear and meaningful way. This can include creating charts, tables, or other visualizations to help communicate the data effectively.

Business data processing involves a variety of tasks that are used to collect, organize, analyze, and disseminate data. These tasks include data origination, data capture, data sorting, data merging, data calculating, data summarizing, and data reporting to help make sense of large volumes of data and make informed business decisions.

**managing output results, sorting and retrieving transmission, both interim**

Managing output results involves ensuring that the data has been processed accurately and that the results are presented in a clear and meaningful way. This includes sorting and retrieving the data as needed, and transmitting the results, both interim and final.

Sorting and retrieving data is an important task in managing output results as it allows users to easily find the information they need. This can be done by sorting data by specific criteria, such as date, customer name, or product, or by using search and filter functions.

Transmission of results is also an important aspect of managing output results. This includes transmitting interim results, such as progress reports, as well as final results,

such as a complete set of data or a final report. Transmission can be done through various methods such as email, file transfer, or printing.

managing output results involves ensuring that the data has been processed accurately, that the results are presented in a clear and meaningful way, and that the results can be easily found and transmitted as needed. This includes sorting and retrieving the data and transmitting the results, both interim and final, in a way that is convenient for the users.

**examples of business data processing and applications payroll, financial, accounting, inventory**

Business data processing is used in a wide variety of industries and applications. Some examples of business data processing and applications include:

1. Payroll: Payroll data processing involves collecting and processing employee information, such as hours worked and pay rates, in order to calculate and distribute employee paychecks. This includes tasks such as data entry, data calculation, and data reporting.

2. Financial: Financial data processing involves collecting, processing, and analyzing financial data, such as sales and expenses, in order to make informed business decisions. This includes tasks such as data entry, data calculation, data analysis, and data reporting.

3. Accounting: Accounting data processing involves collecting and processing financial information, such as invoices and payments, in order to maintain accurate financial records. This includes tasks such as data entry, data calculation, data analysis, and data reporting.

4. Inventory: Inventory data processing involves collecting and processing information about the products a business has in stock, such as the quantity, location, and cost of the products. This includes tasks such as data entry, data calculation, data analysis, and data reporting.

These are just a few examples of business data processing and applications in different industries. Business data processing is used in almost every industry to collect, process, analyze, and disseminate data in order to make informed business decisions.

**A computer system as a potential tool to meet business data processing needs**

A computer system can be a powerful tool to meet business data processing needs. It can automate many of the tasks involved in collecting, processing, analyzing, and disseminating data, which can save time and resources.

One of the main advantages of using a computer system for business data processing is the ability to process large volumes of data quickly and accurately. Computers can perform calculations and analyze data much faster than humans, which is particularly useful when dealing with large data sets.

Another advantage of using a computer system is the ability to automate repetitive tasks. For example, data entry can be automated using optical character recognition (OCR) software, which can scan documents and automatically extract information. This can save time and reduce errors.

Computer systems also offer the ability to store and retrieve data easily. This allows for quick and easy access to historical data for reference and analysis. Data can also be easily shared among different departments and users through a network.

Computer systems can be integrated with other software, such as accounting software and inventory management software, to provide a more complete and efficient solution for businesses. Using a computer system can greatly improve the efficiency and accuracy of business data processing. It can automate many tasks, process large volumes of data quickly and accurately, and provide easy access to historical data for reference and analysis.

**facilities available in computerized systems for data capture; online and offline; validation; storage; processing output; transmission.**

Computerized systems have several facilities available for data capture, including both online and offline methods.

1. Online data capture: Online data capture refers to the process of collecting data directly from the source, such as a website or application, in real time. This is typically done through the use of forms or other input fields on a website or application.

2. Offline data capture: Offline data capture refers to the process of collecting data from sources that are not connected to the internet, such as paper forms or spreadsheets. This data is then entered manually or scanned into the computer system.

In addition to data capture, computerized systems also have facilities for data validation. This refers to the process of checking the data for accuracy and completeness before it is stored and processed. This can include checks for missing or incorrect data, as well as validation against external data sources.

Computerized systems also have facilities for data storage, which includes the ability to store and retrieve data in a variety of formats, such as databases and spreadsheets. This data can be easily accessed, updated, and shared among different departments and users.

Computerized systems also have facilities for processing output, which includes the ability to perform calculations and analyze data in a variety of formats, such as graphs, charts, and reports. This can be used to generate insights and make informed business decisions.

Finally, computerized systems also have facilities for data transmission, which includes the ability to share data among different systems and users, both internally and externally. This can be done through a variety of methods, such as email, file transfer protocols (FTP), and cloud-based services.

7. Overview of Business Applications                                8 sessions

Design, analysis, and development of Computerized Financial Accounting,

Computerized Inventory Control, Computerized Payroll, Computerized Invoicing application

**Business Applications analysis, and development of Computerized Financial Accounting**

Computerized financial accounting is the use of computer technology to automate and streamline the process of recording and reporting financial transactions. This can include everything from basic bookkeeping tasks, such as recording sales and expenses, to more complex activities like financial forecasting and budgeting. Businesses use computerized financial accounting systems to improve the accuracy, efficiency, and speed of their financial operations, as well as to gain greater insights into their financial performance. Some common business applications of computerized financial accounting include:

- Automating the process of recording and tracking financial transactions, such as sales, expenses, and payments.

- Generating financial reports, such as income statements and balance sheets, in real-time.

- Analyzing financial data to identify trends and patterns, such as identifying areas of overspending or identifying sales trends.

- Budgeting and forecasting future financial performance.

- Improving financial decision-making by providing real-time financial information to managers and other stakeholders.

- Automating compliance with financial regulations and reporting requirements.

- Integration with other business systems such as inventory management, payroll, and CRM.

- Providing a secure, centralized location to store and access financial data.

**Business Applications: Computerized Inventory Control**

Computerized inventory control is the use of computer technology to manage and track inventory levels, sales, and purchasing. This can include everything from basic inventory management tasks, such as tracking stock levels and reordering products, to more advanced features like forecasting demand and setting inventory targets. Businesses use computerized inventory control systems to improve the efficiency, accuracy and speed of their inventory management. Some common business applications of computerized inventory control include:

- Tracking inventory levels in real-time to ensure that stock is always available to meet customer demand.

- Automating the process of reordering products when stock levels fall below a certain threshold.

- Generating reports that provide insight into inventory levels, sales trends, and purchasing patterns.

- Forecasting demand for products to ensure that the right amount of stock is always on hand.

- Managing and tracking the movement of products throughout the supply chain.

- Integrating with other business systems such as accounting, sales, and e-commerce platforms.

- Improving inventory accuracy by reducing human error and increasing the speed of data entry.

- Reducing the risk of stockouts and overstocking by providing real-time information about inventory levels.

- Enhancing security by controlling access to inventory data and tracking inventory movements.

Computerized inventory control systems can be used in a variety of industries, including retail, manufacturing, wholesale, and logistics.

**Computerized Payroll**

Computerized payroll is the use of computer technology to automate the process of calculating, withholding, and distributing employee pay. This can include tasks such as calculating taxes and deductions, generating paychecks or direct deposits, and tracking employee hours and attendance. Businesses use computerized payroll systems to improve the accuracy, efficiency, and speed of their payroll operations, as well as to gain greater insights into their employee data. Some common business applications of computerized payroll include:

- Automating the process of calculating employee pay, including taxes and deductions.

- Generating and distributing paychecks or direct deposits in a timely manner.

- Tracking employee hours and attendance, and automatically calculating overtime pay.

- Generating reports that provide insight into employee pay and attendance data.

- Managing employee benefits and deductions, such as 401(k) contributions, health insurance, and other deductions.

- Integrating with other business systems such as accounting, human resources, and time and attendance systems.

- Improving accuracy by reducing human error and increasing the speed of data entry.

- Complying with all necessary regulations and laws regarding payroll.

- Enhancing security by controlling access to payroll data and tracking payroll movements.

Computerized payroll systems can be used in a variety of industries, including retail, manufacturing, wholesale, and logistics. They are widely used by small to large-sized companies.

**Computerized Invoicing application**

Computerized invoicing is the use of computer technology to automate the process of creating, sending, and tracking invoices. This can include tasks such as generating invoices based on sales or service data, sending invoices electronically, and tracking payment status. Businesses use computerized invoicing systems to improve the efficiency, accuracy, and speed of their invoicing operations, as well as to gain greater insights into their customer data. Some common business applications of computerized invoicing include:

- Automating the process of generating invoices based on sales or service data.

- Sending invoices electronically, via email or an online portal.

- Tracking payment status and generating reminders for overdue invoices.

- Generating reports that provide insight into customer data and invoicing activity.

- Integrating with other business systems such as accounting, sales, and customer relationship management (CRM) systems.

- Improving accuracy by reducing human error and increasing the speed of data entry.

- Enhancing security by controlling access to invoicing data and tracking invoicing movements.

- Automating compliance with tax regulations and laws related to invoicing.

- Offering customers, the ability to view and pay invoices online.

Computerized invoicing systems can be used in a variety of industries, including retail, manufacturing, wholesale, and service-based businesses. They are widely used by small to large-sized companies.


**Practice Question**

1. What are business applications and how do they support the various functions of an organization?

2. What is a business data processing and why is it important for organizations?

3. How does data processing support the various functions of a business, such as finance, marketing, and operations?

4. Can you explain the different types of data processing systems and their specific uses in a business?

5. How does data processing help organizations make decisions and improve decision-making processes?

6. How do organizations collect and store business data, and what are the best practices for data management?

7. How can organizations ensure the security and integrity of their business data?

8. How can organizations analyze and interpret business data to gain insights and identify trends?

9. How does data processing technology, such as big data and artificial intelligence, impact business operations and decision-making?

10. How do organizations implement and maintain data processing systems, and what are the common challenges that arise during this process?

11. How do organizations use data processing to improve customer engagement and satisfaction?

12. How do different types of business applications, such as accounting software, CRM systems, and ERP systems, support specific business processes?

13. How can business applications improve efficiency and productivity within an organization?

14. How do business applications integrate with other systems and technologies, such as databases and the cloud?

15. How do organizations select and implement business applications, and what are the common challenges that arise during this process?

16. How do organizations ensure the security and compliance of business applications and the data they store?

17. How do organizations use business applications to gain insights and make data-driven decisions?

18. How do business applications support collaboration and communication within an organization?

19. How do mobile and web-based business applications impact the way organizations work and interact with customers?

20. How do organizations use business applications to improve customer engagement and satisfaction?