

4.13: Summary

In this chapter, we learned about the role that data and databases play in the context of information systems. Data is made up of small facts and information without context. If you give data context, then you have information. Knowledge is gained when information is consumed and used for decision-making. A database is an organized collection of related information. Relational databases are the most widely used type of database, where data is structured into tables, and all tables must be related to each other through unique identifiers or keys. A database management system (DBMS) is a software application used to create and manage databases and take the form of a personal DBMS, used by one small business or person versus an enterprise DBMS that multiple users can use.

Big data refers to the large, complex datasets with high volume, velocity, and variety that require advanced techniques to store and analyze. A data warehouse is a special form of database that takes data from other databases in an enterprise and organizes it for analysis. Data mining is the process of looking for patterns and relationships in large data sets. Many businesses use databases, big data, data warehouses, and data-mining techniques to produce business intelligence and gain a competitive advantage.

Proper database design applies principles like normalization to reduce duplication and ensure flexibility. Fields have defined data types and constraints. Spreadsheets are limited compared to relational databases in modeling complex data relationships. As data volumes grow exponentially, non-relational databases provide scalability and flexibility lacking in traditional relational models. Data governance and ethics are becoming crucial with the increasing use of data analytics and personal data collection. Overall, data organized in purpose-built databases enables extraction of meaningful information, knowledge, and ultimately wisdom.

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