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Module 1 - Database Research  
  
What is a database?

A database is a sort of container that can store a collection of information. That information can have a simple structure to very complex structure. That structure is organized as records in tables and those records have fields that share relationships. The records within the tables can then be accessed and existing information can be read, modify (updated), cross referenced or deleted and new information can be written.

What is a database function?

A database function allows for certain tasks to be performed on the information in the database, primarily from within the database. These functions can be as simple as sorting the information in an alphanumeric order, grouping the information, analyzing the information and creating reports. Basically, filtering the information against predefined parameters or even executing mathematical operations that calculate things like the sum or the median of multiple record rows.

What are databases used for?

A database is used to store information as data, organizing that data in meaningful ways, like a mailing list of your customers so that it can be search to see who made the most purchases over a specific calendar period or the highest dollar amount, or to determine your five most frequently sold products. This same database could be connected to a website listing your products and provide up to date access to multiple customers at any given time yet also allowing a certain level of security.

What are the advantages and disadvantages of databases?

Some of the advantages are the centralization of information, multiple users can view, sort, share and edit that information simultaneous. They provide a reduction of redundancy. The entry of the information is faster and increases accuracy and the reliability of the information all in a consistent format. That same information can then be queried in ways that reveal things about the data and its relationship to other information. The disadvantages of a database are that whether it is house at a physical location like an on-site server farm or somewhere in the cloud through a service like amazon cloud there are varying costs. The infrastructure for access via direct or remote, the hardware, the software and the skilled individuals required to create and maintain them all add to the costs.

How are databases used?

Databases’ are integrated into almost all (if not all) aspects of our modern world and integral to our daily lives here in the western world specifically where data and its mining are almost a form of currency. Everyone from the financial, medical, and insurance industries to social media, news organizations and streaming media services all use some form of database(s). From simple business databases that hold information like a list of payroll disbursements or an updateable price list of machine screws and their stock availability to weather science where very complex data about interrelated weather patterns are gathered together, stored across multiple database and then analyzed to create predictive models and future weather forecasts. Databases are everywhere, they are used in large office facilities to capture usage statistics in eco-friendly water boiler systems that anticipate hot water needs and create better efficiency via internal analysis of that capture information. Right down to our local grocery stores where a handheld inventory device can be used to scan bar codes where the user then updates the current stock to determine sales volumes or loss through theft. That same information can then be transferred to a larger centralized database where an automation system determines when to order more of the low stock or high selling products and then has them shipped to the store. On an individual level we utilize database perhaps without realizing how often we do. Our personals cell phones with the stored phone numbers and contact list, to our digital devices like sports watches that gather our heart rate, water intake, the calories we burn or number of steps we take, even our portable music devices with our favorite playlists and pod casts. All that information is gathered together and held in databases to be search, sorted, mined, explored and analyzed.