

USING A RELATIONAL DATABASE FOR BUSINESS ADVANTAGES

LO 6.3: Identify the business advantages of a relational database.

Many business managers are familiar with Excel and other spreadsheet programs they can use to store business data. Although spreadsheets are excellent for supporting some data analysis, they offer limited functionality in terms of security, accessibility, and flexibility and can rarely scale to support business growth. From a business perspective, relational databases offer many advantages over using a text document or a spreadsheet, as displayed in Figure 6.12.

Increased Flexibility

Databases tend to mirror business structures, and a database needs to handle changes quickly and easily, just as any business needs to be able to do. Equally important, databases need to provide flexibility in allowing each user to access the information in whatever way best suits his or her needs. The distinction between logical and physical views is important in understanding flexible database user views. The *physical view of information* deals with the physical storage of information on a storage device. The *logical view of information* focuses on how individual users logically access information to meet their own particular business needs.

In the database illustration from Figure 6.10, for example, one user could perform a query to determine which recordings had a track length of four minutes or more. At the same time, another user could perform an analysis to determine the distribution of recordings as they relate to the different categories. For example, are there more R&B recordings than rock, or are they evenly distributed? This example demonstrates that although a database has only one physical view, it can easily support multiple logical views that provide for flexibility.

Consider another example—a mail-order business. One user might want a report presented in alphabetical format, in which case, the last name should appear before first name. Another user, working with a catalog mailing system, would want customer names appearing as first name and then last name. Both are easily achievable but different logical views of the same physical information.

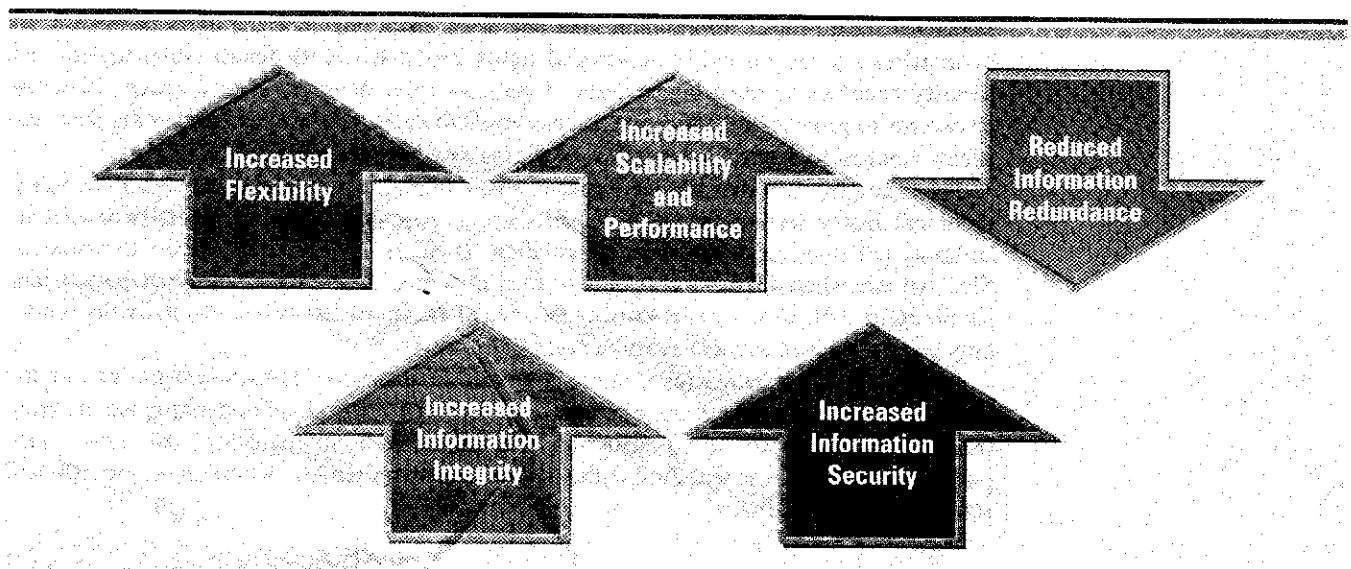
Increased Scalability and Performance

In its first year of operation, the official website of the American Family Immigration History Center, www.ellisland.org, generated more than 2.5 billion hits. The site offers immigration information about people who entered America through the Port of New York and Ellis Island between 1892 and 1924. The database contains more than 25 million passenger names that are correlated to 3.5 million images of ships' manifests.⁴

The database had to be scalable to handle the massive volumes of information and the large numbers of users expected for the launch of the website. In addition, the database

FIGURE 6.12

Business Advantages of a Relational Database



needed to perform quickly under heavy use. Some organizations must be able to support hundreds or thousands of users, including employees, partners, customers, and suppliers, who all want to access and share the same information. Databases today scale to exceptional levels, allowing all types of users and programs to perform information-processing and information-searching tasks.

Reduced Information Redundancy

Information redundancy is the duplication of data, or the storage of the same data in multiple places. Redundant data can cause storage issues along with data integrity issues, making it difficult to determine which values are the most current or most accurate. Employees become confused and frustrated when faced with incorrect information causing disruptions to business processes and procedures. One primary goal of a database is to eliminate information redundancy by recording each piece of information in only one place in the database. This saves disk space, makes performing information updates easier, and improves information quality.

Increased Information Integrity (Quality)

Information integrity is a measure of the quality of information. **Integrity constraints** are rules that help ensure the quality of information. The database design needs to consider integrity constraints. The database and the DBMS ensures that users can never violate these constraints. There are two types of integrity constraints: (1) relational and (2) business critical.

Relational integrity constraints are rules that enforce basic and fundamental information-based constraints. For example, a relational integrity constraint would not allow someone to create an order for a nonexistent customer, provide a markup percentage that was negative, or order zero pounds of raw materials from a supplier. A **business rule** defines how a company performs certain aspects of its business and typically results in either a yes/no or true/false answer. Stating that merchandise returns are allowed within 10 days of purchase is an example of a business rule. **Business-critical integrity constraints** enforce business rules vital to an organization's success and often require more insight and knowledge than relational integrity constraints. Consider a supplier of fresh produce to large grocery chains such as Kroger. The supplier might implement a business-critical integrity constraint stating that no product returns are accepted after 15 days past delivery. That would make sense because of the chance of spoilage of the produce. Business-critical integrity constraints tend to mirror the very rules by which an organization achieves success.

The specification and enforcement of integrity constraints produce higher-quality information that will provide better support for business decisions. Organizations that establish specific procedures for developing integrity constraints typically see an increase in accuracy that then increases the use of organizational information by business professionals.

Increased Information Security

Managers must protect information, like any asset, from unauthorized users or misuse. As systems become increasingly complex and highly available over the Internet on many devices, security becomes an even bigger issue. Databases offer many security features, including passwords to provide authentication, access levels to determine who can access the data, and access controls to determine what type of access they have to the information.

For example, customer service representatives might need read-only access to customer order information so they can answer customer order inquiries; they might not have or need the authority to change or delete order information. Managers might require access to employee files, but they should have access only to their own employees' files, not the employee files for the entire company. Various security features of databases can ensure that individuals have only certain types of access to certain types of information.

Security risks are increasing as more and more databases and DBMS systems are moving to data centers run in the cloud. The biggest risks when using cloud computing are ensuring the security and privacy of the information in the database. Implementing data governance policies and procedures that outline the data management requirements can ensure safe and secure cloud computing.