



• Name: \_\_\_\_\_

• Date: \_\_\_\_\_

• Section: \_\_\_\_\_

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## **BUSN 315: Management Information Systems**

### **Problem Set #3: Suggested Solutions**

**Spring 2026**

**Problem 1. Definitions**

Select FOUR items from the list below, and provide a definition for each item you choose.

- Database Management System
- Client/Server Architecture
- Virtualization
- Data Mart
- Sentiment Analysis
- Data Inconsistency

- **Database Management System:**  
A software system that allows organizations to create, store, organize, and manage data in databases, enabling multiple applications and users to access and share data efficiently.
- **Client/Server Architecture:**  
A computing model in which processing tasks are divided between client computers that request services and servers that provide resources or services over a network.
- **Virtualization:**  
A technology that allows multiple virtual machines or operating systems to run on a single physical server by abstracting the underlying hardware resources.
- **Data Mart:**  
A small, subject-oriented subset of a data warehouse that focuses on a particular business line or department.
- **Sentiment Analysis:**  
A technique that analyzes text data to determine the emotional tone, opinions, or attitudes expressed by users or customers.
- **Data Inconsistency:**  
A condition in which the same data stored in multiple systems or files contain different values.

**Problem 2. True / False**

Determine whether each statement is TRUE or FALSE. If FALSE, justify your answer briefly.

2.A. Modern IT infrastructure refers only to physical hardware such as servers, storage devices, and networking equipment used by a firm.

- FALSE
- IT infrastructure includes hardware, software, networking components, and services, not just physical hardware.

2.B. Bring Your Own Device (BYOD) policies can improve employee productivity and flexibility but may introduce additional security risks for organizations.

- TRUE

2.C. Under the Software as a Service (SaaS) model, users access fully managed applications through the Internet rather than installing them locally.

- TRUE

2.D. In a relational database, each table typically stores information about a single entity and organizes that information into rows and columns.

- TRUE

**Problem 3. Multiple Choice**

Select the BEST answer for each question.

3.A. IT infrastructure refers to:

- a) The physical office space where IT staff work
- b) The shared technology resources that support a firm's information systems**
- c) Only the hardware used by employees to access company networks
- d) The collection of software applications purchased by a firm

3.B. Which of the following best describes virtualization?

- a) Converting analog data into digital data
- b) Connecting multiple organizations to a shared network
- c) Using cloud storage instead of local storage
- d) Running multiple logical machines on a single physical computer**

3.C. The consumerization of IT refers to:

- a) Employees bringing consumer technologies into the workplace**
- b) Firms restricting employee use of consumer technologies
- c) Companies selling IT services directly to consumers
- d) Firms replacing enterprise software with entertainment applications

3.D. A Bring Your Own Device (BYOD) policy allows employees to:

- a) Use only company-issued devices for work
- b) Share corporate devices with customers
- c) Store company data only on office servers
- d) Use personal devices to access company systems**

**Problem 3. Multiple Choice (continued)**

3.E. A database management system (DBMS) is best described as:

- a) Hardware used to store digital files
- b) Software that manages and organizes data within databases**
- c) A spreadsheet used for financial reporting
- d) A programming language used for building applications

3.F. A company replaces many separate departmental data files with a centralized database management system. The primary advantage of this change is that it:

- a) Improves data sharing and consistency across departments**
- b) Eliminates the need for data analysis
- c) Prevents users from accessing the data
- d) Removes the need for software applications

3.G. Which of the following best describes data inconsistency?

- a) Different versions of the same data appear in different systems**
- b) Data stored in encrypted format
- c) Data stored in multiple tables within a database
- d) Data stored in cloud storage

3.H. In a relational database, a primary key is used to:

- a) Connect databases to the Internet
- b) Store backup copies of data
- c) Encrypt sensitive information
- d) Uniquely identify each record in a table**

**Problem 4. Short Answers #1**

A mid-sized accounting firm maintains a small data center with many physical servers. Over time, the firm noticed that most of its servers use only a small fraction of their computing capacity. For example, one server runs the company's internal email system, while another runs accounting software, and another runs file storage. The firm's IT manager proposes consolidating these systems so that several operating systems and applications can run on the same physical server.

4.A. What technology would allow multiple operating systems to run on a single physical server?

- **Virtualization**
- **Virtualization allows multiple virtual machines or operating systems to run on a single physical server, enabling different applications and systems to share the same hardware resources.**

4.B. Briefly explain one advantage this technology provides for the organization.

- **Virtualization improves hardware utilization by allowing multiple systems to run on a single server, reducing the need for many separate physical machines. So virtualization allows the organization to:**
  - **Use hardware resources more efficiently by running multiple systems on one server.**
  - **Reduce the number of physical servers required, lowering hardware costs.**
  - **Reduce energy and maintenance costs associated with operating many servers.**
  - **Simplify system management and deployment**

**Problem 5. Short Answers #2**

A small online bookstore maintains the following two database tables.

**CUSTOMERS**

- Customer\_ID
- Name
- Email
- Address

**ORDERS**

- Order\_ID
- Order\_Date
- Order\_Amount
- Customer\_ID

Each order record contains the Customer\_ID associated with the customer who placed the order. This allows the company to connect orders with the correct customer.

5.A. Identify the role of Customer\_ID in each table.

- The primary key uniquely identifies each customer in the CUSTOMERS table. The foreign key in the ORDERS table links each order to the correct customer.
- Customer\_ID in the CUSTOMERS table is the primary key.
- Customer\_ID in the ORDERS table is a foreign key.

5.B. Suppose a customer changes their email address. Explain why storing customer information in a separate **CUSTOMERS** table (instead of repeating it in every order record) is beneficial for the company.

- **Reduced Data Redundancy:** Customer information does not need to be repeated in every order record. Instead, the database stores the customer's information once and links it to orders using the Customer\_ID.
- **Improved Data Consistency:** If the same customer information were stored in many order records, different versions of the data could appear. Storing the data in one place reduces the risk of conflicting information.
- **Easier Updates and Maintenance:** If a customer changes their email or address, the company only needs to update the information in the CUSTOMERS table rather than updating many different order records.
- **Better Database Organization:** Separating customers and orders into different tables allows the database to represent relationships between entities more clearly and makes the system easier to manage and expand.
- **More Efficient Data Storage:** Avoiding repeated customer information across many records can reduce unnecessary data storage and make the database more efficient.