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COURSE: IT 318 – QUANTITATIVE RESEARCH

**ACTIVITY #3**

Identifying and Defining Concepts/Variables from the Research Problem

Identifying and Defining Concepts/Variables from the Research Problem From the case material, perform the following:

(1) Identity the important concepts/variables.

(2) Determine which is the dependent variable and the independent variable/s.

(3) Define the variables operationally based on the context of the case.

**Research Problem # 1:**

"What is the effect of implementing AI-based fraud detection systems on the rate of fraudulent transactions and customer trust in online banking?"

1. Concepts/Variables
   * AI-based fraud detection systems
   * Rate of fraudulent transactions
   * Customer trust in online banking
2. Dependent Variables
   * Rate of fraudulent transactions
   * Customer trust in online banking

Independent Variables

* Implementing AI-based fraud detection systems

1. Definition of the variables
   * AI-based fraud detection systems - systems that use artificial intelligence algorithms to detect and prevent scams in online banking networks
   * Rate of fraudulent transactions - the rate or percentage of fraudulent activity occurring on an online banking platform over a given time period
   * Customer trust in online banking - customers' trust and belief in the security and reliability of an online banking service

**Research Problem # 2:**

"How does the use of virtual reality (VR) training modules impact employee learning outcomes and knowledge retention in IT companies?"

1. Concepts/Variables
   * Virtual reality (VR) training modules
   * Employee learning outcomes
   * Knowledge retention
2. Dependent Variables
   * Employee learning outcomes
   * Knowledge retention

Independent Variables

* + Virtual reality (VR) training modules

1. Definition of the variables
   * Virtual reality (VR) training modules - virtual reality training are designed to teach or develop specific abilities
   * Employee learning outcomes - improvements in knowledge or skills as a result of the training
   * Knowledge retention - the ability of employees to recall and apply the knowledge gained during training

**Research Problem # 3:**

"How does the integration of cloud computing in data storage systems affect data accessibility and operational costs in healthcare organizations?"

1. Concepts/Variables
   * Integration of cloud computing in data storage systems
   * Data accessibility
   * Operational costs in healthcare organizations
2. Dependent Variables
   * Data accessibility
   * Operational costs

Independent Variables

* + Integration of clous computing in data storage systems

1. Definition of the variables
   * Integration of cloud computing in data storage systems - the use of remote servers hosted on the internet to store, manage, and process data for healthcare organizations
   * Data accessibility - the ease with which healthcare professionals and stakeholders can retrieve, share, and use data stored in the system
   * Operational costs in healthcare organizations - the total expenses associated with running the data storage system

**Research Problem # 4:**

"What is the effect of implementing biometric authentication on system security and user experience in e-commerce platforms?"

1. Concepts/Variables
   * Implementing biometric authentication
   * System security
   * User experience
2. Dependent Variables
   * System security
   * User experience

Independent Variables

* + Implementing biometric authentication

1. Definition of the variables
   * Implementing biometric authentication - the use of unique biological characteristics (e.g., fingerprints, facial recognition) to verify users' identities when accessing e-commerce platforms
   * System security - the protection level of the e-commerce platform against unauthorized access, data breaches, or cyberattacks
   * User experience - the ease, satisfaction, and efficiency with which users engage with the platform, as assessed by user feedback, surveys, or usability testing

**Research Problem # 5:**

"How does the deployment of 5G technology in smart cities affect network performance and the adoption of Internet of Things (IoT) devices?"

1. Concepts/Variables
   * Deployment of 5G technology in smart cities
   * Network performance
   * Adoption of Internet of Things (IoT) devices
2. Dependent Variables
   * Network performance
   * Adoption of Internet of Things (IoT) devices

Independent Variables

* + Deployment of 5G technology in smart cities

1. Definition of the variables
   * Deployment of 5G technology in smart cities - the installation and implementation of 5G cellular network infrastructure in smart city environments
   * Network performance - the speed, reliability, and capacity of the network
   * Adoption of Internet of Things (IoT) devices - the rate at which individuals, businesses, or organizations incorporate IoT devices into their systems