| SCHOOL OF INFORMATION AND TECHNOLOGY | | |
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# SYSADM1 – Physical Infrastructure

# Instructions:

Answer the following questions based on Week 3 Lecture notes.

1. Identify potential issues in physical infrastructure setups and propose solutions to optimize performance or reduce costs.

* Poor connectivity and bandwidth of the network
* Limited data management and capacity for storage
* Ineffective use of available space
* Excessive energy use and its effects on the environment

Proposed Solutions:

* Replace outdated network infrastructure with fiber optic cables or other high-speed, low-latency solutions.
* Utilize physical space more efficiently by using scalable, flexible network options.
* Install management and monitoring tools to keep tabs on energy usage and cut down on waste.
* Reduce the amount of storage required on-site by utilizing cloud storage and data management technologies.

1. You are a project manager responsible for implementing a new infrastructure project, such as a smart city initiative or a digital transformation strategy.
2. What IT systems and technologies are necessary to support the project's objectives?

* Digital platforms, cloud computing, cybersecurity systems, AI and IoT, project management tools, and digital services are required to support a smart town program or digital transformation strategy. Based on data decision-making, automation, scalability, security, and public participation are all made possible by these technologies. Digital platforms combine data analysis, information, and visualization, while cybersecurity measures guard against outside threats. Automation and creativity are made possible by AI and IoT, while cloud computing offers scalability and flexibility. Digital services give citizens access to digital services, encouraging involvement and participation, while project management tools guarantee collaboration and coordination.

1. How can the IT infrastructure be designed to be scalable and flexible?

* It takes a multifaceted strategy to design an IT infrastructure that is both scalable and flexible. Scaling and resource utilization are made simple by cloud computing, virtualization, and encapsulation. Independent service scaling is made possible by microservices architecture. High responsiveness and availability are ensured through load balancing and scalable database and storage systems. Infrastructure configuration and delivery are made easier by automation as well as orchestration technologies. Insights for improvement are provided by thorough analytics and monitoring. Scalable security solutions, such identity and access management systems and firewalls, maintain the security of the infrastructure. Last but not least, flexible and cloud computing systems provide adaptability and flexibility. Organizations can ensure high availability, responsiveness, and efficiency in their IT infrastructure by using these measures, which allow the infrastructure to adapt to changing needs.

1. What are the potential security risks and vulnerabilities, and how can they be addressed?

* In scalable and adaptable IT infrastructures, data breaches represent a serious security concern since they can result in tragic results if sensitive data stored in databases or cloud storage is accessed by unknown individuals. Organizations should utilize strong access controls, encryption, log monitoring and analysis, regular security audits, attacks, and incident response strategies to prevent data breaches. Organizations can reduce the chance of data breaches and secure their sensitive information by implementing these precautions. Training for staff education and awareness can also aid in preventing breaches caused due to mistakes made by employees. Monitoring patches and routine software updates can also help fix security holes that attackers might exploit. Furthermore, if a breach does happen, having a disaster recovery strategy in place helps lessen its effects.

1. How can the IT infrastructure be integrated with existing systems and processes to minimize disruption?

* An organized approach to connecting IT infrastructure with current systems and procedures helps reduce interruption by guaranteeing that new security measures are implemented carefully and under control. Determining the level of integration and possible obstacles requires a detailed evaluation of the current systems, processes, and procedures. It is necessary to create and distribute to all stakeholders a roadmap detailing the integration plan, including schedules, achievements, and resources needed. Integration of essential systems and processes must come first, with a priority on those that have the biggest effects on business operations or security threats. By facilitating integration between new and old systems, APIs and middleware solutions can reduce the need for significant re-coding or re-engineering and enable smooth transfer of information.