RICHFIELD

FACULTY OF INFORMATION TECHNOLOGY
INFORMATION SYSTEMS 621
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ASSESSMENT CRITERIA	MARK ALLOCATION	EXAMINER MARKS	MODERATOR MARKS
MARKS FOR CONTENT			
QUESTION ONE	20		
QUESTION TWO	30		
QUESTION THREE	20		
QUESTION FOUR	20		
TOTAL MARKS	90		
MARKS FOR TECHNICAL ASPECTS			
1. TABLE OF CONTENTS Accurate numbering according to the numbering in text and page numbers.	2		
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Table of Contents

QUESTION ONE

Question 1.1

A software system known as enterprise resource planning (ERP) helps firms to manage numerous company activities and procedures in an integrated manner.

ERP systems cover many functional areas including finance, human resources, inventory management, supply chain management, sales, and marketing to provide an end-to-end picture of an organization's operations.

An ERP system's main objectives are cost reduction, increased efficiency, and streamlining of corporate procedures.

Key Features of ERP Systems:

- Integration: ERP systems combine several organizational functional areas into a single picture of corporate operations.

- Centralized Database :ERP systems store all business data in a consolidated database, making real-time information accessible.

- Customization: ERP systems are extremely flexible, enabling businesses to modify the software to meet their particular requirements.

- Scalability: As an organization grows, ERP systems may adapt to suit its evolving needs.

- Business Intelligence :ERP systems offer strong reporting and analytics capabilities, enabling businesses to make decisions based on data.

Benefits of ERP Systems:

- Efficiency Gains: By automating several corporate operations, ERP systems reduce human labor and increase efficiency.

- Better visibility is made possible by ERP systems, which offer real-time data and a comprehensive view of business processes.

- Productivity has increased as a result of the use of ERP systems, which eliminate redundant jobs and foster better teamwork.

- Cost savings are made possible by ERP systems' elimination of redundant procedures, reduction of manual labor, and operations' streamlining.

- Competitive Advantage: By enhancing production, efficiency, and decision-making, ERP systems give businesses a competitive edge.

Use Cases and Real World Examples:

- Manufacturing: A manufacturing company may manage its supply chain, inventory, and production processes with the aid of an ERP system.

- Retail: A retail business can manage its inventory, sales, and customer service with the aid of an ERP system.

- Education: A student's data, schedule, and academic records can all be managed by an ERP system in a school.

Whirlpool Corporation is one company that has successfully implemented ERP in the real world.

Whirlpool implemented an ERP system that allowed the business to enhance supply chain management while lowering expenses and boosting productivity. Additionally, the corporation was able to save over $1 billion by reducing inventory levels by 30% thanks to the ERP system.

Question 1.2

Decision Support Systems (DSS) and **Transaction Processing Systems (TPS)** are two categories of information system inside an organization.

TPS: *Transaction Processing Systems*

Created to handle and manage an organization's daily transactions, that is data for common transactions including sales, purchases, payments, and inventory management. This data is collected, stored, retrieved, and processed using TPS.

The main objective of TPS is to guarantee that transactions are timely and accurately recorded.

Example: Point of Sale (POS) systems used in retail establishments are one example of TPS.

POS systems are used to record sales information, handle payments, and update inventory measures.

DSS: *Decision Support Systems*

Designed to assist decision-makers in an organization in making wise choices. These tools can be applied to find trends, patterns, and potential opportunities or hazards by analyzing data, producing reports, and offering insights.

DSS's main objective is to enhance decision-making by offering accurate and pertinent information.

Business intelligence (BI) systems are an example of DSS, and executives utilize them to evaluate sales data, market trends, and customer behavior in order to make strategic decisions.

Key Differences between TPS and DSS:

TPS are designed to handle routine transactions vs DSS which are designed to assist in decision-making.

Data Use:

- DSS uses analytical data

- TPS uses operational data

Timeframe:

- DSS offers historical and predicted data,

- TPS offers data that is current.

Emphasis:

- A TPS emphasizes operational effectiveness

- A DSS emphasizes strategic decision-making.

User:

- Operational workers utilize a TPS

- Managers + Executives utilize a DSS.

In conclusion, TPS and DSS are two categories of information systems with distinct functions inside an organization.

DSS are used to enhance decision-making by providing analytical and predictive data, whereas TPS are used to manage and process routine transactions.

QUESTION TWO

Question 2.1

Modern commercial information systems now utilize cloud computing.

Cloud computing entails the distribution of computing resources via the internet, such as servers, storage, databases, software, and analytics. With the aid of cloud computing, businesses may access and utilize these resources as needed without spending money on pricey infrastructure and upkeep.

The role of cloud computing in modern business information systems:

- Collaboration: Since data and applications can be accessed and shared in real-time, cloud computing enables more cooperation amongst staff members, teams, and departments.

- *Scalability:* Depending on their demands, organizations may scale their computing resources up or down thanks to cloud computing. This enables businesses to react swiftly to shifts in demand or operational needs.

- *Flexibility:* Cloud computing enables businesses to access computing resources at any time and from any location using any internet-connected device. As a result, there is more flexibility in the manner and location of employment.

- *Cost Savings:* By removing the need for businesses to invest in expensive infrastructure and upkeep, cloud computing allows them to save a lot of money.

- *Security:* To guard against online dangers, cloud computing services often have strong security measures in place. This gives businesses more security than they could possibly get on their own.

The benefits of using cloud-based solutions:

- *Enhanced Efficiency:* By streamlining company operations, cloud-based solutions can help cut down on the time and effort needed to perform activities.

- *Greater Accessibility:* Employees can work remotely or from different locations more easily using cloud-based solutions because they can access them from any location.

- *Enhanced Collaboration:* Real-time collaboration is made possible by cloud-based solutions, which makes it simpler for staff members to share information and work on projects together.

- *Reduced IT expenditures:* By avoiding the up-front expenditures of hardware and software as well as ongoing maintenance and upgrade charges, businesses can save money.

↪ *Scalability:* Because cloud based solutions may be scaled up or down as necessary, businesses can modify their computing resources to suit shifting business needs.

Examples of Cloud-Based Solutions:

SaaS *(Software as a Service):* SaaS solutions include cloud-based applications like email, customer relationship management (CRM), and enterprise resource planning (ERP) software.

PaaS *(Platform as a Service):* Companies can build, test, and deploy applications using the infrastructure and capabilities offered by cloud-based platforms like Microsoft Azure or Google Cloud Platform.

IaaS *(Infrastructure as a Service):* Businesses can access virtual machines, storage, and networking capabilities through cloud-based infrastructure from businesses like Amazon Web Services (AWS) and Microsoft Azure.

Cloud computing is essential to current commercial information systems as it provides organizations the scalability, cost-savings, flexibility, security, and teamwork needed to thrive in the current business environment.

Utilizing cloud-based solutions allows businesses to extend their computing capabilities as needed, boost accessibility, decrease IT expenses, and improve productivity.

Question 2.2

It takes careful planning and execution to set up a virtual private network (VPN) that enables distant workers to safely access the company's network.

The following actions can be taken:

Step 1: Determine the VPN Type and Requirements

The first step is deciding what kind of VPN you wish to use. Site-to-site VPN and remote access VPN are the two different types of VPNs.

↪ Remote access VPN is excellent for remote workers. You first choose the VPN type before establishing the requirements, such as the quantity of users, bandwidth needs, and security needs.

Step 2: Choose the VPN Software

The next step is to decide the VPN application you'll use to configure the VPN. There are numerous VPN software solutions, including Pritunl, SoftEther VPN, and OpenVPN. Pick a VPN program with a dependable, secure, and user-friendly interface.

Step 3: Configure the VPN Server

Establish the IP address, DNS settings, and authentication procedure for the server. To enable distant employees to access the corporate network, you must additionally establish the VPN server.

Step 4: Set Up User Accounts

Make user accounts for distant workers after setting the VPN server. Each user must have a username and password set up for them, and based on their duties, they must be given the appropriate access privileges.

Step 5: Test the VPN

Before rolling out the VPN to remote workers, it is essential to test the VPN to ensure that it is working correctly. Test the VPN by connecting to it from a remote location, and ensure that all the required applications and resources are accessible.

Security Measures to Implement:

➔ Use robust encryption technologies to secure data sent over the VPN, such as SSL/TLS or IPsec.

➔ Guarantee that only authorized users may access the VPN, utilize multi-factor authentication.

➔ Limit access to the VPN and stop unauthorized access, use firewalls.

➔ Update and patch the VPN program frequently to keep it safe and secure from vulnerabilities.

➔ Ensure that only authorized users have access to critical corporate data and resources by implementing stringent access control procedures.

Configuring a VPN takes careful planning, software choice, server configuration, user account setup, and testing.

Implementing encryption technologies, multi-factor authentication, firewalls, frequent upgrades, and access control policies will help to secure the security of the VPN.

Question 2.3

Acceptable Use Policy for Richfield Laptops and Institutional Property

Introduction: For instructional purposes, Richfield College supplies first-year students with computers and iPads. To guarantee the security and correct use of the equipment, the accompanying guideline explains what constitutes permissible usage of institutional property.

Acceptable Use:

- ! All equipment owned by the institution, including laptops and tablets, must be utilized only for academic work.

- ! Users are responsible for maintaining the safety of institutional property at all times and must notify the IT department right once if anything is stolen or lost.

- ! Without the IT department's prior clearance, users may not install unlawful software or programs on institutional property.

- ! Users are not allowed to change or modify institutional property or make an attempt to go around or turn off any security settings or features.

- ! Users are not permitted to utilize institutional property for unlawful activity, such as the downloading or distribution of copyrighted content.

- ! Users are not allowed to access unsuitable or objectionable information, such as pornographic material, hate speech, or unlawful materials, using institutional property.

- ! All pertinent institutional regulations, such as the IT Security Policy and the Code of Conduct, must be followed by users.

Responsibilities:

- ∴ Users are accountable for the maintenance and security of institutional property, including guarding against theft and destruction.

- ∴ Users are responsible for notifying the IT department as soon as they become aware of any issues with institutional property.

- ∴ In order to prevent loss or damage, users are responsible for backing up their work and data on institutional property.

- ∴ All software and programs must be current and secure, and the IT department is in charge of protecting the security and integrity of institutional property.

- ∴ The IT division is in charge of keeping an eye on how the institution's property is used and making sure this policy is followed.

Consequences of Policy Violations:

If the policy is broken, there will be consequences, such as losing access to institutional property and/or facing disciplinary action in accordance with institutional regulations.

Conclusion:

To protect the security, integrity, and correct usage of these devices, this policy specifies what is and is not permitted while using institutional property, such as laptops and tablets.

To ensure a secure computer environment for all users, this policy must be followed by all users of institutional property.

QUESTION THREE

Question 3.1

The following methods might be used to improve Mr Payback's network performance:

+ Conduct a thorough network evaluation to find any problems with the performance of the network.
  To find bottlenecks and areas that require improvement, this would entail examining the network setup, studying the network architecture, and monitoring network traffic patterns.

+ Implement methods for bandwidth management to distribute and order network traffic. Setting regulations to guarantee that voice and video traffic, which is more important than less important traffic, is given priority would be necessary for this.

+ Network Segmentation: Implement network segmentation to minimize network congestion and improve network performance. This would involve dividing the network into smaller subnetworks to limit the amount of traffic on each segment.

+ Implement network monitoring tools to track network activity in real-time and spot possible problems before they get out of hand. To do this, network monitoring tools can be used to observe network performance data, evaluate network traffic patterns, and pinpoint the causes of the network's congestion.

+ Network Optimization: Ensure that all network devices are correctly setup and that the network infrastructure is built for maximum performance to optimize network performance. This would entail making sure that all hardware is set up to handle the most recent network protocols and that the network infrastructure is built to meet the demands of the company.

Tools that could be used to monitor and analyze network traffic include:

» *Tools for Network Monitoring:* Use tools like Nagios, Zabbix, and PRTG to monitor network traffic, measure performance indicators, and send out warnings when there are network problems.

» *Packet analyzers:* Applications like Wireshark may be used to record and examine network traffic in order to spot problems with performance and potential security risks.

» *NetFlow Analyzers:* To gather and analyze NetFlow data to spot network performance problems like bottlenecks and congestion, use tools like SolarWinds NetFlow Traffic Analyzer.

» Network performance may be tested by monitoring network throughput, latency, and packet loss using tools like Speedtest.net and Iperf.

In conclusion, a thorough strategy that entails network evaluation, bandwidth management, network segmentation, network monitoring, and network optimization would be needed to optimize network performance for Mr Payback.

Question 3.2

Organizations may encounter a number of difficulties while implementing a new information system.

The following are some typical difficulties and methods for overcoming them:

Employees may be reluctant to accept a new system due to their resistance to change. Lower productivity and a slower adoption rate may follow from this.

- *Mitigation:* It's critical to inform staff members of the new system's advantages and include them in the planning and implementation process in order to reduce resistance to change. Assist staff in adjusting to the new system and addressing any issues they may have by providing proper training and assistance.

Integration with Existing Systems: Integrating a new system with an existing system can be difficult, especially if there is incompatibility or a need for considerable modifications.

- *Mitigation:* It's critical to do a comprehensive examination of the current systems and find any potential compatibility concerns early in the planning phase in order to reduce integration challenges. Make sure there is enough assistance available for the integration process and create a clear plan for integrating the new system with old systems.

Data migration: Moving data from an outdated system to a new one can be difficult and risks corrupting or losing some of the data in the process.

- *Mitigation:* It's critical to create a detailed data migration plan and carry out rigorous testing to make sure that data is moved successfully in order to prevent data migration issues. In case of data loss or corruption, it's also crucial to make sure that backup and recovery methods are in place.

Cost overruns: Installing a new system may be expensive, and if expenses are not adequately controlled, they can easily go out of hand.

- *Mitigation:* It's critical to have a detailed budget and cost management strategy early on in the planning phase to mitigate cost overruns. Maintain monthly cost evaluations and make sure project expenditures are tracked and under control.

Security hazards: If a new system is not adequately protected, it may pose security hazards.

- Mitigation: It's crucial to do a complete security analysis and make sure that the right security measures are in place in order to minimize security risks. To secure sensitive data, this may entail putting access limits, encryption, and other security measures in place.

Adopting a new information system is difficult, but many of the difficulties can be avoided with good planning and commmunication.

QUESTION FOUR

Question 4.1

Moore's Law: *"The number of transistors on a computer chip will double every two years, increasing processing capability exponentially. "*

Compared to ordinary computers, quantum computing makes use of a distinct kind of technology, which enables it to do considerably more difficult tasks faster. This suggests that quantum computers could be able to address issues that are beyond the capabilities of current computers.

Prior to quantum computing being a viable alternative to conventional computers, however, there are still considerable technological obstacles to be addressed.

As an alternative, quantum computing may be utilized to address certain issues that are beyond the scope of current technology.

Gordon Moore, a co-founder of Intel, predicted in 1965 that the number of transistors on a microchip would double about every two

years, resulting in an exponential rise in computer capability. This forecast is known as Moore's Law. This prediction has mostly come true, but as

Moore's Law approaches its end, some experts are beginning to consider quantum computing as a possible replacement or addition.

Qubits (quantum bits), as opposed to the classical bits used in conventional computing, are utilized in quantum computing, which is based on the ideas of quantum physics. Qubits have the ability to be in various states at once, which speeds up calculations for considerably more complicated problems.

As a result, quantum computers may one day be able to handle issues that are beyond the capabilities of conventional computers, such as cracking encryption methods, recreating intricate chemical events, and conducting extensive data analysis.

Quantum computing could continue the exponential increase in computer power, potentially replacing Moore's Law. Prior to quantum computers being a viable alternative to current computers there are considerable technological obstacles to be addressed.

Qubits, for instance, are challenging to manage and are sensitive to small noise or interference. The low amount of qubits in use in modern quantum computers also means that they can only do computations that are reasonably straightforward.

As an alternative, quantum computing might support Moore's Law by offering a means of resolving particular issues that are outside the scope of conventional computers.

Although Moore's Law may be replaced or supplemented by quantum computing, there are considerable technological obstacles that must be overcome before this can happen. However, as

quantum computing research advances, it's probable that new uses for this technology may emerge in the future.

Question 4.2

The discipline of quantum computing is one that is fast evolving and has the potential to change many different industries and fields of study.

There ethical issues that need to be taken into account however. Throughout the development and implementation, just like with any other technology that can have a large influence.

These factors are:

➤ *Privacy and security:* Quantum computing has the ability to crack the encryption algorithms now being used to safeguard sensitive data. For instance, if a quantum computer were to be used to hack into a bank's computer systems, it might be able to access clients' financial and personal information, jeopardizing their security and privacy.

➤ *Fairness and bias:* It's possible that quantum computing will make social disparities even worse. For instance, if a quantum computer were to be utilized to improve financial trading algorithms, it might produce significant gains for powerful people or businesses, at the expense of those who lack access to the same technology.

➤ *Safety:* Powerful technologies used by quantum computers can offer safety issues if improperly controlled. For instance, if a self-driving automobile were operated by a quantum computer, any mistakes or issues with the system might lead to accidents and possible injury to people or property.

➤ *Governance and regulation:* As quantum computing technologies proliferate, it's critical to put the right governance frameworks and rules in place to make sure they're used responsibly and for the good of society. o For instance, it might be necessary to control the usage of quantum computing in specific fields or applications, like finance or healthcare, in order to avoid unfavorable effects and guarantee that the technology is applied for the benefit of all.

Accountability and transparency are important in the development of quantum computing technology, and developers should be held accountable for unfavorable effects that may arise.

For example if a business created a quantum computing application that had detrimental social or environmental effects, they ought to be held accountable for these consequences and take action to limit them.

There are numerous ethical issues that accompany quantum computing. It is crucial to take into account the potential effects of quantum computing on governance and regulation, fairness and bias, safety, transparency, and accountability.

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