

1. What is an information System?

An information system is a set of interrelated components that collects, processes, stores, and distributes information to support business decision making, coordination and control.

2. Mention the 5 components that makes up an information system.

- Software
- Hardware
- Telecommunication
- Databases and Data warehouses (Data)
- Human resources and procedures

3. Differentiate between batch and online processing as used in information System.

In information System, online processing handles transaction when they occur and provides output directly to users.

Whereas batch processing is typically used for large amounts of data that must be processed on a routine schedule.

4. What is the difference between intranet and extranet?

An intranet is a private network operated by a large organization, which uses Internet technologies, but is insulated from the global internet.

Whereas an extranet is an intranet that is accessible to some people from outside the company, or possibly shared by more than one organization.

5. Briefly define each of the 3 members of the information triad.

- Confidentiality - this is the prevention of disclosure of information to unauthorized individuals or systems.
- Integrity - this is the assurance that the information being accessed has not been altered and truly represents what is intended.
- Availability - means that information can be accessed and modified by anyone authorized to do so in an appropriate timeframe.

6. What is multi-factor authentication?

Multi factor authentication is an authentication method in which a user is granted access to an information system only after successfully presenting two or more pieces of evidence to an authentication mechanism.

7. What does it mean for a business to have a competitive advantage?

A company or business is said to have a competitive advantage over its rivals when it is able to sustain profits that exceed average for the industry.

8. What does a collaborative information system do?

Collaborative information system is set of tools that create a workflow of information to specific teams and members.

They allow individuals within an organization to share ideas and their talents with other members so that the task can be finished both efficiently and effectively.

9. List the 5 types of information system users.

- Innovators
- Early adopters
- Early majority
- Late majority
- Laggards

10. Why would an organization outsource the development of a system?

An organization would outsource the development of a system mainly to reduce or cut cost for developing the said system, and also to focus on the core business goals and planning.

Organizations also outsource nowadays to reap the benefits of outsourcing such as accessing skilled expertise, reducing overhead, flexible staffing, and increasing efficiency, reducing turnaround time and eventually generating more profit.

11. What does the term globalization mean?

Globalization simply is the process by which businesses or other organizations develop international influence or start operating on an international scale.

12. What does the term information system ethics mean?

Information system ethics is a set of concepts or principles that guides users on the proper use of information.

13. What is the purpose of encryption?

The purpose of encryption is to protect digital data confidentiality as it is stored on computer systems and transmitted using the internet or other computer networks.

14. Describe the role of a systems analyst.

A system analyst researches problems, plans solutions, recommends software and systems, at least at the functional level, and coordinates development to meet business or other requirements. The system analyst selects and configures computer systems for an organization or business. The system analyst must understand the general objectives of the business.

15. What is the difference between pilot and parallel implementation methodology?

For the pilot implementation methodology, the new system is installed for a small number of users to learn, use and evaluate the new system before it is been adopted by all the users.

Whereas in the parallel implementation methodology, all the users begin to use the new system simultaneously with the old system until the implementation is judged to be complete and satisfactory.

Section B

Question 1

- a. Several systems can be used within an organization. Discuss the main features of the following:
- i. Transaction processing system
A transaction processing system is an information system that processes data resulting from the occurrence of a business transaction.
 - ii. Data Warehouse system
A data warehouse system provides a range of ad hoc and standardized query tools, analytical tools, and graphical reporting facilities. The data warehouse system stores current and historical data of potential interest to decision makers throughout the company. The data originate in many core operational transaction systems, such as systems for sales, customer accounts, and manufacturing, and may include data from Web site transactions.
 - iii. Knowledge-based system
These are information systems which generates and utilizes knowledge from different sources, data and information. These systems aid in solving problems, especially complex ones, by utilizing artificial intelligence concepts.
 - iv. Decision support system
Decision support systems are information systems at the organization's management level that combine data and sophisticated analytical models or data analysis tools to support semi-structured and unstructured decision making.
- b. There are typically 3 levels of management information within an organization. Identify the 3 levels giving an example of each.
- Lower supervisory (operational) management
E.g. order processing, material movement control
 - Middle management
E.g. sales management, inventory control, annual budgeting
 - Senior management
E.g. profit planning, personnel planning, operation planning
- c. Outline any 2 fundamental roles of an information system in an organization.
- To support the key aspects of running the organization, such as record keeping, decision making, data analysis and more.
 - To capture globalization opportunities

Question 2

- a. The use of internet is now universal. However, many data security problems can occur not only on the internet but within the company. Briefly describe typical security problems and solutions you would recommend to ensure a company's data is secure both internally and externally.

Typically, external security problems occur over the internet and these types of problems normally occur as a result of hackers trying to get unauthorized access to an organizations information system. Hackers have different way of compromising the security of an organizations information system. They may use various methods such as malicious software, identity theft, social engineering and other means to compromise an organizations network.

Organization insiders tend to pose serious security problems as well. Employees have access to privileged information, and in the presence of sloppy internal security procedures, they are often able to roam throughout an organization's systems without leaving a trace.

To counter these problems an organization could implement firewalls to prevent unauthorized users from accessing private network. Intrusion detection system should also be considered to protect the organizations network against suspicious network traffic and attempts to access files and databases. Antivirus and antispyware software should also be put in place to check and remove viruses from computers.

For internal security reasons, the organization should have a good security policy to protect information and information systems. The security policy drives policies determining acceptable use of the organization information resources and which members of the company have access to its information assets. Users of information systems should only be assigned necessary privileges to ensure the principle of least privilege. Physical security and barriers should also be put in place when necessary to safeguard information systems.

- b. Any business that wants to survive and succeed must develop and implement strategies to effectively counter the 5 competitive forces that shapes the structure in competition in industries. List and explain vividly these competitive forces and suggest ways for strategically countering these forces.
- Competitors (rivalry amongst competitors)
Firms share market space with other competitors who are continuously devising new, more efficient ways to produce by introducing new products and services, and attempting to attract customers by developing their brands and imposing switching costs on their customers.
 - New market entrants (low barriers to entry)
In some industries, there are very low barriers to entry which allows new companies to enter the marketplace.
 - Substitute product and services
In just about every industry, there are substitutes that your customers might use if your prices become too high. New technologies create new substitutes all the time.
 - Customers (bargaining power of customer)

The power of customers grows if they can easily switch to a competitor's products and services, or if they can force a business and its competitors to compete on price alone in a transparent marketplace where there is little product differentiation, and all prices are known instantly (such as on the Internet)

- Suppliers (bargaining power of suppliers)

The market power of suppliers can have a significant impact on firm profits, especially when the firm cannot raise prices as fast as can suppliers. The more different suppliers a firm has, the greater control it can exercise over suppliers in terms of price, quality, and delivery schedules.

To counter these problems an organization should use any of the following strategies

- Cost leadership strategy
- Differentiation strategy
- Innovation strategy
- Growth strategy
- Alliance strategy

Question 3

- a. Traditional HCI defines the 3 types of users: novice, intermediate and expert. Discuss how you would design data capture screens that would be relevant to all 3 levels of users.

- Novice users

Designing data capture screens for novice users require using simple technique and not making things complicated for this group of users. Elements such as radios buttons, drop down menus and check boxes should be used as to make data capturing from this user group an easy process.

- Intermediate users

Design data capture screens for intermediate users also require consideration like the novice users but you may consider providing indication and guidelines when necessary.

- Expert users

Design data capture screens for experts require less considerations as these groups of users have knowledge of what to input into a system. Nevertheless, you should be careful as these your groups can be sneaky and may try to beat the system.

- b. For EITHER the term **Big Data** OR the term **Social Media Data**, describe what is meant and identify some of the difficulty in processing the data.

Big data is a term that describes the large volume of data both structured and unstructured that inundates a business on a day-to-day basis. But it's not the amount of data that's important. It's what organizations do with the data that matters. Big data can be analysed for insights that lead to better decisions and strategic business moves

- Lack of Understanding
- High cost of data solutions
- Too many choices
- Low Quality and inaccurate data
- Security gaps
- Keeping up with growth in data

- c. State and explain any 4 characteristics of useful information.

- **Accurate**

Accurate information is error free. In some cases, inaccurate information generated because inaccurate data is fed into the transformation process.

- **Complete**

Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.

- **Relevant**
Relevant information is important to the decision maker
- **Reliable**
Reliable information can be depended on

Question 4

- a. System developers need to ensure that they are up-to-date with legal issues concerning data and information. Give 2 examples of relevant legal acts you are familiar with and briefly state which areas they cover.

Data Protection Act

The data protection act is a legislation that is enacted to protect the privacy and personal data of individuals. It regulates the process personal information is acquired, kept, used or disclosed by data controllers and data processors by requiring compliance with certain data protection principles.

Computer Misuse Act

The computer misuse act protects personal data held by organizations from unauthorized access and modification. The act makes the following illegal:

1. Unauthorized access to computer material
2. Unauthorized access to computer material with intent to commit further crime
3. Unauthorized modification of data
4. Making, supplying or obtaining anything which can be used in computer misuse offences.

Failure to comply with the computer misuse act can lead to fines and potentially imprisonment.

- b. Investment in information technology can allow a business to lock in customers and suppliers (lock out competitors) by building valuable relationships which might become more valuable to customers and

suppliers that it deters them from abandoning a company for its competitors or by intimidating it into accepting less profitable business arrangements. Discuss.

Investing in information systems can allow a firm or business to have a competitive advantage over its competitors. Doing so, it can offer less price for superior value which in turn locks in customers and deters them from their competitors. This is basically using the cost leadership strategy.

Also, firms may lock in suppliers by providing them with better options thereby giving the supplier reasons to stick with the firm. By so doing, the firm builds a valuable relationship between the supplier and itself which in turn deters the supplier from dealing with the firm's competitors so as to keep the relationship between them.

c. There is a growing inter-dependence between the ability to use information technology and the ability to implement corporate strategies and achieve corporate goals. Business firms invest heavily in information systems to achieve 6 strategic business objectives. Outline any four of these objectives.

- **Operational Excellence**
Businesses continuously seek to improve the efficiency of their operations in order to achieve higher profitability
- **New product, services, and business models**
Information systems and technologies are major enabling tools for firms to create new products and services, as well as entirely new business models.
- **Customer and supplier intimacy**
When a business really knows its customers, and serves them well, the way they want to be served, customers generally respond by returning and purchasing more. The more a business engages its suppliers, the better the supplier can provide vital inputs. The result is a lower cost of doing business.
- **Improved decision making**
Information systems and technologies have made it possible for managers to use real-time data from the marketplace when making decisions. Previously, managers did not have access to accurate and current data and as such relied on forecasts, best guesses, and luck.
- **Competitive advantage**
Doing things better than your competitor, charging less for superior products, and responding to customers and suppliers in real time all add up to higher sales and high profits that your competitors can not match.
- **Survival**
Firms also have to invest in information systems and technologies because they are necessities for doing business. Information systems are not a luxury. In most businesses, information systems and technology are core to survival.