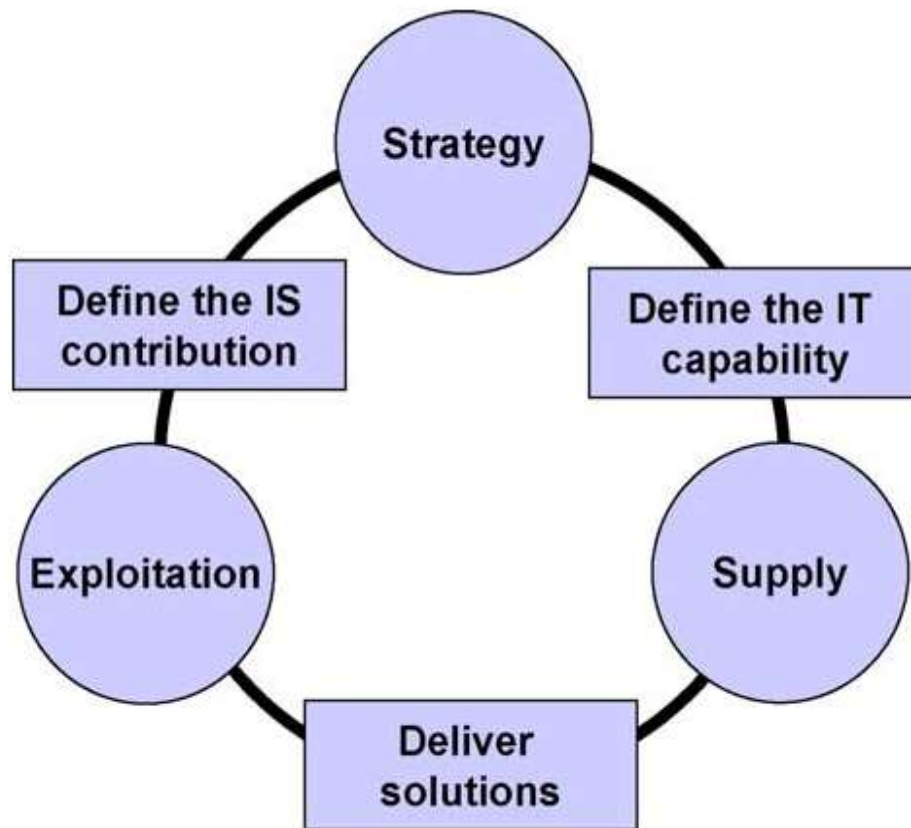


## STRATEGIC INFORMATION SYSTEM



### Compiled Lecture Notes

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# SECTION I

## INTRODUCTION

### 1.1 Definition of Terms

- **Strategic information systems (SIS):** are information systems that are developed in response to corporate business initiative. They are intended to give competitive advantage to the organization. They may deliver a product or service that is at a lower cost, that is differentiated, that focuses on a particular market segment, or is innovative.
- **Strategic information management (SIM):** is a salient feature in the world of information technology (IT). In a nutshell, SIM helps businesses and organizations categorize, store, process and transfer the information they create and receive. It also offers tools for helping companies apply metrics and analytical tools to their information repositories, allowing them to recognize opportunities for growth and pinpoint ways to improve operational efficiency.
- **Strategic management (SM):** is the way an organization maps the strategy of its future operations. The term strategic points to the long-term nature of this mapping exercise and to the large magnitude of advantage the exercise is expected to give an organization. Information technology contributes to strategic management in many ways.

### 1.2 Ways of Gaining Competitive Advantage

Some of the more common ways of thinking about gaining competitive advantage are:

- **Deliver a product or a service at a lower cost.** This does not necessarily mean the lowest cost, but simply a cost related to the quality of the product or service that will be both attractive in the marketplace and will yield sufficient return on investment. The cost considered is not simply the data processing cost, but is the overall cost of all corporate activities for the delivery of that product or service. There are many operational computer systems that have given internal cost saving and other internal advantages, but they cannot be thought of as strategic until those savings can be translated to a better competitive position in the market.
- **Deliver a product or service that is differentiated.** Differentiation means the addition of unique features to a product or service that are competitive attractive in the market. Generally such features will cost something to produce, and so they will be the setting point, rather than the cost itself. Seldom does a lowest cost product also have the best differentiation. A strategic system helps customers to perceive that they are getting some extras for which they will willingly pay.
- **Focus on a specific market segment.** The idea is to identify and create market niches that have not been adequately filled. Information technology is frequently able to provide the

capabilities of defining, expanding, and filling a particular niche or segment. The application would be quite specific to the industry.

- **Innovation.** Develop products or services through the use of computers that are new and appreciably from other available offerings. Examples of this are automatic credit card handing at service stations, and automatic teller machines at banks. Such innovative approaches not only give new opportunities to attract customers, but also open up entirely new fields of business so that their use has very elastic demand.

### **1.3 Role of Information Technology in Strategic Management**

- **1. Innovative applications.** IT creates innovative applications that provide direct strategic advantage to organizations. For example, Federal Express was the first company in its industry to use IT for tracking the location of every package in its system. Next, FedEx was the first company to make this database accessible to its customers over the Internet. FedEx has gone on to provide e-fulfillment solutions based on IT and is even writing software for this purpose.
- **2. Competitive weapons.** Information systems themselves have long been recognized as a competitive weapon. Amazon.com's one-click shopping system is considered so significant and important to the company's reputation for superior customer service that it has patented the system. Michael Dell, founder of Dell Computer, puts it bluntly: "The Internet is like a weapon sitting on the table, ready to be picked up by either you or your competitors".
- **3. Changes in processes.** IT supports changes in business processes that translate to strategic advantage. For example, Berri is Australia's largest manufacturer and distributor of fruit juice products. The principal goal of its enterprise resource planning system implementation was "to turn its branch-based business into a national organization with a single set of unified business processes" in order to achieve millions of dollars in cost-savings. Other ways in which IT can change business processes include better control over remote stores or offices by providing speedy communication tools, streamlined product design time with computer-aided engineering tools, and better decision-making processes by providing managers with timely information reports.
- include better control over remote stores or offices by providing speedy communication tools, streamlined product design time with computer-aided engineering tools, and better decision-making processes by providing managers with timely information reports.
- **4. Links with business partners:** IT links a company with its business partners effectively and efficiently. For example, Rosenbluth's Global Distribution Network allows it to connect agents, customers, and travel service providers around the globe, an innovation that allowed it to broaden its marketing range.

- **5. Cost reductions.** IT enables companies to reduce costs. For example, a BoozAllen & Hamilton study found that: a traditional bank transaction costs \$1.07, whereas the same transaction over the Web costs about 1 cent; a traditional airline ticket costs \$8 to process, an e-ticket costs \$1. In the customer service area, a customer call handled by a live agent costs \$33, but an intelligent agent can handle the same request for less than \$2.
- **6. Relationships with suppliers and customers.** IT can be used to lock in suppliers and customers, or to build in switching costs (making it more difficult for suppliers or customers to switch to competitors). For example, Master Builders sells chemical additives that improve the performance characteristics of concrete. The company offers customers MasterTrac, a tank-monitoring system that automatically notifies Master Builders when additive inventories fall below an agreed-on level. Master Builders then resupplies the tanks on a just-in-time basis. The customer benefits from an assured supply of product, less capital tied up in inventory, and reduced inventory management time and processing. Master Builders benefits because competitors face a more difficult task to convince concrete companies to switch to them
- **7. New products.** A firm can leverage its investment in IT to create new products that are in demand in the marketplace. Federal Express's package-tracking software is one example. In Australia, ICI Explosives no longer views its business model as just selling explosives; it now also writes contracts for broken rock. ICI engineers developed computer models that specify drilling procedures and explosives use for different types of rockfaces to produce rock in the sizes that the customer needs. , "The redefinition of ICI's role not only generated much higher margins for the business, it also gave ICI a much more defensible competitive position"
- **8. Competitive intelligence.** IT provides competitive (business) intelligence by collecting and analyzing information about products, markets, competitors, and environmental changes. For example, if a company knows something important before its competitors, or if it can make the correct interpretation of information before its competitors, then it can act first, gaining strategic advantage through first-mover advantage (the competitive advantage gained by being the first to offer a particular product or service that customers deem to be of value).

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**SECTION I Revision Questions**

1. Define the following terms as applied in Strategic Information Systems:
    - (a) SIS
    - (b) SIM
    - (c) SM
  2. Kenya Power and Lighting Company (KPLC) Reengineered and Rebranded to Kenya Power. Briefly describe the role played by information systems in Company Reengineering and Rebranding.
  3. Describe the role played by Information Systems in Strategic Management.
  4. Describe ways in which a company would use information systems to gain competitive advantages.
-

## **SECTION II**

### **TYPES OF INFORMATION SYSTEMS**

#### **1.1 Components of Information Systems**

The six components that must come together in order to produce an information system are:

- **Hardware:** The term hardware refers to machinery. This category includes the computer itself, which is often referred to as the central processing unit (CPU), and all of its support equipment. Among the support, equipment are input and output devices, storage devices and communications devices.
- **Software:** The term software refers to computer programs and the manuals (if any) that support them. Computer programs are machine-readable instructions that direct the circuitry within the hardware parts of the system to function in ways that produce useful information from data. Programs are generally stored on some input/output medium, often a disk or tape.
- **Data:** Data are facts that are used by programs to produce useful information. Like programs, data are generally stored in machine-readable form on disk or tape until the computer needs them.
- **Procedures:** Procedures are the policies that govern the operation of a computer system. "Procedures are to people what software is to hardware" is a common analogy that is used to illustrate the role of procedures in a system.
- **People:** Every system needs people if it is to be useful. Often the most overlooked element of the system are the people, probably the component that most influence the success or failure of information systems. This includes "not only the users, but those who operate and service the computers, those who maintain the data, and those who support the network of computers."
- **Feedback:** it is another component of the IS, that defines that an IS may be provided with a feedback (Although this component isn't necessary to function).

Data is the bridge between hardware and people. This means that the data we collect is only data until we involve people. At that point, data is now information.

## 2.2 Types of Information Systems

The types of information systems can be presented in the following way:

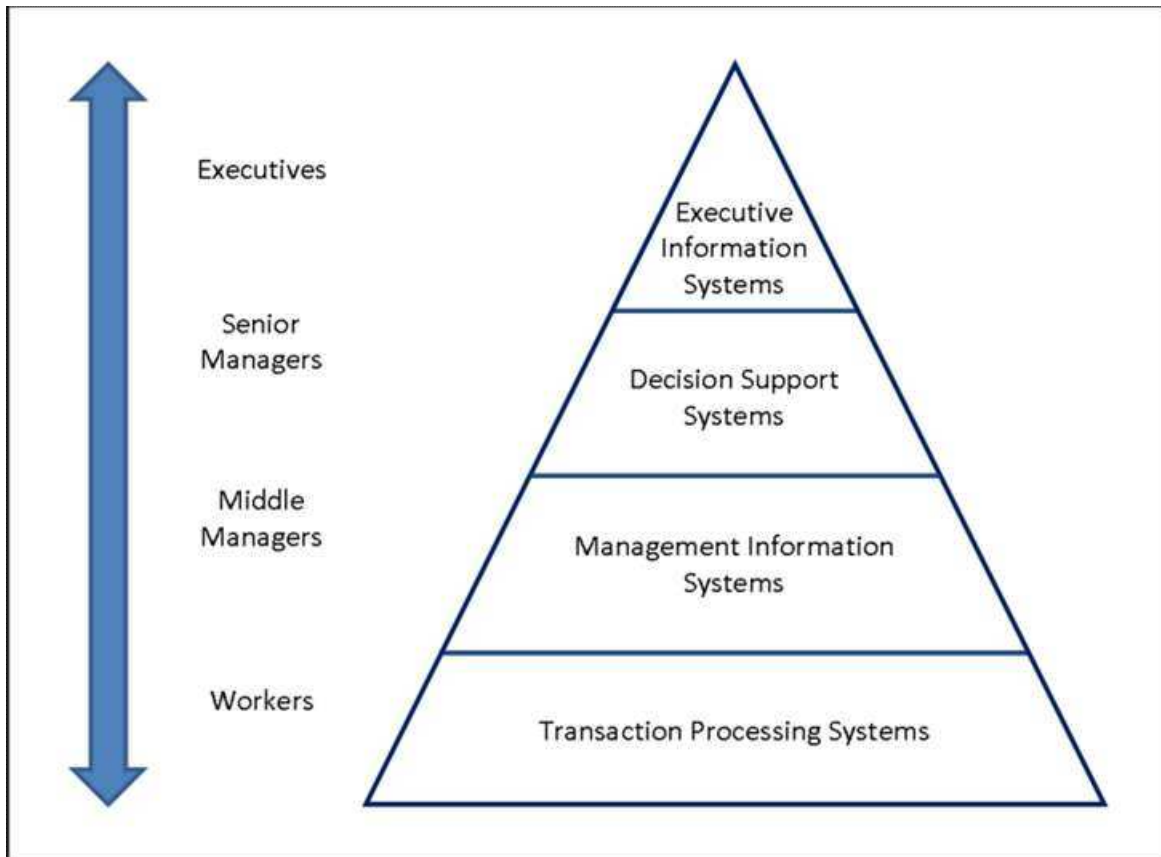


Figure 1.1: Types of Information Systems

### 1. Transaction Processing Systems

- Transaction Processing System are operational-level systems at the bottom of the pyramid. They are usually operated directly by shop floor workers or front-line staff, which provide the key data required to support the management of operations.
- This data is usually obtained through the automated or semi-automated tracking of low-level activities and basic transactions.
- **Functions of a TPS:** TPS are ultimately little more than simple data processing systems.
- **Some examples of TPS:** Payroll systems; Order processing systems; Reservation systems; Stock control systems; Systems for payments and funds transfers;
- **Salient Features:** Produce information for other systems; Cross boundaries (internal and external); Used by operational personnel + supervisory levels; Efficiency oriented

### 2. Management Information Systems

- For historical reasons, many of the different types of Information Systems found in commercial organizations are referred to as "Management Information Systems".



- However, within our pyramid model, Management Information Systems are management-level systems that are used by middle managers to help ensure the smooth running of the organization in the short to medium term.
- The highly structured information provided by these systems allows managers to evaluate an organization's performance by comparing current with previous outputs.
- **Functions of a MIS:** MIS are built on the data provided by the TPS
- **Some examples of MIS:** Sales management systems; Inventory control systems; Budgeting systems; Management Reporting Systems (MRS); Personnel (HRM) systems;
- **Salient Features:** Based on internal information flows; Support relatively structured decisions; Inflexible and have little analytical capacity; Used by lower and middle managerial levels; and Deals with the past and present rather than the future; and Are efficiency oriented.

### 3. Decision Support Systems

- A Decision Support System can be seen as knowledge based system, used by senior managers, which facilitates the creation of knowledge and allow its integration into the organization.
- These systems are often used to analyze existing structured information and allow managers to project the potential effects of their decisions into the future.
- Such systems are usually interactive and are used to solve ill structured problems. They offer access to databases, analytical tools, allow "what if" simulations, and may support the exchange of information within the organization.
- **Functions of a DSS:** DSS manipulate and build upon the information from a MIS and/or TPS to generate insights and new information.
- **Some examples of DSS:** Group Decision Support Systems (GDSS); Computer Supported Co-operative work (CSCW); Logistics systems; Financial Planning systems; and Spreadsheet Models;
- **Salient features of DSS:** Support ill- structured or semi-structured decisions; Have analytical and/or modeling capacity; Used by more senior managerial levels; Are concerned with predicting the future; and Are effectiveness oriented.

### 4. Executive Information Systems

- Executive Information Systems are strategic-level information systems that are found at the top of the Pyramid.
- They help executives and senior managers analyze the environment in which the organization operates, to identify long-term trends, and to plan appropriate courses of action.
- The information in such systems is often weakly structured and comes from both internal and external sources.

- Executive Information System are designed to be operated directly by executives without the need for intermediaries and easily tailored to the preferences of the individual using them.
- **Functions of an EIS:** EIS organizes and presents data and information from both external data sources and internal MIS or TPS in order to support and extend the inherent capabilities of senior executives.
- **Some examples of EIS:** Executive Information Systems tend to be highly individualized and are often custom made for a particular client group; however, a number of off-the-shelf EIS packages do exist and many enterprise level systems offer a customizable EIS module.
- **The role of EIS:** Are concerned with ease of use; Are concerned with predicting the future; Are effectiveness oriented; Are highly flexible; Support unstructured decisions; Use internal and external data sources; and Used only at the most senior management levels.

## 2.3 Types of Information Systems Strategies

### 1. Operations support system:

- In a firm, data execution is performed by the user end, which is later processed to generate useful data products and services like reports, which are utilized by different users. Such a strategy is called **operation support**.
- The primary purpose of this system is to keep a check on transactions, operations, control, chain supply, and management.
- It also helps to facilitate internal and external talks, and it updates the central main database of the organization.
- The operation support system is further divided into three systems which are-
  - Transaction Processing System (TPS)
  - Process Control System
  - Enterprise Collaboration System

### 2. Management Support System

- Firms require accurate data in a specific format to understand the decisions of the organizations. Management support system strategy enables the effective decision and task operation process more manageable for the managers.
- They are essentially divided into a different strategy like management, decision, accounting and expert information system.
- These systems facilitate and provide precise information and data to the manager for easy routines, decision-making processes. Decision support system which helps to solve particular issues related problems.

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**SECTION II Revision Questions**

1. Describe the SIX Components of Information Systems.
  2. Using a diagram, describe the types of information systems that can be found in an organization setting.
  3. ABOVE LIMIT INSURANCE COMPANY LIMITED has downsized and fired its entire operational staff numbering 50 located within its head office. As a Strategic Information Systems expert, describe the factors that may lead to bloated low level systems within the organization.
  4. Explain the level and role of the CEO, Middle-Level Manager, and a Data Clerk in information system management.
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**CLASS PRESENTATION ASSIGNMENT**

*Present a paper on the models for strategic information systems.*

*[Michael porter's model – competitive advantage; cost and competitive advantage; differentiation advantage; focus strategies for advantage; wiseman's strategic perspective view]*

**Required:**

*A two-page handwritten concept paper  
Reference materials used*

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## SECTION III

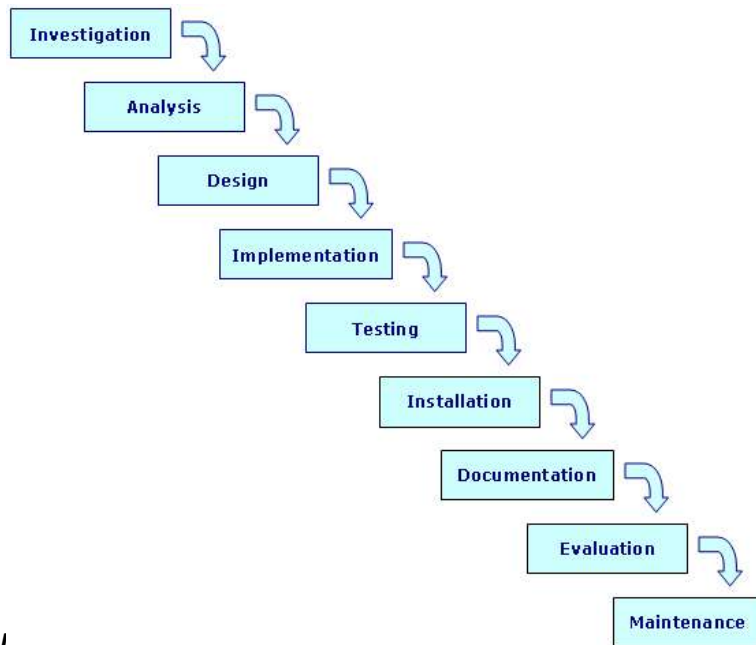
### INFORMATION SYSTEMS DEVELOPMENT

#### 3.1 Introduction

- The process (activity) whereby a work activity or a larger organizational setting is facilitated by introducing a new socio-technical information system or modifying or expanding an existing one.
- **ISD** includes sub-activities of analysis, design, development, implementation, and evaluation. Depending on the viewpoint, it can be seen as a software engineering process of a software producer, an application acquisition process of a software user, or a works development process.
- Systems development is a process used in systems engineering, information systems, and software engineering for planning, creating, testing, and deploying an information system

#### 3.2 System Development Life Cycle

- The systems development life cycle (SDLC), also referred to as the application development life-cycle, is a process for planning, creating, testing, and deploying an information system.
- The systems development lifecycle concept applies to a range of hardware and software configurations, as a system can be composed of hardware only, software only, or a combination of both.
- The term **System Development Life Cycle** is used to describe the sequence of steps that are followed when building a new ICT system. Each step or phase in the development cycle consists of a series of activities.
- The **Waterfall Model** is used to describe how system development flows downwards through the phases.
- There are usually six stages in this cycle: analysis, design, development and testing, implementation, documentation, and evaluation.



**Figure 3.1: Waterfall SDLC Model**

### 1. System Investigation

- First the IT system proposal is investigated. During this step, consider all current priorities that would be affected and how they should be handled.
- Before any system planning is done, a feasibility study should be conducted to determine if creating a new or improved system is a viable solution.
- This will help to determine the costs, benefits, resource requirements, and specific user needs required for completion. The development process can only continue once management approves of the recommendations from the feasibility study.
- The following represent different components of the feasibility study:
  - Operational feasibility
  - Financial feasibility
  - Technical feasibility
  - Human factors feasibility
  - Legal/Political feasibility

### 2. Analysis

- The goal of analysis is to determine where the problem is, in an attempt to fix the system. This step involves breaking down the system in different pieces to analyze the situation, analyzing project goals, breaking down what needs to be created, and attempting to engage users so that definite requirements can be defined.

### 3. Design

- In systems design, the design functions and operations are described in detail, including screen layouts, business rules, process diagrams, and other documentation. The output of this stage will describe the new system as a collection of modules or subsystems.
- The design stage takes as its initial input the requirements identified in the approved requirements document. For each requirement, a set of one or more design elements will be produced as a result of interviews, workshops, and/or prototype efforts.
- Design elements describe the desired system features in detail, and they generally include functional hierarchy diagrams, screen layout diagrams, tables of business rules, business process diagrams, pseudo-code, and a complete entity-relationship diagram with a full data dictionary. These design elements are intended to describe the system in sufficient detail, such that skilled developers and engineers may develop and deliver the system with minimal additional input design.

#### 4. Implementation

- During the implementation or production and/or construction stage the product is built or assembled in accordance with the requirements specified in the product, process and material specifications and is deployed and tested within the operational target environment.
- System assessments are conducted in order to correct deficiencies and adapt the system for continued improvement.

#### 5. Testing

- When an ICT system has been implemented the project team will move into the test phase.
- **Module testing** is the term that is used for testing a section of program code that performs a specific task.
- **Functional testing** involves testing an ICT system to check that it is able to perform a particular task (or function) for example the operation of a user interface to add, amend and delete data.
- **Application testing** (or system testing) is checking to ensure that the different parts of the system work correctly by inputting valid and invalid data. The project team will devise a test plan that identifies for each test:
  - The feature or component that is being tested.
    - The data that will be used.
    - The results expected from the test.

#### 6. Installation

Also referred to as the training and transition stage

- Once a system has been stabilized through adequate testing, the SDLC ensures that proper training on the system is performed or documented before transitioning the system to its support staff and end users.
- Training usually covers operational training for those people who will be responsible for supporting the system as well as training for those end users who will be using the system after its delivery to a production operating environment.
- After installation and training has been successfully completed, systems engineers and developers transition the system to its final production environment, where it is intended to be used by its end users and supported by its support and operations staff.

## 7. Documentation

- During this phase of developing an ICT system the project team will be producing:
  - **User documentation** to help others to use the ICT system.
  - *Technical documentation* to support those who will need to install, support and maintain the ICT system.
- User documentation should be easy to understand and illustrated with screen shots. It should avoid the use of technical jargon that may confuse the reader. User documentation might be provide in printed form or made available online. It might include:
  - Information on how to use the menus.
  - Examples of screen and data entry forms.
  - Instructions for data entry.
  - Advice on how to respond to error messages.
  - Examples of data output screens.
  - Examples of printouts.
  - Information on how to troubleshoot the system if things go wrong.
- Technical documentation is for ICT specialists. It should include enough detail to allow a competent ICT professional to fully understand how the system works so that they can maintain the system and make enhancements based on user experience. It could include:
  - The agreed design specification.
  - Data flow diagrams.
  - Entity relationship models.
  - Details of how the system handles data.
  - Details of all the calculations that are carried out and the formulae and functions used.
  - Details of the data validation and verification procedures used.

## 8. Evaluation

- The evaluation phase provides the project team with an opportunity to review the effectiveness of their work by asking a series of questions. For example:

- Is the ICT system working correctly?
- Does the system meet the original requirements?
- Does the system deliver the expected benefits?
- Was the system delivered on time?
- Was the system developed within budget?
- For some ICT projects the final payment to the project team may depend on a successful evaluation that is carried out by an evaluation panel that is independent of the client and the project team.

## 9. Maintenance

- Once an ICT system has been installed and handed over to a client the project team will continue to maintain the system for a number of years to ensure that it continues to meet the needs of users.
- This phase of the system development life cycle will include:
  - Providing support to help solve day to day problems by operating a help desk, telephone hotline or online support system.
  - Providing support to help with changes in the business environment, for example, changes to the VAT rate or the rates and thresholds for the payment of tax and national insurance contributions.
  - Fixing security problems.
  - Producing updates that improve the functionality of the system or allow the system to run on a new operating system.
  - Making improvements to parts of the system that users are unhappy with.
  - Producing minor changes or modifications, known as patches, to correct faults in the system.
- Maintenance tasks are divided into different categories:
  - **Perfective Maintenance:** Making changes to improve the performance of the system.
  - **Adaptive Maintenance:** Making evolutionary changes because of advances in information and communication technologies or changes in the business environment.
  - **Corrective Maintenance:** Rectifying faults that have been found in the system.



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**SECTION III Revision Questions**

1. Define the term information system development as applied in Strategic Information System.
  2. Using a diagram, describe the waterfall model as applied in defining organization information development process.
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## **SECTION IV**

### **INTERNET AND E-BUSINESS**

#### **4.0 Introduction**

- E-business or Online business means business transactions that take place online with the help of the internet.
- The term e-business came into existence in the year 1996. E-business is an abbreviation for electronic business. So the buyer and the seller don't meet personally.
- eBusiness (e-Business), or Electronic Business, is the administration of conducting business via the Internet. This would include the buying and selling of goods and services, along with providing technical or customer support through the Internet.
- **e-commerce** has an extroverted approach that covers customers, suppliers, distributors, etc. On the other hand, **e-business** has an ambivert approach that covers internal as well as external processes. e-commerce requires a website that can represent the business.

#### **4.1 Features of E-Business/E-Commerce/Online Business**

- Some of the features of Online Business are as follows :
  - It is easy to set up
  - There are no geographical boundaries
  - Much cheaper than traditional business
  - There are flexible business hours
  - Marketing strategies cost less
  - Online business receive subsidies from the government
  - There are a few security and integrity issues
  - There is no personal touch
  - Buyer and seller don't meet
  - Delivery of products takes time
  - There is a transaction risk
  - Anyone can buy anything from anywhere at anytime
  - The transaction risk is higher than traditional business

#### **4.2 Types of e-Commerce**

- **Business-to-Business (B2B)**

Transactions that take place between two organizations come under Business to business. Producers and traditional commerce wholesalers typically operate with this type of electronic commerce. Also. it greatly improves the efficiency of companies.

- **Business-to-Consumer (B2C)**

When a consumer buys product from a seller then it is business to consumer transaction. People shopping from Flipkart, Amazon, etc is an example of business to consumer transaction. In such a transaction the final consumer himself is directly buying from the seller.

- **Consumer-to-Consumer (C2C)**

A consumer selling product or service to another consumer is a consumer to consumer transaction. For example, people put up ads on OLX of the products that they want to sell. C2C type of transactions generally occurs for second-hand products. The website is only the facilitator not the provider of the goods or the service.

- **Consumer-to-Business (C2B)**

In C2B there is a complete reversal of the traditional sense of exchanging goods. This type of e-commerce is very common in crowdsourcing based projects. A large number of individuals make their services or products available for purchase for companies seeking precisely these types of services or products.

- **Consumer-to-Administration (C2A)**

The Consumer-to-Administration model encompasses all electronic transactions conducted between individuals and public administration. Some examples of applications include

- **Education** – disseminating information, distance learning, etc.
- **Social Security** – through the distribution of information, making payments, etc.
- **Taxes** – filing tax returns, payments, etc.
- **Health** – appointments, information about illnesses, payment of health services, etc.

- **Business-to-Administration (B2A)**

This part of e-commerce encompasses all transactions conducted online by companies and public administration or the government and its various agencies. Also, these types of services have increased considerably in recent years with investments made in e-government.

## 4.2 Mobile Commerce

- Mobile commerce, also called **m-commerce** or mcommerce, includes any monetary transaction completed using a mobile device.
- It is an advancement of ecommerce, enabling people to buy and sell goods or services from almost anywhere, simply using a mobile phone or tablet device.
- Very simply put M-commerce entails the e-commerce transactions done with a mobile phone. So M-commerce is the use of mobile phones to conduct any type of business transaction.
- The use of wireless technology (WAP) to conduct sales of goods, provide services, make payments and other financial transactions, the exchange of information etc. is the basis of mobile commerce.

### Application of M-Commerce

- **Mobile Banking:** Using a mobile website or application to perform all your banking functions. It is one step ahead of online banking and has become commonplace these days. For example, in Nigeria, the majority of banking transactions happen on mobile phones.
- **Mobile Ticketing and Booking:** Making bookings and receiving your tickets on the mobile. The digital ticket or boarding pass is sent directly to your phone after you make the payment from it. Even in India now IRTC and other services provide m-ticketing services.
- **E-bills:** This includes mobile vouchers, mobile coupons to be redeemed and even loyalty points or cards system.
- **Auctions:** Online auctions having now been developed to be made available via mobile phones as well.
- **Stock Market Reports** and even stock market trading over mobile applications.

### Advantages of M-commerce

- It provides a very convenient and easy to use the system to conduct business transactions.
- Mobile commerce has a very wide reach. A huge part of the world's population has a mobile phone in their pocket. So the sheer size of the market is tremendous.
- M-commerce also helps businesses target customers according to their location, service provider, the type of device they use and various other criteria. This can be a good marketing tool.
- The costs of the company also reduced. This is due to the streamlined processes, now transaction cost, low carrying cost and low order processing cost as well.

### Disadvantages of M-commerce

- The existing technology to set up an m-commerce business is very expensive. It has great start-up costs and many complications arise.
- In developing countries, the networks and service providers are not reliable. It is not most suitable for data transfer.
- Then there is the issue of security. There are many concerns about the safety of the customer's private information. And the possibility of a data leak is very daunting.

### Difference between e-Commerce and M-Commerce

- E-commerce came into existence in the 1970s. Whereas, M-commerce was invented later during the 1990s
- Electronic commerce has a narrower reach than M-commerce, due to a large number of mobile users globally.

- E-commerce is generally a less costly method. The set up of the website and the use of the internet is both relatively cheaper methods. M-commerce, on the other hand, is more expensive due to the creation of the mobile app and the need to use cellular data (for the customers)

### 4.3 Business Intelligence

- Business intelligence (BI) is a technology-driven process for analyzing data and presenting actionable information which helps executives, managers and other corporate end users make informed business decisions.
- BI encompasses a wide variety of tools, applications and methodologies that enable organizations to collect data from internal systems and external sources, prepare it for analysis, develop and run queries against that data and create reports, dashboards and data visualizations to make the analytical results available to corporate decision-makers, as well as operational workers.

#### Importance of Business Intelligence

- Overall, the role of business intelligence is to improve all parts of a company by improving access to the firm's data and then using that data to increase profitability.
- Companies that employ BI practices can translate their collected data into insights of their business processes.
- The insights can then be used to create strategic business decisions that improve productivity, increase revenue and accelerate growth.
- **Other potential benefits of business intelligence tools include:**
  - accelerating and improving decision-making;
  - optimizing internal business processes;
  - increasing operational efficiency;
  - driving new revenues;
  - gaining competitive advantage over business rivals;
  - assisting companies in the identification of market trends; and
  - spotting business problems that need to be addressed.

#### Types of Business Intelligence Tools

- **Ad Hoc Analysis**

Ad hoc analysis is a business intelligence (BI) process designed to answer a single, specific business question. Users may create a report that does not already exist or drill deeper into a static report to get details about accounts, transactions or records.

Ad hoc is an adjective used to describe things that are created on the spot, usually for a single use. Many times, ad hoc analysis is done in response to an event, such as a sudden dip in production or loss of customers.

- **Online Analytical Processing (OLAP)**

OLAP (online analytical processing) is a computing method that enables users to easily and selectively extract and query data in order to analyze it from different points of view. OLAP business intelligence queries often aid in trends analysis, financial reporting, sales forecasting, budgeting and other planning purposes.

For example, a user can request that data be analyzed to display a spreadsheet showing all of a company's beach ball products sold in Florida in the month of July, compare revenue figures with those for the same products in September and then see a comparison of other product sales in Florida in the same time period.

- **Mobile Business Intelligence**

Mobile business intelligence is software that extends desktop business intelligence (BI) applications so they can be used on a mobile device. MBI applications optimizes traditional BI reports so they can be viewed easily on a small screen and is ideal for displaying key performance indicators (KPIs) and alerts on small screens with simple charts, graphs and sparklines. An additional benefit of MBI is that it allows data that's captured by the mobile device to be integrated on-the-fly so that reports are current and mobile workers can make informed decisions in real time.

- **Software-As-A-Service (SaaS) Business Intelligence**

Software as a Service business intelligence (SaaS BI) is a delivery model for business intelligence in which applications are typically deployed outside of a company's firewall at a hosted location and accessed by an end user with a secure Internet connection. Also known as on-demand BI or cloud BI, the technology is sold by vendors on a subscription or pay-as-you-go basis instead of the more traditional software licensing model with annual maintenance fees.

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**SECTION IV Revision Questions**

1. *Differentiate between the following terms as applied in Strategic Information Systems.*
    - a. *E- Business*
    - b. *E- Commerce*
    - c. *M- Commerce*
  2. *Providing a typical example, describe the types of e – Commerce and their application in strategic information systems.*
  3. *Describe the application of M-Commerce for a financial management institution.*
  4. *Define the term Business Intelligence and the importance of its application in an organization.*
  5. *State and explain at least FOUR Business Intelligence Tools.*
-

## SECTION V

### STRATEGIC INFORMATION SYSTEMS PLANNING (SISP)

#### 5.0 Introduction

- Strategic Information Systems Planning (SISP) is an important activity for helping organization to identify strategic applications and to align an organization's strategy with effective information systems to achieve organization's objectives.
- SISP is commonly defined as *the process of identifying a portfolio of computer-based applications to assist an organization in executing its business plans and realizing its business goals.*
- Information systems can be regarded as a strategic resource in an organization. ***The opportunities can be classified in 4 areas:***
  - To gain **competitive advantage.**
  - To **improve productivity and performance.**
  - To enable **new ways of managing and organizing.**
  - To develop **new businesses.**
- Information systems planning should be an integral part of business planning
  - **Business planning** – the process of identifying the firm's goals, objectives, and priorities + developing action plans for accomplishing them.
  - **Information systems planning** – the part of business planning concerned with developing the firm's information systems resources
- **Reengineering and Downsizing:**
  - **Business process reengineering (BPR)** – the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical measures of performance. Difficult and risky
  - **Downsizing** – improve process efficiency by reducing the number of people involved in the process.
  - **Business Rebranding:** The process of instituting a new look and identity to a company of business organization.

#### 5.1 SISP Phases

- SISP has been described in terms of phases and the specific tasks within them. The phases and tasks represent the components of the planning process, with each having its own objectives, participants, preconditions, products, and techniques.
- The phases and tasks can be used to describe an organization's attempts to be comprehensive in its strategic planning process. SISP unfolds in five phases.
- The overall five phase breakdown is as follows:
  - **1) Strategic Business Planning:** Prerequisite to systems planning:
    - It outlines an organization's overall direction, philosophy, and purpose.

- It examines its current status in terms of its strengths, weakness, opportunities, and threats.
  - It sets long-term objectives.
  - It formulates short-term tactics to reach them.
- **2) Information Systems Assessment:** Evaluation of the system to assess its status (current information systems resources) in terms of original or current expectations and how they are serving the organization.
  - **3) Information Systems Vision:** Ideal role that should be pursued for use of information systems resources.
  - **4) Information Systems Guidelines:** Set of statements that clarify use of organization's technical and information systems resources.
  - **5) Strategic Initiatives:** Three to five year long-term proposals that specify new initiatives for information systems organization. SISP process can be summarized graphically as shown below:



**Figure 5.1: SISP Process**



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**SECTION V Revision Questions**

1. Briefly describe the term *SISP* as applied in Strategic Information Systems.
  2. Briefly describe the following terms as applied in *SISP*:
    - a. *Business Reengineering*
    - b. *Business Downsizing*
    - c. *Business Rebranding*
  3. Using a diagram, describe the phases of *SISP*.
-

# SECTION VI

## PRIVACY & SECURITY, ETHICAL & SOCIAL IMPACTS OF INFORMATION SYSTEMS

### 6.0 Introduction

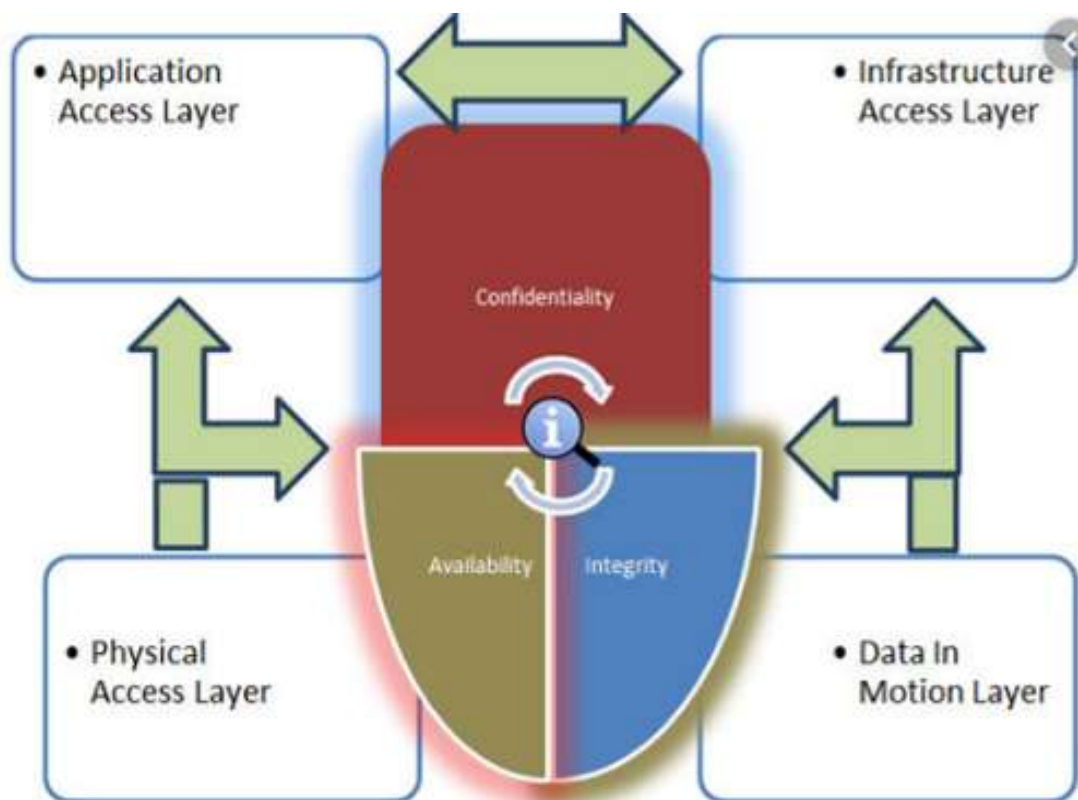
- **Information systems security**, more commonly referred to as **INFOSEC**, refers to the processes and methodologies involved with keeping information confidential, available, and assuring its integrity.
- It also refers to: Access controls, which prevent unauthorized personnel from entering or accessing a system.
- Organizations and people that use computers can describe their needs for information security and trust in systems in terms of three major requirements:
  - **Confidentiality**: controlling who gets to read information;
  - **Integrity**: assuring that information and programs are changed only in a specified and authorized manner; and
  - **Availability**: assuring that authorized users have continued access to information and resources.
- Planning a security program is somewhat like buying insurance. An organization considers the following:
  - The **value of the assets** being protected.
  - The **vulnerabilities of the system**: possible types of compromise, of users as well as systems. What damage can the person in front of the automated teller machine do? What about the person behind it?
  - **Threats**: do adversaries exist to exploit these vulnerabilities? Do they have a motive, that is, something to gain? How likely is attack in each case?
  - **Risks: the costs of failures and recovery**. What is the worst credible kind of failure? Possibilities are death, injury, compromise to national security, industrial espionage, and loss of personal privacy, financial fraud, and election fraud.
  - **The organization's degree of risk aversion**.

### 6.1 Guiding Principles of Information Security

- A principle which is a core requirement of information security for the safe utilization, flow, and storage of information is the **CIA triad**.
- CIA stands for **confidentiality, integrity, and availability** and these are the three main objectives of information security.
- **Confidentiality**: The aim of confidentiality is to ensure that information is hidden from people unauthorized to access it. The confidentiality principle dictates that information

should solely be viewed by people with appropriate and correct privileges. The science (and art) used to ensure data confidentiality is cryptography, which involves encryption and decryption methods.

- **Integrity:** Involves maintaining the consistency, accuracy, and trustworthiness of data over its entire life cycle . Data must not be changed in transit, and steps must be taken to ensure that data cannot be altered by unauthorized people (for example, in a breach of confidentiality).
- **Availability:** Availability is best ensured by rigorously maintaining all hardware, performing hardware repairs immediately when needed and maintaining a correctly functioning operating system environment that is free of software conflicts. It's also important to keep current with all necessary system upgrades.
- Below is an illustration of the CIA triad along with the four layers of information security.



**Figure 6.1: CIA Triad and Layers of Information Security**

- **The Application Access Layer** describes the notion that access to end-user applications have to be constrained to business ought-to-know
- **The Infrastructure Access Layer** describes the notion that access to infrastructure components has to be constrained to business ought-to-know. For instance, access to servers.
- **The Physical Access Layer** describes the notion that the physical access to any system, server, computer, data center, or another physical object storing confidential information has to be constrained to business ought-to-know.
- **The Data In Motion Layer** describes the notion that data ought to be secured while in motion.
- This **little [i] icon in the middle** of the illustration shows the center of information security and the reason for the emergence of the CIA principles; the icon represents information and represents the need to protect sensitive information.

## 6.2 Information Systems Privacy

- Data privacy, also called information privacy, is the aspect of information technology (IT) that deals with the ability an organization or individual has to determine what data in a computer system can be shared with third parties.
- **Invasion of Privacy:** An invasion of privacy occurs when there is an intrusion upon your reasonable expectation to be left alone. This article covers the four main types of invasion of privacy claims, an intentional tort primarily controlled by state laws.
- ***The four main types of invasion of privacy claims are:***
  - Intrusion of Solitude
  - Appropriation of Name or Likeness
  - Public Disclosure of Private Facts
  - False Light
- **1. Intrusion of Solitude**
  - Intruding upon another's solitude or private affairs is subject to liability if the intrusion is considered highly offensive to a reasonable person.
  - This tort is often associated with "peeping Toms," someone illegally intercepting private phone calls, or snooping through someone's private records.
  - Taking photographs of someone in public would not be invasion of privacy; however, using a long- range camera to take photos of someone inside their home would qualify.
  - Making a few unsolicited telephone calls may not constitute a privacy invasion, but calling repeatedly after being asked to stop would.

- **2. Appropriation of Name or Likeness**

- Plaintiffs may make a claim for damages if an individual (or company) uses their name or likeness for benefit without their permission.
- Usually this involves a business using a celebrity's name or likeness in an advertisement. Some states even limit this type of privacy tort to commercial uses.
- **Example:** An advertising agency approached musician Tom Waits to participate in a campaign for a new automobile. Waits, who has a distinctive and easily recognizable voice, declined. The advertisers hired someone who sounds like him to do the soundtrack, prompting Waits to sue the automaker for appropriating his likeness.

- **3. Public Disclosure of Private Facts**

- This type of invasion of privacy claim must be weighed against the protection of free speech. Unlike defamation (libel or slander), truth of the disclosed information isn't a defense.
- If an individual publicly reveals truthful information that is not of public concern and which a reasonable person would find offensive if made public, they could be liable for damages.
- **For Example:** The maiden name of a former prostitute who was acquitted of murder was revealed in a film about the case. Since the trial, she had moved to another city, gotten married and adopted a new lifestyle. Her new friends were unaware of her past, so the disclosure of this true but embarrassing information was deemed an invasion of her privacy.
- **For example,** a woman about to deliver a baby via caesarian section agrees to allow the operation to be filmed for educational purposes only, but instead it's shown to the public in a commercial theater. This is an invasion of her privacy.

- **4. False Light**

- A false light claim is similar to a defamation claim in that it allows an individual to sue for the public disclosure of information that is misleading (or puts that person in a "false light"), but not technically false.
- The key difference is that defamation claims only apply to the public broadcasting of false information.
- Generally, a false light claim must contain the **following elements:** (1) **the defendant made a publication about the plaintiff;** (2) **it was done with reckless disregard;** (3) **it placed the plaintiff in a false light;** and (4) **it would be highly offensive or embarrassing to a reasonable person.**
- **Example:** A 96-year-old woman sued an Arkansas newspaper for printing her picture next to the headline, "Special Delivery: World's oldest newspaper carrier, 101, quits because she's pregnant!" The woman, who was not pregnant, was awarded damages of \$1.5 million.

## 6.3 Components of Information Systems Privacy Policy

- **1. Types of Data Collected:**

- If your business collects personal data, you may be required by state law or federal guidance to itemize the types of personal data you collect. Let your customers know all types of data collected, including the following:
  - Name
  - E-mail address
  - Birthdate
  - Mailing Address
  - Phone Number
  - Credit Card Information
- Many businesses collect information from their customers for varying situations. Privacy laws require businesses to collect only personal data that is needed and indicate why they need it.
- For example, a mailing order would likely require the customer name, address and potentially phone number.

- **2. How Collected Data is Used**

- Spell out how you use the data you collect so customers are clear on why they are giving you their information.
- Everything from website logins to online customer service access requires personal data collection.
- Data sharing with third-party partners should also be disclosed.

- **3. Storage and Security Policies**

- On top of how data is used, don't forget to let users know if your company stores their data and, if so, what security measures you've taken to keep that information safe.
- This point is especially crucial for any type of payment information. The Payment Card Industry Data Security Standard was designed so merchants who accept and process credit card payment information do so in a secure environment.

- **4. Opt-Out Procedures and Company Contact Information**

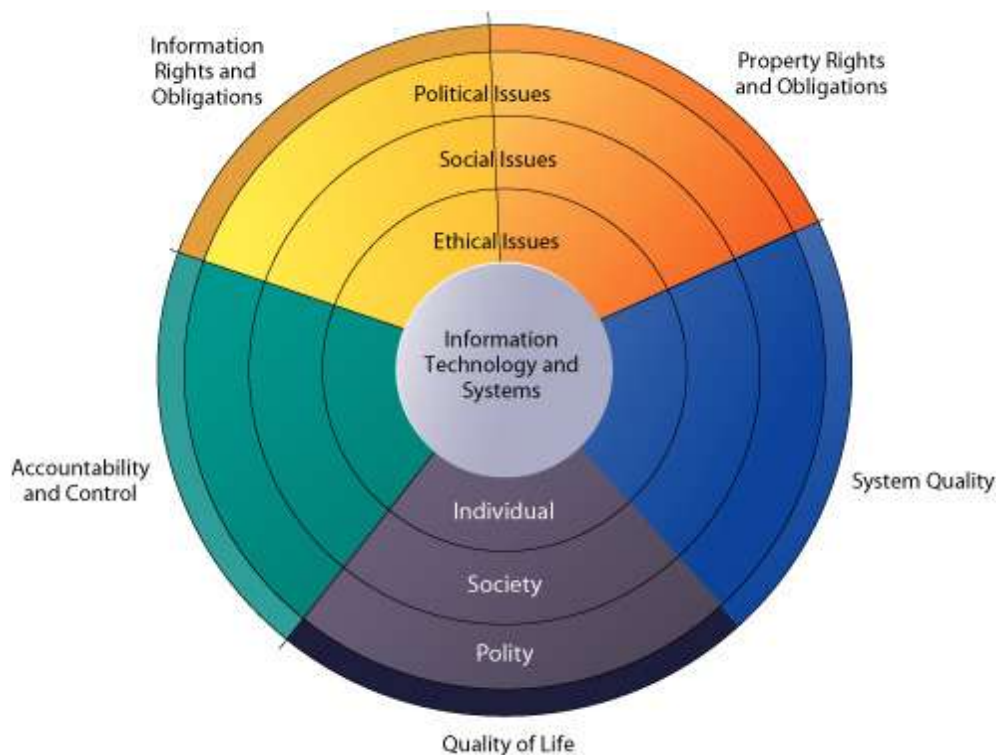
- Companies that send out commercial email marketing campaigns are required to have opt-out options listed in each email.
- You should also have an opt-out policy listed in your privacy statement so customers know how to control their information.

- **5. Effective Policy Date**

- Always include an effective date for your privacy policy so your customers see how recent your policies are.
- You'll more than likely be updating your policy often as technology and collection practices change.

## 6.4 Ethical Issues in Information Systems

- **Ethics** refers to rules of right and wrong that people use to make choices to guide their behaviors.
- Ethics in Information Systems seek to protect and safeguard individuals and society by using information systems responsibly.
- **A model for thinking about ethical, social, and political dimension**



*Figure: Relationship between ethical, social, and political issues in an information society*

- **Moral Dimensions of the information Age**

The major ethical, social, and political issues raised by information systems include the following moral dimensions:

- **1. Information rights and obligations.** What information rights do individuals and organizations possess with respect to information about themselves? What can they protect? What obligations do individuals and organizations have concerning this information?

- **Property rights and obligations.** How will traditional intellectual property rights be protected in a digital society in which tracing and accounting for ownership are difficult and ignoring such property rights is so easy?
- **Accountability and control.** Who can and will be held accountable and liable for the harm done to individual and collective information and property rights?
- **System quality.** What standards of data and system quality should we demand to protect individual rights and the safety of society?
- **Quality of life.** What values should be preserved in an information-and knowledge-based society? Which institutions should we protect from violation? Which cultural values and practices are supported by the new information technology?

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#### **SECTION VI Revision Questions**

1. Define the term INFOSEC as applied in Strategic Information Systems.
  2. CIA Triad is applied as the guiding principles in information security. Using example explain the CIA Triad.
  3. Any organization keen on ensuring information security must consider the layers of information security. Using a diagram, describe these layers.
  4. Using typical example in your country, describe the following types of Invasion of Privacy:
    - a. Intrusion of Solitude
    - b. Appropriation of Names or Likeness
    - c. Public Disclosure of Private Facts
    - d. False Light
  5. State and explain the components of an organization's information systems privacy policy.
  6. Using the model for thinking about ethical, social and political dimensions of information and data, describe the FOUR major issues that affect individuals, society, and politics.
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