

UNDERSTANDING

Information Technology

A Self-study Module

[For CA-Intermediate (IPC) Course]

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Preface

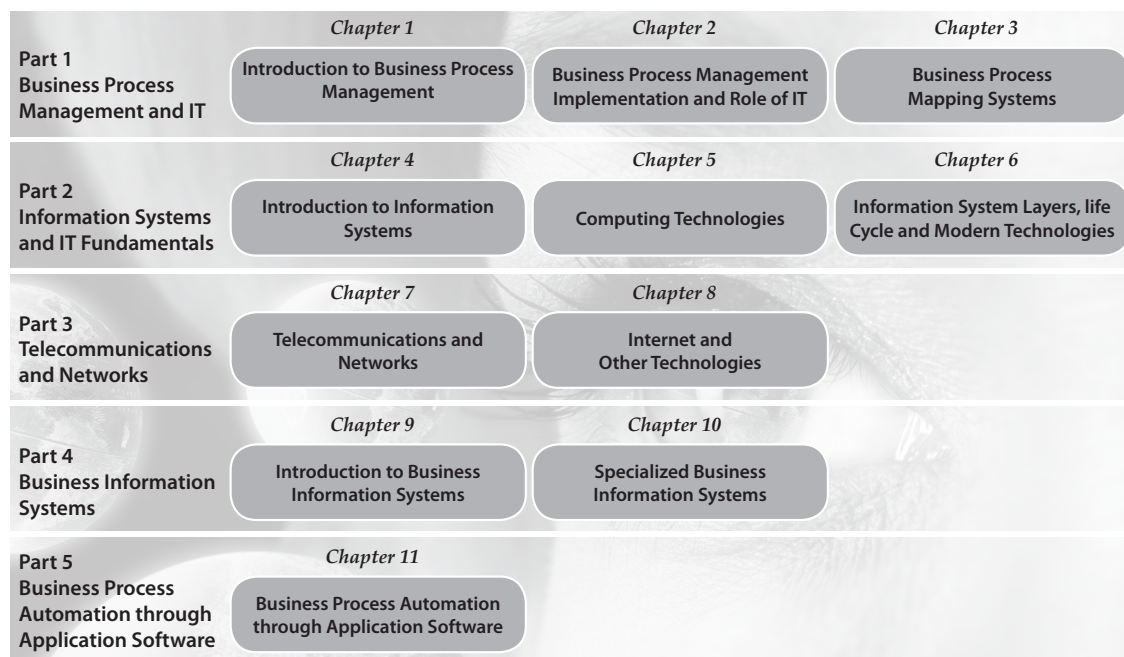
Welcome to this new edition of '*Understanding Information Technology: A Self-study Module*'! As an author, I am sensitive to your learning needs. I believe that presentation is an effective tool that determines the success of an author. For this very reason, I have taken your point of view into consideration. In writing each chapter, I have taken every care to make the content informative as well as easy and interesting to read.

This new course can have a major impact on your career direction and future success. It provides the comprehensive knowledge of information technology that would help you to utilize your talent in the dynamic 21st century business world where information systems and emerging new technologies have taken centre stage in running businesses.

The aim of '*Understanding Information Technology: A Self-study Module*' is to help CA Intermediate (IPC) students by clearly explaining, analysing, and evaluating important information technology concepts. My approach in writing this book was essentially twofold: to write an accessible textbook that students feel comfortable with but without compromising on the academic rigour.

The case-studies, herein, have been taken from contemporary world and leading brands around us. These help to bridge the gap between theories to practice; aiming not only at a comprehensive learning experience but also offering an interesting reading. To supplement this, I have tried to adopt a user-friendly writing style that gives clear and concise explanations to help students engage readily with the content and grasp complex IT concepts easily.

The book '*Understanding Information Technology: A Self-study Module*' has been divided into five parts and seven chapters. The chapter organization provides a student-friendly approach to the study of Information Technology. Structure of this book has been shown in this diagram.



I would be happy to get your feedback, comments and queries. You can get in touch with me at om.trivedi@carvinowledge.in, www.facebook.com/strategyclasses or call me at 9953922272 (between 8 pm – 10 pm).

Good luck for a challenging and successful learning experience!

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Syllabi Mapping

Intermediate (IPC), Group-II Paper-7A: Information Technology (50 Marks)

Level of Knowledge: Working Knowledge

Objective: “To develop understanding of Information Technology as a key enabler and facilitator of implementing Information Systems in enterprises and their impact on business processes and controls”.

Parts	Syllabus	Chapters in the book
Part I	Business Process Management and IT	
	Introduction to various Business processes: Accounting, Finances, Sale and Purchase.	Chapter 1: Introduction to Business Process Management
	Business Process Automation– Benefits & Risks Accounting systems vs. Value chain automation, Information as a business asset Impact of IT on business processes, Business Risks of failure of IT Business Process Re-engineering	Chapter 2: Business Process Management Implementation and Role of IT
	Approach to mapping systems: Entity Diagrams, Data Flow Diagrams, Systems Flow diagrams, Decision trees/tables.	Chapter 3: Business Process Mapping Systems
Part II	Information Systems and IT Fundamentals	
	Understand importance of IT in business and relevance to Audit with case studies.	Chapter 4: Introduction to Information Systems
	Understand working of computers and networks in business process automation from business information perspective Concepts of Computing, Computing Technologies & Hardware –Servers, end points, popular computing architectures, emerging computing architectures & delivery models – example: SaaS, Cloud Computing, Mobile computing, etc. Example: Overview of latest devices/technologies –i5, Bluetooth, Tablet, Wi-Fi, Android, Touchpad, iPad, iPod, Laptop, Notebook, Smartphone, Ultra-Mobile PC etc.)	Chapter 5: Computing Technologies
	Overview of IS Layers–Applications, DBMS, systems software, hardware, networks & links and people Overview of Information Systems life cycle and key phases	Chapter 6: Information System Layers, life Cycle and Modern Technologies
Part III	Telecommunication and Networks	
	Fundamentals of telecommunication Components and functions of Telecommunication Systems Data networks –types of architecture, LAN, WAN, Wireless, private and public networks etc. Overview of computing architectures – centralised, de-centralised, mainframe, client- server, thin-thick client etc. Network Fundamentals–Components, Standards and protocols, Network risks & controls –VPN, Encryption, Secure protocols, Network administration and management– concepts and issues How information systems are facilitated through telecommunications.	Chapter 7: Telecommunications and Networks

	How Internet works, Internet architecture, key concepts, risks and controls E-Commerce and M-commerce technologies	Chapter 8: Internet and Other Technologies
Part IV	Business Information Systems	
	Information Systems and their role in businesses The relationship between organisations, information systems and business processes Accounting Information Systems and linkages to Operational systems Business Reporting, MIS & IT	Chapter 9: Introduction to Business Information Systems
	IT as a business enabler & driver –ERP, Core Banking System, CRM, SCM, HRMS, Payment Mechanisms Organisation Roles & responsibilities and table or authorities, importance of access controls, privilege controls Specialised systems -MIS, DSS, Business Intelligence, Expert Systems, Artificial Intelligence, Knowledge Management systems etc.	Chapter 10: Specialized Business Information Systems
Part V	Business process automation through Application software	
	Business Applications–overview and types Business Process Automation, relevant controls and information systems Information Processing & Delivery channels and their role in Information Systems Key types of Application Controls and their need Emerging concepts– Virtualisation, Grid Computing, Cloud delivery model	Chapter 11: Business Process Automation through Application Software

Contents

<i>Preface</i>	<i>iv</i>
<i>Syllabi Mapping</i>	<i>v</i>
<i>Acknowledgements</i>	<i>vii</i>
<i>Visual Walkthrough</i>	<i>viii</i>

Part 1—Business Process Management and IT **2**

Chapter 1: Introduction to Business Process Management **3**

Introduction	4	Techniques and Processes Used	
What is Business?	4	to Evolve BPM	11
What is Process?	5	BPM Principles and Practices	14
Business Processes	6	Overview of Business Processes	
What is Process Management?	7	and Process Flow	14
Business Process Management (BPM)	8	Classification of Business Processes	18
Business Process Management System	9		

Chapter 2: Business Process Management Implementation and Role of IT **23**

Introduction	24	What is Information System?	34
BPM Implementation Methodology	24	Accounting Information System	34
What is Business Process Automation (BPA)?	27	Processing Cycles of an Accounts BPM	36
BPM Technology	29	Impact of IT on BPM	40
Value Chain Automation	30	Business Process Reengineering	41
Business Process Automation (BPA):		Why Business Process Reengineering (BPR)?	42
Benefits and Risks	31	What is Business Process	
Accounting Systems Automation	32	Reengineering (BPR)?	42

Chapter 3: Business Process Mapping Systems **46**

Introduction	47	Decision Trees/Tables	74
Entity Relationship Diagrams	47		
Data Flow Diagrams	49		
Flowchart	51		

Part 2—Information Systems and IT Fundamentals **82**

Chapter 4: Introduction to Information Systems **83**

- Introduction **84**
- What is an Information System? **84**
- Need for Information Technology **85**
- Reasons to Use of IT for Business **86**
- Importance of IT in Auditing **87**
- IT Risks and Issues **89**
- Impact of IT on Risks and Controls **89**
- Business Process Automation **90**
- Business Process Management **91**

Chapter 5: Computing Technologies **94**

- Introduction **95**
- What is Computing? **95**
- Computing Technologies **96**
- Popular Computing Architecture **101**
- Emerging Computing Models **103**
- Cloud Computing Environment **110**
- Mobile Computing **112**
- Grid Computing **114**
- Network Virtualization **115**

Chapter 6: Information System Layers, Life Cycle and Modern Technologies **118**

- Introduction **119**
- Application Software **119**
- Database Management Systems (DBMS) **121**
- Database Models **123**
- System Software **129**
- Hardware **130**
- Input/Output Devices (Fig. 6.7) **130**
- Input Devices **131**
- Output Devices **133**
- Processing Devices **135**
- Memory Unit **136**
- Network Links **137**
- Important Benefits of a Computer Network **138**
- People: Users **140**
- Information System Life Cycle or Software/
System Development Life Cycle (SDLC) **140**
- Recent Technologies/Devices **144**

Part 3—Telecommunications and Networks **150**

Chapter 7: Telecommunications and Networks **151**

- Introduction **152**
- Networking an Enterprise **152**
- Trends in Telecommunication **152**
- The Business Value of Telecommunications **154**
- Telecommunication Network **155**
- Telecommunication Network Model **156**
- Telecommunications Media/Channels **158**
- Types of Telecommunications Networks **162**
- Area Coverage Based Classification **162**
- Functional Based Classification **164**
- Multi-Tier Architecture **167**
- Ownership Based Classification **171**
- Network Computing **173**
- Transmission Technologies **178**

Transmission Modes	180
Transmission Techniques	180
Network Architectures and Protocols	182
The OSI Model	183
Network Risks, Controls and Security	186
Threats and Vulnerabilities	187

Level of Security	188
Network Security Protocols	190
Encryption and Decryption	191
Network Security Protocols	192
Network Security Techniques	193
Network Administration and Management	194

Chapter 8: Internet and Other Technologies 197

Introduction	198	What is e-commerce?	203
The Internet Revolution	198	Mobile Commerce	208
Networks and the Internet	198	Electronic Fund Transfer	209
Internet Applications	199	EFT Systems in Operation	210
Intranets and Extranets	200		

Part 4—Business Information Systems 212

Chapter 9: Introduction to Business Information Systems 213

Introduction	214	Knowledge Management System (KMS)	223
Information System Concepts	214	Information Creation through Knowledge Management	225
Organisations, Information Systems and Business Processes	217	Knowledge Discovery and Data Mining (KDD)	227
Information Systems and their Role in Businesses	218	Management Information System (MIS)	228
Transaction Processing System (TPS)	221	Decision Support Systems (DSS)	229
Office Automation Systems (OAS)	222	Executive Information Systems (EIS)	231

Chapter 10: Specialized Business Information Systems 235

Introduction	236	Accounting Information System (AIS)	249
Enterprise Resource Planning (ERP)	236	Artificial Intelligence	251
Various Stages of ERP	238	Expert System	252
Customer Relationship Management (CRM)	240	Business Intelligence	254
Supply Chain Management (SCM)	243	Importance of Access and Privilege Controls	256
Human Resource Management Systems (HRMS)	247	Electronic Funds Transfer	258
Core Banking System (CBS)	247	Payment Mechanisms	258

Part 5—Business Process Automation through Application Software	264
Chapter 11: Business Process Automation through Application Software	265
Introduction	266
Business Applications	267
Business Process Automation	269
Information Processing	275
Delivery Channels	276
Controls in BPA	277
Emerging Technologies	282
Glossary	285



Glossary

Accounting Information Systems: Information systems that record and report business transactions and the flow of funds through an organization, and then produce financial statements. These statements provide information for the planning and control of business operations, as well as for legal and historical recordkeeping.

Accounts Payable: Those accounts that represent what a business owes to others.

Accounts Receivable: Those accounts that represent what others owe to a business.

Algorithm: A set of well-defined rules or processes for solving a problem in a finite number of steps.

Analog Computer: A computer that operates on data by measuring changes in continuous physical variables such as voltage, resistance, and rotation. Contrast with Digital Computer.

Analytical CRM: Customer relationship management applications dealing with the analysis of customer data to provide information for improving business performance.

Analytical Database: A database of data extracted from operational and external databases to provide data tailored to online analytical processing, decision support, and executive information systems.

Android: Android is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers.

Application Development Management: The process by which an organization manages the in-house development of software applications.

Application Program Interface (API): The specific method prescribed by a computer operating system or by an application program by which a programmer writing an application program can make requests of the operating system or another application.

Application Service Provider (ASP) : A company that specializes in providing turnkey services for various software applications such that an organization can avoid the administration associated with licensing and updates of common software platforms used throughout the company.

Application Software: Programs that specify the information processing activities required for the completion of specific tasks of computer users. Examples are electronic spread sheet and word processing programs or inventory or payroll programs.

Application Software Package: A set of prewritten, precoded application software programs that are commercially available for sale or lease.

Arithmetic-Logic Unit (ALU): The unit of a computing system containing the circuits that perform arithmetic and logical operations.

Artificial Intelligence (AI) : A science and technology whose goal is to develop computers that can think, as well as see, hear, walk, talk, and feel. A major thrust is the development of computer functions normally associated with human intelligence, for example, reasoning, inference, learning, and problem solving.

Asynchronous: A sequence of operations without a regular or predictable time relationship. Thus, operations do not happen at regular timed intervals, but an operation will begin only after a previous operation is completed. The data transmission involves the use of start and stop bits with each character to indicate the beginning and end of the character being transmitted. Contrast with Synchronous.

Asynchronous Transfer Mode (ATM): A networking technology that parcels information into 8-byte cells, allowing data to be transmitted between computers from different vendors at any speed.

Automated Teller Machine (ATM) : A special-purpose transaction terminal used to provide remote banking services.

Back-End Processor: Typically, a smaller, general-purpose computer dedicated to database processing using a database management system (DBMS). Also called a database machine or server.

Backup Files: Files that have been copied and stored via a backup process to protect against damage or loss of the original files.

Bandwidth: The capacity of a communications channel as measured by the difference between the highest and lowest frequencies that can be transmitted by that channel.

Batch Processing: A category of data processing in which data are accumulated into batches and processed periodically. Contrast with Real-Time Processing.

Best Business Practices: It must have a collection of the best business processes applicable worldwide. And IT package imposes its own logic on a company's strategy, culture and organization.

Beyond The Company: It should not be confined to the organizational boundaries, rather support the on-line connectivity to the other business entities of the organization.

Blocking: a process preventing the transfer of a specified amount of funds or a specified quantity of a security.

Bluetooth: Bluetooth is a wireless technology standard for exchanging data over short distances up to 50 meters (164 feet) from fixed and mobile devices, creating Personal Area Networks (PANs) with high levels of security. It is a feature which is used every day through a number of compatible devices.

BPM lifecycle: It is a generic process optimization methodology defined explicitly for business processes. It provides a high level approach from a phased perspective without prescribing specific techniques such as those found in Six Sigma or Lean.

Bus: A set of conducting paths for movement of data and instructions that interconnects the various components of the CPU.

Business-To-Business (B2B) electronic commerce: Electronic sales of goods and services among businesses.

Business-To-Consumer (B2C) electronic commerce: Electronic retailing of products and services directly to individual consumers.

Business Intelligence (BI): A term primarily used in industry that incorporates a range of analytical and decision support applications in business including data mining, decision support systems, knowledge management systems, and online analytical processing.

Business Process Automation (BPA): Removing the human element from existing business processes by automating the repetitive or standardized process components.

Business Processes: The unique ways in which organizations coordinate and organize work activities, information, and knowledge to produce a product or service.

Business Process Management (BPM): The methodology used by enterprises to improve end-to-end business processes.

Business Process Reengineering (BPR): Restructuring and transforming a business process by a fundamental rethinking and redesign to achieve dramatic improvements in cost, quality, speed, and so on.

Byte: A sequence of adjacent binary digits operated on as a unit and usually shorter than a computer word. In many computer systems, a byte

is a grouping of eight bits that can represent one alphabetic or special character or that can be packed with two decimal digits.

Cache Memory: A high-speed temporary storage area in the CPU for storing parts of a program or data during processing.

Card (payment card): A device that can be used by its holder to pay for goods and services or to withdraw money.

Cathode Ray Tube (CRT): An electronic vacuum tube (television picture tube) that displays the output of a computer system.

Cellular Phone System: A radio communications technology that divides a metropolitan area into a honeycomb of cells to greatly increase the number of frequencies and thus the users that can take advantage of mobile phone service.

center.

Central Processing Unit (CPU): The unit of a computer system that includes the circuits that control the interpretation and execution of instructions. In many computer systems, the CPU includes the arithmetic-logic unit, the control unit, and the primary storage unit.

Client/Server Networks: A computing environment where end user workstations (clients) are connected to micro or mini LAN (servers) or possibly to a mainframe (super server).

Client: (1) An end user (2) The end user's networked microcomputer in client/server networks. (3) The version of a software package designed to run on an end user's networked microcomputer, such as a Web browser client and a groupware client.

Cloud Computing: A type of computing, comparable to grid computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications, involves delivering hosted services over the Internet.

Coaxial Cable: A sturdy copper or aluminum wire wrapped with spacers to insulate and protect it. Groups of coaxial cables may also be bundled together in a bigger cable for ease of installation.

Communications Satellites: Earth satellites placed in stationary orbits above the equator that serve as relay stations for communications signals transmitted from earth stations.

Competitive Advantage: Developing products, services, processes, or capabilities that give a company a superior business position relative to its competitors and other competitive forces.

Computer: A device that has the ability to accept data; internally store and execute a program of instructions; perform mathematical, logical, and manipulative operations on data; and report the results.

Computer Application: The use of a computer to solve a specific problem or accomplish a particular job for an end user. For example, common business computer applications include sales order processing, inventory control, and payroll.

Computer Network: A collection of computers and other hardware interconnected by communication channels that allow sharing of resources and information.

Computer Program: A series of instructions or statements in a form acceptable to a computer, prepared to achieve a certain result.

Computer System: Computer hardware as a system of input, processing, output, storage, and control components. Thus, a computer system consists of input and output devices, primary and secondary storage devices, the central processing unit, the control unit within the CPU, and other peripheral devices.

Computer Terminal: Any input/output device connected by telecommunications links to a computer.

Control: (1) The systems component that evaluates feedback to determine whether the system is moving toward the achievement of its goal and then makes any necessary adjustments to the input and processing

Control Unit: A subunit of the central processing unit that controls and directs the operations of the computer system. The control unit retrieves computer instructions in proper sequence, interprets each instruction, and then directs the other parts of the computer system in their implementation.

Cursor: A movable point of light displayed on most video display screens to assist the user in the input of data.

Customer Relationship Management (CRM): A crossfunctional e-business application that integrates and automates many customer-serving processes in sales, direct marketing, account and order management, and customer service and support.

Customer Relationship Management Systems: Information systems that track all the ways in which a company interacts with its customers and analyze these interactions to optimize revenue, profitability, customer satisfaction, and customer retention.

Customization: The modification of a software package to meet an organization's unique requirements without destroying the package software's integrity.

Data: Facts or observations about physical phenomena or business transactions. More specifically, data are objective measurements of the attributes (characteristics) of entities such as people, places, things, and events.

Data Administration: A data resource management function that involves the establishment and enforcement of policies and procedures for managing data as a strategic corporate resource.

Database: An integrated collection of logically related data elements. A database consolidates many records previously stored in separate files so that a common pool of data serves many applications.

Database Administration: A data resource management function that includes responsibility for developing and maintaining the organization's data dictionary, designing and monitoring the performance of databases, and enforcing standards for database use and security.

Database Administrator (DBA) : A specialist responsible for maintaining standards for the development, maintenance, and security of an organization's databases.

Database Maintenance: The activity of keeping a database up to date by adding, changing, or deleting data

Database Management Approach: An approach to the storage and processing of data in which independent files are consolidated into a common pool, or database, of records available to different application programs and end users for processing and data retrieval.

Database Management System (DBMS) : A set of computer programs that controls the creation, maintenance, and utilization of the databases of an organization.

Data Base Management Systems (DBMS): Software that aid in organizing, controlling and using the data needed by the application programme.

Database Model: A type of data model that determines the logical structure of a database and fundamentally determines in which manner data can be stored, organized, and manipulated.

Database Processing: Utilizing a database for data processing activities such as maintenance, information retrieval, or report generation.

Data Center: An organizational unit that uses centralized computing resources to perform information processing activities for an organization. Also known as a computer

Data Flow Diagram: A graphic diagramming tool that uses a few simple symbols to illustrate the flow of data among external entities, processing activities, and data storage elements.

Data Logging: Recording of all data generated by a device, or the data passing through a particular point in a networked computer System.

Data Mining: Using special-purpose software to analyse data from a data warehouse to find hidden patterns and trends.

Data Warehouse: An integrated collection of data extracted from operational, historical, and external databases and cleaned, transformed, and cataloged for retrieval and analysis (*data mining*) to provide business intelligence for business decision making.

Decision-Support Systems (DSS): 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.

Direct Input/Output: Methods such as keyboard entry, voice input/output, and video displays that allow data to be input into or output from a computer system without the use of machine-readable media.

Distributed Processing: A form of decentralization of information processing made possible by a network of computers dispersed throughout an organization. Processing of user applications is accomplished by several computers interconnected by a telecommunications network, rather than relying on one large centralized computer facility or on the decentralized operation of several independent computers.

Downsizing: Moving to smaller computing platforms, such as from mainframe systems to networks of personal computers and servers.

Duplex: In Communications, pertains to a simultaneous two-way independent transmission in both directions.

e-Commerce Marketplaces: Internet, intranet, and extranet Web sites and portals hosted by individual companies, consortiums of organizations, or third-party intermediaries providing electronic catalog, exchange, and auction markets to unite buyers and sellers to accomplish e-commerce transactions.

EDI: Electronic Data Interchange: The automatic electronic exchange of business documents between the computers of different organizations.

Electronic Business (E-business): The use of the Internet and digital technology to execute all the business processes in the enterprise. Includes e-commerce as well as processes for the internal management of the firm and for coordination with suppliers and other business partners.

Electronic Commerce (e-Commerce) : The buying and selling, marketing and servicing, and delivery and payment of products, services, and information over the Internet, intranets, extranets, and other networks, between an inter-networked enterprise and its prospects, customers, suppliers, and other business partners. Includes business-to-consumer (B2C), business-to-business (B2B), and consumer-to-consumer (C2C) e-commerce

Electronic Commerce: The process of buying and selling goods and services electronically involving transactions using the Internet, networks, and other digital technologies.

Electronic Commerce Server Software: Software that provides functions essential for running e-commerce Web sites, such as setting up electronic catalogs and storefronts, and mechanisms for processing customer purchases.

Electronic Data Interchange (EDI): The direct computer-to-computer exchange between two organizations of standard business transaction documents.

Electronic Funds Transfer (EFT): The development of banking and payment systems that transfer funds electronically instead of using cash or paper documents such as checks.

Electronic Mail (e-mail): Sending and receiving text messages between networked PCs over telecommunications networks. E-mail can also include data files, software, and multimedia messages and documents as attachments.

Electronic Mail (e-mail): The computer-to-computer exchange of messages.

Encryption: To scramble data or convert them, prior to transmission, to a secret code that masks the meaning of the data to unauthorized recipients. Similar to enciphering

End User: Anyone who uses an information system or the information it produces.

Enterprise Application Integration (EAI) software: Software that works with specific software platforms to tie together multiple applications to support enterprise integration.

Enterprise Networking: An arrangement of the organization's hardware, software, network, and data resources to put more computing power on the desktop and create a company-wide network linking many smaller networks.

Enterprise Portal: Web interface providing a single entry point for accessing organizational information and services, including information from various enterprise applications and in-house legacy systems so that information appears to be coming from a single source.

Enterprise Resource Planning (ERP): Integrated cross-functional software that reengineers manufacturing, distribution, finance, human

resources, and other basic business processes of a company to improve its efficiency, agility, and profitability.

Enterprise Software: Set of integrated modules for applications such as sales and distribution, financial accounting, investment management, materials management, production planning, plant maintenance, and human resources that allow data to be used by multiple functions and business processes.

Enterprise Systems: Integrated enterprise-wide information systems that coordinate key internal processes of the firm.

Entity Relationship Diagram (ERD): A data planning and systems development diagramming tool that models the relationships among the entities in a business process.

ERP: It is business management software that allows an organization to use a system of integrated applications to manage the business.

Executive Information System (EIS): An information system that provides strategic information tailored to the needs of executives and other decision makers.

Executive Support System (ESS) : An executive information system with additional capabilities, including data analysis, decision support, electronic mail, and personal productivity tools

Expert System (ES) : A computer-based information system that uses its knowledge about a specific complex application area to act as an expert consultant to users. The system consists of a knowledge base and software modules that perform inferences on the knowledge and communicate answers to a user's questions.

Extranet: A network that links selected resources of a company with its customers, suppliers, and other business partners, using the Internet or private networks to link the organizations' intranets.

Feasibility Study: A preliminary study that investigates the information needs of end users and the objectives, constraints, basic resource requirements, cost/benefits, and feasibility of proposed projects

Feedback: (1) Data or information concerning the components and operations of a system. (2) The use of part of the output of a system as input to the system.

Fiber optics: The technology that uses cables consisting of very thin filaments of glass fibers that can conduct the light generated by laser at frequencies that approach the speed of light.

Field: A data element that consists of a grouping of characters that describe a particular attribute of an entity. For example, the name field or salary field of an employee.

File: A collection of related data records treated as a unit. Sometimes called a data set.

File Management: Controlling the creation, deletion, access, and use of files of data and programs.

File Processing: Organizing data into specialized files of data records designed for processing only by specific application programs. Contrast with Database Management Approach.

Firewall: Computers, communications processors, and software that protect computer networks from intrusion by screening all network traffic and serving as a safe transfer point for access to and from other networks.

Firmware: The use of Microprogrammed read-only memory circuits in place of hard-wired logic circuitry. See also Microprogramming.

Flexibility: An IT system should be flexible to respond to the changing needs of an enterprise. The client server technology enables IT to run across various database back ends through Open Database Connectivity (ODBC).

Flowchart: A graphical representation in which symbols are used to represent operations, data, flow, logic, equipment, and so on. A program flowchart illustrates the structure and sequence of operations of a program, whereas a system flowchart illustrates the components and flows of information systems.

Fuzzy Logic Systems: Computer-based systems that can process data that are incomplete or only partially correct, that is, fuzzy data. Such systems can solve unstructured problems with incomplete knowledge, as humans do.

General-Purpose Application Programs: Programs that can perform information processing jobs for users from all application areas. For example, word processing programs, electronic spreadsheet programs, and graphics programs can be used by individuals for home, education, business, scientific, and many other purposes.

Gigabyte: One billion bytes. More accurately, 2^{30} or 1,073,741,824 in decimal notation

Hardware: (1) Machines and media. (2) Physical equipment, as opposed to computer programs or methods of use. (3) Mechanical, magnetic, electrical, electronic, or optical devices. Contrast with Software.

Human Resource Information Systems (HRIS) : Information systems that support human resource management activities such as recruitment, selection and hiring, job placement and performance appraisals, and training and development

Impact Printers: Printers that form images on paper through the pressing of a printing element and an inked ribbon or roller against the face of a sheet of paper

Information Processing: A concept that covers both the traditional concept of processing numeric and alphabetic data and the processing of text, images, and voices. It emphasizes that the production of information products for users should be the focus of processing activities.

Information System: (1) A set of people, procedures, and resources that collects, transforms, and disseminates information in an organization. (2) A system that accepts data resources as input and processes them into information products as output.

Information Technology (IT) : Hardware, software, telecommunications, database management, and other information processing technologies used in computer based information systems.

Information Technology Management: Managing information technologies by (1) the joint development and implementation of business and IT strategies by business and IT executives, (2) managing the research and implementation of new information technologies and the development of business applications, and (3) managing the IT processes, professionals, subunits, and infrastructure within a company.

Input/Output (I/O) : Pertaining to either input or output, or both.

Input: Pertaining to a device, process, or channel involved in the insertion of data into a data processing system. Opposite of Output

Instruction Set Architecture (ISA): It is the abstract model of a computing system that is seen by a machine language programmer, including the instruction set, memory address modes, processor registers, and address and data formats.

Interface: A shared boundary, such as the boundary between two systems. For example, the boundary between a computer and its peripheral devices

Internet: A rapidly growing computer network of millions of business, educational, and governmental networks connecting hundreds of millions of computers and their users in over 200 countries.

Internet Technologies: The Internet and its technologies are being used to build interconnected enterprises and global networks, like intranets and extranets that form information superhighways to support enterprise collaboration, electronic commerce, and internal business applications.

Internetwork Processors: Internetwork processors such as bridges, routers, hubs, or gateways to other LANs or wide area networks interconnect many LANs.

Intranet: An Internet-like network within an organization. Web browser software provides easy access to internal Web sites established by business units, teams, and individuals, and other network resources and applications.

Knowledge-Based Information System: An information system that adds a knowledge base to the database and other components found in other types of computer-based information systems.

Knowledge Base: A computer-accessible collection of knowledge about a subject in a variety of forms, such as facts and rules of inference, frames, and objects.

Knowledge Management: Organizing and sharing the diverse forms of business information created within an organization Includes managing

project and enterprise document libraries, discussion databases, intranet Web site databases, and other types of knowledge bases.

Knowledge Management Systems: Systems that support the creation, capture, storage, and dissemination of firm expertise and knowledge.

Knowledge Workers: People whose primary work activities include creating, using, and distributing information.

Legacy Systems: The older, traditional mainframe-based business information systems of an organization.

Liquid Crystal Displays (LCDs): Electronic visual displays that form characters by applying an electrical charge to selected silicon crystals

Local Area Network (LAN): A communications network that typically connects computers, terminals, and other computerized devices within a limited physical area such as an office, building, manufacturing plant, or other work site.

Management Information System (MIS): A management support system that produces prespecified reports, displays, and responses on a **periodic, exception, demand, or pushreporting basis**.

Management Support System (MSS): An information system that provides information to support managerial decision making More specifically, an information reporting system, executive information system, or decision support system.

Megabyte: One million bytes. More accurately, 2^{20} or 1,048,576 in decimal notation

Metadata: Metadata (meta-content) are defined as the data providing information about one or more aspects of the data.

Micro architecture: It is a term used to describe the resources and methods used to achieve architecture specification.

MIS (Management Information Systems): It is a general term for the computer systems in an enterprise that provide information about its business operations. It's also used to refer to the people who manage these systems.

Mobile Computing: It is a technology that allows transmission of data, voice and video via a computer or any other wireless enabled device without having to be connected to a fixed physical link.

Modem (MODulation - DEModulation): A device that converts the digital signals from input/output devices into appropriate frequencies at a transmission terminal and converts them back into digital signals at a receiving terminal.

Modem: (MODulator-DEModulator) A device that converts the digital signals from input/output devices into appropriate frequencies at a transmission terminal and converts them back into digital signals at a receiving terminal.

Multiplexer: An electronic device that allows a single communications channel to carry simultaneous data transmissions from many terminals.

Network Architectures - TCP/IP: The Internet's protocol suite is called Transmission Control Protocol/Internet Protocol (TCP/IP). TCP/IP consists of five levels of protocols that can be related to the seven layers of the OSI architecture. TCP/IP is used by the Internet and all intranets and extranets.

Network Architectures - OSI: The International Standards Organization (ISO) has developed a seven-layer Open Systems Interconnection (OSI) to serve as a standard model for network architectures in order to promote an open, simple, flexible, and efficient telecommunications environment.

Network Computing: A network-centric view of computing in which "the network is the computer," that is, the view that computer networks are the central computing resource of any computing environment.

Network Operating System: A network operating system is a program that is used to control telecommunications and the use of and sharing of network resources.

Network Server: LANs use a powerful microcomputer with a large disk capacity as a file server or network server. The server handles resource sharing and telecommunications.

Network Topologies: The various configurations by which computers can be networked and connected together

Office Automation (OA) : The use of computer-based information systems that collect, process, store, and transmit electronic messages, documents, and other forms of office communications among individuals, workgroups, and organizations.

Online Analytical Processing (OLAP) : A capability of some management, decision support, and executive information systems that supports interactive examination and manipulation of large amounts of data from many perspectives.

Open Systems: Model of network protocols enabling any computer connected to a network to communicate with any other computer on the same network or a different network, regardless of the manufacturer.

Operating System (OS): A set of computer programs that manages computer hardware resources and acts as an interface with computer applications programs.

Operating System Software: An operating system (OS) Software is a set of computer programs that manages computer hardware resources and acts as an interface with computer applications programs. The operating system is a vital component of the system software in a computer system.

Output: Pertaining to a device, process, or channel involved with the transfer of data or information out of an information processing system. Opposite of Input

Outsourcing: Turning over all or part of an organization's information systems operation to outside contractors, known as systems integrators or service providers.

Packet: A group of data and control information in a specified format that is transmitted as an entity.

Packet Switching: A data transmission process that transmits addressed packets such that a channel is occupied only for the duration of transmission of the packet.

Parallel Processing: Executing many instructions at the same time, that is, in parallel. Performed by advanced computers using many instruction processors organized in clusters or networks.

Peer-to-Peer Networks (P2P): Computing environments where end user computers connect, communicate, and collaborate directly with each other via the Internet or other telecommunications network links.

Personal Digital Assistant (PDA) : Handheld microcomputer devices that enable you to manage information such as appointments, to-do lists, and sales contacts, send and receive e-mail, access the Web, and exchange such information with your desktop PC or network server.

Point-of-Sale (POS) Terminal: A computer terminal used in retail stores that serves the function of a cash register as well as collecting sales data and performing other data processing functions.

Processor: A hardware device or software system capable of performing operations on data.

Program: A set of instructions that causes a computer to perform a particular task.

Protocol: A set of rules and procedures for the control of communications in a communication network.

Prototype: A working model. In particular, a working model of an information system that includes tentative versions of user input and output, databases and files, control methods, and processing routines.

Quality Assurance Methods for ensuring that information systems are free from errors and fraud and provide information products of high quality.

Radical Redesign: This means getting down to the fundamental – where necessary throwing away the old, out of date rules – and recognizing that quality and innovation are more important to profit than cost.

Random-Access Memory (RAM) One of the basic types of semiconductor memory used for temporary storage of data or programs during processing. Each memory position can be directly sensed (read) or changed (written) in the same length of time, regardless of its location on the storage medium.

Re-engineering: It is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.

Read Only Memory (ROM): It is computer memory containing data that normally can only be read, not written to, usually used by manufacturers.

Real-Time Processing: Data processing in which data are processed immediately rather than periodically. Also called online processing. Contrast with Batch Processing.

Real Time: Pertaining to the performance of data processing during the actual time a business or physical process transpires, in order that results of the data processing can be used to support the completion of the process.

Record: A collection of related data fields treated as a unit.

Reduced Instruction Set Computer (RISC): A CPU architecture that optimizes processing speed by the use of a smaller number of basic machine instructions than traditional CPU designs.

Redundancy: In information processing, the repetition of part or all of a message to increase the chance that the correct information will be understood by the recipient

Register: A device capable of storing a specified amount of data, such as one word.

Remote Access: Pertaining to communication with the data processing facility by one or more stations that are distant from that facility.

Routing: Refers to the process of deciding on how to communicate the data from source to destination, in a network.

Scalability: scalability is the ability of a system, network, or process to handle a growing amount of work in a capable manner or its ability to be enlarged to accommodate that growth.

Secondary Storage: Storage that supplements the primary storage of a computer. Synonymous with auxiliary storage

Serial: Pertaining to the sequential or consecutive occurrence of two or more related activities in a single device or channel

Server (Client-Server Architecture): It is a computer program running to serve the requests of other programs, the "clients".

Server (Hardware): It is a device on a network dedicated to run one or more services (as a host), to serve the needs of the users of other computers on a network.

Server: (1) A computer that supports applications and telecommunications in a network, as well as the sharing of peripheral devices, software, and databases among the workstations in the network. (2) Versions of software for installation on network servers designed to control and support applications on client microcomputers in client/ server networks. Examples include multiuser network operating systems and specialized software for running Internet, intranet, and extranet Web applications, such as electronic commerce and enterprise collaboration.

Smartphone: It is a mobile phone built on a mobile operating system, with more advanced computing capability connectivity than a feature phone.

Software: Computer programs and procedures concerned with the operation of an information system. Contrast with Hardware.

Software as a Service (SaaS): A software delivery method that provides access to software and its functions remotely as a Web-based service.

Spooling: Simultaneous peripheral operation online Storing input data from low-speed devices temporarily on high-speed secondary storage units, which can be quickly accessed by the CPU. Also, writing output data at high speeds onto magnetic tape or disk units from which it can be transferred to slow-speed devices such as a printer.

Storage: Pertaining to a device into which data can be entered, in which they can be held, and from which they can be retrieved at a later time. Same as Memory

Strategic Information Systems: Information systems that provide a firm with competitive products and services that give it a strategic advantage over its competitors in the marketplace. Also, information systems that promote business innovation, improve business processes, and build strategic information resources for a firm.

Subsystem: A system that is a component of a larger system.

Supply Chain: The network of business processes and interrelationships among businesses that are needed to build, sell, and deliver a product to its final customer.

Supply Chain Management: Integrating management practices and information technology to optimize information and product flows among the processes and business partners within a supply chain.

Switch: (1) A device or programming technique for making a selection. (2) A computer that controls message switching among the computers and terminals in a telecommunications network.

Synchronous: A characteristic in which each event, or the performance of any basic operation, is constrained to start on, and usually to keep in step with, signals from a timing clock. Contrast with Asynchronous.

System: (1) A group of interrelated or interacting elements forming a unified whole (2) A group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process. (3) An assembly of methods, procedures, or techniques unified by regulated interaction to form an organized whole. (4) An organized collection of people, machines, and methods required to accomplish a set of specific functions.

System flowchart: A tool for documenting a physical system in which each component is represented by a symbol that visually suggests its function.

System Flowchart A graphic diagramming tool used to show the flow of information processing activities as data are processed by people and devices.

Systems Analysis (1) Analyzing in detail the components and requirements of a system. (2) Analyzing in detail the information needs of an organization, the characteristics and components of presently utilized information systems, and the functional requirements of proposed information systems.

Systems Approach A systematic process of problem solving that defines problems and opportunities in a systems context. Data are gathered describing the problem or opportunity, and alternative solutions are identified and evaluated. Then the best solution is selected and implemented, and its success is evaluated.

Systems Design Deciding how a proposed information system will meet the information needs of end users. Includes logical and physical design activities and user interface, data, and process design activities that produce system specifications that satisfy the system requirements developed in the systems analysis stage.

Systems Development (1) Conceiving, designing, and implementing a system. (2) Developing information systems by a process of investigation, analysis, design, implementation, and maintenance. Also called the systems development life cycle (SDLC), information systems development, or application development

Systems Development Life Cycle (SDLC): It is a conceptual model used in project management that describes the stages involved in an information system development project, from an initial feasibility study through maintenance of the completed application.

Systems Development Tools Graphical, textual, and computer-aided tools and techniques used to help analyze, design, and document the development of an information system. Typically used to represent (1) the components and flows of a system, (2) the user interface, (3) data attributes and relationships, and (4) detailed system processes

Systems Implementation The stage of systems development in which hardware and software are acquired, developed, and installed; the system is tested and documented; people are trained to operate and use the system; and an organization converts to the use of a newly developed system.

Systems Investigation The screening, selection, and preliminary study of a proposed information system solution to a business problem

Systems Maintenance The monitoring, evaluating, and modifying of a system to make desirable or necessary improvements.

System Software: A computer software that is designed to operate the computer hardware and to give and maintain a platform for running application software.

Tablet: It is a one piece general-purpose computer contained in a single panel. Its distinguishing characteristic is the use of a touch screen as the input device.

Task Management A basic operating system function that manages the accomplishment of the computing tasks of users by a computer system.

TCP/IP Transmission control protocol/Internet protocol. A suite of telecommunications network protocols used by the Internet, intranets, and extranets that has become a de facto network architecture standard for many companies.

Telecommunications Channels: Telecommunications channels are the part of a telecommunications network that connects the message source with the message receiver. It includes the physical equipment used to connect one location to another for the purpose of transmitting and receiving information.

Telecommunications Controller A data communications interface device (frequently a special-purpose mini- or microcomputer) that can control a telecommunications network containing many terminals.

Telecommunications Control Program A computer program that controls and supports the communications between the computers and terminals in a telecommunications network.

Telecommunications Media: Telecommunications media are the physical media used by telecommunications channels. They include, twisted-pair wire, coaxial cables, fiber optic cables, terrestrial microwave, communications satellite, cellular, and infrared systems.

Telecommunications Network Components: Telecommunications components include terminals, telecommunications processors, telecommunications channels and media, computers, and telecommunications control software.

Telecommunications Pertaining to the transmission of signals over long distances, including not only data communications but also the transmission of images and voices using radio, television, and other communications technologies.

Telecommunications Processors: Multiplexers, concentrators, communications controllers, and cluster controllers that allow a communications channel to carry simultaneous data transmissions from many terminals. They may also perform error monitoring, diagnostics and correction, modulation-demodulation, data compression, data coding and decoding, message switching, port contention, and buffer storage.

Telecommunications Software: Telecommunications software, including network operating systems, telecommunications monitors, web browsers, and middleware, control and support the communications activity in a telecommunications network.

Teleconferencing The use of video communications to allow business conferences to be held with participants who are scattered across a country, continent, or the world

Terabyte One trillion bytes. More accurately, 2 to the 40 th power, or 1,009,511,627,776 in decimal notation

Total Quality Management Planning and implementing programs of continuous quality improvement, where quality is defined as meeting or exceeding the requirements and expectations of customers for a product or service

Touchpad: A touchpad is a pointing device featuring a tactile sensor, a specialized surface that can translate the motion and position of a user's fingers to a relative position on screen.

Transaction An event that occurs as part of doing business, such as a sale, purchase, deposit, withdrawal, refund, transfer, or payment

Transaction Document A document produced as part of a business transaction, for example, a purchase order, Pay-check, sales receipt, or customer invoice.

Transaction File A data file containing relatively transient data to be processed in combination with a master file. Contrast with Master File.

Transaction Processing Cycle A cycle of basic transaction processing activities including data entry, transaction processing, database maintenance, document and report generation, and inquiry processing.

Transaction Processing Systems (TPS): Computerized systems that perform and record the daily routine transactions necessary to conduct the business; they serve the organization's operational level.

User Interface That part of an operating system or other program that allows users to communicate with it to load programs, access files, and accomplish other computing tasks.

Value Chain Viewing a firm as a series, chain, or network of basic activities that adds value to its products and services and thus adds a margin of value to the firm

Videoconferencing Real-time video and audio conferencing (1) among users at networked PCs (desktop videoconferencing) or (2) among participants in conference rooms or auditoriums in different locations (teleconferencing) Videoconferencing can also include whiteboarding and document sharing.

Virtual Communities Groups of people with similar interests who meet and share ideas on the Internet and online services and develop a feeling of belonging to a community.

Virtual Company A form of organization that uses telecommunications networks and other information technologies to link the people, assets, and ideas of a variety of business partners, no matter where they may be, to exploit a business opportunity

Virtualization: Virtualization is the creation of a virtual (rather than actual) version of something, such as an operating system, a server, a storage device or network resources.

Virtual Machine Pertaining to the simulation of one type of computer system by another computer system.

Virtual Mall An online multimedia simulation of a shopping mall with many different interlinked retail Web sites.

Virtual Memory: It is an allocation of hard disk space to help RAM. Virtual memory combines computer's RAM with temporary space on the hard disk.

Virtual Organization: Organization using networks to link people, assets and ideas to create and distribute products and services without being limited to traditional organizational boundaries or physical location.

Virtual Private Network A secure network that uses the Internet as its main backbone network to connect the intranets of a company's different locations or to establish extranet links between a company and its customers, suppliers, or other business partners

Voice Conferencing Telephone conversations shared among several participants via speaker phones or networked PCs with Internet telephone software.

Voice Mail Unanswered telephone messages that are digitized, stored, and played back to the recipient by a voice messaging computer

Voice over IP (VoIP) A process where the Internet is used as the network carrier for telephone or voice communication.

Web Browser A software package that provides the user interface for accessing Internet, intranet, and extranet Web sites. Browsers are becoming multifunction universal clients for sending and receiving e-mail, downloading files, accessing Java applets, participating in discussion groups, developing Web pages, and other Internet, intranet, and extranet applications.

Web Publishing Creating, converting, and storing hyperlinked documents and other material on Internet or intranet Web servers so that they can be easily shared via Web browsers with teams, workgroups, or the enterprise

Wi-Fi: It is the name of a popular wireless networking technology that uses radio waves to provide wireless high-speed Internet and network connections. Wi-Fi networks have limited range.

Wide Area Network (WAN): A data communications network covering, a large geographic area.

Wireless Technologies Using radio wave, microwave, infrared, and laser technologies to transport digital communications without wires between communications devices. Examples include terrestrial microwave, communications satellites, cellular and PCS phone and pager systems, mobile data radio, and various wireless Internet technologies.

Word Processing The automation of the transformation of ideas and information into a readable form of communication It involves the use of computers to manipulate text data to produce office communications in the form of documents

Workstation (1) A computer system designed to support the work of one person. (2) A high-powered computer to support the work of professionals in engineering, science, and other areas that require extensive computing power and graphics capabilities.

World Wide Web (WWW) A global network of multimedia Internet sites for information, education, entertainment, e-business, and e-commerce.