Business Information Systems - Lecture notes - ITM102EXAM

Business Information Systems (Ryerson University)

CHAPTER 1

- Organizations that ignore impact of technology and information systems when conducting business will likely risk the business itself.
- Organization must keep up with these rapid technology chances or risk becoming obsolete.

- **Moore's Law:** computing power doubles every 18 months (maximum number of transistors in an integrated circuit)

- **Information Technology (IT):** is a key enabler to all organizations and impacts all businesses disciplines.
    - The physical components; hardware and software.
    - Enabler for processes to perform steps they were designed to accomplish.
    - Without a clear goal, process, and people IT is irrelevant.

- **Knowledge Work:** discovery, analysis, transformation, synthesis, and communication of data, information, and knowledge.
    - Impossible to do without technology.

- **Information System (IS):** organized collection of people, information, business processes, and information technology – designed to turn inputs to outputs in order to achieve a goal.
    - Enhance work, decision making, problem solving, communicating and coordinating.

INPUT → PROCESS → OUTPUT

Data, Info, Knowledge, Decisions	"Business Processes" People, Info Technology	"Business Value" Data, Info, Knowledge, Decisions

- **Input:** items entered into a system to transform into outputs.
- **Process:** series of steps to transform inputs into outputs.
- **Outputs:** the end result, product or service.

- **Data:** raw, unorganized facts.
- **Information:** processed, organized, transformed data that is useful.
- **Knowledge:** information plus human experience and judgment.

- **Business processes:** steps to transform inputs into outputs to achieve a goal.
- **People:** people or organizations who have both an interest in and an influence in the implementation, or operation of a companies IS system.
- **Decision:** choice made from alternatives to follow or avoid some course of action.
- **Business Value:** positive return created through integration of organizations people, information, IT and business processes.

- **Productivity zone:** intersection of people, technology, and processes.
    - by applying equal weight to each element and being able to optimally combine each, business can achieve superior productivity and enhance competitive advantage.

- **Internet:** communication, information, and commerce.
- **Communication:** ability for business to share information between themselves and business partners.
    - Ability to make information available and to find information in a timely manner. (**World Wide Web**)
- **Information overload:** too much info on the internet, i.e. Google.
- **Commerce:** using the internet as an avenue for buying and selling goods.
- **E-commerce:** the use of information systems, technology, and computer networks by individuals and organizations to create business value.

- **Business:** organization with one or more people who:
    1. Decide on common goals to pursue.
    2. Work together to locate and organize resources.
    3. Create processes to achieve the desired goals.
- Typically, primary goal is to generate economic value.

- **Business environment:** is a complex collection of political, economic, social, and technological factors that organizational leaders must consider when making decisions regarding goals.

- Organizations use advanced info systems:
- **Transaction Processing System (TPS):** captures and processes transactions to make them available to the organization.
    - Transaction: exchange of something of value the business produces for something in return that the business values.
- **Management Information System (MIS):** provides timely information to decision makers through processing and reporting.
- **Decision Support System (DSS):** provides analytical and visualization tools to support and enhance decision making and planning.
- **Enterprise Resource Planning (ERP):** integrates and standardizes processes, and standardizes the storage of management and data.
- **Customer Relationship Management (CRM):** integrates data collection, transformation, storage, and analysis of customer transaction data., including purchases, service requests, and other forms of customer contact

- **Globalization:** means that modern businesses use information technology to expand their market to customers around the globe to find the lowest cost suppliers regardless of location.
    - Much of the globalization is due to use of internet and internet related technologies.

- Thomas Friedman books, related to technology (except for one)
    - Collapse of the Berlin Wall
    - Netscape: an early search engine allowing general public to search internet.
    - Workflow Software: using internet technologies to allow work to be done without human intervention.
    - Open Sourcing: allowing online contribution and collaboration.
    - Outsourcing: allowing work to be divided between companies/locations, enabling them to be more efficient; then info integrated back to organization. (Ex, customer call centers)
    - Offshoring: allowing companies to take their operations to another location, allows them to produce better, faster, cheaper.
    - Supply Chaining: using technology to streamline operations and provide products/services to market faster and cheaper.
    - Insourcing: allowing companies to use outside firms to manage key operations on their behalf, thus allowing them to focus on core business.
    - Informing: the ability to find any type of information online.
    - "The steroids": technology such as mobile phones, iPods, instant messaging, and voice over internet protocol.

CHAPTER 2

- IT allows you to communicate with others.
- IT enables transactions between you and organizations you deal with.
- IT helps you obtain, organize, analyze, and store data and information.
- Accept and store info; perform mathematical equations; apply logic to make decisions; retrieve, display, and send info; consistently repeat these actions.

- Three basic categories:
- **Hardware:** electronic and mechanical components that you can see and touch. (ex, monitor)
- **Software:** is the set of instructions that direct the hardware.
- **Network technology:** increases their power by allowing users to share resources including hardware, software, and information.
- These categories created a **platform**.

- **Processing hardware:** directs the execution of instructions and the transformation of data using transistors.
- **Transistor:** electronic switch that can be on or off.
- **Microprocessor:** a tiny chip made up of transistors.
    - This chip contains most of the components that make up **central processing unit (CPU)**.
- Megahertz (MHz): millions of cycles per second, Gigahertz (GHz): billions.

- **Computer Hierarchy:** categorizes processes according to their power.
- **Supercomputer:** largest, fastest; performs processor intensive computations using parallel processing.

- **Mainframe:** large; carries out many of the organizational processing needs using high speed processing chips and large amounts of memory.
- **Server farms:** medium, many; allows multiple servers to handle network processing activities.
- **Personal computer:** small to medium: enables users to carry out processing tasks needed to perform their job.
- **Personal digital tings:** small; portable computing power.
- **Embedded processors:** extremely small; programmable chips embedded in appliances and products to make them "smart."

- **Memory:** temporarily locates data and instructions.
- **Read Only Memory (ROM):** long term; contains instructions and data that only special devices can alter.
- **Random Access Memory (RAM):** short term; stores data only until they are no longer needed, or until computer is shut down.

- **Input Hardware:** provides the interface used for data entry into a device.
- **Output:** provides the interface used to retrieve information from a device.
- **Storage Hardware:** stores data, information, and instructions for the long term. (ex, usb)
- **Communication Hardware:** connects one IT device to another.
    - **Network interface card (NIC):** provides the physical connection between a computer and a local network.
    - **Modems:** allow you to connect to a remote network with a cable.

- **Software:** information that specifies how a device should work with other data.
- Three main categories:
- **System Software:** includes any software required to control the hardware components and to support the execution of application software.
    - Operating system software: coordinates and handles the details of working with the computer hardware.
        - OS software performs 2 tasks:
        1. Managing the hardware and software resources of the computer.
        2. Providing a stable and consistent interface between application programs and the hardware.
    - **Utility software**: provides additional tools that you can use to maintain and service your system.
- **Application software**: is a complete, self contained program or set of programs for performing a specific job.
    - **Productivity software**: an important group of application software for business professionals.
        - Document preparation software: creates documents composed of text, image, and supporting graphics.
        - Electronic spreadsheet software: for performing general calculations and analyses, such as financial analysis, budgeting, and forecasting.

        - Presentation graphics software: for performing professional quality slides and graphics for business presentations; often requires a business professional to be able to access and manipulate large amounts of ideas
        - Database management system (DBSM): for designing, creating, updating, and querying data
        - Personal information management (PIM): for managing personal information, such as to do lists, schedules, and emails

- **Middleware:** purpose is to link applications that use dissimilar software or hardware platforms and act like a specialized messenger/translator to manage the exchange of information.
    - Essential when implementing new types of software.

- Open source software: can be used, modified, improved, and redistributed. Often are free of cost or have very low costs.

- Computer network consists of 4 primary components:
    1. Data that computers share on the network
    2. Special hardware
    3. Software that allows computers to communicate and share data
    4. Communication media to link the computers together

- Network Categories:
- **Local Area Network (LAN):** within immediate location/building; sharing files, resources, servers, and other hardware among the members of an organization.
- **Wide Area Network (WAN):** over large geographical area; sharing data, information, and resources among units of an organization distant from one another.
- **Private Area Network (PAN):** very small space; provides communication among computer devices in close proximity.
- **Metro Area Network (MAN):** few blocks to enter metro area; provides data and voice transmissions typically at high speeds. (100mbps)
- **Internet:** worldwide; shares data and information with all stakeholders in the organization, as well as the general public.

- Network hardware:
    1. **Hardware to connect a device to a network:** connects computers or other devices to networks includes modems, cable modems, network interface cards, and wireless cards.
        - Carrier/communications medium: physical link that forms a network connection.
    2. **Specialized hardware for handling network traffic:** devices that help coordinate the data traffic on a network.
        - Bridge: device that lets you connect to a network or break a large network into two smaller, more efficient networks.
        - Router: connects, translates, and then directs data that cross between two networks.

        - Hub/Concentrator: serves as a central connection point for cables from the devices on the network.
        - Repeater: amplifies signals that are sent along the transmission route.
        - Wireless Access Point: bridge that connects wired and wireless networks.
    3. **Specialized computers that control the network and the delivery of data on the network:** on most networks specialized computers called servers manage the various functions of the network.
        - File Server: fast computer that requires a large amount of RAM & storage space.

- **Network software:** manages network functions and the flow of data traffic over a computer network.
- Protocol: standard set of rules that allow communication of data between nodes on a network.

- **Internet service provider (ISP):** provide connections for customers to use via dial-up or cable.
- **Wi-Fi:** popular name for 802.11 standards for wireless network access.
- **Voice Over Internet Protocol:** to make calls anywhere in the world and bypass traditional switched telephone calling; uses packet switching and TCP/IP to carry voice instead of data.
- **Cloud computing:** computing over the internet; users can use any Internet connection to access their resources on virtual computers anywhere in the cloud.

- Technologies that make the web work:
- **Client/server networks:** the networks over which data travel.
- **Browser:** application software that lets user's request and view web pages
- **HTTP protocol:** the standardized rules for exchanging data/messages over the Web, governs HTTP request and response.
- **HTML:** the language that guides the display of a requested page, combination of text content, images, videos and sounds.

- Components of the WWW:
- **Uniform Resource Locater:** specifies a unique address for each page that indicates the location of a document, browser sends request over the web that makes its way to corresponding server.
- **Client/Server network:** sequence of activities from http request to http response; data found, loaded and sent back to client.
- **Web Browser:** software application that allows you to easily navigate the Web and to view the content that you find there.
- **Search engines:** user's access an HTML form based web page that allows them to enter their specific search criteria, send request and search a database get response.
    - **Web crawlers**: special software to search the web; move around from sites, read meta tags and report data back to database.
    - **Meta tags**: contain information that describes what a site is.
    - **Metasearch engine**: a web-based tool that allows you to review the search results generated by other search engines; sends out query to other engines, and returns list.

- **Electronic commerce:** a transaction carried out using computer networks.
- Static content: refers to fixed information, such as company information, online marketing, and electronic versions of company brochures.
    - Web presence: business has established existence online.
    - Brochureware: sites with only static content.
- **Dynamic content:** information on a web page can change depending on number of factors i.e. time, user profile, and location.
- **Cookie:** small bit of data created by programs running on the server, stored on the client machine, and passed back and forth in the HTTP request and response.
- HTML Form controls: components of page that allow you to enter input
- Persistent Data: data that remains available for a period of time.
- Personalization: identifies the user using a cookie. (refer to chapter 5)

- **Scripting Language:** a high level computer language that another program – browser – interprets when executed.
    - Java applet: small independent java program typically used to play games online.
    - Plug-ins: Google toolbar.
- **Server side programming:** programs that run on the server in response to browser requests.

- **E-Commerce & Payment Systems:** shopping and ordering system, the merchant account, the payment gateway and the security system.
    - Merchant account: a bank account that allows merchants to receive the proceeds of credit card purchases
    - Secure Gateway Provider – company that provides a network to process encrypted transactions from a merchant's website
    - Payment Gateway – links an e-commerce site with the banking network
- **Secure Socket Layer (SSL) protocol:** allows a client and a server to communicate in a way that prevents eavesdropping, message forgery, or tampering.
    - Secure server: server that encrypts data using the SSL protocol

- **Transport Layer Security (TLS):** message sent with this can be handled by a client that uses SSL.
- **Secure Electronic Transaction (SET**): combines several security standards to provide a system that can ensure private and secure transactions.
- **Extensible markup language (XML):** organizes data based on meaning rather than how it should appear.
- **Web services:** standardized way for one computer program to request and run another computer program over the Internet
- **Service Oriented Architecture (SOA**): infrastructure that supports full-scale use of web services i.e. passing data between two computers
- **Mashup:** web application that seamlessly combines information from more than one source into an integrated experience i.e. combining job postings, with google maps.

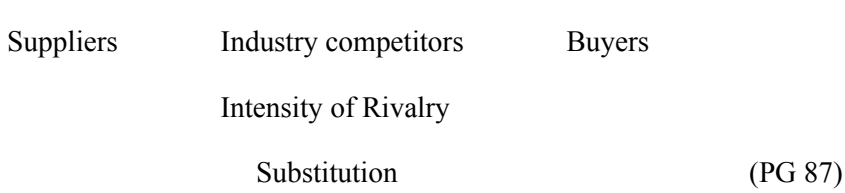
- <u>Internet Security Threats:</u>

- **Malware:** use of malicious codes as part of a subversive, organized scheme. Some examples are viruses, worms, Trojans.
- **Scareware**: type of malware designed to trick victims into purchasing and downloading useless and potentially dangerous software.
- **Virus:** program able to copy itself and infect a computer.
- **Worm:** destructive software that can spread by itself; once started on computer, automatically sends out infected emails to everybody in the user's address book.
- **Spam:** unsolicited and undesired emails.
- **Phishing:** attempt to gain personal and confidential information for fraudulent purposes.
- **Denial of service Attack (DoS):** attempt to make a website unavailable to its users. An attacker will do this by sending target so many communication requests that the target server eventually goes down becomes unavailable. No website safe from DoS attacks.

- **Groupware:** software that help individuals and teams keep up with their scheduled meetings, monitor projects, share files. ex. Blackboard.
- **Intranet:** set of services for distributing private information throughout the organization using a collection of private computer networks brought together to form an organization wide, private network. (from LAN to WAN)
- **Platform independence:** employees can access internet using a Mac, windows, or any PC platform.

CHAPTER 3

- Technology is a collection of tools that enable; enables strategy, business processes, problem solving and decision making.
- **Business Strategy**: According to Michael Porter strategy is – a broad based formula for how a business is going to compete, what its goals should be, and what plans and policies will be needed to carry out those goals.
    - Strategy becomes a road map for what needs to be done to create business value and competitive advantage.
- **Porter's Five Forces Model:**



(PG 87)

- **Open Systems Model:** business operates by transforming inputs into outputs and by constantly interacting with its environment. (PG 88)

- **Stakeholder:** a person or entity that has an interest in and an influence on how business will function in order to succeed; may be internal or external.

- **Organizational Boundary:** allows a business to receive inputs and to produce outputs; from suppliers, government agencies, customers/clients, other potential stakeholders. → Organizational decision makers – management and employees, shareholders, board of directors.

- All business organizations possess structures that organize info, responsibility and authority.
- **Functional structure:** the lines of authority and communication are vertically oriented.
    - Advantages: clear chain of authority, economies of scale, significant technical expertise.
    - Disadvantages: poor communication and coordination, relatively inflexible or slow to respond to change, employees focus on functional area goals.
- **Decentralized structure:** the lines of authority and comm. are vertically oriented.
    - Advantages: faster response and greater flexibility, greater communication, greater development of breadth of managerial skills.
    - Disadvantages: duplication of resources and efforts, technical knowledge not as in-depth, less direct control.
- **Matrix structure:** blends the functional and decentralized organizational structures; top to bottom organized as functional, left to right product focused.
    - Advantages: increased flexibility and responsiveness to business needs/environmental changes, enhanced problem solving, cooperation, communication, resource sharing, and decision making occurs closer to customer.
    - Disadvantages: frustration due to dual lines of authority, increased need for coordination between functional areas consumes time/resources, potential for goal conflict between functional/ decentralized components of matrix.

- **Business process:** series of steps that transforms inputs to main outputs.
    - Defined by Michael Hammer and James Champy: a collection of activities that takes one or more kinds of input and creates n output that is of value to the customer.
- **IGOE:** method used to analyze and better understand processes; Inputs, Guides, Outputs, Enablers.
    - Inputs: resources needed to start process.
    - Guides: rules or policies within a process.
    - Outputs: results of a process.
    - Enablers: special kind of input/resource that facilitates a process.
- Input Types:
- **Data, Info, Knowledge:** raw facts, summarized data, information derived from research, expert knowledge relevant to businesses goals.
- **Labour:** people hired to carry out all or part of the essential business processes or supporting functions.
- **Raw materials:** ingredients from which the company makes its products.
- **Capital:** money businesses need to operate.
- **Technology:** available in many forms, and greatly extending beyond PCs and software applications.

- **Feedback:** special kind of measurement created by a business process that is then returned to the system to control the system's future inputs, processes, and outputs.
    - Used to monitor efficiency and effectiveness of a process.
- **Business Process Reengineering (BPR):** study of business processes to find ways of making them more efficient; goal is to reduce cost, increase throughput and speed, increase quality and service.
- **Continuous improvement:** organizations focusing on improving results all the time.
- **Competitive Advantage** = quality of insight + speed of execution + cost competitiveness.

- 3 aspects to create business value and competitive advantage:
- **Automating:** using automation to execute repetitive, routine tasks without human intervention.
    - Business can complete tasks with more speed, economy, consistency and accuracy.
    - Ex, Banking – ATM machines, Grocery/Retail – bar code inventory, Travel – reservation and scheduling systems.
- **Informating:** recognizing that executing also creates new data information; then organization can process new data to improve.
    - Allows business to identify flaws in the process and use new found knowledge to do things differently.
- **Transforming:** using IT to help businesses acquire or maintain a competitive advantage over or in line with competitors.
    - Company processes competitive advantage when sustains higher-than-average profits.

- **Rational Decision:** choice that you make about what actions you will take (or not take) in a given situation after analyzing the consequences of each option.
    - Using information to reduce uncertainty in outcomes of decisions.
- **Structured Decision:** one that can be programmed, is routine or repetitive.
- **Semi-structured decision:** choice that is not so easy. (i.e. choosing an elective)
- **Unstructured Decision:** a complex situation, with no obvious or single correct decision or decision process.
- The quality of the final output will likely be based on the quality of the inputs.

- **Productivity:** ability to create business value with the least cost.
- **Efficiency:** getting the most output from a given input.
- **Effectiveness:** pursuing the goal or task that is appropriate for the given situation.

- **Problem:** situation that fails to meet your goals, needs, or expectations.
- **Problem Solving:** refers to a series of steps or a process taken in response to some event or activity.
- **IADD:** model is a more formal expression of the problem-solving process.
    - Investigate: Determine if there is a problem or an opportunity, and if it's possible to solve or take advantage of.
    - Analyze: Gather data that are relevant to the heart of the problem .
    - Decide: Evaluate solutions and make choices regarding how to implement the solution.
    - Do: Implement the solution and monitor the results

- **Criteria:** the factors that you think are important and relevant to solving the problem.

CHAPTER 4

- **Value Chain:** by Michael Porter; a connected series of activities, each of which add value or supports the addition of value to the firm's goods services.
- 5 core components:
- **Inbound logistics:** receiving, warehousing, and inventory control of raw materials required to create a product or service.
- **Operations:** value creating and often proprietary activities that transform the raw inputs into the final product.
- **Outbound logistics:** activities required to get the finished product to the customer, including packaging, warehousing, and order fulfillment.
- **Marketing Sales:** all activities associated with getting buyers to purchase the product, including working with distributors, retailers, marketing, pricing.
- **Service activities:** are those that maintain and enhance the product's value, including customer support, repair services.
- An organizations value chain is the sum of its primary and supporting activities.

- **Functional Information Systems (FIS):** focus on activities of the functional department to improve its efficiency and effectiveness.
    - Examples: Accounting IS, Marketing IS, Human Resources IS, Financial IS, Manufacturing IS.
- **Workflow Management System (WMS),** or Business Process Management (BPS): supports activities that several departments of the organization may carry out.
    - Workflow: represents the steps, organizational resources, input and output data, and tools needed to complete a business process.
- **Transaction Processing System (TPS):** enable transaction activities and capture the key data created by a transaction.
    - Transaction: an exchange of goods or services between two or more parties.
    - **ACID:** characteristics of a transaction.
        - Atomicity: a transaction must be unequivocally completed.
        - Consistency: all unchanging properties of data must be preserved.
        - Isolation: each transaction should execute independently of other transactions that may occur at the same time on the system.
        - Durability: the characteristics of a completed transaction should be permanent.
- **Management Information Systems (MIS):** meet the need of storing processed transaction data as reports for managers.
    - Periodic reports: such as a company's annual financial statements or monthly sales reports, which are updated and generated after specific time period has passed.

    - Exception reports: monitor when, and perhaps why, exceptions occur of key values, defined as critical to the operation.
    - Demand reports: generated based on user requests.
- **Executive Information System (EIS):** designed to provide summary information about business performance to those making higher-level strategic decisions
- **Document Management System (DMS):** enters, tracks, routes, and processes the many documents used in an organization.
    - Used to support workflow systems.
- **Knowledge Management (KM):** how the company recognizes, generates, manages, and shares knowledge.
    - Explicit knowledge: anything that can be written down, stored and codified.
    - Tactic knowledge: includes the know-how the people have through learning/experience.
- **Groupware:** can be a simple communication tool like e-mail, or it can be more complex, providing shared workspaces to store common files and tools for conferencing.
- **Decision Support Systems (DSS):** help businesses use communication technologies, knowledge, and models to organize and access data to perform decision-making activities.
    - Financial model: using financial math models to support decision making.
    - Statistical model: using statistics and probability to describe scenarios.
    - Optimization model: helps find "best" solution.
    - Simulation model: conducting experiments to test possible outcomes.
- Types of DSS: Communications-driven, Data-driven, Document-driven, Knowledge-driven, Model-driven.

- **Supply Chain:** system of organizations, people, technology, activities, information, and resources involved in moving a product or service from supplier to customer.
    - Transforms natural resources and raw materials into a finished product.
- **Supply Chain Management (SCM):** manages materials, information, and finances as they move from supplier to manufacturer to wholesaler to retailer to consumer.
    - Seek to optimize the supply chain to create business value and competitive advantage.
    - Materials management: the procurement, storage, and use of raw materials to be used in the end product.
    - Inventory Management: finished goods inventory.
    - Order management: orders by customers, distributions, retail outlets.
    - Logistics management: plans for shipping the product and tracking it from origin to destination and related shipping documentation.
- **Enterprise Resource Planning (ERP):** integrates departments and functions across an organization; company runs all of its applications from a single database.
- **Enterprise Systems:** large-scale applications that support business units or functions; they are another way that an organization might apply IT to its value chain.
    - Inbound logistics: component to value chain that includes raw material procurement and warehousing.
        - *Radio Frequency Identification Technology (RFID)*: uses radio waves to automatically identify objects and transmit this information to an IT system.
- *Logistics Management Systems*: these systems track materials and other assets upon arrival into the warehouse and inventory.

    - Outbound logistics: involves the warehousing and distribution of finished goods.
        - *Transportation Management Systems (TMS)*: systems in place to ensure finished product ends up in market when intended to.
        - *Inventory Management Systems (IMS)*: constantly monitor the supply of finished goods to ensure that enough supply is on hand to meet demand.
- **Customer Relationship Management (CRM):** provides organizations with the tools to service customers better through knowing their past purchases, purchasing patterns, and even what their future needs may be.
- *HR Information Systems (HRIS)*: house information about employees including contact information, year of experience, and training received.

- **Software as a Service (SaaS)**: renting software.
- **Utility Computing Services:** provides services hosted on the servers, which can be accessed from anywhere.
- **Application Service Provider (ASP):** an online technology company that develops and delivers software tools on the Internet.

- Applying IT to support organization and its processes: 1: support of the value chain, 2: automating, 3: informating, 4: transforming/gaining competitive advantage.

- **Business Process Outsourcing (BPO)**: process sent to another location or vendor that can perform the process more effectively and efficiently.

- **Enterprise Risk Management (ERM)**: a process affected by an entity's board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.
    - Risk appetite: deciding how much risk they can stand.
- COSO's ERM Objectives:
    - Strategic: high level goals, aligned with and supporting its mission.
    - Operations: effective and efficient use of its resources.
    - Reporting: reliability of reporting.
    - Compliance: compliance with applicable laws and regulations; reduces risk.

- **In-sourcing:** refers to the strategic decision made by a business to bring various services or functions back in-house, rather than globally source them.

- **Risk transfer:** move the risk to someone who is more able to deal with it.
- **Risk deferral:** postpone exposure to the risk until circumstances are more favourable or resources are available to address the risk.
- **Risk reduction:** either reduce the probability of the risk occurring or lessen the impact.
- **Risk acceptance:** realize that some risks are unavoidable and make sure that contingency plans are in place.
- **Risk avoidance:** eliminate the possibility of the risk occurring; however, that may close the doors on some business opportunities as well

- **Disaster Recovery Plan:** allows an organization to resume operations after a major event that interrupts normal business processes.
- **Business Continuity Plan:** addresses problem prevention, response to crises, resumption of business, recovery of losses, and restoration of systems and processes.

- **Roll-Back Strategy:** essentially involves being able to reverse every action that took place to make the change happen so that everything is returned to its original state with no damage done.
- **Control Advantage:** the strengthening of internal controls and compliance through the application of IT-based controls to business processes, policies, and procedures.
- (Table 4.7, pg.152) - Framework and Standards
- **Controls:** are specific actions, including policies and procedures, designed to ensure the achievement of business objectives.
    - Control is a process that runs throughout the organization.
    - Control influences how people behave at work.
    - Control can only provide reasonable, not absolute, assurance of achieving objectives.
- **Effective controls:** prevent, detect, and correct actions that increase enterprises risk of failing to meet business objectives.
- **Internal Control:** a process effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in following categories:
    - Effectiveness and efficiency of operations.
    - Reliability of financial reporting.
    - Compliance with applicable laws and regulations.
- Internal Control processes:
    - Segregation of Duties: jobs do not span lines of control that would allow mistakes or fraud to go undetected.
    - Authorization controls: prevent scope creep and cost overruns in various situations, such as major projects.
    - Security: separate login's for different databases.
    - ID Code: creates an audit trail that organizations can follow to ensure proper controls are in place and working.
    - Verification controls: confirm that the application is accomplishing e-commerce functions without error.
    - Control totals: can help detect fraudulent actions.
    - Supervisory Review: supervisors should periodically audit and review processes and transactions

CHAPTER 5

- **E-commerce:** way of doing business around the world in an instant without the need for a physical business presence.
    - Transactions that involve buying and selling through the internet.
    - E-Business: broader use of internet technologies to reduce operating costs.
- Types of e-commerce:
- **Business to consumer (B2C):** online equivalent of the retail store as well as other services.
- **Business to business (B2B):** electronic exchanges between companies.
- **Business to government (B2G):** online sales to government agencies.
- **Consumer to government (C2G):** electronic payment of taxes as well as purchase of various types of licenses.
- **Consumer to consumer (C2C):** use of online auctions like eBay and similar other sites.

- **Physical products:** include anything that requires an actual shipment of the item from a central distribution point to the buyer.

- **Digital products:** receive products directly over the internet or other computer networks.
- Main difference between the two is the delivery process.

- **E-commerce business model:** combines a specific type of website with a successful revenue model that produces profits for the website owner.

- Top ways companies make money on the internet:

1. Displaying advertising and being paid for click-throughs from the online community to those advertising products or services.

2. Selling goods and services online.

3. Earning royalties, access fees, or revenue, sharing from selling access to their platform to third party developers.

4. Selling aggregate data about online user behaviors or selling controlled access to users with their permission through targeted offers.

5. Getting users to subscribe to your services, usually on a monthly or annual basis.

6. Selling upgrades to a premium subscription service by first offering a free service with more limited capacity or capability.

7. Imposing a very slight fee for specific transactions that add value beyond some kind of initial free access, which added up and billed or deducted from a user account.

8. Charging a portion of any transaction that you facilitate for others either as a brokerage or as a re-seller.

9. Using an auction or cooperative model that is a derivative of a transactional or retail site, but with pricing controlled by the marketplace and the variations in supply and demand.

10. Selling your company to a strategic buyer.

- Website types:
- **Portal:** provides a gateway to many other websites; yahoo, msn.
- **Search engine:** finds websites that contain a word or phrase; google.
- **Browse or search and buy:** sells goods and services; chapters, iTunes.
- **Sales support:** provides information on a product before or after the sale; dell, mcafee.
- **Information service:** provides news, information, and commentary; national post, tsn.
- **Auction:** facilitates sales between parties; ebay, paypal.
- **Travel:** sells travel tickets and tours; expedia, travelocity.
- **Special interests or services:** provides information, product sales and support, and contacts between visitors; craigslist, lavalife.

- **Information density:** the quality and quantity of information about products and services of interest to them.
- **Google Ad Words:** is a way of linking your paid advertising to searches of key words by consumers.
- **Mass customization:** the ability to create custom products or services on demand.
- **Personalization:** is a marketing message that a business customizes for each potential customers interests, based on his or her searching, browsing, and buying habits.

- Ecommerce dramatically affects competition between organizations in a number of interesting ways such as:

    - Reducing barriers to market entry.
    - Preventing any company from "owning" the market.
    - Enhancing collaboration/ alliances.
    - Multiplying market niches.
    - Changing market place drivers.
- **Cooperative website:** where competing sellers partner on a common website.
- **Niche markets:** are one area where ecommerce has shown itself to be superior to almost any existing form of marketing.
- Websites allow a business to stay open 24/7/365.

- **E-commerce strategy:** general term for how a business intends to use computer web based networks and information systems to compete in its global marketplace.
    - Henry Mintzberg, suggest strategy is a plan, pattern, position and perspective.
    - *Customer relationship management*: creates an integrated marketing experience for customers.
- **Conceptual strategy:** what the strategy wants to do.
- **Technology strategy:** how the strategy will do it.

- **Mobile-commerce:** is the use of laptops, mobile phones, and PDA's to connect to the internet and web to conduct many of the activities normally associated with ecommerce.

- **B2B transactions** into two types:
- **Spot buying:** you buy at market prices determined by supply and demand from someone you don't know.
- **Strategic sourcing:** involves forming a long term relationship with another company; the companies set prices through negotiation.
    - *One-to-one marketing model*: two companies collaborate to create a trading relationship that is good for both of them.
- **Company-centric business model:** a company is either a seller to many other companies or a buyer from many companies.
- **E-procurement:** also known as *procurement process*; is where a single buyer is provided products needed to carry out businesses from the many-to-one model.
- **Exchange model:** companies buy and sell from each other through spot buying transactions.
- There are two categories of exchange:
    - Vertical: exchanges meet the needs of a single industry.
    - Horizontal: exchanges deal with products and services that all companies need.
- For a procurement to occur between businesses three key elements must be provided:
    - the purchase order, the invoice, the receipt of goods.
- **Inter-organizational system (IOS):** a networked information system used by two or more separate organizations to perform a joint business function.
- Two most common forms of IOS:
- **Electronic data interchange (EDI):** allows the exchange of structured information between two computer applications, using a minimum of human involvement.
- **Extranets:** uses internet technologies to interconnect the intranet of an organization with the intranets of its business partners.

CHAPTER 6

- A business counts on its IS to deliver accurate data and information; it wants data in different forms and organized in different ways.
- **Data:** raw unorganized facts, numbers, pictures, etc.
- **Information:** data that has been organized and is useful to a person.
- **Knowledge:** created when a person combines experience and judgement with information.
- **Wisdom:** adds insight and ethics to the experience and professional judgement inherent in knowledge.
- **Explicit knowledge:** knowledge that is readily codified; ex: knowledge in a textbook.
- **Tacit knowledge:** knowledge that you gain through experience, insight, and discovery.
- **Knowledge work:** involves the discovery, analysis, transaction, synthesis, and communication of data, information, and knowledge.
- **Discovery:** the finding of data, information, and knowledge relevant to a task, problem, issue, or opportunity.
- **Analysis:** breaking down the whole into its more discrete parts to better understand how it works.
    - *Process Mapping:* if you are analyzing a business process.
    - *Quality Assurance:* if analyzing product quality.
    - *Performance Testing:* if assessing fitness or standards.
- **Transformation:** knowledge work that requires you to use the results of your analysis to deepen your understanding of the data and information.
- **Synthesis:** allows you to interpret trends or patterns that seem to explain the past and the present and may suggest courses of action for the future.
- **Communication:** the ability to share your analysis, ideas, and solutions with others.

- **Database Management System (DMS):** is a collection of software that allows users to create and work with a database.
    - Database: consists of interrelated data, stored in files, and organized so computer can find data easily.
- **Data hierarchy:** organizes stored data in increasing levels of complexity.
    - Data Character: specific combo of bits.
    - Field: combo of characters.
- Advantages to using a database system to organize data:
    - Organization of the data is independent of any one software application; allows all applications to access the data in a standard manner.
    - Organization of the data redundancy; a DBMS may need to store only one record of data for a particular product.
    - The DBMS can include features for maintaining the quality of the data, handling security, and synchronizing access by simultaneous users.
    - Allows for capabilities such as improved data access, allowing different views of the data for different users, and report generation.
- **Relational data model:** databases store information about entities, such as suppliers and products, and the relationships between those entities.
- **Relational database management system (RDBMS):** stores data in one or more tables, corresponding to entities; tables consist of records, represented by the rows of the table.
- **Data modeling:** is the process of analyzing the data required by the processes of an organization to support it both operationally and strategically.

- **Entity Relationship Diagram (ERD):** indicated the entities and relationships for the data that the IS will store.
- **Logical data model:** translates the ERD into a diagram of a table in the database.

- **Data flow diagram (DFD):** is a traditional IS model that depicts how data move or flow through a system:
    - External entities that send input or receive output from the system.
    - Processes that show activities that move or transform data.
    - Data stores that usually correspond to tables in the data model.
    - Data flows that connect the components.

- **Data warehouse:** is a means of storing and managing data for information access, typically composed of data from one or more transaction databases.
- **Data mart:** extracts and recognizes subject area specific data to allow business professionals to focus on a specific subject area.
- **Data mining:** includes a set of techniques for finding trends and patterns in large sets of data.
- 4 main reasons for data warehouse:
    - Automatic production of standard reports and queries.
    - Queries against summary of detailed data.
    - Data mining in detailed data.
    - Interfacing with other applications and data stores.

- **Business Intelligence (BI):** process for gaining competitive advantage through the intelligent use of data and information in decision making.
    - *Data sourcing*: mining data information from text documents, databases, images, media files, and web pages.
    - *Data analysis:* producing useful knowledge from the collected data and information, using tools, such as data mining and text/image analysis techniques.
    - *Situation awareness:* culling out and relating the useful facts and knowledge, while filtering out irrelevant data.
    - *Risk assessment:* identifying decision options and evaluating them based on expectations of risk and reward.
    - *Decision support:* using interactive software to identify and select intelligent decisions and strategies.
- **Tactical decisions:** making informed decisions after conducting research.
- **Operational decisions:** analyzing operations and then making decisions based on performance.
- **Strategic decisions:** making a final decision to continue with a product or not, based on previous analyses.

CHAPTER 7

- **Pre-development questions:** questions asked before an organization starts a system design project – referred to as the *concept design and inception stage.*
    - What are we planning and why?
    - Is the project feasible?
    - Should we build/buy/ or lease?
    - If we build, should we do it in-house or outsource it?
- **Feasibility Study:** a detailed investigation and analysis of a proposed development project that is undertaken to determine whether it is technically and economically possible to successfully build the proposed system.

- **Technical feasibility:** examining potential solutions and evaluating these solutions based on its capabilities and the capabilities of any technology partners it may choose to work with.
- **Financial feasibility:** if organization can pay for the project and the project presents a sound investment of the organization's limited resources.
    - Tangible Costs: a value can be easily applied.
    - Intangible: difficult to measure in monetary terms.

- 3 primary options for **obtaining** an IS: Buying, Leasing, Building.
    - Buying: faster and less costly than building system from scratch.
    - Leasing: lowest cost, and fastest to place.
    - Building: most likely to provide a competitive advantage; complete control over system; customization.
- **In-House Development:** using businesses own staff.
- **Outsource:** hiring another external company.
- **Offshoring:** when the outsourcing company is located primarily in a foreign country.

- **Stakeholder Analysis:** should begin as part of the feasibility study.
- **Project sponsor:** individual ensures that project goals correspond to the organization's business objectives.
- **Project manager:** demands knowledge of methods and techniques to ensure delivery of project on time and on budget.
- **Account management:** responsible for sales and service of the project team.
- **Architecture and Design:** must provide well-designed user interface.
- **Analysts:** provide methods of processes to translate high level requirements in their particular area to lower levels of detail.
-
- **Developers:** create the system itself by coding and deploying the technical infrastructure and programming it to perform requires tasks.
- **Specialists:** handles unique aspects of the project; often called **Subject Matter Experts (SMEs)**.
- **Client Interface:** a client may be internal or external customer of team's organization; has responsibilities towards successful completion of the project.

- **System Development Life Cycle (SDLC):** stages and activities of system development.
- **Four Pillars** that impact an IS project: *people*, *tools*, *management*, and *methodology*.
- **Waterfall method:** steps of traditional SDLC shown as flowing from one to the next from top to bottom.
- **Concept;** *pre-inception* or *idea phase***:** involves the environment within the organization that either promotes or inhibits the development of ideas for systems.
- **Inception;** *feasibility* or *planning phase***:** phase begins when an organization has the idea to build an information system.
- **Elaboration:** the project team finalizes the requirements for the system and project plan, and designs the system architecture.
- **Construction:** the team builds the initial running system; implements core functionalities, incorporates additional features.
- **Production:** once the system is up and running, the organization must continuously monitor, maintain, and evaluate it.
- **Retirement:** at some point, system may lose its value to the company; often marks the concept of a new system to replace the obsolete one.

- **Methodology:** provides a framework for executing both the project management and technical processes of an IS project throughout the life cycle.
- **Waterfall methodology:** at one time, was the only accepted methodology, evolved from SLDC.
- **Build and Fix Model:** those who knew simply did; developers sat down briefly to find out requirements, wrote programs, created databases and know together hardware to create rudimentary system; then tested and debugged it.
- **Waterfall Model:** defines a set of phases and a new phase begins only after acceptable completion of the preceding phase.
    - Idea is that if things are done right on each face, there will be little or no need to move back upstream, thereby achieving one of primary benefits in structured methodology.
- **Evolutionary Model:** developers first investigate, specify, and implement an important core part of the system with minimal functionality; then tests and evaluates and plans for next version.
- **Prototyping:** the project team works with customers to progressively build the system from an initial outline specification; final system essentially evolves from initial prototype.
- **Agile Development** methodology**:** designed to satisfy continuously changing requirements, the team develops software in short development cycles or increments.
- Evolutionary and agile are an attempt to reduce the somewhat constricting formality of the pure waterfall approach; agile development known as **rational unified process (RUP).**
- RUP built on 6 best practices:
    - Develop iteratively, manage requirements, use component architecture, model visually, verify quality, control changes.

- **Model:** a simplified representation of something real, such as a building, or information system that business professionals can manipulate to study the real item in more detail.
    - Includes diagrams that developers can use to examine, evaluate and adjust to understand the system.
- **Unified Modeling Language (UML):** consists of several graphical elements that, when combined, form a set of diagrams.
    - Purpose is to show multiple views of a system.
    - The set of UML diagrams is a **system model**.
- **Use Case diagram:** captures all the possible ways to use a system.
- **Sequence Diagram:** shows the order of various activities and by who, and how they interact with the various system components as they occur in order.

- **Integrated Development Environments:** allows developers to complete several programming tasks within the same software application.
- **Code Generation:** a developer can use graphical diagrams to define a system's components and how they are related.
- **Computer Aided Software Engineering (CASE):** use of computer based support in the software development process; supports the creation and maintenance of the many documents, diagrams and data that the project team creates.
- **Silver Bullet Syndrome:** occurs when there is an overreliance on the tools for the success of the project, while neglecting the other pillars of a development project.

- **Project Management:** the application of knowledge skills, tools, and techniques to project activities to meet project requirements.
- **Descoping:** focus on a set time deadline for receiving the final software, often at the expense of incorporating every single last requirement.
- **Iron Triangle/Triple Constraint:** On Time, On Budget, On Scope.

- **Project Management Triple Constraint**: good people + good process + good strategy = extraordinary results. (on time, on budget, on quality → on-strategy)

- 4 core functions that lead to specific project objectives:
    - **Time Management:** estimating the duration of the project, developing an acceptable schedule, and managing the project to ensure timely completion.
    - **Cost management:** preparing a budget and managing the costs to stay within budget.
    - **Scope Management:** identifying and managing all the tasks required to complete a project.
    - **Quality Management:** ensuring that the finished product satisfies its defined goals.
- The facilitating functions support the project activities: HR management, communications management, risk management, and procurement management.
- **Project Portfolio Management (PPM):** an organization has actually selected projects that are strategic.
- **Project Management Integration:** includes the development of the project plan, and the coordination of changes to the plan as they occur.
- **Project Time Management –** main activities:
    - **Define activities:** identifying the activities required to produce project deliverables.
    - **Sequence activities:** identifying and documenting relationships between project activities.
    - **Estimate activity resources:** estimating the type and quantity of material, people, equipment, or supplies required by each activity.
    - **Estimate activity durations:** approximating the number of work periods needed to complete individual work activities with estimated resources.
    - **Develop schedule:** analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule.
    - **Control schedule:** monitoring the status of the project to update project progress and managing changes to the schedule baseline.
- **Gantt chart:** provide a standard format for displaying the results of the first four time-management activities.

- **Risk management:** to recognize, address, and eliminate sources of risk before they threaten the successful completion of the project; two main categories, risk assessment and risk control.
- Most common areas where risks can occur in an IS project:
    - Feature creep: as project progresses, user requirements may increase beyond team's ability to handle.
    - Requirements gold-plating: project has more requirements than is really needed.
    - Short-changed quality: if project is rushed, corners are often cut in areas like testing, documentation, and design tasks.
    - Research oriented development: occurs when a design attempts to push the boundaries of what is technically feasible in too many areas.
    - Friction with customers: caused by perceives lack of cooperation on one side or the other or personality conflicts

- **Program:** to break down a very large project into a series of smaller, interrelated projects, or to group a series of related projects into a single work effort.
- **Program management:** activity of managing several projects together.
- **Portfolio Management:** selection of projects aligned to an organization's overall strategy that provide the company with a benefit is of utmost importance.

- **Project Management (PM) Software:** designed to support and automate project management and decision making tasks; 3 levels.
    - Low-level packages: for entry level users; include tools for basic scheduling, project control, reporting, filtering, and sorting.
    - Medium-level software: adds to these functions by providing resource-leveling. Resource-allocation, cost-control, and flexible-charting capabilities.
    - High-level software: provides advanced functions including scheduling by user-defined rules, programming languages and risk management.
- **Program Evaluation Review Technique (PERT) Chart:** a project team uses a PERT chart to schedule and manage the tasks within a project.
- **Critical Path:** sequence of tasks that determines the overall completion time of the project.
- **Slack:** tasks not on critical paths may have the luxury of extra time.

CHAPTER 8

- Web 2.0 was first coined by Tim O'Reilly.
- **Web 2.0** referred to as the **interactive web**: moving from a passive site that basically displays information to a site that permits interaction with visitors or users.
- **User generated content:** things like blogs and conversation threads.
- **Semantic Web:** is a next generation, but not separate, web that makes information sharing and exchange easier by focusing on content, searchability, and interpretability at a technical level.

- The popularity of social networking and blogging is not limited to younger teens and adults:
- 83% of 13-17 years old, and 74% of 18-29 year olds, have visited a site.
- 6 in 10 people in their 30s have visited at least one site.
- 45% of people in their 40s have.
- One third of 50+ years have.

- **Social Utility:** you only spend time on sites that are useful to you; time invested on the site somehow contributes to your happiness or social satisfaction.
- **Three Pillars of Sociability:** validate, participate, affiliate → viral communities.

- Web 2.0 sites are more expensive to create and run than traditional websites.
- Increase demand for **compression technologies:** help reduce the costs of storage & transmission.
- **Freedom of Information and Privacy Protection Act (FIPPA):** create obligations that companies and organizations must adhere to by law to operate.

- **Participating identity:** identity used to create and post additional content or take the actions required to begin to fully participate in the online community.
- **Self-Regulating:** members report conduct they feel is outside group norms to a moderator who is responsible for drawing the inappropriate behavior to the attention of the member or removing or restricting member's privileges.
- **Tagging:** involves associating keywords with your content to make it searchable so that other users can locate it and interact with it.
- **Folksonomy:** a collective cloud tag that helps users access information quickly and efficiently.
- **Viral Social Interactions:** where something that is funny, unusual, shocking, interesting, or newsworthy almost instantly spreads online from its origins to nearly every corner of the world.

- **Schadenfreude:** drawing happiness from other's misery or misfortune.
- **Online social strategy:** an awareness of the risks of undertaking any kind of online social campaign that might backfire.
- **Mash-up:** two campaigns that are juxtaposed side by side (example Unilever, Axe and Dove), with two different messages (unauthentic positions).
- **Brandstorm:** a situation where a traditional brand faces an online storm that can quite literally damage the value of its brand overnight.

- **Direct marketing:** messages, offers, or promotions that come directly from the company to the consumer in some form. (i.e. advertising, mail)
- **Indirect marketing:** sources of information from anything other than direct marketing messages from companies. (i.e. product and ranking review sites)
- **Platform Plays:** general purpose social media sites.
- **Micro Markets:** these are purpose built sites designed to meet a specific need.
- **Media transparency:** making sure your brand and advertising message are coherent and consistent.