

Chapter 1: Introduction to Information Systems

What is an information system?

- Information systems have existed as long as we have told stories
- Since the dawn of time we have used information systems to: **create, collect, filter, process** and **transmit** information
- Today, information systems are driven largely by IT/ICT
 - o i.e. **Information Technology/Information Communication Technology**
- Today, we consider ICT/IT **ubiquitous**, and essential for business

ICT/IT driven information systems are everywhere

- How many ICT Systems have you interacted with today?
 - o Were you cold this morning? (weather app)
 - o Caught the bus or train? (smart rider)
 - o Did you park on campus? (parking app)
 - o Try to get into a building on campus before 7am? (student card swipe)
 - o Buy something? (credit card)
 - o Log-in to OASIS? (internet)
 - o Check email and social media? (internet)

Key topics this week

- 1.1 Why should I study information systems?
- 1.2 What is a computer-based information system?
- 1.3 How does IT impact organisations?
- 1.4 Why are information systems important to society?

Introduction

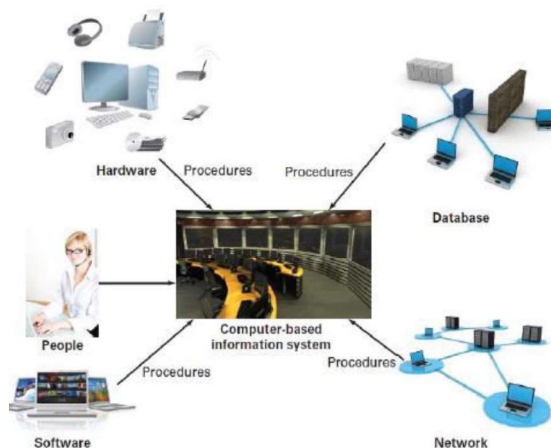
- What is Information Systems?
- Is **Information Technology (IT/ICT)** the same as **Information System (IS)**? No, not quite
 - o Modern **IS** utilises **IT/ICT** to collect, process, store, analyse and disseminate information for a specific purpose
- **IS** is conceptualised as a triangle
 - o **IT/ICT** refers to computer-based tools that support data-processing within an IS
- From Wikipedia:
 - o An information system is any **organized** system for the **collection, organization, storage** and **communication** of **information**... More specifically, it is the study of **complementary networks** that people and organizations use to collect, filter, process, create and distribute data

1.1 Why should I study information systems?

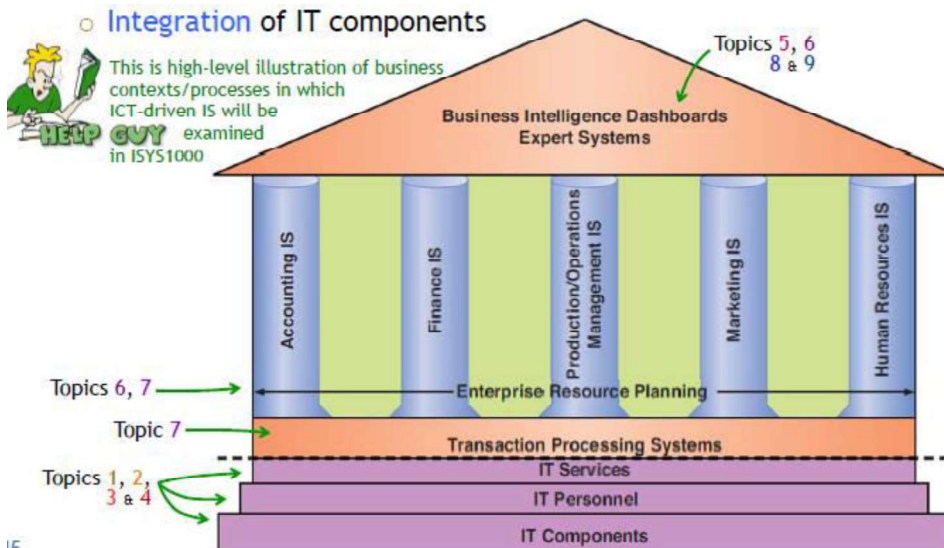
- 1. To become an **informed user**
 - o MIT Technology Review refers to your generation as **Homo conexus**
 - ICTs are so deeply embedded in your life that your daily routines would be almost unrecognisable to a university student just 20 years ago
 - you need to become an informed user: i.e., a person knowledgeable about information systems and information technology

- Informed users:
 - benefit more from their organisation’s ICT applications because they have increased capacity to understand what is ‘behind’ those applications
 - get more value from whatever technologies they use
 - are in a position to enhance the quality of their organisation’s ICT applications with their input
 - are in a position to review, recommend, and help select the ICT applications their organisation will use
 - are able to keep abreast of both new IT/ICTs and rapid developments in existing IT/ICTs
- 2. To better understand career opportunities IS and/or ICT
 - “The people who are able to make sense of (digital data) information, market products to customers online and use their digital expertise are in demand.”
 - Hot job titles include:
 - IT project manager
 - business analyst
 - digital marketing manager
 - mobile app developer
 - JavaScript developer
 - almost anyone with IT knowledge.

1.2 Computer-based Information Systems (CBIS)



- **H** **Hardware:** is a device such as a processor, monitor, keyboard or printer. Together, these devices accept data and information, process them and display them.
- **D** **Software:** is a program or collection of programs that enable the hardware to process data
- **S** A **database** is a collection of related files (in the form of tables/cells) containing data
- **P** A **network** is a connecting system (wireline or wireless) that permits different computers to share resources
- **U** **Procedures** are the set of instructions about how to combine hardware, software, databases and networks in order to process information and generate the desired output/result
- **N** **Users** are those individuals who use the hardware and software, interface with it or utilise its output



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- They support entire organisations

- **Enterprise Resource Planning (ERP) Systems**
 - Strong ERP helps organisations coordinate and share data across multiple **FAISs (Functional Area Information Systems)**
 - **FAIS** are IS used within functional areas/departments:
 - Information systems for **accounting** and **finance**
 - Financial planning and budgeting
 - Managing financial transactions
 - Investment management
 - Control and auditing
 - Information systems for **marketing**
 - Customer relationship management (CRM)
 - e-Business systems
 - social media analysis and management
 - Information systems for production/operations management (POM)
 - Supply Chain Management (SCM)
 - Logistics management (inventory/quality control)
 - Planning, production and operations management
 - Product life cycle management (PLM)
 - Information systems for **human resources (HR)** management
 - Employee KIOSK
 - Employee record management
 - Booking/purchasing systems
- **Enterprise Resource Planning (ERP) Systems**
- **Transaction Processing Systems (TPSs)**
 - A TPS is an system that manages an ICT-driven 'transaction'
 - E.g. a booking, purchase, search or cancellation
 - Monitors, collects, stores and processes data from the organisation's basic transactions that generate data
- **Interorganisational Information Systems (IOSs)**
 - Customer relationship management (CRM) system
 - Supply chain management (SCM) system
 - Uses **Extranet** technologies (secure VPN use of internet)

- e-Commerce
- Support Organisational Employees
 - **Office automation systems** (OASs): Develop documents (word processing), schedule resources (electronic calendars), support communication (e-mail, voice mail, videoconferencing, groupware)
 - **FAISs**: Functional Area IS - Summarise data and prepare reports
 - **Business intelligence** (BI) systems: Support complex, non-routine decisions
 - **Expert systems** (ESs): Attempt to duplicate the work of human experts by applying reasoning capabilities, knowledge, and expertise within a specific domain
 - **Dashboards** (or digital dashboards): Provide fast access to information for decision making
 - **Identify information systems** used by each group of employees: e.g., Clerical workers, lower-level managers, middle managers, executives, knowledge workers

1.3 How does IT impact organisations

- reduce the number of middle managers
 - NB: middle-management: subordinate to the executive management, responsible for 2+ lower levels of junior staff
 - Increase number of employees who can report to a single manager
 - competition for promotions will decrease
 - promotional opportunities will increase
- change the nature of a manager's job
 - major consequence of ICT has been to change how managers make many of their decisions
 - ICTs provide many tools (e.g., business intelligence (BI) apps such as **dashboards, search engines** and **intranets**)
 - ICTs provide managers with near real-time information
 - Increases supervise employees/teams who are geographically dispersed
- change the nature of work-force (will ICTs eliminate jobs?)
 - organisations respond to today's highly competitive environment by doing more with less – ICTs can significantly facilitate this process
 - as computers continue to advance in terms of intelligence and capabilities the competitive advantage of replacing people with machines increases rapidly
 - This process frequently leads to (large-scale) layoffs
 - future employee's (i.e., you) will consistently have to demonstrate how they add value to their organisation beyond what IS alone can offer.
 - while ICT can cause job-losses: IS and ICT can create entirely new categories of jobs, e.g., medical record keeping, nanotechnology.
- ICT impacts on employee's health and safety
 - Increase availability/connectivity can result in less down-time and increase job-stress
 - Long-term/continual over-use of keyboards can lead to repetitive strain injuries including backaches and muscle tension in the wrists and fingers
 - Designers aware of problems associated with the prolonged use of PCs
 - The science of designing machines and work settings that minimise injury and illness is called **ergonomics**
 - More sedentary work and increased obesity, particularly in men

- ICT provides increase opportunities for people with disabilities
 - Increase physical access and accessibility to ICTs
 - New employment opportunities for people by integrating speech and vision-recognition capabilities to ICTs
 - Still many web/graphical user interface issues to solve particularly for impaired vision users

1.4 Why are information systems important to society

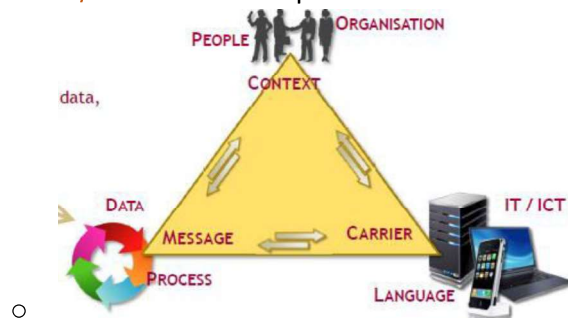
- ICT affects/impacts our quality of life (lifestyle)
 - Changes how we work and play
 - “workplace” is evolving from traditional 9-to-5 job at one location to 24 hours a day at any location
 - Positive: increased flexibility that can significantly improve the quality of leisure time
 - Negative: can place employees on ‘constant call’ where they are never truly away from the office, even when they are holiday
- “Robot” revolution on the way
 - Quasi-autonomous devices becoming increasingly common on factory floors, hospital corridors and farm paddocks and in homes
 - E.g. Roomba (vacuum floors), Scooba (wash floors), Dirt Dog (sweep garages), Verro (clean pools) and Looj (clean gutters)
- Improvements in health care
 - Better and faster diagnoses
 - Long-distance surgery and medical discussions
 - More accurate patient monitoring
 - Dangers of self-diagnosis

Introduction to Business Information Systems Summary Exam Notes

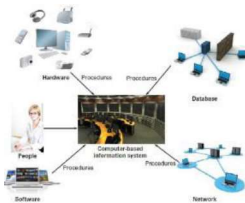
Chapter 1 – Introduction to information systems

Information Systems

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- **IS** is conceptualised as a triangle
 - o It's not an information system without these three characteristics
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1.2 Computer-based Information Systems (CBIS)



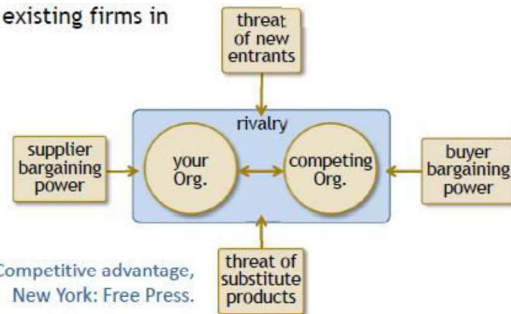
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Chapter 2 – Strategy, Competitive advantage and information systems

2.2 Competitive Advantage and Strategic IS

- Competitive Forces Model

- R ○ The threat of entry of new competitors
- T ○ The bargaining power of suppliers
- T ○ The bargaining power of customers (buyers)
- The threat of substitute products or services
- B ○ The rivalry among existing firms in the industry
- B existing firms in



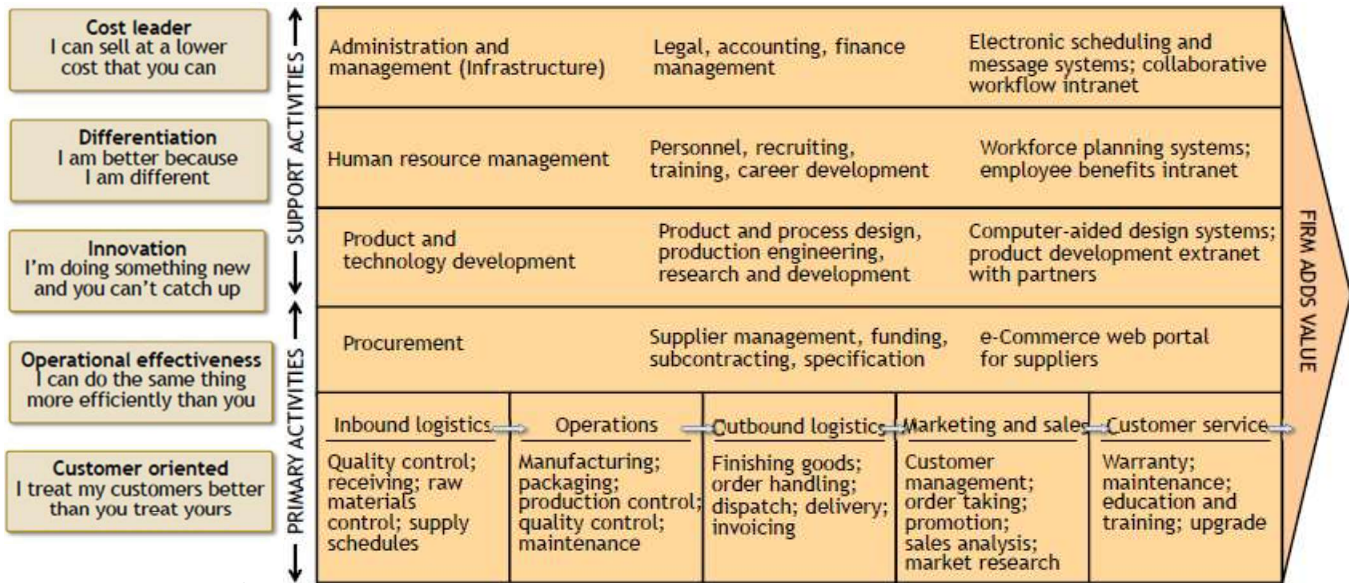
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Threats	High	Low
New competitors	Market entry is easy	Significant barrier to enter the market
Suppliers (bargaining power)	Buyers (companies) have few choices	Buyers (companies) have many choices
Customers (bargaining power)	Buyers (customers) have many choices	Buyers (customers) have few choices
Substitute products/services	There are many substitutes	There are few substitutes
(Established) competitors	Intense competition among many firms	Decreased intense competition among firms

- FFT: What is the impact of the internet on each of these threats?
 - M E Porter, 'Strategy and the internet', Harvard Business Review, March 13 2001, pp. 62–78

- Value chain model

- Value chain: identifies specific activities where organisations can use competitive strategies for greatest impact
- Primary activities
 - Relate to production and distribution of the firm's products and services, creating value for which customers are willing to pay
 - Examples: Inbound logistics, operations, outbound logistics, marketing and sales, and services
- Support activities
 - Do not add value directly to a firm's products and services, but support the primary activities
 - Examples: Infrastructure (accounting, finance, management), human resources management, research and development, procurement



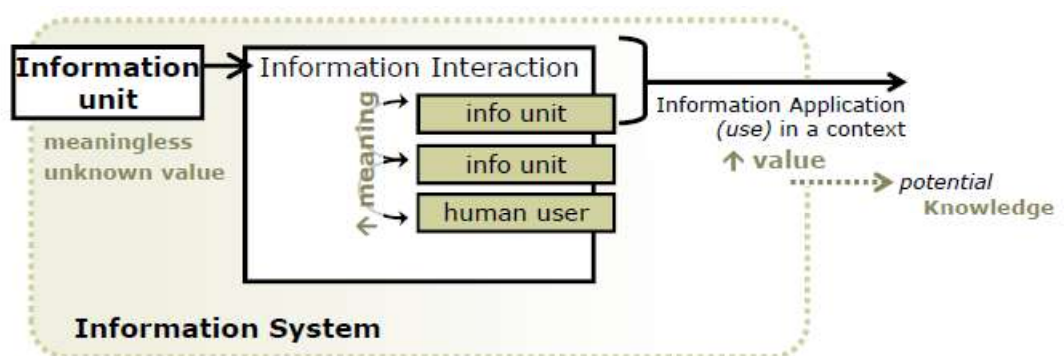
○ Strategies for competitive advantage

- **Cost leadership**: produce products and/or services at the lowest cost in the industry
- **Differentiation**: offer different products, services or product features
- **Innovation**: Introduce new products and services, add new features to existing products and services, or develop new ways to produce them
- **Operational effectiveness**: improve manner in which internal business processes are executed so that a firm performs similar activities better than its rivals can
- **Customer orientation**: concentrate on making customers happy

Chapter 3 – Data and Knowledge Management

Introduction

What is **data**? What is **information**? What is **knowledge**?



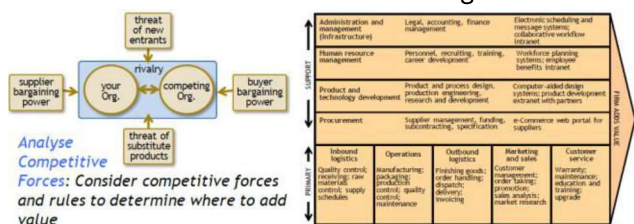
- So we can define these concepts loosely in terms of:
 - **Data** is raw (unprocessed) facts that have some relevancy (albeit unknown) to an individual or organization
 - **Information** is data that has been processed or given some structure that brings meaning to an individual or organisation
 - **Knowledge** is data and/or information that has been organised and processed to convey understanding, experience, accumulated learning and expertise as they apply to a current problem or activity

Two Applied Frameworks

Creating Business Value with IT

1. Perform Value Chain Analysis

- Analyse the value chain with respect to
 - o Competitive forces
 - Analyse Competitive Forces: Consider competitive forces and rules to determine where to add value
 - 1. Determine what is the dominant competitive force (Porter's Five Forces) for the business
 - 2. Using the rules (below) to determine where to increase value in the value chain
 - a. To Decrease Buyer or Customer Power; Increase value on demand side of value chain; Increases switching cost
 - b. To Decrease Threat of New Entrants; Increase value of support activities; Increases barrier to entry
 - c. To Decrease Threat of Substitute Products; Increase value of Primary VC activities (and R&D); Better overall product
 - d. To Decrease Threat of Supplier Power: Increase the value of supply side of value chain; More procurement options
 - e. To Decrease Rivalry Among Existing Competitors: Increase value across the value chain; Better business overall
 - o Value chain feedback to see where best to create business value in value chain
 - Get customers to indicate the extent to which they believe each activity in the value chain adds value to the product or service.
 - Then focus on creating business value in either:
 - 1. Highest Value-Adding Activities – to further enhance their value, or
 - 2. Lowest Value-Adding Activities – to increase their value.



- » New competitors? → ↑ value of support activities = ↑ barrier to entry
- » Bargaining power of suppliers? → ↑ value of inbound log. = ↑ procurement options
- » Bargaining power of customers? → ↑ value on demand side = ↑ switching cost
- » Substitute products? → ↑ value of Primary VC activities (& R&D) = better product
- Existing firm rivalry? → ↑ value across value chain = Better business overall

2. Determine Business Strategy and Process

- Determine the desired business strategy and business processes (or activity) to create business value
 - o Determine what business strategy AND business processes are needed to increase the business value (i.e. what changes are needed)
 - o Doing something new
 - o Doing something better
 - o Doing something differently