Introduction to Information Systems

Data Science Education Program

Chapter #1

Information systems and people

Chapter #1 Subjects and Topics

- Information systems in action:
  - Managing operations
  - Supporting customer interactions
  - Making decisions
  - Collaborating in teams
  - Gaining competitive advantage
  - Improving individual productivity
- The nature of information
  - What makes information valuable
- The components of an information system
  - People / technology / processes / data

- Information systems throughout the organisation
  - Information systems in business
  - Information systems in non-profit organisations (charities) and government
  - inside the IT department
  - Improving your own productivity
- Promises, perils, and ethical issues
  - Privacy breaches and amplification effects
- The ethical factor
  - Ethical issues surrounding information systems
- Chapter #1 case studies
  - The *Nasdaq* and *Twitter*

Key Terms and Concepts

- The following table shows the essential keywords and concepts located on page 56 with the chapter summary

- The chapter provides multiple examples to illustrate the concepts introduced:

  - I have updated some examples and added additional current examples to illustrate the concepts where appropriate

KEY TERMS AND CONCEPTS

operations management	competitive advantage	information technology (IT)	e-discovery
customer relationship management (CRM) system	data	information and communications technology (ICT)	management information systems (MIS)
data-driven decision making	information	business process	chief information officer (CIO)
business intelligence	information system	business process management (BPM)	crisis management team
social networking sites	user-generated content (UGC)		
	Web 2.0		

Information systems in action

Information Systems Examples

- Dancing with the stars:
  - A popular USA television reality show
  - IS: audience voting
- Hurricane Sandy:
  - A USA weather emergency that prevented voters travelling to the polling stations in November 2021
  - IS: voting by email
- Walmart:
  - A huge USA based retail organisation that developed a leading information system
  - IS: inventory (stock) tracking

Dancing with the stars

- This was a television show where competitors were marked using two methods:
  - A panel of judges (50%)
  - An on-line vote by the public (the viewers) using: (a) a telephone, (b) text messages, or (c) by logging onto the show website (50%)
- There were millions of public votes to be recorded and counted
  - The system must handle the large volume of votes in a very short time
  - To calculate the results the system used a computerized information system to collate the votes and arrive at the final result
  - From opening the voting, the results were required within 30 minutes

Hurricane Sandy and Electoral Systems

- Every year in the geographic areas around the southern USA there are tropical storms and hurricanes
- Hurricane *'Sandy'* arrived around November 2012 and coincided with the 2012 elections
- In the state of New Jersey:
  - It was decided that voters could cast their ballots by email
  - This required a large information system
  - While minor issues may arise in any voting system information systems are becoming ever more relevant to elections where an increasingly large proportion of votes use email, posted, and on-line systems
- Electoral systems must be capable of handling large volumes of votes
  - For example: in the 2020 USA presidential election there were around 160 million votes

Walmart

- Walmart:
  - A huge retail organisation in the USA with sales of $446 billion in 2012 the sales were
  - The company developed a pioneering client IS to:
  - Track shipments moving from supplier factories, warehouses, and retail stores
  - Tags attached to pallets were capable of transmitting data wirelessly
- The result was superior intelligence relating to:
  - The location of goods
  - The movement of goods and potential supply chain issues
  - The intelligence to spot problems quickly and improve the supply chain effectiveness

An Educational Institution

- A University is an educational institution where there is a requirement to record activities for many reasons which include:
    - *People* (staff, students, administrative staff, etc.)
    - *Infrastructure* (construction, maintenance, etc.)
    - *Finance* (accounts and salaries etc.)
    - *Legal* and regulatory requirements
- Keeping track of the demands requires the management of data and information:
    - To achieve this the University employs many interconnected IS
    - Such systems enable the University to function efficiently
- IS are in many formats including:
    - *Spreadsheets*, *databases*, *document record systems* etc.

An Historical Context

- The early computers were limited and IS were also limited to:
  - Payroll
  - Invoicing and tracking
  - General ledgers and inventory management
- While such activities remain important modern IS have developed and now address:
  - Company activities, customer activities, supplier activities, partners and citizens etc.
  - In practice an IS may address all *stakeholders* in the organisation

What are Stakeholders?

- A *stakeholder* is anyone with an interest in a business

- Stakeholders are *Individuals*, *groups* or *organisations* that are affected by the activity of the business and include:
  - *Owners* who are interested in profit and survival of the business.
  - *Managers* who are concerned about their salary.
  - *Workers* who want to earn high wages and keep their jobs
  - *Customers* who want the business to produce quality products at reasonable prices
  - *Suppliers* who want the business to continue to buy their products
  - *Lenders* (banks and bond holders)who want to be repaid on time and in full
  - *Shareholders* who own shares in a listed company

What are Stakeholders?

- Stakeholders also include:
  - The *community* which has a stake in the business as employers of local people.
  - Business activity also affects the local environment: for example, noisy night-time deliveries or a smelly factory would be unpopular with local residents
  - *Internal stakeholders* are groups within a business: e.g., owners and workers
  - *External stakeholders* are groups outside a business: e.g., the community

Stakeholders

- The figure illustrates the broad and diverse range of people and organisations that make up '*stakeholders*'

- All stakeholders will form part of the population used to create information systems
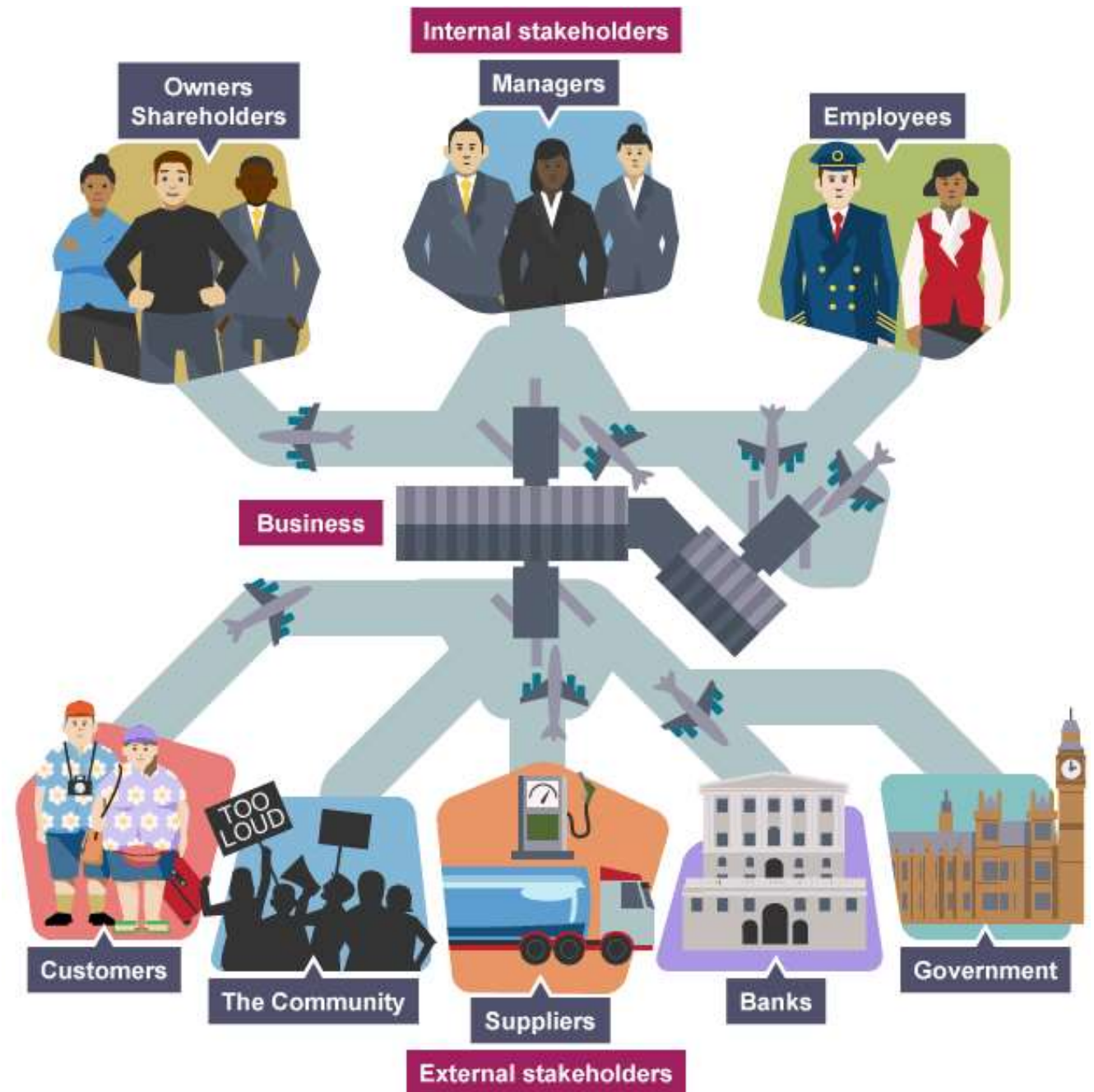
Managing operations

Operations Management

- ## Managing operational activities includes:
  - The design, operation, development, and improvement of all systems and processes used by an organisation to deliver the goods and services

- ## IS are a vital component in the operational management of at all levels of the company and include:
  - Accounting, asset management, inventory control, and supply-chain management

- ## Moreover:
  - IS must implement the governmental, regulatory, and legal requirements of the markets in which the company operates

Commercial Information Systems

- Many companies use commercial IS to:
  - Manage 'back-office' functions
  - Such software is available from many organisations such as *Oracle*, *SAP*, and *Microsoft* etc

- The practice of 'outsourcing' has become a frequently used approach which uses:
  - Companies contracted to provide the 'back-office' services
  - Such companies are in many geographical locations
  - The approach has not always been successful with customer service complaints resulting in 'back-office' functions being returned to an 'in-house' system

Industry-Specific Functions

- IS are required by organisations to:
  - Manage production processes and assembly lines (fig: 1.2)
  - Universities must manage student academic records, class schedules, faculty assignments, student financial aid, and student grades etc (fig: 1.3)
  - Transport companies use IS to: (a) keep track of vehicles and shipments, (b) optimise routing of vehicles and shipments, and (c) minimise the cost of operations
  - The growth of 'just-in-time' deliveries of components requires IS's to manage 'real-time' global supply chain management
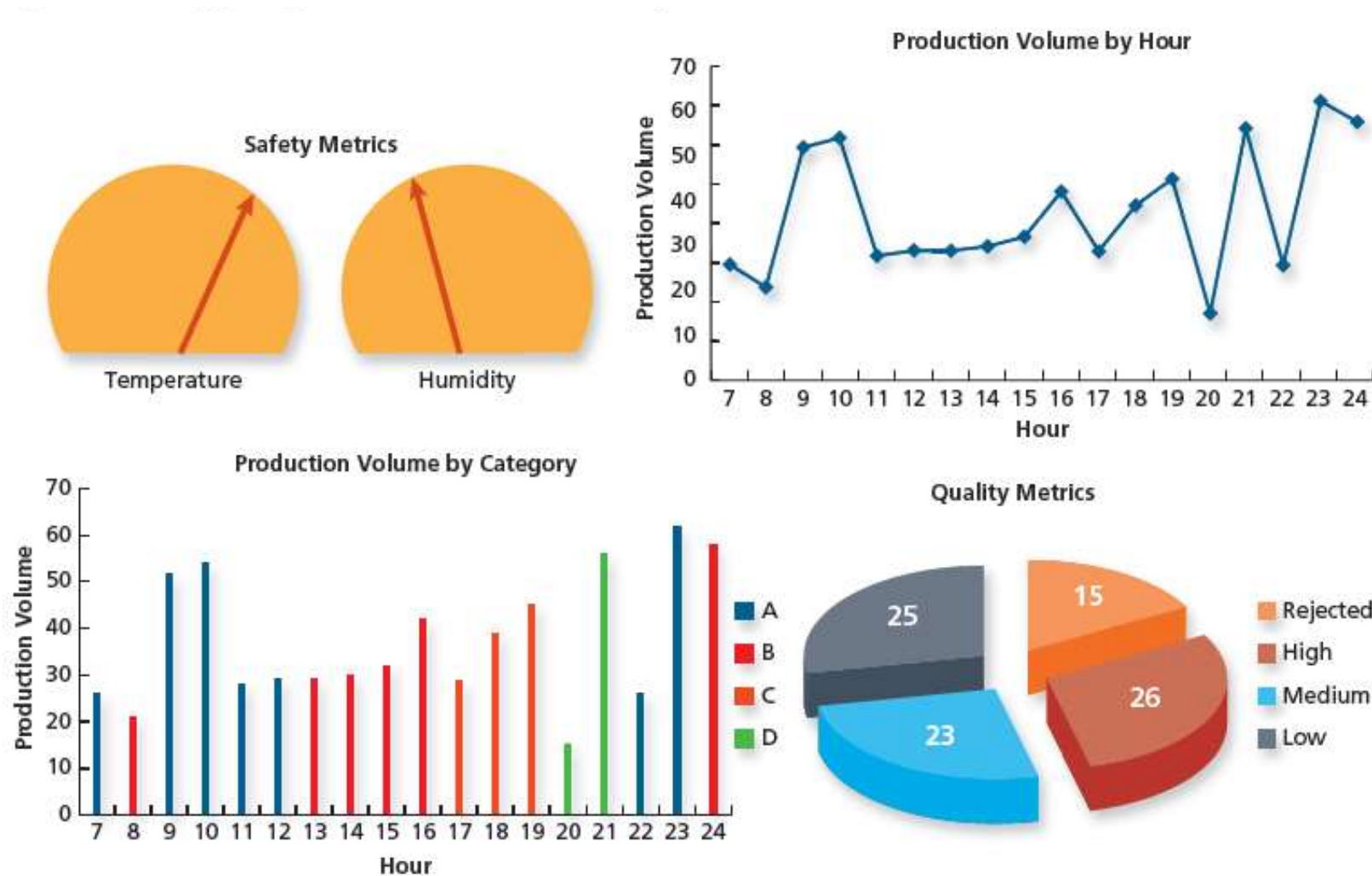
Organizations and IS (Figure 1.1)

- The important roles of IS in organisations:
  - Operations management
  - Customer interactions
  - Decision making
  - Collaboration on teams
  - Strategic initiatives
  - Individual productivity

FIGURE 1-1
The major roles of information systems in organizations.

Manufacturing IS (Figure 1.2)

FIGURE 1-2

Manufacturing information system displaying production volumes and other metrics.

Student IS (Figure 1.3)

IS Functions	Course	Days	Time	Location
• Update contact information • Submit request • View requirements • Register for courses	Business 111	MW	14:00-15:00	Macintyre
	Business 111	MW	15:00-16:00	Doyle
	Business 112	T-TH	9:00-10:45	Student Services
	Business 112	-	-	On-Line
	Business 112	M	9:00-11:45	Garcia
	Business 113	W	1:00-2:45	Doyle

Figure 1.3. An example of a student information system with on-line services for students and the faculty

The Objectives

- Realising improvements in the performance of an organisation can provide:
  - Cost savings
  - Competitive advantage
  - Improvements in quality control
- When considering UPS:
  - It was realised that avoiding left turns reduced delivery times
  - This was due to left turns taking longer (in the USA) that right turns
  - Also, there are cost savings (reduced fuel consumption)
    - Systems that support operations are considered in Chapter 5

Supporting customer interactions

Interacting with Customers

- Interactions with:
  - Administrators, managers, Clients, students, patients, clinicians, citizens, other stakeholders
- Customer Relationship Management (CRM) systems build and maintain relationships.
- Web-based systems
  - Bricks and clicks (order on-line → collect at a physical shop)
  - online self-service (order on-line → delivered)
  - Online sales (e.g., Amazon)

CRM Systems

- Customer Relationship Management (CRM) systems are discussed in Chapter 5)

- CRM systems are IS that enable effective records to be kept updated with ongoing customer interactions and cover:
  - Accounting activities
  - Customer contact details and responses

- Relationships are important to organisations:
  - The aim is to maintain relationships
  - To support all the processes that relate to such relationships

A Retail Example

- A 'bricks-and-mortar' retail shop needs a sales system to:
  - Identify purchases in a shopper's basket
  - Weigh products where needed
  - Calculate the bill
  - Feed the data into the inventory IS
  - Manage the various methods of payment and banking
  - Manage theft of products
- Methods to manage such requirements include:
  - The use of barcoding to track product sales and inventory control
  - To limit errors in transactions

An On-Line Example

- Web-based shopping and self-service has transformed customer relationships by:
    - Reducing telephone interactions

- Web-based shopping systems:
    - Generally mirror the 'bricks-and-mortar' methods in the use of on-line "shopping carts" and "checkouts"

- web applications provide opportunities for:
    - Improved customer relationships
    - An improvement in understanding the customer and their motives, desires, and purchasing patterns

Amazon

- The success of Amazon is built on the Internet and its CRM systems

- Amazon has many operations which include:
  - The Amazon marketplace (on-line shopping)
  - The Amazon Web Service (AWS) division
  - The Amazon Prime division

- The benefits obtained as identified in the on-line example apply and:
  - The data obtained and processed into information is useful in building customer relationships with improved sales performance

Variations in Customer Interactions

- Many variations in customer interactions exist and are developing

- Consider the following examples:
  - On-line shopping
  - On-line voting
  - Social media
  - Government systems (e.g., taxation and service provision)

- Developing relationships involves:
  - Improving commercial performance
  - Addressing faults and complaints
  - Building long term loyalty to a brand and building the brand
  - Addressing security and privacy concerns (discussed in Chapter 10)

Making decisions

Decisions in Organisations

- Decision-support systems and business intelligence is discussed in Chapter 7

- In summary: these topics include an ever-growing category the blend:
  - Complex and rapid analysis of information with artificial intelligence and human knowledge
  - For knowledge workers (in particular): the value of understanding how to leverage the vast amount of information to inform decision-making is critical to an organisations commercial success

Decision-Support

- Decision-support may be considered under a number of general headings

- Data, information, and knowledge driven decision making

- Business intelligence

- Decision-support systems including:
  - Information systems
  - Artificial intelligence
  - Data processing
  - Human knowledge

Decisions – Restaurant Example (Fig. 4)

- Some decisions are instinct driven

- Data-driven decisions are increasingly used by organisations where:

  - Very large volumes of data and information are utilised

  - The data and information support decision-making by identifying tends and patterns

- In the restaurant example sales date will show:

  - How much is taken in sales in specific periods during the day

  - This information will drive decisions regarding opening hours and closing times

Decisions – a Restaurant Example (Fig. 4)

- ## Figure 1-4

- How do managers answer the four questions shown in the figure?

Business Intelligence

- A critical topic in the current busines environment it refers to:
  - All data and information used to make informed decisions
  - Sources can be from both within and external to the organisation

- Considering the restaurant example:
  - The manager can use customer records along with publicly available information (e.g., income levels and demographics) for post codes to identify opportunities for new branches

Collaborating in teams

Collaboration and Teamwork

- Information systems provide support for collaborative teamworking in organisations and beyond

- Location independent interactive collaboration is facilitated by software Cloud-based systems such as:
  - Skype (Microsoft), Voo Vmeeting, Zoom, Hewlett Packard, Google, and Cisco WebEx, the Microsoft *Sharepoint,* etc

- For the corporate world there are professional collaborative software systems from:
  - Cisco Systems , Hewlett Packard, Google, and Microsoft

The Microsoft Virtual Boardroom

- A good example of corporate level collaborative software is the Microsoft *VirtualBoardroom*®

- *VirtualBoardroom*®: is a secure web-based board portal helping company secretaries and administrators share confidential information with board members who can then access, navigate and annotate documents remotely

- It features a unique publishing tool enabling board packs to be generated simple on-line

- The *VirtualBoardroom app* is the paperless way to access your board information on your computer or tablet

The Microsoft Virtual Boardroom

- Once authenticated, you will be able to browse all your boards and committees

- Current and archived board packs and other key reference material can then read, annotated, and shared

- Documents can be viewed in full screen, online and offline.

- Key features of the Microsoft *VirtualBoardroom*® app are set out on the following slide

- There are alternative systems including sophisticated virtual boardrooms with a virtual boardroom table where corporate meeting may be held

The Microsoft Virtual Boardroom

Microsoft Virtual Boardroom app Key Features
Secure, one-off authentication
Access to instantly updated board packs + other documents
Alerts on updated meeting information such as date, time, location and attendees
Comprehensive document search
Document bookmarks for simple navigation
Document annotation including text notes, strikeout, highlight + freehand
Note summary page created from your annotations
Sort board packs and their contents to help find the documents you need
Synchronise meetings and events to your device calendar
Offline document viewing
Security using the App PIN lock

Collaborative Cloud-Based Systems

- The sophisticated (and generally expensive)collaboration software is not required for personal use
    - In such cases the social media platforms provide systems to support on-line communities

- The success of social networks has prompted companies to use the collaborative features to support their business goals

- Research has shown that large companies often use experiments to identify how collaborative features can support business

Collaborative Cloud-Based Systems

- Research suggests that for around 50% of large companies:
  - Will depend heavily on *internal* social networks for employees
  - Social networks will be as important as email

- The towards collaborative communication has been clear over time however:
  - The Covid-19 pandemic has demonstrated and emphasized the use of such on-line meeting and collaborative systems
  - The pandemic has accelerated the trend and increased the acceptance by sceptics

Conclusions

- Notwithstanding the current popularity of collaborative systems:
  - Developing such systems (within an organisation) requires careful consideration of the way(s) people work together
- The possibilities are many as are the preferences of many people and groups of people
- Consider on-line university courses:
  - Should students web cams be turned on? or off?
  - Opinions differ but there are security, privacy, and invisibility issues to consider
- IS can support virtual teamwork (as discussed in Chapter 8) and practical experience is informing their use on technical and societal levels

Gaining competitive advantage

Competitive Advantage

- Gaining competitive advantage is important for:
  - Commerce, businesses, and services
  - Non-profit organizations
  - Government
  - Academia

- What is competitive advantage?
  - It is anything that gives a company a lead over rivals

- Competitive advantage can be achieved by:
  - The development of innovative IS (e.g., the apple iPhone GUI and 'Siri')
  - IS are fundamental in the development of an organization's strategy and strategic vision
  - However: there are potential ethical dilemmas (see Chapters 3 and 10)

Competitive Advantage and Strategy

- Strategy is important for non-profit and governmental organisations
- For such organisations IS can be innovative by offering new services
- For example:
  - In the USA citizens can apply for social security benefits on-line rather than in person
  - Governments can attempt to combat terrorism using IS with analysis of large volumes of data
  - The Covid-19 pandemic has promoted on-line systems and the use of IS to:
    - Disseminate public service health information
    - Make enquiries and book testing
    - Engage in research surveys
    - Enquire about vaccination and make bookings on-line

Academia

- Educational institutions are increasingly reliant on income derived from student fees to support their operations
- To promote the institution:
  - Information systems with related data analysis are employed in all areas of operations
  - IS are used in on-line systems to promote the institution and generate interest in the educational opportunities and extra curricular facilities offered
- For students and staff:
  - Institutions disseminate all manner of information relating to the delivery of courses and important information
- Educational institutions are in competition to recruit students:
  - IS are central to developing strategies and gaining an educational competitive advantage

Improving individual productivity

Introduction to Information Systems

Productivity

- What is productivity?
  - Essentially *productivity* relates to the effective and efficient use of time while minimizing wasted time
  - This definition does not exclude leisure time and rest which can be an important component in effective use of time
- to improve personal productivity there are many available tools:
  - Smartphones providing: *email, voice calls, web browsing, contact databases, games, software applications that eliminate repetitive and tedious tasks, electronic calendars, note-taking applications* (manuscript and voice), and *on-line collaboration systems, social media* applications, etc.
  - Similar functionalities are available using *tablets, laptop computers* and *PC's etc.*

Productivity

- The development over decades of application software to enable tasks to be performed has been important in improving productivity
- Office application software has developed and includes:
  - Word processing (a WYSIGIG system)
  - Professional publishing applications (e.g., LaTeX)
  - Graphic programs and computer-aided-design (CAD)
  - Database programs
  - Spreadsheet programs
- Such application software has enabled users to carry out tasks with a basic level of computer literacy:
  - This makes the power of computer technologies available to the majority of the population with relatively limited training

Cloud-Based Systems

- Developments in cloud-based systems including the fog and edge computing paradigms:
  - Have resulted in significant improvements is productivity (both human and technical)
- The availability of cloud-based applications has reduced the level of computer literacy required to use sophisticated software systems.
- For example, consider:
  - Cloud-based data storage and backup systems
  - Cloud-based big-data analytic solutions
  - Cloud-based applications including:
    - Infrastructure-as-a-Service (IaaS) and Network-as-a-Service (IaaS)
- Cloud-based services and systems can leverage the power of such services while improving productivity

Productivity Considerations

- While the availability of devices, technologies, and applications available to users is wide and varied:
  - Care must be taken to consider the available technologies in terms of their usefulness and user needs
  - Using technologies must be measured and evaluated in terms of how they make users more effective and productive
  - There are many situations where a paper notepad and pen are the optimal solution
- Moreover: many technologies are not particularly intuitive and require some instruction
- Additionally: the levels of pervasiveness and ubiquity are important:
  - For example, consider the pervasive nature of Microsoft Office 365

Productivity Quiz

	Not at All True for Me				Very True for Me		
1. I empty my email inbox every day.	1	2	3	4	5	6	7
2. I keep a to-do list, and always keep it up to date.	1	2	3	4	5	6	7
3. I use email filters to sort messages by how important they are.	1	2	3	4	5	6	7
4. I stay logged into my social network most of the day so I am alerted when updates occur or messages appear.	1	2	3	4	5	6	7
5. I rarely print anything out.	1	2	3	4	5	6	7
6. I send and receive text messages very frequently, though most are unimportant.	1	2	3	4	5	6	7
7. I focus on the most important projects and can ignore distractions.	1	2	3	4	5	6	7
8. I have a clear vision of what I want to achieve and make priorities.	1	2	3	4	5	6	7
9. I keep my calendar online rather than on paper, and I keep it up to date.	1	2	3	4	5	6	7
10. My electronic files are very well organized.	1	2	3	4	5	6	7

FIGURE 1-19
How do you use technology to improve your productivity? Take this short quiz.

The nature of information

Information

- In Week #1 (T1) we have considered:
  - Why study information systems?
  - Digital information processing and the relationship between data, information, and knowledge
  - The knowledge economy as modelled in the following slide
  - What is an information system?
- Information systems operate on data processed into information
- Information may be summarised as:
  - Facts, data, intelligence, and knowledge, etc.
- For this course:
  - *Data* refers to individual facts or pieces of information
  - *Information* is data of facts assembled and analysed to add meaning or usefulness (as shown in the following slide)

The Knowledge Economy

- Information has been defined as:
  - Data processed

- The process of achieving knowledge needs:
  - Selection (CAPTA)
  - Analysis
  - The application of intelligence (rational input)

- The figure shows a:
  - Conceptual model illustrating the progression of data processing from the raw data to wisdom (rational decision-support)
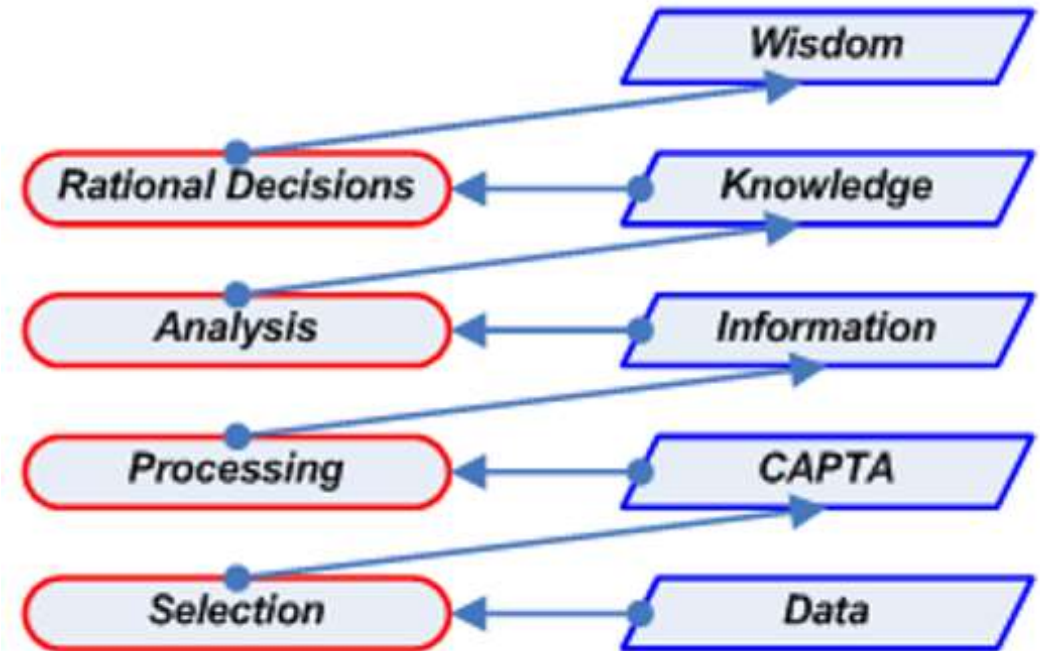
Shown is the intermediate stage (CAPTA) where an initial selection of relevant and useful raw data is implemented

Information

- Consider a medical application:
  - A patient's temperature is a piece of data
  - When combined with other symptoms, test results, and medical history it becomes a valuable diagnostic metric
- Now consider patient data from multiple patients':
  - Combining data from multiple patients into a dataset along with the diagnostic decisions we can improve the diagnostic process
- As shown in the previous slide:
  - The processing of data in a dataset with selection, refinement, and analysis results in information with meaning that is useful to the user and ultimately knowledge
  - Figure 1.6 sets out examples of the continuum from data to information and knowledge as meaning and usefulness develop

Introduction to Information Systems

Figure 1.6

Data	Information	Knowledge
Patient's temperature at walk-in clinic on Dec. 15 = 103.9° F.	Table showing flu diagnoses in region during month of December	Worldwide map of flu outbreaks suggesting pandemic
01010011 01001111 01010011	Binary code for SOS	HELP!!!
Microsoft (MSFT) closing stock price	Graph of Microsoft highs and lows for one year	Combined with analysis of other information, leads to broker's recommendation to buy, hold, or sell stock
CWOT	Complete Waste of Time (text messaging abbreviation)	May be interpreted as an insult
GPS coordinates	Map showing location with push pin	Location of Taj Mahal in India
Invoice #259 Total Amount = $139.23	Total Sales for Southern Region in First Quarter = $2,156,232	Fastest growing sales region; consider broader marketing campaign

What makes information valuable?

Information Value

- Separation and selection of useful information is a non-trivial task given the volume of available information.
- Effective access of the available data is made more difficult given the growth in the capability to capture, store, and process data in to information
- There are three essential characteristics of information that make it relevant to the user:
  - *Timeliness*
  - *Accuracy*
  - *Completeness*
- We must also consider the source(s) of the information:
  - The Internet provides much information which is biased and inaccurate

Timeliness

- Timeliness is variable and domain specific
- Consider 'real-time' data-driven applications:
  - High frequency trading in financial instruments demands continuous 'real-time' data updates in milliseconds
    - The volume of data processing in such systems can exceed 5 million data items per second
  - Stock market trading requires 'real-time' stock price updates
  - News streams and weather data are areas where timeliness is a potential issue as the dynamic nature of news can impact human activities
- There are applications where timeliness is less of an issue
- Consider low priority applications:
  - In such applications (e.g., social media) updating of information is a lower priority

Accuracy

- Accuracy may appear to be an obvious requirement
  - For example: we must consider the source(s) of the information as the Internet provides much information which is biased and inaccurate with deliberate disinformation
- However, there are degrees of accuracy:
  - The degree of accuracy may be viewed in terms of the nature of the decision
  - Additionally, the degree of accuracy id dependent on the timeliness of the data
  - There is a 'trade-off' between accuracy and timeliness and the level of structure in the information
- The following slide shows the relationship between the nature of the decision and the nature of the information used to reach decisions

Information Structure

Unstructured Information

Structured Information

Strategic

Tactical
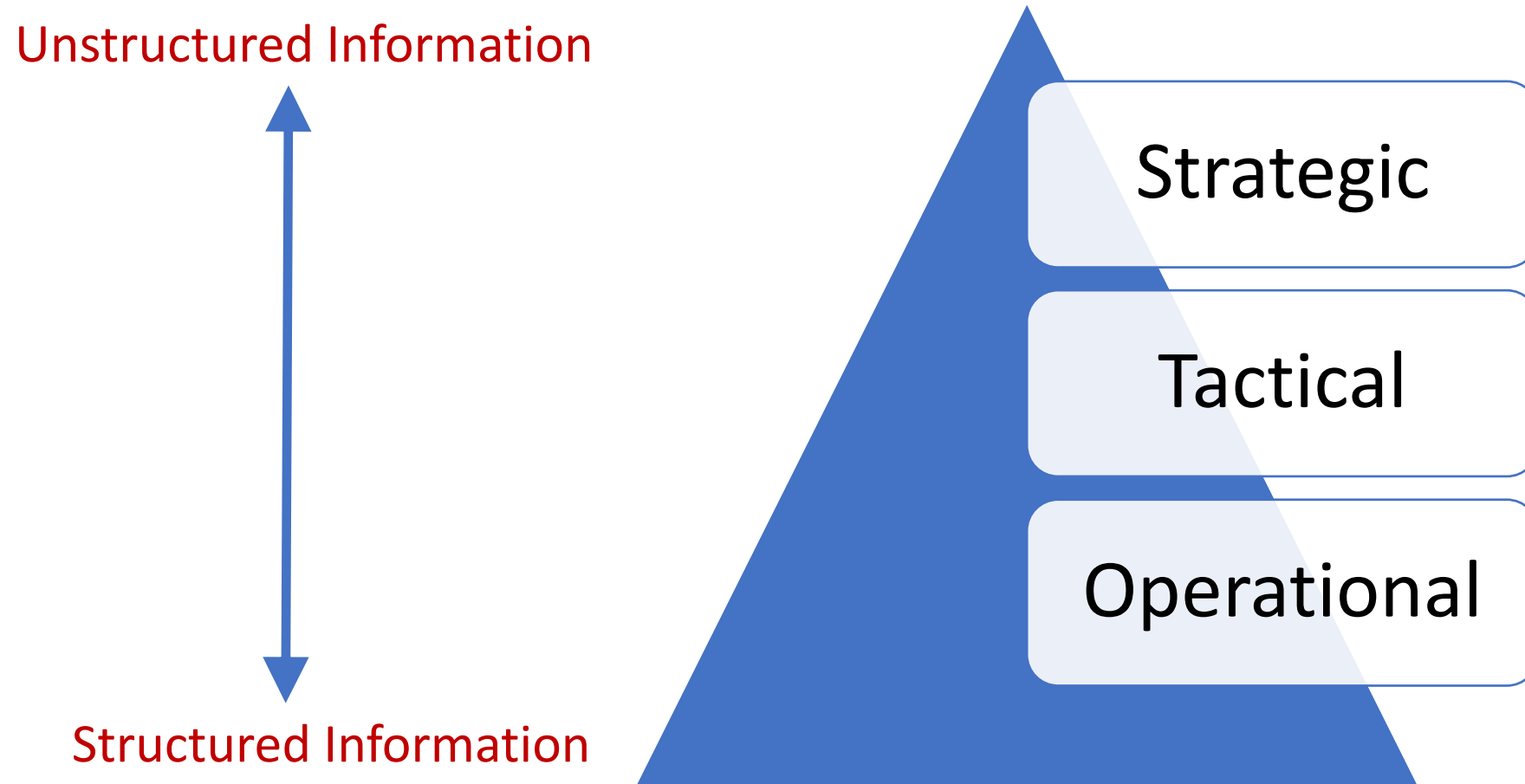
Operational

Information and Decision Support

- The previous slide shows the three types of decision in an organisation:
  - *Operational*, *tactical*, and *strategic*
- Additionally, we can see the type of information structure:
  - *Structured* --> *unstructured* information
- There are three main types of decision:
  - *Operational* decisions require 'real-time' structured data and information
  - *Strategic* decisions are less dependent on data structure than long term trends
  - *Tactical* decisions require some structure but less than operational decisions

Accuracy *vs* Timeliness 'Trade-Off'

- Information may be considered in terms of its strategic value
- In practice *tactical* and *strategic* decisions will use both structured and unstructured information
- *Operational* decisions will always require 'real-time' structured information
- Consider how the information type is used in the three decisions:
  - For *strategic* decisions *quick and dirty* information may be better than *slow and accurate* information
  - For *operational* decisions *structured* information is essential
  - For *tactical* decisions, a combination of *structured*, *unstructured*, and *semi-structured* information is used

Accuracy *vs* Timeliness 'Trade-Off'

- There are three main types of decision and each have a main function within an organisation
- *Operational* decisions relate essentially to 'day-to-day' decisions on 'real-time' problems and situations, for example:
  - Applying a discount to a sale or approving a sale using a credit card
  - Delivery scheduling and credit control
- *Tactical* decisions relate generally medium-term decisions, for example:
  - Decisions relating to sales and marketing of products
- *Strategic* decisions relate to a longer-term strategy of an organisations, for example:
 - Organisational re-structuring and research and development projects

Completeness

- Completeness:
  - Adds value to information
  - This can assist in eliminating (or at least mitigating) bias or 'spin' in the information
- Consider a marketing survey which:
  - Focuses on a single demographic
  - Polls only customers entering a physical shop (or) only on-line customers
  - Uses a telephone poll where only land-line (or) mobile telephone subscribers are contacted
  - Such surveys will produce a biased result which (may) not reflect the interests of a 'real-world' customer base
- Striving for completeness can mean delays that affect timeliness

The components of an information system

The Components

- Information systems require four components:
  - *People*
  - *Technology*
  - *Processes*
  - *Data*
- In practice:
  - These components are not discrete
  - The components are interactive and interrelated
- In the following slides I will:
  - Introduce these components
  - Consider how they operate in IS design and development
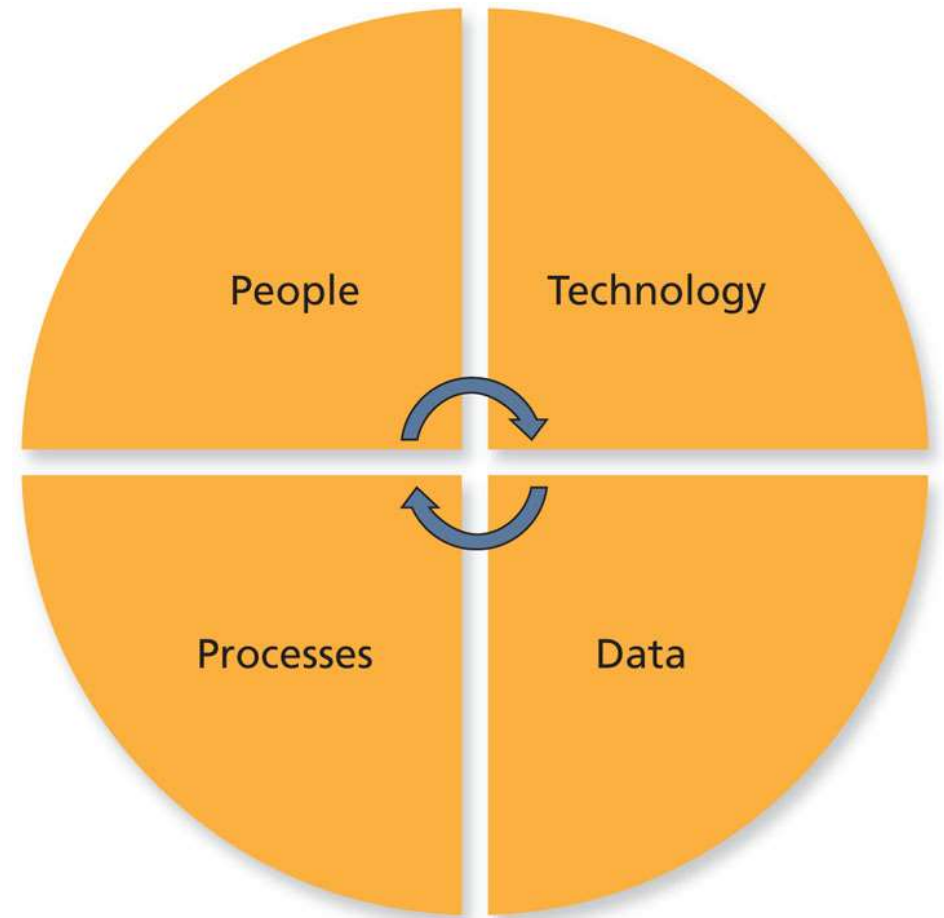
People and Organisations

- An organisation is a 'shell' and 'people' will define an organisation, its policies, and its ethical approach to business

- Research has identified character traits in people and related ways in which they operate

- The following slides introduce:
  - People a as discussed in chapter #1 of the course textbook (page 43)

- An additional topic (not included in the course textbook):
  - *Belbin roles*
  - The *Myers-Briggs Type Indicator* (MBTI)
  - *Personality types*

People and personality types

People and IS Design

- In week #1 (T1) the aspects of IS design and development were introduced
- The design and development process requires people to work together in teams with roles such as:
  - Visionaries, developers, and managers
- The design and development process also involves stakeholders which include:
  - Analysts, liaisons, users, customers, contributors, and sometimes 'roadblocks'
- Of the four components the most important (generally underestimated and unpredictable) role is played by people
  - People will define the success of failure of an IS project

People and IS Design

- *Leaders*:
  - Are generally the proposers for an IS to implement the company strategic objective
  - However, IS may be proposed at many levels within an organisation for any number of purposes
- *Managers* and *staff*:
  - Will be employed in many departments and sections within an organisation
  - In practice teamwork describes the work of such departments and sections
- *Technology* (generally a team activity):
  - Will work with colleagues:
    - Leaders, managers, staff, finance, human resources, and stakeholders plus other functional areas
    - The goal is to produce a user-friendly and people-oriented IS

People and IS Design

- In the design and development process data is crucial
- *Analyst*:
    - The data and the processing of data is carried out by an *analyst* (generally a teamwork activity with a *lead analyst*)
    - The aim is to identify the requirements specification
    - Involve all stakeholders in the design of the system
- There are many examples of IS where:
    - The analysis is not adequate or suitable to address the problem the IS aims to address
    - In such cases the IS will simply not suitable and will not be be used
    - This will affect the promoting organisation and affect the efficiency of its operations

User-Generated Content

- Analysts will use multiple sources of data and information in the design and development process for an IS
- For example:
  - User-generated content (UGC) is used in the design and development of many well known IS such as: Wikipedia, eBay, Craigslist, YouTube, Facebook, and Twitter etc.
  - Such systems may not exist without community support enlisted using UGC
- Web 2.0:
  - UGC forms an important component is Web 2.0 systems analysis, design, and development
  - UGC derived community support obtained using UGS is essential given the highly interactive nature of Web 2.0 systems

User-Generated Content

- Teams that manage systems based on UGC derived content:
  - Work hard to promote the positive user feedback and contributions
  - Additionally, negative feedback is vital to good user-friendly systems
  - Microsoft Windows 10 incorporated a 'Feedback Hub' for users to provide feedback (positive and negative) relating to the OS operation and features
- We all are aware of the potential for cyber-criminal activity:
  - The design, development, and maintenance of an IS must seriously consider such activity
  - The aim is to defeat (or at least mitigate) such criminal activity
- Social network platforms have recently been impacted by 'fake-news'
  - The networks are 'not publishers' but must monitor content to restrict fake news

People (agents)

- Leaders
  - Executives
  - Directors
- Managers and staff
- Information technology team
- Consultants and design engineers
- Users of a system (user generated content)
- The list of people – stakeholders (disscus)

Belbin roles and personality types

An additional topic not in the course textbook

Personality Types and Organisations

- This section:
  - Introduces Belbin roles and the *Myers-Briggs Type Indicator*
  - considers the personality traits the characterize Belbin roles
  - Considers the relationship of Belbin roles to information systems
  - Consider the relationship of Belbin roles to information systems design

Belbin Team Roles

- There are nine Belbin team roles:
  - Resource investigator
  - Team worker
  - Coordinator
  - Shaper
  - Completer finisher
  - Implementer
  - Plant
  - Specialist
  - Monitor evaluator

What are Belbin Roles?

- The *Belbin Team Roles* (or *Inventory*) is:
  - A behavioural test

- Alternative terms:
  - The *Belbin Self-Perception Inventory* (BSPI)
  - The *Belbin Team Role Inventory* (BTRI)

- It was devised by Prof Meredith Belbin:
  - To measure preferences for nine Team Roles;
  - He had identified eight of those whilst studying numerous teams at Henley Management College

The Belbin Inventory

- The *Belbin Inventory*:
  - Assesses how an individual behaves in a team environment
  - The environment relates to collaborative or committee interactions
- The assessment includes '360-degree feedback' (evaluation) from:
  - *Observers*
  - *The individual's own evaluation of their behaviour and actions*
- The alternative assessments contrasts how individuals' see their behaviour with how their colleague's assessment

The Belbin Assertion

- Belbin has asserted that the *Team Roles* are not equivalent to *personality types*:
  - Unlike the *Myers-Briggs Type Indicator* (MBTI) which *is*:
    - a psychometric instrument used to sort people into one of 16 personality types
- The *Belbin Inventory* scores people on how strongly they express behavioural traits from nine different Team Roles
- A person may and often does exhibit strong tendencies towards multiple roles

The Myers-Briggs Type Indicator

- The *Myers-Briggs Type Indicator* (MBTI) *is*:
  - an introspective self-report questionnaire

- The purpose of the questionnaire is to indicate:
  - The different psychological preferences related to how individuals perceive their world
  - How individuals react to stimuli
  - How individuals draw conclusions and make decisions

What are Personality Types?

- Personality type:
  - Refers to the psychological classification of different types of individuals
  - *Personality types* are sometimes distinguished from *personality traits*,
  - *personality traits*: embody a smaller grouping of behavioural tendencies

- Personality types are sometimes said to involve *qualitative* differences between people

- Personality traits may be understood as *quantitative* differences

- According to type theories, for example:
  - *Introverts* and *extraverts* are two fundamentally different categories of people
  - According to trait theories, introversion and extraversion are:
  - Part of a continuous dimension, with many people in the middle

Shaper

Shaper

- The *Shaper* is a task-focused individual who pursues objectives with vigour and who is driven by tremendous energy and the need to achieve

- For the *Shaper*, winning is the name of the game

- The *Shaper* provides the necessary drive to ensure that the team is kept moving and does not lose focus or momentum.

- *Shapers* are people who challenge the team to improve
    - They are dynamic and usually extraverted people who enjoy stimulating others, questioning norms, and finding the best approaches for solving problems

- The *Shaper* is the one who shakes things up to make sure that all possibilities are considered and that the team does not become complacent

- *Shapers* could risk becoming aggressive and bad-humoured in their attempts to get things done

- *Shapers* often see obstacles as exciting challenges, and they tend to have the courage to push on when others feel like quitting

Completer finisher

Completer-Finisher

- The *Completer Finisher* is a perfectionist and will often go the extra mile to make sure everything is "just right," and the things he or she delivers can be trusted to have been double-checked and then checked again

- The *Completer Finisher* has a strong inward sense of the need for accuracy, and sets his or her own high standards rather than working on the encouragement of others

- They may frustrate their teammates by worrying excessively about minor details and by refusing to delegate tasks that they do not trust anyone else to perform

Implementer

Implementer

- The *Implementer* takes their colleagues' suggestions and ideas and turns them into positive action

- They are efficient and self-disciplined and can always be relied on to deliver on time

- They are motivated by their loyalty to the team or company, which means that they will often take on jobs everyone else avoids or dislikes

- However, they may be viewed as '*closed-minded*' and '*inflexible*' since they will often have difficulty deviating from their own well-thought-out plans, especially if such a deviation compromises efficiency or threatens well-established practices

Plant

Plant

- *Plants* are creative, unorthodox and generators of ideas

- If an innovative solution to a problem is needed, a Plant is a good person to ask. A good *Plant* will be bright and free-thinking

- *Plants* can tend to ignore incidentals

- The Plant might be caricatured as the absent-minded professor/inventor, and often has a hard time communicating ideas to others

- Multiple *Plants* in a team can lead to misunderstandings, as many ideas are generated without sufficient discernment or the impetus to follow the ideas through to action

- *Plants* can also create problems with the timing of their ideas

- The fact that the team has decided on a valid way forward and is now in the implementation stage will not stop the Plant from coming up with new solutions and disrupting the implementation process

Monitor-evaluator

Monitor-Evaluator

- *Monitor Evaluators* are fair and logical observers and judges of what is going on in the team

- Since they are good at detaching themselves from bias, they are often the ones to see all available options with the greatest clarity and impartiality

- They take a broad view when problem-solving, and by moving slowly and analytically, will almost always come to the right decision

- However, they can become very critical, damping enthusiasm for anything without logical grounds, and they have a hard time inspiring themselves or others to be passionate about their work

Specialist

Specialist

- The Belbin Team Inventory was revised to include the *Specialist* role, since the role was not revealed in the original research because no specialized knowledge was required for the simulation exercise

- *Specialists* are passionate about learning in their own particular field. As a result, they are likely to be a fountain of knowledge and will enjoy imparting this knowledge to others

- They also strive to improve and build upon their expertise. If there is anything they do not know the answer to, they will happily go and find out

- *Specialists* bring a high level of concentration, ability, and skill in their discipline to the team. However: a specialist can only contribute on that specialism and will tend to be uninterested in anything which lies outside its narrow confines

Teamworker

Introduction to Information Systems

Teamworker

- A *teamworker* acts as the "oil" between the cogs that keep the machine that is the team running smoothly

- They are good listeners and diplomats, talented at smoothing over conflicts and helping parties understand one another without becoming confrontational

- Since the role can be a low-profile one, the beneficial effect of a *teamworker* can go unnoticed and unappreciated until they are absent, when the team begins to argue, and small but important things cease to happen

- Because of an unwillingness to take sides, a *teamworker* may not be able to take decisive action when needed

Coordinator

Coordinator

- A *Coordinator* is a likely candidate for the chairperson of a team, since they have a talent for stepping back to see the big picture

- *Coordinators* are confident, stable and mature and because they recognise abilities in others, they are very good at delegating tasks to the right person for the job

- The *Coordinator* clarifies decisions, helping everyone else focus on their tasks

  - They are sometimes perceived to be manipulative and will tend to delegate all work, leaving nothing but the delegating for them to do

Resource-investigator

Resource-investigator

- The *Resource Investigator* gives a team a rush of enthusiasm at the start of the project by vigorously pursuing contacts and opportunities

- He or she is focused outside the team and has a finger firmly on the pulse of the outside world

- Where a Plant creates new ideas, a *Resource Investigator* will quite happily appropriate them from other companies or people

- A good *Resource Investigator* is a maker of possibilities and an excellent networker but has a tendency to lose momentum towards the end of a project and to forget to follow things up

Belbin Team Roles In Practice

- Team roles are an important dynamic in team activities and collaboration

- The (nine) roles are an assessment and measure how an individual behaves in a team environment

- Individuals will generally identify with a specific role (often unconsciously)

- For example:
  - A *Coordinator*: may be the chairman of an organization board or a committee
  - A *Plant*: may be the creative thinker within a team
  - A *Teamworker*: may be the team member who can resolve conflicts

Chapter #1: the components of an information system: technology

Introduction to Information Systems

Technologies Overview

- Information technology (IT)
    - Hardware
    - Networks
    - Software
- Information communications technology (ICT)
    - Hardware
    - Software
    - Telecommunications
- User generated content
    - Web 2.0 and web 3.0

- Wireless communications plus 3G, 4G, and 5G

Technologies

- In considering IS there are two general terms used:
  - *Information Technology* (IT)
  - *Information Communications Technology* (ICT)
  - In practice, the terms are often used interchangeably

- *Information technology* includes (but is not limited to)
  - Hardware
  - Systems software: operating systems etc.
  - Application software:
    - Applications such as word processors and on-line educational systems etc.
    - Software to implement artificial intelligence and machine learning
  - Telecommunications (also part of ICT!)

Software and Web-based Systems

- The development of the Internet and the World Wide Web (WWW):
  - Has driven the development of diverse and heterogeneous software systems
  - The data traffic originally used a very slow 'dial-up' telephone connection
  - The development of 'broadband' technologies with high data rates is a significant development which is needed for modern software (system and application)
  - The developments ana take-up of Cloud-Based-Systems demands high data rates
- The software developments have:
  - Revolutionsed and transformed business and information dissemination using IS globally with access *anytime-and-anywhere* 24/7

Technologies

- **Information communications technology**:

  - Refers to a broader collection of technologies

  - The primary role of ICT is the telecommunications component in an IS

  - The process involves moving electronic signals from one location (a user) to another remote location (the other user)

- Moving signals involves many functions (beyond the scope of this course) but primarily includes:

  - Traffic routing and route optimisation

  - Adding features to improve traffic speeds, eliminate (or reduce) noise, implement security protocols, and analyse traffic patterns (part of the optimisation function)

Wireless Systems

- The development and take-up of wireless technologies (in all their formats) due to the convenience, lack of wires, and flexibility

- Wireless systems utilising mobile systems using 3G and 4G technologies are slower than many broadband connections
  - The rapid development of 5G provides data rates comparable to many broadband connections
  - It may be the case in future that 5G mobile systems will replace broadband connectivity

- Technology developments provide a basis upon which:
  - Organisations can create applications and systems accessible by partners, suppliers and customers *anytime-and-anywhere*

People, Technology, UGC, and Web 3.0

- While the 'people' component and user generated content (UGC) play key roles in Web 2.0 systems development:

  - Technology is a major driver of what has been termed Web 3.0

  - the Internet-of-Things (IoT) has billions of sensors all connected to systems using the Internet (IoT is a major driver for 5G technologies)

- IoT sensors:

  - Track location, motion, speed, and pollution

  - Medical applications use sensors to track physical patient metrics (e.g., cardio-vascular function, brain activity, skin-based metrics, temperature, etc.

  - The data collected by sensors is an invaluable data source used in big-data analytics

Processes

Business Processes

- *Business Processes* (BP) are a set of activities to achieve a specific (or *purposeful*) action or task

- *Business process management* (BPM) focuses on designing, optimizing, and streamlining busines processes including the human element

- BP and BPM address:
  - *Information systems*
  - *Security*
  - *Improve business processes*
  - *Eliminate a process completely* (system re-design)

Business Processes

- Organisations use an IS to:
  - Support, streamline, and on occasion remove business processes to improve efficiency of operation and decisions are made about how:
    - *A BP functions*
    - *How data and information is managed (from input to output)*
    - *And how IS support for processes is provided*
  - For example:
    - *Is employer activity to be logged*
    - *Is supervisor approval required to approve electronically all purchases or will there be defined purchase values*
    - *What decisions will be automated with an IS making data-driven decisions (and) what decisions require human approval*
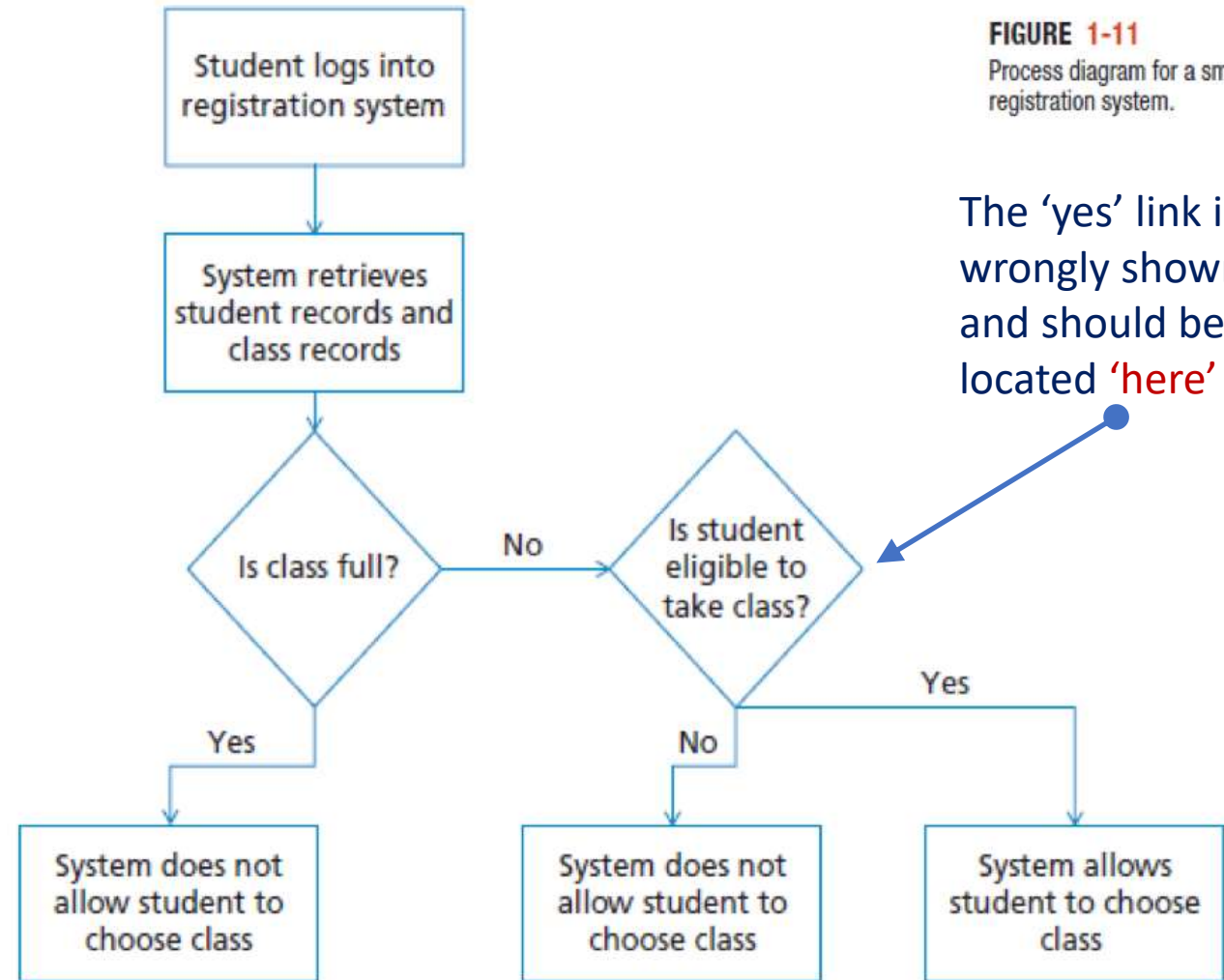
Business Process Policy

- Managers and administrators:
  - Develop policies that affect IS processes and the systems that enforce such policies

- A major policy strategy involves security and must:
  - Implement controlled rules for access rights and permissions
  - Set rules regarding password lifetime (e.g., it must be changed at regular and frequent intervals) and the format of passwords (e.g., not simple passwords but alpha-numeric with special characters)
  - Set rules regarding password sharing
  - Additionally, there will be security protocols to enforce secure customer behaviour

Process Design (1)

- BP design is influence by decisions made by people and decisions are influenced by how people view IS and BP improvements

- For example, consider a university student class registration system where students select courses from a list and enroll (if there are places available):

  - Notifying students of success (or failure) in registration may use a letter
  - Alternatively, the process may be automated with a pro-forma email sent to students (see Figure 1-10 on page 45 of Chapter #1)

- The automated approach:

  - Improves efficiency and may be appreciated by the university and staff
  - Students may find the automated approach impersonal and mechanical?

Student Registration System

- A process diagram for a smarter student registration system

- The flow diagram uses the internationally recognised syntax to show how the system functions and where decisions are made

FIGURE 1-11
Process diagram for a smarter registration system.

The 'yes' link is wrongly shown and should be located 'here'

Student logs into registration system

System retrieves student records and class records

Is class full? — No → Is student eligible to take class?

Is class full? — Yes → System does not allow student to choose class

Is student eligible to take class? — No → System does not allow student to choose class

Is student eligible to take class? — Yes → System allows student to choose class

Business Process Management (BPM)

- BPM focuses on designing, optimizing, and streamlining busines processes including the human element

- Systems analysts:
  - Study processes considering all stakeholders and suggest
  - Suggest strategies to leverage the power of IS(s)
  - Propose changes to steps implemented in IS(s)
  - Use many software systems designed to simulate business processes and carry out *what-if?* experiments to inform the analysis

- Management of business processes consider:
  - Control of data and employee access and manage data security
  - Control Internet access and the ability to copy data and information

Business Process Reviews

- BP reviews:

    - Are required regularly and frequently to address fast changing environments

    - Accommodate date protection and regulatory requirements

- There are many examples of organisational problems where:

    - Organisations have failed to keep the required records

    - Failed to address the required retention and access to (all) company records and communications (including email and manuscript notes)

- There are systems (discussed in later chapters) that provide:

    - Software to manage data storage and access as legally required

   - Provide a reporting structure

Data

Data

- Data is fundamental to an organisation and the IS

- In week #1 (T1) I have provided an overview of:
  - Data, information systems, the knowledge economy, and the processing of data including selection of data processed into information useful to the user

- Data is highly domain specific:
  - Consider the examples of data shown in Figure 1-12 (see the following slide)
  - The types of data and the domain are clear from the figure

- Verbal data (spoken language) is increasingly important (e.g.,):
  - Systems analyse voice patterns
  - Analyse customer vocal patterns to assess emotional stress (Figure 1-13 shows a readout of voice sound waves)

Figure 1-12

- Data is the raw ingredient for every information system

- The figure shows:
  - A range of domain specific data across systems in a digital format
 - The data can be used independently or in combination to provide useful information

CHAPTER 1 INFORMATION SYSTEMS AND *PEOPLE*

FIGURE **1-12**
Examples of data.
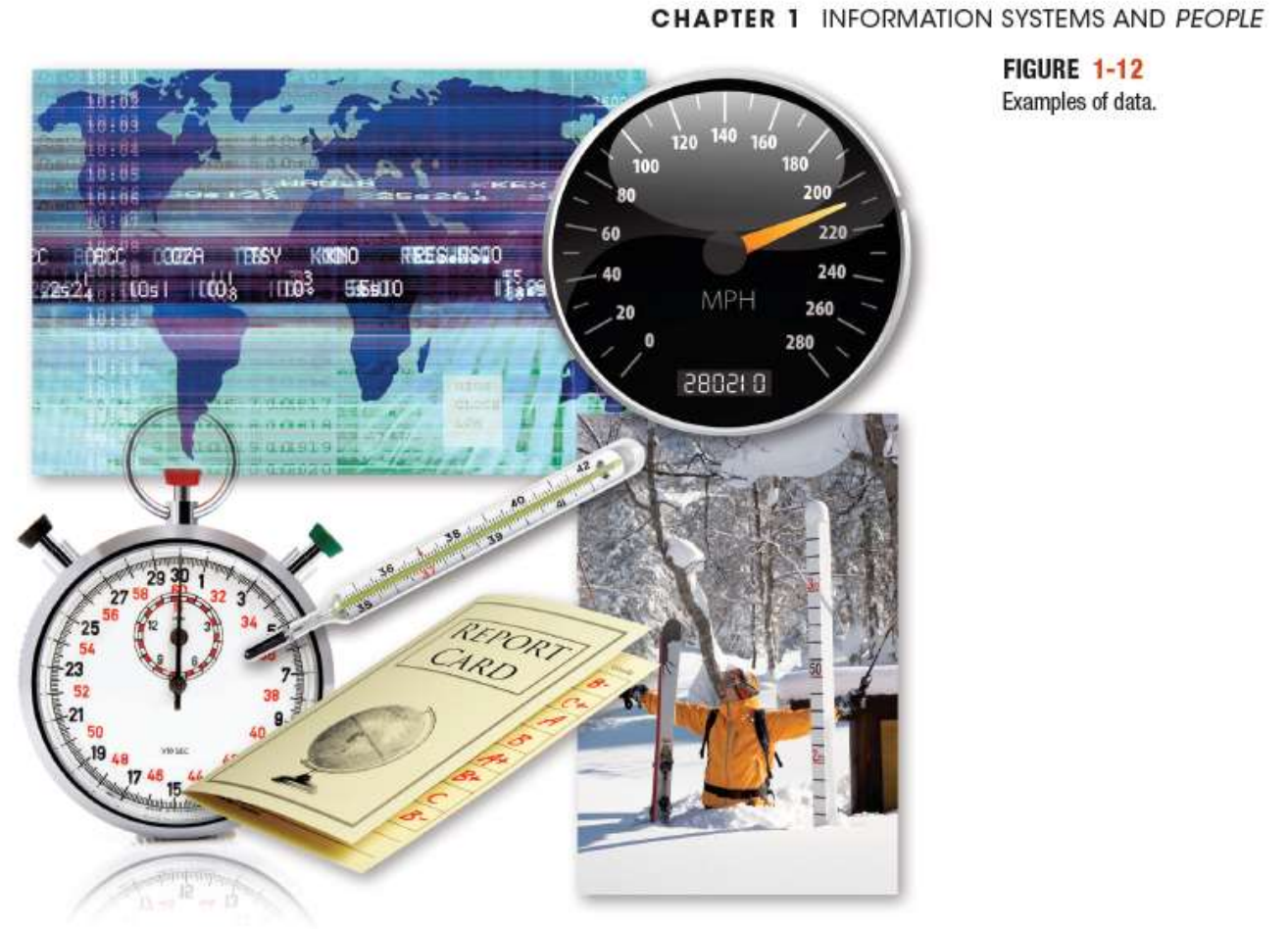
Information system design

Information Design Methodologies

- Essentially two approaches to IS design:
  - Hard Systems Methodology (HSM)
  - Soft Systems Methodology (SSM)
- HSM focuses on:
  - Component technology
  - Management systems
- SSM extends the HSM:
  - While HSM recognizes the technology and management systems
  - SSM considers the agents (people and groups of people) in an organization

Information Systems: Elements and Interactions
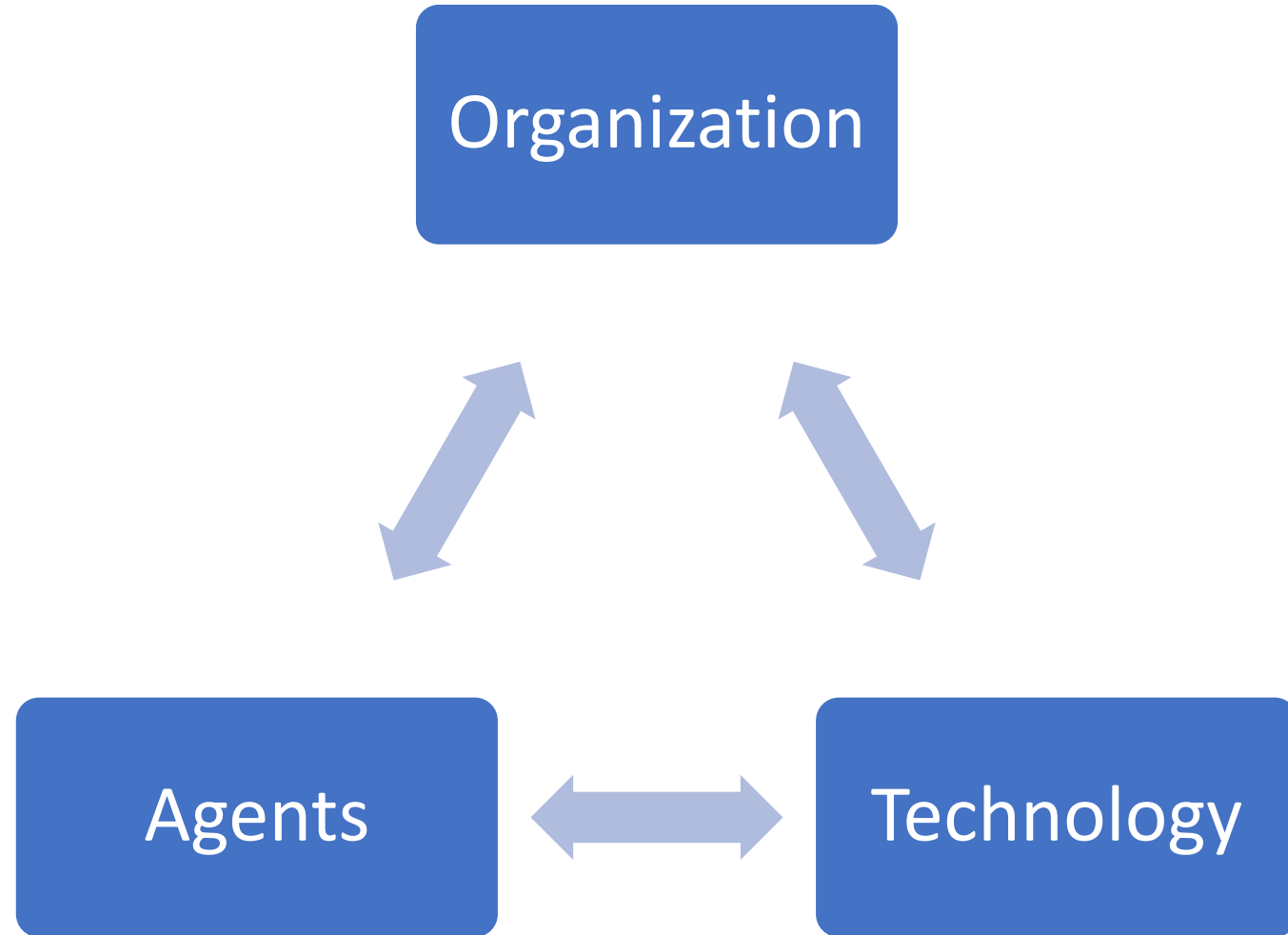
Belbin roles and Information system design

Belbin Team Roles and Information Systems Design

- ## Hard Systems Methodology (HSM)
  - While the HSS identifies *people*, it has as its focus a *technology*

- ## Soft Systems Methodology (SSM):
  - Incorporates both *technology* and *agents* (people)
  - Addresses relationships between individuals and groups working in organisations

- ## Belbin roles Identify behavioural traits and as such:
  - Form an important aspect in organisations
  - Successful accommodation of individual traits will improve corporate performance

Summary

- This section has provided set out a brief overview of:
  - Belbin roles
  - personality traits the characterize Belbin roles
  - The relationship of Belbin roles to information systems
  - The relationship of Belbin roles to information systems design
  - The *Myers-Briggs Type Indicator*

- Belbin has asserted that the *Team Roles* are not *exactly* equivalent to *personality types* but in operation in a team environment the team roles point to specific personality traits which impact how people operate in a team environment

- However: the *Myers-Briggs Type Indicator* is a psychometric instrument used to sort people into one of 16 personality types

Information systems: the discipline

Management Information Systems

- Information Systems address how people, technology, processes, and data interact and work together
  - This process is often classified as *Management Information Systems* (MIS):
  - MIS supports decision-making at the managerial level (as discussed in Chapter 7)
  - MIS is a research field investigated by *universities*, *private-sector analysts*, and *government researchers* which draws together:
    - *Academics*, *practitioners* from *business*, *computer science*, *psychology*, *sociology*, *public administration*, and related fields of study

- Research investigates:
  - How to create systems which can help organisation to achieve more with less resources
  - How to make companies more competitive and improve productivity
  - How to improve the lot of stakeholders in an organisation

Major Topics in MIS Research

Topic	Sample Research Questions
Development of information systems	What are the best ways to develop new software? How should end-users be involved in the development process?
IT in organizations	How should managers introduce change when new systems are implemented? What kinds of IT policies about "acceptable use" work best in different organizations?
IT and individuals	How should IT develop systems for the disabled? What kinds of interfaces are easiest for people to use?
IT and collaboration in groups	Why do virtual teams succeed or fail? How can managers use social networking to promote innovation?
IT and markets	How does the Internet affect the real estate business? How should businesses promote online sales?

FIGURE 1-14
Major research topics in MIS.

Management Information Systems

- MIS is a relatively young discipline:
  - It is being barely 30 years old and therefore developing rapidly with many published research papers

- In the early days few researched the impact of IT on markets
  - However, the Internet has changed the landscape with increased activity
  - The Internet provides potentially valuable opportunities to invent global marketplaces (e.g., Amazon)
  - Domains of interest include: *financial instruments* (stocks and commodities), *property* (real-estate), *music*, *books* (new and second hand), *rare antiquities*, and even *on-line dating websites*
  - How organisations build trust and make a profit in these e-marketplaces is a very hot research topic

Teamwork and Collaboration

- Research into IT and group collaboration is has developed into an important field of study
  - The interest in this field is driven by globalisation where team members are dispersed around the world
- The growing use of on-line tools:
  - Drives subtle change in the psychology of group dynamics
  - Such changes are not universally positive
  - Investigations of successful (and unsuccessful) teams have identified strategies used to promote successful virtual teams
  - Students may engage in virtual teamworking, this is especially the case for on-line learning
- Virtual teamwork and collaboration skills are critical

The Discipline

- The discipline addresses:

    - Development of IS with IT and ICT in organizations

    - IT with individuals and groups

    - IT and markets (sales and marketing)

- The people component in IS design and development:

    - This is particularly important and the level of importance is growing

    - Just making technology function fails to provide acceptable and intuitive solutions and systems

    - People form teams created with team members and specialist experts in particular fields and effective teamworking and collaboration is essential given the increasing size and complexity of current systems

    - The Belbin roles (discussed earlier) will be relevant in creating effective teams

Information systems throughout the organisation

Information Systems in Business

- In week #1 (T1) I observed:
  - "Information is power"
  - An IS provides the information required for organisations to function effectively as discussed in this lecture
- IS apply to all levels and roles within an organisation
- Whatever an employee role or function including:
  - Marketing, *finance*, *human resources*, *sales*, *manufacture*, and *entrepreneurship*
- Information systems are central to the effective carrying out of the role
- Information systems must provide the required information is a clear format to inform decisions (and reach rational decisions)
- Rational decision-making is central to effective management of processes and people

Information systems in non-profits and government

Introduction to Information Systems

Information Systems in Government

- Governments are increasingly using online services:
  - To disseminate (make public):
    - General information
    - Statutory and regulatory information
  - For service applications
  - For online communications
    - For example: applications for official documents such as a driving license
  - For public information services:
    - For example: information relating to the Covid-19 pandemic
- Such services:
  - Require back-end information systems with on-line networked access
  - Databases with *in-memory* and *persistent* data storage
  - Are increasingly using cloud-based systems

Information Systems in Non-Profit Organisations

- A nonprofit (or charity) requires:

  - Fundraising

  - Updating supporters with information on activities

  - Micro-volunteering

    - Systems to encourage volunteering

- A charity will also:

  - Implement relief operations

    - Requires back-end IS and related databases

- Charities operate in many areas of life and society:

  - For example: there are medical charities, charities which provide support for social campaigns, and military charities

Inside the IT department

The IT Department

- The function of an IT department is to provide ICT support throughout an organisation including support and maintenance for:
  - IT systems and database systems including security
  - Communication and email systems including the company website
  - Intranet and intranet (including an extranet) systems
  - Computer support for employees with a help desk
  - Networking systems including flexible home working
- IT departments may use:
  - In-house systems or externally procured systems (this is discussed in other chapters in this course)
- In the following figure 1-15 you will see a typical IT department organisational structure with Figures 1-16 and 1-17 describing staff roles and functions

Figure 1-15

- A sample organisational structure for an IT Department
  - This is a *hierarchical* management structure
  - An alternative is a *flat* management structure
  - The structure types are discussed in other chapters in this course
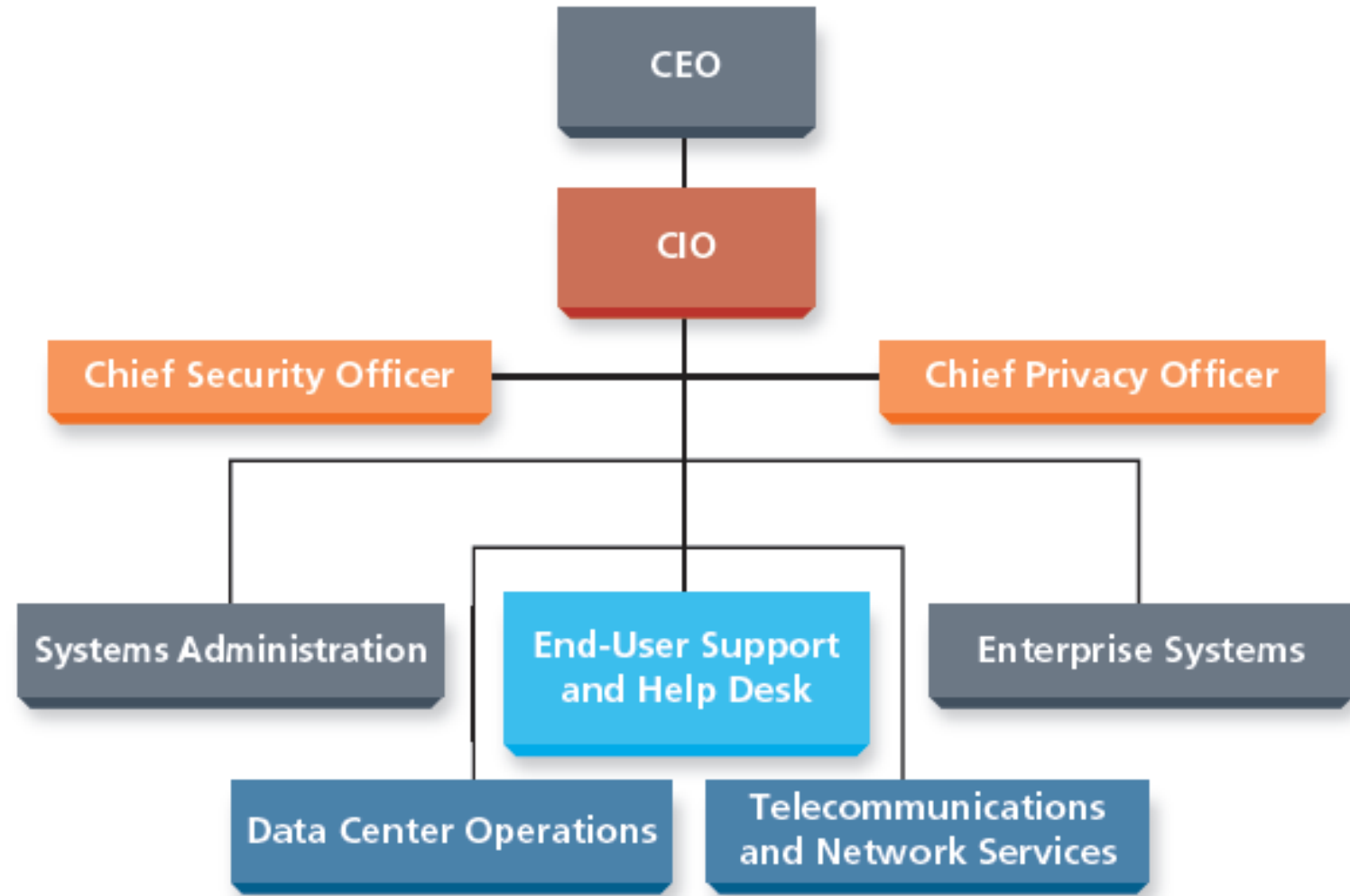
Figure 1-16

IS Department Areas	Function
Help Desk	Provides services to internal and external customers on technology issues; answers the phone or e-mail "help desk" and troubleshoots problems; installs and maintains desktop equipment.
Systems Administration	Installs, manages, and updates servers.
Operations	Maintains the environmentally controlled areas in which servers and communications equipment are located; handles backups and archiving.
Enterprise Systems and Applications	Develops, installs, maintains, and oversees the organization's mission-critical software applications.
Telecommunications and Network Services	Installs and manages communications technologies and networks, including voice, cell phones, and wireless networks.

Figure 1-17

Title	Description
Chief Information Security Officer	Oversees security, ensuring that confidential information is protected from hackers, disasters, accidents, and rogue employees.
Chief Privacy Officer	Manages privacy issues and helps shape policy about how sensitive and confidential data about customers, citizens, employees, patients, and others are handled and protected.
Chief Technology Officer	Position is usually more technical compared to the CIO, overseeing technology solutions and innovative uses.
Chief Knowledge Officer	Manages efforts to improve the organization's ability to capture, nurture, and disseminate knowledge and expertise.

Collaborating on information systems

Figure 1-18

- Collaboration is central to effective operation
  - Disconnection is not uncommon
  - The IT Department and other staff must collaborate on all levels
- Additionally:
  - The IT Department must be treated as an important area within an organisation
  - Often the IT Department has limited importance

For the CIO and IT Staff:

- *Focus on business goals.* The objective of a project is not to "upgrade all the servers," but to improve productivity, attract more customers, reduce costs, earn revenue, increase customer loyalty, reduce carbon emissions, etc.
- *Avoid jargon.* Learn to speak the language your colleagues in other departments understand, and reserve the technical jargon for internal IT communications.
- *Communicate the value of IT.* Although many focus on how much IT costs, the savings or revenue IT generates through improved productivity or added sales are captured in other departments.
- *Emphasize return on investment.* Evaluate projects in terms of their ultimate payoff, the same way business managers judge other kinds of initiatives.
- *Be proactive.* Propose and support innovative projects with clear business goals, rather than just react to problems and proposals as they arise. Ensure that people like Nikia know how to contact IT to discuss their innovative ideas.
- *Embrace customer service.* Strive for the highest level of customer satisfaction for your internal customers, not just the ones who buy your company's products and services.
- *Become a hybrid.* The most successful IT professionals have solid technology skills, but are also very well grounded in the business so they can easily communicate.

For People in Other Areas:

- *Describe your end goal, not the means to get there.* The more your IT colleagues understand what you want to accomplish, the better equipped they will be to help.
- *Learn how to contact IT for different purposes.* If you are not sure, ask.
- *Be familiar with how information systems are already supporting your organization.* Explore the company's intranet and review announcements about new initiatives.
- *Network.* Keeping in touch with your colleagues in and out of IT builds trust and creates networks of people who can share knowledge.
- *Do your homework.* Especially after taking this course, you will be prepared to research your ideas and the information system solutions others have attempted, so you are more familiar with what is possible.
- *Be an active partner.* As your project develops, keep in close touch with IT to provide timely assistance and feedback at every step. If you do not, the result may be quite different from what you expected.

Promises, perils, and ethical issues

Ethical Issues and Considerations

- Privacy:
  - Keeping personal data safe
  - Restricting the data captured and retained
- Trust
- Crisis management:
  - Managing data breach
  - Managing the 'fall-out' of a data breach
- Reputation:
  - Corporate responsibility
  - User (personal) responsibility

Privacy breaches and amplification effects

Privacy Breaches

- Privacy breaches present a significant risk and challenge affecting for example:
  - Commercial organisations
  - Governmental systems and non-profit organisations
  - Educational institutions
  - Military and security systems
- The damage caused may include:
  - Reputational damage
  - Financial implications and commercial damage
- As discussed in this course:
  - Addressing such issues is vital for all types of organisations
  - IS form a central in the management of privacy breaches for all stakeholders

Responsibility for Privacy Breaches

- Who is responsible? For privacy breaches and leaks of information?

  - Designers and developers of flawed information systems>

  - Users who fail to use effective security?

  - Companies who opt for *usability* over *security*

- The question:

  - Are users who suffer the affects of *phishing, vishing, spearphishing,* or *malicious software*:

    - *Responsible or their predicament* (caveat emptor: the principle that the buyer alone is responsible for checking the quality and suitability of goods before a purchase is made)?

    - *A victim of a poorly designed IT system*?

  - Such questions have no easy answers!

Chapter #1 Subjects and Topics Review

- Information systems in action:
  - Managing operations
  - Supporting customer interactions
  - Making decisions
  - Collaborating in teams
  - Gaining competitive advantage
  - Improving individual productivity
- The nature of information
  - What makes information valuable
- The components of an information system
  - People / technology / processes / data

- Information systems throughout the organisation
  - Information systems in business
  - Information systems in non-profit organisations (charities) and government
  - inside the IT department
  - Improving your own productivity
- Promises, perils, and ethical issues
  - Privacy breaches and amplification effects
- The ethical factor
  - Ethical issues surrounding information systems
- Chapter #1 case studies
  - The *Nasdaq* and *Twitter*

3/2/2021

Week #1 coursework

Introduction to Information Systems

Keywords and Concepts

- At the end of all the chapters you will find:
  - Essential keywords and phrases identifying concepts, subjects, and topics introduced
- It is important that you read and understand the concepts covered by the keywords and phrases
- Moreover: it is important to note:
  - The keywords and phrases have special meanings and general translations will not produce correct translations
  - It is important that general translation software (e.g., using a mobile phone) is not used to translate the keywords and phrases into Chinese!
  - The meanings are spelt out in the chapters!

Coursework

- At the end of the chapter you will find:
  - Chapter Review Questions
    - Work through the 8 questions
  - Project and Discussion Questions
    - Work through the 18 questions
  - Application Exercises
    - Work through the 2 exercises
- The subjects and topics introduced in the questions and exercises:
  - Are required to demonstrate an understanding of the subject and topics studied
  - Will be used in the individual and team assignments and the final examination

# Week #1 case studies

Case Studies

- At the end of the chapter you will find 2 case studies designed to illustrate the application of concepts introduced in Chapter #1:
  - The Nasdaq
  - Twitter
- Read and understand the case studies
- Apply the concepts introduced in Chapter #1 to understand how to apply them to practical 'real-world' use-cases

Nasdaq

- High frequency trading exchange
  - Speed of trading and reactions to market movements:
  - Benefits
  - Problems
- Public offering
  - Facebook

FIGURE 1-23
Flash crash on May 6, 2010.
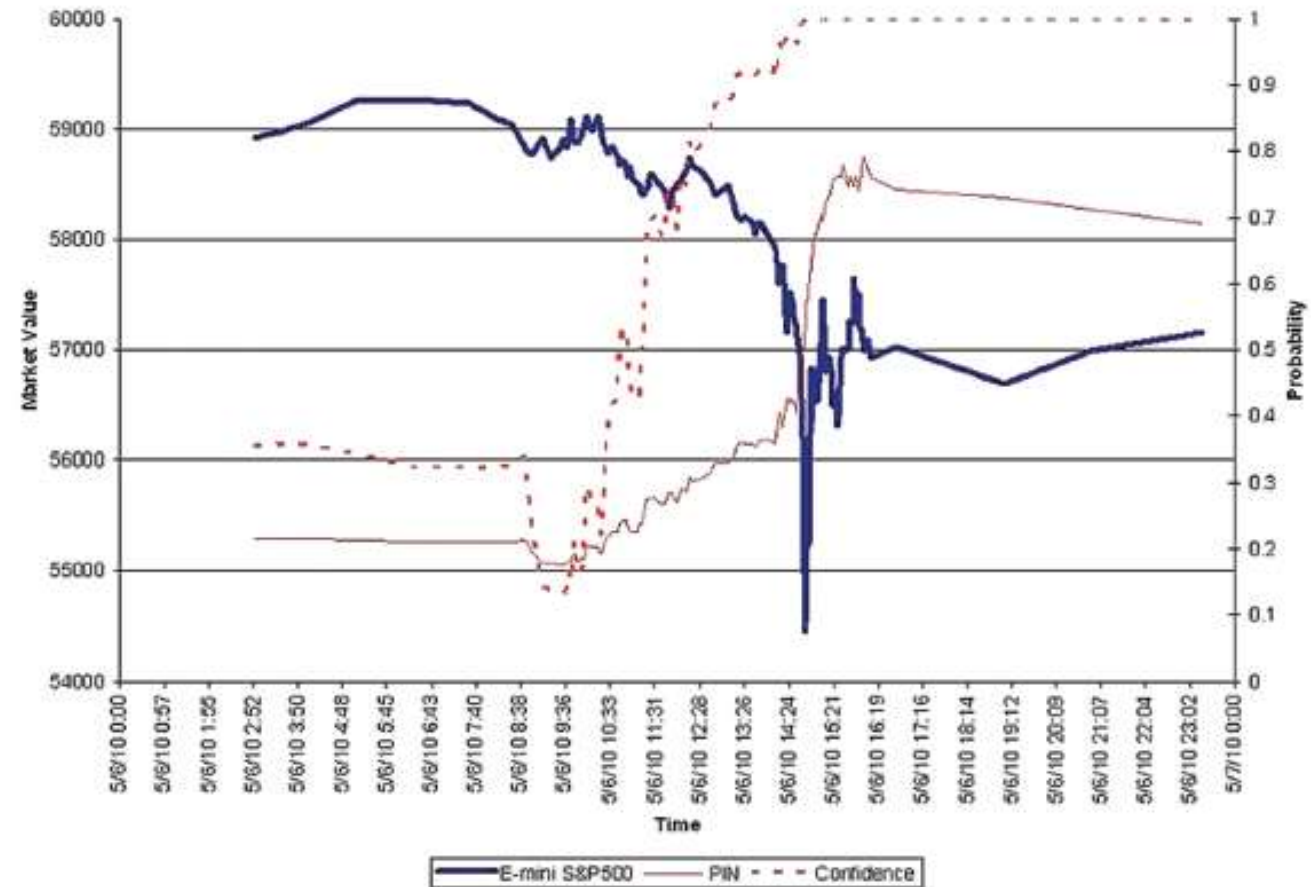
Twitter and Situational Awareness

- Emergency response:
    - Situational awareness

- Use and enhancements:
    - May cause inhibition
    - Legal issues

- Challenges:
    - Privacy issues
    - Disinformation
    - Promotes and reinforces one position

Twitter and Situational Awareness

FIGURE 1-24

Reformatting tweets to improve disaster response.

Original Tweet:

Sherline Birotte aka Memen. Last seen at 19 Ruelle Riviere College University of Porter a3 story schol building

Restructured Tweet:

#haiti #ruok Sherline Birotte aka Memen. Last seen #loc 19 Ruelle Riviere College University of Porter #info a 3 story schol building