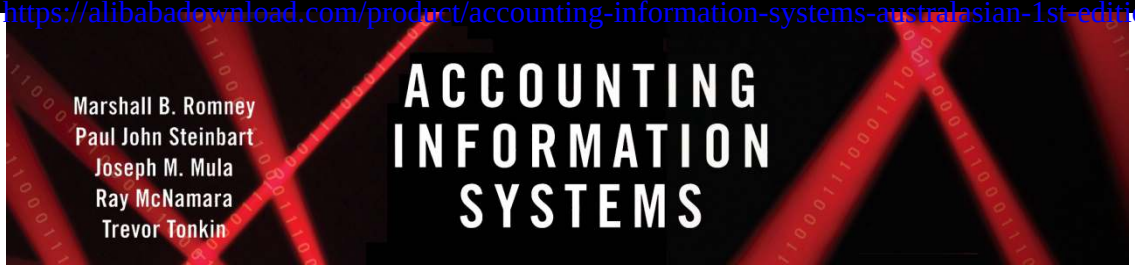

Chapter 1

Accounting information systems: Theoretical foundation and overview

Instructor's Manual

Learning Objectives:

1. Understand the theoretical foundation to accounting information systems (AISs).
2. Distinguish data from information, discuss the characteristics of useful information, and explain how to determine the value of information.
3. Explain what decisions an organisation makes and the information needed to make them.
4. Identify the information that passes between internal and external parties and an AIS.
5. Describe the major business processes present in most companies.
6. Explain what an AIS is and describe its basic functions.
7. Discuss how an AIS can add value to an organisation.
8. Explain how an AIS and corporate strategy affect each other.
9. Explain the role an AIS plays in a company's value chain.
10. Explain why accountants need to be knowledgeable about AISs.
11. Understand how ethics are important in AISs and how to analyse an ethical issue.

Learning Objective One

You should be able to understand the theoretical foundations to AIS.

Information systems exist because they are an integral part of a modern **organisation**.

The theory of the firm (Coase 1937) provides an explanation for the importance of accounting information systems. The argument may be summarised as follows:

1. The main reason why it is profitable to establish a firm is the huge cost in doing everything for oneself.

2. Firms are established because it is profitable to do so.

3. Firms organise to reduce transaction costs of repeated and complicated activities involved in creating, selling, and distributing goods and services.

4. Firms reduce costs of organising by entering into contracts

5. As a firm gets larger costs of organising additional transactions within a firm may rise.

6. As a firm grows, an entrepreneur fails to place resources in uses where their value is greatest; that is, fails to make the best use of resources available.

7. Firms compete with each other in the market for resources and customers.

8. The efficiency of the entrepreneurial decision-making is, in part, based on the relevance and efficiency of its information system.

9. The more efficient is management decision-making with respect to resource allocation within the firm, the lower its organising costs and the larger it can grow.

Agency Theory explanation for the role of Accounting Information systems in a firm:

1. The existence of a firm can lead to agency costs where ownership of a firm is separate from its management.

2. Owners want to extract maximum performance for minimum remuneration.

3. Manager/employees want maximum remuneration for minimum effort.

4. Owners will sensibly adjust a manager's remuneration downwards to compensate for their shirking and consumption of perquisites.

5. To maximise their remuneration, managers have incentives to write contracts, which constrain managers' actions.

6. Inclusive in managers' contracts will be a need for monitoring and this monitoring function is performed or supported by information systems.

7. The demand for information systems is also a function of contracting relationships between various principals (owners) and agents.

The KEY POINT is that the nature of agency relationships will determine the nature of the IS.

Drivers of Business and Information System Change

As an information system is the primary source of information for managerial decision-making, drivers of systems' changes are the same drivers of changes in the business itself as shown in **Figure 1.2** on **page 6**.

1. Globalisation – technology enables changes in the way we communicate, transport goods and services, and travel on a global scale. Information systems must adjust to this virtual business space so that appropriate collection, storage and processing of data can produce separate and consolidated reports for local and headquarter management decision-making. Firms also recognise the need and capability to use systems' costs as a way of reducing organising costs (see **Figure 1.1** on **page 5**).

2. Deregulation – legislators in Australia and other countries in Asia and South America have focused on the deregulation of their financial, labour and business markets. The effect is increased competition and the resultant need for companies to be more efficient both with their product markets and their information systems.

3. Advances in technology – the pace of change of technology is rapidly allowing greater communication and connectivity than ever before. The value of a network doubles with every new connection (Metcalfe's Law). The more interconnected people are, the more valuable the network. Moore's Law6 argues that chip density doubles every 18 months. However, there are no laws currently describing increases in storage capacity or increases in the speed of communication. In 2011, the placement in receivership of one of Australia's largest booksellers (Borders and Angus and Robertson) was initially attributed to the trend in buyers' habits to make their purchases over the internet rather than in shops. This is a classic example of technology enabling consumers to undertake transactions more cheaply via the web than through traditional corporations. Thus companies need to adapt and use information systems to be more efficient and reduce costs of transacting with customers. Social networking is the new frontier to which corporations must adapt.

4. Outsourcing and downsizing - outsourcing and downsizing are two organisational responses to business pressures. Almost all of Australia's communications and banking companies have outsourced their customer

relations to offshore call centres.

Multiple Choice 1

Firms organise to:

a. Provide management with an opportunity to increase self-esteem.
b. Act for the social good by increasing employment.
c. Reduce transaction costs of repeated and complicated activities involved in creating, selling, and distributing goods and services.
d. Provide customers with an easy and convenient way to make purchases.

Multiple Choice 2

Which of the following is a driver of business and information systems change?

a. Globalisation.
b. Global warming.
c. Advances in banking software.
d. Changes in leadership theories.

Learning Objective Two

Distinguish between data and information, discuss the characteristics of useful information, and explain how to determine the value of information.

Information is data that have been organised and processed to provide meaning to a user.

Data are facts that are collected, recorded, stored, and processed by an information system.

Systems, Data, and Information

Good design can be defined as the process of inventing objects or items that display a new physical order in response to function. Good design is the successful execution of the following three components of design:

1. Determine objectives (not always an easy task).

2. Determine what needs to be done to achieve those objectives.

3. Choose the 'best' components to execute the actions needed to achieve objectives.

These components of good design also need to be applied when designing non-physical things such as systems.

Systems

- A system is a set of two or more interrelated components that interact to achieve a goal.
- Systems are almost always composed of smaller subsystems.
- Each subsystem is designed to achieve one or more organisational goals.
- When the **Systems Concept** is used in systems development, changes in subsystems cannot be made without considering the effect on other subsystems and the system as a whole.
- **Goal Conflict** occurs when a decision or action of a subsystem is inconsistent with another subsystem or the system as a whole. **Goal Congruence** is achieved when a subsystem achieves its goals while contributing to the organisation's overall goal.
- The systems concept also encourages integration, which is eliminating duplicate recording, storage, reporting, and other processing activities in an organisation.

Data

Data are facts that are collected, recorded, stored, and processed by an information system.

Several kinds of data need to be collected in businesses, such as:

1. Facts about the activities that take place.
2. The resources affected by the activities.
3. The people who participate in the activity.

Information

- Information is data that have been organised and processed to provide meaning to a user.
- There are limits to the amount of information the human mind can effectively absorb and process.
- **Information Overload** occurs when those limits are passed.
- When you get more information than you can effectively assimilate, you suffer from information overload for example final exams week!
- When you've reached the overload point, the quality of decisions declines while the costs of producing the information increases.

- The value of information is the benefit produced by the information minus the cost of producing it.

A good example of the value of information is provided on **page 8** for the **7-Eleven shops in Japan**. Each shop uses information for:

1. Keeping track of the 3,000 items sold in each shop and determining what products are moving, at what time of the day, and under what weather conditions.

2. Keeping track of customers (what and when they buy). If their best customers are single men, for example, the shop makes sure it has the fresh rice dishes they purchase on their lunch hour and at the end of the workday.

3. Ordering sandwiches and rice dishes from suppliers automatically. Orders are placed and filled three times a day so shops can always have fresh food. Because food orders take as many as 12 hours to prepare, 7-Eleven allows its suppliers to access sales data in their computers so they can forecast demand.

4. Coordinating deliveries with suppliers. This allows the shops to reduce the number of deliveries from 34 to 12 a day, resulting in less clerical receiving time.

5. Preparing a colour graphic display that indicates which shop areas contribute the most to sales and profits.

Table 1.1 on **page 9** provides ten characteristics that make information useful and meaningful for decision-making.

1. Relevant - reduces uncertainty, improves decision-making, or confirms or corrects prior expectations.

2. Reliable - free from error or bias; accurately represents organisation events or activities.

3. Existence - the transactions, assets, obligations and equity generated in the system exist.

4. Valid - only those transactions and reports that are authorised by the firm should be processed.

5. Complete - does not omit important aspects of the events or activities it measures.

6. Timely - provided in time for decision-makers to make decisions.

7. Measurable transactions, assets, liabilities, and equities processed in the system are measured accurately.

8. Understandable - presented in a useful and intelligible format.

9. Verifiable - two independent, knowledgeable people can produce the same information.

10. Accessible - available to users when they need it and in a format they can use.

These characteristics come from two sources from the Statement of Financial Accounting Concepts No. 8 of the Conceptual Framework for Financial Reporting, which can be downloaded from:

http://www.fasb.org/cs/BlobServer?blobkey=id&blobwhere=1175822892635&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs

and from the audit assertions intrinsic in financial information.

These characteristics are particularly important when building control systems. A designer on an information system and the manager of an organisation should ask themselves, what in my system insures that these characteristics are present in all information processed.

Multiple Choice 3

Data differ from information in which way?

a. Data are output and information is input.
b. Information is output and data are input.
c. Data are meaningful bits of information.
d. There is no difference.

Multiple Choice 4

Which of the following is not a characteristic that makes information useful?

a. It is reliable.
b. It is timely.
c. It is inexpensive.
d. It is relevant.

Learning Objective Three

Explain what decisions an organisation makes and the information needed to make them.

Key Decisions and Information Needs

Using S&S case we can use business processes to delineate the key decisions that will need to be made within each process and determining those decisions, ascertaining what information will be needed to reach those decisions. **Table 1.2**, **page 10**, is an excellent example of the variety of information needed, the processes they relate to and the key decisions needed in the business.

The case will help students to understand that before collecting data and processing it into information the decisions that management and other external users will be making need to be known first. Only after this is known can we begin designing and using the AIS to capture, collect, and process the correct data as needed by decision makers.

Multiple Choice 5

Which of the following is not a means by which information improves decision-making?

a. Increasing information overload.
b. Reducing uncertainty.
c. Providing feedback about the effectiveness of prior decisions.
d. Identifying situations requiring management action.

Learning Objectives Four and Five

Identify the information that passes between internal and external parties and an AIS.
Describe the major business processes present in most companies.

Reorganise Business Processes

Taking the list of business processes from S&S it is easier to group them into categories that almost every organisation has. These are:

1. **The Revenue Cycle**—goods and services are sold for cash or future promise to receive cash (Accounts Receivable).

2. **The Expenditure Cycle**—purchase of inventory for resale or raw materials for use in production in exchange for cash or a promise to pay cash in the future (Accounts payable).

3. **The Production or Conversion Cycle**—raw materials are converted into finished goods.

4. **The Human Resource/Payroll Cycle**—employees are hired, trained, compensated, evaluated, promoted, and terminated.

5. **The Financing Cycle**—how companies acquire capital by selling shares or borrowing money and where investors are paid dividends or interest.

6. **General ledger and Reporting Cycle**—data processed through the other cycles is brought together and classified to provide useful information for decision-making.

For each of these processes there is a basic give-get relationship that is called **transaction processing**. **Figure 1.5** on **page 12** provides a description of the basic give-get exchanges.

1. Revenue Cycle—give goods, get cash or A/R
2. Expenditure Cycle—give cash or A/P, get goods or raw materials
3. Production Cycle—give labour and raw materials, get finished goods
4. Human Resource—give cash, get labour
5. Financing Cycle—give cash, get cash

The figure also shows the relationship between these cycles and the general ledger and reporting system function. **Figure 1.6** on **pages 14 and 15** shows the details of each cycle with the last activity in each cycle is the sending of information to other cycles.

Multiple Choice 6

Which transaction cycle includes interactions between an organisation and its suppliers?
a. Revenue cycle
b. Expenditure cycle
c. Human resources/payroll cycle
d. General ledger and reporting system

Multiple Choice 7

In which cycle does a company ship goods to customers?
a. Production cycle
b. Financing cycle
c. Revenue cycle
d. Expenditure cycle

Learning Objective Six

Explain what an accounting information system (AIS) is and describe its basic functions.

What Is an Accounting Information System?

An **Accounting Information System (AIS)** is a system that collects, records, stores, and processes data to produce information for decision makers. It is the intelligence—the information-providing vehicle for the language of business.

This is illustrated in **Figure 1.8** on **page 16**.

Another definition that is not in the book: "An accounting information system is a unified structure within an entity, such as a business firm, that employs physical resources and other components to transform economic data into accounting information, with the purpose of satisfying the information needs of a variety of users. It is an organisation's primary information system.

Six components of an Accounting Information System:

1. The **people** who operate the system and perform various functions.

2. The **procedures and instructions**, both manual and automated, involved in collecting, processing, and storing data about the organisation's activities.

3. The **data** about an organisation and its business processes.

4. The **software** used to process data.

5. The **information technology infrastructure**, including computers, external devices (e.g. printers, external hard drives), and network communications devices used in an AIS to collect, store, process, and transmit data and information.

6. The **internal controls** and **security measures** that safeguard AIS data.

These six components enable an Accounting Information System to fulfil **three important business functions**:

1. **Collect and store data** about organisational activities, resources, and personnel—organisations have a number of business processes, such as making a sale or purchasing raw materials, which are repeated frequently.

2. **Transform data** so management can plan, execute, control and evaluate activities, resources and personnel.

3. **Provide adequate controls** to safeguard the organisation's assets and data, to ensure that the assets and data are available when needed and data are accurate and reliable.

Multiple Choice 8

Which of the following is a function of AIS?
a. Reducing the need to identify a strategy and strategic position.
b. Transforming data into useful information.
c. Allocating organisational resources.
d. Automating all decision-making.

Learning Objective Seven

Discuss how an AIS can add value to an organisation.

How an AIS Can Add Value to an Organisation

1. **Improving the quality and reducing the costs** of products or services by providing timely feedback on performance.

2. **Improving efficiency** by providing relevant, accurate and up-to-date information on a timely basis.

3. **Sharing knowledge and expertise** can improve operations and provide a competitive advantage.

4. Improving the efficiency and effectiveness of its supply chain by integrating internal systems with those of suppliers.

5. **Improving the internal control structure** to protect against fraud, errors, system failures, and disasters.

6. **Improving decision-making** through assistance in each stage of the decision-making process.

AIS and Decision-making

An AIS can help improve decision-making in several ways:

- It can identify situations requiring management action.

- It can reduce uncertainty and thereby provide a basis for choosing among alternative actions.

- It can store information about results of previous decisions, which provides valuable feedback that can be used to improve future decisions.

- It can provide accurate information in a timely manner.

- It analyses sales data to discover items that are purchased together, and it uses such information to improve the layout of merchandise to encourage additional sales of related items.

Learning Objective Eight

Explain how an AIS and corporate strategy affect each other.

The AIS and Corporate Strategy

Information Technology and Business Strategy

Figure 1.9 on **page 18** shows how IT developments can affect business strategy and should be viewed in conjunction with **Figure 1.2** on **page 6**.

For example, the internet has profoundly affected ways many activities are performed, significantly affecting both strategy and strategic positioning. The internet dramatically cuts costs, thereby helping companies to implement a low-cost strategy.

The internet makes a company's products available almost anywhere.

Another technological advance is **predictive analysis**, which uses data warehouses and complex algorithms to forecast future events.

An organisation's AIS plays an important role in helping it adopt and maintain a strategic position.

Multiple Choice 9

An AIS can provide support to:

a. The value chain of a company.
b. Aid in corporate decision-making.
c. Promote the organisational strategy.
d. All of the above.

Learning Objective Nine

Explain the role an AIS plays in a company's value chain.

The Role of the AIS in the Value Chain

The objective of most corporations is to provide value to their customers.

Figure 1.10 on **page 19** shows the five primary activities that form an organisation's ***value chain***.

1. **Inbound logistics** consists of receiving, storing, and distributing the materials an organisation uses to create the services and products it sells.

2. **Operations activities** transform inputs into final products or services.

3. **Outbound logistics** activities distribute finished products or services to customers.

4. **Marketing and sales** activities help customers buy the organisation's products or services.

5. **Service activities** provide post-sale support to customers.

Four categories of ***Support activities*** allow the five primary activities to be performed efficiently and effectively.

1. **Firm infrastructure** is the accounting, finance, legal and general administration activities that allow an organisation to function.

2. **Human resources activities** include recruiting, hiring, training, and providing employee benefits and compensation.

3. **Technology activities** improve a product or service.

4. **Purchasing activities** procure raw materials, supplies, machinery, and the buildings used to carry out the primary activities.

Using IT to redesign **supply chain systems** yields tremendous benefits and cost savings. **Figure 1.11** on **page 20** shows the sequential elements of the Supply Chain:

1. Raw Materials Supplier

2. Manufacturer

3. Distributor

4. Retailer

5. Consumer

Multiple Choice 10

Which of the following is a primary activity in the value chain?
a. Purchasing
b. Accounting

c. Marketing and sales
d. Human resource management

Learning Objective Ten

Explain why accountants need to be knowledgeable about AISs.

Why study accounting information systems?

AIS knowledge and skills are critical to an accountant's career success.
The accountant must:

1 Interact with the AIS as part of their normal activities.

2. Design and be responsible for the internal control activities of the organisation.

3. Be responsible for recommending improvement in business processes based on the analysis of information generated by the AIS.

4. As an auditor you need to be able to evaluate the accuracy and reliability of information produced from an AIS.

5. Understand how a system is developed, how it operates and how you can instigate controls.

6. Understand that an organisation's AIS may be vulnerable to attack from inside and outside of the firm as companies become more "virtual" due to the effects of globalisation and competition.

All accounting bodies in Australia, New Zealand and Asia require the inclusion of information systems design, development and applications in accredited accounting degrees. Some bodies make it compulsory where others recommend the AIS area to be included.

Learning Objective Eleven

Understand how ethics are important in AISs and how to analyse an ethical issue.

Ethics in accounting and information systems

Fraud and corruption is mainly perpetrated by employees, 'knowledgeable insiders' who know the systems and controls in their organisation and see an opportunity to embezzle assets of their company.

Enron and WorldCom Parmalat, HIH and Clive Peeters are examples of fraudulent corporate behaviour some of which used earnings management to mislead shareholders and stakeholders.

The ASX Corporate Governance Guidelines recommend that Companies should establish a code of conduct and disclose the code or a summary (see http://www.asx.com.au/governance/corporate-governance.htm). Companies that are part of the ASX 300 index are required to comply with the ASX guidelines or provide reasons for their failure to comply.

Accountants are expected to maintain high ethical standards with Codes of Conduct developed by the CPAA <www.cpaaustralia.com.au>, ICAA, <www.charteredaccountants.com.au>, IPA <www.publicaccountants.org.au> and CIMA <www.cimaglobal.com/Our-locations/Australia>.

Table 1.3 on **page 24** provides a template to guide decision-making when confronted by an ethical issue.

The proliferation of computers and information systems are creating ethical dilemmas. There are moral choices to be made by staff in relation to data that is gathered from customers and suppliers as well as employees. These revolve around issues of control and access to private and confidential data, and the misuse of data stored in large databases and data warehouses.

Another issue that comes with the proliferation of computers in the work environment is the private use of computers and computer power including the access of "restricted sites". Forward-looking organisations have developed computer usage guidelines that not only specify rules for the use of computers but also for corporate email.

Emails themselves present significant security issues particularly as it is the habit of most email users to forward the email history with an email. This is often the source for sensitive information going outside the organisation.

ANSWERS to Multiple Choice Questions:

Multiple Choice Number	Multiple Choice Answer
1	C
2	A
3	B
4	C
5	A
6	B
7	A
8	B
9	D
10	C

References Used:

1. Michael E. Porter and Victor E. Millar, "How Information Gives You Competitive Advantage" Harvard Business Review, (July-August 1985), pp. 149-160.
2. Michael E. Porter, "What Is Strategy?" Harvard Business Review (November-December 1996), pp. 61-78.
3. Statement of Financial Accounting Concepts No. 8 of the Conceptual Framework for Financial Reporting, which can be downloaded from http://www.fasb.org/cs/BlobServer?blobkey=id&blobwhere=1175822892635&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs

Answer to Chapter quiz:

Number	Answer	Number	Answer
Q1.1	B	Q1.6	B
Q1.2	C	Q1.7	C
Q1.3	A	Q1.8	B
Q1.4	B	Q1.9	C
Q1.5	A	Q1.10	C

SUGGESTED ANSWER TO ETHICAL ISSUE

Gavin Finlay is preparing the income tax return of a client who has earned more income than expected. On 2 July, the client pays for advertising and asks Finlay to backdate the expense to the preceding financial year, which ends on 30 June. Backdating the deduction would lower the client's immediate tax payments. After all, there is a difference of only two days between 2 July and 30 June. This client is important to Finlay. What should he do?

Use the stakeholder analysis framework described in this chapter to analyse the ethical dilemma you identify and arrive at an ethical decision.

Ethical issue – note: students' responses may vary	
Question to ask	**Decision**
1. What is the ethical issue?	1. Recognise the ethical issue or dilemma • The client is asking you to be part of a deception (to knowingly lie about a transaction. • The consequences are that the result is an avoidance of income tax. • If discovered it will have serious reputational effects. • It may have implications for you future dealings with your client for future transaction. • But you do not know if the client is on an accrual basis for taxation purposes (the case would imply not) and whether the advertise payment relates to an expense incurred in the prior period or the new tax year. • The client is important to you.
2. What are the principle elements in this situation?	2. Move towards an ethical resolution by answering these questions in sequence
a. What parties (stakeholders) may be harmed?	• Client Gavin Finlay. • The commissioner for Taxation. • Yourself as a part to a fraudulent transaction. • The accounting profession by virtue of one of their members acting unethically.
b. Whose rights or claims may be violated?	• The Taxation Department. • The client Gavin Finlay. • Your rights as an accountant not being compromised by the client. • The profession who has a vested interest in not having their member harm the reputation of the profession. • Your ability to keep your client and therefore income.
c. Which specific interests are in conflict?	• You have a professional obligation to advise your client according to ethical standards set by the accounting professions and the Taxation Act. • You also have a responsibility to look after your family and earn sufficient income to stay in business. • Your client long-term vs. short-term costs may be in conflict owing to the excessive penalties that may be levied if this deception is detected (penalty can be the amount of tax again plus 20% per annum non-tax deductible).

d. What are your responsibilities and obligations?	• Based on the professional ethics standards you must act in the best interests of the profession and not concede to the request of Gavin Finlay. • You have an obligation under the taxation act as an agent to act honestly. • You also have a duty of care to act in the interest of your client taking long-term and short-term costs into consideration and the ease with which this deception can be identified.
3. What are your options and what are the consequences?	3. Specify alternatives and weigh up impacts of each on various stakeholders. **- Alternatives** a. Backdate the transactions in the accounts. b. Tell Gavin Finlay you cannot backdate a transaction but you can process any transactions he has recorded and presented to you. c. Tell Gavin Finlay that you cannot backdate a transaction and thereby knowingly be party to tax avoidance. **- Impact of alternative on stakeholders** a. Major negative impact on Gavin Finlay is that be receives what must be a modest reduction in taxation at the risk of a significant fine if discovered; a major impact on you as the agent if you have knowingly taken part in falsifying documents your licence as a tax agent, you may be disciplined by the profession; and finally you may bring the profession into dispute. b. Ethically, you cannot pretend that you do not know something once you know it and that you are immune to the consequences that have been detailed in part a. In addition, of detected, the client will likely tell the Tax Department that they acted with your knowledge and consent. c. The major impact of alternative c is that you may loose the client who is of significant value to you. However, this is likely to be the case anyway if he your value to him is solely as a preparer of taxes. Acting ethically also ensures that you will not be asked to be party of a more significant violation later.
4. What shall I do?	4. Select the best or most ethical alternative considering all the circumstances and consequences. • Alternative 3c is the best and most ethical alternative • Placing the pros and cons from the client's perspective may cause the client to retain your services.

Suggested Answers to Discussion Questions

D1.1 The value of information is the difference between the benefits realised from using that information and the costs of producing it. Would you, or any organisation, ever produce information if its expected costs exceeded its benefits? If so, provide some examples. If not, why not?

Most organisations produce information only if its value exceeds its cost. However, there are three situations where information may be produced even if its cost exceeds its value.

a. It is often difficult to estimate accurately the value of information and the cost of producing it. Therefore, organisations may produce information that they expect will produce benefits in excess of its costs, only to be disappointed after the fact.
b. Production of the information may be mandated by either a government agency or a private organisation. Examples include the tax reports required by the ATO and disclosure requirements for financial reporting.
c. When decision-makers operate in an uncertain environment where they do not have a decision model to guide their processes, they tend to request more and more information. This information may not be of value but the uncertainty drives them to request more and more information. A good example is the retail industry. Bar codes, scanning technologies, and computerised systems allow buyers to get sales information down to the product level on a daily basis. Buyers often ask for this information when what they really needed was the trends and analysis that becomes meaningful after weeks or months. Daily data of this type can serve little purpose.

D1.2 Can the characteristics of useful information listed in **Table 1.1** on **page 9** be met simultaneously? Or does achieving one mean sacrificing another?

Several of the criteria in **Table 1.1** on **page 9** can be met simultaneously. For example, more timely information is also likely to be more relevant. Verifiable information is likely to be more reliable.

However, achieving one objective may require sacrificing another. For example, ensuring that information is more complete may reduce its timeliness. Similarly, increased verifiability and reliability may reduce its timeliness.

The decision maker must decide which trade-offs are warranted in a given situation.

D1.3 You and a few of your classmates decided to become entrepreneurs. You came up with a great idea for a new mobile phone application that you think will make lots of money. Your business plan won second place in a local competition, and you are using the $10,000 prize to support yourselves as you start your company.

a. Identify the key decisions you need to make to be successful entrepreneurs, the information you need to make them, and the business processes you will need to engage in.
b. Your company will need to exchange information with various external parties. Identify the external parties, and specify the information received from and sent to each of them.

The author turns this question into an in-class group activity. Students are divided up in groups, told to close their books, and given 15 minutes to:

a. Think through the business processes, key decisions, and information needs issues in their group.

b. Identify the external users of information and specify the information received from and sent to each of them.

One group is selected to present their answers to the class. The other groups are told to challenge the group's answers, provide alternative answers, and chip in with additional answers not provided by the selected group. Since the group that presents is not selected until after the time has expired, students are motivated to do a good job, as they will be presenting to their peers.

The value of this activity is not in arriving at a "right answer" as there are many right answers and student answers will vary. Instead, it is in thinking through the issues presented in Table 1.2 (business processes, key decisions, and information needs) and Figure 1.3 (interactions with external parties). Student answers should contain many of the things in Table 1.2 and Figure 1.3 as well as others not shown, as retail operation differs from an application development enterprise.

The author concludes the exercise by having the students turn to Table 1.2 and Figure 1.3 while he emphasises the need for owners, managers, and employees of organisations to identify the information needed to make key decisions in the company's business processes and the key information interchanges with external parties. All of the data needed to produce this information must be entered into the AIS, processed, stored, protected, and made available to the appropriate users.

While this active learning activity takes more time than a lecture does, it drives the point home much better than a lecture would. It also keeps the students more engaged in the material.

D1.4 How do an organisation's business processes and lines of business affect the design of its AIS? Give several examples of how differences among organisations are reflected in their AIS.

An organisation's AIS must reflect its business processes and its line of business. For example:

- Manufacturing companies will need a set of procedures and documents for the production cycle; non-manufacturing companies do not.
- Government agencies need procedures to track separately all inflows and outflows from various funds, to ensure that legal requirements about the use of specific funds are followed.
- Financial institutions do not need extensive inventory control systems.
- Passenger service companies (e.g. airlines, bus, and trains) generally receive payments in advance of providing services. Therefore, extensive billing and accounts receivable procedures are not needed; instead, they must develop procedures to account for prepaid revenue.
- Construction firms typically receive payments at regular intervals, based on the percentage of work completed. Thus, their revenue cycles must be designed to track carefully all work performed and the amount of work remaining to be done.

- Service companies (e.g. public accounting and law firms) do not sell physical goods and, therefore, do not need inventory control systems. They must develop and maintain detailed records of the work performed for each customer to provide backup for the amounts billed. Tracking individual employee time is especially important for these firms because labour is the major cost component.

D1.5 Figure 1.9 shows that organisational culture and the design of an AIS influence one another. What does this imply about the degree to which an innovative system developed by one company can be transferred to another company?

Since people are one of the basic components of any system, it will always be difficult to transfer successfully a specific information systems design intact to another organisation. Considering in advance how aspects of the new organisational culture are likely to affect acceptance of the system can increase the chances for successful transfer. Doing so, may enable the organisation to take steps to mitigate likely causes of resistance. The design of AIS, however, itself can influence and change an organisation's culture and philosophy. Therefore, with adequate top management support, implementation of new AIS can be used as a vehicle to change an organisation. The reciprocal effects of technology and organisational culture on one another, however, mean that it is unrealistic to expect that the introduction of a new AIS will produce the same results observed in another organisation.

D1.6 Figure 1.9 shows that developments in IT affect both an organisation's strategy and the design of its AIS. How can a company determine whether it is spending too much, too little, or just enough on IT?

There is no easy answer to this question. Although a company can try to identify the benefits of a new IT initiative and compare those benefits to the associated costs, this is often easier said than done. Usually, it is difficult to measure precisely the benefits of new uses of IT. Nevertheless, companies should gather as much data as possible about changes in market share, sales trends, cost reductions, and other results that can plausibly be associated with an IT initiative and that were predicted in the planning process.

D1.7 Apply the value chain concept to S&S. Explain how it would perform the various primary and support activities.

The value chain classifies business activities into two categories: primary and support.

The five primary activities at S&S:

1. Inbound logistics includes all processes involved in ordering, receiving, and temporarily storing merchandise that is going to be sold to S&S customers.
2. S&S does not manufacture any goods, thus its operations activities consists of displaying merchandise for sale and protecting it from theft.
3. Outbound logistics includes delivering the products to the customer.
4. Sales & marketing includes ringing up and processing all sales transactions and advertising products to increase sales.
5. Service includes repairs, periodic maintenance, and all other post-sales

services offered to customers.

The four support activities at S&S:

1. Firm infrastructure includes the accounting, finance, legal, and general administration functions required to start and maintain a business.
2. Human resource management includes recruiting, hiring, training, evaluating, compensating, and dismissing employees.
3. Technology includes all investments in computer technology and various input/output devices, such as point-of-sale scanners. It also includes all support activities for the technology.
4. Purchasing includes all processes involved in identifying and selecting vendors to supply goods and negotiating the best prices, terms, and support from those suppliers.

D1.8 Information technology enables organisations to easily collect large amounts of information about employees. Discuss the following issues:

These questions involve traditional economic cost/benefit issues and less well-defined ethical issues.

Useful websites include:
Australian legislation:
http://www.austlii.edu.au/au/legis/cth/consol_act/ca1968133/
Copyright Legislation:
http://www.austlii.edu.au/au/legis/cth/consol_act/tma1995121/
Competition and Consumer Act:
http://www.austlii.edu.au/au/legis/cth/consol_act/tma1995121/
Spam Act 2003:
http://www.austlii.edu.au/au/legis/cth/consol_act/sa200366/
Wrongs Act 1958 (Vic) see Part 1 Criminal Defamation
http://www.austlii.edu.au/au/legis/vic/consol_act/wa1958111/
Classification (Publications, Films and Computer Games (Enforcement) Vic 1995
http://www.austlii.edu.au/au/legis/vic/consol_act/cfacga1995596/
Crimes Act 1958 (Victoria) - Division 11 Incitement, ss.321G-321L, re incitement to commit an offence)
http://www.austlii.edu.au/au/legis/vic/consol_act/ca195882/
Autonomous Sanctions Act (2011) (Commonwealth)
http://www.austlii.edu.au/au/legis/cth/num_act/asa2011270/
Crimes Act 1958 (Victoria) (see Division 11 Incitement, ss.321G-321L, re incitement to commit an offence)
http://www.austlii.edu.au/au/legis/vic/consol_act/ca195882/
Autonomous Sanctions Act (2011) (Commonwealth
http://www.austlii.edu.au/au/legis/cth/num_act/asa2011270/

a. To what extent should management monitor employees' email?

Generally, the courts have held that organisations have the right to monitor employees' email. Such monitoring can have disastrous effects on employee morale, however. On the other hand, it might provide legitimate information about group members' individual contributions and productivity. Most organisations now have an information and technology policy that specifies the rights and obligations of employees. Such a policy lays clear ground rules for all aspects of IT including emails.

b. To what extent should management monitor which Web sites employees visit?

   Students are likely to argue whether or not this should be done. One potential benefit that could be argued is the likelihood that if employees are aware that they will be monitored they will be less prone to surf the Web for non-work-related uses. However, firms are responsible for the actions of their employees. Accessing pornographic sites, exchanging child pornography, accessing sites with aims against Australian Interest (e.g. radical religious sites) can result in serious reputational and possible criminal damage to the firm.

c. To what extent should management monitor employee performance by, for example, using software to track keystrokes per hour or some other unit of time? If such information is collected, how should it be used?

   Arguments pro and con can be generated about the effects of such monitoring on performance and on morale. Clearly, the specifics of any incentive schemes tied to such metrics are important.

d. Should companies use software to electronically "shred" all traces of email?

   Arguments can be raised on both sides of this issue. Try to get students to go beyond the legal ramifications of recent news stories and to explore the ethical implications of destroying different kinds of email. Ask them to examine some emails they have received and report on size and content of the email trails that are on the forward list. Specifically the number of people in the train they do not know, the number of organisations whose employees have added content to the email, and finally whether there is any information in the trail that they feel was never intended to be forwarded.

e. Under what circumstances and to whom is it appropriate for a company to distribute information it collects about the people who visit its website?

   Direct students to the guidelines followed by organisations that certify how various web sites use the information they collect. Students are likely to make the argument that personal information is inherently private and sacrosanct. To challenge that view, ask them about the legitimacy of developing and maintaining a reputation. Doesn't that involve the divulgence and sharing of personal information among strangers? Ask the class if it is feasible (or undesirable) to totally prevent or prohibit such sharing of information.

D1.9 Apply the relevant concepts explained in the theoretical framework to S&S. Do they explain why S&S want to develop an AIS for its various primary and support activities? Discuss and validate your response.

The key aspects of S&S that benefit from the application of our theoretical framework are:

a. The nature of the business: the electronics business is cost competitive at the shop front and eBusiness levels. The question that S&S must address is what competitive advantage they have in terms of costs and how will this be maintained.
b. How might changes in regulation (deregulation) impact the business?

Currently internet transactions do not attract GST in the way that bricks and mortar-based transactions are affected.

c. The impact of technology also impacts on how their business can be transacted. Ask the class how apps may affect this type of business; will social networks have an impact? Will eBay be a competitor?
d. How might the information systems impact on the ability to sell to customers? The one fact that the old mail order traders knew was that the easiest person to sell to was one who has already purchased from you.

D1.10 How relevant is Coase's 1937 Theory of the Firm to modern organisations? This is probably an ideal question to begin the study of accounting information systems. The essence of Coase's theory is that firms are justified only because they can do things better than we can as individuals. Firms have an advantage in contracting costs. When the buyer can buy what they want cheaper than the firm can supply, then the firm will shrink and/or fail. The classic example is book sales. Australia's Borders Books could not adjust its cost structures to meet the onslaught of internet sales. Get students to compare book prices at http://www.bookdepository.co.uk/ vs. their local bookshop.

An even more dramatic example is the demise of the Japanese dominance of the motor vehicle industry. With modern technology and a seemingly more positive work ethic, the Japanese car industry dominated the world in the 1980's as did the "Asian Tigers" in almost every branch of electronics. In the 1990's the US car industry fought back with lower cost and higher quality. However, the Japanese industries have never fought back. They are plagued with "employment for life" as evidence of a failure to embrace cost control as the primary role of the corporation in reducing costs. Whatever advantages a corporation may develop; competition will whittle that advantage away. The focus needs to be in controlling costs.

Suggested Answers to the Problems

P1.1 Information technology is continually changing the nature of accounting and the role of accountants. Write a two-page report describing what you think the nature of the accounting function and the accounting information system in a large company will be like in the year 2020.

Numerous answers are possible. Several articles addressing this topic have appeared in Strategic Finance and the Journal of Accountancy. The impact of ERP systems is a good place to start.

P1.2 The annual report is considered by some to be the single most important printed document that companies produce. In recent years, annual reports have become large documents. They now include such sections as letters to the shareholders, descriptions of the business, operating highlights, financial review, management discussion and analysis, a discussion of company internal controls, segment reporting, inflation data, and the basic financial statements. The expansion has been due in part to a general increase in the degree of sophistication and complexity in accounting standards and disclosure requirements for financial reporting.

The expansion also is reflective of the change in the composition and level of sophistication of users. Current users include not only shareholders but also financial and securities analysts, potential investors, lending institutions, sharebrokers, customers, employees, and—whether the reporting company likes it or not—competitors. Thus, a report that was originally designed as a device for communicating basic financial information now attempts to meet the diverse needs of an ever-expanding audience.
Users hold conflicting views on the value of annual reports. Some argue that they fail to provide enough information, whereas others believe that disclosures in annual reports have expanded to the point where they create information overload. Others argue that the future of most companies depends on acceptance by the investing public and by its customers; therefore, companies should take this opportunity to communicate well-defined corporate strategies.

Required

a. Identify and discuss the basic factors of communication that must be considered in the presentation of the annual report.
b. Discuss the communication problems a corporation faces in preparing the annual report that result from the diversity of the users being addressed.
c. Select two types of information found in an annual report, other than the financial statements and accompanying footnotes, and describe how they are helpful to users of annual reports.
d. Discuss at least two advantages and two disadvantages of stating well-defined corporate strategies in an annual report.
e. Evaluate the effectiveness of annual reports in fulfilling information needs of the following current and potential users: shareholders, creditors, employees, customers, and financial analysts.
f. Annual reports are public and accessible to anyone, including competitors. Discuss how this affects decisions about what information should be provided in annual reports. (*CMA Examination, adapted*)

a. Identify and discuss the basic factors of communication that must be considered in the presentation of the annual report.

The annual report is a one-way communication device. This requires an emphasis on clarity and conciseness because there is no immediate feedback from the readers as to what messages they are receiving.

The preparer must attempt to identify the users/audience of the report, and to determine their values, beliefs, and needs. Then the preparer can determine the language, i.e. words and phrases that would be appropriate and familiar to the users/audience.

The preparer must also consider the organisation of the material in the report. Logical ordering and attractive formatting facilitate the transmission of ideas.

However, the quantity of legislative disclosures together with the accounts presentation along with governance reports and directors' report make the reading an analysis of these reports more difficult.

b. Discuss the communication problems a corporation faces in preparing the annual report that result from the diversity of the users being addressed.

The different users of annual reports have differing information needs, backgrounds, and abilities. For some users, the annual report may serve as an introduction to the company and/or the only significant information about the company. Rather than using the report to communicate to all users, SAC 2 Objective of General Purpose Financial Reporting identifies the following three categories of user groups as the primary users of general purpose financial reports, and those whose common information needs should dictate the type of information to be disclosed by such reports: resource providers, recipients of goods and services, and parties performing a review or oversight function

- Resource providers: Providers of resources include those who may be compensated either directly or indirectly for the resources they provide. The former category includes employees, lenders, creditors, suppliers and, in the case of business entities, investors and contributors. The latter category includes donors, members of non-business entities such as clubs, societies and professional bodies, and, in the case of public sector bodies, parliament, taxpayers and ratepayers.
- Recipients of goods and services: recipients of goods and services are those who consume or otherwise benefit from the goods and services provided by the reporting entity. This category comprises customers and beneficiaries. In many non-business entities recipients of goods and services include resource providers, for example, ratepayers, taxpayers and members of professional associations.
- Parties performing a review or oversight function: certain parties, including parliaments, governments, regulatory agencies, analysts, labour unions, employer groups, media and special interest community groups, perform oversight or review services on behalf of the community. Members of this group tend to have indirect or derived interests in general purpose financial reports since they advise or represent those who have direct interests.

c. Select two types of information found in an annual report, other than the financial statements and accompanying footnotes, and describe how they are helpful to users of annual reports.

Other than the financial statements and accompanying footnotes, an annual report provides information concerning:

- Directors' Report.
- Governance and Remuneration Report.
- Management's discussion and analysis of results.
- Organisational objectives, strategies, and management's outlook for the future.
- Board of Directors members and the officers and top management of the organisation.
- Segment data and performance information.
- New initiatives and research information.
- Recent share price history and share information.

Students will have many and varied answers as to how the information is helpful, which should lead to a rich class discussion. This discussion can be combined with the discussion of part e.

d. Discuss at least two advantages and two disadvantages of stating well-defined corporate strategies in an annual report.

Stating well-defined corporate strategies in a company's annual report accomplishes the following:

- Communicates the company's plan for the future and resolves any disparate issues.
- Provides a vehicle for communicating the company's strengths.
- Builds investor confidence and portrays a positive image.

Disadvantages:

- Locks management into fulfilling stated objectives and strategies, causing inflexibility.
- Communicates to unintended users who could put the company at risk (i.e. competitors).

e. Evaluate the effectiveness of annual reports in fulfilling information needs of the following current and potential users: shareholders, creditors, employees, customers, and financial analysts. Annual reports fulfil users' information needs as discussed below.

1. Shareholders. Annual reports meet the statutory requirement that publicly held corporations are to report annually to shareholders and report on the stewardship of management to both current and potential shareholders. The annual report gives shareholders financial and operating information such as income from operations, earnings per share, the Balance Sheet, Cash Flow Statement, and related footnote disclosure that potential shareholders need to evaluate the risks of and potential returns on investment. However, the volume of data presented in annual reports can result in information overload that reduces the value of the reports. Confusion can result from reducing technical concepts to common concepts or by the presentation of duplicate messages by different forms of media.

2. Creditors. The annual report of public companies provides financial information as well as trend information. This allows creditors to project financial solvency and to evaluate the company’s ability to repay loans.

3. Employees. The annual report gives the employees information such as a description of the company's pension plan and the employee share incentive plan. This gives employees a base from which to compare their benefits program to those of other companies. Annual reports also provide employees with a year-end review of the results to which they have contributed during the year. In this sense, the annual report provides reinforcement and rewards. The annual report also informs or reminds employees of the organisation's values and objectives and sensitises them to the aspects of the organisation with which they are not familiar. On the other hand, the employee already knows how the organisation is performing so the annual report does not provide any substantive additional information.

4. Customers. The annual report provides customers with trend information and management performance information. They can use this to assess the company's past and current performance.

5. Financial analysts. The set of audited comparative financial statements provides the basis for analysis done by financial analysts. Notes, which are an integral part of the statements, describe or explain various items in the statements, present additional detail, or summarise significant accounting policies. Financial analysts are the most sophisticated class of users of annual reports. However, some data may be too condensed. Analysts may also need information in addition to that provided in annual reports to facilitate their analyses.

f. Annual reports are public and accessible to anyone, including competitors. Discuss how this affects decisions about what information should be provided in annual reports.

Management may omit information entirely from the annual report or disguise it because competitors have access to annual reports. The objective of reporting should be to reveal as much as possible without giving away proprietary information or a competitive edge.

P1.3 The use of IT at UFSAA

a. Why should UFSAA collect data on which auto parts are fixed most frequently? What could it do with this data?

Companies should gather and store data if the benefits received from the data are greater than the cost of collecting it. The data regarding the auto parts that get fixed most frequently is probably not costly to gather. It would probably be part of the claims information submitted by the insured parties. Therefore, the only significant cost would be to store the data and process it.

UFSAA passes the data on the parts to parts manufacturers, suppliers, and the Big Three automobile manufacturers. These companies use the data to improve their parts. Some use the data to determine which new products to offer. For example, one supplier may see that other suppliers are producing low quality products and determine that they could produce a better product for the same or a lower price.

As stated in the case, USAA also uses the cost information to encourage customers to take actions that result in cost savings for their insurance division. The repair of windscreens in the case is a classic example.

b. Even though UFSAA offered to waive the deductible, the repair shops still managed to convince 95% of the owners to replace rather than repair their damaged windshields. How could USAA use its AIS to persuade more shop owners to repair rather than replace their windows?

UFSAA began capturing data on the repair records of the various shops that worked for them. They published this information in the newsletter sent to repair shops. The shops noticed how they compared to other shops and began repairing more windshields. Over a four-year period, the number of repaired windshields rose from 5% to 28%.

c. How does the image-processing system at USAA add value to the organisation?

The system adds value by streamlining business processes and making them more effective and efficient. Before the image-processing system was installed, policy service representatives had to work with paper documents. Customer files were often missing or incomplete and documents were misfiled. The result was delays, multiple phone calls, and an inability to bring problems to timely closure. Now the documents are never missing or misplaced and service representatives have all the information they need to make a decision on the first phone call.

d. How do the remote deposit capture and mobile banking system at UFSAA add value to the organisation?

USSA's customers are widely scattered and USAA does not have local offices everywhere there are military personnel. In addition, military personnel also are deployed in areas where they have ready access to mobile phones but not personal computers. Therefore, USAA needs a way to deposit funds on a timely basis and to interact by phones that are able to access the internet. The new applications meet these needs. It is a service all Australian Banks now offer.

Below are some newsworthy items and a sampling of articles that report developments in the US of their equivalent organisation USAA. These links were active at the time of preparing this manual.

https://www.usaa.com/inet/ent_blogs/Blogs?action=blogsummary&blogkey=newsroom
http://www.americanbanker.com/search/index.html?zkDo=search&frommonth=03&fromday=23&fromyear=2011&tomonth=09&today=23&toyear=2012&publication=all_articles&query=USAA&x=0&y=0
http://www.cio.com/article/print/32260
http://pirp.harvard.edu/pubs_pdf/mosco/mosco-p94-9.pdf

P1.4 Match the description in the right column with the information characteristic in the left column.

F 1. Relevant	a. The report was carefully designed so that the data contained on the report became information to the reader.
E, C 2. Reliable	b. The manager was working one weekend and needed to find some information about production requests for a certain customer. He was able to find the report on the company's network.
D 3. Complete	c. The data on a report was checked by two clerks working independently
G, B 4. Timely	d. An accounts receivable aging report that included all customer accounts.
A 5. Understandable	e. A report checked by 3 different people for accuracy.

C 6. Verifiable	f. An accounts receivable aging report used in credit granting decisions.
B 7. Accessible	g. An accounts receivable aging report was received before the credit manager had to make a decision whether to extend customer credit.

P1.5 The Howard Leasing Company is a privately held, medium-sized business that purchases school buses and leases them to school districts, churches, charitable organisations, and other businesses. To better serve its customers and, more importantly, to protect its investment in the buses, Howard operates a large maintenance facility to maintain and repair leased vehicles. Howard's annual sales for last year were $37 million, with a net income of $2.9 million. Howard employs approximately 150 people. You were recently hired by Howard, and you are eager to prove your worth to the company. Your supervisor just called you into her office and asked you to prepare an accounts receivable ageing report as of the end of the year for use in the upcoming audit of the company's financial statements.

Student solutions will vary based on their background and education. The following is one possible solution.

a. What is an accounts receivable aging report?

An accounts receivable aging report lists customer account balances by length of time outstanding.

b. Why is an accounts receivable aging report needed for an audit?

An accounts receivable aging report is needed during an audit to determine whether the company's accounts receivable balance is properly valued.

c. What is an accounts' receivable aging report used for in normal company operations?

An accounts receivable aging report is used in normal company operations to provide information for:

- Evaluating current credit policies.
- Determining appropriate credit limits for new customers.
- Deciding whether to increase or decrease the credit limit for existing customers.
- Estimating bad debts.
- Initiating collection procedures for overdue accounts.

d. What data will you need to prepare the report?

To prepare an accounts receivable aging report, credit sales and cash collections data is needed for each customer granted credit.

e. Where will you collect the data you need to prepare the report?

The data needed to prepare the accounts receivable aging report can be collected from the sales transaction and cash collections files or tables

f. How will you collect the necessary data for the report?

If the data is in machine-readable form, it can be collected by preparing and running programs or queries that will extract the sales and cash receipts data. If the data is maintained on paper, it can be collected from daily or monthly sales reports and daily or monthly cash receipts reports.

g. What will the report look like (i.e. how will you organise the data collected to create the information your supervisor needs for the audit)? Prepare an accounts receivable aging report in Excel or another spreadsheet package.

The accounts receivable aging report should look something like the following, whether it is prepared on paper or in Excel:

Customer Number	Customer Name	0-30 Days Outstanding	31-60 Days Outstanding	61-90 Days Outstanding	91+ Days Outstanding

h. How will you distribute the report? How many copies will you make? Who should receive the copies? What security features will you implement?

The accounts receivable aging report should be restricted to employees with operational or authoritative responsibility for customer accounts, such as the accounts receivable clerk, the credit manager, and the controller. If the report is in an electronic form, access to the report should be restricted to appropriate authorised personnel. If the report is distributed on paper, only as many copies as necessary should be produced and they should be delivered in a manner that ensures the confidentiality of the data. Security features could include placing the report on a password-protected server or encrypting the file prior to emailing it or placing it on a server.

P1. Based on Wal-Mart's success in the United States, many expected the company to quickly dominate the British market after it bought the Asda grocery chain in 1999. That has not happened; Wal-Mart's market share in groceries is a little more than half that of its biggest competitor, Tesco. Initially, Tesco's sales and net income rose significantly while Wal-Mart's sales and net income increased at a much slower rate. More recently, Wal-Mart has made small gains in market share, and Tesco has had small decreases. Wal-Mart found out that Tesco is a formidable worldwide competitor. Tesco operates almost 2400 shops in Britain in four different formats. It has a very successful operation in Central Europe, and it has expanded to the United States with Fresh & Easy shops. In Korea, Tesco's 174 shops are thriving while Wal-Mart gave up after an eight-year effort to succeed and sold its 16 shops. One of the biggest reasons for Tesco's success is its use of technology. In 1995, Tesco started a loyalty card program, called Clubcard, and over 80% of its shoppers are members. Shoppers fill out an application in the shop and receive a plastic card and a key fob in the mail that is scanned before they make a purchase. Tesco gathers massive amounts of data about its customers' 15 million purchases each week. Sales data are analysed and turned into information that provides Tesco with a significant competitive advantage. As traditional advertising loses effectiveness, these large stores of data allow Tesco to find new and creative ways to market its products.

a. What kind of information do you think Tesco gathers?

- The Clubcard application filled out in the shop captures data such as customer names, addresses, household size, ages of children, dietary preferences, and income levels.

- When the Clubcard is used to qualify for the discounts, Tesco computers record everything a customer purchases.

b. How do you think Tesco has motivated over 12 million customers to sign up for its Clubcard program?

- It offers merchandise discounts to customers who sign up and gives card users a point for every pound spent. Points can be used to reduce the price of future purchases or exchanged for frequent flier kilometres.

- Big spenders are sent special promotions

c. What can Tesco accomplish with the Clubcard data it collects? Think in term of strategy and competitive advantage.

- Customised Coupons and promotions. Tesco analyses customer purchases and customises its marketing based on the results. Quarterly, Tesco mails active Clubcard customers three coupons (discount vouchers similar to those found in "Sale Catalogues" or on the back of your supermarket-shopping docket) for frequently purchased items and three coupons for items they are likely to buy or that Tesco wants them to try. Tesco is so good at understanding their customer's tastes and preferences that their coupons are 10 to 15 times more likely to be used than other coupons. The quarterly mailing also contains vouchers that allow members to redeem their accumulated points. Some 95% of all vouchers are redeemed.

- Cross marketing. Analysis of customer data allows Tesco to discover unique buying habits. For example, men who purchased nappies for newborns buy more beer than the normal male – presumably because they are more likely to stay at home and less likely to go out.

- Improved decision-making. Tesco has been able to make better decisions and set better company goals than ever before. Using data on purchases and the ethnic makeup of the neighbourhoods surrounding the shops, Tesco is able to stock goods that have greater customer appeal. For example, Tesco noticed that customers in a small shop in a South Asian and Arab part of town were not buying complete meals. They went elsewhere to buy certain staple foods and Asian brands. Further analysis led to the decision to replace the small shop with a Supercentre that offered more than 800 foreign products. It included a halal butcher shop, the latest movies from India, Arabic and Asian newspapers, and an Indian jewellery counter. Tesco also redesigned its shopping carts to handle the bulk purchases of its customers more easily.

- Customer loyalty. Tesco used Clubcard data to neutralise Wal-Mart's most significant advantage. Tesco identified 300 items that price-sensitive shoppers frequently purchased and lowered their prices. This kept the customers most likely to shop at Wal-Mart from defecting.

- New product rollouts. Analysis of Clubcard data showed that affluent customers were not buying certain products like fruit, cheese, and wine. This led to the introduction of a premium quality brand, "Tesco's Finest," that successfully attracted affluent customers. Customer data also allows Tesco to figure out quickly how new initiatives are working. For example, when Tesco rolled out ethnic foods for Indians and Pakistanis, data analysis showed that white affluent customers were also buying the products. The rollout was quickly expanded to include them.

- Improved supplier relationships. Outside companies are taking advantage of Tesco's data to improve their decision-making. When Kimberly-Clark introduced a premium toilet paper, it used Clubcard data to track who purchased it and who continued to purchase it. Further analysis showed that those who bought the toilet paper also were big buyers of skin-care products. This allowed Kimberly-Clark to develop a marketing program that offered free beauty treatments to those who continued to buy the toilet paper.

d. What are some of the disadvantages to the Clubcard program?

Some critics believe that loyalty card programs:

- Are too expensive to maintain and that companies can buy data to achieve similar results for less than the loyalty program costs.

- Slows down checkout lines.

- Are a threat to the customer's privacy.

e. Do an internet search to find out how Tesco is doing in comparison to Wal-Mart and other grocers and retailers. Write a few paragraphs explaining your findings.

Students should easily be able to find information that updates the competition between these two powerhouse retail companies.

Source: Rohwedder, Cecille. "No.1 Retailer in Britain Uses 'Clubcard' to thwart Wal-Mart," Wall Street Journal, June 6, 2006, pp. A1. http://online.wsj.com/article_print/SB114955981460172218.htm

P1.7 Have you ever imagined having one electronic device that does everything you would ever need? Mobile phone makers in Japan have gone beyond the imagining phase. Mobile phones in Japan are becoming more versatile than ever. Newer models of mobile phones contain a myriad of applications and can do many of the things that a personal computer (PC) can do. PCs are also able to function as phones. A small but growing number of professionals are trading in their laptops for handheld computers. Mobile phone

manufacturers in the United States and elsewhere are quickly catching up to their Japanese counterparts.

As technology is moving so quickly, there are no right answers to this question. There are thousands of new mobile phone applications created each year. The author does not usually collect this problem. Instead, he has the students describe the different things they do with their phones. He then adds other things that he and others he knows use them for. The point is to discuss how fast technology is changing, the need to keep up with the changes, and the use of technology as a competitive advantage.

Some things to consider mentioning are:

a. What commercial activities can be done with a mobile phone? With a mobile phone/PC combination device? What do you do when you're on your mobile phone? What do you expect to be doing in five years?

Newer models of mobile phones contain a myriad of applications, including video cameras, digital music players, television remote features, and digital recording. For example:

1. The e-wallet function virtually turns a mobile phone into a credit card or debit card. Such a mobile phone can buy items from a vending machine or convenience store, pay for train tickets and cab fares, and purchase and sell shares and bonds. Businesses cater to this new technology by including bar codes in their catalogues or on street advertisements. Users can then use their phone to scan the barcode that brings the user to that company's website. Users may then proceed to learn more about the item and order it with a click of the button.

2. The Japanese now use mobile phones to watch up to 7 free television stations. Newer models can digitally record up to 30 minutes of those television programs.

3. SONY has a hard disk recorder that can be programmed via mobile phone to record TV shows.

4. Mobile phones are also being used as a remote for televisions and karaoke players.

5. The Japanese also use mobile phones as video cameras and music players.

6. Users everywhere use mobile phones to navigate to their destination.

b. How can businesses use this technology to attract more customers, sell more products, advertise their products, facilitate the sale of products, and conduct and manage their businesses more efficiently and effectively?

In order to make products and services available to the consumers using mobile phones, an infrastructure must be in place. Such things as bar coded products and vending machines that accept e-wallet transactions from mobile phones are necessary for the device to be of use to the consumer.

Businesses that can provide this infrastructure will be well positioned to take advantage of the mobile phone/PC revolution. Indeed, auction sites have noticed heavier volume from mobile users buying and selling items. Share brokers are reporting that 20%-30% of trades are coming from mobile devices.

c. What are some problems or drawbacks you can see with using these devices in business?

The problems and drawbacks of these new devices include a relatively high sales price, short battery life, limited performance, having to drill down several menu layers to reach desired functions, and theft.

P1.8 Classify each of the following items as belonging in the revenue, expenditure, human resources/payroll, production, or financing cycle.

a. Purchase raw materials	- Expenditure cycle
b. Pay off mortgage on factory	- Financing cycle
c. Hire a new assistant controller	- Human resources/payroll cycle
d. Establish a $10,000 credit limit for a new customer	- Revenue cycle
e. Pay for raw materials	- Expenditure cycle
f. Pay payroll cheques to factory workers	- Human resources/payroll cycle
g. Record goods received from vendor	- Expenditure cycle
h. Update the allowance for uncollectible accounts	- Revenue cycle
i. Decide how many units to make next month	- Production cycle
j. Complete picking ticket for customer order	- Revenue cycle
k. Record factory employee timecards	- Human resources/payroll cycle
l. Sell concert tickets	- Revenue cycle
m. Draw on line-of-credit	- Financing cycle
n. Send new employees to a business ethics course	- Human resources/payroll cycle
o. Pay utility bills	- Expenditure cycle
p. Pay property taxes on office building	- Expenditure cycle
q. Pay federal payroll taxes	- Human resources/payroll cycle
r. Sell DVD player	- Revenue cycle
s. Collect payment on customer accounts	- Revenue cycle
t. Obtain a bank loan	- Financing cycle
u. Pay sales commissions	- Human resources/payroll cycle
v. Send an order to a vendor	- Expenditure cycle
w. Put purchased goods into the warehouse	- Expenditure cycle

P1.9. In Chapter 1 we present a theoretical framework to better understand the growth and use of AIS. Two main theories are identified 'Theory of the Firm' and 'Agency theory'. Search the accounting and IS research literature to see if you can identify any other theories that may be applicable. Write a report

making sure to back up your findings with references to articles and websites.

Answers to this question but a Google Scholar search would suggest the following might be considered:

- Human information processing
- Decision theory
- Contingency theory
- Control theory
- Information technology culture conflict
- Organisational theory
- REA models
- Systems theory.

P1.10. Metcalf's Law and Moore's Law capture the rapid growth in computer power. Collect some statistics from the literature and the web to validate these laws. In today's fast advances in networks, does the equation $n(n-1)/2$ or n^2 still hold? What about chip density? Is it doubling every 18 months or less? Write a report on your findings including graphs of statistics for both laws and citing reference to back up your findings.

Like Moore's Law, which states that the number of transistors on a chip will double every 18 to 20 months, Metcalfe's Law is a rough empirical description, not an immutable physical law. Metcalfe's Law was named in 1993 by George Gilder, publisher of the influential *Gilder Technology Report*. It is named for Robert M. Metcalfe, the inventor of Ethernet.

The following gives an interesting analysis of Metcalfe's Law
Briscoe, B., Odlyzko, A. and Tilly, B.(2006) *Metcalfe's law is wrong - communications networks increase in value as they add members-but by how much?*, Spectrum, IEEE, Vol. 43, No. 7, pp. 34-39.
It may be downloaded from:
http://www.cse.unr.edu/~yuksem/teaching/nae/reading/2006-briscoe-metcalfes.pdf

A counter argument is provided by Simeon Simeonov (July 26, 2006). "Metcalfe's Law: more misunderstood than wrong?"
http://blog.simeonov.com/2006/07/26/metcalfes-law-more-misunderstood-than-wrong/

Suggested Answers to the Cases

C1.1 The website for this book contains an adaption of Russell L. Ackoff's classic article "Management Misinformation Systems" from Management Science. In the article, Ackoff identified five common assumptions about information systems and then explained why he disagreed with them.

Read the five assumptions, contentions, and Ackoff's explanations. For each of the five assumptions, decide whether you agree or disagree with Ackoff's contentions. Prepare a report in which you defend your stand and explain your defence.

The exact nature of the answers will vary. Grading should be based on how well students defend the positions they take. If you plan on discussing the case in class, be sure to cover these key points:

Assumption 1: If the problem is too much information, the solution involves filtering information. You may want to compare and contrast the effectiveness of different internet search engines to illustrate this point. The value of data mining in using data warehouses is also relevant here.

Assumption 2: If decision-makers do not really need all the information they want, then the solution may involve asking decision-makers to explain exactly how and why they use various data items.

Assumption 3: Is the key providing more data, or more information? Identifying the difference in a given decision setting may be difficult, but is crucial to solving this problem.

Assumption 4: Ackoff presents a nice example of how sometimes too much communication hurts. Other topics that could be discussed to clarify this issue might include asking students to identify situations in inter-personal relationships when it might not be appropriate to follow the general adage about telling the truth. Also, discuss the interaction of performance measurement and communications.

Assumption 5: The key point is to get the class to consider the degree to which the analogy about how much the average driver needs to know about how a car works applies to information systems. Ask them to identify situations when lack of knowledge about how a car works can harm the average driver. Are there any analogous situations with information systems?