**Solutions Manual**

to accompany

**Accounting Information Systems 4e**

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**Chapter 1: Introduction**

**Discussion Questions**

**1.1 Describe some inputs, processes and outputs of an accounting information system. (LO1, LO2, LO3)**

*Inputs*: Sales order (record purchase requests from customers), purchase data (data about purchases initiated with our vendors), Receiving data (data about arriving goods), shipping data (data about goods sent to customers), invoices (received from vendors)

*Processes*: Check data is valid, sort data, manipulate data

*Outputs*: Invoice (sent to customer), cheque (sent to vendor), profit and loss report, accounts receivable report

**1.2 What is the difference between data and information? (LO2)**

Data are the raw facts relating to or describing an event. For example, data relating to a sale could include the customer’s name, address, salesperson ID, the sale number, sale date, items purchased, quantity purchased and so on. On its own this data is not all that useful. However, through the application of rules and knowledge the data can be made meaningful, thus converting it to information. For example, the collection of data relating to sales may be summarised into sales by customer or sales by product, to provide information about high spending customers or slow moving products.

**1.3 What is information overload? What are its consequences? (LO2)**

Information overload refers to the situation where an individual has more information than required and can’t meaningfully process this information when making a decision. The potential consequences of information overload include the production of reports and information that serves no purpose and deleterious decision making by employees who are unable to synthesise the volume of information that they are exposed to.

**1.4 Briefly summarise the changing relationship between accounting and information systems. (LO4)**

This question can be answered with reference to Figure 1.5, which depicts the changing nature of and interaction between accounting and information systems. Regarding the role of accounting we see that initially accounting was the primary source of information for an organisation. In the original manual accounting environment, the people who did the accounting also represented the technology of the system – the accountant kept records and stored data and synthesised it into reports. In essence, the accounting function and the information technology function were one. The advent of computing technology and other processing technologies described in the chapter were based around ways of making the accounting task easier. When the information technology first hit organisations it was predominantly seen as a way of helping the accountant – thus information systems were the domain of the accountant. This is represented in the top part of figure 1.5. The domain of information technology soon expanded, encompassing more than just accounting. As a consequence, we have the scenario depicted with the intersecting circles in figure 1.5. With the growth of information systems, the traditional roles of data management and storage that were previously the domain of the accountant began to be consumed by the information systems domain, with the accounting function being separate from the technology that allowed its execution. Finally, technology was incorporated to many areas of the organisation, not just the accounting role. The technology/information systems role became the focus, and it served many areas of the business, of which accounting was one. Thus accounting became a user of the information systems function in order to complete its tasks. Thus accounting has gone from being in control of the information systems function to being a user of the information systems function as technology has advanced and it has become necessary for people to be experts in technology.

**1.5 Compare the role of the accountant today to his or her role before the introduction of computer technology. How have the responsibilities and duties changed over time? (LO4)**

The discussion of this question can be tied into the discussion in question 1.4. What becomes evident from the historical discussion of the evolution of the accounting and information systems function is that the accountant has gone from being responsible for both the accounting function and the information management function associated with accounting to just being responsible for the accounting function. The technically qualified personnel, who do not necessarily have accounting skills, have become responsible for the information storage function associated with accounting. In a sense, the responsibilities of the accountant have been reduced, since they have lost direct control of the information storage function associated with the accounting discipline. Some may also argue that this shift has created a greater need for accountants to be trained not just in the technical skills of accounting but also in skills of information management, for example information systems.

**1.6 What are some of the uses of accounting information? Provide five examples of how accounting information may be used and who it would be used by. (LO5)**

The table below provides some typical examples of how accounting information may be used.

|  |  |
| --- | --- |
| USER | USES OF ACCOUNTING INFORMATION |
| Shareholder | Uses the general purpose financial reports to assess the performance of the company they have invested in, assessing both historical performance and using the historical information to make predictions about future performance. |
| Managers | Are commonly exposed to bonus schemes that are based on profit levels or other financial performance indicators. Thus managers have accounting information being used as a performance assessment device. |
| Union | May use financial reports of companies – particularly profit information – to substantiate claims for higher wages for union members. |
| Bank | Will look at financial performance and financial position information when assessing credit worthiness of loan applicants. |
| Suppliers | A company’s suppliers may wish to view financial information before entering in to long term supply agreements, in order to ensure that the company is able to meet the terms of the agreement and pay for the supplies that are purchased. |

**Problems**

**1.1 Conduct a web search and find an example of each of the following data input techniques: manual keying via a keyboard, MICR, barcode scanning, image scanning, voice recognition, and optical mark readers. Construct a table describing how each the technology can be used in an organisation, and its advantages and disadvantages.**

|  |  |  |  |
| --- | --- | --- | --- |
| Technology | Example | Advantages | Disadvantages |
| Manual keying | Data entry personnel | Efficient for small volumes of input | Time consuming  Prone to error if appropriate input controls do not exist |
| MICR | Cheques at banks | Security benefits  Processing efficiency | Different countries use different styles of MICR fonts  Requires a special magnetized ink  Not foolproof and can be used for fraud |
| Barcode scanning | Supermarket checkouts, Airport baggage tracking, Mail delivery, Freight control | Quick, efficient, accuracy of data input | No universal standard for barcodes |
| Image scanning | Capturing documents electronically | Captures images as well as text, Reduced paper storage | Files can be large |
| Voice recognition | Victoria case mentioned in the chapter | Human like interaction | Effect of accents and pronunciation on ability to recognise inputs  Need to train the system |
| Optical mark readers | TAB, Uni exams | Accuracy, speed of scanning, no need for data validation | Requires standardised input forms, specialised software and specialised scanning devices |

**1.2 You are responsible for advising a new grocery store on appropriate data capture techniques that can be used in its sales system. Using the table you completed in problem 1.1 as a guide, select an appropriate input technique and advise management on its strengths and weaknesses and why it is the best option for the organisation. Conduct a brief web search for your chosen input technique and see whether you can find some cost estimates.**

Given that the business context is that of a grocery store, it would seem that several of the technologies mentioned in 1.1 can be ruled out immediately. The eliminated technologies would include MICR, image scanning, voice recognition and optical mark readers. This leaves manual keying and barcode scanning. The selection between the two would then depend on contextual matters, such as the volume of transactions being processed and the required speed for handling the transactions. For a large grocery store, the option barcode scanning would appear to be the logical choice, with its benefits of quick and accurate data capture and the ability to immediately update inventory data as the goods are sold. For a large organisation, the costs of such a system can probably be spread, allowing a certain degree of economies of scale to be attained.

A smaller organisation may prefer manual keying of sales transactions, provided that transactions were typically not of a large size (in terms of number of items to be entered) and speed was not a critical factor. They should also be aware of the possibility of data entry error and the need for input validation routines.

A theme to consider here is that the needs of the organisation and the context in which it operates should determine the technology that is adopted – there is no one right answer. Do not allow yourself to be driven by the technology and just adopting technology for technology’s sake. Make sure it is relevant to the business environment in question.

**1.3 The chapter discussed the idea of a system and its components. Construct a table listing the objective, inputs, processes, outputs and the external environment that affects the operation of each of the following systems:**

**(a) University enrolment system**

**(b) Public transport ticketing system**

**(c) Citilink road tolling system**

**(d) Myercard charge card system**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SYSTEM | OBJECTIVE | INPUT | PROCESS | OUTPUT | EXTERNAL |
| (a) | To enrol students into the university and manage enrolment information during the duration of study | Student Details  Subject Details | Confirm eligibility to enroll  Confirm payment options  Store data | Enrolment receipt  Timetable | Government regulations regarding enrolment details  HECS requirements  Privacy Act |
| (b) http://www.metlinkmelbourne.com.au/metcard/ | To administer tickets to public transport users and record usage of public transport | Ticket options  Validated ticket (for retravel on an existing ticket) | Confirm valid ticket options  Generate ticket  Validate ticket | Approved ticket  Validation confirmation | Government regulations – fee schedules  Privacy Act |
| (c) <http://corporate.transurban.com.au/Transurban/tunav.nsf/Home+Page/Transurban~splash?open> | To track usage of tolled roads and manage revenue associated with road usage (around 650,000 transactions per day) | Car user details  Location details (start point, end point) | Confirm valid car  Calculate toll, based on start and end points  Update customer accounts | Customer usage statement  Fines for un-authorised use | Government regulations  Privacy Act |
| (d) <http://www.myer.com.au/services/cmcard.asp> | To provide customers with an instore credit purchase option | Customer details  Purchase details | Check credit limit  Update amount owing balance  Capture purchase | Invoice / statement to customer  Accounts Receivable reports | Credit regulations  Privacy Act |

**1.4 Describe some of the external influences that affect an accounting information system. To what extent do you think these influences dictate the design of an accounting system?**

There could be a range of ideas in response to this question. The obvious one is the impact that the accounting standards have on a system, since any accounting system should be able to produce reports that comply with the Generally Accepted Accounting Principles that are in place and govern a company’s reporting activities. Additionally, there is the possible mention of factors like the Tax Act. With the introduction of the GST accounting systems have had to be able to cope with the new recording and reporting requirements that came with the Goods and Services Tax being introduced, ranging from having the information available to prepare a Business Activity Statement to having a general ledger system that accommodates GST accounting. More generally, tax requirements such as those relating to income tax, may also be discussed, including their impact on record keeping for events like payroll and income tax collected. These legislative / authoritative forces would be expected to have a large impact on the design of the system. For example, following the introduction of the GST in Australia, many makers of accounting software packages acted to ensure that their packages were GST compliant.

**1.5 Based on the historical perspective of accounting information systems presented earlier in this chapter, consider the following questions.**

**(a) Do you think that the accounting function will be totally engulfed by the information systems function?**

**(b) What are the implications of the shifts in emphasis described for potential graduates?**

**(c) What sort of skills do you think an accounting graduate would require as a result of these changes over time?**

**Conduct a web search of the big accounting firms and identify some of the skills they are typically looking for in graduates. Do they seem to be emphasising accounting skills or information skills? Why do you think this is so?**

This question is designed to get students thinking about the importance of information systems. Additionally, it is linked to the idea that being an accountant is not just about keeping the books and making sure that the debits and credits balance at the end of the day. Reference to Figure 1.2 should illustrate this point, with a lot of the careers viewed as careers in accounting being more about working with organisations in a variety of capacities, rather than just being the stereotypical bookkeeper. This has a huge implication on the type of skills that graduates require. Suddenly a technical knowledge of accounting is a necessary but not sufficient qualification. In addition to that, skills in information technology / information systems become important, as is evidenced by the ever changing relationship between accounting and information systems. Additionally, some familiarity with the operation of business processes becomes important.

As to whether accounting will be totally engulfed by information systems – this is more of a speculative question than an empirical one. Some students may argue that there will always be a role for an accountant, since someone has to know the accounting standards and ensure that records are appropriately maintained and reporting requirements are met. Alternatively, some may argue that the traditional work of accountants has already been taken over by information systems, with the development of computer programs and so on. Again, reference to Figure 1.2 could be a useful exercise, drawing out which of those career paths require accounting knowledge, which ones require IS knowledge and which ones require knowledge of both IS and accounting.

**1.6 Read the article in figure 1.1 ‘IBM and SAP come up with package deal’, and answer the following:**

**(a) What is viewed by the author as one of the key weaknesses of SAP’s existing ERP platform?**

**(b) What are the expected benefits of the alliance between SAP and IBM?**

**(c) What are the motivations for SAP to undergo this new packaging of their product?**

1. The author mentions that the traditional problems that are seen as being associated with SAP implementations are that they are typically over budget or that the technology does not work as expected. This can be seen as a product of the typical SAP architecture requiring “engineers and consultants [to] embark on a complex, costly and lengthy integration project.”
2. The expected benefits of the alliance between SAP and IBM are that it will make the SAP product more accessible to those organisations that do not have the big budgets associated with traditional ERP implementations. This will provide SAP with growth in the SME sector of the market place.
3. The motivations behind SAP undergoing this alliance with IBM, allowing for the repackaging of their product, include:
   1. The alliance with IBM will provide access to a new range of customers through IBM’s already strong distribution networks
   2. The alliance allows SAP to branch out from the large scale organisations to the organisations in the small to mid-sized sector of the market place.

**1.7 A computer science student says to you, ‘Any information system purporting to be useful to an organisation mustbe computerised, otherwise we are just wasting our time developing new technologies like storage devices, processors and so on.’ How would you respond to such a statement? Do you think the computer science student is correct? Why?**

The response to the statement by the computer science student should emphasise that an information system does not have to be computerised. An information system can operate just as well without computerisation – it simply depends on the requirements of the users. It is certainly true that technology has increased the capabilities of our information systems (for example storage capacities and processing power) and their benefits have been realised in many areas, including the accounting information systems area, but the systems will still involve people and manual processes. From the accounting information perspective, there has been an increased role for technology, as is evident in the shifting relationship between the information systems and accounting functions, as was discussed earlier. However, as the careers in the accounting box also drew out, accounting is more than just numbers and it is definitely also much more than just having the latest technology.

**1.8 Read the article in AIS focus 1.1 ‘Woolworths’ pursuit of customer intimacy’, and answer the following:**

**(a) Why has Woolworths moved towards the data-mining project?**

**(b) What are the different data sources that will be used in the project?**

**(c) What would be some of the expected benefits of this project?**

**(d) How has the retail environment changed over the years and how can technology attempt to reverse those changes?**

1. Woolworths has moved towards the data-miming project in order to better understand their customers and add a degree of intimacy to the relationship that the large retail store has with its many customers. The top management of Woolworths were concerned that Woolworths had become somewhat impersonal for customers and was seeking to change this. As Chief Executive Michael Luscombe observed, “We have moved from a position where the shopkeeper had intimate knowledge of the customer to mass market retailing where we’ve been able to deliver greater efficiency and lower prices…but we’ve lost that intimacy and ability to know what the customer wants.”
2. The different data sources that will be combined for this project are:
   1. Credit card data from the store’s Ezy Banking alliance with the Commonwealth Bank
   2. Sales data

The combination of these data sources will allow for an understanding of what customers buy and provides an insight into customer spending habits.

1. Some of the expected benefits Woolworths would expect to gain from this project are:
   1. Better customer relationships through a more intimate understanding of the customer and their buying habits
   2. The ability to customise marketing campaigns and mail-outs to customers based on their prior spending habits
   3. An enhanced level of understanding, and listening to customers.
2. The retail environment has changed in many different ways over the years. These changes are evident if we take a look at the supermarket from a systems perspective. For example, an analysis of the input techniques used to capture data about transactions shows a progression from keying in items to barcode scanners that are linked up to LCD displays for customer convenience. The use of sales data is also an avenue where the retail sector has shown a willingness to progress. For example Woolworths is looking for ways to extract value from their sales data through the use of sophisticated database technologies and data mining techniques. Alternatively, the outputs a supermarket generates have also changed. The generic catalogue that would reach every household faces the prospect of being replaced by customised marketing and coupons that are generated based on consumer spending habits, making the marketing activities more targeted in their action.

**1.9 Using the data in figure 1.3 as a basis, describe how data are converted into information.** **In doing so, you should describe what differentiates data from information and provide at least three examples of the different types of information that could be generated from the data in figure 1.3.**

In doing so, you should describe what differentiates data from information and provide at least three examples of the different types of information that could be generated from the data in figure 1.3.

Data is converted into information through the application of knowledge and rules. The distinction between data and information is its usefulness. Data is merely a representation of facts – for example the details relating to an individual sale. A mass of data (for example all sales that occurred in a month) is not a great deal of use to us for decision-making and can’t be meaningfully interpreted. Consequently, we find ways to simplify or summarise the data in order to make it meaningful. This is the process of converting data to information.

Ways which this could be done, based on the data contained in figure 1.3., include:

*Sales Summary* – This could include total or average sales for each week, the fortnight.

*Customer Summary* – Total sales grouped by customer.

*Customer Margins* – Gross margin per customer.

*Sales Margins* -Average gross margin for the fortnight.

**1.10 Read the article in figure 1.10 ‘Of mice and matriculation’, and answer the following:**

**(a) Why is the IIA switching to computer based exams?**

**(b) What are some of the people-based issues that may be confronted in making the switch from paper to computer-based exams?**

**(c) What are some of the technology-based issues that could be confronted in making the switch from paper to computer-based exams?**

**(d) Why do you think that small group testing is important before the IIA implements the new system?**

**(e) What has/could the IIA do to encourage acceptance of the new system?**

1. The IIA is switching to computer based exams in order to improve the efficiency with which the examinations are conducted. With more than 50,000 examination candidates worldwide the institute needed a way to overcome the delays in managing and distributing paper examinations for completion and marking.
2. Some of the people based issues that may be confronted by the IIA in making the switch from paper based to computer based exams are:
   1. Computer literacy – people from different parts of the world may have varying levels of computer literacy.
   2. Resistance to change – people my not trust the new technology or be resistant to a change in the examination process
   3. Employment – potentially, the work of the manual examiners is no longer required
3. Some of the technology based issues that could be confronted by the IIA in making the switch from paper based to computer based exams are:
   1. Technology security – being able to verify that the person completing the online exam is the actual candidate
   2. Technology reliability – ensuring the system is reliable and has a minimal risk of failure during the conduct of the exam
   3. Technology access – not all candidates for the IIA exams may have access to the internet in order to do the online testing.
4. Small group testing of the new system is an important step for the IIA to conduct prior to fully implementing the new online testing system because it allows for the identification of any errors or problems before the system goes fully on line. This allows for early identification of any bags prior to the full roll out of the complete system.
5. Some of the strategies that the IIA could (has) adopted to encourage greater usage/acceptance of the new system include:

- Results for electronic tests available to candidates much quicker than those for paper based exams

- Charging a higher fee for candidates to sit the paper based exam than that which is charged for the electronic exam

**1.11 Read the AIS Focus 1.5, ‘Royal Australian Mint’s system upgrade’, and answer the following:**

**(a) What benefits do you think the Royal Australian Mint would expect from the system?**

**(b) Based on your understanding of the article, what problems did the Royal Australian Mint have with its previous system?**

**(c) Why do you think the Royal Australian Mint had each business area map out their process as a part of adopting the new system?**

**(d) What issues may the Royal Australian Mint face in implement the new system throughout the organisation?**

1. From the details in the article, the benefits expected from the new system are:
   1. A higher level of integration across the different processes within the Royal Australian Mint
   2. A higher degree of consistency between the business processes in place and the software systems that are used to support the business processes
   3. A better understanding of what happens in each business process
   4. A faster, more efficient means of processing transactions (e.g. the paperless annual leave system)
2. The problems that the Royal Australian Mint had with its previous system include:
   1. System Support – as the previous system had grown with the organisation, in order to accommodate the new reporting needs that management faced, and add-on programs and reporting options had been added to the system, the ability to maintain the system had declined. The article gives the impression that this is partially due to a lack of organisational memory (additions to the system by people no longer at the Mint) and partly due to the number of add-ons and additions that had been made.
   2. The old system incorporated computer-based aspects as well as paper based aspects. This created bottle necks in the processes. For example, there is mention of the annual leave process and the paper-based stages speeding up entry into the system and authorisation.
3. The Royal Australian Mint would have had each business area map out their process in order to ensure that the new system was designed around the activities that are performed in the process. It would also facilitate process redesign, which fits well with the adoption of an ERP system and matching process and technology. It could also be a way of gathering a clear representation of the needs of each of the business processes.
4. Implementation issues that be faced in the new process could include:
   1. Resistance of staff to the new processes – particularly if it results in changes to their work habits and responsibility
   2. Learning issues as staff acquire knowledge of how to use the new systems – for example the online leave application system represents a very different way of capturing and authorising the leave requests. This will require staff and leave administrators to learn and understand the working of the new system.
   3. Resistance from staff as a result of add-on programs or reports that were built in to the old system being removed or redesigned as part of the new system.

**1.12 Read figure 1.11 ‘Customs stalled at SmartGate’, and answer the following:**

**(a) Why do you think it is important to do adequate testing before implementing a new system?**

**(b) What benefits could come from the new Customs technology?**

**(c) What different types of technology are necessary for this system to work?**

**(d) What are some of the technical problems that earlier versions of the technology have faced?**

**(e) How could this system impact on the users of the system? (This could include people employed by Customs as well as travellers.)**

1. It is important to do adequate testing on a new system for several reasons, which include:

In the case of the passport checking system, the reasons of particular importance would seem to be:

* This is a system that has direct implications and consequences for national border control. The risk of false identification of passengers would appear to be a major concern for system developers.
* If the system is implemented and has technical problems the consequences, in terms of delays and immigration processing times, could be large.

1. The benefits that could come from the new technology include:
   1. Faster processing of incoming passenger details at customs
   2. Heightened border security
   3. Better protection of passport documents from the threat of forgery
2. The different types of technology necessary for this system to work include:
   1. Face recognition software to capture the image of the traveller and compare it to the stored image
   2. Biometric identification technology
   3. Document scanning technology
   4. Database technology
3. Some of the technical problems that the earlier versions of the system have faced include:
   1. The system not being able to deal with passengers who are wearing hats / glasses
   2. Unacceptably high false rejection rate errors in the face recognition software
   3. The system not being able to accommodate passengers who do not stand still during the initial face recognition process
4. This system could impact on users in a number of ways.

For employees of Customs some of the impacts could be:

* Reduced need for manual passport checking at airport arrival centres
* Faster turnaround of arriving passengers

For travellers some of the impacts could be:

* Quicker procedures for clearing immigration
* A need to upgrade their passport to the new biometric passport

**1.13 Read figure 1.7 “Treasury tips $4m more into XBRL effort”, and answer the following:**

1. **Identify the main difference between Australian and US implementation of XBRL.**
2. **Describe a benefit of XBRL for:**
3. **companies preparing reports**
4. **an investor in a company**
5. **an analyst who monitors listed companies**
6. **Explain why the evolution of XBRL standards necessarily included:**
7. **the accounting profession**
8. **accounting software vendors**
9. **the government.**
10. Identify the main difference between Australian and US implementation of XBRL.

The major distinction between the adoption of XBRL standards in Australia and the United States is that of choice. In the United States the switch to XBRL was mandatory, having been required by the Securities and Exchange Commission following their move to a new system for managing company disclosure data. As a result, 500 of the larger companies were required to implement the data tagging framework. In Australia the framework is optional.

1. Describe a benefit of XBRL for:
2. companies preparing reports

A suggested benefit for companies is that the adoption of XBRL reporting techniques could see a boost in business business investment activity (the argument for shy I not clear from the article, but perhaps it is because of the improved ability to analyse and compare data and identify targets for takeover/merger?) The article also posits that adopting XBRL could be seen as a sign of transparency – the argument being thaht the easier you make it for data about your company to be analysed the less you have to hide.

1. an investor in a company

For an investor, the shift to XBRL offers several benefits. One such benefit is the ease at which financial data may be filtered and sorted as a result of the tags being applied to the financial report data. In addition, the tags offer consistency for comparing between different companies. The article refers to the ‘opaque measures’ and ‘confusing and at times misleading terminology’ that have been employed when communicating financial results. The consistent structure applied by XBRL allows for these to be overcome.

1. an analyst who monitors listed companies

The job of the analysts includes the task of following companies and making forecasts and recommendations based on financial and other information available in the market place. Conceivably, this process could be facilitated by XBRL. Which would allow for the data across companies and also across time to be more easily gathered and sorted.

1. Explain why the evolution of XBRL standards necessarily included:
   1. the accounting profession
   2. accounting software vendors
   3. the government.

These three bodies needed to be involved in the drafting of the standards for reasons of consistency and compliance. From a consistency perspective, there is an obvious need for any reporting framework to be compatible with the laws of the day and the practice of the profession. To this extent, software developers and vendors would need to interact with the accounting profession and government in order to develop and sell software that complied with professional practice and the relevant laws of the day.

The accounting profession’s involvement in the development of the XBRL framework is also critical. Afterall, it is accounting data to which the XBRL will be applied. This means that developers of the XBRL would need to be familiar with the accounting standards and accounting terms and key figures when developing their taxonomy. This would necessitate the involvement of the accounting profession.

The government would also need to be involved since the evolution of XBRL standards is necessarily based on existing accounting regulations and standards, which stem from government legislation. In addition, involvement of the government could assist in gaining support for the framework and the adoption of the framework once it is complete.