

CPA

Certified Public Accountant Examination

Stage: Foundation F2

Subject Title: F2.3 Information Systems

Revision Guide



INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS OF RWANDA
Driving Sustainable Performance

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STUDY TECHNIQUE

What is the best way to manage my time?

- Identify all available free time between now and the examinations.
- Prepare a revision timetable with a list of “*must do*” activities.
- Remember to take a break (approx 10 minutes) after periods of intense study.



What areas should I revise?

- Rank your competence from Low to Medium to High for each topic.
- Allocate the least amount of time to topics ranked as high.
- Allocate between 25% - 50% of time for medium competence.
- Allocate up to 50% of time for low competence.

How do I prevent myself veering off-track?

- Introduce variety to your revision schedule.
- Change from one subject to another during the course of the day.
- Stick to your revision timetable to avoid spending too much time on one topic.

Are study groups a good idea?

- Yes, great learning happens in groups.
- Organise a study group with 4 – 6 people.
- Invite classmates of different strengths so that you can learn from one another.
- Share your notes to identify any gaps.

EXAMINATION TECHNIQUES

INTRODUCTION

Solving and dealing with problems is an essential part of learning, thinking and intelligence. A career in accounting will require you to deal with many problems.

In order to prepare you for this important task, professional accounting bodies are placing greater emphasis on problem solving as part of their examination process.

In exams, some problems we face are relatively straightforward, and you will be able to deal with them directly and quickly. However, some issues are more complex and you will need to work around the problem before you can either solve it or deal with it in some other way.

The purpose of this article is to help students to deal with problems in an exam setting. To achieve this, the remaining parts of the article contain the following sections:

- Preliminary issues
- An approach to dealing with and solving problems
- Conclusion.

Preliminaries

The first problem that you must deal with is your reaction to exam questions.

When presented with an exam paper, most students will quickly read through the questions and then many will ... **PANIC!**

Assuming that you have done a reasonable amount of work beforehand, you shouldn't be overly concerned about this reaction. It is both natural and essential. It is natural to panic in stressful situations because that is how the brain is programmed.

Archaeologists have estimated that humans have inhabited earth for over 200,000 years. For most of this time, we have been hunters, gatherers and protectors.

In order to survive on this planet we had to be good at spotting unusual items, because any strange occurrence in our immediate vicinity probably meant the presence of danger. The brain's natural reaction to sensing any extraordinary item is to prepare the body for 'fight or flight'. Unfortunately, neither reaction is appropriate in an exam setting.

The good news is that if you have spotted something unusual in the exam question, you have completed the first step in dealing with the problem: its identification. Students may wish to use various relaxation techniques in order to control the effects of the brain's extreme reaction to the unforeseen items that will occur in all examination questions.

However, you should also be reassured that once you have identified the unusual item, you can now prepare yourself for dealing with this, and other problems, contained in the exam paper.

A Suggested Approach for Solving and Dealing with Problems in Exams.

The main stages in the suggested approach are:

1. Identify the Problem
2. Define the Problem
3. Find and Implement a Solution
4. Review

1. Identify the Problem

As discussed in the previous section, there is a natural tendency to panic when faced with unusual items. We suggest the following approach for the preliminary stage of solving and dealing with problems in exams:

Scan through the exam question

You should expect to find problem areas and that your body will react to these items.

PANIC!!

Remember that this is both natural and essential.

Pause

Take deep breaths or whatever it takes to help your mind and body to calm down.

Try not to exhale too loudly – you will only distract other students!

Do something practical

Look at the question requirements.

Note the items that are essential and are worth the most marks.

Start your solution by neatly putting in the question number and labelling each part of your answer in accordance with the stated requirements.

Actively reread the question

Underline (or highlight) important items that refer to the question requirements. Tick or otherwise indicate the issues that you are familiar with. Put a circle around unusual items that will require further consideration.

2. Define the Problem

Having dealt with the preliminary issues outlined above, you have already made a good start by identifying the problem areas. Before you attempt to solve the problem, you should make sure that the problem is properly defined. This may take only a few seconds, but will be time well spent. In order to make sure that the problem is properly defined you should refer back to the question requirements. This is worth repeating: Every year, Examiner Reports note that students fail to pass exams because they do not answer the question asked. Examiners have a marking scheme and they can only award marks for solutions that deal with the issues as stipulated in the question requirements. Anything else is a waste of time. After you have re-read the question requirements ask yourself these questions in relation to the problem areas that you have identified:

Is this item essential in order to answer the question?

Remember that occasionally, examiners will put ‘red herrings’ (irrelevant issues) into the question in order to test your knowledge of a topic.

What’s it worth?

Figure out approximately how many marks the problem item is worth. This will help you to allocate the appropriate amount of time to this issue.

Can I break it down into smaller parts?

In many cases, significant problems can be broken down into its component parts. Some parts of the problem might be easy to solve.

Can I ignore this item (at least temporarily)?

Obviously, you don’t want to do this very often, but it can be a useful strategy for problems that cannot be solved immediately.

Note that if you leave something out, you should leave space in the solution to put in the answer at a later stage. There are a number of possible advantages to be gained from this approach:

- 1) It will allow you to make progress and complete other parts of the question that you are familiar with. This means that you will gain marks rather than fretting over something that your mind is not ready to deal with yet.
- 2) As you are working on the tasks that you are familiar with, your mind will relax and you may remember how to deal with the problem area.
- 3) When you complete parts of the answer, it may become apparent how to fill in the missing pieces of information. Many accounting questions are like jigsaw puzzles: when

you put in some of the parts that fit together, it is easier to see where the missing pieces should go and what they look like.

3. Find and Implement a Solution

In many cases, after identifying and defining the problem, it will be easy to deal with the issue and to move on to the next part of the question. However, for complex problems that are worth significant marks, you will have to spend more time working on the issue in order to deal with the problem. When this happens, you should follow these steps:

Map out the problem

Depending on your preferred learning style, you can do this in a variety of ways including diagrams, tables, pictures, sentences, bullet points or any combination of methods. It is best to do this in a working on a separate page (not on the exam paper) because some of this work will earn marks. Neat and clearly referenced workings will illustrate to the examiner that you have a systematic approach to answering the question.

Summarise what you know about the problem

Make sure that this is brief and that it relates to the question requirements. Put this information into the working where you have mapped out the problem. Be succinct and relevant. The information can be based on data contained in the question and your own knowledge and experience. Don't spend too long at this stage, but complete your workings as neatly as possible because this will maximise the marks you will be awarded.

Consider alternative solutions

Review your workings and compare this information to the question requirements. Complete as much of the solution as you can. Make sure it is in the format as stipulated in the question requirements. Consider different ways of solving the problem and try to eliminate at least one alternative.

Implement a solution

Go with your instinct and write in your solution. Leave extra space on the page for a change of mind and/or supplementary information. Make sure the solution refers to your workings that have been numbered.

4. Review

After dealing with each problem and question, you should spend a short while reviewing your solution. The temptation is to rush onto the next question, but a few moments spent in

reviewing your solution can help you to gain many marks. There are three questions to ask yourself here:

Have I met the question requirements?

Yes, we have mentioned this already. Examiner Reports over the years advise that failure to follow the instructions provided in the question requirements is a significant factor in causing students to lose marks. For instance, easy marks can be gained by putting your answer in the correct format. This could be in the form of a report or memo or whatever is asked in the question. Likewise, look carefully at the time period requested. The standard accounting period is 12 months, but occasionally examiners will specify a different accounting period.

Is my solution reasonable?

Look at the figures in your solution. How do they compare relative to the size of the figures provided in the question?

For example, if Revenue were 750,000 and your Net Profit figure was more than 1 million, then clearly this is worth checking.

If there were some extraordinary events it is possible for this to be correct, but more than likely, you have misread a figure from your calculator. Likewise, the depreciation expense should be a fraction of the value of the fixed assets.

What have I learned?

Very often in exams, different parts of the solution are interlinked. An answer from one of your workings can frequently be used in another part of the solution. The method used to figure out an answer may also be applicable to other parts of your solution.

Conclusion

In order to pass your exams you will have to solve many problems. The first problem to overcome is your reaction to unusual items. You must expect problems to arise in exams and be prepared to deal with them in a systematic manner. John Foster Dulles, a former US Secretary of State noted that: *The measure of success is not whether you have a tough problem to deal with, but whether it is the same problem you had last year.* We hope that, by applying the principles outlined in this article, you will be successful in your examinations and that you can move on to solve and deal with new problems.

ASSESSMENT STRATEGY

Examination Approach

The examination seeks to test students' knowledge and understanding of the role and application, analysis and evaluation of Information Systems and Information Technology.

Question 1 is a case-study set within a real-life business context. This assesses the ability to transfer strategic and practical knowledge of Information Systems to a business situation. It also tests the ability to assimilate information, identify problems/issues and recommend appropriate solutions.

Question 2 is compulsory. This essay-type question facilitates the examination of a range of topics across different syllabus areas.

Question 3 to 6 have, as their major element, one of the main topic areas from the syllabus. Students are expected to demonstrate sufficient knowledge relating to technology and developments to effectively contribute to the formulation of an information technology strategy.

Examination Format

Examination Duration: 3 Hours

The examination is unseen, closed book.

It is divided into two sections. Section A is compulsory and consists of an unseen mini case-study for 25 marks and a second 15 mark question. Section B has four 20 mark questions. Students are required to answer 3 questions out of 4 from this section.

Marks Allocation

Question	Marks
1 Compulsory Question (Mini Case Study)	25
2	15
Choice of 3 questions out of 4	<u>60</u> (20 marks each)
Total	100

LEARNING RESOURCES

Core Texts

Laudon and Laudon, Management Information Systems - Global edition, Publ. Prentice Hall 2011 / ISBN 9780273754596 12th edition.

Manuals

Institute of Certified Public Accountants of Rwanda – F2.3 Information Systems

Supplementary Texts and Journals

O'Brien, Management Information Systems - A Managerial End-User Perspective (Irwin, International Student Edition).

Wright/Harcos, Micro Computer Applications in Accounting (McGraw Hill).

Useful Websites (as at date of publication)

<http://www.icparwanda.com/>

www.isc.ie - Information Society Commission.

www.isaca.org - Information Systems Audit and Control Association (ISACA).

www.bbc.co.uk/click - BBC's Technology Programme.

www.thedigitalhub.com - The Digital Hub Development Agency.

www.enterweb.org - The Knowledge Portal for Small Business.

www.clickz.com/stats/ - The Click Z Network.

F2.3 INFORMATION SYSTEMS
REVISION QUESTIONS AND SOLUTIONS

REVISION QUESTION 1

Define the term Group Decision Support System and explain how it can improve group decision-making. Identify four factors involved in the successful outcome of any group meeting?

(8 Marks)

SOLUTION

Beyond three to five attendees the traditional meeting process breaks down. GDSS software tools contribute to a more collaborative atmosphere by guaranteeing contributors' anonymity so that attendees can focus on evaluating the ideas themselves. The GDSS software tools follow structured methods for organising and evaluating ideas and for preserving the results of meetings, allowing non-attendees to locate needed information after the meeting.

The documentation of the meeting by one group at one site can also be used as input to another meeting on the same project at another site. If properly designed and supported, GDSS meetings can increase the number of ideas generated and the quality of decisions while producing the desired results in fewer meetings.

The nature of electronic meeting technology is only one of a number of factors that affect meeting processes and output. The outcome of group meetings depends upon the composition of the group, the manner in which the problem is presented to the group, the facilitator's effectiveness, the organisation's culture and environment, the quality of the planning, the cooperation of the attendees, and the appropriateness of tools selected for different types of meetings and decision problems.

REVISION QUESTION 2

What is customer relationship management? Why are customer relationship management systems so important for businesses?

(6 Marks)

SOLUTION

CRM systems capture and integrate customer data from all over the organization, consolidate the data, analyse them, and distribute the results to various systems and customer touch points across the enterprise. Well designed CRM systems provide a single enterprise view of customers that is useful for improving both sales and customer services. These systems also provide customers with a single view of the company regardless of what touch point the customer uses.

Benefits include: better customer service, make call centres more efficient, cross-sell products more effectively, help sales staff close deals faster, simplify marketing and sales processes, acquire new profitable customers, sell additional products and services, provide customer information for developing new products, increase product utilization, reduce sales and marketing costs, identify and retain profitable customers, optimise service delivery costs, retain high-lifetime value customers, improve customer loyalty, improve response rates to direct mail, increase product profitability, respond quickly to market opportunities.

REVISION QUESTION 3

What is an enterprise system and describe the benefits and challenges of using enterprise systems in an organisation.

(8 Marks)

SOLUTION

Enterprise systems focus on integrating the key internal business processes of the firm. Enterprise software is used by enterprise systems and is a set of integrated software modules for finance and accounting, human resources, manufacturing and production, and sales and marketing that allows data to be used by multiple functions and business processes.

Enterprise software consists of a set of interdependent software modules that support basic internal business processes. The software allows data to be used by multiple functions and business processes for precise organisational coordination and control. Organisations implementing this software would have to first select the functions of the system they wished to use and then map their business processes to the predefined business processes in the software. Some of the business processes supported by enterprise software include financial and accounting processes, human resources processes, manufacturing and production processes, and sales and marketing processes.

Benefits include creating an enterprise-enabled organisation, providing firm wide knowledge-based management processes, providing a unified information system technology platform and environment, and enabling more efficient operations and customer-driven business processes. Challenges include a daunting implementation process, surviving a cost-benefit analysis, inflexibility, and realising strategic value.

Companies can use enterprise systems to support organisational structures that were not previously possible or to create a more disciplined organisational culture. They can also improve management reporting and decision making. Furthermore, enterprise systems promise to provide firms with a single, unified, and all-encompassing information system technology platform and environment. Lastly, enterprise systems can help create the foundation for a customer-driven organisation.

Enterprise applications are very difficult to implement successfully. They require extensive organisational change, large new software investments, and careful assessment of how these systems will enhance organisational performance. Management vision and foresight are required to take a firm- and industry-wide view of problems and to find solutions that realise strategic value from the investment.

REVISION QUESTION 4

Explain why information systems are vulnerable to unauthorised access, abuse or fraud and describe the most common security threats against contemporary information systems.

(7 Marks)

SOLUTION

Computer systems tend to be more vulnerable to destruction, error, and fraud than manual systems for the following reasons:

- Data are stored electronically, where they are not immediately visible or easily audited.
- Data are concentrated in electronic files. Effects of a disaster such as a hardware malfunction, power outage, or fire can be more extensive. An organisation's entire record keeping system could be destroyed.
- There may not be a visible trail to indicate what occurred for every computer process.
- Operation of automated systems requires specialised technical expertise. Unless the systems are properly protected, it may be easy for programmers and computer operators to make unauthorised changes.
- Data files can be accessed and manipulated directly in online systems.
- Data can be stolen, corrupted or destroyed by hackers and computer viruses.
- Errors can be entered in data.
- Errors can be accidentally inserted when desired updates are installed.
- Many programs can be accessed through telecommunications, and telecommunications can produce errors in data transmission.
- Hardware and software can fail.
- Purposeful and accidental problems, such as programming and data errors, can occur.
- Individuals (or groups) can steal data, services, and equipment.

Key areas where systems are most vulnerable include: hardware or software failure and errors; personnel actions; terminal access penetration; fire or electrical hazards; user errors; theft of services, data, and equipment; program changes; and telecommunications problems.

REVISION QUESTION 5

List and describe four types of information systems controls that could be employed by an organisation to make their systems more secure.

(6 Marks)

SOLUTION

For protection, a company must institute good security measures, which will include firewalls, investigation of personnel to be hired, physical and software security and controls, antivirus software, and internal education measures. These measures are best put in place at the time the system is designed, and careful attention paid to them. A prudent company will engage in disaster protection measures, frequent updating of security software, and frequent auditing of all security measures and of all data upon which the company depends. Full protection may not be feasible in light of the time and expenses involved, but a risk analysis can provide insights into which areas are most important and vulnerable. These are the areas to protect first.

Information systems controls measures include:

- Application controls such as
 - Input controls check the data for accuracy and completeness when they enter the system. There are specific input controls for input authorisation, data conversion, data editing, and error handling.
 - Processing controls establish that data are complete and accurate during updating. Run control totals, computer matching, and programmed edit checks
 - Output controls ensure that the results of computer processing are accurate, complete, and properly distributed.
- Firewalls prevent unauthorised users from accessing internal networks. They protect internal systems by monitoring packets for the wrong source or destination, or by offering a proxy server with no access to the internal documents and systems, or by restricting the types of messages that get through, for example, email. Further, many authentication controls have been added for Web pages as part of firewalls.
- Intrusion detection systems monitor the most vulnerable points in a network to detect and deter unauthorised intruders. These systems often also monitor events as they happen to look for security attacks in progress. Sometimes they even can be programmed to shut down a particularly sensitive part of a network if it receives unauthorised traffic.
- Antivirus software is designed to check computer systems and drives for the presence of computer viruses. Often the software can eliminate the virus from the infected area. To be effective, antivirus software must be continually updated.

REVISION QUESTION 6

Explain how the Internet challenges the protection of individual privacy and intellectual property.

(8 Marks)

SOLUTION

Contemporary information systems technology, including Internet technologies, challenges traditional regimens for protecting individual privacy and intellectual property. Data storage and data analysis technology enables companies to easily gather personal data about individuals from many different sources and analyse these data to create detailed electronic profiles about individuals and their behaviours. Data flowing over the Internet can be monitored at many points. The activities of Web site visitors can be closely tracked using cookies, Web beacons, and other Web monitoring tools. Not all Web sites have strong privacy protection policies, and they do not always allow for informed consent regarding the use of personal information. This allows information that a user may have given voluntarily for a good purpose, for example logging into the New York Times site, to be shared with some other site. Spamming or e-mail that uses a user's e-mail address is another invasion of privacy. It should also be noted that Intellectual property is subject to a variety of protections under three different legal traditions:

- Trade secrets
- Copyright
- Patent law

Traditional copyright laws are insufficient to protect against software piracy because digital material can be copied so easily. Internet technology also makes intellectual property even more difficult to protect because digital material can be copied easily and transmitted to many different locations simultaneously over the Net. Web pages can be constructed easily using pieces of content from other Web sites without permission

REVISION QUESTION 7

What are the business advantages and disadvantage of cloud computing?

(6 Marks)

SOLUTION

Cloud computing is the idea of making computing resources available based on what a user really needs instead of what they might need.

The advantages include:

- Not dependent on physical location of either resources or users.
- Users access computing resources on their own not necessarily dependent on IT staff.
- Based on standard network and Internet devices.
- Resources serve multiple users with computing virtually assigned according to need.
- Resources are increased or decreased according to demand.
- Charges are based on the amount of resources actually used.
- Large investments in IT infrastructure are not necessarily needed or investments are significantly reduced.
- Firms can shift additional processing requirements to cloud computing during peak business periods.
- It allows a more flexible IT infrastructure.

The disadvantages include:

- Responsibility for data storage and control is transferred away from the organization to a third party.
- Security risks and chances of data compromises are increased.
- Risk diminishing system reliability.
- Increase dependency on a third party making everything work.
- Huge investments in proprietary systems supporting unique business processes may be at risk.

REVISION QUESTION 8

Define the term 'outsourcing' and explain the benefits and possible drawbacks of outsourcing the development of this system to an external organisation.

(8 Marks)

SOLUTION

Outsourcing is subcontracting a process, such as product design or manufacturing, to a third-party company. Outsourcing of information systems is the process of subcontracting the development and sometimes the operation of information systems to a third party company who provide these services. The work is done by the vendor rather than the organisation's internal information systems staff. The decision to outsource is often made in the interest of lowering firm costs, redirecting or conserving energy directed at the competencies of a particular business, or to make more efficient use of labour, capital, technology and resources.

Organisations that outsource are seeking to realise benefits or address the following issues:

- Cost savings. The lowering of the overall cost of the service to the business. This will involve reducing the scope, defining quality levels, re-pricing, re-negotiation, cost restructuring. Access to lower cost economies through offshoring generated by the wage gap between industrialised and developing nations.
- Cost restructuring. Operating leverage is a measure that compares fixed costs to variable costs. Outsourcing changes the balance of this ratio by offering a move from fixed to variable cost and also by making variable costs more predictable. Improve quality. Achieve a step change in quality through contracting out the service with a new Service Level Agreement.
- Operational expertise. Access to operational best practice that would be too difficult or time consuming to develop in-house.
- Staffing issues. Access to a larger talent pool and a sustainable source of skills.
- Capacity management. An improved method of capacity management of services and technology where the risk in providing the excess capacity is borne by the supplier.
- Catalyst for change. An organisation can use an outsourcing agreement as a catalyst for major step change that cannot be achieved alone. The outsourcer becomes a Change agent in the process.
- Reduce time to market. The acceleration of the development or production of a product through the additional capability brought by the supplier.

- Risk management. An approach to risk management for some types of risks is to partner with an outsourcer who is better able to provide the mitigation.
- Time zone. A sequential task can be done during normal day shift in different time zones - to make it seamlessly available 24x7. Same/similar can be done on a longer term between earth's hemispheres of summer/winter.
- Customer Pressure. Customers may see benefits in dealing with your company, but are not happy with the performance of certain elements of the business, which they may not see a solution to except through outsourcing.

Possible drawbacks include:-

- Quality of service
- Productivity
- Staff turnover
- Failure to deliver business transformation
- Security
- Qualifications of outsourcers

Note: Candidates should define IT outsourcing and describe three advantages and three drawbacks.

REVISION QUESTION 9

Describe the core activities in the systems development process.

(8 Mark)

SOLUTION

This is a formal methodology/process for managing the development of systems and is still the principal methodology for medium and large projects. The overall development process is partitioned into distinct stages, each of which consists of activities that must be performed in fashion and implement an information system. The stages are usually gone through sequentially with formal “sign-off” agreements among end users and data processing specialists to validate that each stage has been completed. Users, managers, and data processing staff have specified responsibilities in each stage. The approach is slow, expensive, inflexible, and is not appropriate for many small desktop systems.

A typical development process or systems life cycle consists of systems analysis, systems design, programming, testing, conversion, and production and maintenance. Systems analysis is the phase where the problem that the organisation is trying to solve is analysed. Technical specialists identify the problem, gather information requirements, develop alternative solutions, and establish a project management plan. Business users provide information requirements, establish financial or operational constraints, and select the solution. During systems design, technical specialist’s model and document design specifications and select the hardware and software technologies for the solution. Business users approve the specifications.

During the programming phase, technical specialists translate the design specifications into software for the computer. During the testing phase, technical specialists develop test plans and conduct unit, system and acceptance tests. Business users provide test data and scenarios and validate test results.

During the conversion phase, technical specialists prepare a conversion plan and supervise conversion. Business users evaluate the new system and decide when the new system can be put into production. During the production and maintenance phase, technical specialists evaluate the technical performance and perform maintenance. Business users utilise the system and evaluate its functional performance.

Summary of above:

- Feasibility Study – cost benefit – recommendation – various type of feasibility
- Analysis Stage user input – information gathering – questionnaires, interviews, observation, records
- Logical Design – what in terms of data, processes, information

- Physical Design – how in terms of hardware, software, data structures etc
- Development – coding and testing
- Implementation – types of implementation procedures
- Maintenance – reasons for – errors, environmental and internal requirements

REVISION QUESTION 10

Define information system prototyping and the benefits and limitations of it as a systems development method.

(6 Marks)

SOLUTION

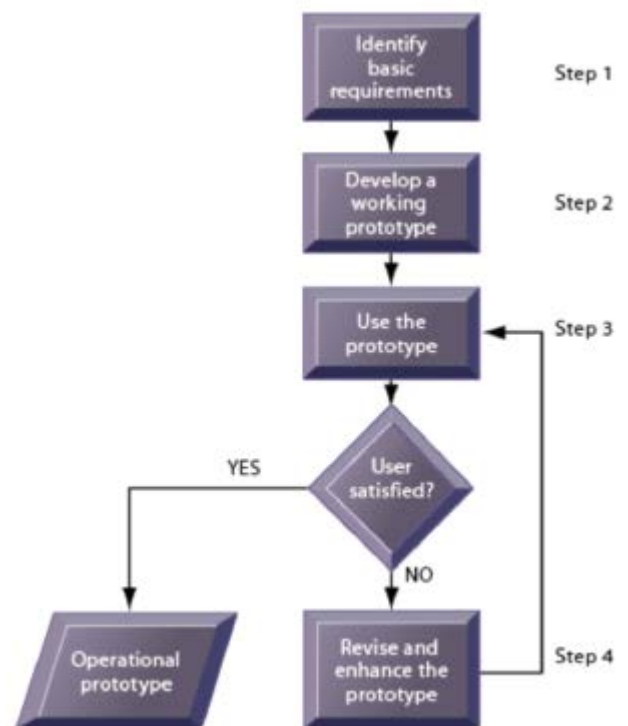
Prototyping is the process of building an experimental system quickly and inexpensively for demonstration and evaluation so that end users can better define information requirements. The prototype is a preliminary model that is refined until it meets end-user requirements. The process of repeating the steps to build a system over and over again is called an iterative process. Prototyping is more explicitly iterative than the conventional life cycle and it actively promotes system design changes.

The four-step model of the prototyping process consists of the following:

1. Identify the user's basic requirements
2. Develop a working prototype
3. Use the prototype
4. Revise and enhance the prototype

The process of developing a prototype can be broken down into four steps. Because a prototype can be developed quickly and inexpensively, systems builders can go through several iterations, repeating steps 3 and 4, to refine and enhance the prototype before arriving at the final operational one.

Prototyping is most useful when some uncertainty exists about user requirements or a design solution. It is especially valuable for the design of the end-user interface of an information system such as on-line display and data entry screens. End-user involvement means that the system is more likely to fill user requirements. However, rapid prototyping can gloss over essential programming and documentation steps, or be poorly designed for large quantities of data.



THE PROTOTYPING PROCESS

REVISION QUESTION 11

What is the function of risk assessment and how is it carried out information systems?

(7 Marks)

SOLUTION

A risk assessment determines the level of risk to the firm if a specific activity or process is not properly controlled. Business managers working with information systems specialists can determine the value of information assets, points of vulnerability, the likely frequency of a problem, and the potential for damage.

Security risk analysis involves determining what you need to protect, what you need to protect it from, and how to protect it. It is the process of examining all of the firm's risks, and ranking those risks by level of severity. This process involves making cost-effective decisions on what you want to protect. The old security adage says that you should not spend more to protect something than it is actually worth. A full treatment of risk analysis is outside the scope of this section; however, there are two elements of a risk analysis that should be briefly covered:

1. Identifying the assets
2. Identifying the threats.

For each asset, the basic goals of security are availability, confidentiality, and integrity. Each threat should be examined with an eye to how the threat could affect these areas. One step in a risk analysis is to identify all the things that need to be protected. Some things are obvious, like all the various pieces of hardware, but some are overlooked, such as the people who actually use the systems. The essential point is to list all things that could be affected by a security problem.

Here is an example list of categories:

- Hardware: keyboards, terminals, workstations, personal computers, printers, disk drives, communication lines, terminal servers, routers.
- Software: source programs, object programs, utilities, diagnostic programs, operating systems, communication programs.
- Data: during execution, stored online, archived off-line, backups, audit logs, databases, and in-transit over communication media.
- People: users, people needed to run systems.
- Documentation: on programs, hardware, systems, and local administrative procedures.
- Supplies: paper, forms, ribbons, and magnetic media.

Once the assets requiring protection are identified, it is necessary to identify threats to those assets. The threats can then be examined to determine what potential for loss exists.

REVISION QUESTION 12

Distinguish between unstructured, semi-structured and structured decisions.

(6 Marks)

SOLUTION

Unstructured decisions are those in which the decision maker must provide judgment, evaluation, and insights into the problem definition. Each of these decisions is novel, important, and non-routine, and there is no well understood or agreed-on procedure for making them. An example of a structured decision might concern whether to launch a new product or whether to invest in a particular country. Structured decisions are repetitive and routine, and decision makers can follow a definite procedure for handling them to be efficient. A structured decision might concern staff scheduling. Many decisions have elements of both and are considered semi-structured decisions, in which only part of the problem has a clear-cut answer provided by an accepted procedure. In general, structured decisions are made more prevalent at lower organisational levels, whereas unstructured decision making is more common at higher levels of the firm. Semi-structured decisions are decisions in which some aspect of the problem are structured and others are unstructured.

REVISION QUESTION 13

Name and describe six principal electronic payment systems used on the Internet.

(6 Marks)

SOLUTION

The electronic payment systems include digital credit card payment, digital wallet, accumulated balance payment, stored value payment systems, digital cash, peer-to-peer payment systems, digital checking, and electronic billing presentment and payment.

Digital credit card payment systems provide secure services for credit card payments on the Internet and protect information transmitted among users, merchant sites, and processing banks.

Digital wallets store credit card and owner identification information and provide these data automatically during electronic commerce purchase transactions.

Accumulated balance payment systems accumulate micro-payment purchases as a debit balance that must be paid periodically on credit card or telephone bills.

Stored value payment systems enable customers to make instant online payments from a value stored in a digital account. A smart card is a credit card-size plastic card that stores digital information and can be used for electronic payments.

Digital cash is an electronic form of currency, moves outside the normal network of money, and is used for micropayments or larger purchases.

A peer-to-peer payment system is an electronic payment system for people who want to send money to vendors or individuals who are not set up to accept credit card payments.

An electronic billing presentment and payment system is used to pay routine monthly bills; it allows users to view their bills electronically and pay them through electronic funds transfers from bank or credit card accounts.