

INFORMATION SYSTEMS

FORMATION 2 EXAMINATION - AUGUST 2015

NOTES:

Section A - You are required to answer Questions 1 and 2.

Section B - You are required to answer any **three** out of Questions 3 to 6.

Should you provide answers to all of Questions 3 to 6, you must draw a clearly distinguishable line through the answer not to be marked. Otherwise, only the first three answers to hand for these four questions will be marked.

TIME ALLOWED:

3 hours, plus 10 minutes to read the paper.

INSTRUCTIONS:

During the reading time you may write notes on the examination paper but you may not commence writing in your answer book. **Please read each Question carefully.**

Marks for each question are shown. The pass mark required is 50% in total over the whole paper.

Start your answer to each question on a new page.

You are reminded to pay particular attention to your communication skills and care must be taken regarding the format and literacy of your solutions. The marking system will take into account the content of your answers and the extent to which answers are supported with relevant legislation, case law or examples where appropriate.

List on the cover of each answer booklet, in the space provided, the number of each question attempted.

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Time Allowed: 3 hours, plus 10 minutes to read the paper.

SECTION A

Answer **BOTH** Question 1 and Question 2 in this Section.

(Both Compulsory)

1. Airlie Ltd is an online travel website, offering customers the ability to search for the best deals across a range of comparison sites and provider websites, and then to book and pay online through Airlie Ltd. Currently, it offers hotel accommodation, car hire and a limited number of excursions. Despite being a reasonably late entrant to the market, the company's brand recognition, sales and market share has grown substantially over the past two years. However, the business has yet to make a profit in this competitive market. Airlie Ltd's business model is primarily based on referral fees – when a customer books accommodation or car hire with a third party provider through the company's website, a small percentage of the total price is retained by Airlie Ltd. This accounts for approximately 85% of all revenues. Other revenue streams include onsite advertising (10% of revenue) and 'pay per click' arrangements with one hotel group (attracting a lower margin but high volume, and making up 5% of revenue).

The company has recently secured a substantial venture capital investment and intends to use this to grow the business further, aware that in this competitive, low-margin marketplace, increasing turnover is essential to survival and profitability. Options to achieve this include acquiring a smaller competitor (Hamilton); diversifying the product offering to include travel incidentals such as travel insurance, airport transfers and airport parking (which attract higher margins); a major advertising campaign (the specifics of which have not yet been discussed); and/or an investment in business intelligence and business analytics.

Airlie Ltd's Chief Executive, Hugh Whitsunday, is convinced that the need for action is clear: *"business intelligence and business analytics could bring tangible benefits as we seek to grow. Even if we acquire a competitor, even if we diversify the product offering, we just don't have the detailed information we need to understand our customers, their buying habits and how we can engage more with those existing customers"*.

Jane Whitehaven, Airlie Ltd's new Head of Marketing, is also keen to generate repeat business from existing customers, and has been critical of her predecessor's efforts in this area: *'our competitors – Reef, Hayman – have engaged much more with social commerce and social marketing than we have. Paying for a few online ads on search engines, drives some traffic to the site, but in this marketplace we need to do more!'*

REQUIREMENT:

Candidates are asked to address the following, based on a critical analysis of the case study above.

- (a) Comment on Hugh Whitsunday's statement that *"business intelligence and business analytics could bring tangible benefits as we seek to grow"*.
(6 marks)
- (b) Suggest how business intelligence and business analytics tools could be used to achieve such benefits.
(10 marks)
- (c) Assess the possible opportunities for Airlie Ltd arising from social commerce and social network marketing, and to what extent these may be appropriate for this organisation.
(9 marks)

[Total: 25 Marks]

- 2.** Write briefing notes on any **THREE** of the following topics. In each case your note should include a summary of the main points relating to the topic.
- (a) Formal planning and control tools in implementing information systems.
 - (b) Systems analysis in implementing Supply Chain Management software.
 - (c) Business-to-business e-commerce for a large business that purchases components.
 - (d) Moral dimensions of information systems for an e-tailer.
 - (e) Business benefits of collaboration in a professional services firm. (Each part carries 5 marks.)

[Total: 15 Marks]

SECTION B

Answer **ANY THREE** of the four questions in this Section.

- 3.**
- (a) Porter's model suggests five competitive forces that influence the success of the firm. Assess the extent to which Information Systems can support the generic strategies used to address such competitive forces. (6 marks)
 - (b) Using the example of an online retailer to illustrate your answer, discuss the impact of Information Systems on the value chain of a business. (8 marks)
 - (c) Outline the steps involved in business process management and the usefulness of such an approach in dealing with Information Systems change. (6 marks)

[Total: 20 Marks]

- 4.**
- (a) Contrast Decision Support Systems with Group Decision Support Systems, explaining and giving examples of each. (10 marks)
 - (b) Suggest possible challenges in implementing Group Decision Support Systems. (4 marks)
 - (c) Explain the term eXtensible Business Reporting Language (XBRL) and its usefulness in communicating financial information within organisations. (6 marks)

[Total: 20 Marks]

- 5.**
- (a) Explain what is meant by the term Enterprise Resource Planning (ERP) systems, and outline the options available to an organisation deciding to acquire ERP software. (6 marks)
 - (b) It is suggested that Enterprise Resource Planning (ERP) systems improve efficiency and customer satisfaction. Why might this be the case? You should illustrate your answer with examples. (6 marks)
 - (c) Assess the competitive forces model for IT infrastructure investment and its usefulness in explaining the value of IT infrastructure investment. (8 marks)

[Total: 20 Marks]

- 6.** (a) Discuss the three main categories of cloud-based services, giving examples of each. (9 marks)
- (b) Suggest possible reasons for the growing popularity of cloud-based Customer Relationship Management (CRM) software. (5 marks)
- (c) Explain two possible conversion strategies that could be adopted by an organisation moving to a new, cloud-based system, suggesting advantages and disadvantages of each. (6 marks)

[Total: 20 Marks]

END OF PAPER

SUGGESTED SOLUTIONS

THE INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS IN IRELAND

INFORMATION SYSTEMS

FORMATION 2 EXAMINATION - AUGUST 2015

SOLUTION 1

Purpose: To examine the candidate's understanding of: business intelligence and business analytics, and the usefulness of such tools in the scenario described; relevant tools for use in the scenario described; the impact of social media on the information gathered and disseminated by organisations; and how social media could be used in the context of the scenario described.

Links: P2 Strategy and Leadership.

Options: Candidates must answer all parts of the question. Answers should not vary significantly from those given below.

Essential components: Candidates must be able to show a depth of understanding of the areas identified above (under Purpose).

- (a) Candidates are expected to define business intelligence and business analytics, and to evaluate the given statement by suggesting the possible benefits for Airlie Ltd and other issues which need to be considered if such benefits are to be achieved.

Business intelligence is a vendor defined term used to describe the infrastructure for warehousing, integrating, reporting and analysing data that comes from the business environment, including big data. The infrastructure collects, stores, cleans, and makes relevant information available to managers, and may include databases, data warehouses, data marts, Hadoop and analytic platforms.

Business analytics is also a vendor-defined term relating to the tools and techniques for analysing and understanding data, including online analytical processing (OLAP), statistics, models and data mining. At its core, business intelligence and analytics are about integrating all the information streams produced by a firm into a single, coherent, enterprise-wide set of data, and then, using modelling, statistical analysis tools and data mining tools to make sense out of all these data so managers can make better decisions and better plans, or at least know quickly when their firms are failing to meet planned targets.

BI and BA can be beneficial to the firm in gathering, storing and analysing the organisation's own data (possibly in combination with externally-sourced data) to better understand factors that are important to their business, including customer behaviour. It can provide a basis for more informed, and hopefully better business decision making on a range of issues. By providing better information on customer and business line profitability, Airlie Ltd can target marketing to customers (to secure repeat custom or encourage customers to book more with them at each transaction) and develop their business line offerings based on customer preferences. Decisions on new business lines could be informed by analysis of data on existing lines, and evaluated on the basis of scenario modelling.

However Airlie Ltd should also consider that business intelligence infrastructure and business analytics tools normally require a considerable investment and ongoing cost for the business. The infrastructure and systems bought will only lead to benefits being achieved if the data being fed into these systems is clean, reliable and relevant. Similarly, benefits will only be seen if the management team at Airlie Ltd is involved, and capable of asking intelligent questions and analysing the data they receive. Management and broader users need to receive information from these tools in an appropriate way, for example through an integrated delivery platform that integrates a range of information and brings it to the manager's desktop or mobile platform in a reliable, timely and easy to use way.

2 marks for defining BI/BA, 4 marks for evaluating the possible benefits, relevant to Airlie Ltd.

- (b) Production reports: These are pre-defined reports which are specific to the industry and to a functional area of the business, for example, for Airlie Ltd, such reports might include: customer satisfaction reports; call centre resolution rate reports; marketing related reports on campaign effectiveness; loyalty and attrition; market basket analysis; direct and indirect spending.

Parameterized Reports: users enter several parameters as in a pivot table to filter data and isolate impacts of parameters. An example for Airlie Ltd might be identifying how sales vary by region and date/season, which might lead to different advertising campaigns in different regions.

Dashboards/Scorecards: visual tools for presenting performance data defined by users. Such dashboards/scorecards could be used by Airlie Ltd to give users, particularly senior managers, an overview of the most important metrics for the business.

Ad hoc query/search/report creation: functions that allow users to create their own reports based on queries and searches, i.e. not just to run the reports predefined by the vendor or at the time of installation. These would normally be run by managers or business analysts in response to their specific queries such as, for example, investigating sales in a subsection of a region to inform future marketing strategy.

Drill down: the ability to move from a high-level summary to a more detailed view. For example, to be able to see sales per region, then to drill down into sales for a particular region to see more detail such as bookings by day of the week, value of bookings, combination of services booked.

Forecasts, scenarios, models: these include the ability to perform linear forecasting, what-if scenario analysis, and analyse data using standard statistical tools. Predictive analytics use statistical analysis, data mining techniques, historical data and assumptions about future conditions to predict future trends and behaviour patterns. Variables that can be measured to predict future behaviour are identified, and a collection of such predictors is combined into a predictive model for forecasting future probabilities with an acceptable level of reliability. One possible use for Airlie Ltd might be to predict response to a direct marketing campaign. By identifying customers less likely to respond, Airlie Ltd can lower its marketing costs by ignoring these customers and focussing on those more likely to respond.

An alternative use of modelling is the use of big data analytics, whereby an organisation uses the information it holds on its customers (possibly including information from previous purchases, social networks and signals from around the web), together with a database of information on other individuals, to deliver customised recommendations to individual users based on their specific set of tastes. An example might be eBay's use of Hunch.com. For Airlie Ltd, such prediction technology could be used to suggest additional services or particular services based on a customer's previous purchases – such as suggesting 4/5 star hotels, or higher-specification car rental.

2 marks per suggestion(to a maximum of 10 marks), well explained and with a clear example relevant to Airlie Ltd.

- (c) Social commerce includes a number of features which could be beneficial to Airlie Ltd as the organisation seeks to grow.

Social sign-on refers to websites allowing users to sign into their sites through social network sites, such as Facebook. This would allow Airlie Ltd to receive valuable social profile information from Facebook, which can then be data mined and used to target marketing, make product recommendations, or to build a relationship with the customer. While such information may be particularly useful to Airlie Ltd, an investment in infrastructure and tools would be necessary to gather, store, and analyse the information gathered. This could involve a significant cost which would need to be carefully weighed against possible benefits.

Network notification creates an environment where customers can share their approval or disapproval of a product, services or a brand. Examples include the Facebook like button on Google's +1, encouraging customers to visit, for example, Airlie Ltd's Facebook page and 'like' the organisation their approval is shared with their friends on that network. Twitter can also be used as a rapid means of responding to customer questions, comments and even complaints. By encouraging customers to follow the brand, brand identity can be developed, relationships built and useful content generated (where text mining is used on feedback from followers on twitter, social networks and related sites). While this also means negative feedback is more visible, some research indicates that even this may be useful in offering the organisation a chance to respond to such feedback, develop products and services and may lead to a perception of the organisation as transparent and listening to their customers. Such information can be useful to Airlie not solely for marketing purposes but also in making decisions about their product offering, and continuing supplier relationships. Again the organisation would need to think

carefully about the costs of infrastructure and tools, and the possible negative effects of a public platform for comments and complaints (especially given that they sell services which are provided by a third party, meaning they may have limited control over the quality of the service ultimately provided).

Collaborative shopping involves creating an environment where customers can share their shopping experiences with one another by viewing products, chatting, or texting. For Airlie Ltd it might be useful to link these conversations to social networking sites to allow friends to chat about Airlie Ltd's brand and products, for example through talking about a particular destination. Similarly, social search (recommendations) enables an environment where consumers can ask their friends for advice on the purchase of products and services. Allows the users to identify products and evaluate these based on the evaluations of their friends (or friends of friends). Social recommender tools can use a customer's social profile to recommend products. For Airlie Ltd, this might include linking to friends who have visited or are a 'destination expert' for a particular area, or have previously bought a particular service. However a difficulty of these approaches is that their use is dependent on friends having using Airlie Ltd's services or visited these destinations.

Social marketing can include activities designed to shape perceptions of the brand, solidify customer relationships, promote particular products or officers, and can be augmented by a range of tools to assess the usefulness of such marketing. For example, Airlie Ltd could promote its Facebook page through advertising, pay for promoted Tweets or promoted trends on Twitter, meaning that these are displayed more prominently, and designed to increase awareness of the brand and drive traffic to the website. Online advertisements on other sites could also be used to promote the brand's Facebook page or Twitter account – usually with users clicking on the advertisement and being taken to the relevant page. Airlie Ltd could then use customer relationship management software to track engagement and ultimately purchases, identifying who purchased, how much they spent, what they purchased. This information could then be used to evaluate conversion rates and overall return from the particular campaign, and to provide useful information for further campaigns. Relevant costs would include the costs of advertising and purchase of software and infrastructure to analyse data generated. A particular concern might be to ensure that Airlie Ltd is well equipped as an organisation and that its systems are sufficiently robust to respond to the hoped-for increase in demand.

3 marks per suggestion (to a maximum of 9 marks), well explained and with a clear example relevant to Airlie Ltd.

SOLUTION 2

Tutorial Notes: -

Purpose: Responses for each question are expected to include a summary of the main facts relating to the topic.

Links: P2 Strategy and Leadership.

Options: Candidates should answer three of the five parts/sub-questions

Essential components: Each sub-question has an aspect that allows the student to show what they know about a broad topic. Each also provides an opportunity for candidates to show they understand the relevance of the broad topic in a specific context. In general, 5 key points are expected on each sub-question for the 5 marks. 4 of these could be general points but must be relevant.

- (a) Formal planning and control tools may be used in documenting and monitoring project plans, and include Gantt charts and PERT charts. Gantt charts list project activities and their corresponding start and completion dates. They visually represent the timing and duration of different tasks in a development projects as well as their human resource requirements. It shows each task as a horizontal bar whose length is proportional to the time required to complete it. However Gantt charts do not depict task dependencies and how tasks are affected if one is behind schedule or how tasks should be ordered. A PERT chart on the other hand graphically depicts tasks and their interrelationships. It shows, as a network diagram, the activities that make up a project and the activities that must be complete before other specific activities can start. Within the diagram, each activity is represented by a node, which is numbered and shows the task, duration, start and completion date. Arrows between nodes indicate the sequence of tasks. In practice, both types of charts may be used to explain complex projects.

Documenting project plans in this way can be useful to identify bottlenecks and the impact of problems on project completion times. This may be particularly relevant in the implementation of complex Information Systems change. They can help systems developers partition projects into smaller, more manageable segments with defined, measurable business results. Progress can then be monitored against these plans.

(5 marks)

- (b) Systems analysis is the analysis of a problem that a firm tries to solve with an information system. It consists of defining the problem, identifying its causes, and specifying the solutions, and identifying the information requirements that must be met by a system solution.

It begins by identifying the primary owners and users of data along with the existing hardware and software, and details the problems associated with the existing systems. For supply chain management, this might include issues around stockouts, overstock, and issues in procurement due to the lack of timely or accurate information.

Objectives would then be set of what a solution – such as a new information system or improvement of the existing system - should achieve. For example, this may be in terms of reducing stockholding levels. A number of possible solutions would normally be suggested, and the organisation would assess the feasibility of each: identifying whether the proposed solution is feasible, or achievable, from a financial, organisational, and technological standpoint. A written systems proposal report describes the suggested costs, benefits, advantages and disadvantages of each alternative.

Within this process it is important to define the information requirements that must be met by the solution – identifying who needs what information where, when and how. Requirements analysis carefully defines the objectives of the new or modified system and develops a detailed description of the functions that the new systems must perform.

Faulty analysis is a leading cause of systems failure and high systems development costs. A system designed around the wrong set of requirements will either have to be discarded because of poor performance or will need to undergo major modifications: for example, a supply chain management system which does not adequately specify the requirements for information around delivery lead times, stockholding requirements. Similarly, where management's analysis of the proposed solutions does not reflect correct assumptions around the realistic feasibility of the software (including the technological and organisational implications) wrong decisions may be made and suboptimal software selected.

(5 marks)

- (c) Business-to-business (B2B) e-commerce is the term used to describe electronic sales of goods and services between businesses. It is a large and growing market, and suggested benefits of transacting in this way include reduced human intervention in procurement (leading to costs savings and possibly greater accuracy); reduced administrative overhead relating to procurement (further cost savings); optimised stock holding levels; and stronger supplier relationships. B2B e-commerce is increasingly being facilitated by internet-enabled mechanisms.

B2B e-commerce can be facilitated through electronic data interchange (EDI): the direct computer-to-computer exchange between two organisations of standard business transactions such as orders, shipment instructions or payments. Transactions are automatically transmitted from one information system to another through a network, eliminating the printing and handling of paper copies at one end and the inputting of data at the other. Major industries usually have EDI standards that define the structure and information fields of electronic documents for that industry. In addition, EDI can be used as a system for continuous replenishment, giving suppliers online access to selected parts of the purchasing firm's production and delivery schedules to automatically ship materials and goods. EDI can be mediated through a private network, however web-enabled EDI is becoming much more common as an increasingly low-cost and flexible alternative. For component procurement, businesses can use the internet to locate the lowest cost supplier, search online catalogues of supplier products, negotiate with suppliers, place orders a, make payments and arrange transportation.

Internet technology can be used to create extranets or electronic marketplaces for linking to other businesses for purchase transactions. These could include the use of private industrial networks or private exchanges, where a large firm uses a secure website to link to key suppliers and other partners. The site is controlled by the purchasing firm and allows for the secure sharing of detailed information on product design and development, marketing, production scheduling, inventory management and unstructured communication. An example is VW group supply.

Alternatively, net marketplaces (or e-hubs) provide a single, digital marketplace based on net technology for many different buyers and sellers, either owned and operated as independent intermediaries or industry operated. Participants in net marketplaces can establish prices through online negotiations, auctions, requests for quotations or fixed prices. Some net market places support contractual purchasing based on long term relationships with designated suppliers – Exostar is an example of an industry-owned (aviation) net marketplace that supports this. Others, particularly independently owned third-party net marketplaces connect buyers and suppliers for spot purchasing based on immediate needs.

(5 marks)

- (d) Five moral dimensions, reflecting ethical, social and political issues have been suggested in respect of information systems:

- Information rights and obligations: what information rights do individuals and organisations possess with respect to themselves? What can they protect? For example: how can customers' confidential data (e.g. credit card details) be protected when entered on the website?
- Property rights and obligations: how will traditional intellectual property rights be protected in a digital society in which tracing and accounting for ownership are difficult and ignoring property rights is so easy? For example: how can proprietary assets – including databases of customer information - be protected from attack through the website?
- Accountability and control: who can and will be held accountable and liable for the harm done to individual and collective information and property rights? For example: are clear policies and procedures in place to prevent/detect data breach?
- System quality: what standards of data and system quality should we demand to protect individual rights and the safety of society? For example: what processes and controls should be put in place to secure data/prevent access/ensure continuity of service?
- Quality of life? What values should be preserved in an information and knowledge-based society? What institutions should we protect from violation? What cultural values and practices are supported by the new information technology? For example: to what extent does the online content need to be made accessible to users? What impact will a 24 hour online presence have on staff?

(5 marks)

- (e) Collaboration is defined as working with others to achieve shared and explicit goals. It focusses on task or mission accomplishment and usually takes place within an organisation, or may take place between organisations. It may be short or long-term and involved one-to-one or many-to-many interactions. Benefits include:
- Productivity: people interacting and working together can capture expert knowledge and solve problems more quickly than the same number of people working in isolation from each other. There will be fewer errors. Examples might include the use of tax experts on complex audit engagements or due diligence procedures.
 - Quality: people working collaboratively can communicate errors, and corrective actions faster than if they work in isolation. Collaborative and social technologies help reduce time delays in design and production. Examples might include the use of multi-level and multi-specialism teams with differing expertise engaging more closely and raising issues more quickly.
 - Innovation: people working collaboratively can come up with more innovative ideas for products, services, and administration than the same number working in isolations from one another. Advantages include diversity and the wisdom of crowds. Examples include the diversity of client experiences which may lead to different ideas and approaches being shared among the group.
 - Customer service: people working together using collaboration and social tools can solve customer complaints and issues faster and more effectively than if they were working in isolation from each other. Examples include faster responses to client queries, working to deadlines and faster sharing of results of work done.
 - Financial performance: as a result of these, collaborative firms have superior sales, superior sales growth and financial performance. Examples might include repeat business on ad hoc transaction services or retention on audit engagements.

(5 marks)

canidates to answer a maximun of three parts.

[Total: 15 marks]

SECTION B

SOLUTION 3

Tutorial Notes: -

Purpose: To examine the candidate's understanding of: the use of information systems strategies in responding to global competitive forces (and particularly the strategies associated with such a response); the effect of internet technologies on business operations, as explored through the value chain; and business process management as a means to effect Information Systems change.

Links: P2 Strategy and Leadership.

Options: Candidates must answer all parts of the question. Answers should not vary significantly from those given below.

Essential components: Candidates must be able to show a depth of understanding of the areas identified above (under Purpose).

- (a) Candidates are expected to demonstrate both their understanding of the four generic strategies and how information systems can assist in implementing such strategies.

Low-cost leadership: securing competitive advantage by keeping costs low. IS can assist in a range of ways, including: providing real-time, accurate information that facilitates cost monitoring and control; reducing processing times with increasing automation; minimising stock-holding by enabling better forecasting and replenishment. Other relevant suggestions and examples are acceptable.

Product differentiation: securing competitive advantage by differentiating products from the offerings of competitors. IS can assist by, for example: using stored information to develop a more personalised, or faster, shopping experience for customers; using proprietary technology to enhance the product/buying experience. Other relevant suggestions and examples are acceptable.

Focus on market niche: securing competitive advantage by serving a target market better than competitors. IS can assist by using (perhaps data mining) stored information on the target market to: develop a more personalised, or faster, shopping experience for customers; facilitate targeted marketing; utilise Customer Relationship Management software; engage in customer profitability (or risk) analysis. Other relevant suggestions and examples are acceptable.

Strengthening customer and supplier intimacy: securing competitive advantage by developing loyalty with customers and suppliers. IS can assist by: using stored information as suggested above; facilitating Electronic Data Interchange between the organisation and its customers and suppliers (for example, allowing suppliers access to production schedules and stock levels); utilising Customer Relationship Management or Supply Chain Management software (affecting switching costs). Other relevant suggestions and examples are acceptable.

2 marks for detailing the four strategies,

4 marks for a clear explanation of how IS can be used in implementing the strategy.

- (b) Candidates are expected to discuss the value chain and its components, and to clearly explain the effect of the internet on the value chain, using examples relevant to an online retailer.

Candidates should begin by discussing the value chain model, as a series or chain of basic activities that add a margin of value to a firm's products or services. It allows organisations to highlight the specific activities where competitive strategies can be applied, and in the context of information systems, the specific, critical leverage points where a firm can use information technology most effectively to enhance its competitive position. For an online retailer, it may be particularly important to evaluate business activities and how these may be impacted upon by internet technologies.

The value chain highlights primary activities (those most directly related to the production and distribution of the firm's products and services, which create value for the customer) and support activities (those that make the delivery of the primary operations possible).

Primary activities include:

Inbound logistics: receiving and storing materials for distribution to production. Possible IS usage: automated warehousing systems are crucial for an online retailer for efficient stock management and good customer service through accurate inventory levels.

Operations: transforming inputs into outputs. Possible IS usage: computer-controlled machining systems; manufacturing planning applications; each focussed on producing products in the most time and resource efficient way due to competition on price from other online retailers.

Sales and marketing: promoting and selling the firm's products. Possible IS usage: computerised ordering systems are essential for an online retailer and can be a source of competitive advantage (Amazon's patented 'one-click' technology). Customer relationship management applications; data mining on existing customer information for targeted marketing also extensively used.

Service: maintenance and repair of goods and services. IS usage very dependent on the goods and services involved, may include equipment maintenance systems.

Outbound logistics: storing and distributing finished products. Possible IS usage: automated shipment scheduling systems are essential in large online retailers and a possible source of competitive advantage (facilitating same day or one day delivery); parcel tracking increasingly an expectation of customers.

Support Activities include:

Administration and Management: organisational infrastructure associated with managing the organisation as a whole. Possible IS usage: electronic scheduling and messaging systems; range of decision-support systems providing timely and reliable information to management.

Human resources: employee recruiting, training and hiring across all primary and support activities. Possible IS usage: workforce planning systems; HR-specific applications to facilitate confidential storage of employee data.

Technology: improving products and the production process. Possible IS usage: computer-aided design systems; decision support systems to monitor the efficiency of various processes and activities.

Procurement: purchasing inputs. Possible IS usage: computerised ordering systems; supply chain management applications; electronic data interchange. Particularly relevant to an online retailer as procurement over the internet tends to raise bargaining power over suppliers; substitute products may emerge from new suppliers; widening of geographic market may impact on price and supply availability.

2 marks for identifying the supply chain activities, 4 marks for highlighting relevant IS usages,
2 marks for specific examples relating to an online retailer.

(c) Candidates should demonstrate an understanding of business process management as a continuous cycle of process redesign and process monitoring.

1. Identify processes for change: decide which business processes are to be improved
2. Analyse existing processes: processes are modelled and documented, noting particular issues such as bottlenecks, labour intensive tasks and other time delays
3. Design the new process: produce a detailed specification of the new process
4. Implement the new process: implement the new process and accompanying technologies and systems, making necessary changes and revisions
5. Continuous measurement: once implemented, continue to measure the process: is it working effectively, is it still appropriate or is further change needed.

It may be appropriate for information systems change in scenarios where the existing process is weak and needs to be replaced in its entirety: a much more significant organisational change than automation or rationalisation of procedures. It can lead to dramatic gains in productivity and efficiency. However, need for change is at a process, rather than an organisational level (that is, it is not requiring a paradigm shift). The advantages of business process management over business process redesign include the recognition of a constantly changing environment and the building in of behaviours that continually check the continuing appropriateness of the process/need for change. Possible challenges in implementing BPM include the resistance of employees to change, the costs of process redesign and risks in the design and implementation of new processes.

3 marks for explaining the steps in business process management and
3 marks for explaining its usefulness in the context of information systems.

SOLUTION 4

Tutorial Notes: -

Purpose: To examine the candidate's understanding of: Decision Support Systems and Group Decision Support Systems; challenges in using Group Decision Support Systems; and XBRL in an internal business context.

Links: P2 Strategy and Leadership.

Options: Candidates must answer all parts of the question. Answers should not vary significantly from those given below.

Essential components: Candidates must be able to show a depth of understanding of the areas identified above (under Purpose).

- (a) Candidates are expected to define Decision Support Systems (DSS) and Group Decision Support Systems (GDSS), and clearly explain the difference between such systems for decision making.

DSS – A business intelligence system for non-routine decision making, which sets out to answer questions as part of semi-structured decision making by combining information from transaction processing systems, management information systems and some external sources. It is distinguished from TPS and MIS by the fact that such information is used as a basis for modelling, such as sensitivity analysis, multidimensional data analysis. These systems are used by 'super-user' managers or business analysts.

GDSS – An interactive computer-based system for facilitating the solution of unstructured problems by a set of decision makers working together as a group in the same location or in different locations. Rather than provide information and modelling that enables an individual to make a particular decision, GDSS use hardware and software to facilitate group meetings. Hardware includes computer and networking equipment, display screens and may also include dedicated desktops under each participant's control so that their input can be shared as and when they decide to do so over the meeting network and/or on display screens. Software includes electronic meeting software that collects, documents ranks and edits the ideas offered. Contributions are made anonymously and simultaneously by participants. Subsequently, information is stored on the ideas submitted, evaluation of these ideas and results, and can be made available to non-participants.

These systems are distinguished by: their individual decision-making (DSS) versus group decision-making (GDSS) orientation; their purpose as tools for analysis (DSS) versus tools for engagement (GDSS); and the capability of GDSS to deal with less structured information, decisions and decision-making processes.

4 marks for explaining each system type, and 2 marks for clearly distinguishing between them.

- (b) Possible challenges range from:

Managers may be reluctant to share their decision making authority with others, and this may blur lines of responsibility within the organisation. How managers are evaluated may need to change.

Issues within the group (personality clashes, dominance of the group by certain members) or how the meetings are organised and conducted may impact on the quality of the decision made and the length of time taken to make the decision.

GDSS meetings may be time consuming: the suggested benefits of the decision being taken as a group should be carefully weighed against the likely time taken in negotiating a solution.

Some decisions may not be appropriate for a GDSS, for example, where there are limited possible outcomes, or where the outcome is not contested.

Either 4 x 1 mark or 2 x 2 marks depending on the detail given.

- (c) eXtensible Business Reporting Language (XBRL) is an XML-based markup language used to communicate financial and business data electronically. Software is used to 'tag' the data contained in financial statements with contextual information such as scale (€m, €000) date (as at 31.12.14) and nature (for example, non-current assets – freehold property). When such tagged data is read by XBRL-enabled software, it can be quickly and accurately sorted, classified and analysed.

XBRL can be useful internally to businesses which have global operations and where businesses have subsidiaries or divisions which use different operating and financial systems. By using XBRL to tag the financial data of these different divisions/subsidiaries/locations then regardless of the native language, or systems used to produce the financial data, that data can be more easily and reliably consolidated and analysed. Sending financial

data tagged with XBRL saves time and cost by preventing re-keying, also leading to improved accuracy and reliability of data. As such, it allows managers to focus on analysis- potentially improving and speeding decision making. It may also alleviate some of the difficulties in operating older or proprietary systems in different parts of the organisation.

3 marks explaining XBRL, 3 for usefulness internal to business.

SOLUTION 5

Tutorial Notes: -

Purpose: To examine the candidates' understanding of: Enterprise Resource Planning (ERP) systems; how software to enable such systems may be obtained; benefits of ERP systems and the use of the competitive forces model to explore the value of IT infrastructure investment.

Links: P1 Auditing, P2 Audit Practice & Assurance services and P2 Strategy & Leadership.

Options: Candidates must answer all parts of the question. Answers should not vary significantly from those given below.

Essential components: Candidates must be able to show a depth of understanding of the areas identified above (under Purpose).

- (a) Enterprise systems, sometimes referred to as Enterprise Resource Planning (ERP) systems, are systems which integrate business processes in manufacturing and production, finance and accounting, sales and marketing, human resources and others as necessary into a single software system and comprehensive data repository. This can be contrasted to the traditional approach where these businesses each have their own, unintegrated systems. While each business process has its own module within the software, data is stored in a centralised database and can be used by multiple business processes. When data is entered by one process (such as the accounting function) it is immediately available to other business processes.

ERP software is usually purchased from a software vendor, and examples include SAP, Oracle, IBM and Microsoft. Companies would choose which business processes they wished to include in the ERP and map their business processes to the software. Where these are not a comfortable match the software can be customised, however this is difficult given the complexity of these systems, and can create risks that the performance of the new systems and the information and process integration intended might be compromised.

ERP software is increasingly available as cloud –based software, particularly for small and medium sized organisations (e.g. SAP's Business One on Demand). It is also increasingly available as open source products at no or lower cost, but with less functionality and support.

ERP is not usually developed in-house except for very large complex organisations (and in which case it is usually developed with consultants), reflecting the complexity of such systems, the importance of the integrations and the risks of such integrations not working effectively.

2 marks for explanation, 4 marks for sources

- (b) ERP systems are suggested to increase operational efficiency by providing managers across business processes with timely, accurate and relevant information to aid in their decision making.

Using ERP systems, firms can respond more quickly to customer requests for information or products. With one system integrating ordering, manufacturing and delivery data, better information is available to create more accurate sales and production forecasts, minimising costs and the risks of stock outs – both more efficient for the business and leading to higher customer satisfaction. With better information gathered on processes such as the manufacturing process this can be used as a basis to analyse the performance of these processes, and ultimately identify bottlenecks, delays or other areas for improvement. With linkages between ordering, manufacturing and delivery information, better decisions can be made about the levels of production, timing of production and stockholding leading to cost savings and greater efficiency.

Greater sharing of information, standardisation of information and reports can assist senior managers in comparing performance across the firm, possibly identifying areas where improvement is required.

6 marks

- (c) The competitive forces model for IT infrastructure investment suggests six factors that can be used to address the question of how much an organisation should spend on its IT infrastructure. These include:

1. Market demand for your firm's services: identify the services provided to customers, suppliers and employees and identify whether these services currently meet their needs and expectations. For example; do customers complain of slow responses to queries?
2. Your firm's business strategy: what is the firm's medium to long-term business strategy, and what services and capabilities will be needed to achieve the objectives set?
3. Your firm's IT strategy, infrastructure and cost: examine existing IT plans and their alignment with business strategy; evaluate total infrastructure costs (possible using a total cost of ownership approach).

4. Information technology assessment: where is the company's IT in relation to current trends? While highly experimental technologies can be problematic it may also be short sighted not to invest in new technologies that can build the organisation's capabilities and lead to competitive advantage.
5. Competitor firm services: what technology services are competitors offering their customers, suppliers and employees, and compare these to your firm. If falling short your firm may be at a competitive disadvantage
6. Competitor firm IT infrastructure investments: benchmark IT expenditures against competitor firms

Completing such an assessment may be time consuming and costly, and it may not be possible to adequately answer all of the questions posed: for example, it may be particularly difficult to identify how much your competitors spend on IT, or to get a picture of what competitor firms offer their employees. However the merit in the model, as compared to other models of IT infrastructure valuation (such as total cost of ownership) is that it acknowledges that firms do not exist in a vacuum, and that the appropriate level of IT infrastructure investment is a function not only of internal matters but also environmental factors. It provides a framework to explore whether present or suggested levels of IT infrastructure are placing the organisation at a competitive advantage or disadvantage by comparison to competitor firms.

4 marks for explaining the model, 4 marks for assessment of its usefulness.

SOLUTION 6

Tutorial Notes: -

Purpose: To examine the candidates' understanding of: cloud computing services; benefits of software-based cloud computing (based on the example of CRM software) and possible conversion strategies where moving from an old system to a new system.

Links: P2 Strategy and Leadership.

Options: Candidates must answer all parts of the question. Answers should not vary significantly from those given below.

Essential components: Candidates must be able to show a depth of understanding of the areas identified above (under Purpose).

- (a) Cloud Computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand. The three main categories are Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS).

Infrastructure as a Service (IaaS): customers use processing, storage, networking and other computing resources from cloud service providers to run their information systems. Examples include computing resource management, network management and storage management: Amazon Web Services (AWS) offers a range of storage services, including the Simple Storage Service (S3) for storing customer data.

Platform as a Service (PaaS): customers use infrastructure and programming tools supported by the cloud service provider to develop their own applications. Examples include Salesforce.com's Force.com which allows developers to build applications that are then hosted on Salesforce.com's servers as a service.

Software as a Service (SaaS): customers use software hosted by the vendor on the vendor's cloud infrastructure and delivered over a network. Customers access the applications via a web browser with the data and software maintained on the providers' remote servers. Examples include Google Apps for business applications and Salesforce.com for customer relationship management software.

3 marks for each type, well explained with relevant examples

- (b) The growing popularity of cloud-based Customer Relationship Management (CRM) software may be due to:

- Cost savings on purchasing multiple licenses, installation and maintenance
- Increased flexibility, easier to add or remove access by staff members
- Benefitting from regular upgrades, patches and fixes by the software provider without the disruption of upgrading individual machines
- The need to build in strong access controls may improve the overall control environment
- Taking data and software offsite may be safer in event of a disaster – important customer information would still be easily accessible

5 marks

- (c) Candidates can explain any two of the following possible conversion strategies:

The direct cutover strategy: replaces the old system entirely with the new system on an appointed day. It is the most risky of all conversion processes, and appropriate only where: the system being replaced is of little value; the new system is very different; the new system and existing system are simple; and the need for conversion is urgent. The primary advantage is that the conversion process is immediate and inexpensive. The primary disadvantage is the risk: failure could result in a loss of system integrity and a failure of system security. With no system to fall back on, if the conversion is not effective the costs can be much higher than using other methods.

The pilot study strategy: New system is tested and introduced at either specifically selected locations or specifically selected functions/services, and if successful is introduced system-wide. It may be suitable where the existing system/new system crucial to the survival of the company. This conversion process allows for debugging before the system is installed throughout the rest of the organisation. Disadvantages include that the conversion process is segmented and can extend the conversion time period and increase the overall cost of conversion.

The phased approach strategy: a new system is gradually introduced and the old system is gradually removed, often working on the basis of functions or organisational units. It may be appropriate where the new system is very different from the old system and both the old system and the new system are crucial to the company. Advantages include a reduced risk of failure (in comparison to direct approaches), and given the lower possibility

of major disruption and data loss it could be argued that despite being a higher-cost strategy, this is a more efficient use of resources. Disadvantages include that this approach may take considerable time and timetabling these phases can be problematic. It can be costly and incompatibilities may arise between the different phases of installation.

The parallel strategy: Both the new system and the old system are operated simultaneously for a period of time until satisfied that the new system is operating correctly. It may be appropriate where the data processed/information produced by system being replaced is of substantial value and both the old system and the new system are critical to the company. This is the least risky of all strategies; as if the new system fails the old system can be used as a backup. However, disadvantages include that the installation may take considerable time and additional costs may be incurred: effectively work is being duplicated by running both systems. Operational problems may result and there is a risk of duplication of transactions without proper monitoring.

2 marks for each of two well explained strategies.