THE BCS PROFESSIONAL EXAMINATIONS
BCS Level 6 Professional Graduate Diploma in IT

October 2007

EXAMINERS' REPORT

MANAGEMENT INFORMATION SYSTEMS

General Comments

The overall pass rate of 56% on this examination was disappointing. Several candidates were well prepared for the examination and provided answers of at least pass standard. However there were too many others that clearly had not covered or understood the syllabus. Such candidates are advised to wait until they are more acquainted with the material before submitting themselves to be examined. A minority of candidates attempted to answer questions by merely restating points previously made elsewhere in the examination, or by simply commenting on the scenarios described in the question. Candidates are advised that they will not gain marks for such poor efforts.

At Professional Graduate Diploma level, the examiners are looking for clear and logical presentation of the required answer points. Furthermore, although sufficient time is allocated for detailed answers, some answers were far too brief, contained only general knowledge and not the deeper understanding the examiners require. Many candidates would have achieved higher marks if they had spent more time clarifying their thoughts before answering the question.

A large minority of candidates answered more than the required three questions. This meant that there were often four or five poor answers rather than three good answers. As credit is only given for the three best answers, future candidates are advised to attempt only three questions and to concentrate their time and thoughts accordingly.

An indication is given below of the expected answer points. However, marks were given for alternative answers if relevant to the question set.

Question 1

For **EACH** of the following MIS technologies, provide a brief description and, using examples, critically evaluate the business situations to which it is most suited.

      a)   Videoconferencing.

(7 marks)

      b)   Executive Information System (EIS).

(9 marks)

      c)   Rule-based Expert System (ES).

(9 marks)

Answer Pointers

This is a fairly straightforward question, requiring candidates to know about three MIS subtypes and their appropriate application to a business.

a) Videoconferencing:

This is a system that supports communication and decision making by two or more people in remote locations. Candidates may discuss the principal types of video conferencing, namely desktop and room-based. Points made about desktop videoconferencing may include the following:

- PC has microphone and camera attached for audio-visual contact.
- Normally other software available for group work such as authoring tools and chat facilities.
- Can see and listen to whom you are conferencing with.
- Can be a delay in transmission of speech and picture, but this continues to become less of an issue as network bandwidth increases.

Points that could be made about room-based videoconferencing include the following:

- A dedicated room is set up at each site, with appropriate equipment including cameras, microphones, seating and screens.
- The screens show the pictures of the remote room(s) as appropriate, and possibly also what is being transmitted from the local room (if there are two screens or when picture-within-picture is available).
- A technical person is typically needed to operate the equipment (e.g., to move the cameras, to zoom in appropriately, to change which camera is transmitting, etc.)
- The system automatically picks up the person who is speaking and makes them the focus of attention.
- There is a delay in transmission, but this is improved when there are several dedicated lines for communication and when they have high bandwidth.
- Somebody needs to structure and chair/control the meeting from the business side of things.

Points regarding the business situations to which videoconferencing is most appropriate may include the following:

- Where two or more people need to communicate and collaborate on a task from remote locations.
- Where it is cost effective to implement videoconferencing, given the potential usage requirements and equipment/running costs.
- Where there are many people in the same location interacting with many people in one or more other locations (room-based videoconferencing).
- Where the interaction is one-to-one typically (desktop videoconferencing).
- Where the nature of the communication is not antagonistic, and is well planned, and mostly of an information disseminating nature.

- Where other forms of teleconferencing is insufficient (e.g., just audio-conferencing or text-conferencing/chatting).

(For a sound overview of videoconferencing – 4 marks, plus for mentioning appropriate business situations with examples – 3 marks = 7 marks)

b) Executive Information Systems (EIS).

Candidates may start by defining an EIS, which is a computer-based system that provides appropriate management personnel with quick and easy access to information for decision making purposes. They may discuss the fact that EIS started out as senior management tools, but become enterprise-wide management tools as benefits for all management levels were identified.

Performance (CSF/KPI) monitoring, via a dashboard or similar concept, is a major part of an EIS. Traffic light colour coding visually shows, for an important corporate issue, whether the company is fairing well (green), at a borderline level (yellow) or badly (red) on a particular aspect of operations. The EIS also would typically allow drill down from a KPI of interest so that the reasons why a CSF/KPI's performance is as it is, can be investigated. Once the cause is located, the manager can then put in steps to rectify the position if need be (i.e., control the situation as required).

Most modern EIS also allow a flexible yet user-friendly reporting interface to the underlying data, via an OLAP facility (candidates may talk about this in more detail). It may also provide a briefing book facility, where a series of reports can be sequenced together for management to view at a briefing meeting, and possibly drill down from if need be. The data stored in an EIS may come from several sources, both internal and external to the company. A data warehouse may be an important source of corporate data for the EIS.

Business situations to which an EIS is appropriate include:

- Where monitoring and controlling of corporate operations occurs (it is not really a planning tool as such), and where the following sorts of questions are typically being asked:

    - "What business are we in and how are we doing?"
    - "What are our competitors doing?"
    - "What's our current financial position?"

- Where fixed structure, and possibly flexible, reporting is required, on an "as needed" basis.
- Where the company will invest in the software and in the staff training to ensure that the flexible reporting is used to its maximum potential.
- Where the data sources can be integrated to ensure appropriate basis for quality EIS reporting.

(For a sound overview of EIS – 5 marks, plus mentioning appropriate business situations for EIS application with examples - 4 marks = 9 marks)

c) Rule-based Expert System (ES).

This is a computer-based system that contains knowledge in the form of IF.THEN rules, which allow it to perform decision support operations that otherwise would ordinarily require human expertise. Candidates may attempt to describe the components typically found within an ES; the inference engine, the knowledge base (which contains the rules in the case of a rule-based ES), the working memory (sometimes considered part of the knowledge base) and the user interface. Candidates may discuss how these components work together in the support of decision making, and the use of the backward and/or forward chaining methods of inference.

Business situations to which ES are appropriate:

- Where the decision making situation can be described in terms of rules and facts (this is not always an appropriate format for knowledge representation – Artificial Intelligence (AI) provides many others including frames and scripts, and semantic nets).
- Where the expert(s) is/are able to articulate rules to support the decision maker and that any conflicts can be resolved.
- Where expertise is needed yet scarce.
- Where training of potential employees with the expertise captured in the ES is required.
- Where the decision situation is a bounded one, and the knowledge is sufficiently deep to justify an ES implementation.

(For a sound overview of ES – 5 marks, plus mentioning appropriate business situations for ES application with examples – 4 marks = 9 marks.)

Examiners' Comments.

This was an extremely popular question (with 94% of the candidates opting to attempt it), and just over 50% of these candidates passed the question. Most candidates were able to provide a reasonable description of videoconferencing, although several candidates did not mention which type of videoconferencing they were describing and/or considered teleconferencing to be the same as videoconferencing (which is not the case). A few candidates provided some statements of videoconferencing benefits (e.g., to support decision making, very effective, etc.) which were so general that they could have been written as the benefits of any form of meeting, electronic or otherwise! Many candidates omitted to discuss the application of videoconferencing to business, beyond listing a few general benefits of the technology.

As in Part (a), the description of Executive Information Systems (EIS) was reasonably well attempted, with most candidates being able to describe one or two key characteristics and one or two benefits of the technology. Many mentioned the fact that an EIS can start as an upper management tool, and then can evolve into something that is also useful for middle and lower levels of management. Several candidates mentioned drill down and hot spot features, with traffic light colour coding, but many explanations of these EIS concepts showed a distinct lack of true understanding as to their nature. Again as in Part (a) of this question, the theory of the technology was better described than its business application, with many candidates providing very limited, if any, discussion of suitable EIS business application areas.

Part (c) of this question was, surprisingly, very poorly answered, with very few candidates gaining pass level and above. Many candidates simply did not know what an Expert System (ES) is, let alone a Rule-Based ES (RBES). Several candidates thought an ES was some form of knowledge repository, which could be queried in a similar way to a database system using SQL. Moreover, many candidates thought a Rule-Based ES to be a system that performs operations in accordance with a set of procedures or rules. The ES application descriptions were as poor as the Rule-Based ES overviews, and very few provided high quality examples to illustrate suitable business applications for a Rule-Based ES.

Question 2

A company wishes to undergo a Business Process Re-engineering (BPR) activity with respect to its core business processes.

      (a)   Explain why companies undertake a BPR activity, and what it might entail.

(10 marks)

      (b)   Discuss the extent to which MIS could be employed within the new business processes that result from a BPR activity.

(15 marks)

Answer Pointers

This question focuses on Business Process Re-engineering (BPR), and the use of MIS to support the new business processes.

Part (a) tests candidates' understanding of what BPR is all about, why it came about and the activities involved. A possible definition of BPR is the endeavour to enhance organisational performance by improving the efficiency, effectiveness, and adaptability of key business processes. This may be approached in a radical way, as Hammer conceived BPR to be in the early 1990s, where re-design of processes was not constrained by existing process implementations: radical re-thinking was considered the only approach. However, this was not always seen as realistic, and a more tempered approach to re-design was recommended.

Reasons for BPR could include corporate performance being lower than expected, competitor's positions strengthening in the marketplace, wanting to keep other potential entrants out of the market, new technology making new business approaches possible, and so on.

The following are a possible breakdown of the substantive steps that may be taken within a BPR activity where existing processes are investigated:

- Develop business vision and process objectives – you have got to know what needs to be improved and by how much, and what it is you are aiming for.
- Identify the processes to be re-engineered.
- Understand and measure existing processes to identify where they are the least effective/productive and to provide one or more yardsticks against which any potential new processes can be evaluated.
- Consider the re-design of each process and identify IT levers – determine the proposed re-design of each process and identify where IT is essential to the achievement of that new process. Candidates may mention the use of a suitable diagrammatic technique for documenting a new process.
- Design and implement a prototype of each process – see if it will bring the planned benefits and effectiveness
- Institutionalise the process within the company (if it does appear to bring the required benefits based on the assessment of the prototype implementation).

In addition, the company staff need to be made aware of the BPR activity, and its rationale, consequences and benefits, so that a commitment to the project may be obtained. A BPR team also needs to be established with the appropriate make-up, before the substantive work commences.

(For a sound definition/rationale for BPR and any added commentary – 4 marks, plus outlining each activity (technical and non-technical) to a total maximum of 6 marks = 10 marks)

Part (b) involves the candidate thinking about where MIS could figure within the new processes that result. (It is expected that answers will vary significantly in this part and each will be considered on merit.) MIS can be used in a variety of ways within the new processes. Indeed, all operational processes will require some degree of monitoring and controlling, and this is where MIS could figure strongly. EIS could provide overall effectiveness monitoring of process Key Performance Indicators (KPI's), Management Reporting Systems (MRS) could provide fixed periodic reports that enable comparison of measures over time. DSS could simulate processes, so that problems and their impacts can be identified and evaluated. Alternatives can be considered using the same simulation model, when a particular problem occurs. Office Automation Systems (OAS) could aid communication and decision making surrounding the processes and their operation, for example via the use of e-mail, videoconferencing, etc.

(For a general statement of the extent of MIS usage within the new processes – 3 marks, plus any point/example/commentary in justification of the extent – 1 mark to a maximum of 12 = 15 marks.)

Examiners' Comments

Of all the questions on this paper, this was the most poorly answered, and only approximately 1 in every five answers was of sufficient calibre to pass. Part (a) required candidates to describe the rationale for, and typical activities found within, Business Process Re-engineering (BPR). Here, many candidates only gave partial answers, frequently omitting the description of typical BPR activities and therefore straightaway losing 6 of the 10 marks on offer. The rationale for BPR was generally sound when attempted. Those that attempted to define BPR in some manner commonly referred to it as being an IT system issue only (or indeed an IT system itself), which it is clearly not. Some thought BPR was concerned with the reverse engineering of legacy systems, which again it is not.

Part (b) was probably the worst section in terms of answer quality on the entire paper. Many candidates did not understand what the question expected of them, and provided at best some broad statements about the use of MIS in organisations (which attracted one or two marks at most). Some discussed how MIS could help the BPR process, and whilst not strictly what was asked for, these types of answers were awarded a few marks where appropriate. The candidates' answers to this question suggest that candidates had not expected BPR to be on this examination paper, possibly given its absence on MIS examination papers in recent years, and were therefore ill-prepared to tackle such a question effectively.

Question 3

Home Maintenance Direct, a mail order hardware organisation, has been able to expand its business by mailing details of special offers to selected customers and, by using a call centre, keeping them updated with telephone calls and emails. Although the organisation provides building supplies to private individuals at low prices, additional discounts are provided to registered builders. Whilst this approach has been successful, poor record keeping has resulted in staff becoming confused between the two types of customer and occasionally registered builders are charged the non-discounted price and become angry and complain.

a)   Describe a type of package solution that could manage and store details of the various communications made with the customers.

(10 marks)

b)   Discuss the possible implications this package would have on other systems that store customer information

(10 marks)

c)   Outline the management information that could be provided by such a package.

(5 marks)

Answer Pointers

a) Identification of a CRM system (or other acceptable alternative with the similar functionality).

Customer relationship management (CRM) systems collect, manage, share and store all information that may be used to acquire and keep customers, improve services and maximise the potential for greater sales. Every contact made with customers should be recorded and be available for all.

Contacts could be web access, emails, text messages, phone calls, faxes etc.

Provides up to date information on all contacts and, based on such information, can select those customers most likely to spend.

Will have simple input facilities for call centre staff to log details of every call received and made.

Call centre staff can attempt to cross-sell and up-sell based, on customer history.

CRM can the basis for establishing loyalty schemes

Administrative departments as well as sales can use CRM

(1 or 2 marks per point depending upon level of explanation, maximum 10 marks.)

b) Requires update of the CRM database from other contact media (mailing companies, telephone preference, telephone lists, etc).

Interfaces will have to be made with other customer systems, notably accounts, marketing and customer DIP systems.

Continued use of legacy systems could result in errors and inconsistencies

Two-way replication may be necessary in some instances

If a system cannot be updated on-line, special considerations would have to be made for multiple transactions occurring on the same day

Other systems could be candidates for a message broking solution

Other systems may require end user facilities for interrogation of CRM database.

CRM systems generate high network traffic, which could have an effect on other systems.

(2 marks for each valid point, maximum 10 marks.)

c) Every contact with every customer, irrespective of contact medium, can be maintained.
Statistics of sales resulting from the various sales campaigns can be analysed to focus on the best type of campaign.
Call centre staff can be paid commission based on the records in the CRM system.
Customer enquiries can be answered immediately and with confidence.
CRM software can integrate the information from different areas, ensuring that anyone who views it on screen sees all relevant customer details.
Once a customer's details have been captured into a CRM system, everyone in the organisation knows what information that customer has already provided.
CRM's allow more effective monitoring and control by management.
Regularly updated sales figures allow more accurate budget planning for sales targets.
(1 mark for each item of management information mentioned maximum 5 marks.)

Examiners' Comments

This was a popular question and most candidates who attempted it gained reasonable marks. For Part a), a few candidates just commented on the question and provided general commercial advice to Home Maintenance Direct, gaining no marks for their efforts. Similarly, other candidates described package software in general and also gained no marks. Candidates must be more specific and apply their knowledge to the question.

Overall, Part b) was poorly answered. Many candidates repeated what they had written for Part a) or provided brief answers that demonstrated limited understanding.

Many candidates were able to provide reasonable answers for Part c).

Despite the comments above, there were some excellent answers to this question.

Question 4

The new Chief Executive Officer (CEO) of a large international company is concerned by the number of MIS projects that either fail to deliver the expected benefits or exceed the original budget. The CEO seeks to reduce the risks inherent in large projects and wishes to introduce a method of formally evaluating developments which considers only tangible benefits. You have been engaged as an independent consultant to advise the CEO.

a)   Explain how the risks inherent in any large project could be minimised.

(5 marks)

b)   Using examples, argue why it is necessary for intangible benefits to be included when evaluating MIS projects.

(10 marks)

c)   Describe and give an example of a financial evaluation approach suitable for MIS developments.

(10 marks)

Answer Pointers

a) A reasoned and logical approach to risk management should include most of the following:

- A formal development methodology should be used.
- Methodology will ensure that system requirements, boundaries, budgets and contingencies are established.
- The project management organisation needs to be established with appropriate sponsors, structure, project managers, steering committees and user representation.
- A project plan to include phasing, pilot projects, sign-offs and review points.
- Strategic risk management to take account of the impact of technology developments, changes in requirements and cyclical changes.
- Formal ongoing frequency/severity risk management to identify, prioritise and resolve the day-to-day risks.
- Change management.
- Communication management.

(1 mark for each point addressed and explained, maximum 5 marks.)

b)   No prescribed answer, examiners were seeking a reasoned discussion and arguments on why intangible benefits should be included in any MIS evaluation.

Financial analysis techniques:

- With MIS, costs and benefits have different time frames. The costs are immediate and tangible, whereas the benefits may take some time to appear and may be intangible. This may cause problems in trying to justify an IS initially, as immediate benefits may be expected. Example: a new road or a new building will have immediate and constant benefits, whilst the benefits of a MIS may take some time before they are maximised.

- Despite these different timescales, the payback period for an MIS must be quicker and the rates of return higher than traditional systems with much longer lives.

- MIS systems may bring intangible benefits such as improved customer service, better understanding or more information. These cannot be directly measured or quantified but they may lead to quantifiable gains in the long term.

- MIS can change very quickly during a project, causing some systems to become obsolete very quickly. This affects initial budget estimates considerably and may require them to be changed several times.

- As the life of MIS is often much shorter than a traditional project, it may require further investments throughout its life to maintain, redesign, rebuild or reprogram it.

- As intangible benefits are often impossible to quantify, it is difficult to budget for them.

(1 mark for each point raised and discussed, maximum 6 marks, use of appropriate examples 4 marks, overall 10 marks.)

c)   Any description of an appropriate financial evaluation method was acceptable. As an example the description below is for the Accounting Rate of Return method:

The ARR process is as follows:

- Calculate the total investment for the project.
- Calculate the net cash inflows (or savings in expenditure), which will be realised in each period of the project's life.
- Calculate the accounting profit over the life of the project.
- Divide the total profit by the number of periods and express this as a percentage of the average investment.
- The average investment may be calculated on an annual basis or approximated as (initial investment + final investment) ÷ 2.

Advantages:

- Simple and uncomplicated.
- Comprehensible – gives percentage return.
- Relates to financial accounts.

Disadvantages:

- Ignores the time value of money.
- Cannot relate target return to economic objectives.
- Suffers from problems of accounting measurement.
- Ignores cash flow.
- Prefers relative return to absolute return.

(5 marks for any relevant process and 5 marks for the description, including the pros and cons, total 10 marks.)

Examiners' Comments

This was the least popular question and those candidates attempting it generally achieved disappointing marks. In many cases, only a half-completed page was submitted.

Part a) was straightforward and many gained the full five marks.

For Part b), many candidates did not understand the concept of 'intangible benefits' and wrote instead about tangible benefits. Few provided examples and thus the marks awarded were low.

Part c) demonstrated that most candidates had no understanding of financial evaluation and hardly any examples were provided. Because the financial evaluation of MIS is such an important feature of any development, the examiners were surprised by the apparent lack of knowledge and understanding.

Question 5

It is a commonly held opinion that end-user computing increases corporate productivity.

a)   In the context of MIS, discuss the arguments for and against this statement.

(10 marks)

b)   Identify and describe five prerequisites of a successful end-user MIS.

(10 marks)

c)   Explain how the success of any end-user MIS could be measured a year after implementation.

(5 marks)

Answer Pointers
a)   No set answer for this part of the question, but the candidate were expected to consider some reasoned arguments, for example-

For:

- Users are familiar with their business applications
- MIS extract can easily be made available
- Many users are computer literate
- Reduces maintenance backlogs

Against:

- Software maintenance nightmare
- Lack of standardised approach
- No documentation
- Vulnerable to staff leaving
- No backup/recovery strategy
- Blurred boundaries between MIS providers and users

(5 marks each for the relevance of "for" and "against" arguments, 10 marks in total.)

b)   The expected prerequisites are listed below. Candidates were expected to identify the points and demonstrate understanding by describing or providing relevant examples for each of these points:

- Agreed boundaries between end-user and corporate MIS computing.

- Use of common software/desktop setup. The need for the whole organisation to have a common computing platform.

- Shared resources. The need for shared programs, data, files, standards, naming conventions, networks etc.

- Data ownership. Data ownership and availability to be agreed by all participants. This should include a possible need for an initial data analysis to include the identification of both standing and transactional data.

- Training.

(2 marks given for each point identified and described, maximum 10 marks.)

c)   Measures of the success of end-user MIS include:

- User, management and customer surveys
- Absence of data duplication
- Consistency and timeliness of data
- Existence of standards
- Productivity improvements (Business and IS)

(1 mark for each measure, including a reasoned explanation, maximum 5 marks.)

Examiners' Comments

The second most popular question, with many candidates clearly enjoying the opportunity to argue for and against a point. Consequently, Part a) gained reasonable marks enabling around 60% of candidates to obtain a pass on this question.

However, Part b) required deeper levels of knowledge and many candidates either failed to answer Part b) or merely repeated the same invalid points several times.

Part c) was more straightforward and most candidates gained some marks. Others were unable to obtain marks by being vague about the topic or by providing measures at too high a level.

Despite the above comments, there were some excellent answers.