Introduction

Level 6 Professional Graduate Diploma in IT

The final stage within the BCS three-stage Higher Education Qualification program, the Level 6 Professional Graduate Diploma (PGD) enables candidates who have already achieved the Level 5 Diploma in IT to gain depth of knowledge and expertise in their field.

Our modules have been created in-line with the SFIAPlus framework and latest developments in the industry, giving you a competitive edge in the IT job market and showing your dedication to the industry. You will have the opportunity to learn about topics such as advanced database management, network information systems, web engineering and programming paradigms, as well as to build upon knowledge and skills developed during the Level 5 Diploma.

To successfully achieve the qualification, candidates need to complete:

- One core module (Professional Project in IT)
- Four optional modules

Depending on entrance conditions, completing the Level 6 PGD in IT may support entry onto a Master’s degree course at selected global universities.

Management Information Systems Optional Module

The Management Information Systems module is an optional module that forms part of the Level 6 PGD in IT – the final stage within the BCS three-stage Higher Education Qualification program.

Candidates will develop their understanding of management information systems (MIS) in a wider managerial context and in terms of selecting, supporting, designing and developing computer applications. The module focuses on concepts a manager should understand in order to make the most effective use of computerised information systems.

Qualification Suitability and Overview

Candidates must have achieved the Diploma in IT or have an appropriate exemption in order to be entered for the Professional Graduate Diploma (PGD). Candidates can study for this PGD by attending a training course provided by a BCS accredited Training Provider or through self-study, although it is strongly recommended that all candidates register with an approved centre. Studying with an approved centre will deliver significant benefits.

Candidates are required to become a member of BCS, The Chartered Institute for IT, to sit and be awarded the qualifications. Candidates may apply for a four-year student membership that will support them throughout their studies.

The Level 6 PGD is suitable for professionals wishing to gain an advanced formal IT qualification, and this module may be particularly relevant for candidates who are, or will be, in a position to make or influence decisions about selecting, designing and supporting MIS, as well as those interested in career opportunities such as software development, computer systems analysis, web development, or information security management.

<table>
<thead>
<tr>
<th>Total Qualification Time</th>
<th>Guided Learning Hours</th>
<th>Assessment Time</th>
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</thead>
<tbody>
<tr>
<td>1414 hours</td>
<td>250 hours</td>
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SFIA Levels

This module provides candidates with the level of knowledge highlighted within the table, enabling candidates to develop the skills to operate successfully at the levels of responsibility indicated.

<table>
<thead>
<tr>
<th>Level</th>
<th>Levels of Knowledge</th>
<th>Levels of Skill and Responsibility (SFIA)</th>
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<tbody>
<tr>
<td>K7</td>
<td>Evaluate</td>
<td>Set strategy, inspire and mobilise</td>
</tr>
<tr>
<td>K6</td>
<td>Synthesise</td>
<td>Initiate and influence</td>
</tr>
<tr>
<td>K5</td>
<td>Analyse</td>
<td>Ensure and advise</td>
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<tr>
<td>K4</td>
<td>Apply</td>
<td>Enable</td>
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<tr>
<td>K3</td>
<td>Understand</td>
<td>Apply</td>
</tr>
<tr>
<td>K2</td>
<td>Understand</td>
<td>Assist</td>
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<tr>
<td>K1</td>
<td>Remember</td>
<td>Follow</td>
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SFIA Plus

This syllabus has been linked to the SFIA knowledge skills and behaviours required at Level 6.

EMRG4

Supports monitoring of the external environment and assessment of emerging technologies to evaluate the potential impacts, threats and opportunities to the organisation. Contributes to the creation of reports, technology roadmapping and the sharing of knowledge and insights.

PEMT4

Supervises individuals and teams. Allocates routine tasks and/or project work. Provides direction, support and guidance as necessary, in line with individuals’ skills and abilities. Monitors progress against agreed quality and performance criteria. Acts to facilitate effective working relationships between team members.

STPL5

Contributes to the creation and review of a systems capability strategy which meets the strategic requirements of the business. Develops models and plans to drive the execution of the strategy, taking advantage of opportunities to improve business performance. Takes responsibility for investigative work to determine requirements and specify effective business processes, through improvements in information systems, data management, practices, procedures, organisation and equipment.

ARCH4

Contributes to the development of solution architectures in specific business, infrastructure or functional areas. Identifies and evaluates alternative architectures and the trade-offs in cost, performance and scalability. Produces specifications of cloud-based or on-premises components, tiers and interfaces, for translation into detailed designs using selected services and products. Supports a change programme or project through the preparation of technical plans and application of design principles that comply with enterprise and solution architecture standards (including security).

DLMG5

Defines systems development projects which support the organisation’s objectives and plans. Selects, adopts and adapts appropriate systems development methods, tools and techniques selecting appropriately from predictive (plan-driven) approaches or adaptive (iterative/agile) approaches. Ensures that senior management is both aware of and able to provide the required resources. Facilitates availability and optimum utilisation of resources. Monitors and reports on the progress of development projects, ensuring that projects are carried out in accordance with agreed architectures, standards, methods and procedures (including secure software development). Develops road maps to communicate future development activity.

Learning Outcomes

Upon completion of this module, candidates will be able to:

- Understand types of MIS applications in organisations.
- Discuss the development of management information systems in organisations.
- Select and design MIS systems appropriate to meet management requirements.
- Critically evaluate MIS contributions to the strategic management of organisations.

Further detail regarding the SFIA Levels can be found at [www.bcs.org/levels](http://www.bcs.org/levels).
Syllabus

1. Management within organisations

Learners will be able to:

1.1 Explain management activities, roles and levels.

Indicative content
a. Activities of management, e.g.:
   i. Planning
   ii. Organising
   iii. Monitoring
   iv. Controlling
b. Mintzberg’s 11 managerial roles, classified as one of interpersonal, informational and decisional role types
c. Top, middle and low levels of management within an organisation

Guidance
Candidates are expected to be able to explain the nature of each management activity, managerial role and managerial level, as these are fundamental concepts of management information systems (MIS). In the exam, candidates may be asked to discuss the suitability of one or more different types of MIS to support one or more of these levels, roles or activities. They may also be asked to identify a suitable MIS to support a particular role or activity or level. Candidates may be required to provide a suitable diagram to support a description of management levels (e.g. the management triangle).

1.2 Explain management planning and control systems.

Indicative content
a. Interrelation between planning and control systems
b. Use of feedback and feedforward within management control systems

Guidance
As fundamental MIS concepts, candidates should be able to articulate the relationship between planning and control systems, and the nature of the latter, e.g. feedforward or feedback. They may be asked to consider an MIS that supports planning and control systems, which may relate to a specific organisational case scenario or in more general terms.

1.3 Explain methods of strategic planning in an organisation.

Indicative content
a. Activities
b. Techniques
c. Results

Guidance
Candidates should be able to identify and explain the key activities in corporate strategic planning, as well as how this may be done in a top-down or bottom-up manner. Candidates may need to explain one or more techniques or methods to support elements of corporate strategic planning, such as SWOT analysis, CSF identification, Balanced Scorecard and the Five Forces model. These may relate to a company scenario, or candidates will need to supply examples to illustrate their application. Candidates should also be to identify and describe MIS features which could be used to support corporate strategic planning activities, such as those found within BI systems, and they may need to explain the outcomes, benefits and weaknesses of corporate strategic planning processes.

1.4 Explain the nature of decision-making.

Indicative content
a. Decision-making models
b. Classification of decision-making situations

Guidance
In the exam, candidates may be asked to explain decision-making, for example, by describing a model of their choice or explaining a specific model such as Simon’s decision making model (i.e. intelligence, design and choice). Candidates may be asked to give supporting examples of decisions analysed using the model. They may also need to explain classification of decision-making (e.g., unstructured versus structured, group versus individual) and the differences in their MIS support. Candidates should be able to use a case scenario in order to identify or explain the nature of the decision making taking place and to suggest MIS support.

1.5 Explain the nature of information.

Indicative content
a. Classifications and characteristics
b. Nature of information and decision-making at different management levels
c. MIS subtypes typically implemented at each level of management to support information or decision-making requirements

Guidance
Information must be timely, relevant, accurate, and complete. Candidates may be asked to describe one or more of these attributes and justify why the attribute must be present for the target to be information rather than data. Candidates’ examples should illustrate the attribute and its presence. Candidates may be asked to discuss how MIS or specific MIS types can support the presence of information attributes, either with reference to a case scenario or in more general terms. Information requirements differ across management levels, and candidates may be asked to explain or justify one or more of these differences. They may also be asked to address support at different levels via MIS types, sometimes using supporting illustrative examples.
Learners will be able to:

2.1 Explain Management Reporting Systems (MRS).

Indicative content

- Definition
- Components
- Types of reports
- Application

Guidance

Candidates should be able to define a management reporting system and articulate its key components (e.g., interface, database) and their attributes (e.g., predominant use of internal data). Given MRS’ emphasis on structured reporting, candidates should be able to articulate different reports that can be provided by an MRS, such as summary reports, exception reports, periodic reports and ad hoc reports. Given a particular report description based on a case scenario, candidates should be able to explain its nature. They should be able to articulate the support that MRS can offer, as well as its benefits and limitations, either in relation to a case scenario or in more general terms. Candidates should also be able to propose and describe a suitable MRS for a given case scenario and explain the relationship between this type of MIS and others such as DSS, ES and BI systems.
2.2 Explain Decision Support Systems (DSS).

Indicative content
a. Definition
b. Components
c. Models and techniques
d. Application

Guidance
Candidates should be able to define a decision support system, both in general and specifically in relation to individual DSS, and describe its key components and how they interrelate to provide decision support. In relation to the model component or the underlying model base, candidates should be able to understand the nature of these mathematical models and which techniques can be employed, such as simulation, optimisation or forecasting. Candidates should be able to articulate the range of support that DSS can offer, as well as its benefits and limitations, either in relation to a case scenario or in more general terms. They should also be able to propose and describe a suitable DSS for a given case scenario and explain the relationship between this type of MIS and others such as MRS, EIS, ES and BI systems.

2.3 Explain Group Decision Support Systems (GDSS).

Indicative content
a. Definition
b. Components
c. Models and techniques
d. Application

Guidance
Candidates should be able to define a Group DSS and compare this to an individual one, as well as to appreciate the differing nature of the DSS components within GDSS. They will need to understand that the nature of the models found within a model base is more about group collaboration support than the subject of the decision. Candidates should be able to describe some GDSS model techniques, such as nominal group technique, brainstorming, voting and Delphi. They should be able to articulate the range of support that GDSS offer and their benefits or limitations, either in relation to a case scenario or in more general terms. This includes the different configurations and support, depending on location of the decision makers, decision making as a limited-time event, and asynchronous or synchronous decision making. Candidates should be able to propose and describe a suitable DSS for a given case scenario, as well as to explain the relationship between this type of MIS and others, especially Individual DSS.

2.4 Explain Office Information Systems (OIS).

Indicative content
a. Video-conferencing
b. Chat
c. Email

Guidance
Candidates should be able to define an office information system as a key communication tool within an organisation and describe key elements such as email, chat and videoconferencing. Candidates should be able to articulate OIS opportunities as well as OIS benefits and limitations, either in relation to a case scenario or in more general terms. Candidates should be able to propose and describe a suitable OIS feature which would be useful for a given case scenario. They should be able to explain the relationship between this type of MIS and others, especially GDSS where there is some overlap (e.g., a chat or a videoconferencing facility could be considered a simple GDSS if used for communications relating to decision making).

2.5 Explain management support knowledge-based systems.

Indicative content
a. Expert Systems (ES) and Neural Network (NN) systems
   i. Definition
   ii. Components
   iii. Application

Guidance
Candidates should be able to define both an Expert System (ES) and a Neural Network (NN) system, as types of knowledge based systems that can provide management decision making support. They should know the key components of an ES and their nature or function, including the common use of production rules within knowledge bases, and how they interrelate to provide the necessary decision support. They will need to be able to understand the technique of NN within NN systems, and how this can be used to support decision making. Candidates should be able to articulate the support that ES/NN systems can offer and the benefits/limitations of each, either in relation to a case scenario or in more general terms. Candidates should be able to propose and describe a suitable ES for a given case scenario, and explain the relationship between ES and other MIS, such as BI systems. They should also be able to understand the ways in which knowledge-based systems such as ES can be embedded within other MIS to support their function.
2.6 Explain the application of Online Analytical processing.

**Indicative content**

- a. Supporting management decision making through application of:
  - i. Online analytical processing (OLAP)
  - ii. Data mining
  - iii. Business intelligence (BI) tools

**Guidance**
Candidates should understand what OLAP stands for and what an OLAP tool typically provides. This includes appreciating the data concepts supported within an OLAP tool (e.g., hypercubes, dimensions, values and levels), as well as the operators, such as drill down, roll up, pivot and slice-and-dice. Candidates should also be able to understand the concept of BI systems, their typical features and how they interrelate to provide the necessary decision support. They should be able to discuss evolution from the executive information system's concept to BI systems, as well as the functions this offers for BI systems. Candidates should be able to articulate the support that BI systems can offer and their benefits or limitations, either in relation to a case scenario or in more general terms. They should be able to propose and describe a suitable BI system for a given case scenario, and to explain the close relationship between BI systems and other MIS, such as MRS, DSS and ES/NN systems.

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2.7 Explain data warehouses and data mining facilities.

**Indicative content**

- a. Relationship between data warehousing and other MIS facilities

**Guidance**
Candidates should be able to understand the concept of data warehousing, as it is pivotal to the data provision within many MIS such as BI systems. Candidates should be able to describe what a data warehouse is, and its key characteristics, as well as to understand the process of ETL and its options. They should be able to articulate the support a data warehouse can offer (e.g., its focus of support on structured data), either in relation to a case scenario or in more general terms. As well as to propose and describe a suitable data warehouse system for a given case scenario.

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2.8 Explain the relationships of MIS to other enterprise applications.

**Indicative content**

- a. Transaction processing systems (TPS)
- ii. Enterprise resource planning (ERP) systems

**Guidance**
Candidates should be able to understand that TPS and provision through ERP provide a vital data source for data warehouses and MIS. They should be able to explain the types of traditional TPS found within many organisations, such as sales order processing, and to explain the support for organisation functions (e.g. HR, finance, operations, marketing, etc.) commonly found within comprehensive ERP systems, which is integrated through a centralised data repository. Candidates should be able to provide examples of TPS and/or ERP systems to illustrate their answers, as well as be able to recognise them within case scenarios. They should also be able to articulate the relationship between TPS/ERP and a proposed MIS within case scenarios.

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2.9 Evaluate IS within functional areas.

**Indicative content**

- a. Human resources
- ii. Marketing and sales
- iii. Production
- iv. Accounting and finance
- v. Customer relationships management (CRM)
- vi. Product supply chain management systems

**Guidance**
Each organisational function requires both operational and management support. Candidates should be able to articulate the key activities that take place within each function and how these could be supported by TPS/ERP and MIS. They should be able to explain the support that MIS/TPS/ERP systems can offer, either in relation to a case scenario or in more general terms. Candidates should also be able to propose and describe a suitable MIS for a given function or functions as described within a case scenario.

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2.10 Explain the internet and MIS provisions.

**Indicative content**

- a. Internet and links to legacy MIS
- b. Internet customer interfaces
- c. Security issues

**Guidance**
Candidates should understand and be able to discuss how the internet can be used as part of the effective provision of an MIS, e.g. to enable MIS to reach all relevant employees, to enable integration of different legacy systems, or to extend the services and capacity available. Candidates should be able to discuss the benefits and risks associated with systems provision over the Internet.
3. Development of MIS

Learners will be able to:

3.1 Analyse the role of Strategic Planning and Strategic IS Planning.

**Indicative content**

- Role of Strategic Planning and Strategic IS Planning (SISP) in identifying MIS requirements
- MIS role in supporting Strategic Planning/SISP

**Guidance**

Candidates should be able to explain how both the interrelated processes of corporate strategic planning and Information Systems (IS) strategic planning can identify MIS opportunities for an organisation. Candidates may be asked to show how one or more techniques used within corporate or IS strategic planning could result in an MIS proposal, such as SWOT analysis or CSF identification. As corporate and IS strategic planning involves decisions, there is a potential for MIS to support the decision making within these processes; candidates need to be able to discuss the role of MIS as a support system for corporate strategic or IS planning activities, as well as to identify potential systems and their characteristics.

3.2 Explain how to manage MIS projects.

**Indicative content**

- Project management methodologies
- MIS feasibility study
- Assessment of economic, technical, social and political issues from an MIS perspective
- Cost-benefit analysis
- Overall approaches to MIS development, e.g. Traditional vs. other approaches such as evolutionary and phased

**Guidance**

Candidates need to be able to articulate the contents and purpose of an MIS feasibility study and the dimensions it needs to cover; this may be in general terms or in relation to a given company scenario. Candidates should also be able to describe and apply cost-benefit analysis, including the use of both quantitative and qualitative measures and the value of money (NPV). Candidates should be able to define and describe the key development approaches for an MIS, and be able to discuss their relative advantages and limitations in relation to MIS in general or to specific MIS types (e.g., BI systems, MRS, DSS). They must be able to identify and justify a suitable approach for a given MIS development scenario.

3.3 Explain the techniques and methodologies for supporting MIS development.

**Indicative content**

- Data warehouse/BI systems development methodologies and techniques
- Fact finding techniques (e.g. SQIRO)
- Database design techniques
- OO methodologies and associated techniques
- Techniques particular to MIS developments, e.g.:
  - Value analysis
  - ROMC
  - CSF/KPI hierarchy diagramming

**Guidance**

There are several development techniques that are useful to the development of one or more MIS types. Some of these are used within many type of IS, such as SQIRO to support fact finding activities or requirements determination, and OO methodology and associated techniques. Others are more specific to one or more MIS types, such as ROMC for data-oriented DSS and CSF/KPI hierarchy diagramming for designing drill down within BI systems, or enabling development of underlying components such as a database or data warehouse. Candidates should be able to identify suitable techniques for a given case scenario or be able to evaluate their merits and weaknesses in relation to a particular type of MIS.

3.4 Evaluate the use of case tools to aid MIS development.

**Indicative content**

- Definition
- Classification
- Support for development

**Guidance**

Computer-Aided Software Engineering (CASE) tools provide support for development of information systems such as MIS. Candidates need to be able to define the CASE tool concept, and discuss the different forms that CASE tools can take. In the exam, they may be asked to discuss CASE tools in general or in relation to the support of a specific development technique or activity, or in relation to a specific MIS development case scenario. Candidates may also be asked to evaluate the potential of CASE tools to support specific MIS development techniques.

3.5 Explain the suitability of packages vs bespoke development.

**Indicative content**

- Off-the-shelf systems versus customisable packages
- Benefits and weaknesses of each approach
- Package evaluation process

**Guidance**

Candidates need to be able to understand the range of approaches to an MIS provision that can be taken with regard to software development. For each approach, they need to be able to describe its benefits and weaknesses, as well as compare it to other approaches. There may be several potential package solutions, with or without customisation, available for a given MIS development; candidates need to be able to articulate a suitably robust process for determining the best one for a given scenario. This will involve identifying both mandatory and desirable criteria to evaluate each package, and a method for performing that evaluation. Candidates may be expected to describe the evaluation process in relation to a given case scenario or in more general terms.
4. Applications

Learners will be able to:

4.1 Explain developments in hardware and software.

Indicative content

- Developments in hardware
- Developments in software
- Developments in Internet and communications capabilities
- Implications for MIS

Guidance

Candidates need to be able to show that they are keeping up to date with developments in relation to implementing MIS and supporting management work. Candidates may be asked to consider specific contemporary or recent advances and how these may affect MIS provision, either in general or more specifically to a sector, a type of organisation, or to functions such as customer services, marketing, or top management. Candidates should be able to provide examples of the potential or actual effects of the advance on MIS provision to support their answers.

4.2 Describe and explain trends in management.

Indicative content

- E.g. the possible movement towards flexible, virtual organisations and the role of MIS

Guidance

Candidates should show that they are keeping up to date with any changes in management thinking and approaches, such as the concept of the virtual organisation as a flexible and potentially transient system. Candidates should be able to articulate the concept and discuss the contribution of MIS (in general or in relation to one or more specific MIS types) to the effective performance of newer forms of organisation.

4.3 Explain MIS and mobile computing.

Indicative content

- Definition
- Benefits
- Drawbacks and consequences

Guidance

Mobile computing has presented a number of opportunities for widening the availability of MIS yet also come with some limitations and potential negative consequences. Candidates should be able to discuss opportunities, benefits and limitations of mobile MIS and their impact, both in general terms as well as in relation to a given business scenario.
Explain MIS and social media.

Indicative content
a. Definition
b. MIS design
c. Opportunities
d. Challenges

Guidance
Candidates should be able to describe the social media concept and how it can be used to provide enhanced MIS operations. They should be able to understand the effects on the design of MIS, e.g., use of both qualitative and quantitative data, and its real-time and continual nature, as well as the challenges of this. Candidates should be able to discuss these in general terms as well as in relation to a given business or social media scenario.

Examination Format
This module is assessed through completion of an invigilated written exam.

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<td>No (no materials can be taken into the examination room)</td>
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<td>Passmark</td>
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Adjustments and/or additional time can be requested in line with the BCS reasonable adjustments policy for candidates with a disability or other special considerations.

Question Weighting
Candidates will choose three questions from a choice of five. All questions are equally weighted and worth 25 marks.
Recommended Reading

Primary texts

Title: Essentials of Management Information Systems  
Author: K. C. Laudon and J. P. Laudon  
Publisher: Pearson Prentice-Hall  
Date: 2012  
ISBN: 978-0132668552

Additional texts

Title: Management Information Systems  
Author: T. Lucey  
Publisher: Thompson  
Date: 2005  
ISBN: 978-1844801268

Title: Information Systems Management in Practice  
Author: B. McNurlin and R. Sprague  
Publisher: Prentice Hall  
Date: 2013  
ISBN: 978-1292023540

Title: Decision Support Systems and Intelligent Systems  
Author: E. Turban, J. Aronson and T.-P. Liang  
Publisher: Pearson Prentice-Hall  
Date: 2010  
ISBN: 978-0136107293
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Document Change History

Any changes made to the syllabus shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and changes made. The purpose is to identify quickly what changes have been made.

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<tr>
<th>Version Number</th>
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<tr>
<td>Version 1.0</td>
<td>Document created</td>
</tr>
<tr>
<td>August 2021</td>
<td></td>
</tr>
<tr>
<td>Version 3.2</td>
<td>minor amends made to layout.</td>
</tr>
<tr>
<td>December 2023</td>
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