
Overview

This sub discipline covers the core competencies required to create software to address the needs of business problems and opportunities, resulting in a variety of software solutions, ranging from operating and control software to web based or specialist applications, such as accounting software and games software.

Development activities produce software that translates the design deliverables from HCI design, data design and software design, into working software. These designs will include, at a detailed level, functions and processing, interfaces, data handling and storage needs and how the system will be used by and interact with people, as appropriate. Development involves the translation of the designs into working software solutions that meet the business needs.

There is a wide range of software development activities that may be undertaken in a variety of environments appropriate to both the business and technical contexts in which they will be used, The software development environments used will be selected and specified during the design phase when the physical models are produced.

In some organisations, software development may be undertaken as part of a holistic life cycle approach where one individual or team may complete all stages; whereas in other organisations, each stage of development may be undertaken by individuals or teams or as part of projects and/or programmes..

**Performance
criteria**

Plan software development activities

You must be able to:

- P1 Assist with the identification of sponsors of and stakeholders for software development activities
- P2 Identify and collate information on IT architecture models and design deliverables to inform software development
- P3 Verify data and information contained within software development deliverables
- P4 Allocate the development of software components to subordinates
- P5 Ensure that software components will operate on the required range of technology platforms

Perform software development activities

You must be able to:

- P6 Correctly select and apply software development procedures, tools and techniques
- P7 Follow organisational standards for the systems development lifecycle
- P8 Accurately translate a physical software design into functional designs for software components
- P9 Define clearly and accurately the functional requirements of software components
- P10 Update software as required to ensure continued effectiveness or in response to external factors
- P11 Transfer own skills, knowledge and understanding from one development environment and programming language to other languages and environments
- P12 Assist with discussion, negotiation and agreement of how the software will function with sponsors and stakeholders during software development

Control software development activities

You must be able to:

- P13 Advise colleagues on the use of appropriate programming constructs to produce effective software
- P14 Advise subordinates on how to optimize the use of system resources by software
- P15 Monitor the effectiveness of software produced in optimizing system resources and meeting design specifications
- P16 Analyse and interpret the results of testing in order to inform development work

Contribute to the management of software development projects and programmes

You must be able to:

- P17 Contribute to the update of software development deliverables, where appropriate, as a result of projects, and programmes
- P18 Contribute to the integration of software development activities , where appropriate, into projects and programmes

- P19 Contribute to the communication of the need for systems development and testing activities to align with software development deliverables
- P20 Contribute to the monitoring of the alignment of systems development, testing and implementation activities with software development deliverables
- P21 Document software development activities clearly and accurately
- P22 Contribute to the presentation of the information contained within software development deliverables to a wide range of sponsors, stakeholders and other individuals

Knowledge and understanding

You need to know and understand:

Implement the infrastructure for software development activities

- K1 who are the sponsors of and stakeholders for software development activities
- K2 The range of software that may be developed
- K3 The importance and relevance of software development activities on the full life cycle of information within an organisation
- K4 The importance and role of software development activities in enabling the 'end to end' development of an information technology solution to meet the business needs
- K5 The importance and relevance of architecture to software development work
- K6 The potential implications of software development deliverables being incorrect, incomplete, inadequate and/or inappropriate
- K7 The range of issues associated with software development activities
- K8 The procedures, tools and techniques that can be used to conduct and document software development activities
- K9 The procedures, tools and techniques that can be used to undertake functional testing
- K10 The importance undertaking ongoing functional testing against functional requirements during software development
- K11 The importance of undertaking functional/unit testing as an integral part of software development work
- K12 The importance of integrating testing into development work as required
- K13 Gather and use information data and knowledge relating to IT architecture models in order to inform software development activities
- K14 Analyse and interpret IT architecture models
- K15 Verify the accuracy, currency, completeness and relevance of information used during software development activities
- K16 Identify and select the procedures, tools and techniques to use for software development activities
- K17 Implement and maintain procedures, tools and techniques relating to software development activities

Perform software development activities

You need to know and understand:

- K18 The programming languages available and their suitability for different tasks
- K19 The range of development environments that are available and their advantages and disadvantages
- K20 The range of data formats that can be used and their suitability for use in different types of software development work
- K21 The range of commands that can be used to manipulate data and their suitability to meet a range of business needs
- K22 The range and types of data structures that can be used and their suitability for different applications
- K23 Identify and select naming conventions and standards to be used during

- software development in line with organisational standards
- K24 Identify, select and apply service level requirements as specified in physical designs that must be incorporated within software development deliverables
- K25 Identify, select and use the full range of design specifications, for example those relating to data and HCI
- K26 Identify, select and implement the most appropriate data storage structures to use
- K27 Identify, select and apply lessons learned from previous software development assignments
- K28 Use and apply plans and standards relating to software development activities

Control software development activities

You need to know and understand:

- K29 The importance of software development aligning with software design requirements
- K30 The importance of ensuring that program constructs work coherently and effectively together
- K31 The importance of ensuring that software solutions combine data and the commands to manipulate it in the most effective manner
- K32 The need for monitoring of the alignment of software development work with software design work
- K33 The procedures, tools and techniques that can be used to monitor software development against:
 - K33.1 software designs
 - K33.2 service level requirements
 - K33.3 testing activities and deliverables
- K34 The procedures, tools and techniques that can be used to monitor the quality and effectiveness of software development activities
- K35 the importance of communicating the results of testing to others as necessary
- K36 Verify that developed software meets:
 - K36.1 the design requirements
 - K36.2 specified processing and functional needs
- K37 Use and apply procedures, tools and techniques to monitor, analyse and report on:
 - K37.1 alignment of software development activities with any relevant legislation, regulations and external standards
 - K37.2 alignment of software development with software designs
 - K37.3 that specified processing and functional needs are met
 - K37.4 the alignment of software development work with service level requirements
- K38 Analyse and interpret the results of testing in order to inform development work

Contribute to the management of software development

You need to know and understand:

- K39 Who is involved with testing activities relevant to software development

- work
- K40 Who may be working on the development of other elements of a software solution
 - K41 The importance of discussing, negotiating and agreeing how the information technology system will be integrated and implemented with sponsors and stakeholders during software development
 - K42 The importance of managing changes to business requirements through change control mechanisms during software development activities
 - K43 The importance of ensuring co-ordination between software development, systems development and testing activities
 - K44 The importance of securing sign off of software development deliverables prior to handover
 - K45 The importance of the handover of responsibility for the software to service management/support services
 - K46 The importance of integrating software development activities into projects and programmes, as appropriate
 - K47 The importance of coordinating testing carried out during development work with testing that will be carried out subsequently by others
 - K48 The possible implications of software development deliverables being incorrect, incomplete, inadequate and/or inappropriate
 - K49 Document how the software has been developed and functions
 - K50 Document lessons learned from software development activities to inform future assignments
 - K51 Analyse and interpret the strategy and plans for testing

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