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## Overview

The System Development sub-discipline covers the competencies required to develop/enhance, acquire, reuse and/or commission a range of systems elements, such as software, hardware and networking elements and interface them to produce a holistic, 'end to end' working IT or Telecom enabled or system that meets a specific business need.

Software elements may be developed/enhanced, acquired, reused or commissioned, according to the approach that best meets the business needs.

Hardware and networking elements that need to be included in the system configuration may range from large-scale storage, processing and connectivity devices housed in data centres, to hand-held devices, using wireless connectivity to present information contained in the system to the end user or consumer. Some of these devices may need to be designed produced or assembled specifically to work as part of individual IT enabled or Telecom systems.

System elements may be developed/enhanced or commissioned to meet a specific need for an organisation (bespoke) or may be acquired package products that provide generic capabilities designed to address the needs of many organisations or may be existing operational assets that can be reused.

Systems development necessitates a 'end to end' perspective from those individuals involved in it, ensuring that all of the system elements, assets and services required to meet the business need are available and interfaced in a way which produces an outcome which best supports the business needs.

Systems development contexts can include, but are not limited to:

- Desktop, mainframe, process control, web and mobile applications
- Cloud computing software and data resources that are delivered as a service over the Internet. This includes: software as a service (SaaS), storage as a service (STaaS) and desktop as a service (DaaS)).
- Implementation and exploitation of digital and social Media in systems development
- Real world web/Internet
- Big data, difficult data and data warehousing (data searching and data mining)
- Green IT including both the impact on the environment of the increased use of IT & Telecoms systems and also the benefits that IT & Telecoms can have in reducing the environmental impact of other sectors

Working in the senior professional role involves:

- Implementing the infrastructure for systems development activities;
- Initiating systems development activities,
- Managing systems development activities; and
- Monitoring, analysing and reporting on systems development activities

**Performance  
criteria**

*You must be able to:*

**Implement the infrastructure for systems development activities**

- P1 select and apply appropriate standards relating to systems development activities
- P2 identify and implement systems development procedures, tools and techniques
- P3 implement and maintain effectively the procedures, tools and techniques to monitor and assess the effectiveness of systems development activities

**Initiate systems development activities**

*You must be able to:*

- P4 correctly identify sponsors of and stakeholders for any systems development assignment
- P5 verify the accuracy, currency, completeness and relevance of information used during systems development activities
- P6 interpret all information that needs to be considered during any systems development assignment
- P7 recommend effective well argued proposals on 'buy or build' options in order to meet business needs

**Manage systems development activities**

*You must be able to:*

- P8 ensure the alignment of systems development activities with all relevant legislation, regulations and external standards in line with organisational policies and strategy
- P9 ensure the co-ordination of systems development activities with all other solution development and implementation activities within own area of accountability
- P10 ensure that the 'end to end' IT enabled system incorporates all system elements in a way which ensures its optimum effectiveness

P11 take timely and appropriate action in the event of systems development activities/packages not supporting the business needs

P12 effectively manage external providers of systems development services and products

**Monitor, analyse and report on systems development activities**

*You must be able to:*

P13 monitor the quality and progress of systems development work within own area of accountability, reporting any issues in a timely manner

P14 communicate effectively and in a timely manner with sponsors, stakeholders and external bodies on all aspects of systems development activities

P15 clearly and accurately present and report as requested, findings and recommendations from systems development activities

**Knowledge and understanding**

*You need to know and understand:*

**Implement the infrastructure for systems development activities**

- K1 the range of approaches that may be used to undertake systems development, and their appropriateness in a range of business and organisational contexts
- K2 the range of issues associated with systems development activities
- K3 best practice in systems development
- K4 the potential implications of failings in integrity, confidentiality and information security during systems development activities
- K5 the procedures, tools and techniques that can be used to:
  - K5.1 conduct and document systems development activities
  - K5.2 monitor the progress of systems development activities against standards and budgets
  - K5.3 manage the assessment, selection and delivery of ‘off the shelf’ packaged systems and services
  - K5.4 monitor the alignment of IT enabled systems development activities and ‘off the shelf’ packages and services with any relevant legislation, regulations and external standards
  - K5.5 monitor the alignment of with any relevant legislation, regulations and external standards
  - K5.6 monitor the alignment of systems development work with systems designs and service level and operational requirements
  - K5.7 monitor the alignment of IT enabled systems development and testing activities
  - K5.8 monitor the delivery from and the quality and effectiveness of external providers of systems development deliverables
  - K5.9 monitor the delivery, quality and effectiveness of ‘off the shelf’ packages and services
  - K5.10 monitor the quality and effectiveness of internal and external

systems development activities

- K6 identify, select and apply standards relating to:
  - K6.1 internal systems development activities
  - K6.2 the use of external providers of systems development services and 'off the shelf' packages and services
- K7 identify, select and implement procedures, tools and techniques to:
  - K7.1 conduct and document systems development activities
  - K7.2 monitor the progress of systems development activities against standards and budgets
  - K7.3 manage the assessment, selection and delivery of 'off the shelf' packaged systems and services
  - K7.4 monitor the alignment of internal and external systems development activities and 'off the shelf' packages and services with any relevant legislation, regulations and external standards
  - K7.5 monitor the alignment of with any relevant legislation, regulations and external standards
  - K7.6 monitor the alignment of systems development work with systems designs and service level and operational requirements
  - K7.7 monitor the alignment of systems development and testing activities
  - K7.8 monitor the delivery from and the quality and effectiveness of external providers of systems development deliverables
  - K7.9 monitor the delivery, quality and effectiveness of 'off the shelf' packages and services
  - K7.10 monitor the quality and effectiveness of internal and external systems development activities

**Initiate systems development activities**

*You need to know and understand:*

- K8 who are the sponsors of and stakeholders for any systems development activities
- K9 the range of system elements that may be developed, enhanced or acquired/commissioned in order to produce a working IT enabled system
- K10 the implications of external factors on systems development activities
- K11 the fact that effective systems development activities require clear and timely decision making about which system elements are to be developed/enhanced, which are to be commissioned, which can be reused and which need to be acquired
- K12 the fact that the selection of the most appropriate systems elements to be used is a critical aspect of systems development activities
- K13 who are the external providers of systems development services
- K14 the benefits and disadvantages of using external systems development providers
- K15 the benefits and disadvantages of using 'off the shelf' packaged systems and services in a range of business and organisational contexts
- K16 the importance of assessing 'off the shelf' package systems and services against design deliverables and requirements in order to identify gaps and mismatches
- K17 the importance of making timely decisions as to how to close any gaps between 'off the shelf' package systems and services and design deliverables and requirements
- K18 identify who are the internal and external sponsors of, and stakeholders for, any systems development activities
- K19 verify the accuracy, currency, completeness and relevance of information used during systems development activities
- K20 identify and apply lessons learned from previous systems development assignments
- K21 use information to identify:

- K21.1 the full range of design specifications required to support the 'end to end' IT enabled system
- K21.2 what system elements need to be developed, acquired, commissioned and combined in order to produce the 'end to end' IT enabled system
- K21.3 which packaged systems and services should be considered and/or assessed against the design deliverables and requirements
- K21.4 which existing system elements should be considered for reuse, enhancement and or decommissioning in order to meet the requirements
- K21.5 service level and operational requirements that must be met by IT enabled systems development deliverables
- K21.6 the gaps and mismatches that may exist between requirements and package systems and services
- K21.7 external factors in systems development activities
- K21.8 what inputs need to be incorporated into any system and what required outputs need to be produced from it
- K21.9 the rules and controls required to ensure the integrity and security of the proposed IT enabled system
- K22 manage the assessment of the suitability of:
  - K22.1 'off the shelf' packages and services to meet business needs for an IT enabled system
  - K22.2 external providers of systems development services to meet business needs for an IT enabled system

*You need to know and understand:*

**Manage systems development activities**

- K23 the legislation, regulations and external standards that may apply to systems development activities
- K24 the fact that the impact of any relevant legislation, regulations and

- external standards needs to be reflected in systems development activities
- K25 why systems development activities need to be aligned with testing activities
- K26 the importance of ensuring co-ordination between systems development and service management activities
- K27 the importance of agreeing how the 'end to end' IT enabled system will be integrated and implemented with sponsors and stakeholders during systems development
- K28 who needs to sign off systems development deliverables or the acquisition/commissioning of package elements or system deliverables
- K29 the importance of integrating systems development activities into projects and programmes, as appropriate
- K30 the importance of handing over responsibility for the system to systems testing, integration and implementation activities
- K31 the importance of ensuring all system elements work coherently together in the most effective manner to meet the requirements and that the effectiveness of individual system elements may need to be compromised in order to achieve this
- K32 the importance of managing relationships with and deliverables from external providers of systems development services and products
- K33 identify who:
  - K33.1 needs to be involved in any systems development activities
  - K33.2 needs to sign off any systems development or package selection deliverables
- K34 use and apply information to manage systems development activities
  - K34.1 from architecture models and design deliverables
  - K34.2 from service level and operational requirements
  - K34.3 relating to the business



K35 manage:

- K35.1 changes to requirements through change control mechanisms during systems development activities
- K35.2 the co-ordination of the delivery of a range of system elements from internal and external sources
- K35.3 The combination of individual system elements into a working 'end to end' IT enabled system to meet the business needs
- K35.4 the alignment of systems development activities with all relevant legislation, regulations and external standards
- K35.5 the acquisition, commissioning and decommissioning of appropriate system elements
- K35.6 the sign off of systems development deliverables
- K35.7 the hand-over of responsibility for an 'end to end' developed system to systems testing, integration and implementation activities
- K35.8 relationships with external providers of software development services and products

K36 design and develop systems:

- K36.1 aligned to architecture models and systems design deliverables
- K36.2 aligned to service level and operational requirements

K37 take actions:

- K37.1 in the event of systems development activities not supporting the business needs
- K37.2 in the event of systems development deliverables/packages failing to operate as required to support the business needs
- K37.3 to take account of external factors external in systems development activities

K38 take actions to ensure:

- K38.1 that the 'end to end' IT enabled system incorporates all

system elements in a way which ensures its optimum effectiveness

K38.2 that inputs that need to be incorporated within any system and the outputs required from it are in place

K38.3 co-ordination between systems development and any relevant testing, integration, implementation and service delivery activities

K38.4 the rules and controls required to ensure the integrity and security of the proposed are applied consistently across all system elements supporting the 'end to end' IT enabled system

K38.5 that consistent and coherent standards are applied across all system elements used in an IT enabled system

K38.6 that systems development activities are integrated where appropriate, into projects and programmes

### **Monitor, analyse and report on systems development activities**

*You need to know and understand:*

K39 the fact that rules and controls are required to operate consistently across all systems elements to ensure the integrity and security of any proposed IT enabled system

K40 why systems development activities and external deliverables need to be monitored:

K40.1 for alignment with any relevant legislation, regulations and external standards

K40.2 for alignment with systems designs and service level and operational requirements

K40.3 for quality and effectiveness

K40.4 to optimise the use of system resources

K40.5 to ensure confidentiality, integrity and security

K41 why the quality and effectiveness of systems development activities

needs to be monitored

- K42 the importance of managing relationships with sponsors, stakeholders and external bodies
- K43 verify that a complete set of system elements have been identified, selected and are available for use in an IT enabled system
- K44 monitor, analyse and report on:
  - K44.1 the progress of systems development activities against standards and budgets
  - K44.2 the alignment of internal and external systems development activities and 'off the shelf' packages and services with any relevant legislation, regulations and external standards
  - K44.3 the alignment of with any relevant legislation, regulations and external standards
  - K44.4 the alignment of systems development work with systems designs and service level and operational requirements
  - K44.5 the alignment of systems development and testing activities
  - K44.6 the delivery of development deliverables from external providers of systems
  - K44.7 the delivery, quality and effectiveness of 'off the shelf' packages and services
  - K44.8 the quality and effectiveness of internal and external systems development activities
- K45 manage relationships with sponsors, stakeholders and external bodies on matters relating to systems development activities
- K46 present information on systems development activities in an understandable form to a wide range of sponsors, stakeholders and other individuals, in order to confirm understanding and ensure business needs are being met
- K47 identify and document lessons learned from software development activities to inform future assignments

## ESKITP5015v2

### Manage IT and Telecoms systems development

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