



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN7226A Manage development and application of testing artefacts

Release: 1

ICTTEN7226A Manage development and application of testing artefacts

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to plan and manage a test regime by developing testing artefacts to evaluate application software for a telecommunications network. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.
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Application of the Unit

Application of the unit	Network engineering staff or senior technical officers with project management roles and authority to direct the activities of software testing and evaluation apply the skills and knowledge in this unit. Mobile phones, wireless modems, set top boxes, media centres, web applications and content servers use application software to provide a telecommunications service.
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan the test effort and develop test strategy for software testing	1.1. Analyse the functionalities of an application software from the system design document and create a test strategy for a new telecommunications product line 1.2. Produce the steps in developing the test strategy and the attributes of each step according to enterprise policy 1.3. Produce a test strategy to evaluate the suitability of the application software for integration into the telecommunications network 1.4. Assess a range of tests required to evaluate the performance and functionality of the application software and determine the tests required to suit the test regime 1.5. Evaluate features of testing tool and debuggers and select an appropriate tool to test the software application and detect faults 1.6. Produce a test plan based on the requirements of the project specifications and identify testing artefacts required for model based software testing
2. Plan the development of testing artefacts	2.1. Develop software testing strategies for uncovering evidence of defects in software systems as part of the quality assurance process 2.2. Produce a test dependency model of the relationship between the test regime and the test levels in software testing for referencing and validation 2.3. Analyse the software testing requirements to determine the domain testing and application testing artefacts requirements to validate the software product
3. Develop and manage testing artefacts	3.1. Create reusable domain artefacts to detect early defects in domain testing 3.2. Modify domain test artefacts by binding the variability to create application test artefacts to detect defects in product line applications 3.3. Produce test reporting associated with phases of a test cycle within test plan 3.4. Analyse test reports and evaluate the impact of test plan with the testing artefacts on the testing environment 3.5. Manage the progress of test plan to minimise the

ELEMENT	PERFORMANCE CRITERIA
	risks associated with testing and ensure test complies with test requirements 3.6. Report detected defects to product evaluation personnel and prepare a strategy manage the defects 3.7. Analyse the testing metrics produced by the test tool to manage the tracking of defects and use metrics to plan process improvements 3.8. Produce an evaluation report from the traceability matrix to manage the defects or failures from the test plan

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to evaluate product and technology needs
- communication skills to:
 - interact with enterprise personnel, customers and other contractors, while maintaining a customer focus and consideration of customer needs
 - liaise with internal and external personnel on technical and operational matters
- literacy skills to:
 - prepare reports given a specific format
 - read and interpret technical documentation, software and hardware manuals, specifications and relevant enterprise policy
- numeracy skills to take and analyse measurements
- planning and organisational skills to:
 - break large projects into a series of small projects
 - manage and prioritise own work
 - organise testing
- problem solving skills to resolve software, hardware and logistics problems
- safety awareness skills to follow all related occupational health and safety (OHS) requirements and work practices
- task management skills to work systematically with required attention to detail and adherence to project requirements
- technical skills to:
 - configure software testing tools

REQUIRED SKILLS AND KNOWLEDGE

- create traceability matrix
- develop software testing strategies

Required knowledge

- applications software features and functionalities
- configuration of software testing tools
- creation of testing artefacts
- creation of traceability matrix
- domain and application testing
- elements of test plans
- features of testing tools and debuggers
- identification of types of risks
- management of:
 - software defects
 - test traceability
- phases of test cycles
- production of test reviews
- steps in developing test strategy
- testing procedures

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Evidence of the ability to:

- produce the steps in developing the test strategy
- produce a test strategy to evaluate the suitability of the application software
- develop software testing strategies for uncovering evidence of defects in software systems
- create reusable domain artefacts to detect early defects in domain testing
- produce test reporting associated with phases of a test cycle within test plan
- produce an evaluation report from the traceability matrix .

Context of, and specific resources for assessment

Assessment must ensure:

- site where testing artefacts can be developed and applied
- software tools currently used in industry
- vendor products, specifications, equipment and enterprise policy required for the activity.

Methods of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

- direct observation of the candidate managing development and application of testing artefacts
- review of tests plans, reports and evaluation documents prepared by the candidate
- oral or written questioning of the candidate to assess required knowledge.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:

- ICTTEN7225A Manage network testing strategies.

EVIDENCE GUIDE

	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.
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Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Application software may be for:

- firmware
- games software
- media centre
- mobile phone
- operating system
- set-top box
- sever
- web application
- wireless modem.

RANGE STATEMENT***Test strategy*** may include:

- communicating test plans to stakeholders and obtain buy-in from business clients
- coordinating test environment and data requirements before starting phase
- defining objectives, timelines, and approach for test effort
- defining test activities with roles and responsibilities.

Steps in developing the test strategy may include:

- change management:
 - models for assessing impact of changes on testing
 - plan for managing requirement changes
 - process for keeping test artefacts in sync with development artefacts
- configuration management:
 - list of testing artefacts
 - tools and techniques for configuration management
- communication and status reporting
- testing approach:
 - methodology for test development and execution
 - planning for test execution cycles
 - specification of test environment set-up
 - testing process life cycle
 - testing templates, checklist and guidelines
- test automation:
 - criteria for feasibility of test automation
 - defect management
 - test automation strategy
 - test tool identification
- test environment specifications:
 - configuration management, maintenance of test bed and build management
 - hardware and software requirements
 - test data creation
- testing metrics:
 - metric to match strategic objectives
 - plan of process improvement based on metrics
 - techniques for collecting metrics
 - tools to gather and analyse metrics
- types of testing:

RANGE STATEMENT	
	• different phases of testing required • different types of testing • test coverage • objective and scope of testing: • business objectives • extent of application to be tested • goals to be met by testing effort • what systems and components need to be tested.
Range of tests may include:	• compatibility • on demand testing • performance • process improvement • technical • test management • verification.
Features of testing tool and debuggers may include:	• automated functional graphical user interface (GUI) testing tool • benchmarks • formatted dump or symbolic debugging • performance analysis or profiling tool • program monitors; • code coverage reports • instruction set simulator • program animation.
Test plan may include:	• acceptance or commissioning test • design verification or compliance test • manufacturing or production test • regression test.
Testing artefacts produced by software testing may include:	• domain or application testing • test case • test data • test harness • test plan • test scripts • test suite • traceability matrix.
Software testing strategies may refer to:	• defects when software system does not behave as specified • test level requirements

RANGE STATEMENT	
	• variability of product line.
Defects may be:	• deferred • fixed • rejected • treated.
Test levels refer to:	• integration test of multiple element that form a configuration specified in architecture • system test that validates behaviour of whole system • unit test of single element.
Domain testing features may:	• aim at testing common parts and preparing test artefacts for variable parts • create reusable test artefacts for application testing • deal with variability of various domains • uncover evidence of defects in domain artefacts.
Application testing features may:	• aim at reusing test artefacts for common parts and reuse predefined variable domain test artefacts to test specific applications • reuse domain test artefacts to uncover evidence of defects in product line applications.
Phases of a test cycle may include:	• defect retesting • regression testing • requirements analysis • test closure • test development • test execution • test planning • test reporting • test result analysis.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering
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