Australian Government

Department of Education, Employment and Workplace Relations

ICAGAM401A Produce an interactive game

Release: 1

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Modification History

Release	Comments
Release 1	This Unit first released with *ICA11 Information and Communications Technology Training Package version 1.0*

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to produce an interactive game using an industry standard authoring tool.

Application of the Unit

This unit applies to game designers, games programmers, animators and other personnel working in the game development industry.

Licensing/Regulatory Information

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.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
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.*

Elements and Performance Criteria

1. Identify game component assets	1.1 Obtain ***project brief and documents***
	1.2 Identify ***game-production assets*** required to meet creative and production requirements and ***technical specifications***
	1.3 Discuss formats of assets and issues of asset integration and with appropriate ***personnel***
	1.4 Save all digital assets in the appropriate format for inclusion, and store for retrieval
	1.5 Determine sequence for development of beta version prototype for testing game play
	1.6 ***Create a schedule*** for production and testing
	1.7 Determine strategies for ***monitoring production progress*** against schedule
2. Identify capability of game-engine software and tools and make selection	2.1 Identify and review the range of industry standard ***game-engine software and development tools*** available
	2.2 Assess the software and tools related to specified game concepts and play requirements
	2.3 Discuss ***considerations for selection of game-engine software*** with relevant personnel to ensure selection will meet specified outcomes
	2.4 Select game-engine software
3. Use game-engine software	3.1 Load game engine, including sound and game play
	3.2 Create a new file for the specified task and name appropriately
	3.3 Display and use ***tools and features of software*** relevant to the game production process
	3.4 Create custom code to achieve a unique function
4. Create game-play sequence and prototype	4.1 Import and assemble game-play assets in appropriate sequence according to creative and technical requirements
	4.2 Create and ***check game-play elements*** according to creative and technical requirements
	4.3 Test and run game-play sequence as a presentation to ensure the sequence meets creative, production and technical requirements
	4.4 Export to game engine and create prototype
	4.5 Save file formats and identify for specified purpose

5. Evaluate game prototype	5.1 Demonstrate initial prototype to relevant personnel 5.2 ***Evaluate*** against criteria, including achievement of a creative and user-friendly product 5.3 Discuss and agree on required changes 5.4 Assist if required in ***tests and user trials*** 5.5 Evaluate feedback from user trials 5.6 Confirm endorsement from relevant personnel to develop prototype into complete product
6. Transform prototype into final proof of concept prototype	6.1 Make necessary changes as indicated by user trials 6.2 Integrate all game elements as required by specifications 6.3 Make final checks to ensure all sequences conform to the navigation design 6.4 Save into specified storage systems

Required Skills and Knowledge

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

Required skills

- analytical skills to analyse documentation and images to inform implementation of game specifications
- communication skills to:
  - check and confirm brief requirements
  - communicate clearly using speech and text
  - communicate technical requirements related to software development, graphics requirements and code development to supervisors and other team members
  - give constructive feedback
- literacy and numeracy skills to read briefs, game documentation, scripts, storyboards, scenarios, images, and technical and conceptual information
- planning and organisational skills to:
  - appropriately refer decisions to a higher project authority for review and endorsement
  - balance talent, experience and budget
  - delegate tasks and responsibility appropriately
  - establish clear roles and goals to achieve required game development outcomes
  - meet project deadlines
- problem-solving skills to recognise and address quality issues and problems
- teamwork skills to:
  - contribute to and work in a collaborative team
  - realise a unified game-play vision
- technical skills to:
  - resolve basic hardware, software and other technical issues associated with game production
  - use correct file formats and archiving procedures.

Required knowledge

- basic programming techniques
- capabilities and constraints of game engines
- computer game development, including specific terminology
- current game-play hardware and software products
- risk and critical path management
- technical constraints that hardware imposes on software development, graphics requirements, code development and creative visual design.

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: • apply a variety of strategies for game trialling and testing • demonstrate original and innovative approaches to the creative development of a game • implement game development and production strategies • maintain integrity of the design brief and game design document • undertake risk assessment and critical path planning.
Context of and specific resources for assessment	Assessment must ensure access to: • computer hardware, software, games engines and file storage • copyright and intellectual property legislation • OHS legislation and enterprise policy • appropriate learning and assessment support when required • modified equipment for people with special needs.

Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:
	• work samples or simulated workplace activities
	• observation of game production activities
	• verbal questioning of aspects of game development, including:
	  • capability of game engines and software tools to meet the requirements of the brief
	  • evaluating game prototypes from technical, design and game-play perspectives
	  • game testing and trialling procedures
	  • maintaining integrity of the design brief and game design document
	  • risk assessment and critical path planning
	  • translating design and technical specifications into working game prototypes.

Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, where appropriate.

	Assessment processes and techniques must be culturally appropriate, and suitable to the communication skill level, language, literacy and numeracy capacity of the candidate and the work being performed. Indigenous people and other people from a non-English speaking background may need additional support. In cases where practical assessment is used it should be combined with targeted questioning to assess required knowledge.

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.

Project brief and documents may include:	• concept drawings • designer's notes • development environment description • game design document • game-play designs • help notes • information design • operating manual • storyboard • style and design principles • style and medium • target market information • technical design document and review process.

Game-production assets may include:	• current work files
	• development kits
	• existing digital product libraries:
	  • character models
	  • environments
	  • motion capture data
	  • sound effects
	• game engines, including customised game engines
	• personnel.

Technical specifications may include:	• backup procedures • delivery platform • difficulty levels • disc or memory space • format for final product • navigation design • pixel size • polygon count • source code and game assets archiving • specifications for phases of game development: • alpha version - pre-production

	• beta version - playable prototype • gold version - completed game • trialling and testing • systems and workplace standards for documentation, including: • computer-file management • job lists • progress reports • target market.
Personnel may include:	• animators • concept artists • game-play designers • graphic designers • instructional designers • modellers • motion capture technicians • producers • programmers • project managers • sound engineers • team members • technical directors • writers • other specialist or technical staff.
Creating a schedule may involve:	• allocating work tasks in consultation with other team members • analysing key requirements of the brief • assessing concept viability against resource availability • conducting risk assessment regarding possible issues and constraints and potential solutions • creating an overall project plan and schedule • determining workflow with consideration to available resources • identifying key milestones and associated deliverables: • alpha version - pre-production • beta version - playable prototype • gold version - completed game • trialling and testing • identifying stakeholders and devising strategies to meet stakeholder needs • identifying the critical path • researching background information

	• setting project objectives against achievable timeframes.

Monitoring production progress may involve:	• balancing quality and scheduling requirements
	• coordinating the efforts of development, quality assurance, sales, marketing, public relations and finance
	• ensuring the timely production of assets to brief requirements, including:
	  • animation components
	  • graphic
	  • images
	  • interfaces
	  • text
	  • video
	• identifying and applying testing procedures
	• monitoring workload allocated to individual personnel
	• progressive game testing to ensure playability
	• renegotiating variations and schedule slippage ahead of milestone dates
	• identifying sound and applying contingency strategies.

Game-engine software and development tools may include:	• BigWorld • Dunia • Half life • Jade • Quake • Riot • Scimitar • Unreal.

Considerations for selection of game-engine software may include:	• application of code libraries
	• application of game engine functionality for an interactive game
	• assessing coding strategy for compliance to brief and for optimal performance of game engine:
	  • function testing
	  • test plan development
	  • validating results
	• assessing viability of existing code in relation to interaction of game-play elements
	• assessing strategy for game-play code
	• basic code writing abilities for customising game engine functions
	• building
	• code creation specifically for handling exceptions
	• code creation strategy for interaction of game-play elements

	• data structures • documentation of code development • environmental models • game engine customising • game platform and game platform logic • integration of custom code into game engines • sound capability • spatial data structures • technical constraints imposed by the architecture of given game engine.
Tools and features of software may include:	• animation • compilers • debugging software • development software • efficiency • flexible systems suitable for non-programmers • graphics • graphics system design • middleware • operating systems • plug in tools • programming for game integration • rendering • sound • system architecture for real time game environments and simulations • tools for designers and play analysis.
Check game-play elements may involve:	• chance • fun • logic • playability • rules • skill • strategy.
Create prototype may involve:	• bug fixing, bug databases, creating stable code bases and game tuning • building flexible systems, configurable by others • code review and test harnesses • designing and implementing tests and incorporating feedback from quality assurance • developing a comprehensive design for all missions and levels, including concept visuals

	• developing a walkthrough for at least one mission or level
	• developing story synopsis and scripts for each level
	• knowledge of games as dynamic systems:
	  • applying game tuning strategies in light of feedback from actual play
	  • characteristics of a balanced game
	  • working with quality assurance and understanding play-test feedback
	• use of appropriate tools and skills for fast, interactive development
	• user-guide development.

Evaluate game prototype may involve:	• examining and analysing the impact of decisions, after the fact, such as:
	  • business decisions
	  • design decisions
	  • methodology and process decisions
	• product 'post-mortems' reviewing actual use of resources to achieve outcomes against initial project plan and schedule.

Tests and user trials may involve play test procedures:	• determining criteria for measurement of success with a given audience • play testing to monitor player frustration, progress and enjoyment • selecting test subjects • testing game with target market and other diverse populations.

Unit Sector(s)

Game development