

Australian *Flexible Learning* Framework

supporting e-learning opportunities

The VET E-portfolio Roadmap:

A strategic roadmap for e-portfolios to support
lifelong learning

www.flexiblelearning.net.au



Australian Government

Department of Education, Employment
and Workplace Relations

➔ Acknowledgements and background information

The VET E-portfolio Roadmap (Roadmap) was compiled by the Australian Flexible Learning Framework's E-portfolio business activity with national stakeholder consultations and background research conducted by education.au

The Roadmap has been endorsed by the Flexible Learning Advisory Group (FLAG) on behalf of the States and Territories.

For more information on the Framework's E-portfolio business activity, please visit:
<http://flexiblelearning.net.au/e-portfolios>

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Section 1: Introduction

The VET E-portfolio Roadmap was commissioned by the national training system's e-learning strategy, the Australian Flexible Learning Framework's (Framework¹) national E-portfolio business activity² in 2008 to assist in the development of a national standards-based framework to support interoperable e-portfolio systems in the national training system.

It is recognised that there are diverse valid purposes and user requirements for e-portfolios, many of which are significant only to individuals or to a local or organisational situation. However, some potential benefits of e-portfolios usage (in particular those that support mobility and recognition between different learning settings and workplaces) are best served by national action to develop consistent understandings of the necessary standards, policies and business rules.

The key objectives of the vocational education and training (VET) sector's national E-portfolio business activity are to:

- establish understanding of the standards requirements to enable e-portfolios to effectively support learner transitions nationally
- reach agreements between jurisdictions and with other sectors on standards, business rules and policies to enable a national infrastructure to operate and to provide guidelines for developers and users of e-portfolio tools and applications
- establish an operating infrastructure which supports individual state and territory requirements while delivering national portability and verifiability of learner information.



This roadmap is a national strategic planning tool which is designed to support the diverse requirements for e-portfolios across the VET sector and beyond, while identifying the key areas that require national action to enable learners to utilise their e-portfolio to support lifelong learning. This roadmap document explains the goals for a collaborative approach to e-portfolios in the VET sector and lays out a plan for the national VET system to realise these goals. The document was compiled following intensive research and national stakeholder consultations.

¹ <http://flexiblelearning.net.au>

² <http://flexiblelearning.net.au/e-portfolios>

⇒ What is an e-portfolio?

An e-portfolio is a learner-driven collection of digital artifacts articulating experiences, achievements and evidence of learning.

There are many different definitions of what an e-portfolio (electronic portfolio) is or could be used for, and the definition above will not necessarily encompass every possible permutation. However, establishing a flexible starting point should enable the sector to develop a consensus of what the common attributes of an e-portfolio may be. This particular definition is based on an original definition developed by the JISC³ in the UK⁴.

From the Australian VET context, a number of commonly identified use-cases have been identified to demonstrate potential uses of e-portfolios for the VET system⁵. These scenarios explore the application of e-portfolios for the following stages of a learner's involvement with the VET system:

- transitioning into the VET sector
- learning within the VET sector (including planning and reflection)
- transitioning from the VET sector to further education
- transitioning between VET and employment.

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⇒ Why are e-portfolios important to VET learners?

E-portfolios support lifelong learning by enabling individuals to document and reflect upon their learning and skills development. Among wide ranging uses and benefits attributed to e-portfolios, the most regularly cited include provision of a vehicle for:

- supporting transitions and student mobility
- planning and reflecting on learning and career development
- recognising skills and learning styles
- verification of qualifications
- security and control of private information
- recording evidence of employability skills.

³ <http://jisc.ac.uk>

⁴ JISC (2008) *Effective Practice with E-portfolios : supporting 21st century learning*, <http://www.jiscinfonet.ac.uk/e-portfolios>

⁵ These use-cases are based on the *Developing E-portfolios for VET* report released in 2007, <http://e-standards.flexiblelearning.net.au/news-older-items.htm#a5>

⇒ What is an e-portfolio system?

An e-portfolio system is one or more software applications or services used by the learner to create, maintain or present their e-portfolio.

If we think of the e-portfolio as a product or outcome⁶, then the e-portfolio system is the tool or tools used to create that product.

Technical solutions for e-portfolio systems may vary from a single e-portfolio system which incorporates a range of functionality to a loose collection of different software applications used together to create an e-portfolio. In practice, most implementations will probably fall somewhere in the middle.

It is vital for those wishing to implement a VET e-portfolio system to understand the requirements which enable the e-portfolio system to integrate or be interoperable with a wide range of existing and future systems.

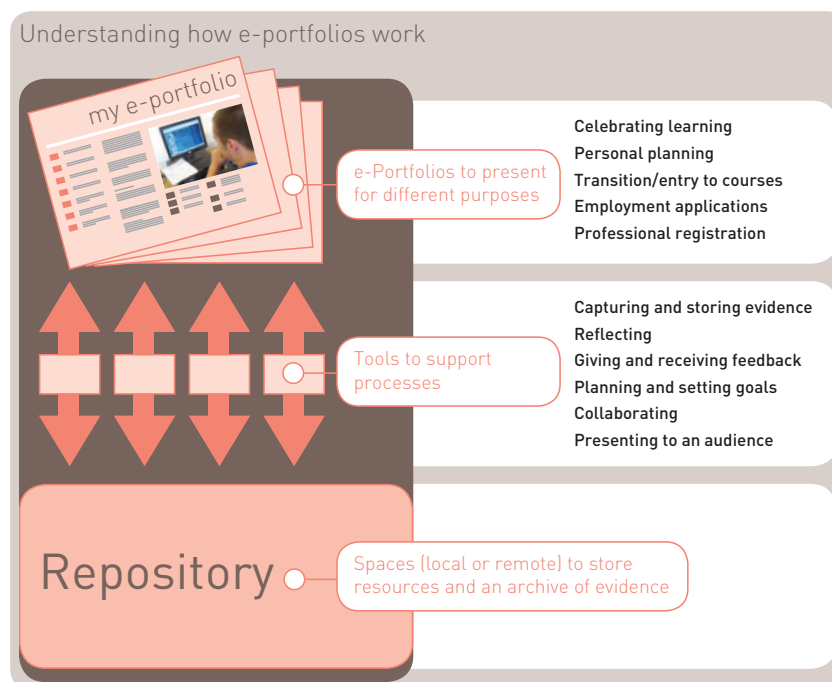


Figure 1: JISC (2008) *Effective Practice with E-portfolios*, p7 ⁴

⁶ JISC InfoNet <http://www.jiscinfonet.ac.uk/e-portfolios>

⇒ Activities or processes for a VET E-portfolio system

The following four primary activities (also called business processes) summarise typical activities or processes which occur in the development or creation of a VET e-portfolio system. These activities may or may not happen sequentially.



Figure 2: Key VET E-portfolio system activities or business processes

⇒ A reference model for VET e-portfolio systems

The following reference model expands on the key activities/business processes outlined above by including the related services/functionality and possible data sources which support the implementation of interoperable e-portfolio systems.

4 The related services outlined in the diagram below describe the functions of a 'typical' VET e-portfolio system. An actual implementation of an e-portfolio system may implement a subset or superset of these services. A variety of software applications or combinations of software applications may also be used to provide these services or functions.

The highlighted services in the diagram (authenticate, authorise, annotate, validate) are those which will be addressed by the roadmap at a national level initially. Definitions of these services are available in Appendix 3.

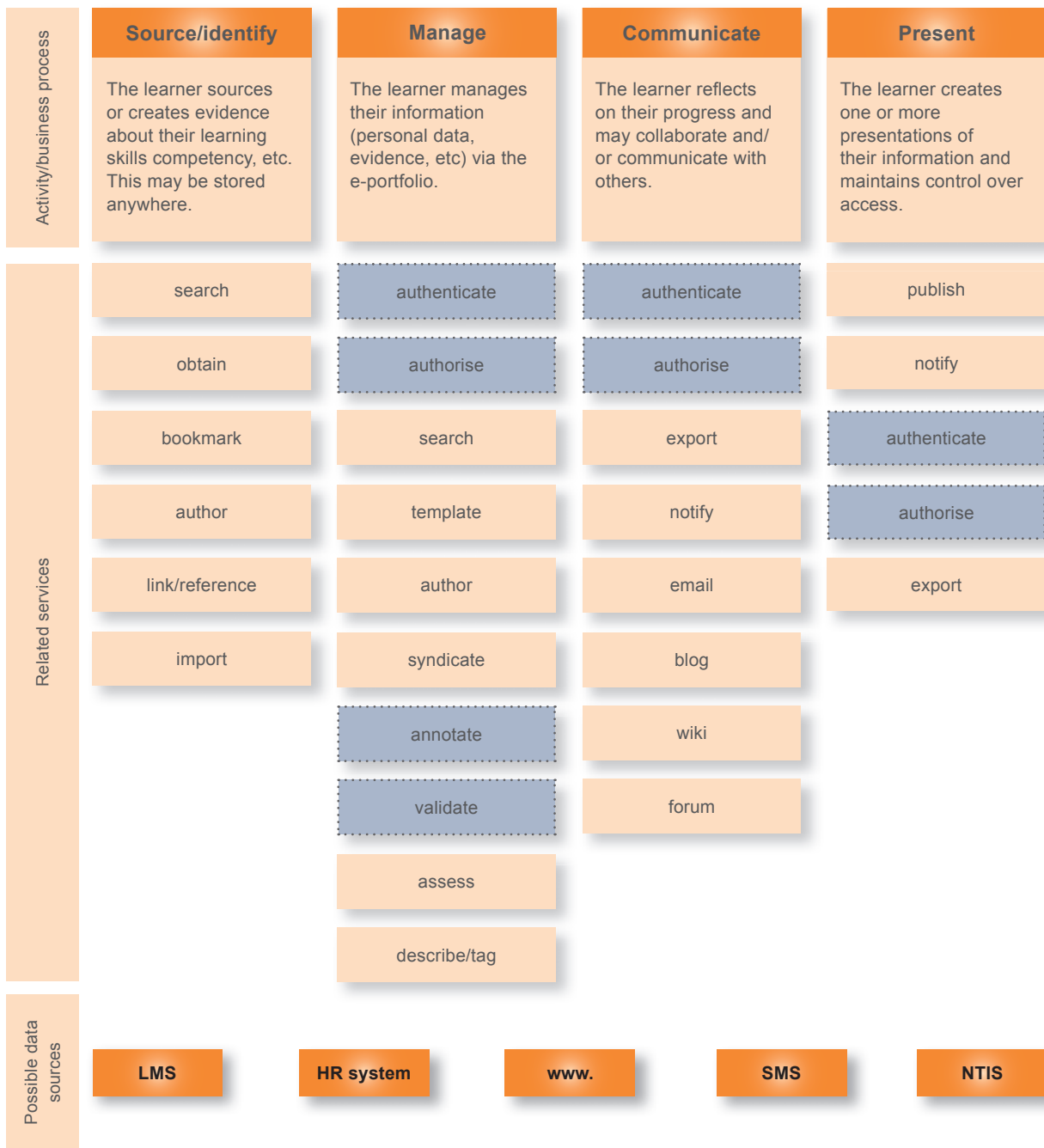


Figure 3: VET e-portfolio system and related services. The blue shaded 'related services' items will be addressed at a national level.



Section 2: VET E-portfolio Roadmap goals

As a national strategic planning tool, this roadmap defines a number of goals to enable a national approach to e-portfolios across the sector. These goals were identified through research and stakeholder consultation.

⇒ Portability



Goal 1: Enable portable e-portfolios and associated content to effectively support learner transitions and lifelong learning.

A learner should be able to access and develop their e-portfolio throughout their lifelong learning journey. This will require them to be able to move their e-portfolio between various e-portfolio systems.

⇒ Verification



Goal 2: Enable electronic verification of educational qualifications, membership of professional associations or trade/occupational licensing information.

The ability to electronically verify evidence will help to streamline applications for employment, course admissions and recognition of prior learning processes.

⇒ Privacy



Goal 3: Ensure that personal data is protected and under the control of the e-portfolio owner.

There are legal requirements for privacy which, along with agreements on ownership of content, need to be clearly articulated and addressed in e-portfolio implementations.

⇒ Ownership



Goal 4: Ensure key stakeholders, including e-portfolio owners (learners) and organisations hosting e-portfolios systems, understand their copyright and intellectual property (IP) obligations.

Copyright and IP considerations can affect the access and usage rights for a range of different types of e-portfolio content.

⇒ Access control



Goal 5: Enable effective authentication methods for third parties seeking access to sensitive personal information.

Effective digital security facilitates learners' privacy rights under law, allowing only authorised access to protected content and services.

⇒ Infrastructure



Goal 6: Advocate the availability of sufficient web connectivity, appropriate access devices, and sufficient digital infrastructure.

Access to appropriate infrastructure is required to support widespread adoption of e-portfolios within the sector.

⇒ Storage



Goal 7: Establish a shared understanding of storage issues and requirements for e-portfolios in VET.

Storage agreements need to take into account that some e-portfolio content will be stored in the e-portfolio system, whilst some content will be stored in other systems or on the internet.

⇒ Embedding



Goal 8: Establish a strategic approach to developing effective e-portfolio practice.

The uptake of e-portfolios as a teaching, learning and recognition tool needs to be accompanied through professional development, adequate business structures and support.

⇒ Transitions



Goal 9: Promote e-portfolio good practice which supports learner transitions and key national policy drivers such as RPL (recognition of prior learning) and fast-tracking apprenticeships.

E-portfolios provide a means for presenting a variety of evidence from formal and informal learning environments which have been acquired through workplace and life-wide experiences.

A complete summary of the VET E-portfolio Roadmap goals and strategies is available in Appendix 1.



Section 3: VET E-portfolio Roadmap key outputs

The resulting knowledge and experience gained from addressing and achieving the nine goals will be distilled into three key outputs aimed at facilitating e-portfolios for lifelong learning in the national VET sector:

- national guidelines for VET managers of learner information
- functional specifications for e-portfolio system implementers and developers
- strategies for embedding e-portfolios into VET.

3.1 National guidelines for VET managers of learner information

Achievement of the roadmap goals will result in guidelines for organisations which manage learner information to enable national infrastructure which supports life-long learning.

Better access to information stored on third party databases about an individual enables more well-informed choices regarding personal and professional learning and career development needs, as well as allowing access to evidence of competence which supports learner transitions. The development of these guidelines will require national collaboration and agreement.



3.2 Functional specifications for e-portfolio system implementers and developers

Implementers and developers of e-portfolio systems require specifications for connecting national infrastructure with e-portfolio systems and their related systems, to enable learners to fully utilise and build upon the evidence which supports their knowledge, skills and ability.

These functional specifications for e-portfolio systems will guide implementers and developers on how to effectively utilise national infrastructure and resources.

3.3 Strategies for embedding e-portfolios into VET

Registered training organisations (RTOs) and teachers and trainers require strategies to comprehensively embed e-portfolio systems and practices which enable their learners to proactively plan and manage their lifelong and life-wide learning journeys.

Research, trials and collaboration with other sectors and global e-portfolio activities will result in resources and support mechanisms for the VET sector.



Figure 4: VET E-portfolio Roadmap




Section 4: VET E-portfolio Roadmap implementation strategy

The roadmap will be realised through a national collaborative effort, coordinated by the Framework's E-portfolio business activity. The E-standards Expert Group⁷ will be used as appropriate to agree on national technical standards and interoperability requirements for E-portfolios.




The following Roadmap implementation strategy describes the proposed actions for achieving each of the nine goals as well as identifying which of the three key outputs each action will contribute to:

- 3.1 National guidelines for VET managers of learner information
- 3.2 Functional specifications for e-portfolio system implementers and developers
- 3.3 Strategies for embedding e-portfolios in VET

Roadmap implementation strategy			
Key goal	Actions	Key output	Timelines
Portability 	A technical method for associating competencies, employability skills and other relevant frameworks/ classifications to e-portfolio content/evidence will be investigated and recommended for the VET sector.	3.2	2009 – Research 2010 – Guidelines/ Agreement 2010 – Implemented
	Import/export functional requirements for e-portfolio systems will be recommended and agreed nationally.	3.2	
	The use of a VET person profile to facilitate the portability of e-portfolios which is interoperable with the auEduPerson ⁸ specification will be investigated.	3.1, 3.2	

⁷ The E-standards Expert Group (EEG) is a representative body bringing together expert personnel from major national initiatives (within and outside the Framework), key cross-sectoral organisations and all States and Territories. Members represent the relevant national projects and functions, each State and Territory jurisdiction, and cross-sectoral bodies with complementary roles.

⁸ <http://www.aaf.edu.au/working-groups>



Key goal	Actions	Key output	Timelines
Verification 	Existing systems for validating claims including Qualsearch ⁹ , Purple Passport ¹⁰ and Digitary ¹¹ will be evaluated for their potential suitability in an Australian VET context. The Australian Graduation Statement for Higher Education and European Diploma Supplement will also be considered as part of this investigation.	3.1, 3.2	2009 – Research 2010 – Guidelines/ Agreement 2011 – Implemented
Privacy 	Generic legal advice will be sought regarding privacy issues and the roles and responsibilities associated with the delivery of e-portfolio services.	3.2	2009 – Research 2010 – Guidelines/ Agreement 2010 – Implemented
	Information and advice on privacy and ownership policies will be researched and guidelines for RTOs and developers of e-portfolio systems. This information will be based on best and emerging practice in this area and use-cases illustrating common issues and scenarios will be provided.	3.2, 3.1	
Ownership 	Guidelines concerning the management of copyright and IP in e-portfolio implementation will be developed for the VET sector. In particular: <ul style="list-style-type: none"> guidelines on licensing of materials and usage of third party materials guidelines on appropriate content. 	3.1, 3.2, 3.3	2010 – Research 2010 – Guidelines/ Agreement 2010 – Implemented
	The E-portfolio business activity will monitor relevant developments such as Creative Commons Australia, in particular ccLearn initiatives. ¹²	3.1, 3.2, 3.3	

⁹ <http://www.qualsearch.com.au/>



¹⁰ <http://www.purplepassport.com/>

¹¹ <http://www.digitary.net/>

¹² ccLearn <http://learn.creativecommons.org/>

Key goal	Actions	Key output	Timelines
Access control 	A set of representative VET use-cases for identity, authentication and access control will be developed based on further stakeholder consultations. Although focused on e-portfolios, an identity framework for the VET sector will need to be broader in scope.	3.1, 3.2	2008-2009 – Research/Trials 2010 – Guidelines/ Agreement 2011 – Implemented
	A trial of a user-centric identity framework approach such as OpenID or Information Cards will be undertaken.	3.1, 3.2	
	The sector will also need to engage in related activities such as the higher education sector, auEduPerson and the work of the schools sector in developing a localised version of the SIF data model ¹³ to form a common agreement on data attributes for students. (See actions under Portability above.)	3.1	
	Guidance and support for RTOs implementing e-portfolio systems will be provided.	3.2	Ongoing
Infrastructure 	Infrastructure requirements for learners, e-portfolios and e-portfolio systems to support lifelong learning will be communicated to RTOs, jurisdictions and federal government (including the Digital Education Revolution initiative) and other relevant stakeholders.	3.2, 3.3	Ongoing – Strategic Alliances 2010 – Research/ Guidelines 2011 – Implemented

¹³ <http://specification.sifinfo.org/Implementation/2.0/DataModel.html>

Key goal	Actions	Key output	Timelines
Storage 	Guidance on storage of digital content for e-portfolios will be developed and agreed upon. This guidance will be informed by a number of key resources including higher education sector's Australian E-portfolio Project's e-portfolio toolkit ¹⁴ and JISC e-portfolio ¹⁵ resources. It will be aimed at balancing the needs of learners, RTOs and the requirement for longevity of e-portfolios.	3.2	2010 – Research 2011 – Guidelines/ Agreement 2011 – Implemented
	Guidelines on supporting the longevity requirements for e-portfolios will be developed.	3.2, 3.1	
	Software developers and vendors will be engaged in the development and implementation of e-portfolios in the VET sector to ensure appropriate software is available.	3.2	Ongoing – formal and informal community engagement
Embedding 	The Framework's E-portfolio business activity will play a central role in supporting the establishment and facilitation of communities of practice to provide assistance, dissemination of information and a mentoring role for new users.	3.3	Ongoing
	The business activity will also seek FLAG ¹⁶ and AICTEC ¹⁷ support to advocate the establishment of a cross sectoral working/reference group that focuses on issues such as policy, professional learning, standards and advocacy at national level to support a standards-based approach to e-portfolios across the sectors.	3.3	March 2009 – FLAG June 2009 – AICTEC
Transitions 	Pilot projects within the VET sector will be encouraged to further develop an understanding of the technical and policy requirements of learner transitions.	3.3	Ongoing
	The COAG RPL community will be engaged to ensure e-portfolios support RPL processes.	3.3	

¹⁴ <http://www.eportfolioppractice.qut.edu.au/information2/toolkit/>

¹⁵ <http://www.juscinfonet.ac.uk/e-portfolios/>

¹⁶ FLAG – the Flexible Learning Advisory Group is the Framework's managing body and is the key policy advisory group on national issues related to the directions and priorities for the application of information and communication technologies (ICT) in VET and adult and community education (ACE).

¹⁷ AICTEC – the Australian Information and Communication Technology in Education Committee is a national, cross-sectoral committee responsible for providing advice to all Australian Ministers of Education and Training on the economic and effective utilisation of ICT in Australian education and training.



Section 5: Getting involved

➔ The role of jurisdictions and RTOs

The VET E-portfolio Roadmap is a national strategy that relies on the active cooperation and involvement of jurisdictions and RTOs. By becoming involved in this national activity, jurisdictions and RTOs can benefit from the experiences of others and can ensure their implementations are well placed to benefit learners and ensure quality and consistency.

Diversity and interoperability

By participating in national e-portfolio activities, jurisdictions and RTOs will be supported in implementing e-portfolio systems that enable the recording of evidence of learning. Standard approaches to tying evidence to employability skills, competencies or other frameworks will make e-portfolios more interoperable nationally.

For organisations implementing e-portfolio systems, the specific requirements for particular cohorts of learners or industry groups will vary. To support this diversity, different tools and processes for supporting learners in creating e-portfolios may be used by different RTOs and jurisdictions, however interoperability of e-portfolios across the sector and beyond remains a vital requirement.

Portability across the VET sector and beyond

The reference model for a VET e-portfolio system described in this document was designed to facilitate an understanding of the requirements for e-portfolio systems in the VET sector, including adult and community education (ACE). Utilising the VET e-portfolio system reference model will assist implementers and developers in gaining an understanding of the functionality and interoperability requirements for e-portfolios.



For more information

The VET E-portfolio Roadmap is being facilitated as part of the Framework's E-portfolios business activity.

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Appendix 1: Summary of the VET E-portfolio Roadmap

Portability



Goal 1: Enable portable e-portfolios and associated content to effectively support learner transitions and lifelong learning.

Requirements: A learner should be able to access and develop their e-portfolio throughout their lifelong learning journey. This will require them to be able to move their e-portfolio between various e-portfolio systems.

Strategy: A technical method for associating competencies, employability skills and other relevant frameworks/classifications to e-portfolio content/evidence will be investigated and recommended for the VET sector.

Import/export functional requirements for e-portfolio systems will be recommended and agreed nationally.

The use of a VET person profile to facilitate the portability of e-portfolios which is interoperable with specifications such as auEduPerson⁸ specification will be investigated.

Verification



Goal 2: Enable electronic verification of educational qualifications, membership of professional associations or trade/occupational licensing information.

Requirements: The ability to electronically verify evidence will help to streamline applications for employment, course admissions and recognition of prior learning processes.

Strategy: Existing systems for validating claims including Qualsearch⁹, Purple Passport¹⁰ and Digitary¹¹ will be evaluated for their potential suitability in an Australian VET context. The Australian Graduation Statement for Higher Education and European Diploma Supplement will also be considered as part of this investigation.

Privacy



Goal 3: Ensure that personal data is protected and under the control of the e-portfolio owner.

Requirements: There are legal requirements for privacy which, along with agreements on ownership of content, need to be clearly articulated and addressed in e-portfolio implementations.

Strategy: Generic legal advice will be sought regarding privacy issues and the roles and responsibilities associated with the delivery of e-portfolio services.

Information and advice on privacy and ownership policies will be researched and guidelines for RTOs and developers of e-portfolio systems. This information will be based on best and emerging practice in this area and use-cases illustrating common issues and scenarios will be provided.

Ownership



Goal 4: Ensure key stakeholders, including e-portfolio owners (learners) and organisations hosting e-portfolios systems, understand their copyright and intellectual property (IP) obligations.

Requirements: Copyright and IP considerations can affect the access and usage rights for a range of different types of e-portfolio content.

Strategy: Guidelines concerning the management of copyright and IP in e-portfolio implementation will be developed for the VET sector. In particular:

- guidelines on licensing of materials and usage of third party materials
- guidelines on appropriate content.

The E-portfolio business activity will monitor relevant developments such as Creative Commons Australia, in particular ccLearn initiatives.¹²

Access control



Goal 5: Enable effective authentication methods for third parties seeking access to sensitive personal information.

Requirements: Effective digital security facilitates learners' privacy rights under law, allowing only authorised access to protected content and services.

Strategy: A set of representative VET use-cases for identity, authentication and access control will be developed based on further stakeholder consultations. Although focused on e-portfolios, an identity framework for the VET sector will need to be broader in scope.

A trial of a user-centric identity framework approach such as OpenID or Information Cards will be undertaken.

The sector will also need to engage in related activities such as the higher education sector, auEduPerson and the work of the schools sector in developing a localised version of the SIF data model¹³ to form a common agreement on data attributes for students. (see actions under Portability above).

Guidance and support for RTOs implementing e-portfolio systems will be provided.

Infrastructure



Goal 6: Advocate the availability of sufficient web connectivity, appropriate access devices, and sufficient digital infrastructure.

Requirements: Access to appropriate infrastructure is required to support widespread adoption of e-portfolios within the sector.

Strategy: Infrastructure requirements for learners, e-portfolios and e-portfolio systems to support lifelong learning will be communicated to RTOs, jurisdictions and federal government (including the Digital Education Revolution initiative) and other relevant stakeholders.

Storage



Goal 7: Establish a shared understanding of storage issues and requirements for e-portfolios in VET.

Requirements: Storage agreements need to take into account that some e-portfolio content will be stored in the e-portfolio system, whilst some content will be stored in other systems or on the internet.

Strategy: Guidance on storage of digital content for e-portfolios will be developed and agreed upon. This guidance will be informed by a number of key resources including higher education sector's Australian E-portfolio Project's e-portfolio toolkit¹⁴ and JISC e-portfolio¹⁵ resources. It will be aimed at balancing the needs of learners, RTOs and the requirement for longevity of e-portfolios.

Guidelines on supporting the longevity requirements for e-portfolios will be developed.

Embedding



Goal 8: Establish a strategic approach to developing effective e-portfolio practice.

Requirements: The uptake of e-portfolios as a teaching, learning and recognition tool needs to be accompanied through professional development, adequate business structures and support.

Strategy: The Framework's E-portfolio business activity will play a central role in supporting the establishment and facilitation of communities of practice to provide assistance, dissemination of information and a mentoring role for new users.

The business activity will also seek FLAG¹⁶ and AICTEC¹⁷ support to advocate the establishment of a cross sectoral working/reference group that focuses on issues such as policy, professional learning, standards and advocacy at national level to support a standards-based approach to e-portfolios across the sectors.

Transitions



Goal 9: Promote e-portfolio good practice which supports learner transitions and key national policy drivers such as RPL (recognition of prior learning) and fast-tracking apprenticeships.

Requirements: E-portfolios provide a means for presenting a variety of evidence from formal and informal learning environments which have been acquired through workplace and life-wide experiences.

Strategy: Pilot projects within the VET sector will be encouraged to further develop an understanding of the technical and policy requirements of learner transitions. The COAG RPL community will be engaged to ensure e-portfolios support RPL processes.



Appendix 2: Key national policy drivers

⇒ 2008–2011 Australian Flexible Learning Framework Strategy

The strategy advocates:

- greater flexibility over training with technology forming a greater part in the delivery of training and learners are more empowered to plan and control their learning
- more flexible methods for assessing and recording training achievements
- increasing opportunities for learners to gain recognition of their learning.¹⁸

⇒ COAG agenda

- At its 2005 and 2006 meetings, Council of Australian Governments (COAG)¹⁹ noted that a more responsive and flexible national apprenticeship, VET, and skills recognition system is vital to meeting both current and future skills needs.
- Various government reports supporting increased human capital such as employability skilling and training, including *Assessment and Reporting of Employability Skills in Training Packages* by The Allen Consulting Group (2006), recognise that learning and the acquisition of skills can effectively be achieved through informal processes.

⇒ Other policy considerations

Other current topics within the broader policy context that have relevance for E-portfolios include:

- quality (good practice) in education and training
- improved recognition processes between VET and higher education to better support learner transitions between these sectors (Bradley, Review of Australian Higher Education Report)
- productivity (2020 Summit report)
- national approaches to ICT infrastructure development including through the Digital Education Revolution
- cross-sectoral approaches to ICT infrastructure development

¹⁸ 2008–2011 Framework Strategy http://www.flexiblelearning.net.au/flx/webdav/site/flxsite/shared/Secretariat/2008_2011_Framework_Strategy.pdf (p.15)

¹⁹ COAG – National reform of the vocational education and training sector, http://www.coag.gov.au/coag_meeting_outcomes/2005-06-03/index.cfm#skill

- portability and interoperability of data
- learner-centred learning
- smart cards, identity management, and the 'packaging' of personal profiles in other sectors (such as medical records in the Health sector)
- privacy.



Appendix 3: Definition of e-portfolio system services

The related services defined in the VET e-portfolio system reference model define typical expected functionality and services for e-portfolio systems. Some of the services defined below will support multiple activities, indicating where software functionality could be reused.

Many of these services have been aligned with services already defined by the e-Framework for education and research²⁰. The corresponding or related e-Framework services are highlighted below in bold.

➔ Source/Identity

Name	Service/Functionality definition
Search	Search and discover digital resources either within the e-portfolio system and/or on the wider web. This functionality should utilise existing descriptive information about digital content related to the e-portfolio (metadata etc). [search]
Import	Import digital content into an e-portfolio system. [add][obtain]
Author	The creation of web-based content including an e-portfolio structure and/or content linked to from an e-portfolio. [add]
Link/reference	A service for allowing the creation of a link or reference to a web-based resource externally from the e-portfolio. Also includes bookmarking functionality.

➔ Manage

Name	Service/Functionality definition
Authenticate	Uniquely identifying an individual or entity based on their verification credentials. The authentication process may allow access to one or more web-based services such as an e-portfolio system or related systems. [authenticate]
Authorise	Process of establishing what an authenticate user can do. The owner of an e-portfolio may authorise a third party to have access to all or part of their e-portfolio and web resources that are contained or linked to from the e-portfolio. Access based on authorisation should be able to be removed, or restricted to a particular view of an e-portfolio. [authorise]
Search	[as previously defined]
Template	An e-portfolio system administrator can create a web-based template (XML and/or XHTML) which can be used by e-portfolio owners to structure and organise their e-portfolio.

²⁰ <http://e-framework.org>

Author	[as previously defined]
Syndicate	Make representations of e-portfolio content available for consumption by services using a standard format (such as RSS or ATOM). [syndicate]
Annotate	Functionality which enables an e-portfolio owner or another authorised user to add an annotation (such as a comment) to e-portfolio content. [annotate]
Publish	Enables an e-portfolio owner to publish an e-portfolio or view of an e-portfolio. The publishing process should enable the e-portfolio owner to manage access conditions.
Validate	A service that allows a validation process to occur on a piece of digital content. Validation may be done synchronously or asynchronously. Content validated asynchronously should be digitally signed.
Assess	Functionality/workflow to support an assessment process. [assess]
Describe/tag	The process of assigning metadata to a digital object, collection of objects, an e-portfolio view or an entire e-portfolio.

➔ Communicate

Name	Service/Functionality definition
Authenticate	[as previously defined]
Authorise	[as previously defined]
Export	Enables the owner of an e-portfolio to export all or part of their e-portfolio from an e-portfolio system. This may be part of an archiving process or because the e-portfolio owner will no longer be using the e-portfolio system.
Notify	Send a notification to one or more recipients based on a trigger event. A trigger event could be creation/modification of content, content submitted for assessment etc. [notify]
Email	Send, and receive electronic mail (email) messages.
Blog	Software for creating and maintaining a blog. [add]
Wiki	Software for creating and maintaining a wiki. [add]
Forum	Software for establishing, using and monitoring a web-based forum.

➔ Present

Name	Service/Functionality definition
Authenticate	[as previously defined]
Authorise	[as previously defined]
Export	[as previously defined]
Notify	[as previously defined]