e-Portfolios and the Services Environment

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KERIS
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Overview

• Context

• The e-Framework for Education & Research
  • What
  • Who
  • Why
  • How

• Some trends in development of e-Portfolios

• e-Portfolio activities in Australia
“e” is enabling & transforming more than learning

- Teaching, Learning, Training
- Research
- Administration
- IT Services
- Library Services
- … & the workplace!

ICT Infrastructure is costly to build & maintain

Increasingly networked environment – people, organisations, technology
New capabilities of Internet technologies

- Web 2.0 ...
- Service Oriented Architectures
- Grid computing
- Wireless & mobile access
- Open source innovation

→ Standards & specifications are key
e-Framework Overview
e-Framework – in brief

• An international initiative that provides information to institutions on investing in and using ICT infrastructure. It advocates service-oriented approaches to facilitate technical interoperability of core infrastructure as well as effective use of available funding.

• … and an evolving Knowledge Base http://www.e-framework.org/
e-Framework – Who

• Led by DEST (Australia) and JISC (UK)
  New partners joined in 2006:
  • SURF Foundation (The Netherlands)
  • New Zealand Ministry of Education

• Informed by earlier work
  • ELF (e-learning Framework)
    http://www.elframework.org/
  • IMS Abstract Framework
    http://www.imsglobal.org/af/index.html
  • OKI
    http://www.okiproject.org/
  • LSAL (Carnegie-Mellon)
    http://www.lsal.cmu.edu/ (no longer exists)
to facilitate technical interoperability within and across education and research through improved strategic planning and implementation processes
To achieve this we must have:

A way to…

- Describe and talk about tools & systems
- Integrate diverse tools and systems
- Develop a common understanding of what we have done & can do
- Map a path forward to work on systems
A framework for thinking about & documenting IT systems in terms of component behaviours

... described as services

and aimed at understanding better the points at which we need to integrate & interoperate
Guiding Principles

- A service-oriented approach to system and process integration
- Development, promotion & adoption of Open Standards
- Community involvement in development
- Open collaborative development activities
- Flexible and incremental deployment
Open standards-based interfaces for interoperability … in a service-oriented environment

The e-Framework analyses and documents Service Interfaces
A Buzzword?

Delivery

Services

Access

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A Buzzword?

Enterprise
SOA

Services

Individual & Community
Web 2.0
Terminology

- is always contextual
- needs to be precise when defining specifications & standards

In the e-Framework:
- needs structure & coherence
- aligns business processes and requirements with technical capabilities
• A significant effort has been made to agree on core terminology
  • Necessary for the Knowledge Base / Website
  • Defined core concepts & models
  • Drawn on work of W3C, OASIS SOA TC…

• Attending to this issue earlier rather than later a strategic choice.
NO – not this kind of service!
Characteristics of Services

- Loose Coupling
- Service Contracts
- Autonomy
- Abstraction
- Reusable
- Composable
- Stateless
- Discoverable

(Phil Nichols, 2007)
Principles of Service-Orientation

• Using ‘business’ requirements to leverage IT resources flexibly

• Harnessing diverse IT capabilities through ‘loose coupling’ of discrete components

• Reducing complexity of IT systems development

• Empowering the user

• Connectedness, not silos!
“A software development strategy for describing enterprise solutions utilising discrete components of business functions”

Dan Rehak
Goals of SCORM

- Interoperability
- Reusability
- Accessibility
- Durability
- Adaptability

e-learning content & delivery systems
Goals of the e-Framework

- SCORM goals ++
- Composability
- Flexibility
- Agility
- Scalability
- Sustainability
- Simplicity
- Integration

Service Exposure, Access & Delivery across & within Domains

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Knowledge Base

• Focal point for dissemination of methodologies, good practice guides & results of analysis

• Registries of services & service usage models

• Opportunity for community input & engagement

• Supports a strategic, incremental approach

• Provides a consistent technical vocabulary for documenting components & services

• Acts as a catalyst for the development of further specifications & standards
Collections of related behaviours describing an abstract capability that supports a business process.
Service-Oriented Approach

Expressions are specific cases of genres & can directly inform the design of an implementation

Service Expressions
(e.g., SRW, Z39.50, CQL, ECL)
 Behaviours
 Operations
 Data Definitions
 Standards & Specifications

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Service Usage Models (SUMs)

- Business Function A
  - Service Genre XOR
    - Service Expression a
    - Service Expression b
- Business Function B
  - Service Genre XOR
    - Service Expression d
    - Service Expression e
- Business Function C
  - Service Genre XOR
    - Service Expression f
    - Service Expression g

A SUM can only contain Service Genres OR Service Expressions NOT both.

Data Sources:
- Data Source 1
- Data Source 2
- Data Source 3
- Data Source 4

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Judith Pearce (NLA) New Frameworks for Resource Discovery and Delivery
Student Transfer SUM

Student Transfer Service Usage Model
- A student leaves an organisation – finishes study
- Student arrives at organisation and enrolls in some course(s)
- Student leaves organisation to move to another organisation

Business Function:
- Student Leaves
- Student Arrives (Enrols)
- Student Transfers to other Organisation

Service Genres:
- Publish
- On demand access to Share Data
- Subscribe
- Authentication
- Authentication
- Authorisation
- Authorisation

Related SUMs:
- Student Identifier Management
- Enrol Student
- Student Identifier Management
- Enrol Student

Data Sources:
- Student Register
- Student ROL
- Authentication Data


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But the e-Framework ...

- is not intended to be prescriptive
- is not meant to be implemented all at once
- is not an architecture

and

- can only benefit from stakeholder input!
References – e-Framework

- The e-Framework for Education & Research
  http://www.e-framework.org/

- The e-Framework Development wiki

- IDEA 2006 e-Framework Workshop
  http://adlaustralia.org/idea2006/ef-workshop.html
Defining e-Portfolios

Trends

Visions & Implementations

Scoping Infrastructure Requirements

Applying the e-Framework

... Work in Progress
The concept of managing personal portfolios pre-dates the Internet age – e.g., art and design contexts for evaluation or assessment.

Organising such materials in digital formats provides new opportunities and efficiencies – e.g., banking contexts, where personal assets are managed by a trusted service provider.

In both cases, the common characteristic is the user maintaining control of his or her own portfolio.
Defining e-Portfolios

From a **functional** perspective:

- Personal profiling (& management)
- Publishing
- Presentation
- Packaging
- Portability
- Persistence
- …
Classifying e-Portfolios

- Certification
- Evidence
- Reflective Learning
- Career Portfolios
- Institutional Portfolios
- Presentation Portfolios

- Transition into/from education
- Employability profiling
- Life-long / Life-wide Learning

“Collectible” personal &/or work-related information
An Educause Report expands the concept …

- Student – learning, reflective, career development
- Teaching – sharing practices & resources
- Institutional – sharing accreditation processes

Lorenzo & Ittelson (2005). An Overview of e-Portfolios
Trends?
Trends in Development of e-Portfolios

- There are many e-Portfolio applications servicing the education & training sector
- But, no single consensus on what e-Portfolios are and should be used for
- Interoperability a key challenge for all stakeholders
  - Institutional service providers
  - Technology vendors
  - Individuals moving between organisations
  - Standards & specifications development organisations
- Emergence of lightweight specifications suggest faster development of services to support e-portfolio functions and increased interoperability
• Open Access Movement

http://www.oercommons.org/
http://en.wikipedia.org/wiki/Open_educational_resources
http://creativecommons.org/
http://commons.carnegiefoundation.org/

Share, Remix, Reuse!
EDUCAUSE Learning Initiative  
Horizon Report 2008

- Identifies key tech trends ... 1-5 years
  - Grassroots video
  - Collaboration webs
  - Data mashups
  - Mobile broadband
  - Collective Intelligence
  - Social Operating Systems

e-Portfolios seen as part of a Collaboration Web now and as a key part of Social Operating Systems in the future

“We are seeing a shift in focus; where the primary purpose of the web has been seen as sharing files and applications, there is a growing sense that the real value of the network lies in the way it helps us create, identify, and sustain relationships. This seemingly subtle change—from an emphasis on file sharing to one on relationships—will have a profound impact on the way we will work, play, create, and interact online.”

EDUCAUSE Horizon Report 2008
Three Ideals for ePortfolio Practice

Authenticity
Deliberation
Integrity

Darren Cambridge - The Lifelong and Lifewide Learning Vision
Australian ePortfolio Symposium, Brisbane, Queensland, Australia, 2008-02-07
http://www.eportfoliopractice.qut.edu.au/
1. e-Portfolios are the latest in a long line of approaches to supporting people development, through schools, colleges, higher education, appraisal and continuing professional development.

2. They provide & support opportunities to review, reflect, & record.

3. For individuals, such processes are intrinsically related to the development of a clearer sense of who they are, where they want to go, and how they might get there in the context of working and learning environments which are characterised by increasing change.

4. For business and professional bodies, such processes can be linked to people development through appraisal and continuing professional development processes.

5. Collectively, harnessing the potential of technology, we can make this vision much more real for many more people.

Rob Ward - E-Portfolio practice in higher education: the UK experience
Australian ePortfolio Symposium, Brisbane, Queensland, Australia, 2008-02-07
http://www.eportfoliopractice.qut.edu.au/
Scoping e-Portfolio Infrastructure

- What standards are needed?
  - Identity & Access management
  - Portable, validated student records
  - Competency classification & validation
  - Multiple repository/device interfaces
  - Content management
  - … (User Control!)

- Who will be the trusted service providers?
  - Universities unlikely to be sufficient in long term
  - IT vendors do not have a lot of “trust equity”
Scoping e-Portfolio Infrastructure

Personalised support

Reflective = Learning PFs
- Blogosphere, Logbooks, Progressfiles, PDP
- Audience = self (others)
- Characteristics = personal, open, mostly narrative

Evidence = Presentation PFs
- Written works, assignments, projects, pieces of code, etc.
- Audience = others (employers)
- CMS – file management system
- Characteristics = personal, self-selected, mostly products

Certification = Assessment PFs
- Skills, competences, learning achievements, LIP, UCAS profiles
- Audience = other learning providers + employers
- Characteristics = secure, authoritative
- CMS, Student Record System

Social space
- Audience = friends, community
- Characteristics = social currency

Various services:
- Data services: storage, authn, authz, security, encryption, digital signature, etc.
- Personal services: alumni, Skype, IM, address book, calendar, friends reunited, etc.

http://www.slideshare.net/wgreller/eportfolio-service-model-for-he-2007
Wolfgang Greller

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Scoping e-Portfolio Infrastructure

- Portfolio Initiatives
- Postsecondary Institutions participate in Employment Mapping
- Datamining of Portfolios used to support Career Planning

POSTSECONDARY EDUCATION
Stack & Cloud

LOOSELY COUPLED APPLICATIONS
- Portfolios
- Contextual Mapping
- Template/Rubrics
- Manpower Planning Tools

K – 12
Stack & Cloud Applications

STATE WORKFORCE ORGANIZATIONS
Stack & Cloud Applications

EMPLOYERS
Stack & Cloud Applications

MINNESOTA CONTEXT
- Governor’s Workforce Development Council
- Economic Development Regions
- DEED Regional Clusters of Industry
- Minnesota Job Skill Partnerships
- Emphasis on Science, Technology, Engineering, and Maths (STEM)
- Project “Lead the Way” – 20 high school to college participants

- Perkins Changes support Career/Tech education Collaboration
- iSEEK – Internet System for Employment and Employment and Educational Knowledge
- Portfolio Initiatives Statewide in parts of K12, MnSCU, and Employers

- Individual Employers work with MnSCU Institutions
- Datamining of Portfolios supports Manpower Planning

Donald Norris, 2007
http://www.strategicinitiatives.com/
Interoperability Requirements

Four categories

- Aggregation
- Syndication
- Distribution
- Migration


Interoperability requirements for e-Portfolio services extend beyond ‘e-portfolio to e-portfolio’ communication to include interaction with:

- student records systems
- learning management systems
- content management systems
- authentication and authorisation services
- digital rights management systems
- persistent identifier services
Identifying Relevant Services

- Authentication
- Authorisation
- Blog
- Calendar
- Chat
- Competencies
- Competency Definitions
- Contacts Organiser
- Email
- Forms builder
- Forum
- Learning Profile
- Messaging

- Multimedia Manager
- Occupation Codes
- Packaging
- Personal Profile
- Presence
- Presentation
- Repository
- Resume builder
- Service Manager
- Timetable
- Transcript validation
- Validate
- View

http://e-standards.flexiblelearning.net.au/docs/vet-eportfolio-report-v1-0.doc
21st Century Student Competencies

- Anchoring
- Filtering
- Connecting
- Being human
- Creating & deriving meaning
- Evaluation/authentication
- Critical/creative thinking
- Pattern recognition
- Navigating knowledge
- Acceptance of uncertainty
- Contextualizing

- Communication
- Critical Thinking
- Strategic Problem Solving
- Valuing
- Group Interaction
- Global Understanding
- Effective Citizenship
- Aesthetic Awareness
- Information Technology

Darren Cambridge, 2008
http://www.eportfoliopractice.qut.edu.au/

George Siemens, 2006
http://www.connectivism.ca

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Competency Vocabularies?

- HR-XML Consortium
  http://www.hr-xml.org/
- Int’l Standards Classification of Occupations (ISCO)
- IEEE LTSC WG20 – Competency Data Standards
  http://www.ieeeltsc.org/working-groups/wg20Comp/
- XCRI - eXchanging Course Related Information
  http://xcri.org/
- TenCompetence
  http://www.tencompetence.org/
- ACCI Employability Skills
Communication skills that contribute to productive and harmonious relations between employees and customers

Team work skills that contribute to productive working relationships and outcomes

Problem-solving skills that contribute to productive outcomes

Initiative and enterprise skills that contribute to innovative outcomes

Planning and organising skills that contribute to long-term and short-term strategic planning

Self-management skills that contribute to employee satisfaction and growth

Learning skills that contribute to ongoing improvement and expansion in employee and company operations and outcomes

Technology skills that contribute to effective execution of tasks.
Applying the e-Framework …

- Ep4LL SUM – (JISC) e-Portfolios for lifelong learning
- Mansle SUM – Manchester (UK)
- IDEA ePortfolio demo SUM – IDEA2007
- QTI Rendering and Response Processing Services (R2Q2)

http://www.elframework.org/
Source: eP4LL Reference Model
http://www.nottingham.ac.uk/epreferencemodel/finalreport.htm
**Student Transfer SUM**

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This Service Usage Model focuses on the particular activity of a Student constructing a portfolio and presenting this to other institutions. The portfolio may include Personal Information and Evidence of Learning (transcript, achievements, skills, body of evidence). The Student can customise the presentation of this information for specific institutions/organisations.
Developing an e-Portfolio SUM

IDEA 2007 ePortfolio Demo - Service Usage Model

Summary Descriptions of Requirements for Business Processes
- Student access ePortfolio
- Records data Evidence of learning, transcript...
- Student creates a view or presentation.
- View is exported
- View is presented to institution

Business Process Names
- Student access ePortfolio
- Records Data
- Presents

Service Genres OR Service Expressions (delete one)
- Obtain (Personal Information)
- Update (Evidence)
- Search (Student Information)
- Authentication achievement federation SUM
- Create (Portfolio View)
- Search (Evidence)
- Update (Portfolio View)

Data Sources
- Personal Information
- Student Information
- Employability skills templates
- Course Information
- Evidence
- Portfolio View

Source: Lyle Winton

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InterCog
Key finding:
This project has shown that the e-Framework can reduce the complex challenge of e-Portfolio for lifelong learning to simpler terms, in which it becomes both doable and affordable, and can be implemented and sustained.

http://www.nottingham.ac.uk/epreferencemodel/finalreport.htm
Creating Service Definitions

1. Begin with a simple narrative, non-technical, description of a scenario

2. Develop high level use-cases as a ‘workflow’

3. Identify services that match the flow from the e-Framework registry

4. For services not yet documented, use the templates provided
Questions?
International Initiatives

- Europass
- The Bologna Process
- European Institute for E-Learning (EifEL)
- Career Wales Online
  [https://www.careerswales.com/progressfile/](https://www.careerswales.com/progressfile/)
- ePort Consortium
- Open Source Portfolio (OSP)
Resources – e-Portfolios

- The Australian e-Portfolios in Practice Symposium (2008)

- The Centre for International e-Portfolio Development
  [http://www.nottingham.ac.uk/eportfolio/](http://www.nottingham.ac.uk/eportfolio/)

- The Centre for Recording Achievement