

*e-Portfolios
and
the Services Environment*

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KERIS

March 24, 2008, Seoul, Korea



InterCog

Connecting People, Ideas
& Technology



- Context
- The e-Framework for Education & Research
 - What
 - Who
 - Why
 - How
- Some trends in development of e-Portfolios
- e-Portfolio activities in Australia



Context

- “e” is enabling & transforming more than learning
 - Teaching, Learning, Training
 - Research
 - Administration
 - IT Services
 - Library Services
 - ... & the workplace!
- a complex ecosystem*
- 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



- 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/>





- 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)



e-Framework Goal

*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





What

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

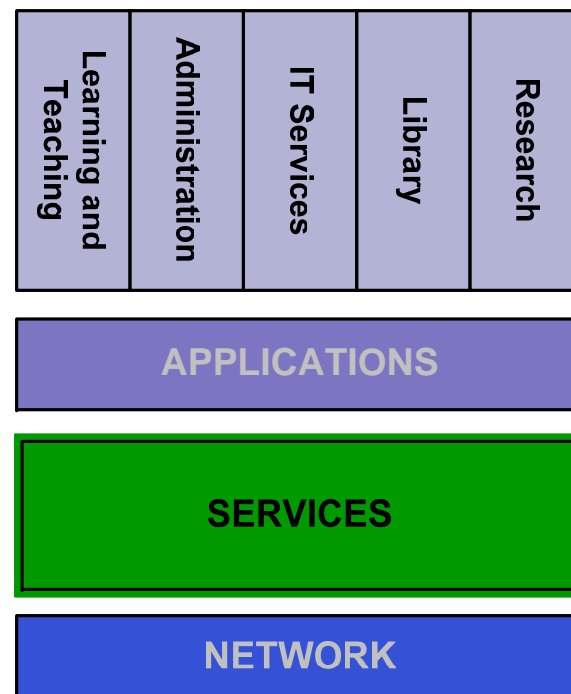
- A service-oriented approach to system and process integration
- Development, promotion & adoption of Open Standards
- Community involvement in development
- Open collaborative development activities
- Flexible and incremental deployment



Scope

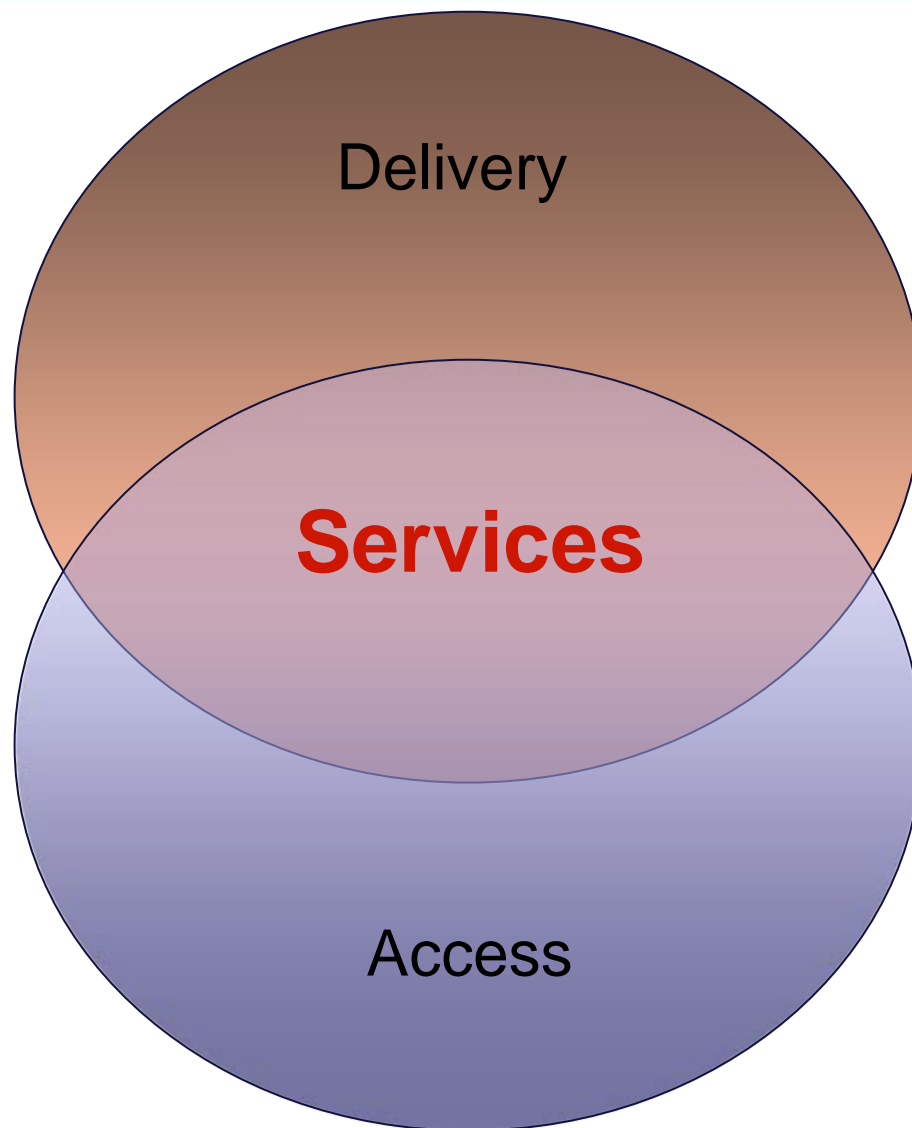
Open standards-based interfaces
for interoperability ...
in a service-oriented environment

The e-Framework analyses and
documents **Service Interfaces**



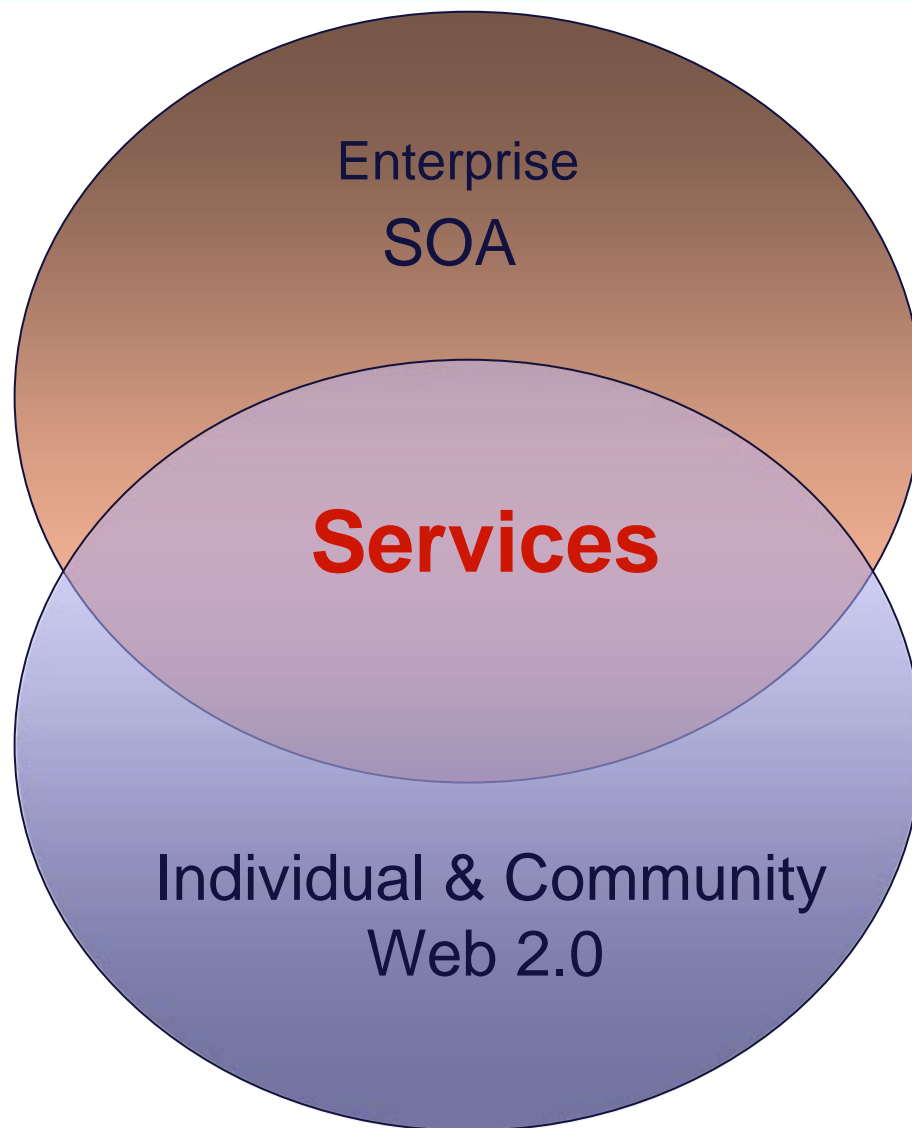


A Buzzword?





A Buzzword?





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**



Terminology (2)

- 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.



JISC

acc

- home
- about us
- what we do
- funding opportunities
- publications
- news
- events

supporting education and research



what we do



The mission of the Joint Information Systems Committee (JISC) is to provide world-class leadership in the innovative use of Information and Communications Technology to support education and research.

JISC funds a national [services](#) portfolio (e.g. JANET) and a range of [programmes](#) (e.g. Digital repositories) and [projects](#) (e.g. NewsFilm online).

services we fund:

???

themes we cover



Select a service

- Archives Hub
- AHDS
- Athens
- Biz/ed
- BUFVC
- Census Dissemination Unit
- Copac
- CrossFire
- Digimap Collections
- Digital Curation Centre
- EDINA
- Education Image Galler
- Eduserv
- ESDS
- ESDS International
- Film & Sound Online
- Hairdressing Training
- The Times Index
- IESR
- Intute
- ISI Web of Knowledge
- JANET
- JISC CETIS
- JISC Collections
- JISC infoNet
- JISC Legal
- JISC Mirror
- JISC Plagiarism Advisory
- JISC RSCs

Select a service

view service

themes we cover

access

international [services](#) portfolio (e.g. JANET) and a range of [programmes](#)
Digital repositories) and [projects](#) (e.g. NewsFilm online).

NO – not this kind of service!



Characteristics of Services

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

(Phil Nichols, 2007)



- 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



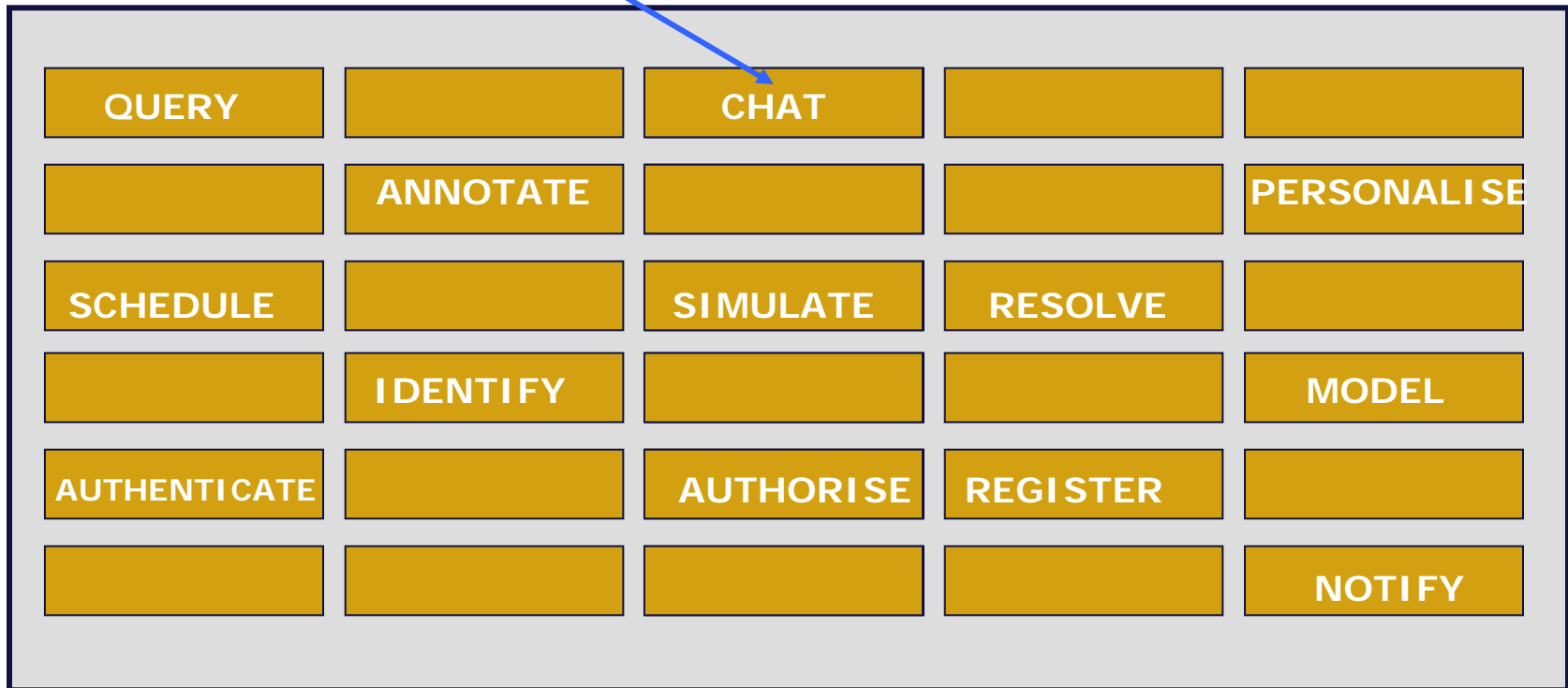
Knowledge Base

- 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



Service-Oriented Approach

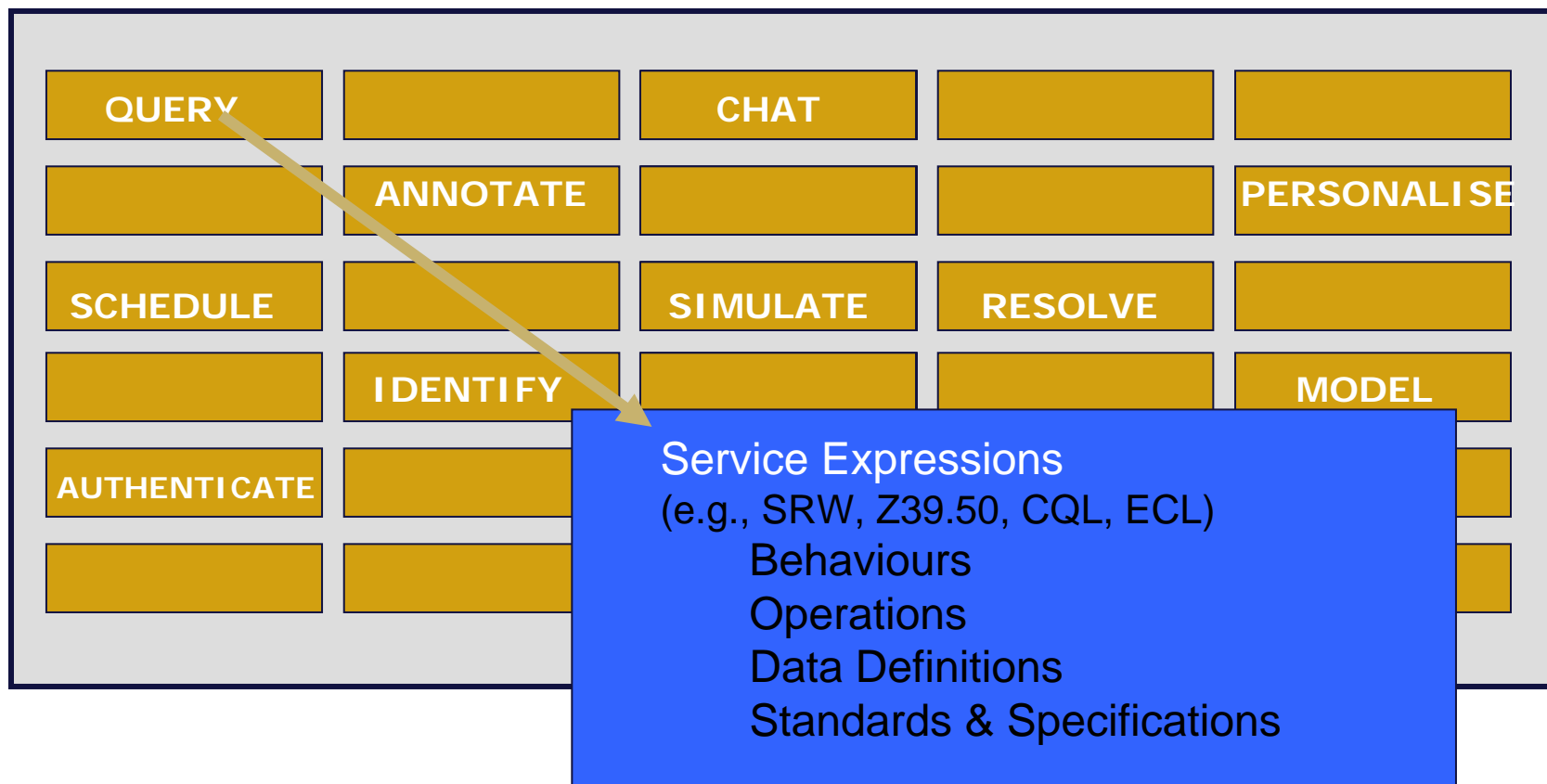
Service Genres



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 Usage Models (SUMs)

Summary description of Business requirements for function and reference to full description	Summary description of Business requirements for function and reference to full description	Summary description of Business requirements for function and reference to full description
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Business Function Name

Business Function A	Business Function B	Business Function C
---------------------	---------------------	---------------------

Service Genres XOR Service Expressions that support the Business function listed above

Service Genre XOR Service Expression a	Service Genre XOR Service Expression d	Service Genre XOR Service Expression f
Service Genre XOR Service Expression b	Service Genre XOR Service Expression e	Service Genre XOR Service Expression g
Service Genre XOR Service Expression c		Service Genre XOR Service Expression a
		Service Genre XOR Service Expression b

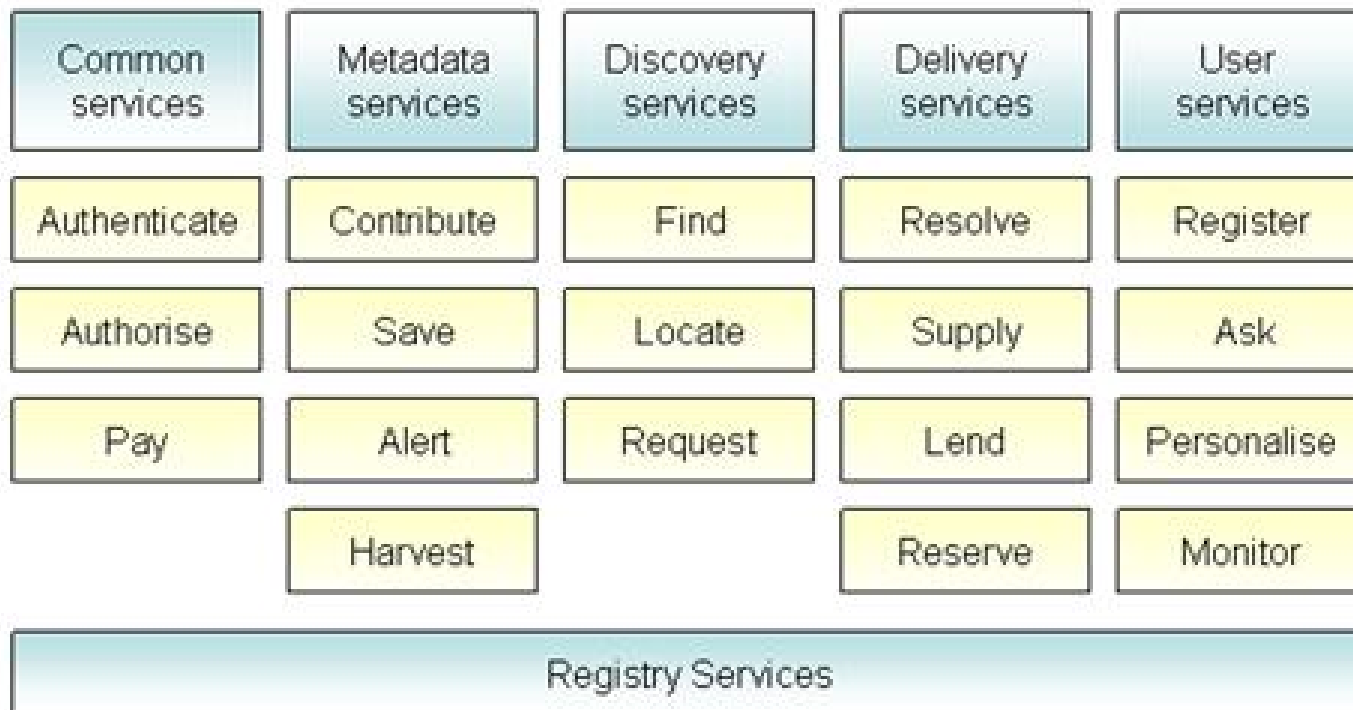
A SUM can only contain Service Genres OR Service Expressions NOT both.

Data Sources

Data Source 1	Data Source 2	Data Source 3	Data Source 4
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SUMs – Business Driven

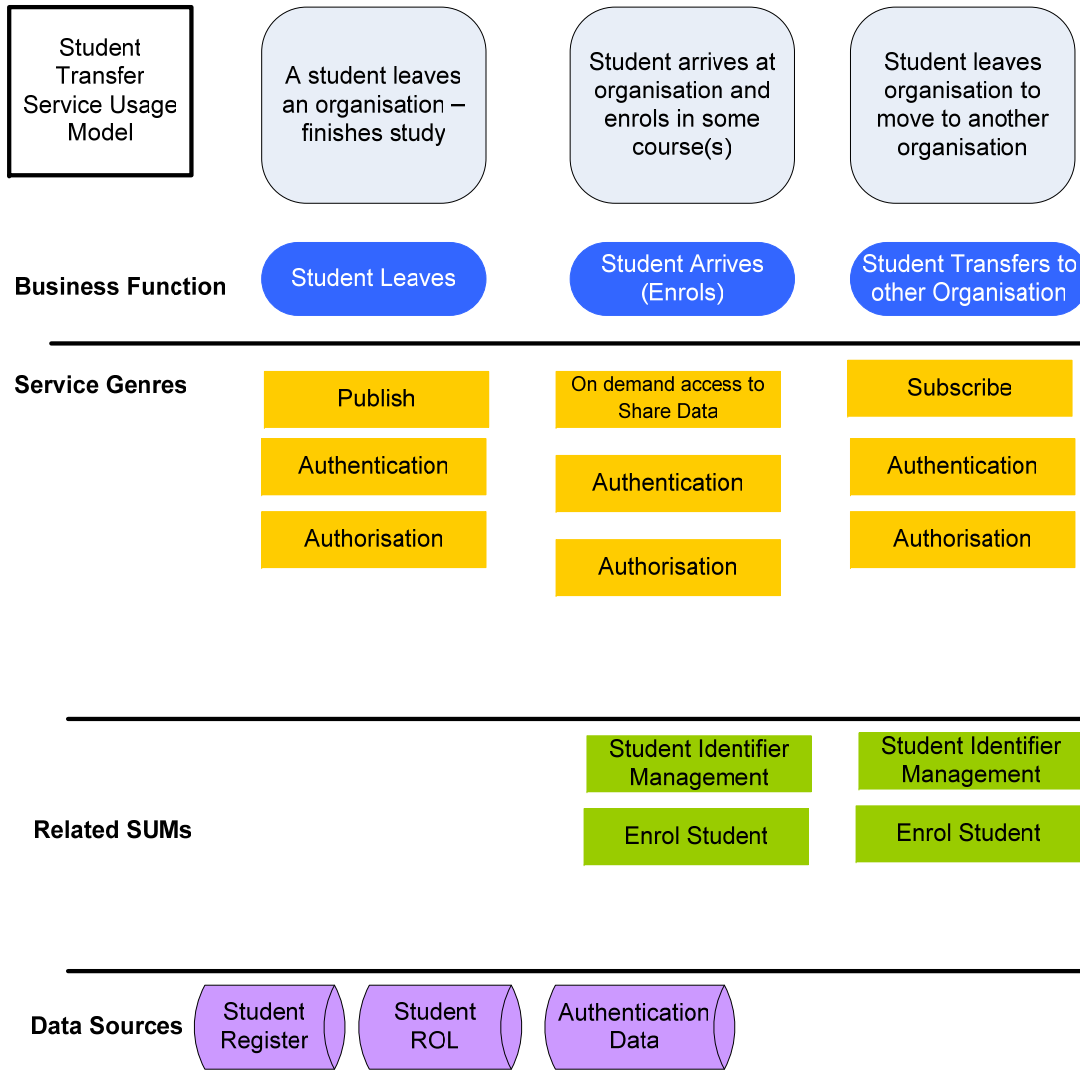


Judith Pearce (NLA) New Frameworks for Resource Discovery and Delivery

<http://www.nla.gov.au/nla/staffpaper/2005/pearce1.html>



Student Transfer SUM





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
<https://e-framework.usq.edu.au/users/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



Defining e-Portfolios

- 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



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



Classifying e-Portfolios

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
<http://www.educause.edu/ir/library/pdf/ELI3001.pdf>



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/>

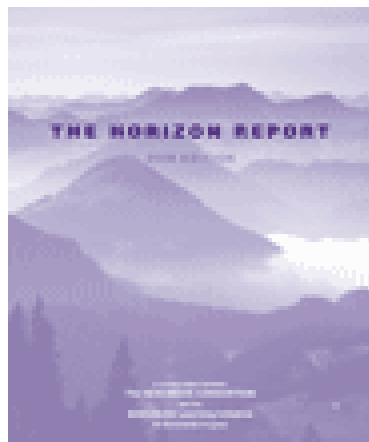
<http://commons.carnegiefoundation.org/>

Share, Remix, Reuse!



Broader Trends

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**

<http://www.educause.edu/ir/library/pdf/CSD5320.pdf>



Trends

“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.eportfolioppractice.qut.edu.au/>



Visions

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.eportfolioppractice.qut.edu.au/>

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- What standards are needed?



- Identity & Access management
- Portable, validated student records
- Competency classification & validation
- Multiple repository/device interfaces
- Content management
- ... (User Control!)



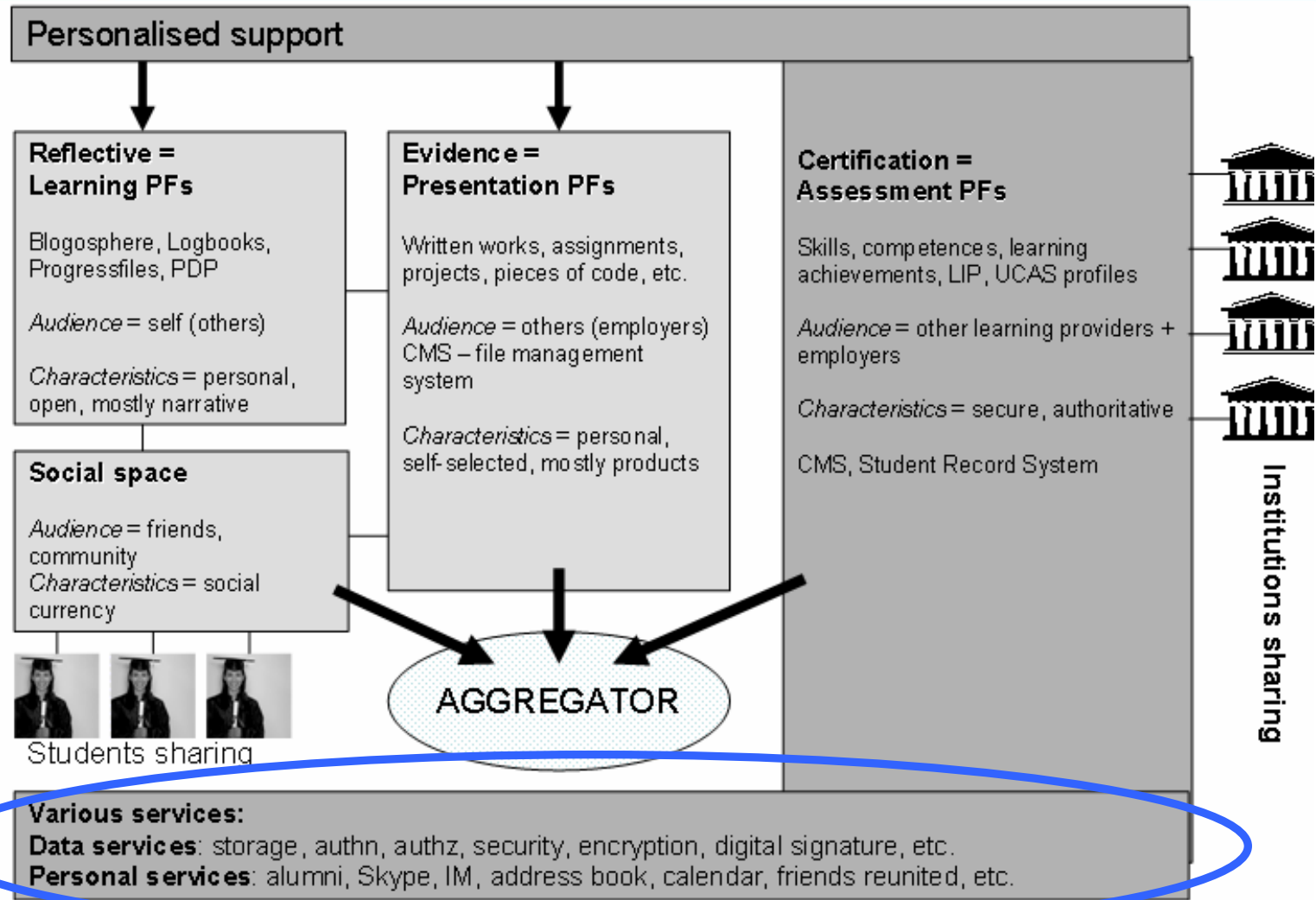
**Trust
Infrastructure**

- 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



<http://www.slideshare.net/wgroller/eportfolio-service-model-for-he-2007>

Wolfgang Greller

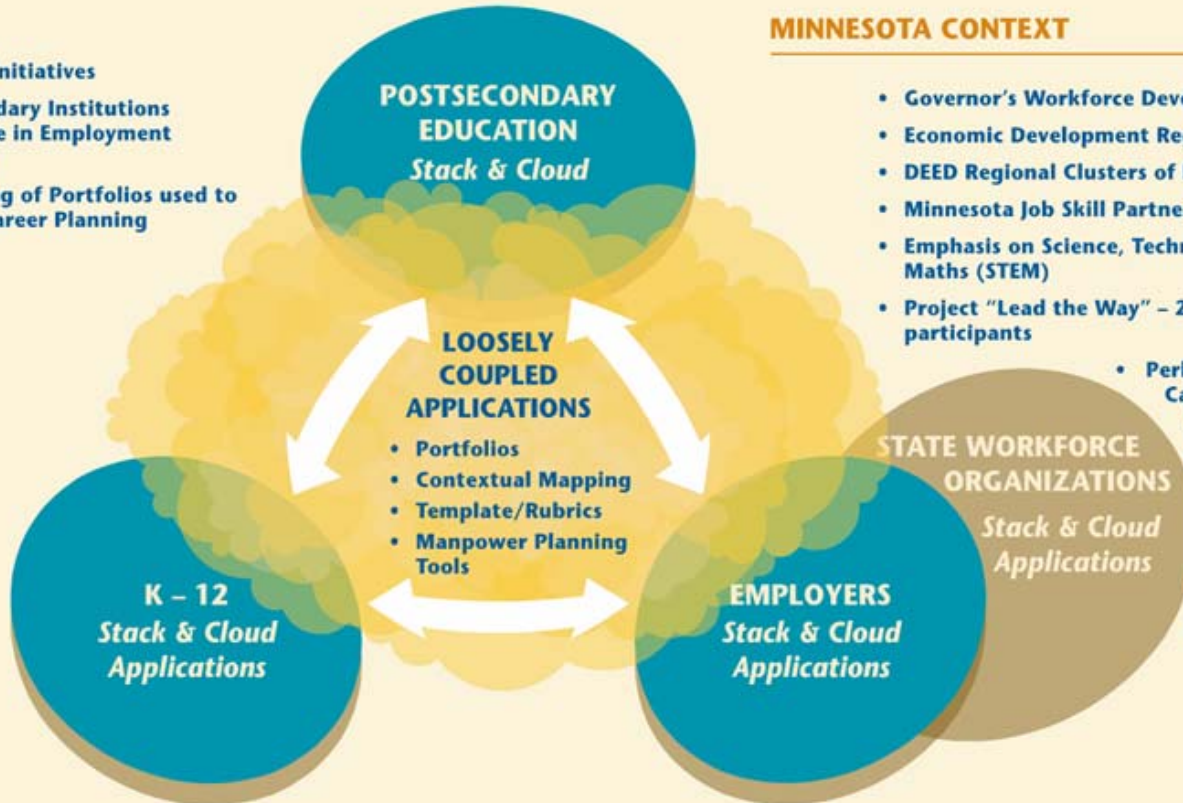
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Scoping e-Portfolio Infrastructure

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



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 Educational Knowledge
- Portfolio Initiatives Statewide in parts of K12, MnSCU, and Employers

- Competencies and Standards of Learning are mapped into K-12
- Portfolios begin to be utilized
- Strong Articulation with Postsecondary and Employers

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

Donald Norris, 2007

<http://www.strategicinitiatives.com/>

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Four categories

- Aggregation
- Syndication
- Distribution
- Migration

Cambridge D. (2006 Revised). *Integral e-portfolio Interoperability with the IMS e-portfolio Specification.*

<http://bugs.sakaiproject.org/confluence/download/attachments/18089/Integral+e-portfolio+Interoperability+2.doc?version=1>



Broader Interoperability

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.eportfolioppractice.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)
<http://www.ilo.org/public/english/bureau/stat/isco/index.htm>
- 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
http://tls.vu.edu.au/sled/QTIU/programs/employability/ACCI_Employability%20skills.pdf



ACCI Employability Skills (2002)

- **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 ...

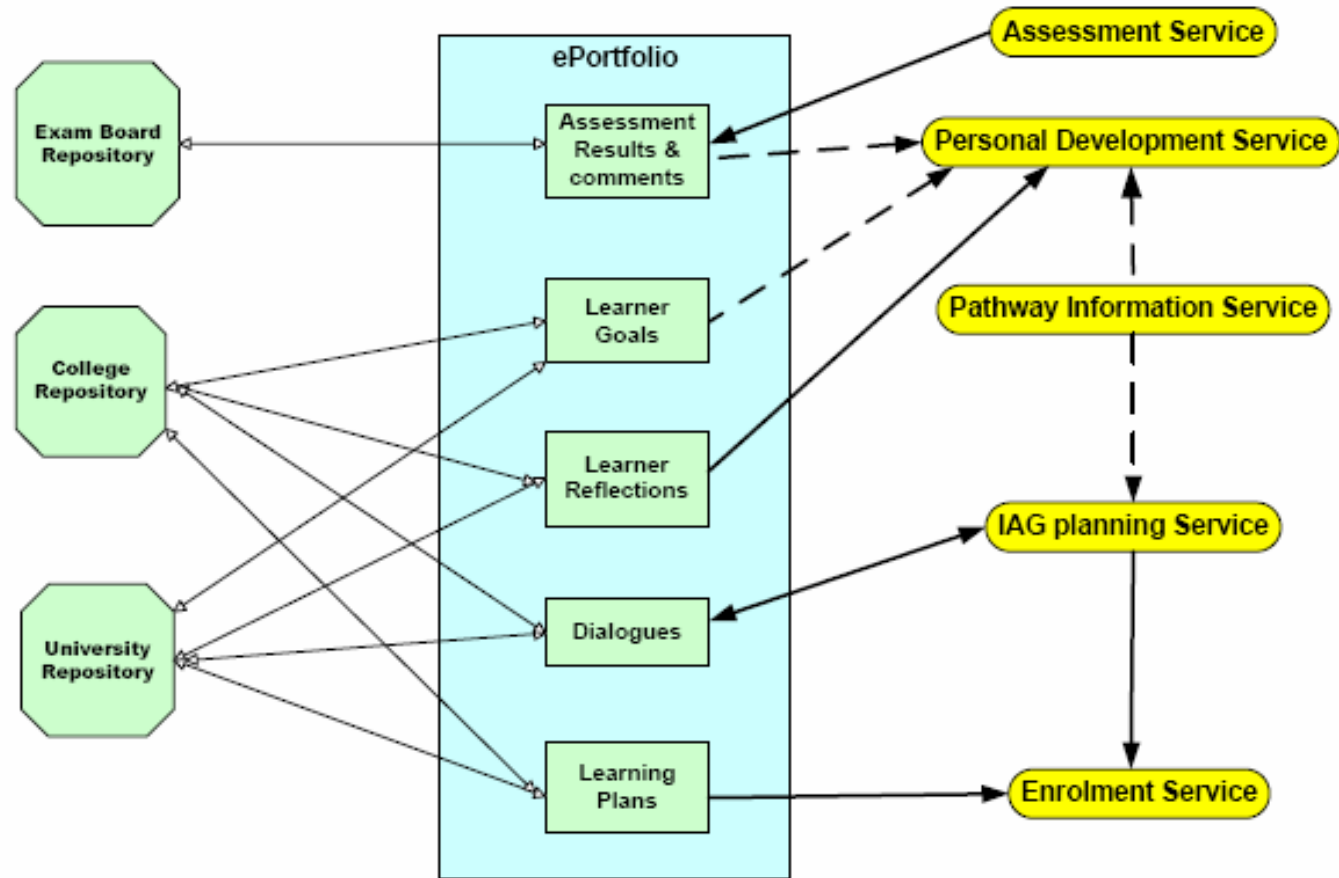
- [Ep4LL SUM](#) – (JISC) e-Portfolios for lifelong learning
- [Mansle SUM](#) – Manchester (UK)
- [IDEA ePortfolio demo SUM](#) – IDEA2007
- [QTI Rendering and Response Processing Services \(R2Q2\)](#)

ELF – The E-Learning Framework (2004-2005)





The Thin ePortfolio

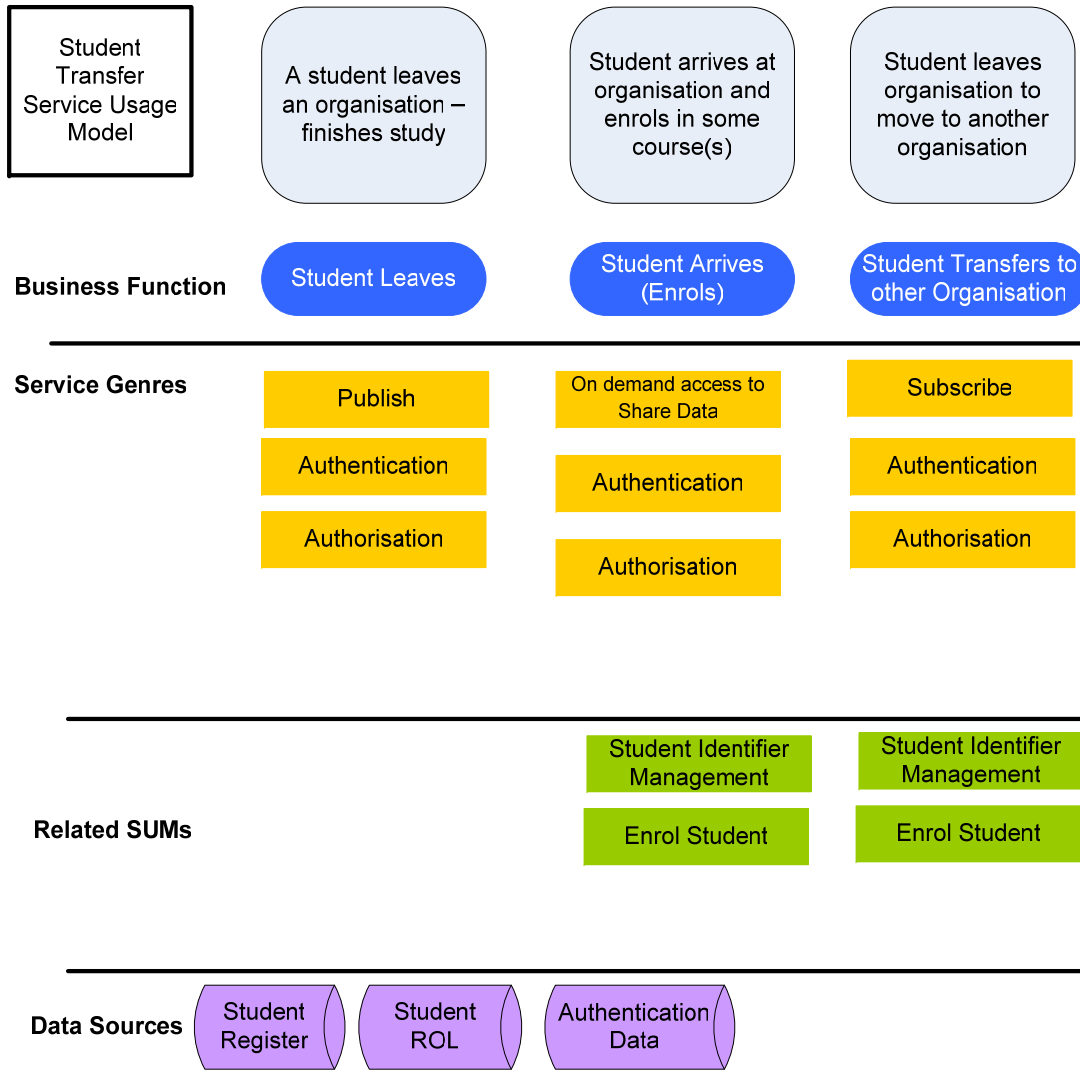


Source: eP4LL Reference Model

<http://www.nottingham.ac.uk/epreferencemodel/finalreport.htm>



Student Transfer SUM



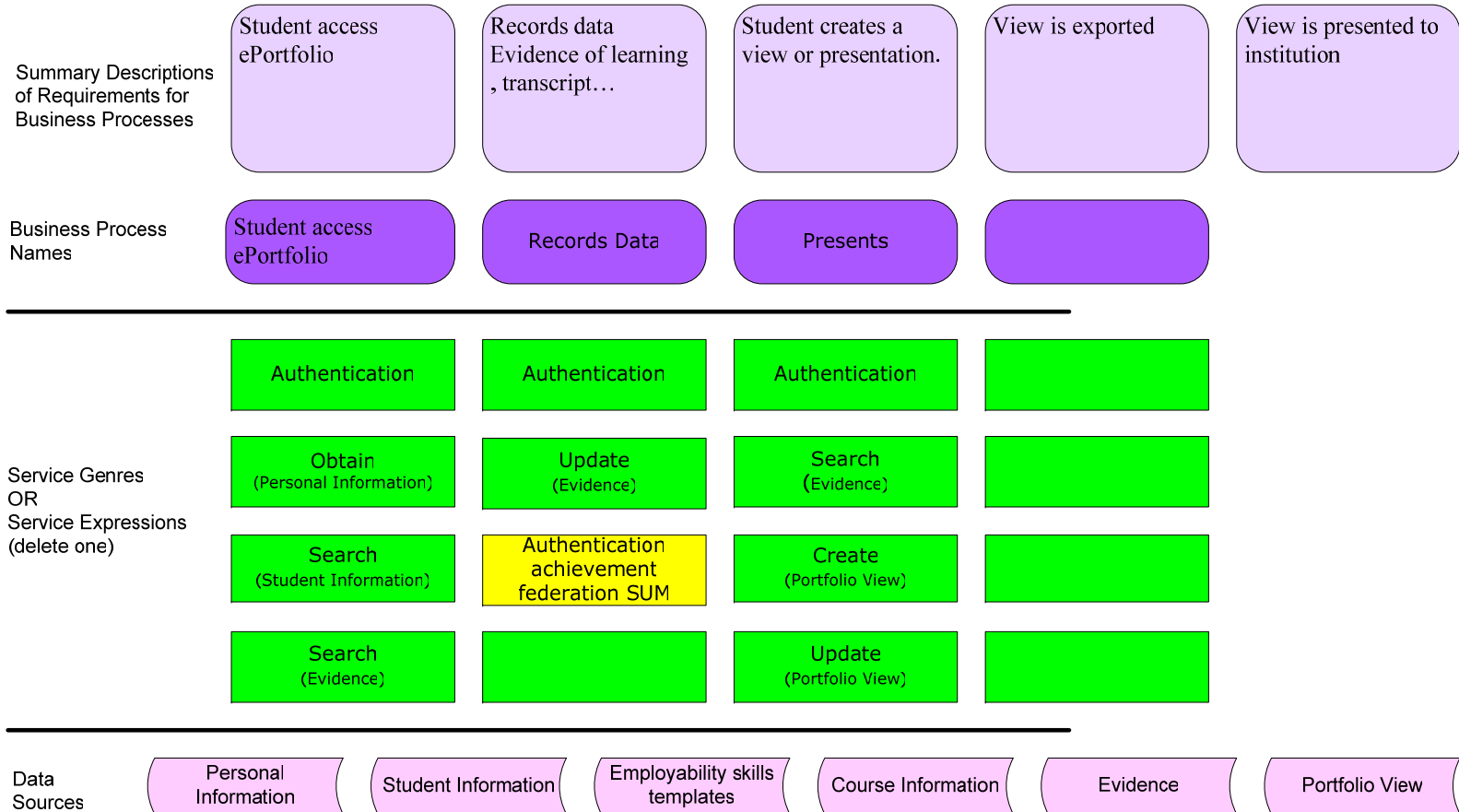


This Service Usage Model focuses on the particular activity of a Student constructing a portfolio and presenting this to other institutions. The portfolio may include Personal Information and Evidence of Learning (transcript, achievements, skills, body of evidence). The Student can customise the presentation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



Developing an e-Portfolio SUM

IDEA 2007 ePortfolio Demo - Service Usage Model



Visio® template for SUM diagram, revised 20070802
Template © Copyright 2007, e-Framework Partners

Source: Lyle Winton

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<https://e-framework.usq.edu.au/users/wiki/IDEAePortfolio>



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
<http://europass.cedefop.europa.eu/>
- The Bologna Process
http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html
- European Institute for E-Learning (EifEL)
<http://www.eife-l.org/>
- Career Wales Online
<https://www.careerswales.com/progressfile/>
- ePort Consortium
<http://www.eportconsortium.org/>
- Open Source Portfolio (OSP)
<http://www.osportfolio.org/>



- The Australian e-Portfolios in Practice Symposium (2008)
<http://www.eportfolioppractice.qut.edu.au/>
- The Centre for International e-Portfolio Development
<http://www.nottingham.ac.uk/eportfolio/>
- The Centre for Recording Achievement
<http://www.recordingachievement.org/>



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