

ANNEX 4 Defining an e-Portfolio Engine for Personal Learning Space

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Intended audience:	General audiences needing to understand the concept of a thin e-Portfolio

"...this is a really important point; we will have to re-engineer the data so that wherever you are in the education system the individual learner can demonstrate to another institution, an employer, or to a parent, what they have done, how they are succeeding and who they are."

(Michael Stevenson head of DfES Technical Group, 6 January 2006) ¹

On a technical level e-Portfolio is not a *service* like *Assessment* or *Career Planning*. Rather e-Portfolio is an *application*, the **engine** which enables the individual learner to join together what they have learned through different *services* so that they can demonstrate to another institution, an employer or a parent what they have done, how they are succeeding and who they are.

The JISC e-Portfolio Reference Model² has defined the functions that such an **e-Portfolio engine** should perform, whether within current *e-Portfolio systems*, which are often specialised *Virtual Learning Environments* (VLEs) or within a wider *Personal Learning Space* in order to enable:

- an individual learner to *integrate* what they are learning in different ways in different contexts;
- to personalise their learning;
- and to present themselves to a range of different audiences.

In this way the individual's experience of learning may be transformed.

A learner should be able to replace a standard *service* provided within one *e-Portfolio system* with a different version of the *service* available from another provider in order to meet the learner's specific needs and preferences. For example, when I complete the staff review form for my employer I may want to use the *learning log* provided by my professional association rather than the equivalent *service* provided by the employer's *e-Portfolio system*. The employer's *learning log* may cover any kind of professional employee whereas the log provided by my association is customised to my specific area of professional expertise. The *e-Portfolio engine* enables this.

By separating the *e-Portfolio application* from the *services* which make use of it we simplify a potentially complex problem to simpler terms in which it becomes capable of practical implementation.

In particular we can develop a set of technical definitions for each of the *services* that make use of an *e-Portfolio engine* to interact with other *e-Portfolio enabled services* and *e-Portfolio enabled repositories*. In this way we can develop an extensible technical definition of the e-Portfolio domain incrementally. This is the thin model of e-Portfolio.

The services identified by the Reference Model are now being submitted to the *e-Framework*. This strategic international initiative includes JISC, DEST in Australia and SURF in the Netherlands. It is developing a service oriented approach to learning, research and administrative processes. This parallels work by major commercial vendors such as Microsoft with whom JISC-CETIS is discussing *Personal Learning Space* and an *e-Portfolio engine*.

¹ Interview with TES reflected on <http://www.autoindustry.co.uk/articles/06-01-06>

² For the full interim report on the e-Portfolio Reference Model see: <http://www.nottingham.ac.uk/epreferencemodel/keydocuments/eP%20RM%20final.doc>

1. Developing Service Definitions

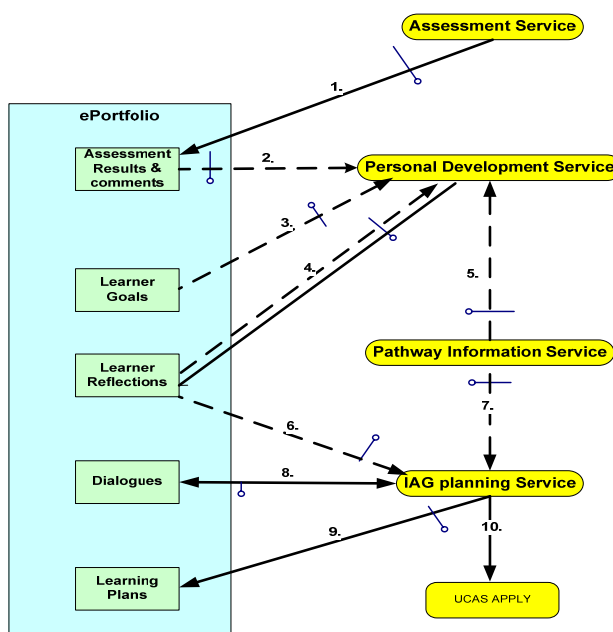
The e-Portfolio Reference Model has developed definitions of key e-Portfolio services by developing use cases of different expressions of a service in order to define the overarching service genre different types of service:

1. Narrative descriptions of a process in plain English told from the learner's perspective provide a *scenario of practice*;
2. High level *use cases* express a process as a *flow of services*. This *encapsulates* (ignores) the types of data passing between the e-Portfolio *services* and *repositories*;
3. More detailed *use cases* of the *web services* within a *service* in which the data types are obvious if not explicit;
4. The next phase of work should specify the data types within the use cases for pilot implementations and then ad-hoc and then formal standards as the model is proven in practice taking specific account of MIAP and Becta work on information flows.

2. Example of a high level use case with narrative

The following service flow grew out of specific use cases for school to college transition, where a student must apply for college courses. An abstract model was developed and in late 2005, when UCAS joined the Reference Model project, a new version of how it applied to the UCAS process was prepared:

ILP Use Case Diagram



Illustrative Use Case

Each of the yellow lozenges represents a distinct service. The narrative below summarises the learner's experience of the process. The diagram illustrates the flow of data between the services and the domains within e-Portfolio. Each stage of the flow requires a narrow interface (the numbered hatpin symbols). These represent application profiles of existing specifications (such as IMS ePortfolio) and standards (such as UKLeaP) allowing existing specifications / standards to be radically simplified.

Gap: This flow covers the formal educational process, but students will engage in valuable informal discussions, often facilitated by collaborative and mobile technologies, which also need to be taken into account by e-Portfolio. The Reference Model will develop use cases for services using mobile and collaborative technologies with Signposter for report in August 2006. It will be important to identify the location of e-Portfolio within the more personalised learning spaces that are being developed.

Narrative from the learner's perspective:

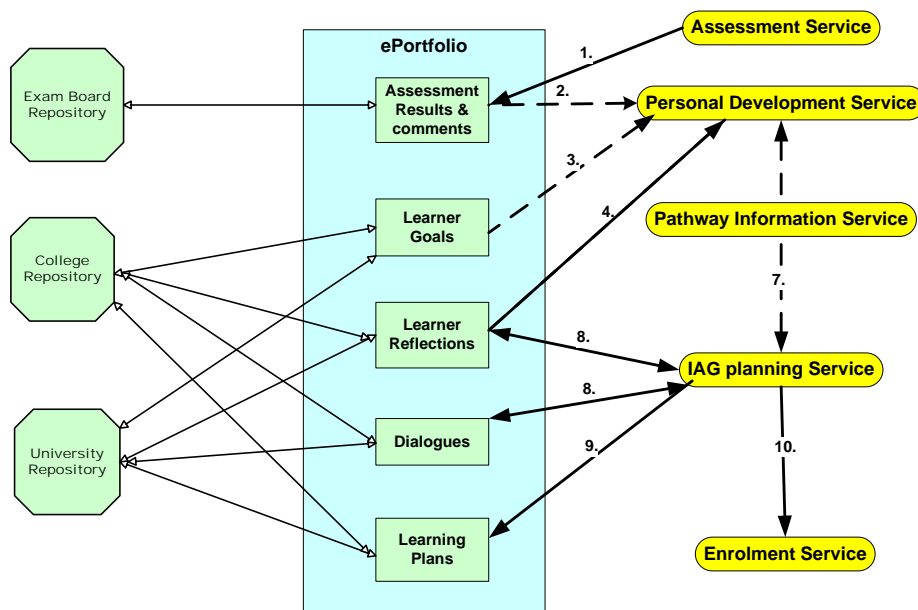
1. **Trigger: An assessment result and a scheduled meeting with an advisor**
2. I call this information into an e-Portfolio-enabled Personal Development Service which helps me review the result in the context of my goals and past reflection.
3. I review the results against my goals

4. in the context of past reflections
5. taking account of pathway information about the grades I need to meet my goals.
6. I make some of my reflections available to my formal advisor in an Information Advice Guidance Planning (IAG) Service. My advisor also calls pathway information
7. We discuss the position together and agree a record of our dialogue
8. We agree a formal learning plan.
9. **Outcome: The plan sets out what I will do to apply to Higher Education.**

This pragmatic approach does not discard existing specifications and standards but requires them to be radically reconfigured. JISC pilots have confirmed that current specifications work but are too complex and therefore too costly for general implementation. By breaking down e-Portfolio into a set of discrete interfaces we can break down an existing specification such as UKLeaP into a simpler set of application profiles discarding the unnecessary superstructure.

3. Thin e-Portfolio

The model is expressed as a *flow of services* (to the right of the page) which supports the development of an *Individual Learning Plan* but here this covers a university student selecting modules for enrolment. An *e-Portfolio engine* (the centre column) manages the data provided by services (the yellow lozenges) and provides data required by them. *Repositories* (to the left of the page) store the data. The type of data exchanged between the *service* and the *repository* is specified in the column representing the *e-Portfolio engine*. The learner must confirm that they have the appropriate pre-HE qualification to take a particular HE module (say an AS level in French held in an exam board repository). They may also wish to review their college e-Portfolio as well as their current university e-Portfolio (held in the college and university repositories). The storage of the information, the engine serving the information and the services providing and consuming the information are each separated out.



The interfaces required to pass information to and from services should be identical to the interfaces required to pass the information to a repository, so no additional interfaces are required. Services are enabled to make use of e-Portfolio by these interfaces, which are *application profiles* of existing, often monolithic, specifications. The interfaces used by the e-Portfolio engine to serve information between services and repositories can discard much of the superstructure of existing specifications. Previous JISC work has demonstrated that existing specifications work but that they are too complex and hence too costly for general implementation. Further JISC work will prove whether the proposed lightweight interfaces are fit for function. Successful implementations should establish de facto standards which can then be formalised, but the emphasis should be on achieving interoperability rather than a standard. In other words, the thin model represents a more pragmatic approach.

From a business perspective, a modular service approach allows an institution to prioritise and customise the progressive implementation of ICT services. If it buys a best of breed VLE containing a full range of *e-Portfolio services* it may still find some of the services are not well

adapted to its specific needs and can replace them. It can add new versions of *services* for learners with particular needs or preferences.

From the Learner's perspective an *e-Portfolio engine* within a *Personal Learning Space* would allow them to select the particular versions of *services* they preferred. By developing their capacity within the scaffolding provided by a controlled learning space which can be progressively personalised, learners entering vocational and professional employment will be able to make effective independent use of Web 2.0. This is an important but neglected aspect of e-Portfolio.

From a vendor (and developer) perspective there are significant opportunities in developing software and hosting services. However, the model also allows a niche version of a service relevant to perhaps 1,000 UK users to be widely sold, providing a low entry point to the market.