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# FOR AN ePORTFOLIO ENABLED ARCHITECTURE: ePORTFOLIOS, ePORTFOLIO MANAGEMENT SYSTEMS AND ORGANISERS

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**Abstract:** In its short and dynamic history, the ePortfolio has rapidly moved from the status of simple paperless portfolio to sophisticated ePortfolio Management Systems. Today, the explosion of new social practices emerging from the use of new media, such as social networks and what is commonly referred to as Web 2.0, tends to blur the frontiers of ePortfolios. This will have an impact on the technology developed by ePortfolio Management System suppliers, as well as on the standards for making them interoperable with related information systems. Is MySpace an ePortfolio? Is 43things an ePortfolio? Is Elgg really an ePortfolio? What is the relationship between an ePortfolio and an ePortfolio Management System? What standards do we need to make ePortfolios interoperable? What ePortfolio parts shouldn't be made interoperable? The objective of this position paper is to describe an ePortfolio architecture where the response to these questions will be offered, providing a pathway for innovation and standardisation, keeping the power of free personalised expression and interoperability. This will be done through the description of an ePortfolio enabled environment based on the interaction between ePortfolios, personal ePortfolio organisers and organisational ePortfolio Management Systems.

**Keywords:** ePortfolio effectively, C11 Making the ePortfolio attractive to learners and learning support staff  
Keywords: interoperability, standards

## Introduction

The ePortfolio started life as an unsophisticated object, amounting in effect to the paperless version of portfolios that had been used over decades for personal and professional development and assessment. The order of magnitude of change was mainly additive: electronic media publishing facilities allowed the creation of "enriched" multimedia portfolios, while hypertext made it easier to *connect* ideas during the reflective process. The Internet brought in a multiplicative order of magnitude, with the ability to connect everything with everything, and above all the possibility to make the content accessible to the whole world. It became an *online paperless portfolio*. Having one's ePortfolio online in turn led to change at another level of magnitude, not just additive or multiplicative, but exponential: ePortfolios can now be mined by search engines and one can use many different services available on the World Wide Web to create one's own repository, publishing and social environment.

So, if the World Wide Web allows everything to be connected to everything, the immediate question that comes to mind is: what are the limits of my ePortfolio? Are MySpace and SecondLife - two of the spaces where I create meaningful artefacts and develop social relations - part of it? Or could I decide to have my ePortfolio Island on SecondLife to create, store and share my ePortfolio? Would that mean that my ePortfolio is part of SecondLife? *Which contains the other?* It is clear that this question could not have been asked about *paper portfolios* or even *online paperless portfolios*. The nature of the new media transforms the nature of the ePortfolio and its dialectic.

Another important aspect of the evolution of the reflection on ePortfolio is its relation to *digital identity*: *is the ePortfolio an expression of my identity through digital media, or is the ePortfolio itself a means of controlling my digital identity?* This is a serious question which requires thought, as it will have consequences for the kind of ePortfolio technology we will expect to support current and innovative practice as well as on the technical standards that will make the technology interoperable.

A further angle to explore the evolution of ePortfolio is that of ePortfolio editing tools. The most obvious gap today is the inability of ePortfolio systems to extract automatically meaningful information collected in an ePortfolio repository. What is the point of tagging all the data collected, if the system is unable to create a draft CV automatically, simply by data mining a structured collection of data? Today, the creation of a CV out of an ePortfolio repository is too often a tedious process where all the work of retrieving and publishing information is purely manual. Proper use of digital technology should allow the display of a CV (or ePortfolio) in many different formats: through a time

line to reveal progression and tell a personal and/or professional story, a mind map to reveal one's vision and values, or a competency map with links to evidence and testimonials, etc.

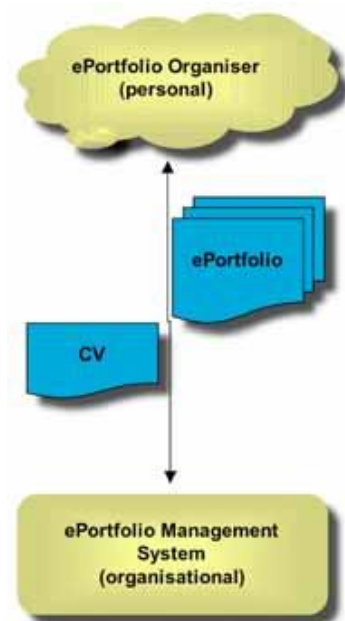
And if this is the case for the CV, which requires an unsophisticated editing process, what about more sophisticated processes such as *reflection* and *connection*? Such processes could greatly benefit from technologies issued from semantic networks such as semantic annotation, topic maps and mind mapping. One has to recognise that current ePortfolio editing systems have not really moved much beyond the very first *paperless portfolios* in their ability to support reflective activities effectively. Some ePortfolios have little more to offer than form-filling exercises and a choice of templates with cute displays.

The last point I would like to address in this introduction is that of *complexity*. The world is complex, learning is complex, the management of learning processes is complex. Yet, most activities on learning technology, and even more on *standards*, are aiming at simplifying the world, using technology as a kind of shoehorn to force life's complexity into a series of predefined machine readable forms. Some believe that by simplifying the world's representation it will be easier to manage. For them, everything has to be expressed into XML schemas, because what we want is machine readable ePortfolios and CVs because we want machines to do the work that humans can't do (like reading thousands of applications for a job offer). The question one should ask is whether when describing individuals into a set computer readable data we are not in reality simply reifying (thingifying) human beings by computational sets and in doing so losing significant information<sup>1</sup>? How can you compute empathy, generosity, non-judgemental behaviours, emotions, and the sense of aesthetics which are expressions of the right brain? While it is almost trivial to compute *skill sets*, how do you compute *mind sets*? And when you hire someone, what is most important (within limits, of course): what a computer can tell you (the obvious)? What is the most reliable indicator of future performance: a mind set or skill set? It depends, and both are surely important. The fact is that computers are good at computing skill sets and poor at computing mind sets.

Does this mean that we should not develop technical standards? Certainly not! We need them to facilitate ancillary work, not to make decisions on behalf of humans and professionals. We want servants, not masters. We need standards like HTML and HTTP that tell you how to write and transport information, not what you can write or express. We don't want standards that lead to dull form filling exercises, but standards that increase the expressive power of the left *and* right brains to convey a holistic vision of individuals.

## The components of an ePortfolio enabled system

So far in this paper, I've used the terms ePortfolio, ePortfolio system, ePortfolio editing system and ePortfolio management system. They represent very diverse pieces of software, obviously interconnected, but with very different purposes. At one point, ePortfolio practitioners started to make distinctions among *learning portfolios*, *assessment portfolios*, *employment portfolios* and *presentation portfolios*. These different "types" of ePortfolios reflected the fact that ePortfolios are being produced and *consumed* (used) in many different processes, or to *manage* different processes. Nevertheless, there is also a clear distinction between the ePortfolio Management System that is used to support, let's say, the assessment process, and the *assessment portfolio* that is produced as the result of this process. They are two different objects. It is the same issue in the context of learning or employment. Therefore, if we accept that there are many different processes to be managed with the help of an ePortfolio, it might not be relevant to try to define a single set of specifications for an ePortfolio, the result of which exercise might be the lowest common denominator or useless complexity.



<sup>1</sup> This may look like a paradox but the computer which is supposed to help putting things into (apparent) order (in French it is more obvious as we use word 'ordinateur' which has no equivalent in English) are insidious creators of entropy (disorder) at higher level: learninh and pedagogy!

I believe that the lack of clarification among these different components is at the root of the inability to develop and adopt ePortfolio standards.

I intend now to explore the following components of an *ePortfolio enabled environment*:

- The ePortfolio,
- The ePortfolio Management System (organisational),
- The ePortfolio organiser (individual).

### **Do we need a new definition for ePortfolio?**

**ePortfolio:** *"a collection of authentic and diverse evidence, drawn from a larger archive, that represents what a person or organization has learned over time, on which the person or organization has reflected, designed for presentation to one or more audiences for a particular rhetorical purpose."*

This is the NLII definition from 2003, which, in my view, is still largely valid. I very much liked the definition, for its inclusive approach *"on which a person or organisation has reflected"* which made an explicit link between individual and organisational learning – a key element of EIFEL's vision on learning. Numerous discussions on the theme: is the ePortfolio a product or a process? Have led me to conclude that a different emphasis is needed.

If I had to change the NLII definition, therefore I would go for something like: *"a collection of authentic and diverse evidence, drawn from a larger archive, representing the capital<sup>2</sup> developed by a reflective learning individual or organisation designed to exploit/valorise their assets in a particular context."*

I certainly don't claim that my definition is better than the one offered by NLII; I just offer it as a variation on a theme, to introduce the notion of individual and social capital through the ownership of assets. In short, the *raison d'être* of an ePortfolio might simply be to valorise one's human and social capital. An ePortfolio could be to human capital what the financial portfolio is to financial capital.

It is now clear to me that an ePortfolio is not a product and a process, but is a product created as the result of a process, this process possibly being managed by digital means, for example an *ePortfolio Management System* or an *ePortfolio Organiser* – or some other tools or services.

So, if we agree to go back to the fundamentals and accept that an ePortfolio is on one level a product, static or dynamic (e.g. generated by an XML stream, like RSS), then we have to ask the question: what tools can we use to organise and author ePortfolios? Do we have to use something labelled ePortfolio Authoring System, or are we free to use whatever tool is convenient to us; and if we choose the latter, is there a risk of negative impact for interoperability, in the ability to exploit the contents of one's ePortfolio?

In order to respond to these questions, we need to ask how ePortfolios and ePortfolio Management Systems relate to each other?

### **ePortfolios and ePortfolio Management Systems**

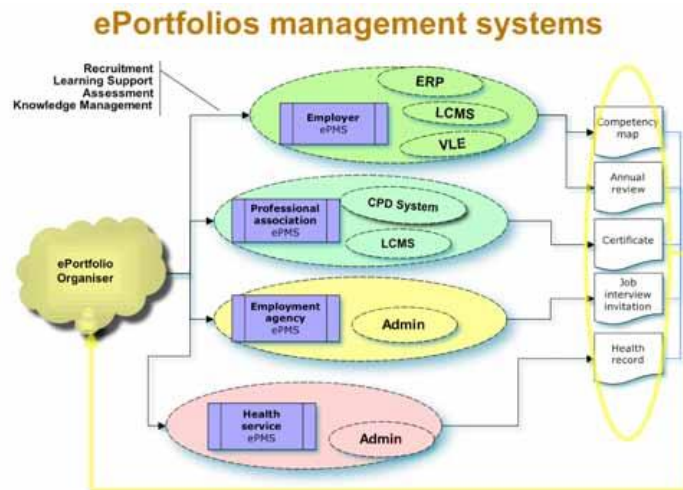
What is an ePortfolio Management System (ePMS)? Is it a system to manage ePortfolios or a system to manage a process in which ePortfolios are being used, produced or consumed? And what is the difference between these activities?

The most common misconception about the relation between ePortfolios (eP) and ePortfolio Management Systems (ePMS) is that the function of an ePMS is to *host* ePortfolios. The main function of an ePMS is not to host ePortfolios but to manage a process during which an ePortfolio can be consumed or produced. Let's take an ePMS dedicated to assessment of prior experience. When registering for assessment, the candidate might submit an embryonic or a complete ePortfolio; then an assessor might plan activities to complete the ePortfolio with more evidence, collect feedback from appropriate sources, make her own observation and then judge the quality of the evidence against a set of standards of competence.

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<sup>2</sup> Competencies, knowledge, social networks, etc.

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In the scenario described above, there is an ePortfolio at the entry of the assessment process, and then the ePortfolio is being developed (enriched), reviewed and finally exported. At the end of the assessment process, the ePortfolio has acquired its final shape and can be exported to be exploited further in another context. The ePortfolio is the evidence against which the certificate is delivered and it can then be hosted wherever the candidate wishes.

The ePMS can be seen as a tool which function is to build an ePortfolio for a specific purpose in a particular context. To provide a definition of an ePMS, we start with a variation on NLII's definition of an ePortfolio:

**ePortfolio Management System:** *a system used to manage (produce, consume and exploit) elements of individual ePortfolios for a specific purpose - scaffolding learning, assessment, employment, competency management, organisational learning, knowledge management, etc.*

We might even further define different types of ePMS, depending on their ability to *consume* existing ePortfolios – e.g. for recruitment – or to *produce* them from scratch – e.g. in assessment. In fact, one might avoid the generic term ePMS altogether as it misled too many in believing that they are about "managing ePortfolios" while they are in fact "managing processes *using* ePortfolios."

Here is a list of ePMS types:

- for recruitment,
- for personal development planning,
- for continuing professional development,
- for assessment of prior learning or experience for assessment,
- for initial education,
- for competency and career management.

It is clear that these ePMS differ widely in the types of functionalities they need to implement, as well as in the type of standards required to make them interoperable with their environment. While HR-XML might be critical for employability, these standards have little relevance in the context of a kindergarten! On the other hand, Liberty Alliance standards might make sense in both contexts to provide a framework for privacy, federation of identities and services.

What is also clear from the short history of ePortfolio Management Systems is that these systems are designed to fit the needs of an *organisation*. An ePMS, nolen volens, belongs to an organisation and represents its interests, values and philosophy. Whatever the degree of freedom offered by an ePMS,

however confident an individual might be that he owns his own ePortfolio, what she/he really owns is her/his projection in the plan of the ePMS owner's values. It is her/his identity in a specific context, for a specific purpose, but this represents only a part of her/him.

So, if there are many sorts of ePMS, each with their own characteristics, and most likely their own set of relevant standards, how can we ensure that individuals will have control over their identity when it might be scattered across many ePortfolios parts that are being hosted at some point by various ePMS? How, as individual, can I use my own set of tools to manage my own archives, create and exploit my own ePortfolios, without relying solely on the provision of the organisations I am interacting with? How can I control my digital identity, i.e. the digital representation of my assets?

## **ePortfolios and ePortfolio organisers**

If we accept the premise that an ePortfolio is some kind of product/document and recognise the fact that ePortfolio Management Systems belong to organisations and are designed to support specific processes that consume and produce ePortfolios, and if we accept the idea that an ePMS can grow into an organisational ePortfolio, then there is a gap that need to be filled: where is the individual ePortfolio Management system?

Where is the system that allows our own collections and connections, protects the privacy of our own reflections and social networks? How can I protect my personal assets, manage my intellectual property rights, or even control the exploitation of personal data by third parties?

This is what I call the Personal ePortfolio Management System (ePortfolio organiser, or ePO for short), in contrast to the Organisational ePortfolio Management System (ePMS). The ePOs belongs to individuals and provides them with the ability to create and control their digital identity. To provide a first definition of an ePO:

**ePortfolio organiser:** (personal learning space managers), *i.e. systems used by individuals to collect, organise, aggregate, connect and publish authentic and diverse learning outcomes to support reflective learning and practice for personal and professional development. This is the space to construct one's personal ID, organise and share knowledge, plan and manage further learning.* NB: I could even suggest as more appropriate term for an eP organiser: Personal AIMS (Assets & Identity Management System) clearly defines the function of this type of system.

The ePortfolio organiser can be seen as a kind of mirror, providing feedback to its owner or a view to the external world, in the form of an ePortfolio. While an ePortfolio provides a snapshot of the learning state, an ePortfolio organiser should be able to provide a deeper view and understanding of the learning process. What is important in the *mirror* is not so much the quality of the image – even a poor quality image will do – but its ability to provide the person with information on which she can act to improve it. For example, there are systems used by employers today to analyse CVs that are able to detect whether a candidate is a job-hopper, so it should be possible to provide ePortfolio owners with ePortfolio data mining services that could provide various kinds of information like professional integration (links from other ePortfolio organisers) etc. What is important is the ability to act upon the image provided, not the accuracy of the initial image.

And this is precisely one of the big gaps in current ePortfolio organiser technologies: although one can spend a great deal of time in collecting and tagging data, there is no tool providing the kind of instant feedback a mirror would. In order to play the role of mirror, it is important to develop technologies that provide dynamic analysis of ePortfolios through data mining and spatial representation.

One, among many, legitimate question is whether or not an ePO could be hosted by a single provider, just like a bank keeping your account. The reality we have to face is that the imprint left in using the Internet is extremely broad, and that we are already using a diversity of services that are distributed all over Cyberspace.

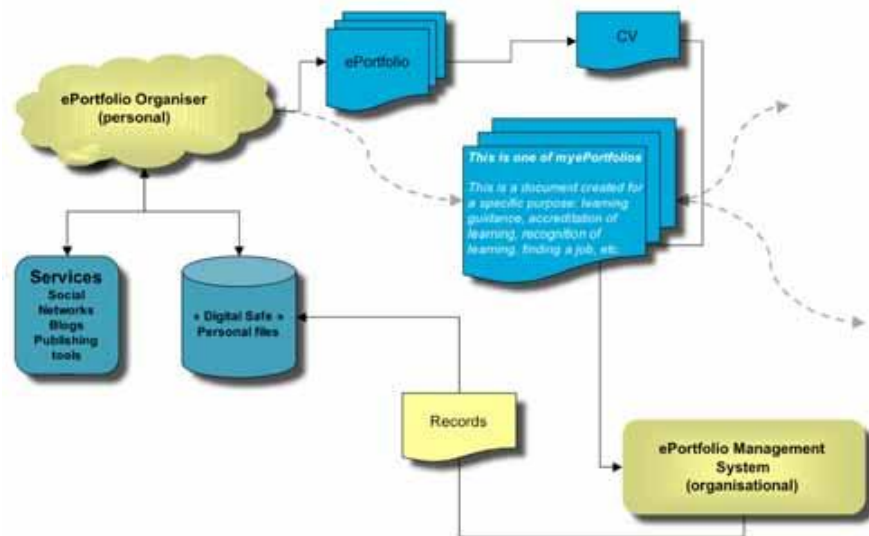
The idea that there could be one place where everything is to be found, let alone the most important things, is not realistic and goes against the nature of the World Wide Web. One the other hand, it might make sense that some providers specialise in ePortfolio data mining, digital assets inventory and

exploitation, and those providers might provide a central point of command and control, the way Yahoo! and Google are doing with the aggregation of multiple services.

So, back to one of my earlier questions: where do MySpace and SecondLife stand in relation to ePortfolio organisers? My claim is that they are part of the ePortfolio organiser as they

hold some of the assets of an individual. This goes equally for Elgg and other social networks as well as all services contributing to the construction and expression of one's digital identity.

## The ePortfolio Ecology



### The conversational ePortfolio framework: a regional ePortfolio system

ePortfolios (documents) are the result of a conversation: with oneself, peers, tutors, clients, managers, assessors, friends, etc. This conversation can take many different forms, for example a personal reflection, an external feedback, an assessment of a simple dialogue. But there is another conversation that is going on: the conversation between the person and institutions and between institutions; it can occur within a personal space (ePO) or an institutional space (ePMS) and across individuals and institutions. For example, a regional authority might be interested in drawing a map of the competencies of a territory. Therefore:

- Anonymous data from individual ePOs and ePMSs are collected, which contain a description of the competencies, within the regional territory,
- Then data are analysed: trends, strengths and weaknesses are elicited and the results of the analysis are published,
- Policy makers engage into a dialogue with employers, educational and training institutions, NGOs and citizens to reflect on what needs to be done to improve employability and employment, innovation and research, etc. – benchmark with other territories,
- Individuals could place themselves on the competency map and reflect on their professional development to keep-up with trends. Some could ask to have their prior learning and experiences accredited being unaware of their value on the labour market,
- Education and training providers could adjust their provision to bridge the gap, and market their offer to target populations identified in a kind of skill gap analysis.

Another conversation could be triggered during a recruitment process:

- An employer publishes a vacant position on a series of job boards or public employment services – regional and international,
- Pools of ePortfolios / CVs are analysed to identify possible good matches. They are notified and invited to respond to the opening,
- Prospective candidates analyse the job offer against their competencies and compile an ad-hoc CV and motivation letter that provide links to relevant ePortfolio parts,
- The employer receives a long list of candidates (50) from which a shortlist (10) is extracted.

The selection is made online against a series of criteria. Each of the candidates receives feedback containing:

- The number of candidates who responded and the number short-listed,
  - The criteria that were used for screening and their own score,
  - The place of the candidate in relation to others – on a multidimensional map,
- Short-listed candidates receive a screening questionnaire to provide additional evidence of skills, competencies and abilities,
  - Less fortunate candidates receive notification of their rejection and are invited to reflect further on the points that were noted as 'weak' during the review process. Based on the collection of feedback received from other prospective employers, patterns emerge (or not) that provide a foundation for further action,
  - Public employment services receive anonymised copies of review outcomes that are analysed to elicit possible patterns and actions – e.g. increase the counselling provision, develop special workshops or training programmes with education and training partners,
  - Long-listed and short-listed rejected candidates readjust their CV/job search portfolio to improve the odds of being short-listed/selected.

Looking for a job is a learning experience that is rich with reflection opportunities. It is an opportunity to better understand what employers really want, as well as one's own strengths and weaknesses. Keeping a reflective journal of one's job quest – that could be private, public or restricted to a group of trusted people – is a means to construct some meaning from a series of events and data that might be interpreted as un- or over-informative ("*nobody likes me!*").

We could describe many more 'conversations' across organisations and institutions during which ePortfolio parts are being consumed and produced.

## **ePortfolio standards**

While existing standards, such as IMS ePortfolio, make sense for a paperless portfolio, it is clear that these specifications are not adequate for a globally ePortfolio enabled system where ePortfolios, ePortfolio organisers and ePortfolio Management Systems interact mutually and with other systems as well. Today's ePortfolio standards development is in a state similar to that of world in which HTML, the structure of a document, would have been defined without the HTTP protocol, i.e. the ability to access and deliver contents<sup>3</sup>.

More generally, one should ask whether it makes sense to have standards specific to ePortfolios or if we would be better off re-using existing standards, even ones defined outside the field of education and human resource management.

The most obvious set of standards relevant to ePortfolios is the one supported by Liberty Alliance related to federation of identities and services, and more recently to people services - they take into account social networks. Microsoft has its own set of standards such as WS\* and Card Space, but other specifications such as Open ID are possible alternatives or complements.

Liberty Alliance should also be studied as an example of a group of organisations that have joined together to create and implement successfully a set of standards limited in their scope, but fundamental to providing a relevant answer to a critical problem. In contrast to IMS Global, which has attempted to define the HTML (XML) of ePortfolios without defining the protocol for accessing ePortfolios, nor ePortfolio architecture, Liberty Alliance has worked on the 3 fronts simultaneously, providing an infrastructure that is vital for most business processes.

The ePortfolio community should be inspired by the example of Liberty Alliance and see in it a way of dealing with important issues with a limited set of specifications, protocols and architecture. One

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<sup>3</sup> EIFEL is currently working with Liberty Alliance and HR-XML to design a HR-XML webservice using Liberty Alliance framework as transport protocol – an ID-SIS in LA's terminology – so we would have the HTML and HTTP of the ePortfolio...

possible domain is the CV. Of course, a CV is not an ePortfolio, but it is and will be for a long time a type of information that can be extracted from an ePortfolio to be presented to an employer or even a university to register for a course. If we are able to make the information contained in a CV easily readable by machines, while keeping the expressive power an individual can use by enriching the xmlised information with powerful editors, this would be a major step for ePortfolios.

We need to get away from the initial misconception that ePMS would have to import and export whole ePortfolios, e.g. when moving from school to higher education, then employment. Such a vision would probably lead to a set of specifications that would rigidify the whole system and kill innovation. There is clearly no need to import a complete ePortfolio when moving from one institution to another and for the most obvious reason: we lead parallel lives, and we belong simultaneously to different groups and institutions, each with their own characteristics. We have to accept that we will have different parts of our ePortfolio organiser distributed over a series of information systems that do not have to talk to each other directly, or if they do, it must be under our control, i.e. the control of our ePO, which will act as kind of digital safe. In an ePortfolio-enabled architecture, we need:

- ePO to manage the various parts of our ePortfolio repository that is distributed – aggregate repositories and publish multiple ePortfolios,
- ePMS to export data when the link with a group or institution is terminated – e.g. export an assessment portfolio after accreditation of prior learning with an awarding body. The (initial) set of standards required is minimum, like IEEE RCD, and, for Europe, CEDEFOP's Certificate/Diploma supplement.

Conversely, there is a whole domain where it is not (yet?) relevant to attempt to develop standards. Personal development planning and continuing professional development (CPD) are processes that are peculiar to individual communities and there is clearly no need (yet?) to abstract those processes into technical standards. There is no need to have a set of standards that will cover the needs of CPD for mechanics, waiters or doctors. Each community can develop their own tools, based on their own specifications, as most of transactions will be within their own system. What will be important is their ability to export information in a format useful, not for another PDP or CDP system, but for a potential employer or for a training organisation in a format already covered by HR-XML specifications. Similarly, when an employee leaves a company, it should be mandatory for the company to provide, not just a certificate, but a portfolio presenting the career of the employee. This can be done using HR-XML standards, and customising to the needs of communities through the process known as *Application profiling*.

Other groups of specifications that are fully relevant to ePortfolios are those related to archives, such as OAI-PMH (<http://www.openarchives.org/>) for the exploitation of meta data; workflow standards, such as BPML (<http://www.ebpml.org/>) for managing processes such as ePortfolio review and assessment, and peer to peer such as JXTA (<http://www.jxta.org/>) for sharing resources across ePortfolio organisers. It is critical before attempting to develop any new standards to establish a proper inventory of all standards relevant to ePortfolios. It is only when we have agreed on such a list (or established different lists, based on different values and approaches) that we might want to reflect on whether we should develop another set of specifications, and if the response is yes, we should further ask ourselves: *are the issues addressed by these new specifications specific to the world of education and training or are they more general problems that should be addressed with other communities?*

It is likely that there are issues that are critical in the context of education and less critical in other contexts; hence the need to develop new specifications. The Schools Interoperability Framework (SIF) is a good example of a series of specifications relevant solely to the world of initial education<sup>4</sup>. It is also possible that the education community come up with a specification that is relevant to a larger community. IMS Content Packaging provides a general solution to transfer contents over the Internet as easily as transferring CD-ROMs, something useful to the publishing industry in general, not just the education and training communities. But there is also the danger that the education community come up with impoverished specifications or implementation of general specifications. For example, while Shibboleth is the academic implementation of the same standards on which Liberty Alliance is based

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<sup>4</sup> Although one should wonder whether those specs are not in the process of being made obsolete with more general frameworks such as Liberty Alliance

(SAML), the two implementations might only become compatible with the next version of SAML, and Shibboleth does not provide the same level of services as Liberty Alliance<sup>5</sup>.

## ePortfolio developments

The underlying technology of ePortfolios is transforming the architecture of existing information systems (IS). We are moving from organisation-centred IS, where individuals were offered a space, to people-centred IS, where the organisation's IS behaves as an *aggregator* of individual or departmental IS. We are moving from top-down to bottom-up flows of information and control – there will be still a strong control at the organisational level, but the diverse entities will be much less tightly coupled, leading to a more *agile* architecture.

While, until now, ePortfolio organisers owned by the individual and ePortfolio Management Systems owned by the organisation, were indistinct entities, in the near future, each of those components will affirm its autonomy, with ePMS evolving towards Organisational ePortfolios Systems. This tendency is already at work with publishers of ePortfolios systems like Nuventive which, in conjunction with an ePMS (iWebFolio) is providing TracDat, a quality management system, which is in fact an organisational ePortfolio. In the UK, the Centre for British Teachers (CfBT) also has an ePortfolio for the continuing professional development of teachers, as well as Stratis, a tool similar to Tracdat, i.e. an organisational ePortfolio for managing quality assurance. It is the ability of ePortfolio suppliers to adapt their provision to the unique needs and business processes of their organisational clients that will make the difference. And this is a very different business from providing ePortfolio organiser services.

On the ePortfolio organiser front, i.e. the system owned and controlled by the individuals, the critical aspect will be the issue of digital identity control, from the *trivial* requirements for single sign on to control of who has access to what and when (including the ability to erase personal information from the Web). Another key aspect will be the ability to exploit one's personal assets, which will be distributed over a series of information systems like 43things, MySpace or SecondLife, as well as education and employment systems or one's computer. Data mining, aggregation, spatial representation are some of the key services required to help individuals to manage and exploit their assets.

## Conclusion

While we are still in the infancy of ePortfolio history, its emergence has already had a major impact on current learning technologies development, as well as on our reflection on information systems and architectures. Beyond learning, employability and social inclusion, the ePortfolio elicits the critical issue of privacy and control: who owns and can exploit our personal data, the digital representation of ourselves. Perhaps the issue of ePortfolio can be subsumed to that of *digital identity*, i.e. the extension of our physical identity, an ePortfolio being the mere projection of one's identity?

This is why I believe that terms such as *ePortfolio organiser* and *ePortfolio Management System* might soon be replaced by other ones such as *Assets and Identities Management systems* (AIMS) with their personal and organisational versions, the latter being some kind of reengineered version of the current ERP (Enterprise Resources Planning). It is that understanding that has driven EIFEL to encourage the cooperation between communities working in the field of digital identity and human capital management. Thanks to EIFEL's efforts, two of those communities, Liberty Alliance and HR-XML, are now talking together, connecting people, ideas and projects.

It is important at this stage that the ePortfolio standardisation community move beyond the discussion on whether 43things is an ePortfolio or not<sup>6</sup>, and beyond a fixation with semantics. It is time to join

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<sup>5</sup> Shibboleth which was initially designed to respond to the needs of libraries and the publishing industry focused on Single Sign On (SSO) across institutions, not on sharing profile data and federation of services, something that on the other hand has been extensively developed by the Liberty Alliance consortium.

<sup>6</sup> I've always been rather irritated by the fact that while most will agree that we have been able to create ePortfolios with simple word processors or presentation tools, although they might not provide all the services one would expect from a modern ePortfolio platform, often the same people will wonder whether social networking tools, that have a much more powerful expressive power than mere word processor, could be used to create ePortfolios. In separating clearly *ePortfolio organisers* from *ePortfolio management systems*, then one could say that you can choose the tools you want as one's personal ePortfolio

communities like the Oasis Group, Liberty Alliance and HR-XML, which are now working on the definition and implementation of standards that are pivotal to the future of ePortfolios. We need to be in a position to influence future standards and developments designed by those who have demonstrated their capacity for successful industry adoption. We should learn from the successes of Liberty Alliance and HR-XML, as well as from our inability as ePortfolio community, to make any serious progress on standards design and implementation.

We have to face the uncomfortable truth that the standards most relevant to ePortfolios are being currently developed outside the mainstream ePortfolio community. This has to be changed, and this is what EIFEL is aiming at.

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'organiser' (from Facebook to plain web publishing tools), this is completely different for ePortfolio Management Systems. Of course, it is perfectly legitimate to look at 43Things is *a kind of* ePMS which is relevant to a series of communities within a specific context (sharing goals and reciprocal learning), but this is not an environment that is relevant to institutions: institutions need their own kind of ePMS, such as those provided by commercial vendors and open source platforms. And they will differ in a school, a university a professional body a learning society, a company, an awarding body or a local community: they manage different processes. ePortfolio organisers could be seen as the digital image of the individual while the ePortfolio management systems would be the digital clone of the institution and its processes.