

ePortfolios and weblogs: one vision for ePortfolio development

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Abstract

Use of the Electronic Portfolio (ePortfolio) is rising around the world and in particular the US and UK. Two main purposes of the ePortfolio include: promotion of student-centred learning and reflection; career planning and CV building. Weblog use has grown rapidly leading to the development of some excellent programs for keeping a daily online 'diary'. This report explores the possibility of merging weblog technology with ePortfolios, creating a platform for learning reflection.

Introduction

This report sets out to explore the idea that weblogs could integrate well with ePortfolios providing the means for reflection. One main strength of the ePortfolio is the ability to alter the dynamics of learning pedagogy, students are actively engaging in their learning not just the recipients of information. Reflecting on what they are learning may help map out future direction. Weblogs are a medium used to 'reflect' on a whole manner of different things; by their very nature, weblogs act like a reflective diary. This could prove perfect for ePortfolios. Students maintain a weblog talking about their learning experiences, these thoughts connect to the digital repository of artefacts and tutor feedback, creating a powerful standard for reflection.

Trent Baston¹ noted in 2002 that momentum for the ePortfolio 'is building'. In March 2004 Darren Cambridge, a leading expert in the field of ePortfolios, said; "from all indications, the level of interest in and acceptance of ePortfolios in US higher education is skyrocketing" (pers. comm.).

Definition

An ePortfolio is a web-based information management system that uses electronic media and services. The learner builds and maintains a digital repository of artefacts, which they can use to demonstrate competence and reflect on their learning. Having access to their records, digital repository, feedback and reflection students can achieve a greater understanding of their individual growth, career planning and CV building. Accreditation for prior or extra-curricular experiences, a sense of control over how

¹ Trent Baston, The Electronic Portfolio Boom: What's it all about?
<http://www.syllabus.com/article.asp?id=6984>

they are represented and direction over what is shown makes the ePortfolio a powerful tool.

How does an ePortfolio work?

An ePortfolio has a similar look and feel to a personal website. The main difference is a link to a personal repository containing items of work, tutor/employer comments, feedback and reflections. As ePortfolios exist for different purposes a “one size fits all” approach will not suffice so the student needs to be able to create front end displays tailored to the task required. For example giving certain items access privileges the ‘owner’ can set up a web front end displaying their CV with three or four actual examples of work and tutor comments. The URL of this front end could be sent to a potential employer so they can read the CV and view examples of work selected to re-enforce the skills base presented in the CV.

Digital Artefacts

A digital artefact is any electronic media, for example; a word document, a video clip, a digital photograph. Production of these artefacts involves digitizing materials such as scanning an illustration. A student wanting to demonstrate debating skills could insert a video clip, showing their participation in a debate with a group of peers, into their ePortfolio. This artefact could be shown to tutors or employers to demonstrate that student’s ability to debate.

To use the ePortfolio for reflection the student would review the artefacts stored in their repository. Using tutor feedback and self reflection the student looks closely at and analyzes their progress, highlighting strengths and limitations, hence indicating developmental needs.

ePortfolio → Gallery → Discussion

Providing each student with a full electronic record of their achievements and artefacts submitted throughout the course of study the student has the ability to organize and reorganize the contents to create different views tailored to specific audiences or generate further discussion and future study, *ePortfolio → Gallery → Discussion*. Combining the artefacts contained in the portfolio along with reflection/discussion provides a rich tapestry of the learners’ experiences and skills. The ePortfolio places the student at the centre of the development process enabling control over their learning.

Purpose of an ePortfolio

The benefits of ePortfolios can be summarized under three areas: a learning tool for the user; a monitoring tool for institutions and a mechanism for employment opportunities. This interaction between institutions, instructors, advisors, employers and peers creates a varied learning community. As George Siemens (2003) observed, ePortfolios can serve as a hub through which to manage our participation and thereby our learning.

Taking control: Power in the Process

With ePortfolios the power lies in the monitoring of process as well as product. With ePortfolios the pedagogy shifts from a course-driven focus to a student-centred approach placing emphasis for learning firmly on the student. Adopting this student-centred approach, the aim should be to encourage and motivate students to identify and respond to their own learning needs and in turn gather and record evidence of this learning within the ePortfolio. The ‘owner’ is responsible for maintaining the system, utilizing its functions and facilities, improving their learning experience and development. Work stored within the student’s personal space, which is private, may be used for reflection and to prove competence.

Taking the prominence away from course driven learning the ePortfolio could allow information and skills that normally fall through the cracks, things such as extra-curricular activities, work experience etc, to be captured and utilized presenting a greater portrait of an individual. This is demonstrated with the pilot webfolio study by Illinois State University, which included a “student life” category allowing extra curricular activities to be captured.

Development and maintenance are the key activities in the success of an ePortfolio, enabling a student to actively engage in their learning and progress. By maintaining their own ePortfolio a student reflects on what they are doing and have done and considers why they are doing it and the reasons for it. It may lead to a clearer understanding of the direction a student wants to pursue. Learning the skills required to use and maintain their ePortfolio students arm themselves with valuable computer skills essential in many work places.

Institutional benefits

ePortfolios could help departments demonstrate more effectively their graduates learning profiles and skills required for the workplace. From the institutional viewpoint an ePortfolio would enable students to demonstrate in their own words and with the products of their own efforts, the value and effectiveness of their educational experiences.

The ePortfolio may facilitate greater interaction between learners and tutors. In paper based portfolio models the majority of interaction was face to face, a student dropping off work at a tutor’s office. ePortfolios permit a wider interaction sphere allowing interface no matter where students or tutors are located. There are no physical, spatial or temporal boundaries.

Employability

An ePortfolio can be an enhanced CV demonstrating in great detail a person’s skill base. Whereas with traditional CVs the applicant could talk about the skills and experiences they gained, the ePortfolio enables a direct link to actual objects that can back up the claims.

Ethos of the weblog

A weblog is defined as any web page with content organised according to date. Originally, these were pages keeping track of a user’s discoveries on the newly-emerging World Wide Web; later the definition expanded to encompass personal

diaries, work-related progress reports and even summaries of current events on newspaper websites.

Weblogs have enormous strengths as a communication medium. This is in part due to some of the technology underlying them, but it is also related to the ease of publishing. A weblog author can press a button to load their weblog client, type some words into a box, press another button – and it's posted up for the world to see. This immediacy and ease of use is paralleled only by email, which may go some way to explain weblogs' increasing popularity. Technorati.com, a weblog search engine, watches nearly 2 million weblogs, while LiveJournal.com, a weblog community, has a further 2.5 million members.

As well as a tool for private reflection, weblogs have additional importance as a medium of sharing one's thoughts between friends, colleagues or fellow students. Given the right platform, a user can see their friends' recent public reflections, aggregated onto one page and displayed in chronological order. In the context of an ePortfolio, course tutors, lecturers, clubs and societies could all have their own weblogs which users could view on their "friends" page. Students can share information they've found or ideas they have on a particular subject, as well as the more social messages which may form a compelling reason for them to use the technology to begin with.

Story so far: the technology

XML

eXtensible Markup Language (XML) is a generalised framework for data files which allows the same set of technologies to be applied to any type of data storage on any computing platform. Because of its interoperable properties, it is ideal for storing and searching through content in situations where it may be produced by several different systems using several different operating systems.

ePortfolios are one such situation. Many different systems are being developed worldwide by different institutions, but the important aspect of any ePortfolio technology is the content itself. While designs of ePortfolio systems do matter, their meaning and importance are reduced if the outside world can't read and manipulate the resulting data, no matter what system is used, and if it doesn't have some guarantee that the data is trustworthy. In other words, the most important aspect from the technology point of view is the file format, and as such a standard should be decided that is:

1. **self-contained:** if a user chooses to make an object available through their portfolio, the link to that object ideally should not be broken when the portfolio is transferred to another location.
2. **transferable from system to system:** a portfolio file created on one system should not corrupt when viewed on another. More importantly, a portfolio created on an open-source ePortfolio system should be easily accepted and stored by a commercially available ePortfolio system and vice versa. Just as we keep and maintain our CVs for life, ideally we should be able to do the same with our ePortfolios, no matter where we choose to learn or work.

3. **secure:** there needs to be some way to verify the accuracy of the information stored within a portfolio file.

Content management with XML

In the case of weblogs, there are two prevalent XML-based technologies for sharing content: RSS² and Atom³. RSS – Really Simple Syndication – uses a small XML dictionary to store summaries of recent weblog postings and their associated links, dates and general weblog information. A user can then keep track of a number of weblogs by viewing their posts through an aggregator, which will parse the XML summaries and display them in chronological order.

RSS was a quick-and-dirty solution that filled a requirement, and as a result is widely used despite being simplistic and . Atom, on the other hand, is a smarter redesign of syndication through XML, retaining the positive aspects of RSS while revising the syntax and adding some new features.

Searching through weblogs

Search engines exist which regularly cache the data from a number of RSS files into their own database, and then allow you to search the weblog links and summaries. This allows a user to search weblogs more accurately than they would through a standard search engine, say Google, because searchable dataset entirely consists of weblog post summaries.

The search engines might also take advantage of other technologies, for example Friend Of A Friend⁴, which allows weblog owners to store how they are related to other weblog owners and create groups of weblog owners with similar interests in a machine-readable format, and ICBM⁵, which allows them to represent their geographical location. As a result, the correct software can search for a weblog in a particular location and then browse from a result to an acquaintance, or find a group of weblogs in the same city.

Weblog feed auto-discovery

If a weblog has an RSS or Atom feed, the owner can choose to add a number of lines to the header of their HTML documents to indicate its existence:

```
<link rel="alternate" type="application/rss+xml" title="RSS"
href="http://squirring.net/index.xml" />
```

This allows search engines and related software to automatically discover them in the following way:

1. A feed is added to an RSS search engine.
2. The search engine loads all pages referenced in links within weblog posts, or within the FOAF file.
3. The search engine looks for the above line in the pages.
4. If a page contains the line, and the XML file exists, go to step 1.

² <http://blogs.law.harvard.edu/tech/rss>

³ <http://www.atomenabled.org/>

⁴ <http://xmlns.com/foaf/0.1/> and <http://www-106.ibm.com/developerworks/xml/library/x-foaf.html>

⁵ <http://geourl.org/>

Transferring data between weblogs

Pages can actually also talk to each other using XML; a technology called SOAP⁶ allows a page on one platform to alert a page on another platform, for example, when it is updated. In fact, SOAP is just a remote procedure call in the form of XML: a client makes a request to a server by sending it some XML; the server sends a message back to the client by sending it another piece of XML, and so on. Again, because XML is used, the messages are not in any way dependent on the computing platform used, and can be parsed by a standard set of technologies.

How this applies to ePortfolios

A redesign of syndication standards for portfolios

Rather than an XML file that stores summaries of weblog posts, the ePortfolio system might maintain a file containing identifying information about the user. XML files generally have a main tag, with all the other tags as children; this could simply be called "portfolio", which might have the attribute "name", containing the portfolio owner's name. Another possibility may be a "portfolio-info" tag, which would contain sub-tags with the date the portfolio was created, the date it was last edited, the establishment it was last edited within and the software platform used. There would be another tag with "user-info" (or a similar name), containing contact details and so on. A sample portion of this part of the portfolio file might look something like the following, although the final XML schema would be significantly more sophisticated.

```
<portfolio name="Ben Werdmuller">
  <portfolio-info>
    <date-created>March 07, 2004 20:45 +00:00</date-created>
    <date-last-edited>March 07, 2004 21:09 +00:00</date-last-edited>
    <establishment>University of Edinburgh</establishment>
    <software>Edinburgh ePortfolio System</software>
  <portfolio-info>
    <user-info>
      <born>January 07, 1979</born>
      <address>
        Moray House School of Education
        Holyrood Rd
        Edinburgh, EH8 8AQ
      </address>
      <country>UK</country>
    </user-info>
  </portfolio>
```

XML allows for binary data to be stored within its tags: this allows for artefacts to be stored as embedded objects within an XML file. There could be a tag called "objects" (or similar), with sub-tags containing particular pieces of work that the portfolio owner might want to make available. Word documents; pieces of art; the type of file wouldn't matter.

As reflection is an important part of the ePortfolio, the idea of syndicating weblogs and posting summaries (indeed, the full text of a post) could be slotted straight in by embedding an atom feed as an object. This type of functionality allows anything to be added to ePortfolios in the future without significantly altering the schema for ePortfolio files themselves, much in the same way that websites allow all kinds of plug-ins to be added to pages without altering the actual HTML syntax.

⁶ <http://www.w3.org/TR/soap/>

Searching through ePortfolios

Just as search engines exist to search through weblog content, they could be configured to search through portfolio files, using exactly the same mechanism. A portfolio could explicitly be added to a search engine on creation, or the search engines could traverse links through Friend Of A Friend or a similar standard in order to discover the portfolios of other people at the same university, within the same research group, or even the same family or friendship group. This list could also be used to keep track of other portfolios the students wish to monitor, or other users they wish to be able to see sensitive content.

Once in the system, two ways of updating content within the search engine might be viable:

1. The search engine reloads content from all the XML files it knows every 24 hours, or some other arbitrary time period.
2. When an ePortfolio system updates a portfolio file, it sends a notification to – "pings" - the search engine. (Each portfolio has an associated list of sites to ping on update.) This is how RSS search engines and recently updated lists currently work, due to the volume of weblogs currently in existence. Additionally, any site pinging a search engine more than once every half hour is banned for an unspecified length of time, to prevent spamming and "denial of service" attacks.

The portfolios would be made available over the Web, as if they were web pages as opposed to XML files. Just as websites often leave a forwarding message when they change address, there might need to be a "dummy" portfolio file standard, which would simply contain the new address of a portfolio that had been recently moved.

A different, or additional solution, might be to make these files available via a peer-to-peer protocol. This, like the stand alone database search engines, would allow a user to search through portfolios by skills, geographical location, and everything else defined within the portfolio schema – but a central database would not be required. This wouldn't require pings; a specific search would query an ePortfolio system, which would then query the other ePortfolio systems it knew about, and so on, until a set of collated results were returned to the user.

Transferring ePortfolios

One could use SOAP to initiate transfers of portfolio files from one system to another. The sending system would issue an XML request to the system set to receive the portfolio; that system would then respond and so on, until the actual portfolio XML file itself was sent and a "successful" or "failed" message was sent. Once again, because the XML would be standard, any ePortfolio system could talk to any other.

Ensuring security

Given the open nature of this standard, a very robust method of ensuring security must be employed. Specifically, the accuracy of any information stored within a portfolio file must be verifiable, as must the identities of two ePortfolio systems transmitting information between each other.

In the real world, a CV is verified accurate by references: there are usually two or more reliable people listed at the bottom that can be called upon to back up the claims within it and submit their own opinions of the CV owner. This could be imitated by including a "references" tag within the portfolio schema; on the Internet it may be wise to add another layer of security in the form of encrypted keys⁷.

Effectively, each reference would have a unique signature, which consists of data encrypted using their private key. Someone checking the references could then decrypt the signature using that person or establishment's public decryption key. The unencrypted data might contain the body of the reference and the portfolio owner's name, or some similar information in order to ensure that the reference wasn't simply copied from someone else's portfolio.

The same could be achieved for SOAP messages while transferring portfolios or similar; each call could be suffixed with a unique signature, ensuring that (say) a portfolio transferred to the University of Edinburgh from Harvard University really was from Harvard, as opposed to a hacker attempting to get their portfolio onto Edinburgh's system.

Future vision

The field of ePortfolios is really exciting at the moment. If open systems are widely implemented across the higher education spectrum, they may profoundly affect not just how we learn, but the way a student finds a job once they finish their course. For example:

- Communication between students and staff is improved. They can learn about each other through the public portions of their portfolios – and most strikingly, the weblog-like sections – revealing their personalities and interests, thereby revealing everyone's "human side" and hopefully reducing students' fear of approaching staff.
- A company seeking to fill a vacancy can just search the network of ePortfolio systems for people with a set of required skills and experience levels. Furthermore, the guesswork in hiring a candidate is reduced, as a person's portfolio contains examples of actual work they have done as embedded artefacts.
- Anyone can search for portfolios with specific skills and interests listed, and discover similar-minded people anywhere in the world. This could have consequences for academic collaboration and the sharing of knowledge between similar departments and units in educational establishments worldwide.

The assimilation of weblog technology and ethos into ePortfolio development is only the first step. Technological innovations within weblogging are impressive, and ePortfolios could really benefit from the same technology. For ePortfolios to really be accepted and implemented both the reflection / assessment tools as well as the employment aids need to be utilized.

⁷ The XML encryption syntax is defined at <http://www.w3.org/TR/2002/REC-xmlenc-core-20021210/>

Conclusion

It remains to be seen if this approach would produce a satisfactory outcome. There are many possible ways ePortfolios could develop. This report gives one possible development path. One thing is certain; if ePortfolios are viewed as a new, separate entity as opposed to an integrated part of one's learning experience, they may never fulfil their potential, becoming a tool that alters learning pedagogy.

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