ELECTRONIC PORTFOLIO BUILT INTO WINDOWS SHAREPOINT COLLABORATION AND LEARNING ENVIRONMENT

Elena Dikova Shoikova

Department of Electronics, Technical University - Sofia, "8 Kl. Ohridski", 1000 Sofia, Bulgaria, phone: +3592 962 40 49, e-mail: shoikova@tu-sofia.bg

This paper reports work-in-progress for a project to create an electronic portfolio for the Technical University-Sofia students. It outlines the components of the project being undertaken and the processes that students will experience. The paper presents the process of electronic portfolio development through five stages and its implementation in the SharePoint Platform for collaboration, communication and learning developed at the Technical University-Sofia R&D Laboratory on eLearning Technology and Standards. The ePortfolio is emerging as the latest tool in professional development, for documenting in-service achievements, career management and seeking employment. Considerable portfolio development has occurred in the field of competency based lifelong learning applying the portfolio as a professional tool. The ePortfolio for English Language Faculty of Engineering students will be trialed in MEng E-Management class during Semester 1, 2008 in a course on E-Learning. An ePortfolio for Master program students will enhance the professional practice portfolio component of their academic program, building throughout each year of the program (and on into their career). The ePortfolio consists of more than an electronic storehouse for a resume and copies of evidence. It includes a self-learning process to help students identify gaps in their current portfolio. The main feature of this process realized as an interactive web solution built in the SharePoint platform, will allow students to identify and reflect their existing skills, competencies and experiences. These capabilities may be compared to examples of job descriptions and corresponding competence profiles. In this way the students can identify if they need additional paid or voluntary work experience or additional skills to meet specific job requirements.

Keywords: electronic portfolio, social network, competency based learning

1. INTRODUCTION

Over the last few years the prominence of, and interest in, e-portfolios in all sectors of education has grown, driven in part by national policy and lifelong and personalised learning initiatives. The picture has often been a complex one, with confusion over what an 'e-portfolio' is. More recently consensus is gathering, and clarity is being brought to the discussions, as our experience with using ePportfolio tools grows. The term ePortfolio often means different things to different people.

Fundamentally an ePortfolio is the product created by learners, a collection of digital artifacts articulating experiences, achievements and learning.

There are four basic approaches to develop ePortfolio systems. *Homegrown:* Information technology staff develops a custom system locally, for example, University of Denver and University of Washington, there is no software licensing. *Open source ePortfolio* system software or modules are publicly available at no

charge. The Open Source Portfolio Initiative (OSPI), for example, is a community of individuals and organisations collaborating on the development of nonproprietary, open source ePortfolio software (http://www.theospi.org/). *Commersial*: An institution purchases a system from vendor, for example, ANGEL ePortfolio (http://www.angellearning.com/products/eportfolio/) and Blackboard Portfolio System (http://www.blackboard.com/products/Academic_Suite/portfolio), which includes licensing and support fees. *Common tools*: an institution uses common HTML editors, such as Microsoft Front Page or Macromedia Dreamweaver, to support the development of ePortfolios.

However, the process of developing and implementing a successful ePortfolio project - one that works and is adopted by users - involves many challenges that must be tackled. An ePortfolio software environment has to be sticky to end users and sustainable as a new enterprise service for students, alumni, and lifelong users. Three key steps are necessary to complete the development of a new ePortfolio system. The initial step is to *conceptualize and define* the overall system operation as determined by a delineation of the functional and technical requirements. In terms of developing an ePortfolio project, this first step is usually initiated by the faculty members and ICT professionals. The second step is to *design the software and develop an environment* that intelligently affords those requirements specified in the first step. During this stage, both *human and technological* aspects have to be considered. The human aspects are certainly the most problematic project issues to be addressed, since they directly affect both usability and user acceptance - issues that can make or break the success of an application. The third and last step is to *implement and maintain* the project, covering business plan, daily operation and software upgrade.

A combination of several attributes can contribute to the development and implementation of a successful ePortfolio project: *Ease of use.* In a successful ePortfolio project, the software environment must offer an attractive and simple interface with minimal or no training required. *Sustainable business plan.* The ePortfolio is a new service, mandating new budgets for software building and licensing, software maintenance and updates, user support and help desk, and faculty development. The success of an ePortfolio project thus certainly depends on a long-term, sustainable business plan. *Advanced features.T*he conceptual architects of ePortfolio projects must include interesting, desirable services not conveniently available elsewhere, for example solutions based on Web 2.0 technologies (Wiki, Blog, RSS), social networking and competency- based learning. *Lifelong support.* Building a lifelong ePortfolio system promotes additional incentives for users to create and maintain their ePortfolios, and any advancement of system use certainly contributes to the business success of an ePortfolio project. *Standards and transportability.* A number of consortia and initiatives are trying to define and refine standards for the various learning technology systems – IMS, ADL, IEEE LTSA.

When these are considered in conjunction with both the technological and the human aspects required for the design and development of such a project, and when

use incentives, interoperability standards, and transportability features are added, the deployment of successful and sticky ePortfolio systems will surely be attained.

2. DEVELOPING AN EPORTFOLIO TO BE USED IN ENGINEERING EDUCATION

An ePortfolio project is underway in the R&D Laboratory on eLearning Technology and Standards at the Technical University-Sofia (TU-Sofia). The ePortfolio project is aimed at providing both students and institution a digital destination to collect evidence of educational growth and assessment. The ePortfolio solution must foster student engagement by putting learners at the center of the portfolio process. Students can build electronic portfolios of their educational achievement and personal growth. Institutions can manage evidence of program achievement. The ePortfolio toll should ties seamlessly to the existing collaborative platform and course environment based on SharePoint Server 2007 (Figure 1), so it's easy for students and faculty to master and for institutions to setup and maintain.

The key rationale for implementing ePortfolios for the TU-Sofia students has primarily been to (1) give students the context in which to reflect upon their social and academic experiences, and to (2) improve upon current career and resume planning. To fulfill these purposes, and others, ePortfolios function in what may be seen as five basic ways, which together work toward placing the student at the center of both their learning and development. These five functions of ePortfolios make clear their more practical uses and benefits for students. The task forced established the following process for meeting the goals: (1) Perform needs analysis and define desired ePortfolio features; (2) Define potential ePortfolio use scenarios; (3) Develop list of software feature requirements to address the use scenarios; (4) Develop ePortfolio solution to be integrated in SharePoint Platform for collaboration, communication and learning; (5) Review and test ePortfolio tool; (6) Pilot ePortfolio projects with ~20 students to test all use scenarios; (7) Devise wider implementation strategy.

2.1. ePortfoplio use scenarios

The following eight descriptions represent potential scenarios for portfolio uses (Figure 2).

Enhanced Resume. An enhanced resume is an electronic resume, similar in format to a traditional resume, but enhanced by links to work samples in various media saved in a student's repository. This enables the student to provide evidence of skills gained from academic and experiential education. In the best cases this will include an opportunity to demonstrate "soft skills" such as critical thinking and problem solving. An ePortfolio system should allow a student to easily customize resumes and share them with specific employers.

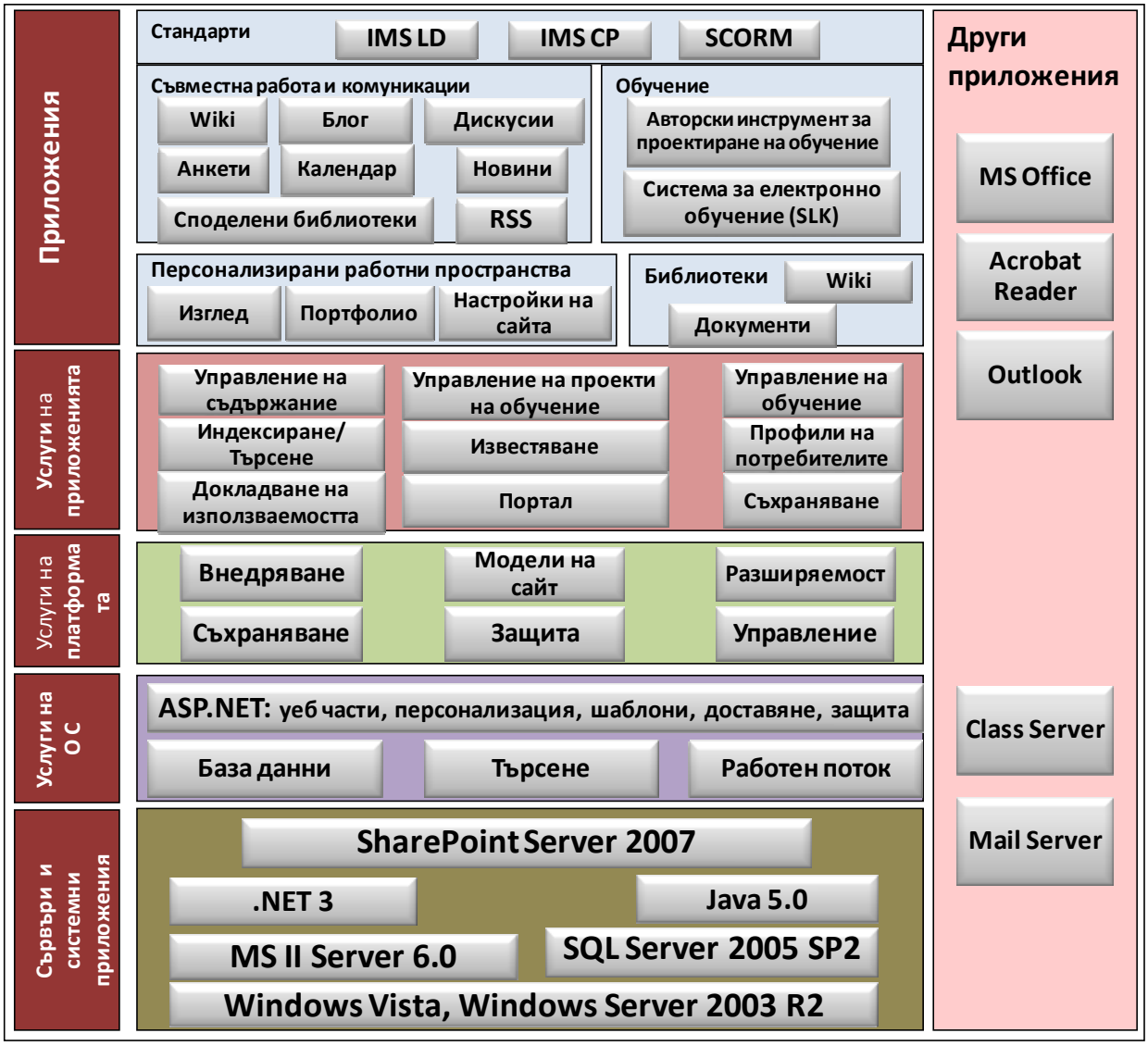

Figure 1. SharePoint Collaborative and Learning Platform

Open Structure Portfolio. An open structure portfolio allows the student control over the structure of a personal website, which can be shared publicly or through restricted access to display results of research, class projects, or bodies of work. This format may be useful to graduate students involved in research as well as students in creative fields who desire extensive control over the structure and visual presentation of their work.

Developmental Completion of Program Requirements. Some programs will want students to collect evidence of their development over their academic careers, providing a view of growth over time and the opportunity to review and reflect on the meaning of work at different points. This type of portfolio typically focuses on student reflection and enables faculty to assess effectively the progression of a curriculum. It can facilitate advice from faculty mentors on important areas of improvement. The portfolio could be used, in part, to provide reflection points to help students integrate academic and experiential learning. There is interest in using a portfolio approach to tracking the progress of students in Ph.D. programs.

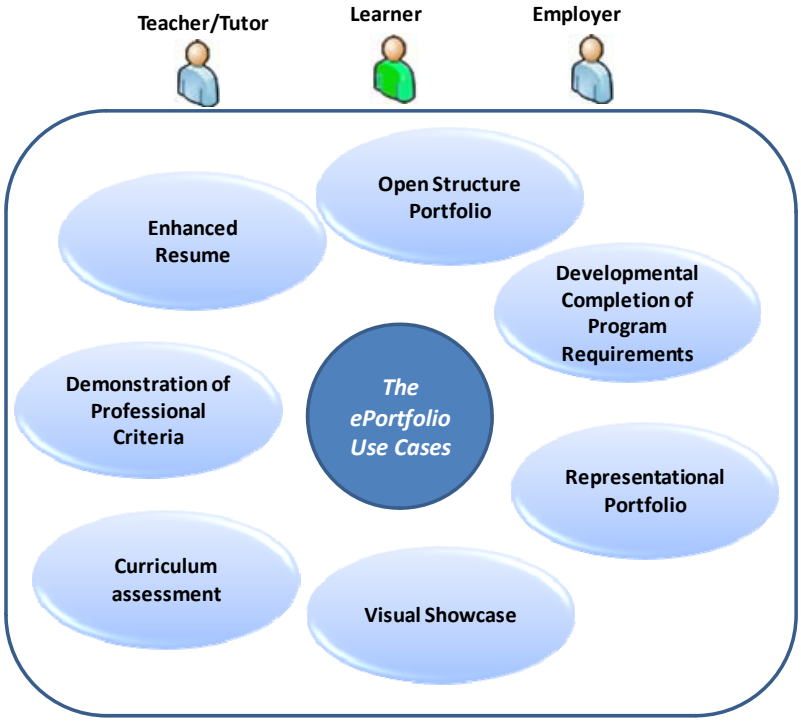

Figure 1. The ePortfolio Use Cases

Representational Portfolio. In a representational portfolio (sometimes called a showcase portfolio), a student presents a final picture of his/her achievement through academic and experiential education. A representational portfolio can be used for reflection on integrating educational experiences, to present authentic evidence of achievement to employers, and for curriculum assessment that measures how well students are meeting ultimate curricular goals.

Visual Showcase. Disciplines that produce primarily visual and/or media-based artifacts (i.e., design, photography, architecture, communication) have specific needs for the display of work, whether the portfolio is organized developmentally or representationally. A visual showcase portfolio should include some form of "gallery" of thumbnail images that can be used to scan the work in the portfolio. Thumbnails should be clickable to launch a larger view of the image/media that could include caption and description information. Students using this type of portfolio are also more likely to desire the ability to customize the overall portfolio design.

Curriculum assessment can be achieved through a portfolio system that allows the association of student work (artifacts) with assessment rubrics and the aggregation of work by multiple students for assessment using the rubrics. The system allows faculty to compare artifacts submitted as evidence of achievement of defined criteria and to distribute the artifacts for anonymous review by expert reviewers.

Demonstration of Professional Criteria. Some professional programs are required to demonstrate achievement of specific standards set by outside bodies, both for accreditation and certification of individual students.

2.2. Define requirements

An ePortfolio is a highly personalized, customizable, web-based information management system, which allows students to demonstrate individual and

collaborative growth, achievement, and learning over time. The ePortfolio functional requirements are summarised in Table 1. Also, the right column outlines the main technology features needed for successful ePortfolio solution development.

Table 1 ePortfolio requirements

Function	Description	SharePoint Tools & Services
STORAGE		
Repository for documents (artifacts)	An ePortfolio is a web-based repository for documents. It functions much like a file cabinet, with file drawers and file folders. Students store artifacts (academic records, resumes, letters of recommendation, mixed media files, along with special-interest, personal and professional development–related content, etc.), within its organizational categories.	Lists, libraries, and sites. Accessibility features.
Access and control	Although students control access to their ePortfolio and the majority of the content, the University would control content protected by law and University policies and regulations. The ePortfolio would be a dynamic system, updated automatically by campus systems and enriched by the student, the student's friends, family, and colleagues.	Lists, libraries, and sites. Accessibility features. Managing access to content.
INFORMATION MANAGEMENT		
Qualitative filtering	The challenge today is to filter what is most useful out of the barrage of information thrust upon students. To meet this challenge, students will need technical and organizational knowledge, as well as an understanding of how people seek, obtain, evaluate, use, and categorize information. That is, students will need information management skills.	Lists, libraries, and sites. Managing and working with content. Tracking versions.
Collect, select, reflect.	Information management processes are inherent in the creation and maintenance of an ePortfolio. *Collection* — gather, save, and store information and artifacts. *Selection* — review and evaluate information and artifacts, identifying those which are useful and important. *Reflection* — become reflective practitioners by documenting and evaluating their own growth over time. Information	Lists, libraries, and sites. Managing and working with content. Tracking versions. Managing

	Management is an integral part of ePortfolio creation and maintenance; it is also an essential skill for students to learn, as they attempt to qualitatively sort through the overabundance of information available today.	access to content.
CONNECTIONS		
Navigate by categories	EPortfolios also provide a medium for students to navigate through the vast networks that make up a university or college. By linking departments and resources directly to the categories of an ePortfolio, students will, in the process of managing and storing information, become connected to resources that are currently available, and yet underutilized. For example, by working within the "Career" category of the ePortfolio, students would find themselves connected (linked) to letter services, counselors, and workshops, all offered by the Career Center. Another example, in the "Leadership" category, under "volunteer opportunities", students would be linked with University programs, services, and offices who offer volunteer opportunities. These sources would, then, connect the student with local and corporate programs who provide opportunities in the community and in the real world.	Lists, libraries, and sites. Navigating to content. Managing and working with content. Working with content types. Managing access to content.
Awareness of resources	Giving students a tool to connect with the larger educational community will improve student awareness of what resources are available and why they are valuable.	Lists, libraries, and sites. Working with content types.
COMMUNICATION		
Presenting artifacts.	EPortfolios would have one main interface (private web page), from which students would navigate and manage information and, in addition, create what are called "presentation pages" (public web pages). By creating presentation pages for specific objectives, students learn how to communicate with various audiences, how to present documents for a purpose, and how to constructively reflect upon and write about artifacts. Students would control access to these presentation pages, restricting them to certain audiences, e.g., classmates, faculty,	Lists, libraries, and sites. Working with content types. Managing access to content.

	employers, graduate schools, friends, or family. In the end, students would have a number of presentation pages, built from the student's main interface, and designed for specific purposes and specific audiences.	
Receiving feedback	EPortfolios are very much a collaborative tool. They also allow students to solicit and receive feedback from faculty, advisors, and others about shared documents in their collection. In fact, ePortfolios are being linked directly to classroom learning systems. Such linking allows faculty, advisors, and others to communicate with students about the artifacts in their collection, whether they are papers, resumes, or various multimedia items. EPortfolios would also enable students to track graduation requirements more closely, allowing for more precise communication with advisors. EPortfolios involve more than collecting artifacts and reflecting upon them, they involve purposeful communication, as students present artifacts and receive feedback.	Lists, libraries, and sites. Working with content types. Navigating to content. Managing access to content.
DEVELOPMENT		
Commitment of Student Affairs	The history of student affairs is one of an enduring and distinctive idea: "the consistent and persistent emphasis on and commitment to the development of the whole person	Managing and working with content. Tracking versions.
Competency matrix	Specific developmental skills are cross-referenced with the ePortfolio categories, e.g., communication skills could be cross-referenced to specific courses, jobs, and so on. By utilizing and customizing the competency matrix, students would be able to comprehend knowledge and skills, such as leadership and social responsibility, relative to coursework, personal interests, and career possibilities. A competency matrix provides students a context in which to understand how to acquire and employ the knowledge and skills they accumulate over the course of their college career. A matrix also allows students a way to see the big picture in terms of their	Lists, libraries, and sites. Working with content types. Navigating to content. Managing access to content.

educational requirements, to visualize a trajectory of their development, and to articulate competencies and experiences to employers and graduate schools in a more concrete manner. Applying developmental theory within the functionality of ePortfolios can deepen the commitment of student affairs to the enhancement of the whole student.

Taken together, these five functions - storage, information management, connections, communication, and development - very well could transform higher education by placing the student at the center of their learning, allowing them to draw connections across subject matters and across realms of student life.

3. IMPLEMENTATION

The ePortfolio implementation has been based on the rich technology features of the Microsoft Windows SharePoint Services 3.0. The electronic portfolio tool is built into SharePoint collaborative and learning platform - which itself is a comprehensive environment for collaborative work, communication and learning. The ePortfolio solution for English Language Faculty of Engineering students will be trialed in MEng E-Management class during Semester 1, 2008 in a course on E-Learning.

4. CONCLUSION

ePortfolios allow students to plan, document, assess, and improve upon their learning by significantly changing the manner in which their education is understood and managed. A common theme of student ePortfolios is their potential to turn information and data into knowledge through two important practices: reflection and social construction. How? By giving students the tools and the context necessary to construct and reflect upon their identity over time. The ePortfolio has, in turn, come to be seen as a major tool in the pedagogy of student-centered learning and student-directed development; and, as a way for students to piece the fragmented nature of their varied activities and courses into a trajectory of their educational and professional development.

6. REFERENCES

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