Report For The CSU Office Of The Chancellor
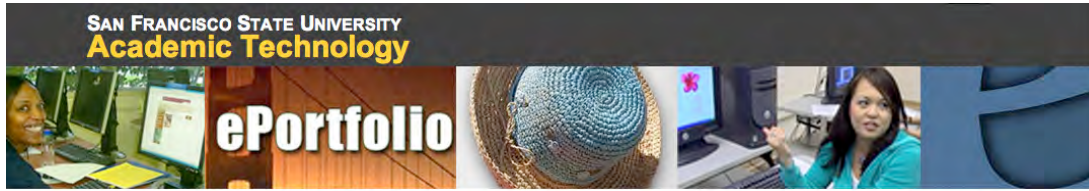# Academic Technology Services Department

SF State Leadership Activity:
ePortfolio Development

June 30, 2008

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EXECUTIVE SUMMARY

San Francisco State University has resident expertise and organizational capacity to advance efforts on the development, use, and sustainability of ePortfolio tools and support services. With the assistance of the CSU, this culminating report documents SF State's efforts to share valuable frameworks and lessons learned on student and faculty support systems, educational best practices, and scalable, sustainable, open source technological solutions for ePortfolio implementations at CSU campuses.

The three deliverables on this project are:

- o **An integrated faculty and student support model**
- o **An ePortfolio educational best practices website**
- o **A case study on selecting an open source ePortfolio tool**

AN INTEGRATED FACULTY AND STUDENT SUPPORT MODEL

What is an ePortfolio?

The concept, and intended use, of portfolios in higher education are not new. Many universities have long been using some form of paper-based portfolios to assess student work or to use for academic program review. What has changed now is that there is a globally growing need to migrate from paper-based portfolios to electronic portfolios. ePortfolios provide users with the digital tools to demonstrate their life-long learning, skills, and development over time to selected audiences.

Why ePortfolios at SF State?

ePortfolios at SF State address a current and emerging need for students to have an environment in which they can collect, select, reflect upon, build, and publish a digital archive of their academic work. These ePortfolios can serve multiple purposes within the SF State academic setting. Students can use them to showcase achievements and/or

receive feedback and assessment from faculty, peers, potential employers or graduate programs. Universities can use them to collect student work and assessment data for accreditation purposes or recruitment of future students. Since ePortfolios are becoming more commonplace in the K-12 and Community College systems, they can also be used by feeder institutions in California to assist with student transfer to SF State.

What support is needed for an ePortfolio initiative?

The use of ePortfolios to showcase and meaningfully assess student, instructor, and university achievement is the embodiment of new learner-centered teaching methodologies that put the student, and the educational products they produce, at the center of instruction and assessment. When creating an ePortfolio, the student, rather than the instructor, is the producer of the educational content, which is represented in various forms of digital media, including webpages, photos, video, sound, and graphics.

True to any university online teaching and learning initiative, an exemplary implementation of ePortfolios at a post-secondary institution dedicates appropriate attention and resources to three intersecting areas:

- *Educational Best Practices*: Demonstrates best teaching and learning practices from an educational planning and assessment perspective. Integrates universal design for learning principles to ensure accessibility for all.

- *Student and Faculty Support Systems*: Offers comprehensive, and tailored, pedagogical and technical support for faculty and students as they develop the technical and cognitive skills associated with assigning, creating, or evaluating
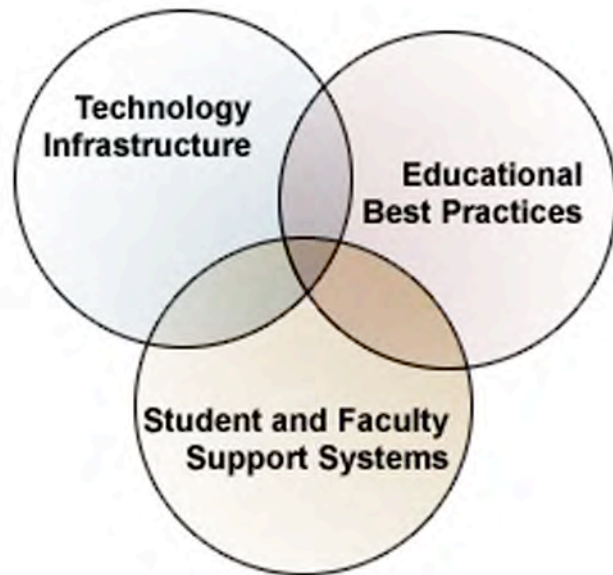
media-rich ePortfolios. Includes training, resources, consultations, and help desk support.

- *Technology Infrastructure*: Provides a reliable, scalable, and robust technological solution for creating, hosting, and archiving ePortfolios. System integrates with, and extends, the current campus technological environment.

In a highly collaborative effort on the part of several key service units on campus, San Francisco State is using its ePortfolio initiative as a catalyst to begin to refocus its Student and Faculty Support Systems into a user-centric, integrated model, with several units on campus contributing expertise, resources, and energies where most appropriate. The contributers include Academic Technology, the Library, the Division of Information Technology, the Center for Teaching and Faculty Development, and the Disabilities Programs and Resource Center. ePortfolios at SF State present an opportunity for these diverse units on campus to collectively achieve aspects of the university mission by offering elements of ePortfolio support within their respective service catalogues.

San Francisco State has recently completed the design of a newly renovated library that is scheduled for completion in Fall 2011. A focal point of the library project is the second level "Multimedia Teaching and Learning Floor" that embodies the spirit of this Integrated Service Model. Although SF State will initiate and pilot this model in the coming year, well before the library is completed, this floor will help further cement this model since these contributing units will work in geographical proximity to provide the faculty and students the support they need to create and share their ePortfolios.

AN ePORTFOLIO EDUCATIONAL BEST PRACTICES WEBSITE

In 2006, SF State launched ePortfolio.sfsu.edu as a "clearinghouse" website to consolidate information about ePortfolio developments across the campus. With a

growing number of students using ePortfolios to demonstrate core competencies in different departments, we recognized a need to include more content and resources specifically addressing the needs of faculty. For faculty interested in using portfolios at class, department, or college levels, we've created content addressing these core pedagogical questions:

- *What are the benefits of using an ePortfolio in my teaching?*
- *What can go into a student ePortfolio?*
- *How do I choose an ePortfolio tool?*

With the support of the Chancellor's office, a new web-based ePortfolio faculty resource area has been created. We have also used this opportunity to work on a new overall site design that aligns with a campus-wide initiative.

New ePortfolio resources for faculty include:
- Overview for Faculty
- Preparation
- Assessment
- Additional Faculty Resources

New content sections include:
a. Guidelines for the pedagogically effective use of ePortfolios
b. Examples of pedagogically effective ePortfolios
c. Examples of ePortfolio templates
d. Sample curriculum for faculty workshops and training (face to face and/or online) on instructing students in using ePortfolios in their courses
e. Sample assessment rubrics for faculty reference.

With these upgrades to our ePortfolio.sfsu.edu site, we have been working to ensure that all of our activities related to electronic portfolios are accessible and more widely available to anyone within the CSU. All new content has been added with the intention of

sharing resources that may be helpful to CSU-wide faculty, staff, students and administrators throughout the system. While each campus may have individual approaches to technology solutions, much of the information on the ePortfolio process may be applicable to any situation. We are pleased to be a part of the OER (Open Educational Resource) movement, and hope to learn how others may be able to use the information we have shared.

Our longer-term development goals include a video with specific examples of the challenges and benefits of SF State students and faculty using ePortfolios. We have begun to capture footage and are seeking resources to complete this work. Other improvements will include a regular updating of the gallery of sample student portfolios and a large documented pilot with undergraduates in Liberal Studies, fall 2009 (using eFolio, Minnesota). We are also looking forward to research on ePortfolios related to our Leadership Campus recognition in the AAC & U's VALUE (Valid Assessment of Learning in Undergraduate Education) project.

The new site (in development) may be viewed at:
http://eportfolio.sfsu.edu/stage/tags/eportfolio-2.0/

A CASE STUDY ON SELECTING AN OPEN SOURCE EPORTFOLIO TOOL

This section of the report is the most extensive, with the technical component comprising the bulk of the activity for this project. The overall goal was to assess the viability of an open source ePortfolio platform for SF State's deployment of integrated ePortfolios across the entire campus. This project is part of a much larger long-term plan. There are several open source ePortfolio systems available for download and use. The scope of this project is restricted to selecting one suitable system.

This project was addressed in four phases: creating a framework for the project, populating a candidate pool, selecting the most appropriate system, and conducting an in-depth analysis of the selected system.

In the first phase, we created a reference framework for this project. We created an overall business case, which addresses long-term need, the scope of this particular project, and the charter for the duration, including a list of the stakeholders and their roles and responsibilities.

In the second phase, we addressed the creation of a subset of open source systems. Our selection of six systems was based on our experiences with ePortfolio systems and evidence of systems that are widely used in several universities and enterprises. We selected CFKeep, DIVA, Elgg, Mahara, Moodle MyStuff, and OSPI. This list was constrained with respect to underlying technologies that support these systems. SF State's Academic Technology unit has a significant team that supports applications that use the LAMP stack – Linux, Apache, MySQL and PHP. For reasons of organizational compatibility and economies of scale and scope, we decided to examine systems with these four underpinning technologies. OSPI, which is a part of the Sakai project is based on Java and requires very hefty implementation resources. It was disqualified for this reason. Another disqualification was with Moodle's MyStuff plug-in due to an inability to access an installed system for analysis. Although Moodle's MyStuff plug-in isn't as extensive as some of the other systems, it shows good promise.

In the third phase, we conducted our analysis with four systems - CFKeep, DIVA, Elgg, and Mahara. We used a well-established list of attributes from EduTools for assessing all the systems across the board. Each system was assessed and scored for its relevance. Next, we used a weighted scoring approach to produce metrics for all four systems. We picked Mahara as the most suitable system for SF State as of June 2008.

In the fourth phase, we conducted an in-depth analysis of Mahara as an open source system. The purpose was twofold: To assess the robustness of the system as a whole, and

to assess its suitability for SF State. We used the Open source Maturity Model (OSMM) to conduct this phase of the analysis. OSMM scores for Mahara indicate that it is quite suitable for a pilot study and is very close to being suitable for production use.

CONCLUDING THOUGHTS

This ePortfolio Leadership Activity for the CSU has given SF State the opportunity to critically assess its Academic Technology Division's ability to deliver on the three key elements we outlined as crucial for the success of any online learning and teaching initiative:

- o *Educational Best Practices*: SF State's newly augmented ePortfolio website now provides models and examples of pedagogically effective ePortfolios, as well as recommendations and guidelines to assist students and faculty as they carry out their ePortfolio projects. AAC&U sponsored research activities in Fall '08 will further inform educational practice.

- o *Faculty and Student Support Systems*: SF State will begin to implement its proposed Integrated Support Model in Fall '08 to provide deeper, further reaching, and more responsive support systems for ePortfolios.

- o *Technology Infrastructure*: SF State has now identified *Mahara* as an open source technology solution that could meet the needs of the campus and integrate with our current open source learning management system, Moodle. Nonetheless, this study has also clarified the need for dedicated in-house technical staff to implement, maintain, and support any chosen open source ePortfolio system.

Given the current budget climate in SF State and the CSU, and the pressing needs of the campus to maintain its existing academic technology systems, SF State has elected to postpone any pilots with the chosen open source ePortfolio solution until further

resources can be secured. In the meantime, SF State will use existing resources to continue to build on its Educational Best Practices and Faculty and Student Support Systems, and will keep using external, hosted solutions, such as eFolio, for its Technology Infrastructure.

I. INTEGRATED FACULTY AND STUDENT SUPPORT MODEL

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the instructor, is the producer of the educational content, which is represented in various forms of digital media, including webpages, photos, video, sound, and graphics.

CRITICAL RESOURCE AREAS FOR ACADEMIC TECHNOLOGY INITIATIVES

Like any university online teaching and learning initiative, an exemplary implementation of ePortfolios at a post-secondary institution dedicates appropriate attention and resources to three intersecting areas:

- *Educational Best Practices*:
  Demonstrates best teaching and learning practices from an educational planning and assessment perspective. Integrates universal design for learning principles to ensure accessibility for all.

- *Student and Faculty Support Systems*: Offers comprehensive, and tailored, pedagogical and technical support for faculty and students as they develop the technical and cognitive skills associated with assigning and creating media-rich ePortfolios. Includes training, resources, consultations, and help desk support.

- *Technology Infrastructure*: Provides a reliable, scalable, and robust technological solution for creating, hosting, and archiving ePortfolios. System integrates with, and extends, the current campus technological environment.
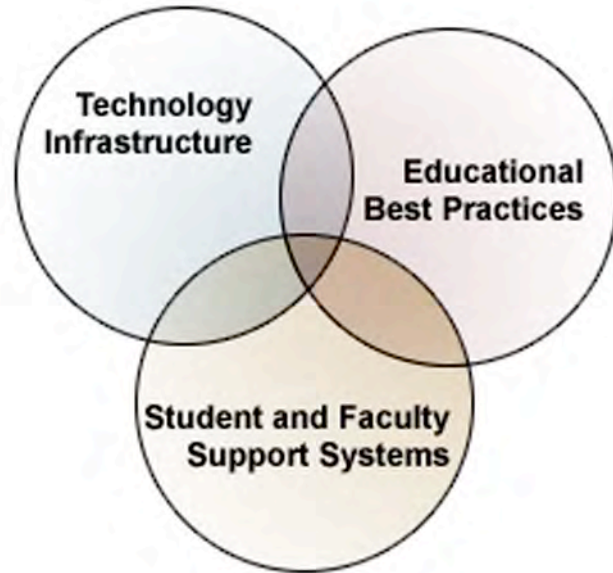
Similar to many universities within the CSU system, SF State has traditionally supported students and faculty through several service units, each with discrete mandates and target audiences with respect to teaching, learning, and technical skills development.

An integrated support model for ePortfolios, therefore, presents an interesting dilemma, since it requires the university to rethink two assumptions associated with more traditional methods of instruction: that faculty can be supported independently from the students they teach, and that technical skills can be developed in isolation from cognitive skills. Indeed, faculty are best supported when their students are supported, so they are free to focus on the art of teaching and research. Furthermore, it is in the physical, and what some refer to as technical, act of creating and assembling digital artifacts that deep reflection occurs and new cognitive levels can be reached.

In the case of ePortfolios, SF State holds the philosophy that faculty and students are best served by an Integrated Service Model, in which administrative lines between service units are invisible to the end user, with services provided based on the need of the individual, rather than the historic mandate of the unit.

MISSION STATEMENTS AND SERVICES

San Francisco State University (SF State)

> *Mission*: The mission of San Francisco State University is to create and maintain an environment for learning that promotes respect for and appreciation of scholarship, freedom, human diversity, and the cultural mosaic of the City of San Francisco and the Bay Area; to promote excellence in instruction and intellectual accomplishment; and to provide broadly accessible higher education for residents of the region and state, as well as the nation and world.

ePortfolios at SF State present an opportunity for diverse units on campus to collectively achieve aspects of the university mission by offering elements of ePortfolio support within their respective service catalogues. As described below in the mission statements of five administrative units, as well as in the services highlighted as relevant to

ePortfolios, the unique mandates of each unit can be celebrated, and clarified, through the contributions they make to this university-wide initiative.

Academic Technology (AT)

Mission: Academic Technology (AT) supports and advances effective learning, teaching, scholarship, and community service with technology.

ePortfolio Relevant Services: In addition to assisting faculty develop technical expertise and competencies through training, consultations, and professional development, Academic Technology also researches, implements, promotes, and evaluates innovations and best practices with respect to teaching with technology. Academic Technology designs, equips, maintains, and supports virtual and physical learning environments, and actively collaborates with campus partners to provide universally accessible solutions for all.

ePortfolio Role: Academic Technology provides the overall leadership for ePortfolios, as well as most of the technology infrastructure and support structures. Academic Technology focuses its support primarily on faculty, though it does extend to students.

The Center for Teaching and Faculty Development (CTFD)

Mission: The Center for Teaching and Faculty Development promotes and supports teaching excellence by responding to the needs of the San Francisco State faculty in their multiple roles of teaching, engaging in the activities of professional achievement and growth, and working in and for an urban community defined, in great part, by its diversity.

ePortfolio Relevant Services: CTFD is actively expanding its program of services offered to faculty to support classroom pedagogy and continues to collaborate with other

departments and units across campus to offer workshops, demonstrations, and forums related supporting faculty in their teaching, scholarship, and service.

ePortfolio Role: Among other contributions to faculty related to teaching and learning, CTFD provides faculty mentorship and guidance on Universal Design for Learning, assessment, educational effectiveness, and the design of curriculum to help students achieve learning outcomes.

The J. Paul Leonard Library (Library)

Mission: The J. Paul Leonard Library aims to empower its University constituency with lifelong learning skills to identify, find, evaluate, use and communicate information in promotion of excellence in scholarship, knowledge and understanding.

ePortfolio Relevant Services: The Library creates a learning environment that promotes study, research and scholarly interaction in the context of a diverse campus community. The Library's Media Access Center (MAC) serves as the central distribution point for the University's non-print materials. Through MAC, students and faculty have access to media materials and equipment used in conjunction with courses and research. The Media Access Center also runs the Library's Laptop Checkout program and manages the MAC Computer Lab, which has a large number of Macintosh and Windows PCs for SF State Students, Staff and Faculty.

ePortfolio Role: The Library provides multimedia production labs and equipment for students, as well as high visibility areas for Academic Technology to distribute information about ePortfolios.

Division of Information Technology (DoIT)

Mission: The Division of Information Technology provides technology leadership and delivers campus-wide, customer-focused information technology services and solutions

to support the academic mission and effective operation of the University through a culture of efficiency, continuous improvement and reliability.

ePortfolio Relevant Services: DoIT offers a wide-range of technology services to the campus community, including Internet/e-mail accounts, a 24-hour computing lab, help desk support, campus-wide software licenses, online services via the Web, and workshops and training for students, faculty and staff on some software applications.

ePortfolio Role: DoIT provides multimedia software training to students and faculty, hosts ePortfolio sites, and responds to help-desk inquiries.

Disabilities Programs and Resource Center (DPRC)

Mission: The DPRC collaborates with SF State's diverse community to ensure that all aspects of campus life -- learning, working and living -- are universally accessible. The DPRC provides the University with resources, education and direct services in order that people with disabilities may have a greater opportunity to achieve social justice and equity.

ePortfolio Relevant Services: DPRC provides students and faculty assistance in coordinating a full range of support services in order that they may define and achieve personal autonomy at SFSU. The DPRC also provides eligible students and faculty with help understanding and managing DPRC services, campus-wide access, attitudinal barriers, other campus resources, and disability civil rights.

ePortfolio Role: In addition to assisting faculty and students with disabilities so they can participate fully in ePortfolio activities, DPRC advises on accessibility needs for an ePortfolio system, and offers training and support to faculty and students on creating accessible materials.

EPORTFOLIO SUPPORT DISTRIBUTION BY ACADEMIC UNIT

In a highly collaborative effort on the part of the above mentioned key service units on campus, SF State is using the ePortfolio initiative as a catalyst to begin to refocus support models into this user-centric, integrated model, with each contributing expertise, resources, and energies where most appropriate. Here is a summary of the various contributors and the roles they play in promoting ePortfolios on campus:

Unit	Educational Best Practices	Technology Infrastructure	Student & Faculty Support Systems
Academic Technology (AT)	ePortfolio leadership, facilitation, and oversight; Student workshops; Faculty workshops;	ePortfolio tool selection & software hosting	Faculty technology labs w/ scanning stations & video/audio suites; QuickGuide creation; ePortfolio website w/ gallery & resources
Library			Student technology labs w/ scanning stations & video/ audio suites; Kiosk for QuickGuide distribution
Division of Information Technology (DoIT)		Webspace to host & archive ePortfolios & digital content	Student & Faculty HelpDesk; Student & faculty technical training on graphics & video software
Center for Teaching and Faculty	Faculty mentorship & guidance on		

Unit	Educational Best Practices	Technology Infrastructure	Student & Faculty Support Systems
Development (CTFD)	Universal Design for Learning; Assessment; Educational effectiveness; Undergraduate learning outcomes		
Disability Programs and Resource Center (DPRC)	Faculty & Student workshops on the creation of accessible media	Provide system requirements & ensure 508 compliance	Consult w/ faculty & students on accessibility req's

INTEGRATED FACULTY AND STUDENT SUPPORT SPACE: 2011

San Francisco State has recently completed the design of a newly renovated library that is scheduled for completion in Fall 2011. A focal point of the library project is the second level "Multimedia Teaching and Learning Floor" that embodies the spirit of this Integrated Service Model.

As you will see in the following floorplan, this design strives to break down administrative separations, in which Academic Technology has historically served primarily faculty, and the Library has historically served primarily students. In this floor, AT and the Library combine their synergistic mandates in geographical proximity to provide a holistic approach to supporting and promoting a media-rich curriculum that culminates in the creation of an ePortfolio.
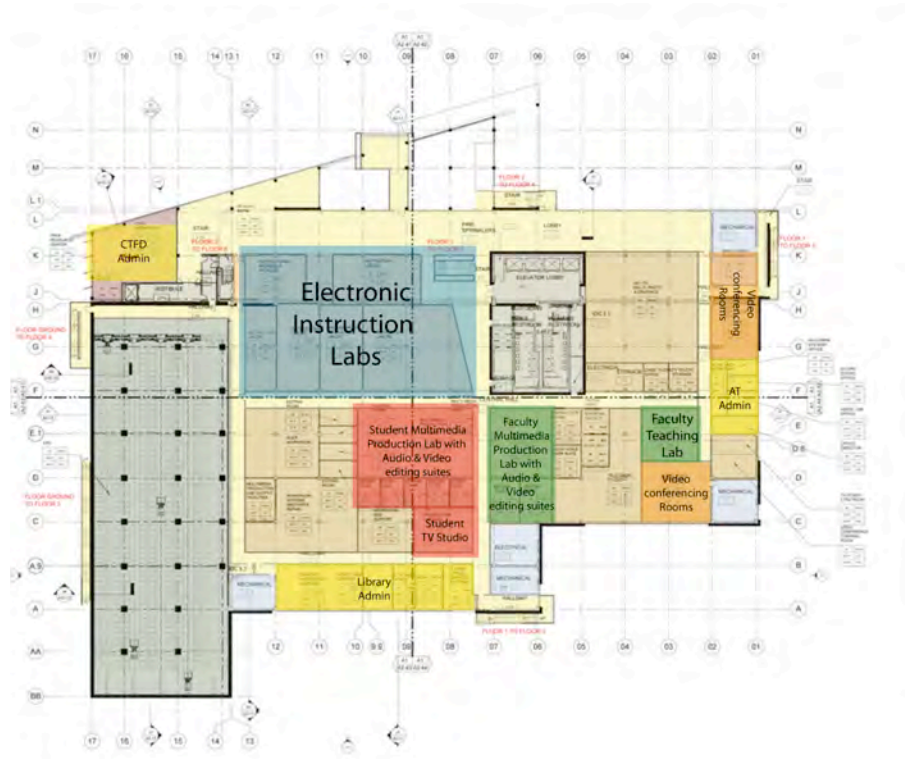
Academic Technology will support a faculty multimedia production lab, surrounded by video and audio suites. Across the hall, in a separate but communicating area, the Library will support a larger, student multimedia production lab, surrounded by a higher number of video and audio suites. These labs will also serve as ePortfolio studios in which student and faculty can create and assemble content into an ePortfolio. These labs will share output areas where students and faculty can print or produce DVDs, or other appropriate media.

Down the hall will be five electronic classrooms, ranging in size from 25 - 75 student capacity, as well as a small television production studio for student use. In addition, this floor will contain several video conferencing rooms, a 15 – person instruction lab for faculty professional development, faculty and staff conference and reading rooms, as well as administrative offices and staff work areas and for Academic Technology, the Center for Teaching and Faculty Development, and the Library Information Technology unit.

Looking ahead, SF State is not content to wait until 2011, when the Library construction project is completed, to implement this Integrated Service Model. SF State is optimistic that the unique, compelling nature of this ePortfolio Initiative can help unite these various units around a common project that promises to bring a high quality educational experience to its many students and faculty. Current collaborations across the units are positive and the time is right for moving this model forward.

II. ePortfolio best Practices Website: New Content for Faculty

In 2006, we launched ePortfolio.sfsu.edu as a "clearinghouse" website to consolidate information about ePortfolio developments across the SF State campus. The original site was geared primarily for students, with an overview of the ePortfolio process, a web tutorial (to accompany use of SF State templates), links to software requirements in different departments, a brief film, and a gallery of student ePortfolio examples.

The site also includes web-building resources with links to various tools used in developing an ePortfolio using SF State templates, including a Picture Resizer, SeaMonkey (a free downloadable HTML editor), Fetch and Filezilla. Academic Technology also offers ePortfolio help to students through a direct email support form.

With a growing number of students using ePortfolios to demonstrate core competencies in different departments, we recognized a need to include more content and resources specifically addressing the needs of faculty.

FACULTY EPORTFOLIO WEB RESOURCE CENTER

With support from the Office of the Chancellor, we have created new content specifically for faculty interested in using ePortfolios at the course/department levels. We have also used this opportunity to work on a new overall site design that will align with a campus-wide initiative. All content from the existing eportfolio.sfsu.edu will be migrated to the new template.

New ePortfolio resources for faculty include:

- Overview for Faculty
- Preparation
- Assessment
- Faculty Resources
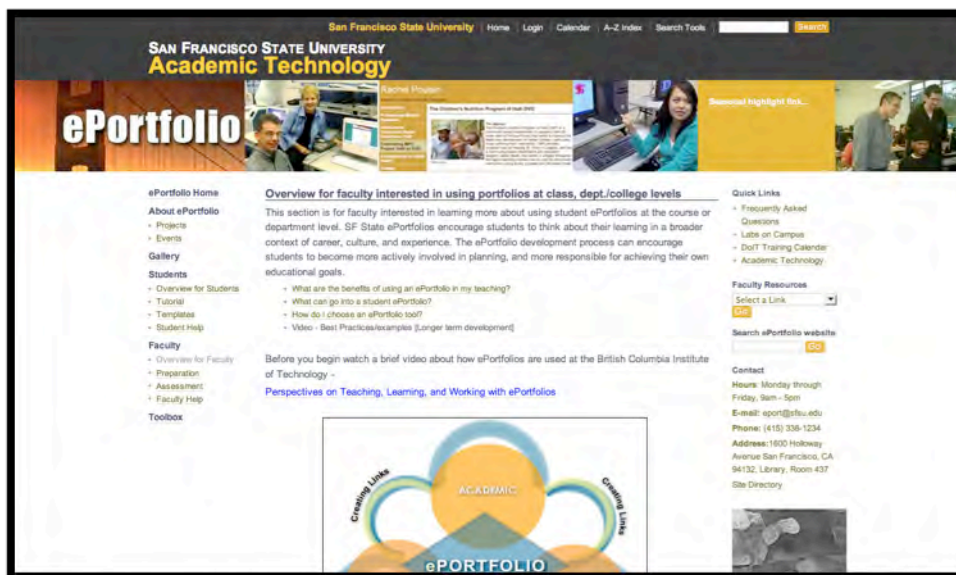
New content sections in the site include:

    a. Guidelines for the pedagogically effective use of ePortfolios

    b. Examples of pedagogically effective ePortfolios

    c. Examples of ePortfolio templates

d. Sample curriculum for faculty workshops and training (face to face and/or
online) on instructing students in using ePortfolios in their courses

e. Sample assessment rubrics

GUIDELINES FOR EFFECTIVE USE

For faculty interested in using portfolios at class, department or college levels we've
created content addressing these core pedagogical questions:

- *What are the benefits of using an ePortfolio in my teaching?*
- *What can go into a student ePortfolio?*
- *How do I choose an ePortfolio tool?*

FACULTY PREPARATION SECTION: SAMPLE CURRICULUM AND RESOURCES

The new faculty section contains key information that faculty will need to begin using
ePortfolios with students. Included are step-by-step processes with information on
creating Learning Objectives, ePortfolio Assignments, and the importance of the
Universal Design for Learning approach. An introductory ePortfolio PowerPoint
presentation and sample handbook are available for download from the website for
faculty to adapt and use within their courses. Links to archived examples of effective
student ePortfolios and templates from different disciplines are also included for faculty
reference.

Examples from the Health Education Department archive

ASSESSMENT: THE "WHAT, WHEN, AND WHO" OF EVALUATING EPORTFOLIOS

The assessment section of the site includes detailed information on formative and summative evaluation of student work using an ePortfolios process. To further support the use of ePortfolios for assessment, the new site includes examples of rubrics including:

1. WASC guidelines for Departmental use of Student portfolios: "Rubrics for Evaluating the Effectiveness of Assessment Processes"
2. AAC & U Sample Metarubrics for:
    a. Integrative Learning
    b. Critical Thinking
    c. Written Communication
3. Competency-based ePortfolio sample rubrics:
    a. Master in Public Health (SF State)
    b. English Education (SF State)
4. General ePortfolio rubrics (3 examples)
5. Oral Presentation of Portfolios rubric
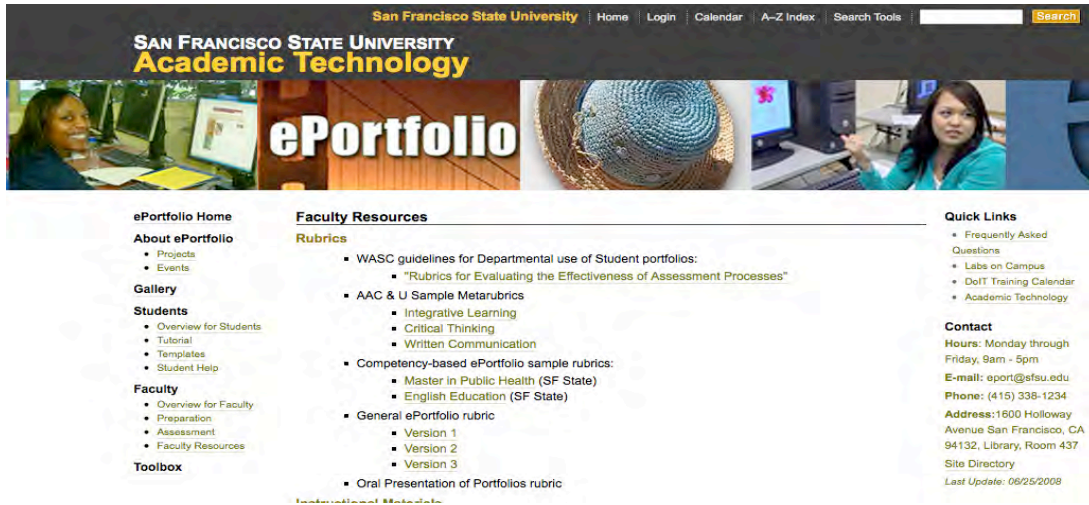
CSU CENTER OF EXCELLENCE APPROACH

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III. CASE STUDY ON SELECTION OF OPEN SOURCE EPORTFOLIO TOOL

This case study investigated the feasibility of using an open source ePortfolio system at SF State. Within this section are the following elements and Project Management-related deliverables:

- Business case and Project Scope
- Project Charter
- Project Plan
- Work breakdown structure (WBS)
- Project schedule in a Gantt Chart
- ePortfolio Weighted Scoring Model
- Open source ePortfolio Comparison Matrix Front runner overview: Mahara
- Use Case Scenario: Mahara
- Open source Maturity Model (OSMM) for Mahara
- Project Management Approach Using DotProject

BUSINESS CASE AND PROJECT SCOPE STATEMENTS			
Draft Version:	#4	**Date:**	April 2, 2008
Project Title:	Investigation of Open source ePortfolio Systems		
Project Managers:	Dr. Ruth Cox Dr. Sameer Verma	**Contact:**	(415)338-7112 / ruthcox@sfsu.edu (415)338-7016 / sverma@sfsu.edu

Project Justification: SF State students, faculty and administration are in need of a durable, secure repository and permission structured ePortfolio system. This system would be a primary tool for the collection, selection, reflection, evaluation, and publication of learning events and artifacts. While SF State has a Learning Management System (iLearn), there is currently no way for students to store their academic digital files - the "intellectual capital" of the university. Such a repository of student work can be tied to program, college and institutional goals

providing valuable data for accreditation and program review.

Ultimately, our goal is to enable students to be able to share their ePortfolio with prospective employers or graduate programs, supporting professional development and promoting student work. This system would provide after-graduation assistance in job seeking by providing a semi-permanent repository for student portfolios.

The Scope of this initial project (Spring, 2008)

SF State has been recognized as a "Center of Excellence" in the CSU related to ePortfolio research and development. This initial project is focused on assessing and researching open source web-based ePortfolio repository and permission layered presentation systems that could interface with iLearn for campus-wide use.

We are looking at tools that may be able to accommodate the existing and emerging need for students to be able to collect, select, reflect upon, build, and publish a digital archive of their academic work. The ePortfolios would serve multiple purposes within the SF State academic setting and beyond to career bridging and professional development. This system may also potentially be used by feeder institutions in California, K-12 initiatives in San Francisco, and Community colleges to assist with student transfer to SF State.

In the Spring of 2008, a semester-long investigation into the viability of open source ePortfolio solutions was launched with support from the CSU Chancellor's office. Within the scope of this preliminary project, six ePortfolio systems were reviewed within a comparison matrix. The work from this project is submitted in this report to the Chancellor's office.

Note:This project does not include the testing, implementation or piloting of an ePortfolio system, but is limited to the identification/research phase of investigation.

Overall Product Characteristics and Requirements:

 These are the desired features and characteristics for a SF State ePortfolio solution:

 Single sign-on: Eligible users can access iLearn (SF State's Learning Management System) and the ePortfolio environment using a single sign-on account.

Templates and Tools: The ePortfolio environment provides an option for authorized users to download files that they can use to create the ePortfolio, and use the templates and building tools. These files will be in the ePortfolio system.

Security: The ePortfolio system must provide several levels of security. For staff, they have access to the whole system when a secure identification is matched. However, students can only access the context that matters to them the most. Therefore, some context will be disabled for students' access. A third party, such as accreditation agencies can only gain access to the ePortfolio space after a mutual agreement is sought from Academic Technology.

Accessibility: The ePortfolio system that integrates within iLearn should work with either a PC or Mac.

Work with LAMP stack: The ePortfolio system must be able to work with the LAMP (Linux, Apache, MySQL, and PHP) stack due to economies of scale and scope for operations with iLearn.

Legal and Technical requirements: Information about copyright, ownership/responsibility, terms and agreements must be made known to users before permission to use is granted.

Storing and Organizing artifacts: Users have control over how they want to store and organize the artifacts in the ePortfolio space.

Commenting/Advising/Reviewing: The feature of commenting allows other users (in the system or outside it) to leave comments for the author on portions of a shared or published ePortfolio.

Sharing/Archiving: The ability to archive existing content, or to be able to share the ePortfolio with peers, potential employers, or reviewers.

Transferring: The ability to transfer the ePortfolio from one system to another is important if the user wants to transfer their ePortfolio from one university to another.

Accreditation Auditing data from ePortfolios:

Request for user-guide documentation: The ePortfolio site should include a section for users to send a quick request to fetch a piece of information out of the user-guide documentation, and send the requested information back to them.

Links: All links to external sites should be tested on a regular basis. If problems are severe, an

announcement will be issued to ePortfolio account holder about the event.

Ask the Expert: Help features that allow a user to drop a question/complaint on how to resolve a problem that user-guide documentation cannot provide otherwise. This feature must be user-friendly and capable of soliciting questions and promptly informing that the question has been received in the proper format. The feature must also be able to forward the questions to site administrators.

Search feature: A search feature allows users to search by topic or keywords to external web resources about the ePortfolio system.

Availability: The site must be available 24/7, with an early announcement to inform users about standard and/or periodic maintenance events.

Content Management and Customization: Users are able to customize according to their needs, using only a basic text box or editing widget rather than templates.

Templates: Various templates have to be available for individual needs. The most focused feature should be the career part which must be attractive to future employers. Assessment is also an important function. Other template features include reflection, blogging, evaluation, presentation, modifiability, user interface, goal setting, and standards.

Publish/Share: Consideration is given, with respect to publishing and sharing the content. This includes what contents the owners want to publish or share, where they are published or shared, and with whom its contents are shared.

Organize: Each student has to have enough storage space to compile their contents for individual needs regardless of the file types. In addition, the tool has to support the ability of categorizing, sequencing, mapping, bookmaking, selecting, aggregating, and reusing/remixing.

Analysis: Analysis tools should provide a systematic way to handle information related to decision making such as summarizing, comparing, or checking for unusual situations regarding privacy, rights management, accessibility, standards, etc. The most important part is to provide a stable and comfortable level of security and privacy.

Sustainability: Sustainability is the key element in terms of providing a long term University wide project. The software has to have good documentation, and integrate with existing systems such as iLearn. The tools must come with good technical support, training materials, and professional services.

Technical Requirement: Technical considerations are related to the physical hardware

environments and requirements, and system support for our needs, as well as interoperability with other CSU systems.

Product-related deliverables:

- Set up accounts for six selected OS ePortfolio tools, and perform features assessments using 'Comparison Matrix' table
- Define constraints for ePortfolio
- Perform OSMM assessment for top ePortfolio tool, and OSMM assessment report.
- Documentation: Charter, Scope, Business Case
- Solution Space & Constraints
- Standard use case scenarios for ePortfolio

Project Success Criteria: It is important to complete this project on time, and meet its project deliverables since its work progress affects the schedule of subsequent projects.

PROJECT CHARTER			
Charter Date:	March 14, 2008	**Drafted Version:**	#3
Project Sponsor:	Academic Technology	**Phone:**	(415) 338-7644
Client Sponsor:	Academic Technology	**Phone:**	(415) 338-7644
Project Managers:	Dr. Ruth Cox and Dr. Sameer Verma	**Phone:**	(415) 338-7112 / (415) 338-7016
Email:	ruthcox@sfsu.edu and sverma@sfsu.edu		
Project Title:	**Investigation of Open Source ePortfolio Systems**		
Project Timeline:	Spring, 2008		
Project Start Date:	March 14, 2008	**Project End Date:**	May 16, 2008

Project Objectives: The primary objective of this project is to investigate the feasibility of using an open source ePortfolio system at SF State; compare and analyze open source systems' features/functionalities based on well-established criteria; and ultimately select an open source ePortfolio system. Next, we have to select the most suitable solution using the Open Source Maturity Model (OSMM) as a benchmark. A final CSU report will be compiled and submitted to the office of CSU chancellor for a decision to move to the next project phase, namely implementation.

To achieve these goals, the team will perform tasks including set up and use of web-based project management tools to manage the project process, perform Q&A testing on ePortfolio tools by registering both user and site administrator accounts, conduct a comprehensive comparison of the solutions, and conduct an in-depth analysis using OSMM to assess the solution's maturity level.

Approach:

Define project goal, refine the scope of project, identify and discuss constraints on the project (such as the project deliverables, sustainability factor of open source systems), determine critically defined criteria that will qualify the implementation and use of open source systems at SF State.

- Use project management tools to manage and track project deliverables.
- Request account for selected tools for the purpose of testing its features/functionalities from user and site administrator's perspective.
- Use WCET edutools "Comparison Matrix" to compare the features of ePortfolio solutions.
- Research selected issues in ePortfolios by using the web and published literature.
- Use the OSMM model as developed by Navica (http://www.navicasoft.com) to assess the maturity level of the top ePortfolio system.
- Develop use case scenarios for ePortfolios, and integrate use cases across ePortfolios to determine the usability of features, ease of use, and UI experiences.
- Set up "Open Source ePortfolio Community" on iLearn (http://iLearn.sfsu.edu/) to publish and share findings.

Roles and Responsibilities			
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Dr. Ruth Cox	Project Manager	Faculty, Health Education & Academic Technology	ruthcox@sfsu.edu (415) 338-7112
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*OTLOS: Online Teaching & Learning Open Source

PROJECT PLAN			
Draft Version:	#4	**Date:**	April 2, 2008
Project Title:	Investigation of Open Source ePortfolio Systems		
Project Managers:	Dr. Ruth Cox Dr. Sameer Verma	**Contact:**	(415)338-7112 / ruthcox@sfsu.edu (415)338- 7016 / sverma@sfsu.edu

Project Plan

This project was divided into four different phases. The first phase addresses the creation of a framework which defines the case, charter and scope of the project. The second phase is about the assessment of different ePortfolio platforms. The third phase is about analyzing the data collected from use cases in the previous phase. The fourth phase addresses our results and conclusions.

The following is a Work Breakdown Structure (WBS) of the project

- Create Project Charter
- Create Project Scope
- Create Comparison Matrix
- Assessment - Moodle MyStuff
- Assessment - KEEP Toolkit
- Assessment - Mahara

- Assessment - DIVA
- Assessment - Elgg
- Populate Comparison Matrix Select candidate e-portfolio projects
- Organize report structure

EPORTFOLIO WEIGHTED SCORING MODEL

When faced with a multi criteria decision-making situation, it is difficult to assess all the criteria for each project option. Additionally, each analysis will depend on many external factors such as the organization, its resources, etc. A weighted scoring model is a tool that provides a systematic process for analyzing and selecting a project based on multiple criteria.
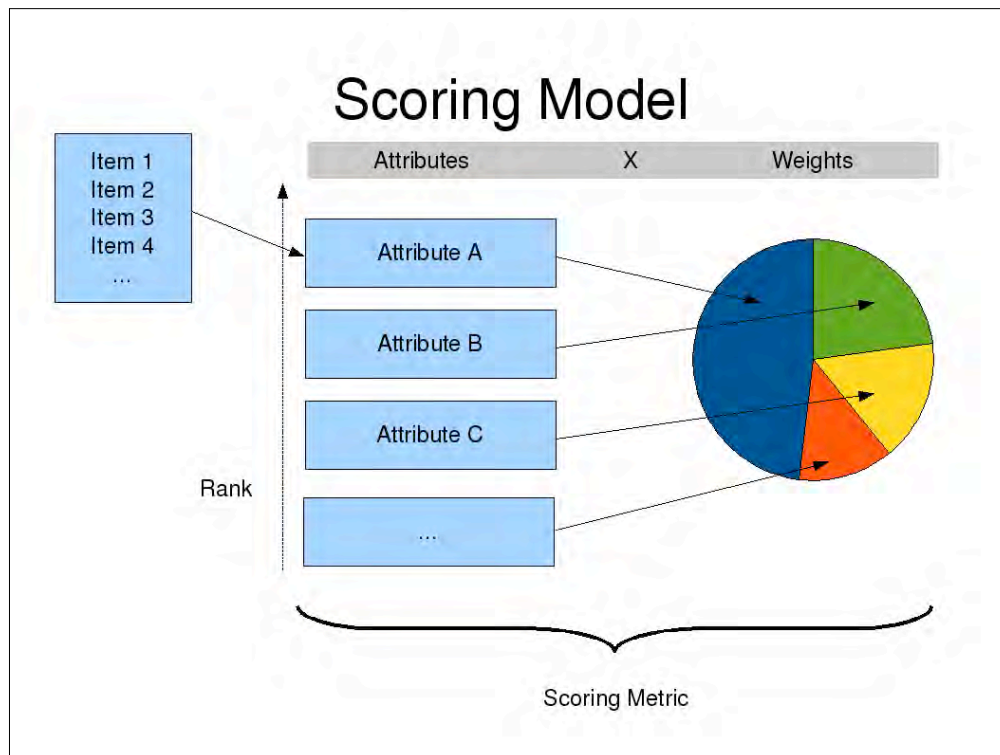
The following is a summary table of the ePortfolio Weighted Scoring Matrix. The attributes used in this scoring model are borrowed from the WCET edutools listing. These attributes are categories that contain several items. We score each item on a scale of 0, 0.5 or 1 depending on the use case and its relevance to the item. For example, under the "Templates" attribute, we have an item that describes "Goal Setting". While scoring this item for KEEP Toolkit, we found that there was some relevance with respect to this item, so we scored it at 0.5. These points are then aggregated into a percentage for each attribute. Some

attributes tend to have more items than others. By using averages instead of raw scores, we normalize for the number of items in each attribute.

The average scores for each attribute are then noted in the matrix as an overall score for that attribute and ePortfolio project. For instance, on the "publishing and Sharing" attribute, based on our use case, Mahara scores 71 points.

By maintaining the same set of items and attributes across all the assessed use cases, we are able to normalize the analysis.

Next, we rank order the attributes. This is where we are able to personalize the approach for SF State. Each institution may rank order these attributes in a different order of importance. At SF State, we found that based on our experiences, and previous pilot implementations, we find "Publishing and Sharing" to be of utmost importance and "Organizing" to be least important in a relative sense. In fact, we were unable to place "Content management and Customization" at rank # 2, because we feel that it has equal importance. Therefore, we placed both "Content management and Customization" and "Publishing and Sharing" at #1. Of course, this means that the next rank position will be at #3.

Next, we convert these ranked positions into a percentage so that we can quantify the scores from a rank to a weight. We divide 100% (the entire weight) into component weights as displayed in the "Weight" column. These percentages act as multipliers for the scores, thereby raising or reducing each attribute's importance in the overall picture. For instance, even though KEEP scored at 75 points on "Organizing", its weight is only at 6%. Therefore the real impact of KEEP's score is at 75*6% = 4.5

Note that the rank order and weights may vary based on organizational needs. Additionally, these can be reassessed every year and readjusted based on changing needs and organizational requirements.

After following this methodology, Mahara emerged as the front-runner as an open source ePortfolio option. In the next sections, we share a sample student use-case scenario and Open Source Maturity

Model for Mahara. References for Mahara as well as use-case scenarios for all of the other tools we reviewed are included in the Appendix.

OVERVIEW OF MAHARA EPORTFOLIO SYSTEM

Mahara is an open source ePortfolio, weblog, resume builder and social networking system, connecting users and creating online learner communities. Mahara is designed to provide users with the tools to demonstrate their life-long learning, skills and development over time to selected audiences. Mahara means 'think' or 'thought' in Te Reo Māori. The software is provided freely as open source (under the GNU General Public License). Because it is open source software, other organisations are welcome to contribute to the software's evolution. The system is modular in design to maximise flexibility and extensibility. See details at http://www.mahara.org/

Features

What makes Mahara different from other ePortfolio systems is that you control which items and what information (Artefacts) within your portfolio other users see. In order to facilitate this access control, all Artefacts you wish to show to other users need to be bundled up and placed into one area. Within Mahara this compilation of selected Artefacts is called a View.

You can have as many Views as you like, each with a different collection of Artefacts, and intended purpose and audience. Your audience, or the people you wish to give access to your View, can be added as individuals or as a member of a Group or Community. ePortfolio owners create Views using a 4 step process and Views have the following features:

- ePortfolio owners can receive public or private feedback on their View and Artefacts within that View.
- Users accessing a View can report any objectionable material directly to the Site Administrator.
- Users can add Views and Artefacts within a View to their Watchlist and receive automated notifications of any changes or updates.

- ePortfolio owners can Submit a View for Assessment by a tutor or teacher allowing for a snapshot of the View and associated Artefacts on a certain date. Other Features of Mahara include:
    - File Repository
    - Blogs
    - Social Networking
    - Résumé Builder
    - Profile Information
    - Administration
- Interface with Moodle
- Scalability
- Security
- Interoperability

Mahara is a stand-alone system that can be integrated into a wider virtual learning framework. It's architecture is inspired by the modular, extensible architecture of Moodle. Mahara is set to standout from other ePortfolio projects because its development concept evolves as a 'pluggable', modular ePortfolio system that is designed to maximize flexibility, extensibility, interoperability, and sustainability. Mahara depends on a user-centric open source ePortfolio System based on Artefacts, Views, Blogs, Resume Builder, and Social Networking System for connecting users and communities.

Mahara's development team has made the source code to Mahara available as an open source application (under GNU General Public License) with guidelines for implementation, case studies of implementation, and user documentation.

The Mahara project has five major milestone deliverables:

- Generating a theoretical framework for student ePortfolios.
- Developing an open source ePortfolio application, made available over the Internet.
- Facilitating a series of case studies.
- Creating documentation for implementation strategies, user guides, and suggested policies.
- Establishing an open source group for further development.

Mahara currently runs on BSD, SunOS/Solaris, Linux platform, and its programming language is mostly written using PHP, and JavaScript. The application is database driven and can be used with Postgres 8.1 or MySQL 5.02+. The latest release version of Mahara is version 1.0.3 (stable) which was released on June 13, 2008. The new release includes improved the HTTP level performance improvements,

improved "login as" functionality, and each institution can now have their own adminstrators and staff members, giving more time to site admin to focus on running the site. Further information about the release note can be obtained at www.mahara.org/wiki/En/Release_Notes.

Origin of the Project

The concept and intended use of Portfolios in higher education are not new. Many universities have long been using some form of paper-based portfolios to assess student work, or use for academic program review. What has changed now is that there is a globally growing need to migrate from paper-based ePortfolio to electronic portfolios. This was just what several universities in New Zealand intended to do - to select the best open source application in a particular area then contribute as good open source citizens. However, there was no existing open source ePortfolio system that truly met the needs of the stakeholders, and subsequently, this gave rise to the idea of forming a project team across universities to initiate the open source Mahara project. This initiative was further supported with funding received from the eCDF committee.

Established in October 2006, Mahara is a collaborative venture funded by New Zealand's Tertiary Education Commission's e-learning Collaborative Development Fund (eCDF), involving Massey University (lead provider), Auckland University of Technology, The Open Polytechnic of New Zealand, and Victoria University of Wellington. The project team is charged with developing an open source ePortfolio application and to provide implementation strategies for the New Zealand tertiary sector. Mahara is based on an Artefacts, Views, and Communities framework where users could create any number of Views, which would be a collection of any number of Artefacts that exist in their portfolio area, where any number of individuals, Communities and fellow members have access as determined by the user. This approach to ePortfolio design establishes a highly flexible system where the ePortfolio owner can display their materials in multiple ways to different audiences and concurrently. This is the kind of eportfolio design/application the eCDF steering committee is drawn to.

In June 14, 2007, Mahara.org site http://www.mahara.org was launched and Mahara 0.7.3 was available for release. The site also maps out the future of Mahara on the "Roadmap" to tell the world what the project team has in store to make Mahara a robust and reliable application. Mahara offers a fully

featured electronic portfolio, weblog, resume builder and social networking system, which connects users and creates online communities. Mahara also has partners that offer to host, train, support and administer services to any interested groups that want to use Mahara.

Original Creator & Developers

The establishment of Mahara is slightly different in that there is no individual that can be viewed as the founder of Mahara. The entire team is divided into two main groups. The committee of the New Zealand's Education Commission's e-Learning Collaboration Fund (eCDF) who initiated and funded the e-learning projects, and the original developers of Mahara from Catalyst IT Ltd.

The Mahara project was born as a result of a collaborating effort from Massey University, the Auckland University of Technology, the Open Polytechnic of New Zealand and Victoria University of Wellington. As part of the Tertiary Education Commission's e-Learning Collaboration Development Fund (eCDF), a project team from these universities has been working on release time to develop an electronic portfolio application for the New Zealand tertiary sector. The steering committee of eCDF are:

- **Massey University** Mark Nichols (Project Chair), Meredith Henson (Project Manager), Bill Anderson, Mark Brow, Mary Simpson, Gordon Suddaby, Rececca Culver (Student Representative)
- **Auckland Univeristy of Technology** Andrew Higgins, Mark Northover.
- **Victoria University of Wellington** Luanna Meyer, Margaret Connor, Margaret Lamot, Rose Mceldowney

Software License

Mahara is licensed under GNU's General Public License. All derivative software, including plug-in modules, is also covered under the GPL. Mahara is an open source product, and it is still relatively young (a little over a year old), and the user community is still growing. Mahara developers share the same vision as many open source developers that nobody should be restricted by the software they use. Under the GNU license, there are four freedoms that every user should have:

- the freedom to use the software for any purpose
- the freedom to share the software with your friends and neighbors
- the freedom to change the software to suit your needs, and
- the freedom to share the changes you made.

MAHARA STUDENT ePORTFOLIO USE CASE

Access

Login into the system using the assigned "Username" and "Password"

Collect

Users can input all the appropriate information under each tab. Users can save the work and store.

- Edit Profile
  - About me
  - Contact information
  - Messaging
  - General
- Profile Icons
- My Resume
  - Cover Letter
  - Interest
  - Contact Information
  - Personal Information
  - Employment History
  - Education History
  - Certifications, Accreditations, and Awards
  - Books and Publications
  - Professional Memberships
- My Goals
- My Skills
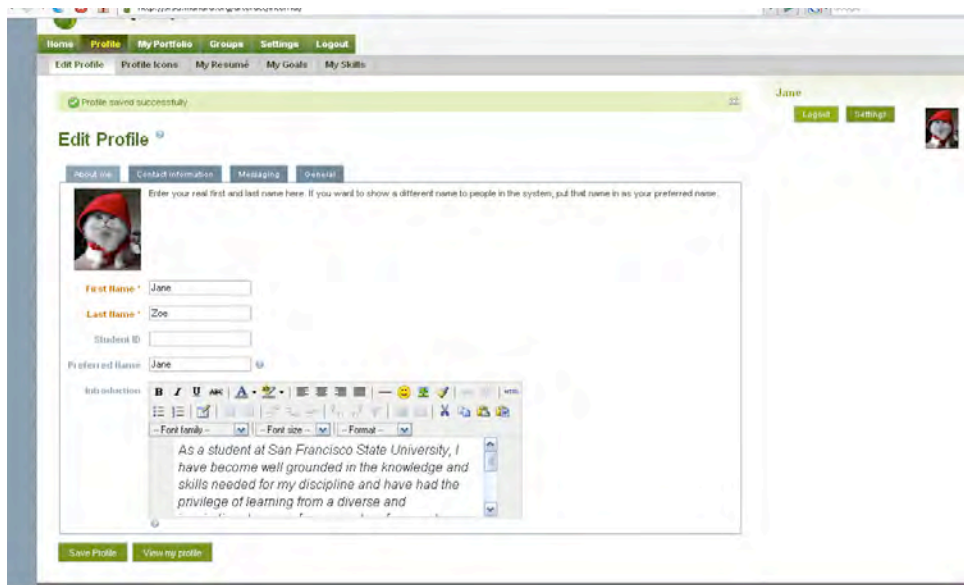
Users can upload files of any formats, such as document, images and videos, and create folders. Filename, description and tags can be applied. Users are prompted to agree to a copyright disclaimer.

Files can be moved by dragging and dropping onto the desired folder. Storage size is assigned by the administrator. The size and usage information is displayed on the right panel as "Quota," so users are aware of storage size at any given point in time.
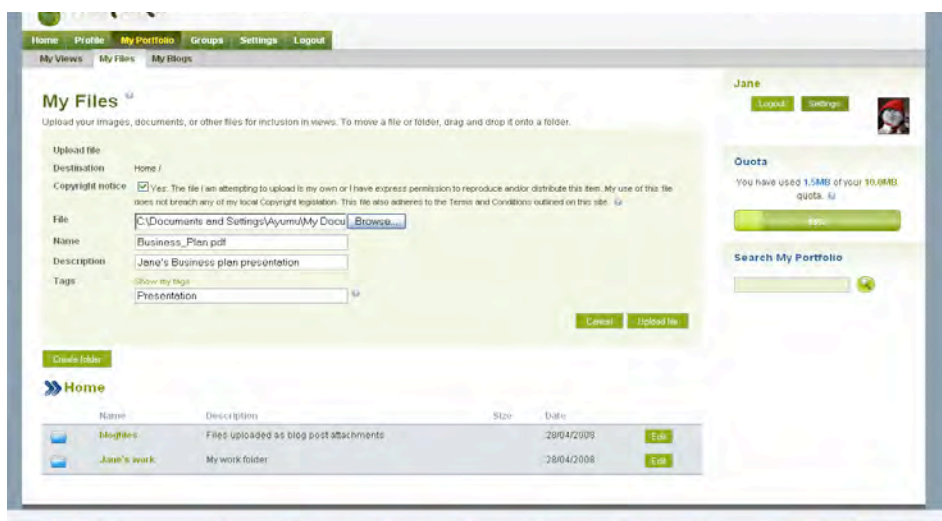
Reflect

Users set the goal for each view/portfolio such as for professional, friends, teacher, etc. Based on each reflection/theme, users can then design contexts, content, and related pages.

- **Select & Build**

Select the contexts that the user desires to present for each view. Drag and drop to desired location.

Contexts Includes

- Blogs
  - Blog
  - Blog Post
  - Recent Blog Posts
- External feeds (External RSS or ATOM feed)
- Files, images and videos
  - External Video
  - File(s) to Download
  - A folder
  - An image
    - Users can specify width of the image (in pixels). The image will be scaled to this width. Leave it blank to use the original size of the image.
- General
  - Text Box – Add notes to users view
- Profile
  - Contact Information
  - Profile Information
- Resume
  - User's entire resume (a quick way to show the whole resume)
  - One resume field (display any resume information)
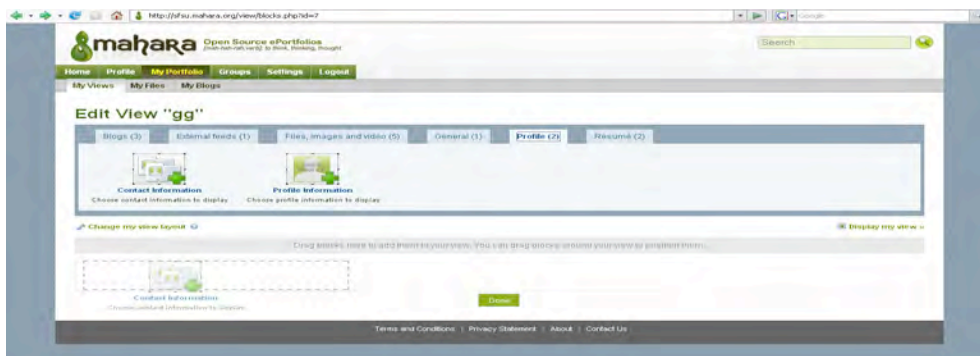
Some contexts such as contact information and resume field allow users to choose only desired information to show by checking the boxes.
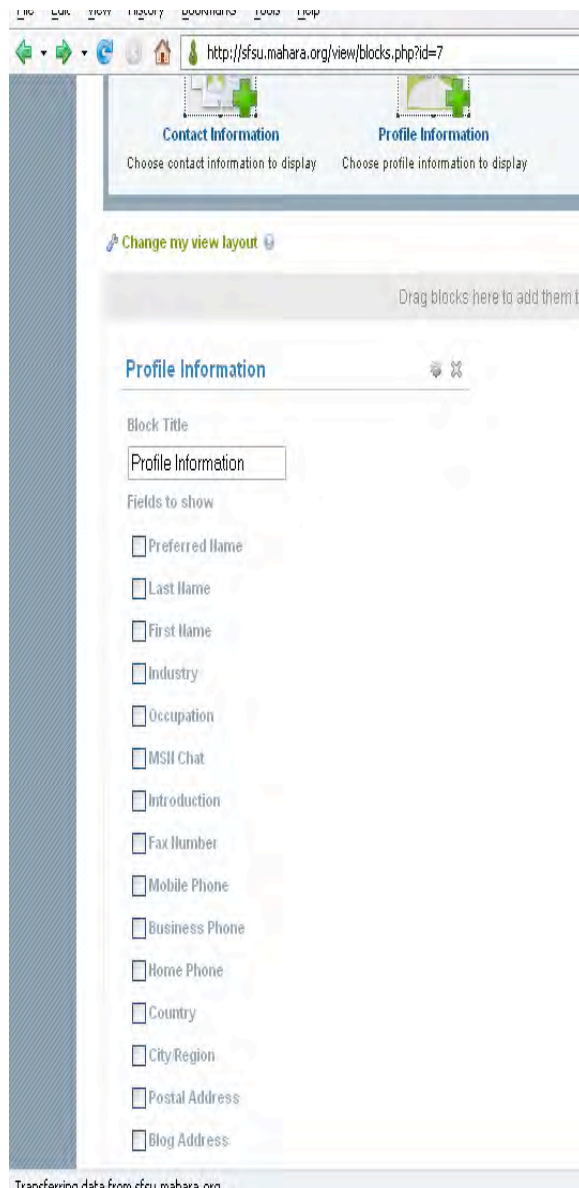
Users can change the layout by dragging the box to the desired location, and change the numbers of columns from 1 to 5. It gives the user an option for each column's width.
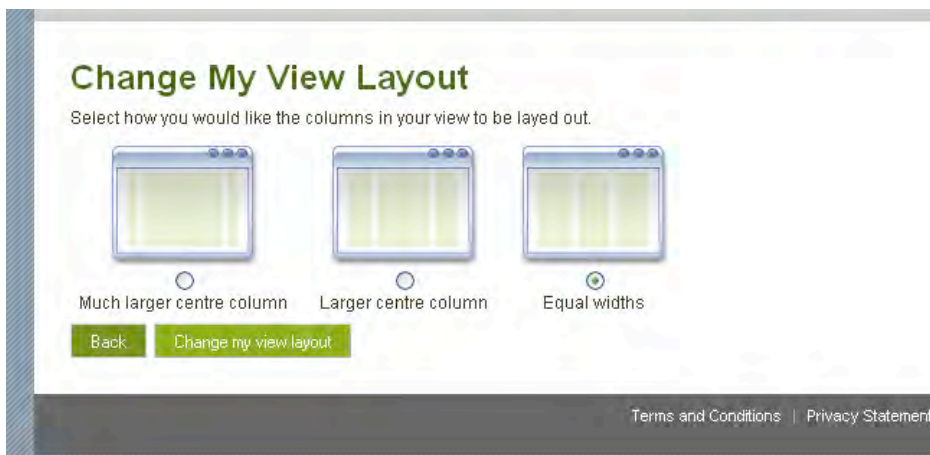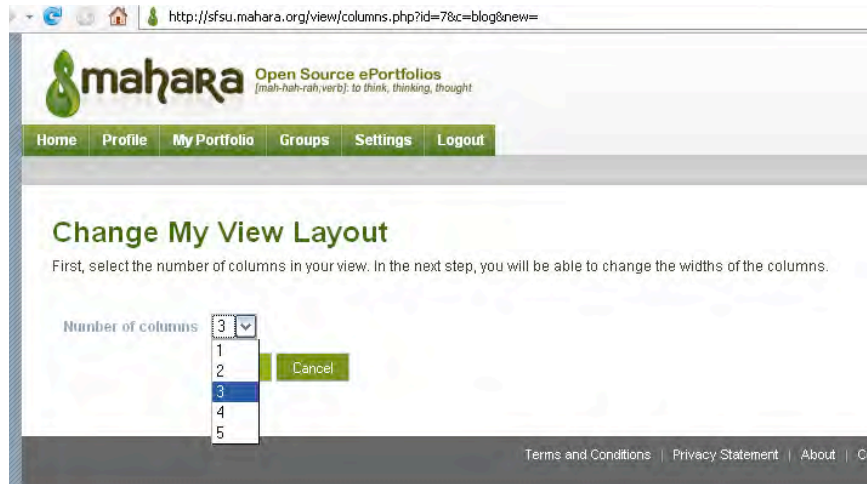
Publish & Share

Users can choose whom to share the portfolio with by adding users, friends or groups. Depending on the administrator's authorization, users also make it public. The accessible date also can be set. User can set an overriding start and/or stop date. Other people will not be able to see the view before the start date and after the end date, regardless of any other access users have granted.
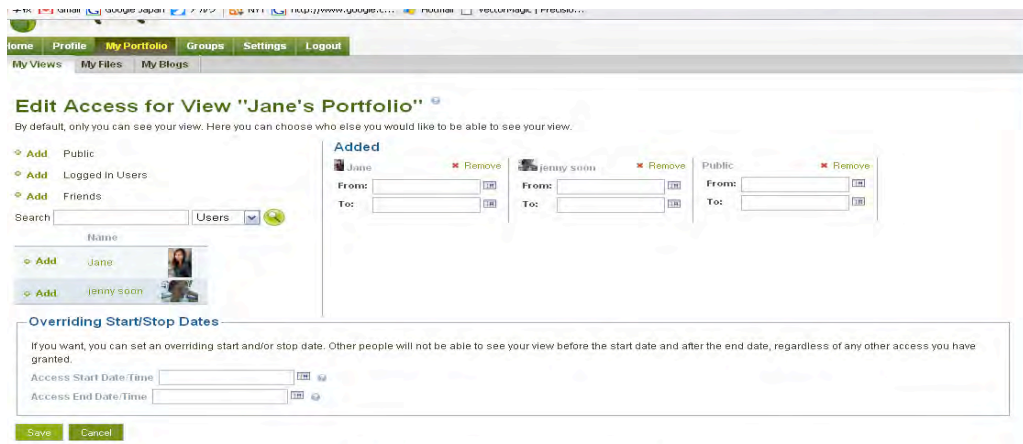
Users can comment on other user's site. Senders can choose comments to be either public or private. (Public - Click the "Make public" box.)

The comments can be delivered through site e-mail according to each user's setting.
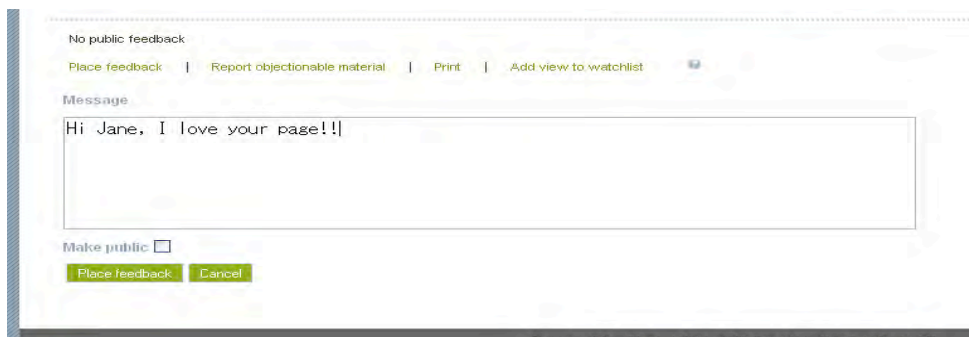
Receivers (Site owner) are allowed to mark the comment as private.

Users receive messages when feedback is submitted by someone.
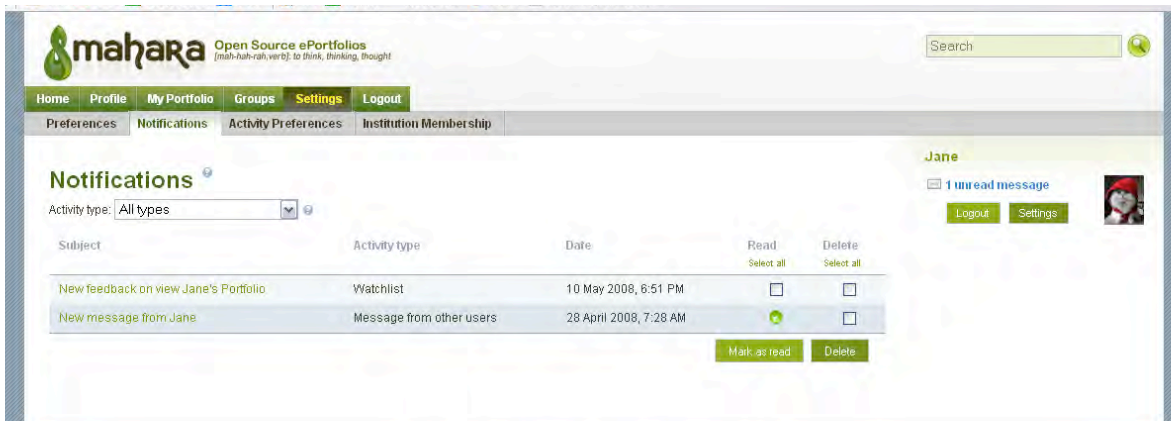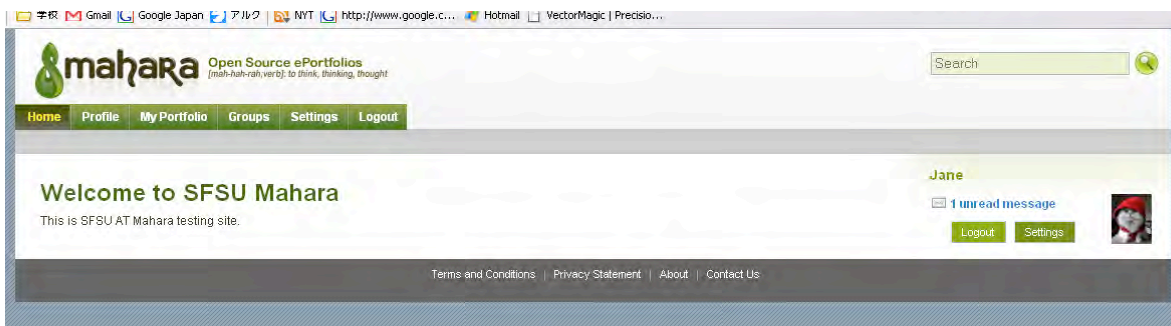
We were able to access the administrative side of Mahara for this use case analysis. The administration site has an extra tab called "Site Administration." Administrators have control over a number of areas:

- Configure Site
  - Site options
    - Configure basic site options such as the name, language and theme
  - Edits site pages
    - Edit the content of various pages around the site
  - Links and Resources Menu
    - Manage the links and files within the Links and Resources Menu
  - Admin Files
    - Upload and administer files that can be put in the Links and Resources Menu
  - Networking
    - Configure networking for Mahara
- Manage Users
  - User Search
    - Search all users and perform administrative actions on them
  - Suspended Users
    - Suspend or reactivate users from using the site
  - Site Staff
    - Assign users Staff permissions
  - Site Admins
    - Assign Site Administrator access rights
  - Admin Notifications
    - Overview of how administrators receive system notifications
  - Add User
    - Create a new user
  - Add Users by CSV
    - Upload a CSV file containing new users
- Manage Institutions
  - Institutions
    - Install and manage installed institutions
  - Institution Members
    - Associate users with institutions
  - Institution Staff
    - Assign users Staff permissions
  - Institution Administrators
    - Assign Institution Administrator access rights
- Administer Extensions
  - Plugin Administrators
    - Install and configure plugin

ANALYSIS USING THE OPEN SOURCE MATURITY MODEL

The Open Source Maturity Model (OSMM) is a weighted scoring model similar to the one used to analyze different ePortfolio projects. OSMM is designed to help organizations successfully implement open source software. The OSMM is a three-phase process for selecting, assessing, and implementing open source products. Using the key software concept of maturity (i.e., how far along a product is in the software lifecycle, which dictates what type of use may be made of the product), the OSMM assesses the maturity level of all key product elements.

	Phase 1: Assess Element Maturity				Phase 2	Phase 3
	Define Requirements	Locate Resources	Assess Element Maturity	Assign Element Score	Assign Weighting Factor	Calculate Product Maturity Score
Product Software						
Support						
Documentation						
Training						
Product Integrations						
Professional Services						

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The output of an OSMM assessment is a score between 0 and 100 that may be compared against recommended levels for different purposes, which vary according to whether an organization is an early adopter or a pragmatic user of IT. The following table lists recommended minimum OSMM scores.

Assessing Product Elements

In the first phase, an organization evaluates each product element with a four-step process: define requirements, locate resources, assess element maturity, and assign element score. Based upon the organization's particular requirements, the available resources are assessed for their maturity and a score between 1 and 10 assigned. The output of Phase 1 is a set of scores for each of the key product elements.

	Type of User	
	Early Adopter	**Pragmatist**
Purpose of Use:		
Experimentation	25	40
Pilot	40	60
Production	60	70

Apply Product Element Weightings

Not every product element is of equal importance. Software is fundamental; support is critical; documentation, though necessary, is less important than the previous two elements. In the second phase, weights are applied to the individual element scores to reflect their overall importance

Overall Product OSMM Score

Overall product maturity score is calculated in Phase 3. The score can also be evaluated to determine if there are problems with the product that the organization needs to mitigate.

The following sections describe the three phases with data and information with respect to the Mahara project. At the end of these sections, we have a scored OSMM matrix and a brief analysis of the product's maturity.

Product

Use Case Requirements

Since the Mahara project is still relatively new, there is plenty of room for improvement. Overall, the SF State ePortfolio project is seeking the following basic requirements for systems:

- Collecting, selecting, reflecting, evaluating, and publishing of learning events and artifacts which includes digital files

- Sharing the electronic portfolio with employers or graduate programs, supporting professional developers and promoting student work.
- Semi-permanent repository of students' portfolios.

Findings and Analysis

Mahara provides standard services to users including an electronic portfolio, weblog, resume builder, file repository, profile information, metadata and social networking system. What makes it different from other electronic portfolios is that users can control which items and what information within one's portfolio other users can see. Site administrators are able to customize a number of features such as language packages and themes, virus control, session and account lifetimes, authentication methods, institution setup, core page editor, and main menu editor. In addition, Mahara's services include a programming interface with Moodle, which is a big plus for integration with SF State's iLearn platform.

Compared to proprietary electronic portfolio systems, there are no significant differences in features. The documentation of the product is good. There are 27 documentation items available including general documentation, functional specifications, research, user guide, default core page text, ePortfolio case studies, Mahara presentations and screenshots. The user community can be located on the Eduforge website. Discussion forums are also hosted at Eduforge, with 4 categories of forums. Responses and discussions are very active. For example, under the help topic, the average number of responses per thread is about 4 and most were responded to within a day.

Mahara was launched in 2006 as a New Zealand government project. It is a new project; first Mahara (unstable) was released in Dec, 2006. The newest version, 1.0.3 (stable) was released on June 13, 2008, and 1.1 is expected to be released soon. The Mahara development team has a very clear roadmap for future versions. The number of downloads currently on Eduforge shows 1367 between version 0.8.X series, and the 0.9 development series. According to an email correspondence (December 2007) with Nigel McNie, a developer of Mahara, there have been 2476 downloads for all versions since November 2006 – 2316 from stable release and 160 from development release to date (Retrieved on December 10, 2007). The product quality can be evaluated by the number of bugs outstanding. Mahara has a Bug Tracking System that reviews and addresses bugs reported by users. Normally, Nigel is the one who updates the bugs reported to Eduforge.org. Currently, there are 592 bugs reported and 83 are open on

the community site, so outstanding bugs are around 14% (as of June 19, 2008). The developers pay attention to bug fixing.

Mahara has done a number of case studies in universities. Based on six documents, the overall quality level is "satisfactory," although the majority of them consider it to be a high potential product. Some suggestions include:

- Usability needs to be more user friendly especially for non-technical users
- Consider offering different types of ePortfolio templates for start-up users
- Inconsistencies and lack of clarity found in some areas of the project and systems
- Ease of use and navigation through the system
- Presentation of its features from a marketing perspective
- Flexibility in catering to the user's needs with regard to the types of artifacts that can be uploaded, its usability, and the level of user control in using the features.
- Existing templates were not meaningful to the students' contexts

Finally, Mahara's development team is not very large. There are 10 core developers, called "Project Administrators," who work at CatalystIT, and 20 other team members that contribute to Mahara. These 20 members do not necessarily belong to CatalystIT. Anyone can contribute by just registering through the EduForge website.

Overall, the product assessment for Mahara scored 6 points out of 10. The biggest disadvantage of the product quality is that Mahara is a still very new project. It does not seem fully ready yet for large organizational use. They currently have been conducting a number of pilot studies with New Zealand, and obtaining useful feedback for improving its systems. Mahara has a large potential to be an excellent product.

Support

Use Case Requirements

Mahara ePortfolio primarily targets two audiences: students and educational organizations. These are examples of what that students expect from Mahara, based on their usage:

- create an account
- create and update ePortfolio artefacts

- design and maintain ePortfolio views
- share personal information with online communities
- alert and handle security issues

On the other hand, there are education institutions which need ongoing support on technical aspects of the system such as:

- setting up a system with a server, either with or without a hosting service
- migration, installation, upgrading, and implementation supports
- control the traffic flow of users
  - secure and manage database information
  - standby online web-tech support to handle emergency requests

Findings and Analysis

The assumption here is the majority of target organizations do not have enough IT experience to provide self-support because of the relative newness of ePortfolios. Community support and paid/commercial support constitute the main source of Mahara support.

The type of support options available in Mahara are:

- Mahara's website and documentation wiki holds information about installing, configuring, using and developing for Mahara.org
- The #mahara IRC channel on freenode provides users the option to chat with developers and users for Mahara in real time
- The forums act as a portal for Mahara communities to engage in discussions
- Training, support and development are available from Mahara partners

Users can have access to Mahara community support from www.mahara.org/community. There is a support forum. Posting pace is not high, but once a question is posted, the response is generally given in a reasonable time. There are only a few postings that have received no response.

On the other hand, a user can obtain support from # mahara on freenode IRC chatting space on http://freenode.net. Their responsiveness is quite high and of professional quality. All of the information indicates Mahara communities are in good health.

Regarding paid/commercial support, the Mahara official site provides a link to two support and training services - Catalyst.net and Flexible Learning Network. There is an offer for Mahara hosting/support services 24/7 on the official website. However, the infrastructure for support services seems to not yet be ready, e.g. lack of service package, of price, of period of coverage, etc. However, one case study conducted by Victoria University reported that the administrator of Mahara.org is capable of giving quick and efficient responses on a case-by-case basis.   According to email correspondence with Catalyst.net, they will look into providing online support services beginning of Mahara 1.0 release.

In conclusion, the support in communities is limited. To get in the Freenode chatting space, chat software is required, which adds a difficulty in finding community support. In addition, commercial services are currently not available. Therefore, Mahara obtains a score of 5 out of 10 for support.

Documentation

Use Case Requirements

Good quality of documentation is a very important factor to consider when it comes to software usage. Based on our use case, it is important for the SF State ePortfolio project to receive good documentation support from the Mahara website. The team will also require different kinds of documentation from both the developers as well as the Mahara community.

Mahara documentation is well-prepared, well-updated, and well-organized. It is not difficult at all to navigate and find the documentation within the Mahara website. In the Mahara website, there are two big categories, namely 'Community,' and 'Documentation' where most of the documentation is located. Documentation under the section 'Community' is mostly compiled and contributed by communities. On the 'Community link,' we found well-organized documentation in the form of discussion forums, general documentation and resources, user guides, implementation guidelines, eCDF ePortfolio project implementation case studies, and finally technical documentation. This link comes with six different types of documentation that target the needs of different types of users. For example, a user who wants to know and learn about Mahara for the first time can check documentation under the title 'Documentation and Resources, and/or 'Userguides'. When the user clicks on either one of these links,

the system will open up another open source community portal 'Eduforge.org' to allow sharing of Mahara documentation at one place. We thought the Mahara team found a smart way to consolidate major documentation into one place, thus, saving work and saving space. The link under 'Documentation' offers users three different languages: English, Gernan, and French. This link provides the primary source of documentation. The Mahara wiki under this 'Documentation' is helpful, and highly organized and cohesive. This page is for both users and developers to find information about installing, configuring, using, and developing for Mahara.

One uniqueness of Mahara documentation is that the Mahara team also collected and published ePortfolio implementation case studies that are piloted in many universities in New Zealand, and also other parts of the world. This type of documentation is extremely useful for a university such as SF State to find what other users experience. This kind of documentation in the form of case studies provides insightful information such as organizational, and technological challenges encountered during the implementation of Mahara, and how these problems or issues were overcome. This can be an important factor that the SF State ePortfolio team will be looking into if they plan on using Mahara in the long run.

Furthermore, there is also another form of documentation which is mostly based on online discussion. For example, users can engage in discussion via IRC channel, #mahara on the freenode network. All the forums and discussions are monitored by developers. This implies there is a certain amount of quality assurance in the process.

A web search about Mahara documentation also returned many results. The major results came back about Mahara documentation on Mahara.org itself, and eduforge.org. The rest of the results are about documentation from independent websites. However, the quality of documentation at the Mahara and Eduforge is by far the most impressive. It should not be too challenging for an ePortfolio team to get a good start implementing Mahara. From what we have reviewed, Mahara ePortfolio is quite suitable for education institutions.

There is no commercial published book about Mahara at this point. A quick search at Amazon.com returned zero hits. Given Mahara is still young, it is not surprising there are no published books about Mahara ePortfolio. We felt that there is really no need for a commercially published book since Mahara and Eduforge websites are sufficient enough in providing up to date documentation. Overall, we assign a score of 8 out of 10 for Mahara documentation.

Training

Use-Case Requirements

Mahara presents a dual perspective on its users: educational institutions and students. For the SF State ePortfolio project team, the availability and quality of the type of training options, preferably free and easily accessible via online are to be considered as part of the resources they would want to use to incorporate within SF State's in-house ePortfolio training.

It is most likely that students need some training to maximize the benefit of ePortfolio use. The training covers:

- user-guide to get started with their ePortfolios
- development of skills for maximized use of ePortfolio such as electronic resume/showcase, design and publication

On the other hand, faculty and institution staff will need some training in order to:

- form a group of trainers on campus
- assure the security of all information that students put in every day
- organize all information and conduct a survey on students' needs
- assure temporary troubleshooting until the professional service intervenes

Findings and Analysis

Concerning informal web-based tutorials, some tutorials are available on http://prokey.podspot.de/ as well as on http://www.podcast.de/podcast/8405/Mahara_Tutoriall in German. They provide a how-to use of Mahara form the point of view of a student user.

Regarding a developer-created online tutorial, a potential user can obtain a complete user-guide from the Mahara website http://www.mahara.org/wiki/Mahara. This guide is available in English, German and French, covering from getting an account in Mahara to how to edit a personal ePortfolio with it. In addition, they provide a complete demo site on user-guides. On the other hand, for the user-education institution, the Mahara website provides a complete Implementation Guide on https://eduforge.org/docman/. Concerning commercially published tutorials, searches on Amazon.com gave no result. Classroom training by the development team is not available.

Our research found there is no plan from Mahara to provide classroom training by the development team. As for the availability of commercial/professional training, we found there are same commercial partners for Mahara as for Mahara Support. These two companies are Catalyst.net.nz and Flexible Learning Network. From what we reviewed in Mahara's website, the major services provided by these companies are:

- Training and workshops for getting the best result from your ePortfolio
- Training the trainers (Coaching and mentoring)

In conclusion, there are few training sources available for Mahara. The most complete training source is found in the documentation provided on the Mahara website. For the others sources, they are not only few in number but also hard to find. Therefore, Mahara training obtains a score of 4 of 10.

Product Integration

User Requirements

To ensure Mahara integrates well with ilearn.sfsu.edu, powered by Moodle.

Findings and Analysis

Mahara involves a basic understanding of web server and database setups. Mahara currently operates with Linux, Apache 2, PHP 5, and MySQL 5. Presently, the most widely known integration of Mahara is Moodle, a free and open source Learning Management System. Mahara allows users to automatically sign-on into both their Mahara and Moodle accounts. Moodle users were reportedly having trouble with

student training and implementation when Mahara was integrated. Seemingly, there was difficulty altering the training time from pre-allocated schedules. The initial release was functionally stable but had some issues, but this was expected. These problems should be referenced for future integrations with other CMS such as iLearn. The system administrators on several forums reported that all problems were resolved.

According to Nigel McNie, one of the core developers of Mahara, the current features are being implemented or are works in progress:

- Merging some feature branches back to trunk, such as one that implements an AJAX login form for when your session times out.
- Implementing logging of data so that statistics can be calculated, and reports generated for the administrator.
- Bug-fixing problems that have cropped up with the recent 1.0.2 release
- Assisting forum members, changing core aspects

When asked about commercial vendors/integration, Mahara developers were not able to provide any information on it. However, on their homepage, it was stated that users are able to share their profile information through Skype, MSN, Yahoo, and Jabber, however we were unable to attain any additional information. Overall, we assign a score of 8 out of 10 for Mahara's product integration.

Professional Services

User Requirements

The SF State ePortfolio project probably will not require paid professional services to help with troubleshooting any technical and non-technical problems during the pilot study. It is unlikely that SF State will use the professional services from CatalystIT and Flexible Learning unless it is absolutely necessary.

Findings and Analysis

Our research led us to find that there aren't many professional services for Mahara, which makes sense, again with regard to the fact that Mahara is a relatively new product, and there are still many developments and refinements on functionality aspects that the Mahara team need to take care of.

At Mahara's website, we found two professional consultancy firms: Catalyst.net nz, and Flexible Learning Network that are partnering with Mahara to provide professional services for any institution to jumpstart on implementing Mahara.

Our email correspondence with Meredith Henson the project manager of Mahara told us that all the professional services presented at Mahara's website are available now to both national and international clients. They could provide their consultancy online or on-site including traveling abroad. It is entirely dependent on the services the client require, the time frame and budget.

The main professional services provided by Catalyst.net.nz and Flexible Learning Network are as follows:

- Designing Pilot Program
- Implement Strategy Development
- Project Management Services
- 24/7 supports services
- Provides coaching, training and mentoring
- Troubleshoot technical issues

Nevertheless, it is unlikely that the SF State ePortfolio team will want to use paid services due to cost factor. If cost is not a concern, we assume the team might only want to hire a consultancy firm to handle critical problems that they could not solve. Overall, we assign a score of 6 out of 10 for this element.

The following is a scored matrix with all the scores. We used a weighting factor of 4, 2, 1, 1, 1, and 1 for Product Software, Support, Documentation, Training, Product Integration, and Professional Services respectively.

	Phase 1: Assess Element Maturity				Phase 2	Phase 3
	Define Requirements	Locate Resources	Assess Element Maturity	Assign Element Score	Assign Weighting Factor	Calculate Product Maturity Score
Product Software	X	X	X	X	4	24
Support	X	X	X	X	2	10
Documentation	X	X	X	X	1	8
Training	X	X	X	X	1	4
Product Integrations	X	X	X	X	1	8
Professional Services	X	X	X	X	1	5
					TOTAL	**59**

Conclusion

A total score of 59 qualifies Mahara for pilot studies and is quite close to a score for full production use. Based on its current role, Mahara works well with its integrated counterpart (Moodle) which is the basis for iLearn. There are several subtle yet significant synergies between the two platforms. Constant updates allow users to utilize the most efficient versions as it continues to improve. A detailed matrix review of Mahara's features and functionality can be found in the Appendix of this document.

PROJECT MANAGEMENT

This project, although limited in its scope, played two roles. One was quite central to the problem, that was to fill the need for an ePortfolio solution. The second was to streamline project management processes within Academic Technology at SF State. Academic Technology has been using various tools for project management, but was looking for a web-based solution, preferably open source, to be able to manage all its projects in a portfolio.

Dr. Sameer Verma, a key part of this team, teaches a course on IT Project Management. He has been investigating different web-based platforms for project management. After a preliminary investigation of a few different solutions, we decided to look further into dotProject, an open source project management tool that was originally created as a commercial application, but was later released under an open source license.

Originally created in 2000 by dotmarketing.org, dotProject was developed as a state of the art Project Management tool for a commercial purpose. Some of its core aims are:

- Clean, simple and consistent user interface
- Project Management functionality for a project management environment
- Open source / open access / free usage

Over the years, dotProject has undergone some formidable updates, additions and code changes and shows continued activity. Some of the features include:

- User Management
- Email based trouble Ticket System
- Client/Company Management
- Project listings
- Hierarchical Task List
- File Repository
- Contact List
- Calendar

- Discussion Forum
- Resource Based Permissions

dotProject is available under the GNU General Public License from http://www.dotproject.net/
dotProject requires Linux, Apache, MySQL, and PHP (LAMP), a stack that is quite familiar to the
Academic Technology staff at SF State.

We decided to use dotProject as our platform to manage the ePortfolio project. This effort has been quite
fruitful in assessing the platform for internal use in Academic Technology at SF State University. An
offshoot of this implementation is that some of the staff will be trained to use this platform to manage
internal projects in Academic Technology. Following are some screen captures of various screens.
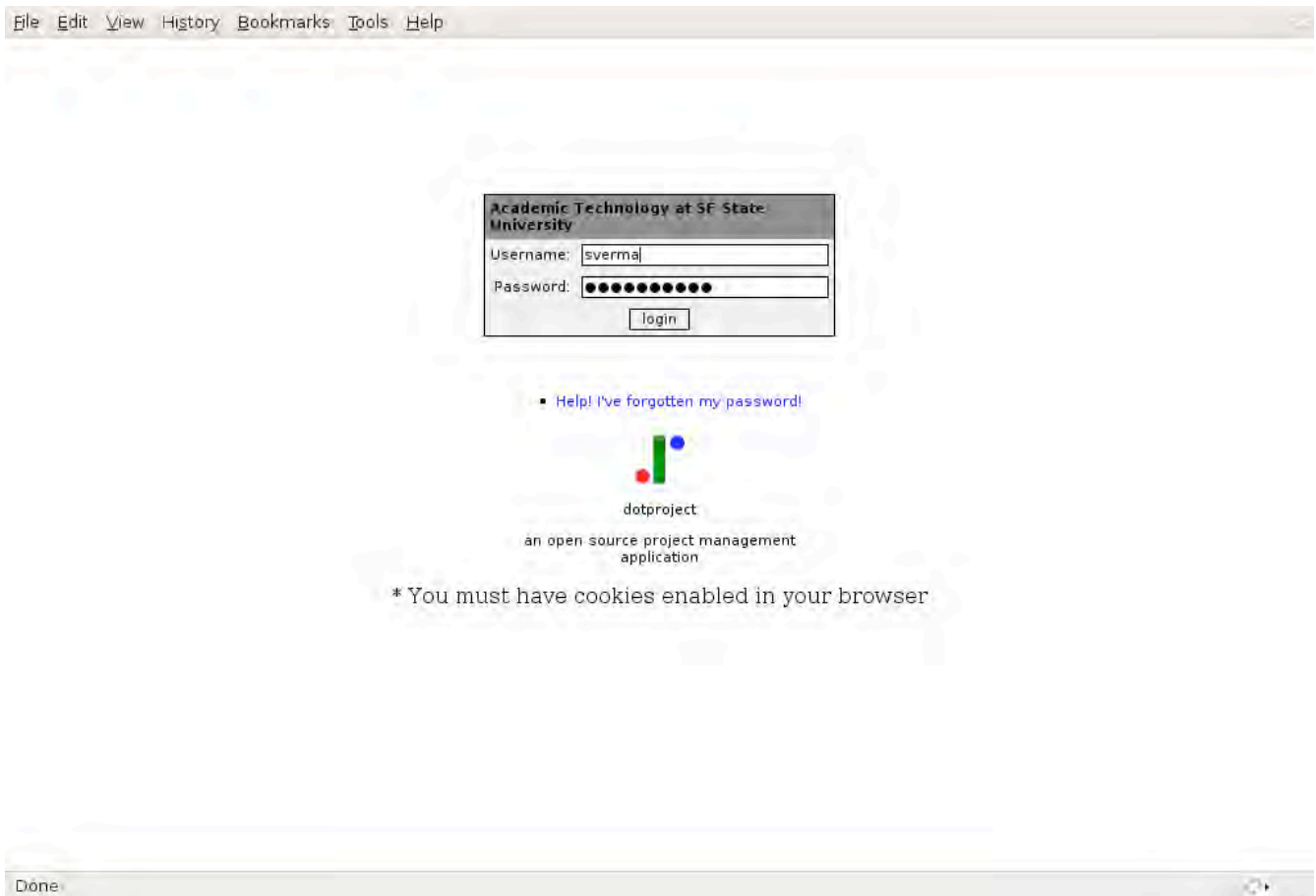
Illustration 1: Login screen

Illustration 2: Project View

Illustration 3: Calendar View

File Edit View History Bookmarks Tools Help

Academic Technology at SF State University   Current user: Sameer Verma   My Info   Logout   Help   - New Item -

Files   Filter: All

tabbed : flat

All Files (10)   Unknown (1)   Document (8)   Application (1)   Folder Explorer

	co	Checkout Reason	File Name	Description	Versions	Category	Folder	Task Name	Owner	Size	Type
Open Source ePortfolio Project											
			Mahara-Table of content.doc	This is contains snap shot and site map of Mahara.	1.00	Document	Root		Ayumu Josha	3.79 Mb	mswor
			Glossary.doc	Glossary terms for ep features	1.00	Document	Root		Jenny Soon	102.5 Kb	mswor
			KEEP_JaneZoe_dummysite_Screenshot.zip	KEEP screenshot	1.00	Document	Root	Acquire Screen Shots	Jenny Soon	8.74 Mb	zip
			KEEP_UseCase.zip	KEEP use case	1.00	Document	Root	Use case	Jenny Soon	4.7 Mb	zip
			Mahara_UseCase.doc		1.00	Document	Root		Ayumu Josha	1.42 Mb	mswor
			eportfolio-matrix051308.xls	Updated Final 5/13 This updated excel contain all individual 4 application scoring sheet & weighted scoring sheet. As you enter "1" on application sheet, it automatically reflect on the "score" sheet.	1.00	Application	Root		Ayumu Josha	85 Kb	vnd.ms
			Password for each site.xls	update of password for each site	2.00	Unknown	Root		Jenny Soon	74 Kb	vnd.ms

Companies Projects Tasks Calendar Files Contacts Forums Tickets User Admin System Admin

Done

Illustration 4: Files repository

Illustration 5: Member directory

Illustration 6: User Management
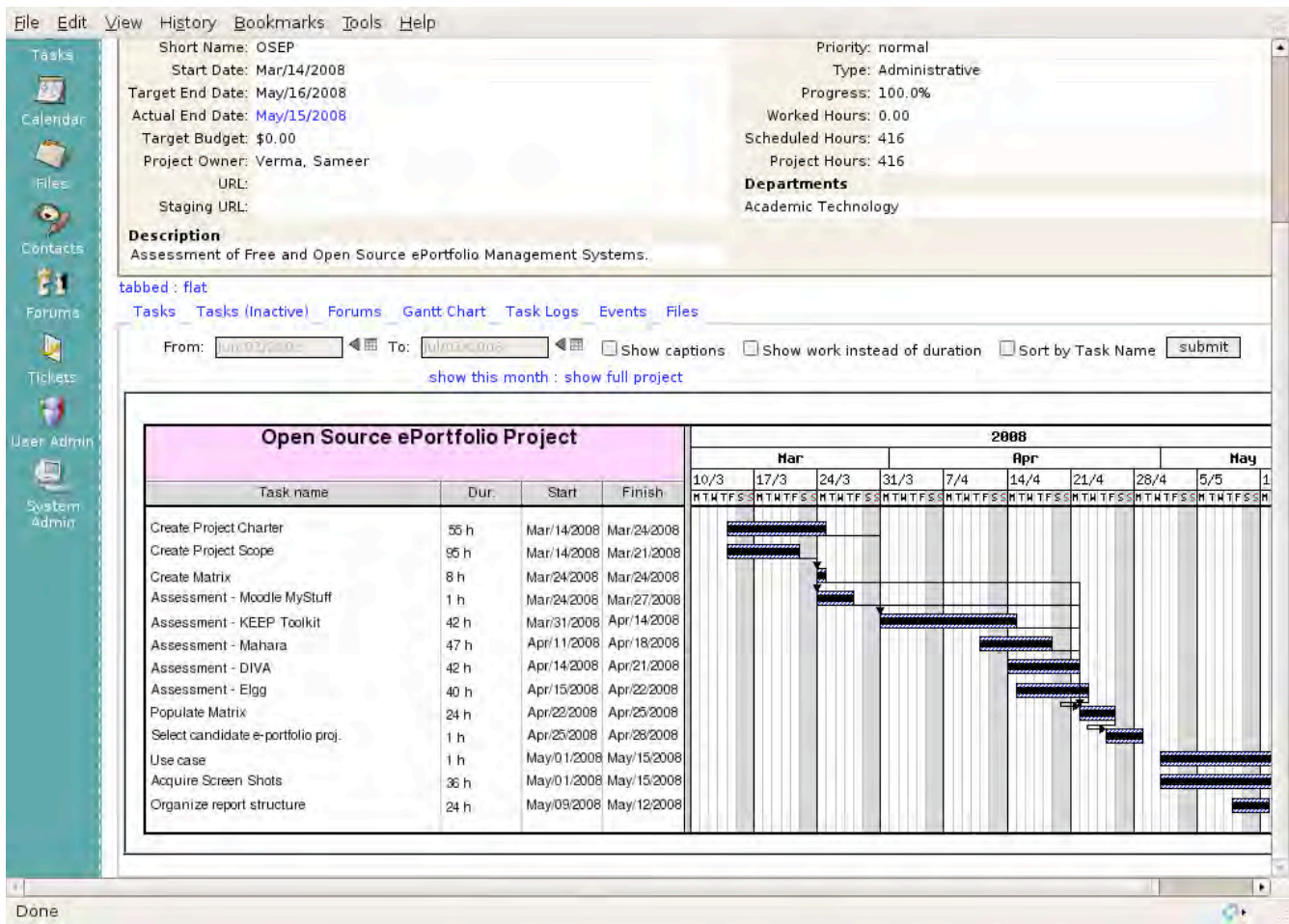
Illustration 7: Gantt Charts

CONCLUDING THOUGHTS

Although SF State has experienced considerable success and recognition for its ePortfolio efforts in recent years, this ePortfolio Leadership Activity for the CSU has given SF State the opportunity to critically assess its Academic Technology Division's ability to deliver on the three key elements we outlined as crucial for the success of any online learning and teaching initiative: Educational Best Practices, Student and Faculty Support Systems, and Technology Infrastructure.

In terms of Educational Best Practices, SF State's newly augmented ePortfolio website provides models and examples of pedagogically effective ePortfolios, as well as recommendations and guidelines to assist students and faculty as they carry out their ePortfolio projects. Research activities in Fall 'o8 associated with FIPSE and AAC&U will help advance SF State's understanding of ePortfolio rubrics and other aspects of assessment.

In terms of Faculty and Student Support Systems, SF State will begin to implement its proposed Integrated Support Model in Fall '08, in which Academic Technology partners with the Library, the Center for Teaching and Faculty Development, the Division of Information Technology, and the Disabilities and Resource Programs Center to provide deeper, further reaching, and more responsive support systems for ePortfolios.

Finally, it terms of Technology Infrastructure, SF State has now identified an open source technology solution that could meet the needs of the campus and integrate with our current open source learning management system, Moodle. Nonetheless, this study has also clarified the need for dedicated in-house technical staff to implement, maintain, and support any chosen open source ePortfolio system. Given the current budget climate in SF State and the CSU, and the pressing needs of the campus to maintain its existing academic technology systems, SF State has elected to postpone any pilots with the chosen open source ePortfolio solution until further resources can be secured. In the meantime, SF State will use existing resources to continue to build its Educational Best Practices and Faculty and Student Support Systems, and will keep using external, hosted solutions, such as eFolio, for its Technology Infrastructure.

APPENDIX AND REFERENCES

GLOSSARY OF TERMS (WCET)

This project relied on a glossary to ensure that all members of the team were in sync with the terms and their relative meaning. We used the list of terms at http://eportfolio.edutools.info/glossary.jsp?pj=16 as a basis. The list is reproduced below. The features glossary will be updated as the features are updated in the database.

Free-form	Free-form composing without the structure of templates using only a basic text box or editing widget (text box with formatting controls like a word processor).
Annotate	Annotating is linking a simple text note to a content resource such as an uploaded file.
Look & Feel	Customized Look and Feel is the ability to change the graphics and how a portfolio looks. Customized Look and Feel also includes the branding of content with institutional logos and navigation to provide a consistent look-and-feel across the entire institutional site.
Online Content Formatting	The online content formatting feature includes basic font alternatives for size and color as well as column sizing on some systems.
Customize / Edit	Customize/Edit feature enables the modification of content including images in some cases.
Internal Linking	Internal linking is linking to resources that are inside the system (or portfolio/website).
External Linking	External linking is linking to web pages or other resources that are outside of the system (or on other websites).
Upload	The upload feature describes the way of importing files into the system.
Templates	Composing with templates is structured composing where the process is

	both sequenced by some mechanism and often the new content is automatically meta tagged by the templating system.
Advise	Templates for advising are usually web forms that are used to facilitate a two-way exchange of information, such as between an academic advisor and a user.
Development	Templates for development support the making of inferences about the learning and development of learners that generally involve the processes of defining, collecting, selecting, designing, analyzing, interpreting, and using data with the express goal of enhancing the learners' development and learning.
Reflection	Templates for Reflection support conscious and careful consideration about one's actions and about the thinking that accompanies actions. One intended pedagogical impact of the process of reflection is to enable the learner to generalize lessons learned beyond the context in which they were learned and be better able to cope with new situations.
Career	Templates for Career development support the development of resumes or other materials that support a users' professional development.
Blogging	Templates for Blogging generally provide a text box structure for easy entry of content to publish quickly and may optionally provide ways to also include attached files. The attached files may be video files, audio files, or just images depending on the system.
Evaluation	Evaluation templates support rubrics for scoring artifacts and or providing feedback.
Presentation	Templates for Presentation provide web forms or similar mechanisms to enable portfolio resources to be organized and communicated to an audience of one or more. Presentation templates usually provide structure for visual design and visual style.
Mentor / Tutor	Templates for mentoring or tutoring use web forms to support a two-way "conversation," either synchronous or a-synchronous, between the

	mentor/tutor and the portfolio user.
Create Templates	The create templates feature is the provision for creating templates to extend the functionality of the templating system.
Modify Template	This feature allows users to change or add components to a pre-existing template. For example, a student could add a new section to the standard template created by an instructor or advisor.
User Interface	User Interface is the ways in which the product is designed to interact with the user in terms of text menus, checkboxes, clickable images, drag-and-drop approaches.
Goal Setting	Goal Setting refers to the support for drafting goals and revising goal statements
Assessment	Assessment templates provide support for the process of assessment which may or may not make use of rubrics for assessment.
Standards	Standards templates provide for the input of text of standards, the description of performance keyed to existing standards, and assessment of the gap between performance achieved and relevant standards.
Publish / Share	Publish/Share is making the content resource available to other than the author.
Access Controls	Access controls feature includes the function to allow or deny access to pages and tools that is usually based on username and password.
View	The view feature includes alternate formatting of the portfolio to enable viewing with assistive devices and other platforms such as handheld devices.
Types	Types supports publishing and sharing different types of resources such as sample assignments, guides, and models.
Archive or Download	Publishing to an archive and downloading function as ways to save content resources in a safe place for later reuse if necessary.
Publish to Course	Publishing to a course enables content resources from a portfolio to be made available inside of a course management system where the user

	has permission to add files. Once published then the access control system of the course management system enables others to view or use the resource.
Publish to Web	Publishing to the Web allows content resources from a portfolio to be made available to a general audience.
Commenting	Commenting enables other users to leave comments for the author on portions of a shared or published portfolio.
Share Templates	Sharing templates allows other users to make use of created or modified templates. Depending on the system this sharing may be implemented as a shared template folder.
Groupwork	Groupwork feature can take many forms from a group portfolios, a wikki, peer reviews, peer circles, peer commenting, to specialized group presentation support.
Multiple Portfolios	This feature involves the ability for a user to create multiple portfolios simultaneously within the portfolio system, either packaging components from the same collection of artifacts for different audiences or creating multiple versions of a portfolio.
Syndicate	Syndicate feature provides for weblog style publishing where new content is quickly made available to subscribed clients.
External Notification	External notification enables users to contact individuals outside of the system from within the system.
Internal Notification	Internal Notification enables users to contact other users inside of the system.
Searching and browsing	Searching and browsing feature supports ways of finding information and making it available.
Organize	Organize includes features that involve adding structure to information and/or artifacts that facilitate the perception of patterns and relationships among the information.
Collection space	Collection space a work space for users to collect and storing artifacts

	(samples of work from various sources and files of all types), so that they can be used within the portfolios.
Categorization	Categorizing is grouping content resources into separate "piles" based on some characteristic or characteristics of the content resources.
Sequencing	Sequencing functionality enables organizing content resources into some form of ordered list such as an alphabetic list or a chronological list. Some sequencing arrangements enable dynamic sequencing based on actions of the user.
Mapping	Mapping functionality enables the making of links between content resources that may be as simple as one-to-one alternatives to a more complex network of interconnecting links analogous to a map of roads linking destination resources.
Bookmarking	Bookmarking feature includes a variety of approaches from user bookmark list to elaborate navigation supports.
Selecting	Selecting functionality supports the user decision processes to pick out and thereby value some content resources over others. Note that this is in contrast to semiautomatic procedures such as filtering.
Aggregate	Aggregate functionality enables or facilitates the process of collecting content resources and making available for later use. A common instance is to automatically aggregate web logs every hour for later reading at a late time.
Reuse/Remix	Reuse/Remix feature supports reusing and combining content from sources both inside and outside of the portfolio system or systems.
Analysis Tools	Analysis tools provide a systematic way to handle information related to decision making such as summarizing, comparing, or checking for unusual situations regarding privacy, rights management, accessibility, standards, etc.
Tracking	Tracking feature includes systems for tracking and reporting page hits and other usage indicators such as where the hits are coming from

	depending on the system.
Reporting	Reporting functions can be used for describing the status of portfolios in the system. For instance, some system reporting functions count and report on the number of students who met or partially met a standard based on a grading rubric. Depending on the system the reported data can be expressed as percentages or frequencies.
Summarizing	Summarizing functionality enables a user to just deal with the more central or important commonalities of content resources. When the content is quantitative this often takes the form of calculated descriptive statistic like the average. When the content is textual this may take the form of an executive summary from an autosummarizer process.
Comparing	Comparing functionality makes it more possible for a user to notice differences and similarities between content resources. Sometimes this functionality takes the form of side by side visual comparisons in the same view.
IMS Schema	IMS Schema functionality is the enabling the user to benefit from the IMS ePortfolio Best Practices. IMS Global Learning Consortium is a standards setting organization promoting reusability of both data structures and content related to online education in general.
Accessibility	Accessibility functionality makes content resources usable by persons with disabilities chiefly through careful attention to the linearizing of content navigation as well as the separation of presentation style and actual symbolic content.
Digital Rights Management	Digital Rights Management (DRM) functionality enables the owners of content to have appropriate copyright control over their intellectual property. Most DRM implementations attempt to make the processes associated with copyright easier for the average user to cope with.
Privacy / Security	Privacy/Security provides the user with some storage space that only that user can access which may be used for work in progress.

Sustainability	Sustainability relates to those issues concerned with the continued use over extended periods of time and the issues related to the migration to other options at then end of the product life cycle.
Company profile	The company profile is the description of publicly available information about the company or open source project that is related to the long term viability of the enterprise.
Conversion Support	Conversion Support is the accommodating legacy systems of content by either accessing it directly from the system or converting it into a another form used inside the system.
Hosted version	Hosted versions are essentially web services that are provided from locations outside of the client institution. The hosting may be the main service or a way to accommodate rapid expansion.
Systems Integration	Systems Integration is the way that the portfolio system works with other institutional systems such as the student information system (SIS), the human resource system (HR), enterprise resource planning (ERP), etc. The integration of the portfolio system with institutional resources, such as integration with a course management system, the ability to add course lists, or other similar information from university files.
Migration/Export	Migration and export supports are often in the form so support for standard formats such as those provided by IMS which can be expected to be available in the future. One aspect of this is exporting portfolios to another portfolio system so that the users can change systems.
eCommerce	ECommerce functionality is to allow for the online purchase of goods or services by credit cards or PayPal.
Pricing/Licensing	Pricing and Licensing refers to the contractual arrangements that enable using the software which may include models that include enrollments, number of installations or other limits on the scope of use. Another aspect is the source code escrow arrangement in the event that the vendor goes out of business.

Staffing Requirements	Staffing requirements include the number of full time equivalent technical staff and help desk support staff that are recommended to support the size of the installation.
Orientation/Training/Help	Orientation/Training/Help refers to the system installation training of technical staff and the orientation of new users to the system as well as the context sensitive or other help subsystem.
Technical Support	Technical support is the service provided by the vendor to deal with technical questions and problems with the software system.
Vendor viability	Vendor viability is a bonus feature that will be provided by the financial reviewer with a conclusion about the provider's ongoing viability along with supporting evidence. In the case of an open source product this will address the viability of the product community to sustain continued development.
Technical	Technical considerations are related to the physical hardware situation and the operating system as well as supporting systems such as databases and storage capacity.
Authentication	Authentication is the way that the system allows users to access the system.
Authorization	Authorization integration is the support for multiple organizational units or organizations within one server setup and each unit contains its own unique database of users and can be authenticated against a different source.
Storage	Storage limitations can include limitations on the number of megabytes, the file types supported, potential for digital preservation.
Server and OS Requirements	Server and OS requirements include the capacity of the server arrangement recommended to support the product at the expected load as well as which operating system is required.
Database requirements	Database requirements are the specifications for the database software needed for the portfolio system.

Other Software Requirements	Other software requirements include such requirements as specific browser software versions of IE, Netscape, Firefox, Opera, etc. or other software not included in the portfolio software system package.
Optional Extras	Optional extra features are additional functionality that is not covered in the main features or additional separate functionality that may be added to the basic software system package at extra cost.

OPEN SOURCE MATURITY MODEL TEMPLATES [MAHARA]

Product Software Maturity Assessment Template

Product Software Maturity Items to be Rated

Item	Description
Product Functionality	It provides similar function to, if not same as proprietary vender's ePortfolio products.
Product Longevity	Mahara project was launched in 2006, and current version is 1.0.2 (June 13, 2008)
Product Quality	There is no QA testing information available. Bugs outstanding is 14% up to date.
Product Team Quality	Development team has a high level of contribution. Respond very quickly for questions. Quick attention to bugs.

OSMM Product Software Assessment Checklist

Open Source Maturity Model	
Product Software Assessment Checklist	
Product Name:	**Mahara**

Product Software Functionality	
Method	Notes
Reviewed applicable standards: Taxonomy, interoperability	Template: HTML, XHTML, Blog, Forum For Interoperability, ePortfolio should be compliant with IMS ePortfolio standards. All code work should be available for further development from programming members of the OS Community where coding conventions are standardized and consistent.
Compared to commercial vendor(s) functionality	No significant differences in terms of functionality. Mahara's users have a control over whom to show and what.
Reviewed technology analyst "best of breed" functionality definitions	Not available
Polled user community	Not applicable
Product Software Longevity	
Product version number	Version 1.0.2 (stable) is released.
Life span of product	First version was released in Dec.2006: first registered on EduForge in Oct. 2006.
Total number of downloads	
Product Software Quality	

Source code review	Not applicable. (server is needed in order to run)
QA assessment: Number of QA tests	Not available
QA assessment: Review of QA tests	Not available
QA assessment: Test coverage assessment	Not available
Activity level of product: Number of outstanding bugs	592 bugs are posted, and 83 bugs is opened to fix: About 14% bugs left to solve
Activity level of product: Number of code check-ins	Not available
Product Software Team	
Size of product team	10 core developer (CatalistIT employees), 20 team members
Skill and experience level of team	Not available

Open Source Maturity Model

Product Requirements Template

OSMM Product Requirements Checklist

Open Source Maturity Model	
Product Requirements Checklist	
Product Name: Mahara	

Product Requirements	
Method	Notes
Create Requirements Task Force	An ePortfolio and a social networking tool combined.
Poll User Community for Requirements	
No Poll taken	Not Applicable
Review Applicable Standards	Taxonomy, Interoperability
Taxonomy	Template: HTML, XHTML
	Blog, Forum
Interoperability	compliant with IMS ePortfolio standards
Review Commercial Vendor Product Materials	

eFolio	EPortfolio
	-Resume, portfolio, but not social network function
TaskStream	Total Accountability management system
	-Competency Assessment & Reporting -EPortfolio -Standard-based Instruction -Resource Management & Communication
Review Applicable Analyst Firm Materials	
None reviewed	Not applicable

Open Source Maturity Model

Technical Support Maturity Assessment Template

OSMM Potential Point Assignments for Support

Type	Points
Community support	4
Paid support	1
Advanced self-support	0
Total support points	5

OSMM Support Assessment Checklist

Open Source Maturity Model	
Support Assessment Checklist	
Product Name: Mahara	

Support Assessment	
Method	Notes
Reviewed mailing lists/forums	There are 2 mailing lists(forums) available. One at the Mahara.org site. The other at Freenode.net site. Few postings receive no response. Response is given in a reasonable time. At Freenode forum, response is given quite quickly. Posting requires certain level of knowledge on ePortfolio.
Assessed paid support	Two companies offer professional support services. However, they are not yet commercially available.
Assessed capability for advanced self-support	ePortfolio being new concept, not many people have experience on a similar products.

Documentation Maturity Assessment Template

OSMM Potential Point Assignments for Documentation

Type	Score
Developer-created	6
Web postings	2
Commercial published documentation	0
Documentation possible maturity score	8

OSMM Documentation Assessment Checklist

Open Source Maturity Model	
Documentation Assessment Checklist	
Product Name:	Mahara

Documentation Assessment	
Method	Notes
Reviewed developer-created documentation	There are many resourceful documentation found at two of the websites. One is the main site of Mahara.org, and the other one is where Mahara team would also post their documentation at eduforge.org. All documentation is easily be found and

	accessible. There is no broken link to view, download the documentation. In term of organization, the links on the page are well-organized and updated. There are many different type and forms of documentation such as wiki, students guide, online mailing list, and so on that put together by developers as well as Mahara communities. For example, documentation put together by the developers is organized under the section 'Documentation' while documentation put together by Mahara communities are put under the section 'Community'. The documentation found at the website is beyond developer-created documentation.
Reviewed web postings	Reasonably available given the age of the Mahara project is only a little bit after one year old. A simple search at Google returned many results. Although many of these results came from two similar websites suggesting these websites are very active in keeping documentation updated.
Reviewed commercially published documentation	A web search at Amazon.com did not return zero hits indicating there is no publication about Mahara at this point in time.

Open Source Maturity Model

Training Maturity Assessment Template

OSMM Product Points Assignments for Training

Training Type	Maturity Points
Web-based minitutorials	1
Developer-created tutorials	2
Commercial tutorials	1
Classroom delivered by development team	0
Classroom delivered by commercial entity	0
Total training maturity possible score	4

OSMM Training Assessment Checklist

Open Source Maturity Model	
Training Assessment Checklist	
Product Name: Mahara	

Web-based Minitutorials	
Method	Notes
Performed web search for web-based training materials	There are two video type tutorials. Both are user-student oriented. Not abandon in quantity
Developer-created Tutorials	

Searched project site	Mahara.org offers user-guide and Implementation guide in it wiki space
Reviewed documentation for quality and thoroughness	Documentation covers all relevant subjects on how to use Mahara. It provides also detailed recommendations on organizational requirements to implement and maximize Mahara's features.
Commercial Tutorials	
Searched project site as well as Amazon.com	Not applicable
Classroom training delivered by development team	Not applicable
Reviewed project site	Catalyst.net.nz and flexible.co.nz are professional training service providers. flexible.co.nz is planning to develop only online tutorial.
Searched project forums and mailings lists for any discussion of training	None
Contacted three customers for references on training (if applicable)	Not applicable
Classroom Training Delivered by Commercial Entity	
Reviewed project site for certified training delivered by partners (if applicable)	Not applicable

Performed web search to locate other training providers not listed on project site	None
Contacted one or more project training providers to determine quality (if applicable)	None

Open Source Maturity Model

Integration Maturity Assessment Template

OSMM Potential Point Assignments for Integration

Element	Score
Integrations identified	4
Necessary integrations possible via self-development	4
Necessary integrations developed by commercial vendors	0
Integration possible maturity score	8

OSMM Integration Assessment Checklist

Open Source Maturity Model	
Integration Assessment Checklist	
Product Name:	Mahara

Integrations Identified	
Method	Notes
Reviewed all applicable system documentation	Currently integrated with Moodle (an e-learning software

Interviewed members of product selection task force to determine needed product integrations	Nigel McNie (Core Developer)
Interviewed development and operations personnel to uncover any undocumented integrations	None Interviewed
Reviewed process tables/Task Manager process list to see if any integration processes can be identified	None Interviewed
Identified any additional integrations required through discussion with task force members, development and operations personnel, and any other affected parties	Nigel provided a link that directed to a thread providing the basic setups for web servers and operation requirements
Necessary Integrations Available via Self-Development	
Identified missing integrations	According Nigel, the developers are still working on: • merging some features to login screesn • implementing logging of data so that statistics can be calculated, and reports generated for the administrator
Evaluated possible integration mechanisms that can be used to create necessary integrations	None
Necessary Integrations Developed by Commercial Vendors	
Identified missing integrations	None
Determined commercial integrations that are	None

available	
Necessary Integrations That Are Not Available	
Identified any integrations that cannot be created via previous four mechanisms	None
For every missing integration, decided whether project can go forward without integration	None

Open Source Maturity Model

Professional Services Maturity Assessment Template

OSMM Product Points Assignments for Professional Services

Element	Maturity Points
Product team offers services	0
Services available from local or regional firms	3
Services available from national or international firms	3
Total professional services maturity possible score	6

OSMM Professional Services Assessment Checklist

Open Source Maturity Model	
Professional Services Assessment Checklist	
Product Name:	Mahara

Professional Services	
Method	Notes
Examined project site for information regarding professional services	Yes. Two firms partnering with Mahara: Catalyst.net and Flexible.co.nz

Performed Google search on "consulting" and project name	Not available
Examined web sites of any professional services firms identified in methods outlined above	Not Applicable
Evaluated professional services firms through interviews	Not assessed
Evaluated professional services firms through reference checking	Not assessed

BRIEF SYNOPSIS AND USE-CASES OF OTHER OS EPORTFOLIO SYSTEMS REVIEWED

DIVA: DESCRIPTION

The Digital Information Virtual Archive (DIVA) is a web-based digital file management and sharing system for faculty in support of their teaching, research, and service activities. DIVA also combines a rich Open Repository which stores compelling digital files from across the University, CSU and community groups. A unique web document builder allows faculty to combine text, images, audio, video and RSS feeds to create online presentations or assignments and special tools like a Slide Show builder gives faculty powerful digital teaching options. Faculty are provided a personal DIVA homepage where they can upload up to 4 gigabytes of digital files and manage them along with the best of what they find in the DIVA Open Repository. DIVA can be an alternative to iLearn when faculty just need a simple web page and don't have time or inclination to spend the time learning web authoring. Group areas provide space to share files with research colleagues, within committees, or informal working groups; Participants can be from SF State or anywhere in the world.

Currently, DIVA is not provided under an open source license, but we considered it as a possible candidate because: 1)it was developed at SF State and shows a high potential for integration with our iLearn LMS platform and 2) The group responsible for DIVA is working to release DIVA under an open source license by mid-2008.

Features:

DIVA takes a decidedly different approach to faculty support tools in several ways:

- DIVA supports the broad range of faculty activities including teaching, research,

and service.

- DIVA supports the broad range of file types and the tasks faculty perform around those.
- DIVA supports the broad range of academic disciplines and can be a powerful tool for encouraging interdisciplinary interaction and activity.
- DIVA combines a content and file repository with a wide range of services to create what we call a "living repository" embedded the authentic work tasks of faculty and those that support them.
- DIVA believes in open academic technology systems and is designed for open access of its repository and well-suited for the range of integration projects we are planning.

Other features:

- Permissions and Visibility
- File Nomination
- Metadata
- Tagging
- Version Control
- Copyright, Fair Use

For more details on DIVA, see http://diva.sfsu.edu/

DIVA USE-CASE

1. ACCESS

Main login screen split up in to courses and groups.

*no different views available, no templates.

2. <u>COLLECT/ REFLECT/ BUILD</u>

Here's a view of a test document from a login view. You also have the ability to view the document as a public view. You can easily add new to that document such as video and audio on the right navigation bar.

DIVA allows users to upload document and display pictures and video. The repository for files is large so larger school projects can still be displayed alongside resumes, cover letters, educational history, etc. Similar to social networking site in controls.

Course main screen. Here you can add documents as well as delete them. You can subscribe to an RSS feed when new documents are added as well as podcasting.
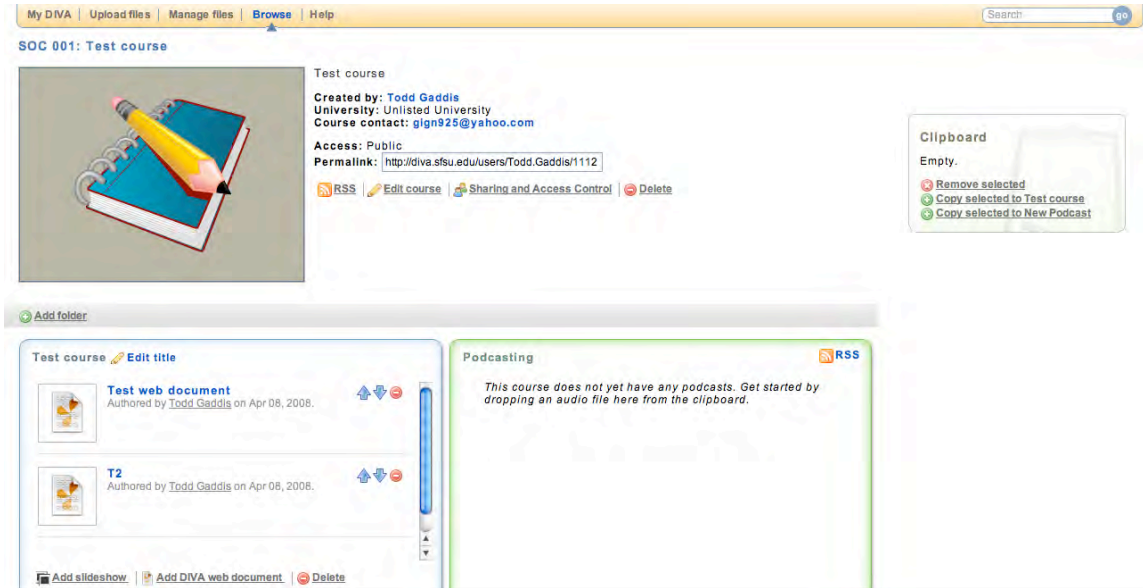
ONLY THE PICTURE ON THIS DEFAULT SCREEN FORMAT CAN CHANGE

3. <u>ORGANIZE</u>

File manager. Able to search and browse all files by course and groups. Very good feature because can upload but not be forced to display everything.
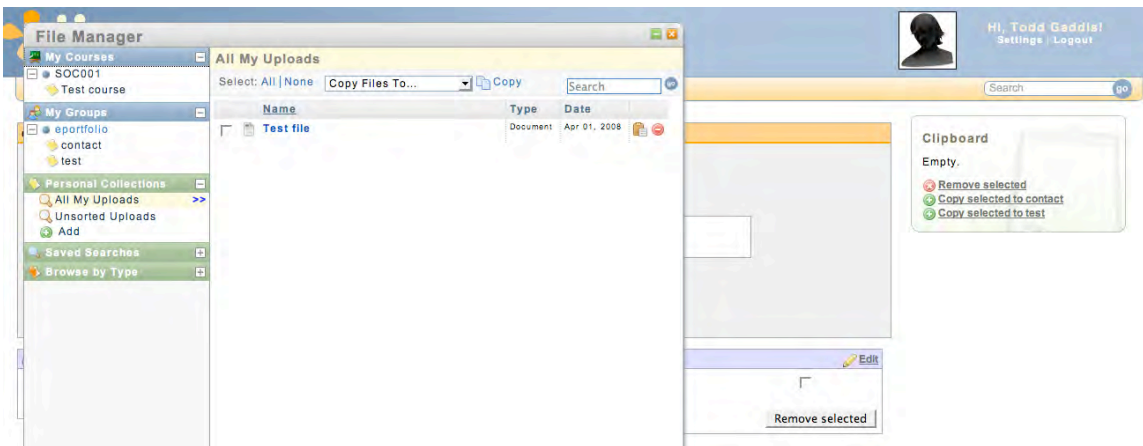
This is the screen for when you create a brand new document. There is a Rich Text editor as well as the authoring tools navigation bar on the right side.
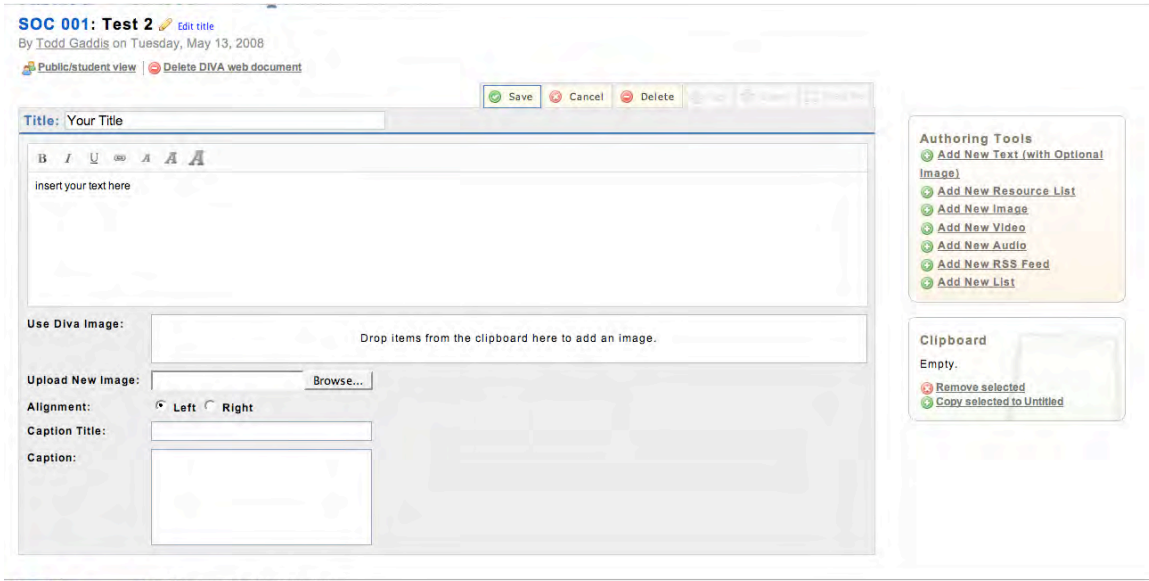
*There is no admin access. We would likely be able develop some sort of access but not positive. Configuring site, managing users, managing Institutions and Extensions are all under the control of the DIVA site administrator.

ELGG: DESCRIPTION

Elgg is an open, flexible social application engine, designed to run at the heart of any socially-aware application. Building on Elgg is easy, and because the engine handles common web application and social functionality for you, you can concentrate on developing your idea. Elgg is open source. That means, when you use Elgg, you have the benefit of being part of a large developer community, with the security and stability that hundreds of eyes can provide. It's also headed and used by Curverider and its partners, so you can be assured that it's in commercial use and will cope with the demands of a popular application.

Features:

Elgg supports

- User, object, file and site management

- Social graph functionality (relationships between users and other users, objects and sites)
- Multiple sites (or applications) per installation
- Easy internationalisation support
- System-wide, tag-based searching across all content and users
- Fine-grained access controls
- Multiple views, allowing for mobile applications and embeddable widgets as well as the traditional web browser view
- Event, plugin and widget APIs

Technical, back-end features

- RSS, FOAF, XFN for content syndication
- OpenID, OpenSocial, OAuth for integration with other web services
- Open Data Definition and an increasing number of data portability formats for import / export
- An extensible RESTful API, with results in JSON, serialised PHP or XML
- AJAX through jQuery and user-definable callbacks
- Easy extension for use with caching systems such as memcached, for increased system performance
- Use of multiple database connections for scalability

End-user features:

- Profile
- Dashboard
- Activity feed
- User preferences
- Comprehensive administration tools
- OpenSocial and Facebook applications

More details are available at http://elgg.org/

ELGG USE CASE

PUBLISH & SHARE

The primary point is that users can be given the URL and tell others what site to go to.

- WYSIWYG; automatic publishing

1. ACCESS

Login in with username and password.
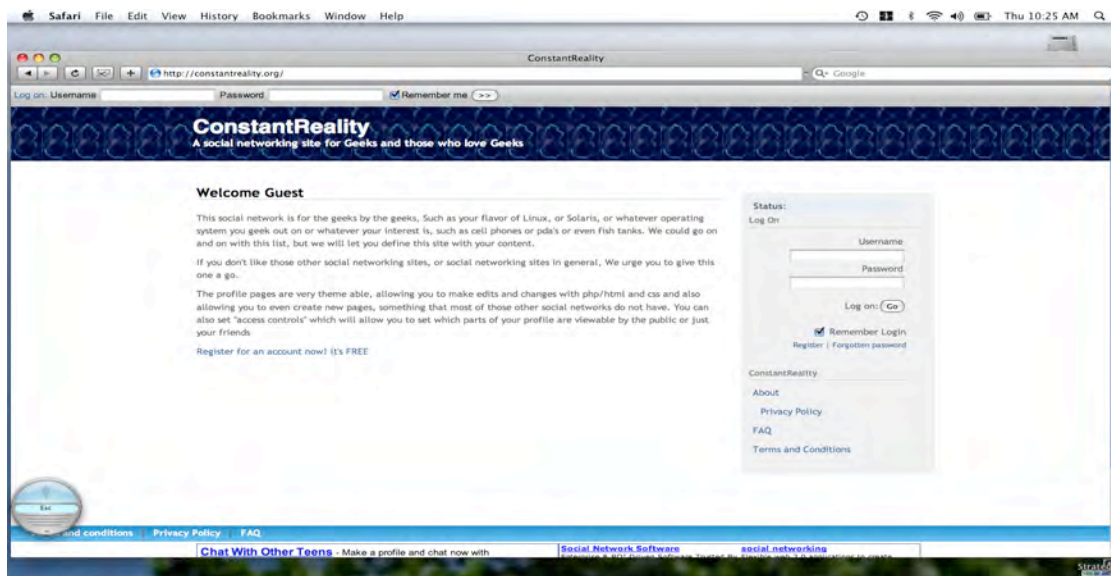
2. COLLECT/ REFLECT/ BUILD

Similar to blogspot and social networking sites. Page also has a text box where users and friends can post comments. Once logged in main page looks like this:
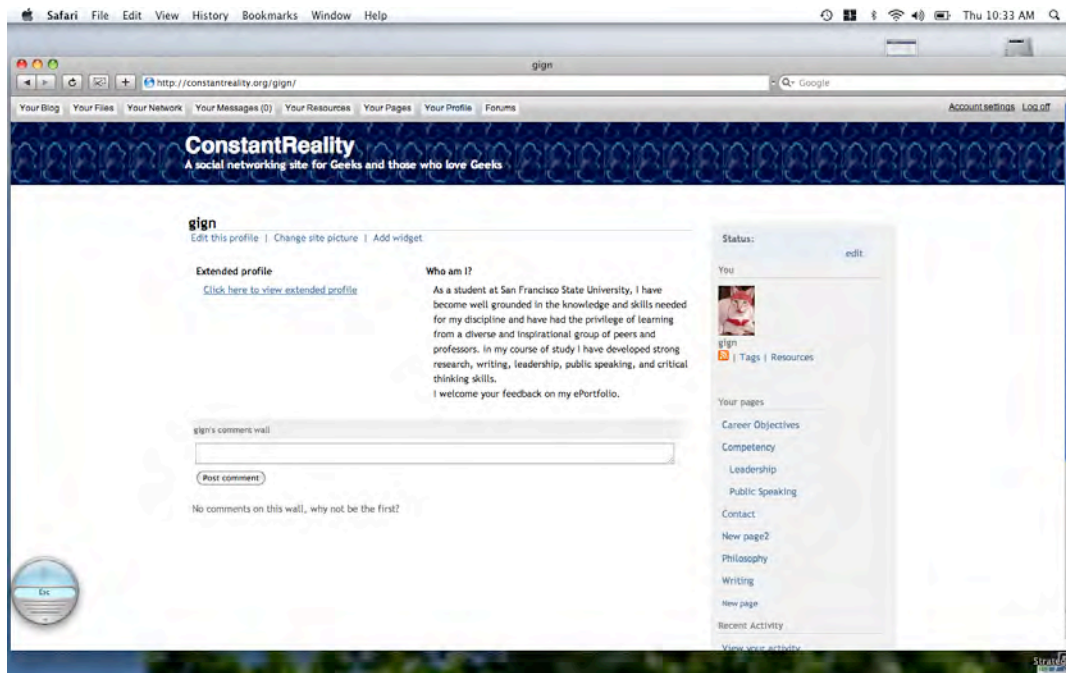
Messages are easily accessed, composed and sent.
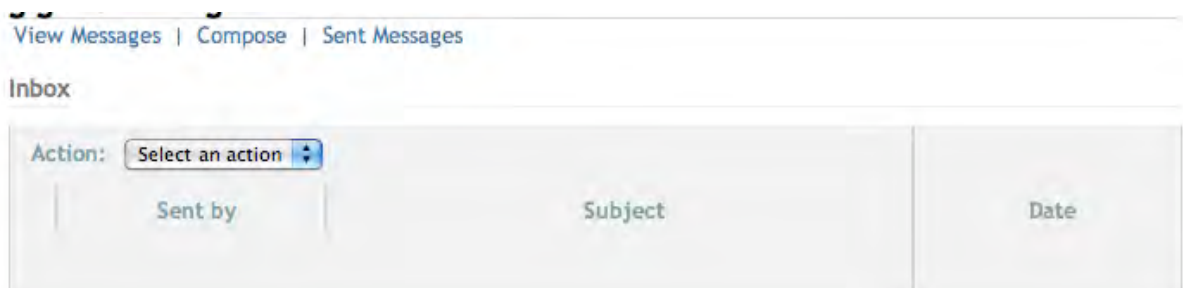
Users can add as many pages as they would like and upload files of any format. Filename, description and tags can be added to all. Individual pages can be specifically designed to meet the needs of career objectives, contact info, work samples, etc. Examples of pages;

*Very similar to eFolio in that page can be previewed before it's saved. Unfortunately, also similar to eFolio when looking at pasting, cutting and formatting as it does not always stay or brings embedded format elements with it.

File management is very easy with the ability to create new folders on the site itself while also allowing to upload files.

Users can also add a variety of widgets that are built into the site.

Add widgets

Select a widget type from the list below:

Blog widget

Displays the latest blog posts from a blog of your choice.

(Add)

Video widget

Displays a video of your choice.

(Add)

Files widget

Displays images of some of your files.

(Add)

Feed widget

Displays the latest entries from an external feed of your choice.

(Add)

Profile widget

Displays the contents of a profile field.

(Add)

Friends widget

PUBLISH/ SHARE

Site and changes are only published once they are saved. However, activity is cataloged so mistakes can be dealt with if changes need to be made.

gign :: Recent activity

| Post a new entry | View blog | Archive | Friends' blogs | Interesting posts | View all posts

Currently viewing recent activity since May 14, 2008.

You may view recent activity during the following time-frames:

- The last 24 hours
- The last 48 hours
- The last week
- The last month

Your recent messages

Activity on weblog posts you have marked as interesting

No activity during this time period.

FRIENDS

Friends can be added provided they are part of the site. Allows online communication.

gign :: Friends I have linked to

Communities | Owned Communities | Community invitations | Friends | Friend of | Friendship requests | Access controls | Invite a friend

You don't have any friends listed! To add a user as a friend, click the 'friend' button underneath a user's icon.

ADMIN

There are no admin controls at this time other than editing the profile. The storage capacity is set by the site administrator. Unsure what admin access we would be able to develop.

CARNEGIE FOUNDATION KEEP TOOLKIT: DESCRIPTION

In the last five years, a main focus of our work at the Knowledge Media Laboratory (KML) of The Carnegie Foundation has been to explore and create distinct forms and models that help faculty and educational institutions document, share, and reflect on some of the critical aspects of their efforts in transforming teaching and student learning.

The multimedia examples and electronic portfolios in the Gallery of Teaching and Learning showcase these attempts. However, our experience suggests that creating such succinct yet appealing and engaging representations and sharing them effectively remains an intellectually and technically daunting task. Despite the increasing interest of faculty, students, programs and institutions to develop and use these kinds of representations for collective knowledge sharing and building, in many cases, there is limited support available for them to explore the possibilities and initiate their own efforts.

The Knowledge Exchange Exhibition and Presentation (KEEP) Toolkit, a set of open source tools developed at the KML, is intended to provide an economical and accessible solution to this challenge. The KEEP Toolkit is available to educators and students at all levels as a free service from our website. We have also made the Toolkit available as an open source software application so that institutions, departments, and educational organizations can also implement and administer the Toolkit locally and integrate it into their local systems as needed. For more information, please see the Site License page.

The latest KEEP Toolkit (Version 2.0) includes a set of tools that enable faculty and students to create succinct Web-based representations of aspects of teaching and learning so they can be shared with others. Users can also create templates that provide both conceptual organization frameworks and visual layouts. By guiding users through framing questions, directions, and rubrics, these templates help them organize materials—such as course materials and artifacts, student work examples, audio, image and video files—in a manner that best represents and contextualizes the content and linked resources.

Features:
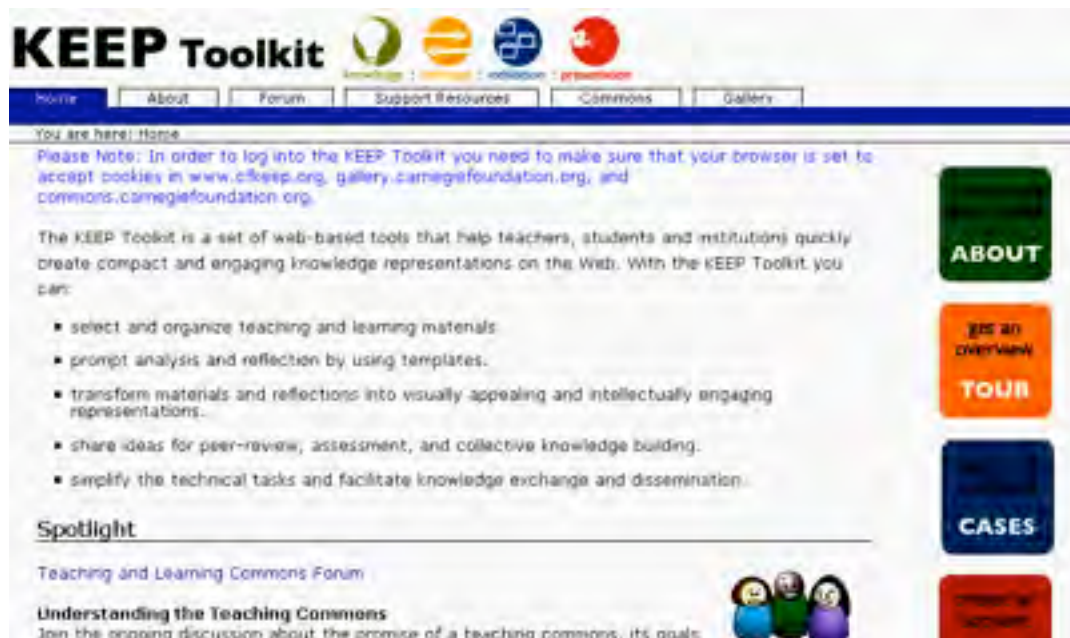
- Dashboard

- License

- Edit Snapshot Functions

- Rich Text Editor

- Add/Delete Box

- Position Box

- Create/Delete Columns

- Upload Images

- Upload Video

- Edit Links

For more details, see http://www.cfkeep.org

KEEP TOOLKIT USE CASE

1. **Access**

- URL: www.cfkeep.org/static/index.html

- Enter Username (email address), followed by Password

2. <u>Collect</u>

Collect artifacts based on the purpose of the portfolio. One user can have multiple ePortfolios. Each ePortfolio builds for certain purpose and target audience. For example, X ePortfolio for class project, Y ePortfolio for employment, Z ePortfolio for documenting your academic growth.

- Gather resources (ingredients) from multiple sources - gather directly from different websites whenever you want to, from your cell phone, digital camera, and so on. Then, you decide if you want to upload these collected resources directly to your ePortfolio templates, or first save them onto your desktop/laptop's local folders. You may choose to save them onto your local folders because you want to organize your thoughts how you want to synthesize information into one.

3. <u>Reflect:</u>

After gathering the collection, we reflect how to use these collections to meet the intended purposes We want X, Y, Z ePortfolios to stand out uniquely. To help the reflection process we can:

- go to "Collect" and look at what we have collected so far,
- look at what we have so far from the KEEP Dashboard, and
- browse KEEP Commons KEEP Gallery, or even KEEP use templates for more ideas.

Reflecting on how to organize the ePortfolio can be done by scanning through "My Dashboard":

Benchmarking – getting ideas from KEEP Commons and KEEP Gallery to support your reflection/thought process.
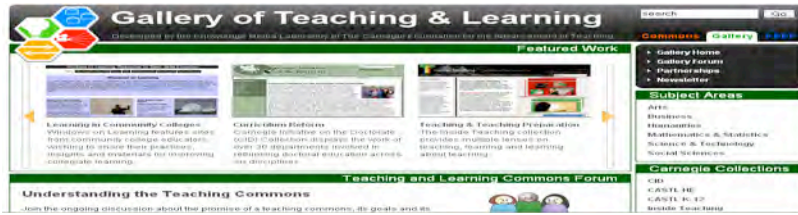
4. **Select**

Selection criteria for materials to include should reflect the purpose or learning objectives that we have established for the portfolio. This is the part where we decide what to select to put into the ePortfolio. After this, we select what templates to use and place the items into each ePortfolio.

You can choose templates from: Scholarship of Teaching and Learning Templates or from case studies.
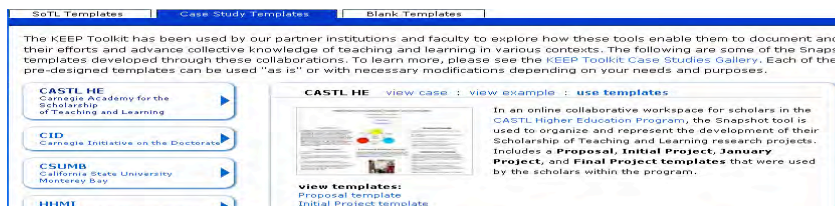
We can also select the "Blank Templates" option to design our own template.
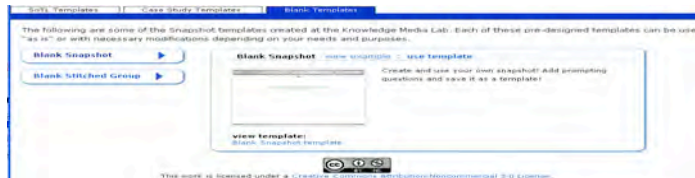
- **<u>Build</u>**

Embedded source code for placing a Youtube video on the homepage

n upload or link video/file/image (external linking)

Create / De-create Hyperlink
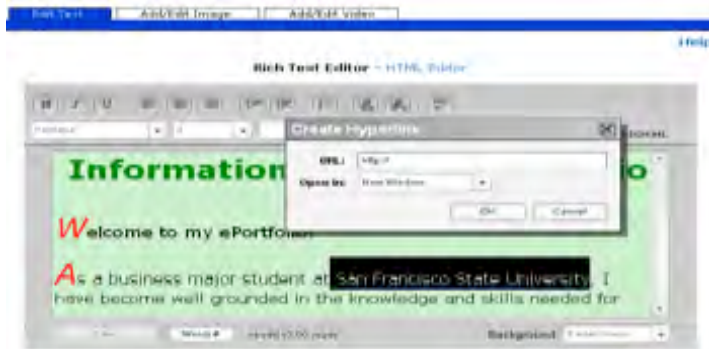
Feature: Edit Text

Feature: Add/Edit Image

Feature: Add/Edit Video

Feature: Tag

Feature: Dashboard displaying current progress

Feature: Stitch

Stitched result

● **Publish**

- **<u>Share</u>**

Feature: Gallery

Gallery Look

Send Shared snapshot/template to friends/others

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