Functionality Mash Up - Evolving to the Next Generation of Learning Management Systems

Dr. Charles Severance
University of Michigan School of Information
IMS Global Learning Consortium
www-dr-chuck.com
April 30, 2008 - JA-Sig Conference
Charles Severance
Developer Network Coordinator
Email: Email

Biography
Dr. Charles R. Severance
Charles is currently the IMS GLC Developers Network Coordinator and Clinical Assistant Professor in the School of Information at the University of Michigan. Previously he was the Executive Director of the Sakai Foundation and the Chief Architect of the Sakai Project.


Charles has taught Computer Science courses at the University of Michigan and Michigan State University.

Charles has developed several tools to assist in the production of multimedia web-based lectures. The tools are called the Sync-O-Matic 3000 and ClipBoard-2000.

Charles is active in television and radio as a hobby, he has co-hosted several television shows including “Nothin but Net” produced by MediaOne and a nationally televised program called Internet: TCI. Charles appeared for over 10 years as an expert on Internet and Technology on a call-in radio program on the local Public Radio affiliate (www.wkar.org).

Chuck's hobbies include off-road motorcycle riding, karaoke and playing hockey.

Charles has a B.S., M.S., and Phd. in Computer Science from Michigan State University.
Outline

• Looking back at looking forward (2004)
• Student-Centered Learning
• What will the “next” LMS look like?
• IMS Learning Tool Interoperability 2.0
• Sakai/IMS Google Summer of Code
• Looking ahead in Sakai and Moodle
States of Water...

- **Frozen** - Vibrating and stuck in a Crystal Structure
- **Melting Point**
- **Liquid** - Fluid flows, but often downhill - cannot fill all of the space - tends to pool at minimum energy - surface tension exists
- **Gas** - Freely flows throughout entire space - space is evenly filled

Time / “Heat” Applied ---

Temperature -->

Dec-2004
Latent Heat of Learning Software

For the past 10 years we have all been all “stuck”, vibrating in place, seemingly with no flexibility, but with plenty of energy.

Dec-2004

Time / “Heat” / Money / Energy Applied -->

Better -->

Frozen - Many different “imperfect” CLEs and LMSs

Melting Point

Boiling Point
Latent Heat of Learning Software

Frozen - Many different “imperfect” CLEs and LMSs

Boiling Point

Liquid - We can tend toward common CLEs, and/or portability makes the choice of CLE irrelevant

Time / “Heat” / Money / Energy Applied --->

Dec-2004

Building a reference implementation of a conventional CLE…

Melting Point

2004

Better -->
Dec-2004

Time / “Heat” / Money / Energy Applied --->

Better -->

Safe base level functionality empowers new thinking, approaches, and standards, (i.e. good chaos). We enter a period of chaotic freedom.

Frozen - Many different “imperfect” CLEs and LMSs

Boiling Point

Liquid - We can tend toward common CLEs, and/or portability makes the choice of CLE irrelevant

Melting Point

Sakai
Time / “Heat” / Money / Energy Applied --->

Dec-2004

Better -->

Melting Point

Boiling Point

2008

Liquid - We can tend toward common CLEs, and/or portability makes the choice of CLE irrelevant

Frozen - Many different “imperfect” CLEs and LMSs

Sakai
Time / “Heat” / Money / Energy Applied -->

Better -->

Dec-2004

Frozen - Many different “imperfect” CLEs and LMSs

Melting Point

Boiling Point

Liquid - We can tend toward common CLEs, and/or portability makes the choice of CLE irrelevant

Gas - Innovation can spread to cover the space of T & L practices

True change in T & L happens in ways can not anticipate. CLE/LMS’s can take completely new forms and directions…
More Than Free Source Code

Open Source leads to Open Thinking and Open Innovation
Open Everything

- Open Source
- Open Intellectual Property
- Open Thinking
- Open Ideas
- Open Innovation
Moodle .versus. Sakai

- Many schools compare and choose
- Neither wins all the time
- Everyone realizes their weaknesses
- Everyone gets stronger
Ideas Flow...

• Moodle adds flexible role system (Sakai)
• Sakai is designing flexible course setup and layout (add Resource) (Moodle)
• Moodle is building Learning Activity Management System (LAMS) Sakai wants this too..
• Moodle is adding web service APIs (Sakai)...

• Communities and adopters are glad to see teaching and learning improving
Addressing Weaknesses

- Moodle is working on increasing its appeal to enterprise institutions
- Sakai is working on building interfaces that teachers will love
Serving the needs of the student…
Facebook is part of a student’s life. Students *choose* to use Facebook.

Sakai and Moodle are something students *must* use for a grade.
Student Centered Learning

What can we learn from Facebook?
Can we make a teaching environment students *want* to use?
University of Michigan Medical School

- What is beyond Sakai and Open Source Portfolio?
- In 2007, they put out a Request for Information (RFI) for a student centered learning system.
- They had a very clear vision of what they wanted.
- Nothing in the marketplace even came close to their requirements.
Learning Management System: Medical School Requirements

• Student-centered
• Self-regulated learning
• Competency-oriented - national and local competencies
• 3 distinct but interactive levels
  • Institutional
  • Personal
  • Portfolio

Casey B. White, Ph.D.
Joseph C. Fantone, M.D.
March 2007
A Model for Self-regulated Learning*

Inner ring is the user's learning cycle.

Outer ring is the institution's learning cycle.

- White CB, Gruppen LD. 2007. Self-regulated Learning in Medical Education. Association for the Study of Medical Education: Understanding Medical Education.
Self-regulated Learning
4-phase cycle
Continuous (formative/summative)
Feedback = key
Student responsibility & Accountability
Lifelong learning
Responding to the need for tracking of competencies defined by others.
The student process operates within the institutional process under the student’s control

AAMC/LCME/Faculty COMPETENCIES

Personal/ Career Goals

Personal Goals
- Independent of (community service), enhancement to (interest in orthopedics) or deeper extension of formal curriculum
- Expectation students will populate (review w/ faculty mentor 2x/yr)
- Several layers of access

The student process operates within the institutional process under the student’s control

AAMC/LCME/Faculty COMPETENCIES

Personal/ Career Goals

Personal Goals
- Independent of (community service), enhancement to (interest in orthopedics) or deeper extension of formal curriculum
- Expectation students will populate (review w/ faculty mentor 2x/yr)
- Several layers of access
**Personal Portfolio**
- Series of folders, at least w/ student access only
- Customizable
- Personal representation learning/aspirations
- Journaling
- Repository (eg, patient letters)
- Can draw in materials from either/both outer circle(s)

**Personal Goals**
- Independent (community service), Enhancement (interest in orthopedics) or Deeper extension of formal curriculum
- Expectation: students will populate (review w/ faculty mentor 2x/yr)
- Several layers of access

---

**Learning Management System: Self-regulated Learning Model**

- **Personal/ Career Goals**
- **AAMC/LCME/Faculty COMPETENCIES**
- **Resources**
- **Adjusting Knowledge/Skills Improvement**
- **Planning Intended Learning Outcomes**
- **Reflection**
- **Self-identified Learning Experiences**
- **Self-assessment**
- **Student Personal Portfolio**
- **Learning Learning Experiences (formal)**
- **Assessing Tests, quizzes, Feedback**
Learning Management System: Self-regulated Learning Model

AAMC/LCME/Faculty COMPETENCIES

- Personal Portfolio
  - Series of folders, at least w/ student access only
  - Customizable
  - Personal representation learning/aspirations
  - Journaling
  - Repository (eg, patient letters)
  - Can draw in materials from either/both outer circle(s)

- Personal Goals
  - Independent (community service), Enhancement (interest in orthopedics) or Deeper extension of formal curriculum
  - Expectation: students will populate (review w/ faculty mentor 2x/yr)
  - Several layers of access

Characteristics across levels
- Search engine
- Drag and drop
- Seamless access to web and databases (Sakai, Portal, MSIS/Oracle, PubMed, etc.)
- Presentation functionality
The Social Dimension

- These pictures focus on the view from the institution into the individual
- The processes and flows are around and toward the student at the center
What are we doing with the resources?

What are we putting in our portfolio?

Do those things just sit there forever?
The “learning turbines” are producing new resources all the time.

These can be people or even groups - constantly making, consuming, and enhancing resources.
What will the Student Centered Learning System look like?

A journey of 1000 miles begins with a single step...
• The desired software cannot be purchased or downloaded. Period. Nothing comes close.
• Lets just write it. Lets build/adopt/extend a student centered learning environment.
• This is not a new feature in an LMS - this must be for the student. It must compete with Facebook.
Teaching and Learning @ Michigan

- Deeply involved in Sakai and OSP
  - 5 FTE working on Sakai
  - 4 FTE working on Open Source Portfolio

- Building Open Courseware / Open Educational Resources

- Michigan also runs BlackBoard on its Flint and Dearborn Campuses

- SharePoint is increasingly used in administrative settings
First: Survey The Market to Learn from others

- Not happy with classic LMS software like Sakai and Moodle
- Look for personal portfolio systems and content management systems and Facebook
- Start from the student perspective and work outwards...
Things to Look At…

- LAMS
- Moodle Portfolio
- Open Source Portfolio
- Mahara
- Chisimba
- Elgg
- Drupal
- Plone
- Joomla
- Facebook
- ....

Always think “personal” not institutional. The institution has an interest - but the user interface must be personal fit institutional needs into a user-centered interface.
Portfolio Evaluation
Moodle 1.9 Site

Welcome to ULCC’s Portfolio Evaluation

As part of our E-learning service we have been evaluating tools to support the ‘personalisation of learning’ agenda. Please follow the links and information in the left menu to access the different platforms and feedback forms.

"Personalisation of Learning"

ULCC are exploring e-learning solutions to raise the quality of personalised learner experience and have initially identified three strands of development:

- **Personalised Learning Plans (PLP):** Support for the process of learning through mapped routes from a starting point to the achievement of individual goals, for example completing frameworks, or gaining sustainable employment. ULCC have developed a plug-in solution for Moodle to manage PLPs.

Thanks to Nate Angell’s Blog Post
Note: The following evaluation and conclusions were only based on about 30 minutes of playing with each of these applications. It is brainstorming and **nothing more**. That means that this is not very scientific and should absolutely **not** be used to guide institutional major investments or strategic directions.

But *at the same time*, how long will students tolerate learning a user interface that theoretically was built for them.

Take all of this with a grain of salt - its intent is to make you think not give you conclusions. This section is for entertainment purposes only.
Moodle Portfolio
Elgg- It is clearly about “you”

Elgg is social software
Elgg - where you fit...

Charles Severance :: 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.
Puts ePortfolio Owners in Control

Established in 2006, Mahara is the result of a collaborative venture funded by New Zealand’s Tertiary Education Commission’s e-Learning Collaborative Development Fund (eCDF), involving Massey University, Auckland University of Technology, The Open Polytechnic of New Zealand and Victoria University of Wellington.

Mahara is a fully featured open source electronic portfolio, weblog, resume builder and social networking system, connecting users and creating online communities. Mahara is designed to provide users with the tools to demonstrate their life-long learning, skills and development over time to selected audiences.

Meaning ‘think’ or ‘thought’ in Te Reo Maori, the name reflects the project’s dedication to creating a user-centred life-long learning and development application as well as the belief that technology solutions cannot be developed outside the considerations of pedagogy and policy.

Mahara is provided freely as Open Source software (under the GNU General Public License). In brief, this means that you are allowed to copy, use and modify Mahara provided you agree to:

- provide the source code to others;
- not modify or remove the original license and copyrights, and
- apply this same license to any derivative.

IN THE NEWS...

- **Mahara 1.0.0 Released**
  2 April 2009
  Mahara 1.0.0 has been released! This landmark release contains many great new features over the 0.9 series.
  more

- **Mahara 1.0.0rc1 Released**
  28 March 2009
  Mahara 1.0.0rc1 has been released, containing many bug fixes and improvements, especially to browser support.
  more

- **Mahara 1.0.0beta2 Released**
  7 March 2008
  Mahara 1.0.0beta2 has been released, which contains the new theme and many bug fixes and improvements.
  more
Mahara - “My Portfolio”

ULCC Portfolio Evaluation
Mahara 1.0.0

My Views

A VIEW

Edit view details

Edit view access
Nobody can see this view

First View

Edit view details

Edit view access
Nobody can see this view

2 views
Mahara - Artifacts

Edit View "A VIEW"

- Blogs (3)
- External feeds (1)
- Files, images and video (5)
- General (1)
- Profile (2)
- Resumé (2)

- External Video
  - Embed Youtube/Google videos
- File(s) to Download
  - Select files for people to download
- A folder
  - A single folder from your Files area
- An image
  - A single image from your Files area

- Embedded media
Mahara - Artifacts
Up Next-Functionality Mashup

ULCC Portfolio Evaluation
Mahara 1.0.0

Edit View "A VIEW"

- Blogs (3)
- External feeds (1)
- Files, images and video (5)
- General (1)
- Profile (2)
- Resumé (2)

- External Video
  - Embed Youtube/Google videos

- File(s) to Download
  - Select files for people to download

- A folder
  - A single folder from your Files area

- An image
  - A single image from your Files area

Embedded media
Functionality/Resource Mashup

Distributed Provisioning for Teaching and Learning Software
Functionality Mash up

- Functionality Mash up is the ability to pull a program into another program under end-user control.
- Functionality Mash up is not just read-only - the mashed up application will need sufficient access to services in the aggregating system to be able to provide rich and dynamic features.
- Functionality mash up includes identity, context, roles, and data interchange.
Which Star Trek Personality Are You?

Are you a fearless leader like Captain Kirk? Or are you a crazy, hard drinking Scotsman like Chief Engineer Scotty?
Add Which Star Trek Personality Are You? to your Facebook account?

Allow this application to:

- Know who I am and access my information
- Put a box in my profile
- Place a link in my left-hand navigation
- Publish stories in my News Feed and Mini-Feed
- Place a link below the profile picture on any profile
- Send me notifications via email

Which Star Trek Personality Are You? was not created by Facebook. By clicking 'add,' you agree to the Platform Application Terms of Use.

Add Which Star Trek Personality Are You?

or cancel
Bodington / Leeds

- Bodington (www.bodington.org) is an LMS developed by Leeds, Manchester, Oxford, and University of the Highlands and Islands.
- Bodington uses a variant of Shibboleth called GuanXI to mash up functionality.
- Leeds has done extensive experimentation with functionality mash up.
"I certainly don't see the VLE or LMS continuing in the form that they currently are, where you have a monolithic application with lots and lots of different tools presented to teachers and students. You very quickly come to the limits of any tool that you use. The answer is to abandon the tool you have been using and to swap in another tool. Now I can see a situation where you extend this from a single tool to all of the tools of an LMS. I can see a situation where the VLE or LMS actually shrinks to a container into which you plug these learning tools". (Dr. Aggie Booth, Leeds University, 2007)
Functionality Mash Up
Future – Learning

Flikr, Google, YouTube, Merlot, delio.us
IMS Learning Tools
Interoperability 2.0

Building the Standards for Learning
Functionality Mashup
IMS Tool Interoperability

- A standard which is currently under development by IMS (www.imsglobal.org) for functionality mash up
- Effectively provides Facebook-like capabilities for learning management systems
- Read-write access from a tool to the LMS
IMSTools Interoperability 1.0

- Demonstrated at IMS Alt-I-Lab 2005 in Sheffield, England
- Blackboard, Sakai, WebCT, Moodle, Samigo, ConceptTutor
IMS Learning Tool
Interoperability 2.0

• Currently in Development
• Specification Leads
  • Bruno van Haetsdaele - Wimba
  • Chris Moffatt - Microsoft
• Learning Functionality Mash Up
• Integrated into “Add Resource” in learning systems
Caveat: This section discusses a specification still under development - anything can change as the specification progresses.
Scenarios

- IMS LTI 2.0 tool installed by the administrator - end-users don’t even realize the tool is hosted externally
- IMS LTI 2.0 generic tool available to instructors - to be placed and configured Mash-Up style (like a general-purpose RSS reader or web-content tool)
- An IMS LTI 2.0 tool is placed when a publisher cartridge is loaded - often these are partially provisioned
Virtual Tool - Admin Install

- Administrator installs a proxy tool and makes it available as a regular tool
- Administrator configures services “sandbox” for the remote tool - exchange of key material
  - Tool may have permission to connect asynchronously
  - Tool may have permission to places “resources” - instances of itself
Instructor MashUp - YouTube

• Instructor creates some learning object in an external service (freelearningsoftware.com)
• The service presents a URL + password
• The instructor pastes this information into an LTI Consumer Tool in the LMS
Instructor MashUp - SandBox

- For instructor mash up - the Instructor configures the ”sandbox” at the time of mash up
- The admin can set an inherited “sandbox” for all instructor-placed tools.
Common Cartridge

• Scenario 1: Content points to a pre-trusted host such as content.pearson.com - administrator has a sandbox pre-configured for tools that point to the pre-trusted host
• Scenario 2: When there is no pre-arranged trust/sandbox - a placement from a cartridge behaves as an instructor-placed IMS LTI proxy tool.
Case Study: UM.SiteMaker
www.gvcsitemaker.com

• SiteMaker is a simple, end-user tool to build web sites
• Database capability called “data tables”
• Combination of power and simplicity
• Written in Apple’s Web Objects by Michigan
• Now has its own open source community and commercial vendor
• Should we rewrite SiteMaker in Sakai? No.
Sakai / Sitemaker Integration

- Launching via IMS LTI 2.0 (an early draft)
- Experiment in the ease of workflow of mashing a tool up
- Model: YouTube - “paste this HTML”
- Production: Fall 2008
Configure Access Groups

Group Name:  (required)
Group Location:  (required)

Groups in use

<table>
<thead>
<tr>
<th>Group Name</th>
<th>Action</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote Participants</td>
<td>View/Configure</td>
<td>In Use</td>
</tr>
<tr>
<td>Remote Group</td>
<td>View/Configure</td>
<td>In Use</td>
</tr>
<tr>
<td>Site Owner/Co-owners</td>
<td>View/Configure</td>
<td>In Use</td>
</tr>
<tr>
<td>Local Group</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The users listed in the Site Owner/Co-owners group above have permission to configure this website. You may add additional users who will be considered site co-owners. You may also remove any co-owners from this list. The site owner can only be changed by an administrator.
Revise Access Group

Group Name: (required)
Remote Participation Password: (leave blank to deny access)
Select Style:

Remote Participants

Use this URL in remote system:
http://192.168.0.8/apps/WebObjects/GVCSiteMaker.woa/wa/lLaunch?site=lti.demo
Kol Halev in Argentina - Part 1

This video was taken during our concert in Rosario, Argentina, during the summer of 2007. The trip was a very rewarding experience, both for Kol Halev and for each of the communitites that we visited.

Comments  Add Comment

I found the music to be spirited, and very heartfelt. Very commendable for the group...
IMS Learning Tools
Interoperability Demonstration

• IMS Learning Impact

• May 12-16, 2008, Austin, TX, USA

• http://www.imsglobal.org/
IMS Developer Network

- My task is to develop the IMS Developer Network
- Improve “in-the-field” availability of standards-compliant implementations
- Develop reusable bits / sample code / test code
- Work with and go-between developers implementing IMS Specs in their products
Sakai / IMS
Google Summer of Code
Update: Sakai and IMS are very pleased to have been selected for Google Summer of code 2008. We are now in the phase of the process where students and mentors interact and get to know each other better. Students applications are accepted by Google from March 24 - March 31. Students interested in working Sakai should read this entire page paying particular attention to the Ideas section below. If you have any questions, you should feel free to contact Dr. Chuck directly.

This Summer of Code 2008 ideas page centers around the notion of building open source reference implementations in a number of Learning Management Systems and environments for the IMS Learning Tool Interoperability specification which is under development.

IMS LTI has the potential to dramatically transform the use of technology in education. With IMS LTI, teachers and students will be able to use a wide variety of tools in their teaching and learning - not just the tools installed in their centrally installed learning management system. In addition, IMS LTI has the potential to put learners in charge of their own learning over their lifetime. The hope is to make the mash-up of teaching and learning tools as simple as placing the Google and YouTube videos on this page.

Presentation: Breaking Down Barriers Between Learning Systems
December 17, 2007, Open University, Milton Keynes UK
General Idea

• Build many different implementations of IMS Tool Interoperability

• Variations on a theme - think beyond just learning management systems

• Try to create an initial body of work to make it worth while to build tools using IMS Tool Interoperability
Proposed Project Ideas

- Sakai
- Consumer
- Producer
- Moodle
- Consumer
- Producer
- Atutor
- Elgg

- Chisimba
- Drupal
- Google Android
- Rails IMS TI Test Kit
- Consumer
- Producer
- Proxied access

Consumer = LMS  Producer = Tool
Applying for a Google SoC at few hours to deadline

Today have been a strange day.

This morning I entered to my boss office like every Monday: we usually make the working planning for all week and also we meet some of his grad students that need help, orientation or (even) more work.

Today was a little different, we had a Campus project meeting at 9h. So we talk about weekend, music and finally about work (not too much). We also attended Gonzalo, he wanted to explain us last improvements that he have made to the WikiBook.

I don’t know what time was when we left FIB (at UPC north campus) to take the bus to the UOC buildings but I’m sure about one thing, we were late.

When we arrived to the meeting Pablo Casado was speaking about problems they faced during the implementation of BPM tool and we discussed about the chosen solution. After

Jordi Piguillem Poch / Marc Alier
Sakai / IMS
Google Summer of Code

• Funded Applications
  • An IMS LTI Producer for Sakai - Katherine Edwards, McGill University
  • An IMS LTI Producer for Moodle - Jordi Piguillem Poch - Universitat Politècnica de Catalunya
  • Improving Sakai’s Presence Capability - Eli Foley - Georgia Tech
Coming back to earth...

We can never get too excited about the ultimate future and lose track of the immediate future.
Serving the institutions and teachers are problems we need to solve today.
MyCamTools - Cambridge University

Adding a Personalized View to Sakai
Cambridge University is experimenting with a new interface to Sakai which is focused on giving the users more control over their interaction with Sakai.

Users also have more flexibility with widgets which provide dashboard information outside of Sakai in the interface of their choosing.
Sakai CamTools Widgets

- Wherever the user wants to learn - meet them there.
Moodle 2.0 Roadmap

- File API - internal repository of files and access controls
- Repository API - allows users to browse external repositories
- Portfolio API - allows Moodle content to be pushed to repositories.
- Learner plans and competencies
- Builds on 1.9 support for outcomes so that individuals can have learning plans which are updated when courses are completed
- Standard Web Services Layer
In reality everything is going in every direction.

Much like boiling water..
A lot of topics

- Looking back at looking forward (2004)
- Student-Centered Learning
- What will the “next” LMS look like?
- IMS Learning Tool Interoperability 2.0
- Sakai/IMS Google Summer of Code
- Looking ahead in Sakai and Moodle
Summary

- Open Source Learning Management Systems such as Moodle and Sakai are just the appetizer
- True innovation will happen with the exchange of ideas and new ways of thinking about teaching
- We are approaching the “boiling point” in teaching and learning