CloudSocial: A New Approach to Enabling Open Content for Broad Reuse

Charles Severance, Ted Hanss, Joseph Hardin
University of Michigan

February 6, 2009
Disclaimer

Report on nascent projects....
Outline

• Connecting the LMS and OER - A brief history
• University of Michigan Medical School - Beyond the LMS
• CloudSocial - www.cloudsocial.org
• IMS Standards - www.imsglobal.org
• CloudCollab - www.cloudcollab.com
• Summary

Warning: This is all under construction
Timeline

- 2002 - 2003 - Joseph/Chuck - Experimenting in LMS
- 2004 - 2006 - Joseph/Chuck Sakai Project
- **Joseph’s obsession:** Better Flow between LMS and OER
- 2006 - Present - Joseph/Ted - OER open.umich.edu
- 2007 - Present - Next Generation LMS - Michigan Medical School
- 2007 - Present - Chuck is Teaching Full Time
- 2008 - Present - Chuck works part time for IMS
A Content Pipeline – Linking Sakai CMS & OCW

Publication Pipeline:
Digital Course Materials:
1. Translating from CMS(s)
2. Creation
3. Vetting
4. Standardizing
5. Increasing Production Values
6. IP Management

One-on-One with Faculty: (2), (3), (5), (6)
Staff at Department Level

What Student Sees – Really, a Bunch of Stuff

Some:
(2) Creation
(5) IP Values

UM OCW Web Site
Very High Production Values

What World Sees – Re-use Targeted
This won’t scale. At some point - success leads to failure. Moving the data into and out of the LMS is a bad plan.
Brainstorming
Beyond the LMS
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.
Learning Management System: Self-regulated Learning Model

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

Personal Portfolio
- Series of folders, at least w/ student access only
- Customizable
- Personal representation learning/aspirations
- Journaling
- Repository (e.g., 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
Next Generation LMS

• Self Regulated Learning

• A blending of the individual needs and the institutional needs

• LMS cannot constrict content

• Lifelong Education

• Competency tracking across courses and throughout life

• Portfolio is implicit

• Informal and formal learning

• Support for ad hoc learning

• Support for setting personal goals

• Open Educational Resources are foundational

• Don’t worry about resources

• We know this takes time - we are patient
• Met **every two weeks** with Dean, Faculty, Educational Designers, Open Michigan staff, Software Developers

• Brainstormed - Gave presentations, shared big ideas

• Installed and **played with LMS/Portfolio Systems**: Sakai, Moodle, LAMS, Mulhara, Pebble - debated strengths and weaknesses

• Summer 2008: Dean Fantone said, “**Enough Talking!**”
Conclusion from Brainstorm

• The scope of this was the entire web - it was not one application
• PubMed - we cannot pull that into an LMS
• Google Searches and random surfing to learn
• If we wanted to build software - it had to be “everywhere” - it had to follow the user as they went around the web
• Our software needed to be an “assistant” - the Microsoft “paperclip”
The Dean’s Challenge

• **Advanced Medical Therapeutics Course** - Fourth Year Students

• **Four weeks** - nearly all online - well produced web content

• Often done from hotel rooms while students interview for internships

• What could we do with that course?

• Failure *was* an option - we should push it and risk it
M4 Therapeutics: Overview and Syllabus

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Video</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Overview (Student Perspective)</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Course Introduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online Modules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seminars</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Individual Research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grading (Quizzes, Projects, Seminars)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Syllabus</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week Dates</td>
<td></td>
</tr>
<tr>
<td>Wk 1</td>
<td>Nov 24-Nov 30</td>
</tr>
<tr>
<td></td>
<td>Drug Development • ENT • GI • Infections I • Respiratory</td>
</tr>
<tr>
<td>Wk 2</td>
<td>Dec 1-7</td>
</tr>
<tr>
<td></td>
<td>Geriatrics • Infections II • Pain Management • Polypharmacy • Prescription Writing • Transfusion &amp; Thrombosis</td>
</tr>
<tr>
<td>Wk 3</td>
<td>Dec 8-14</td>
</tr>
<tr>
<td></td>
<td>Diabetes • Direct-to-Consumer Drug Advertising • PM &amp; R • Psychiatry • Seizure</td>
</tr>
<tr>
<td>Wk 4</td>
<td>Dec 15-21</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular • Pharmacogenetics • Electrolyte Disturbances • OB/GYN</td>
</tr>
</tbody>
</table>

Online Content
Sandro Cindi, M.D.

Tools:
- Tracking / Presence
- Comment / Twitter
- NotePad
- ToDo List
- Question/Answer
- Quiz Tracking
Results of First Pilot

• **Good News**
  - Everything worked technically
  - Faculty *loved* the idea
  - Students *loved* the idea
  - The **TODO** was the most popular tool
  - We learned a lot - terrific feedback

• **Bad News**
  - Students work very much alone and at weird times
  - Their time perspective was - “get this over with as quickly as possible”
  - **No time** to ask a question and get an answer
  - No time to care what other students were thinking
Positive Effects

- Forced us to deploy CloudSocial in production
- Built PHP Framework to allow a new tool to be written in 2 days and a new feature to be added in a few hours
- Validated technical the “Tool Mashup” protocol was sound
- Proved that we “caused no harm” - Medical School is more confident
- Changed our perspective from “will this work” to “what can we do”
Next Steps

• Longitudinal Case Study Course
  • No prepared web content
  • Group work - 12 groups with faculty mentors
  • Use Google, PubMed, whatever they find
  • Looking at ShiftSpace.org

• Open Content Anatomy Web Site
  • Used heavily by students in Year 1
  • Used from many different directions
  • Large, intricate body of valuable content
  • Mostly freely available on the web
  • OER-like
CloudSocial
(aka “the paperclip”)
www.cloudsocial.org
Content Owner adds CloudSocial Run Time to the Content.

Instrutor picks tools for their course. Tools can come from any learning system.

When the page loads, the CloudSocial run time reads tool list and displays menu.

<script type="text/javascript" src="http://www.cloudsocial.net/js/ile-main.js"/>
<script type="text/javascript">ile_init("ILE_33936-10-27_KEY");</script>
CloudSocial Agenda

- Stop creating/editing content in Learning Management Systems
- Stop creating content for a particular course
- Create contextualize resources - put them on the web with decent URLs to the page level - Add the CloudSocial RunTime to all pages
- Contextualize your own material for your students using CloudSocial *the first time you teach*
- New Problem: How to best Collectively Create and Manage Materials
CloudSocial Agenda

• Stop creating/editing content in Learning Management Systems
• Stop creating content for a particular course
• Create contextualized resources - put them on the web with decent URLs to the page level - Add the CloudSocial RunTime to all pages
• Contextualize your own material for your students using CloudSocial *the first time you teach*

New Problem: How to best Collectively Create and Manage Materials

“Create Globally, Educate Locally --- www.cnx.org”
Trends in Teaching and Learning

- Move toward the “web” as the source of learning content
- Move toward open participatory learning and open educational resources
- A hybrid approach towards learning where organizational boundaries and educational structure is less clear
- Move toward social learning - learning and exploring with groups
Making Content the Focus

- Content lives on the web - on any server using any technology
- Instead of moving the content into lots of LMS systems...

- Bring your LMS systems “with you” as you visit different sources of content on the Internet
CloudSocial.org

- CloudSocial is not an LMS
- CloudSocial acts as an intermediary between content owners and learning systems
- CloudSocial allows any LMS to embed itself in content for learners who visit that content launched from their LMS
- CloudSocial does not touch, store, or handle learning activity data - learning activity data remains on the LMS systems which provide the tools
Inverting the Content/LMS

• Today we focus on putting Content into as Many LMS systems as possible

• In the future there will be many sources of content - not just LMS systems - it will be hard to get interchange formats working in all these systems (including legacy)

• So lets put the LMS Into the Content.
Least Squares

Module by: C.J. Ganier

Summary: Describes the use of the least squares method for matrix analysis.

Introduction

We learned in the previous chapter that $Ax=b$ need not possess a solution when the number of rows of $A$ exceeds its rank, i.e., $r < m$. As this situation arises quite often in practice, typically in the guise of 'more equations than unknowns,' we establish a rationale for the absurdity $Ax=b$. 
First Launch

Content Server

Redirect

wikipedia tcp.htm

GET

CloudSocial Session Established

Launch

“LMS” System

Tool

Tool

Tool

Config

CloudSocial Session Established
Technical Steps

- User selects external content from within the LMS (or other system supporting groups of people)
- LMS contacts CloudSocial servers and establishes session context for user/course/institution combination
- User is redirected to the content
- Content contacts CloudSocial servers using Ajax/JavaScript and pulls down menu for course and displays
Tool Context

- CloudSocial maintains context for the tools
- Institution / Course / Role / User / Page
- Page context is optional
Learning Tools in the Cloud

- The CloudSocial servers only hold a tiny bit of tool configuration for a course - they are not the “LMS”

- If done properly, the tools that follow the user around the web can be running back on their campus.

- Think of a toolset from each of the major LMS vendors - this insures that sensitive data stays “back home” - and that the user experience is consistent with the rest of their learning

- The “embedded Moodle” toolset (kind of like Moodle blocks)
Underlying Technology

- This is all based on **IMS Learning Tools Interoperability (LTI)**
- LMS Launch into CloudSocial uses LTI
- **CloudSocial launching** to individual tools uses LTI
- This means that a piece of content can be used with **any LMS** that makes its tools available over IMS Learning Tools Interoperability.
- A mix of tools can be supported
IMS Standards

Dr. Charles Severance
Developer Network Coordinator
IMS Global Learning Consortium
cseverance@imsglobal.org
Two IMS Standards

- **IMS Learning Tools Interoperability** - Tool “mash up”
  - User Identity, Course, Roster, Role
  - Run-Time Services
- **IMS Common Cartridge** - Course Import/Export/Exchange
  - Web Content, Discussion Forums, QTI Materials, and LTI (soon)
  - LTI in Common Cartridge allows large/high-value content to be referenced rather than included
IMS Developer Network

- Lets not just write specs - lets write code while we write specs!
- **Demos** - feedback to the spec development process
- It is a “developers network” - I call folks up and we hack
  - BlackBoard, Wimba, ANGEL Learning, Sakai, Moodle, McGraw-Hill, Pearson, Microsoft, ...
Work tracked tutorial exercises for this section of your textbook. Your work on these exercises will be tracked in your MyMathLab gradebook and study plan.

**Objective:** Use the four steps for solving a linear equation.

Solve.

\[9x + 14 = 6x - 13\]

The solution set is \(\{\}\).

(Type an integer or a simplified fraction. Type \(N\) if the solution is the empty set. Type \(R\) if the solution is all real numbers.)
The science of psychology as studied and practiced today involves five major perspectives or approaches: Neuroscience, Psychodynamic, Behavioral, Cognitive, and Humanistic. Each of the three anecdotes below is best understood by a different one of these five perspectives.

Once there was a little boy named Justin who didn’t like to take his bath. Every night, it seemed, his parents had to fight the "bathtime battle" with him. Finally, in desperation, they threatened that the next time he refused to get in the bath voluntarily, they would simply throw him in, fully clothed. Justin, of course, called their "bluff" and resisted as usual. The parents followed through and threw him into the bathwater with all his clothes on. Justin was shocked and enraged! But, he never fought his parents on the bath issue again.
This is a multi-player simulation that allows a group to run the "Free Rider" simulation from the "Wisdom of Crowds" book by Jams Suroweiki.

Hello: admin@nomail.xy (Instructor) from CF101

Reset  Join

Chips To Put in The Pot: 0

Submit

Game has not started
Current pot total: 0

In this game, there are four turns. In each turn you can give any amount of your tokens. At the end of each round, the pot is multiplied by 1.6 and divided amongst the players.
Hello: csev@umich.edu (Instructor) from SI 301 W09

Chips To Put in The Pot: _____________

Submit

Game has not started
Current pot total: 0

In this game, there are four turns. In each turn you can give any amount of your tokens. At the end of each round, the pot is multiplied by 1.6 and divided amongst the players.

This is my “Clicker”
IMSM Advertisement

• IMS needs more academic participation

• Specification development is members-only because we effectively do it all under mutual NDA - It is kind of fun, actually

• But we feel that this is the only way to align interoperability and data interchange specs on “Day One”

www.imsglobal.org
CloudCollab
Yet Another Open Source Learning Management System
www.cloudcollab.com
CloudCollab Differences

• Written in Python - Hosted on Google App Engine for free - so every teacher and student can have their *own* LMS in production ....

• Intends to be reference implementation of IMS Standards

• Multi-Tenancy Capable using IMS LTI - Can host tool instances for multiple LMS systems, multiple courses, and multiple organizations

• Flexibility: Can be a LTI “tool container”, personal learning environment, small group LMS, small school LMS
Hello: csev@umich.edu (Instructor) from SI300

Please enter a valid, numeric guess

Enter Guess: 

Enter Name (opt): 

Submit

Average: 433 Count: 2

Sean Mehan, 300
csev@umich.edu, 567

Simple Learning Tools Interoperability
IMS Learning Tools Interoperability v2.0 Working Group
© 2009 Charles Severance All Rights Reserved.
More CloudCollab Differences

- Tool Development is simple - Framework takes care of the detail
- Wisdom of Crowd guessing tool: 110 lines of Python (includes data models) and 21 lines of HTML.
- O’Reilly Book: “Building Cloud Applications with Google AppEngine”
- May 2009
- Early version at www.appenginelearn.com
Learning the Google Application Engine

This site provides materials to help learn the Google Application Engine. Before you start to learn the Google Application Engine you should be basically familiar with the Python programming language.

New: You can take a look at the draft book chapters for my upcoming O'Reilly AppEngine book titled, "Building Cloud Applications with Google AppEngine".

- Installing Python and JEdit - We recommend using JEdit as your programmer editor and it will be used throughout the Podcasts.
- Installing the Application Engine and writing your first Application.
  - Macintosh: (Handout, Source Code, Screencast, YouTube)
  - Windows Vista: (Handout, Source Code, High Quality Screencast, YouTube)
  - Windows XP: (Handout, Source Code, Screencast, and YouTube)
- The Request Dumper Program - dumps out the HTTP Request Data (Handout, Source Code, Screencast, YouTube)
- A Basic Web Application for for the Google Application Engine (Handout, Source Code, Screencast, YouTube)
CloudCollab Summary

- Very early days - 4000 lines of code - 1 developer

- Two tools - both games for my Social Computing Course :)

- I am not in a rush - My main goal is that I work to make development is easy - testing with grad students who have 1 programming course

- www.cloudcollab.com

- wiscrowd.appspot.com - Demo server
Overall Summary
Distributed Learning Operating System

• The same content can be used by millions of students simultaneously - with each having a view that is controlled by their “course”

• A course launched from Moodle (or any LMS) could use Moodle tools

• The learning data can be kept exclusively on a campus’s servers to comply with legal issues

• At the same time these launches can come from other social systems like LinkedIn or Facebook
Looking Ahead

- Build and harden the technology
- Document the technology for ease of use and development
- Deploy CloudSocial services in a **consortium model** that is trusted and seen to be “owned by all” - like handle.net
- Convince content owners to use the technology
- Make it easy to build new tools that can plug in
Possible Content Partners

- Individual faculty members
- open.umich.edu
- Commercial Publishers
- ConneXions

- EduCommons
- MIT OCW
- Wikipedia
- ???
My Approach

- I am a faculty member and IMS Consultant - I do this in my spare time
- **This is fun** - there is no rush
- I am involving lots of students
- I want to stay ahead of the hype curve
- I want **a few good collaborators** who can help make it right
Thanks


- Joseph Hardin, Ted Hanss, Joe Fantone, Casey White, Raj Mangrulkar, Chris Chapman, Mike Bleed, Gaurav Bhatnagar, Noah Botimer, Ali Asad Lotia, Clint Newsome, Eileen Quintero, Amanda Visconti
Summary

• CloudSocial inverts the relationship between content and LMS
• Put the LMS into the Content instead of putting the content into the LMS
• Allows millions of learners independently walking through the same content simultaneously viewing the material from different contexts
• This is at the formative stage - many paths forward

http://groups.google.com/group/cloudsocial