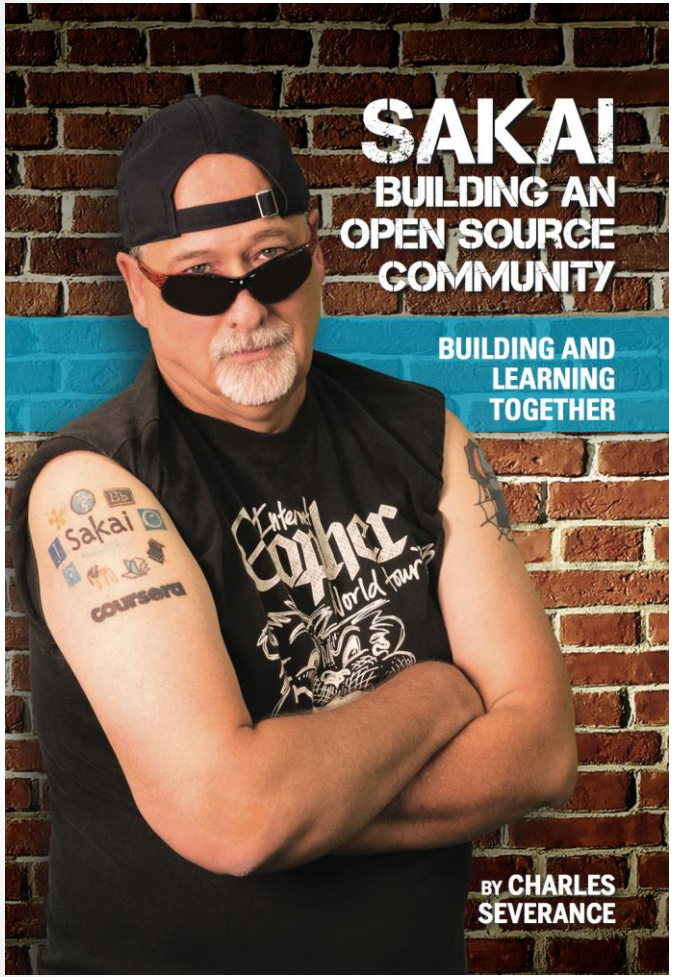
Building the Next Generation Teaching and Learning Environment

Charles Severance
University of Michigan School of Information
Sakai PMC Chair



Enterprise Learning Management System (LMS)

Been there – done that – got the tattoo.. But…

http://planet-fall.deviantart.com/art/The-Monolith-80407794

Enterprise Solutions

- Campus-wide Learning Management Systems
  - Sakai, Canvas, Moodle, Blackboard, Desire2Learn… 100s more
- Learning Object Repositories
  - Canvas Commons, Blackboard xpLor, MERLOT
- Massive Publishers
  - Pearson, McGraw-Hill, K12.com
  - MIT Open Courseware, etc
  - Coursera, Udacity, Lynda, Udemy, edX

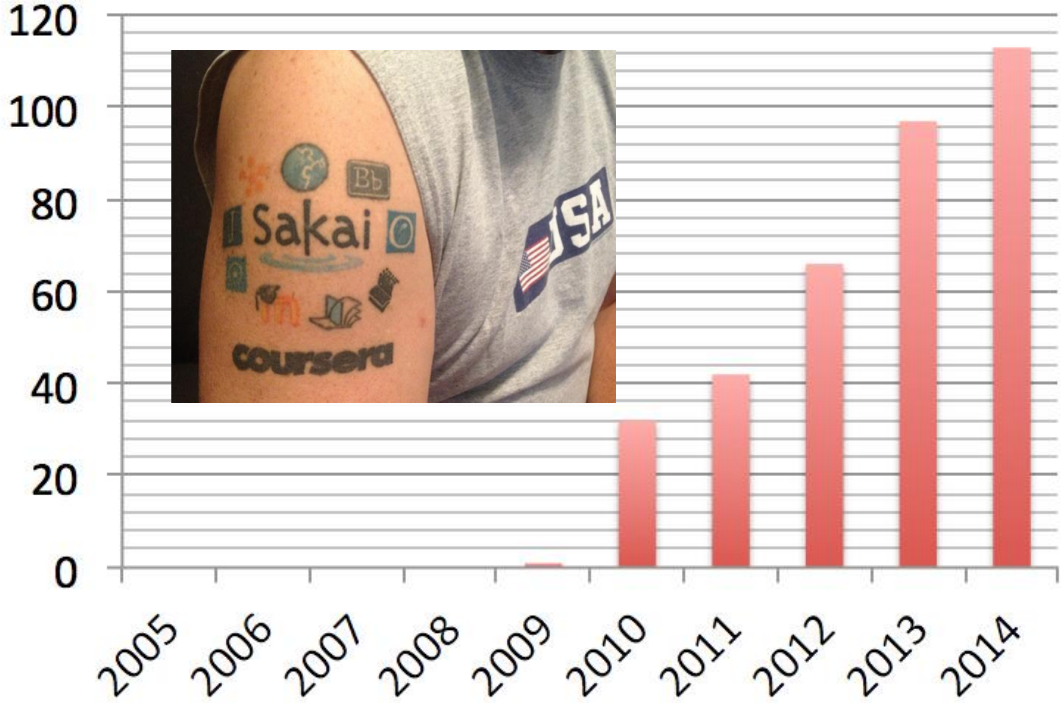
ONE-SIZE FITS ALL
STORE
SALE

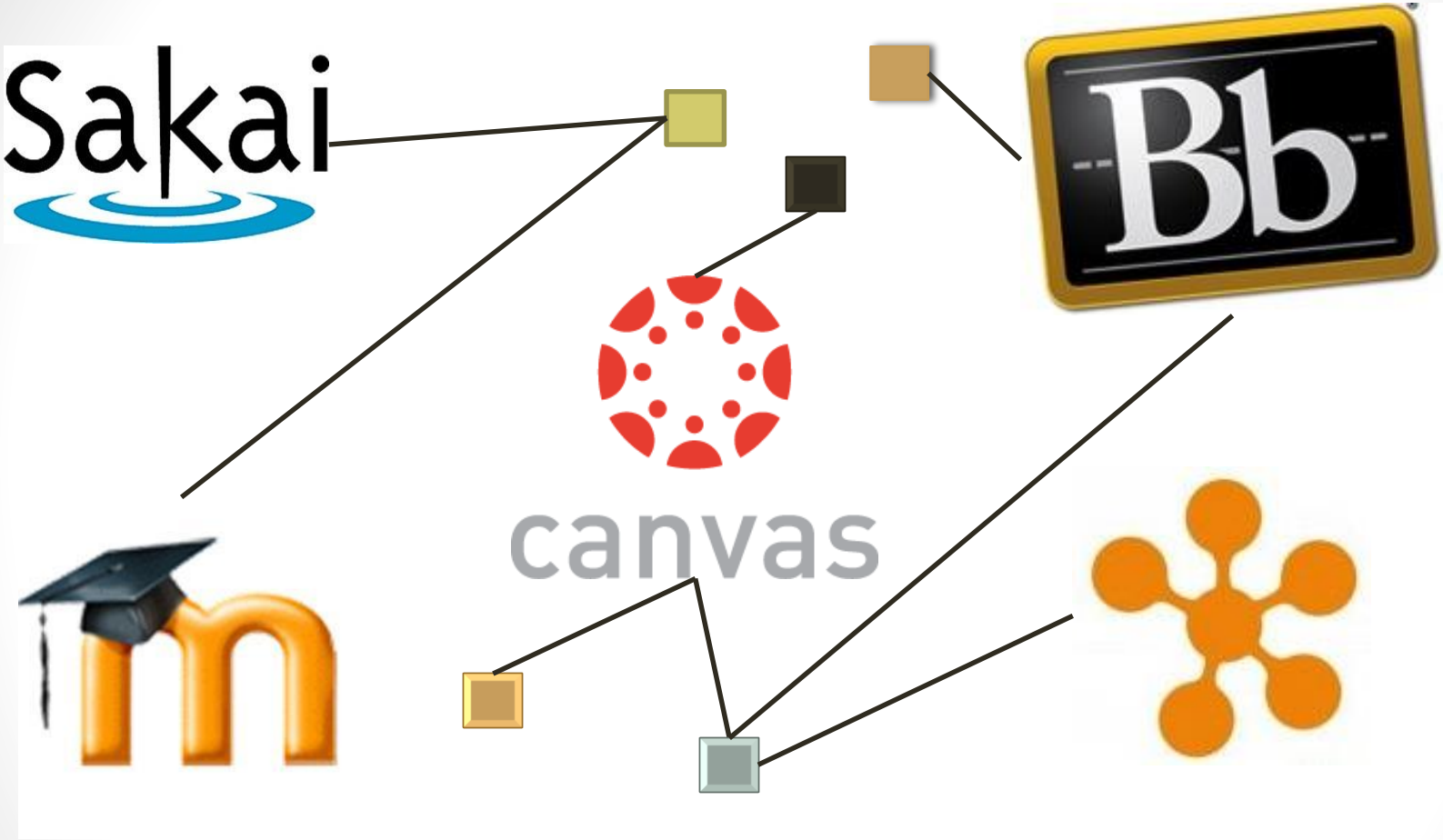
Standards 1.0

- IMS Learning Tools Interoperability (LTI) 1.0
  - 17 May 2010
- IMS Common Cartridge 1.0
  - 1 October 2008

canvas

IMS Global Conformance Certification Growth




Sakai
Bb
canvas

campuscruiser

Blackboard

learning.com

Pearson LearningStudio

Sakai

efmed

UniServity

SAFARI MONTAGE

NovoED

SAMSUNG

Google

edX

canvas

OpenClass

coursera

NUS IVLE

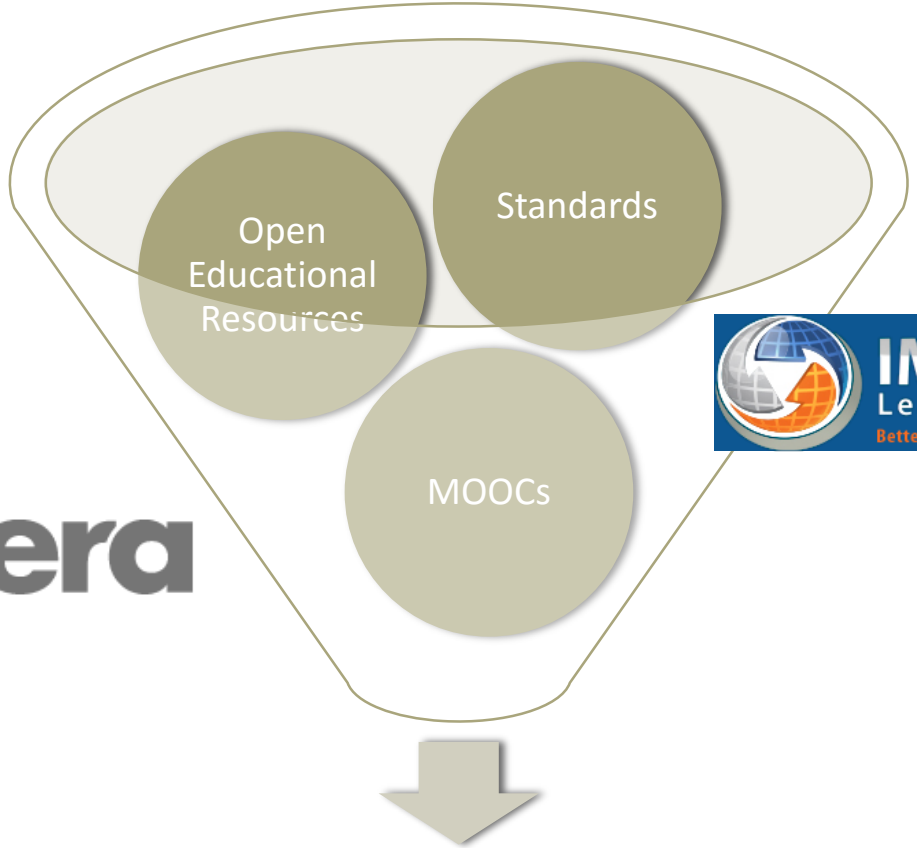
GlobalScholar

Bisk

its

EQUELLA PEARSON

ATutor



Next Generation Digital Learning Environment

EDUCAUSE | LEARNING INITIATIVE

The Next Generation Digital Learning Environment

A Report on Research

Malcolm Brown, EDUCAUSE Learning Initiative

Joanne Dehoney, EDUCAUSE

Nancy Millichap, Next Generation Learning Challenges

ELI Paper
April 2015

https://net.educause.edu/ir/library/pdf/eli3035.pdf

Abstract

In partnership with the Bill & Melinda Gates Foundation, EDUCAUSE explored the gaps between current learning management tools and a digital learning environment that could meet the changing needs of higher

NGDLE Monolith-Style

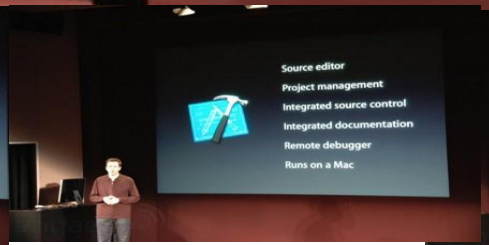
- Repositories
  - Blackboard xpLor
  - Canvas Commons
- App Store:
  - Canvas EduAppCenter
- Small LMS + App Store + Marketed to Teacher
  - Edmodo – App Store not LTI
  - Schoology – App Store with LTI

Standards Next Gen

- IMS Common Cartridge – 1.0, 1.1, 1.2, 1.3, 2.0
- IMS Learning Tools Interoperability 1.0, 1.1, 2.0, *2.1*, *2.2*
  - IMS LTI Content Item - Public Draft
  - IMS LTI Roster Services – WG Draft
  - IMS LTI Outcomes Services – in WG Draft
- IMS Caliper 1.0
- IMS OneRoster – Rest-based SIS integration
- IMS CASA App Store – Relaunching
- IMS CC / EPUB 3.0 Coordination

Source: Ian Dolphin

1,000,000
available in the catalog


Source editor
Project management
Integrated source control
Integrated documentation
Remote debugger
Runs on a Mac

Developer picks price
70% of revenues → developer
No credit card fees
No hosting fees
No marketing fees

http://planet-fall.deviantart.com/art/The-Monolith-80407794
https://pixabay.com/static/uploads/photo/2014/12/02/22/05/snowflake-554635_960_720.jpg

Easy or Not?

- Need to develop standards for interoperability
- Need to train 1000's of developers to implement the standards
- As standards improve they expand and get more complex

Easy or Not?

- Need to develop standards for interoperability
- Need to train 1000's of developers to implement the standards
- As standards improve they expand and get more complex

- Impossible?

We need "WordPerfect"

- A free downloadable off-the-shelf software package that gets people going quickly
- Allow thousands of educational sites to be built and put into production by anyone

"EduPerfect"

- An Learning Management System (LMS) of my own
- An Open Educational Resource site of my own
- A Learning Object Repository (LOR) of my own
- A Learning Record Store (LRS) of my own

- Millions of sites – millions of courses all similar with a common structure but all unique and distinct

What is Tsugi?

Software to allow anyone to build and deploy interoperable educational web sites, content, and learning tools

tsugi

TSUGI

A Framework for Building Learning Tools

Welcome to the www.tsugi.org project. Its goal is to build a scalable multi-tenant "tool" hosting environment based on the emerging IMS standards to help move the industry toward a Next Generation Digital Learning Environment (NGDLE).

View Tsugi on GitHub

Update: A Node version of the Tsugi library is emerging at https://github.com/csev/tsugi-node-sample.

- >> Video Presentation: IMS Digital Revolution
- >> Video Presentation: IMS LTI as Research
- >> Video Presentation: Tsugi Overview

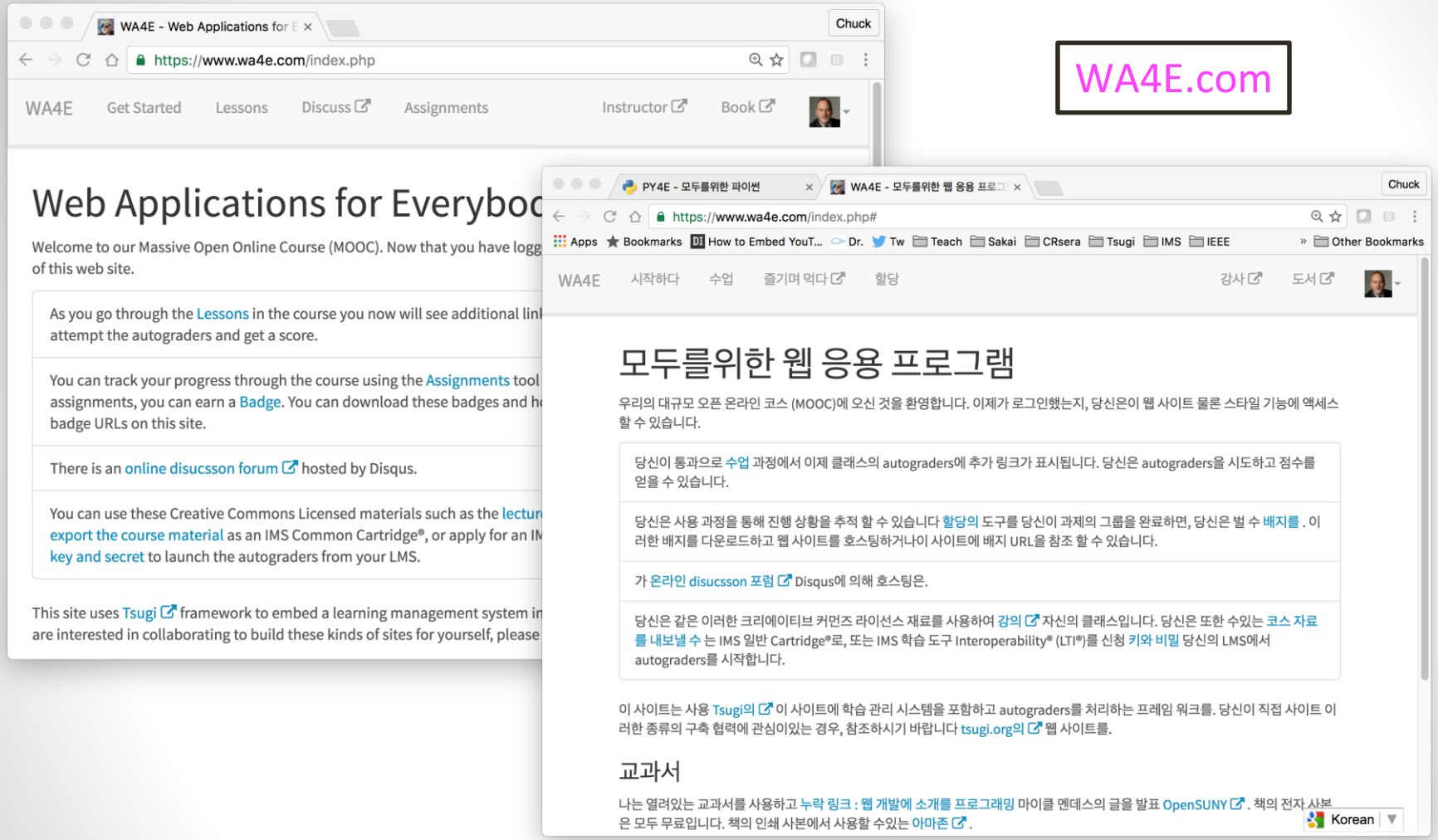
If you want to see this code actually working, you can play with the online demo:

- >> https://lti-tools.dr-chuck.com/tsugi/

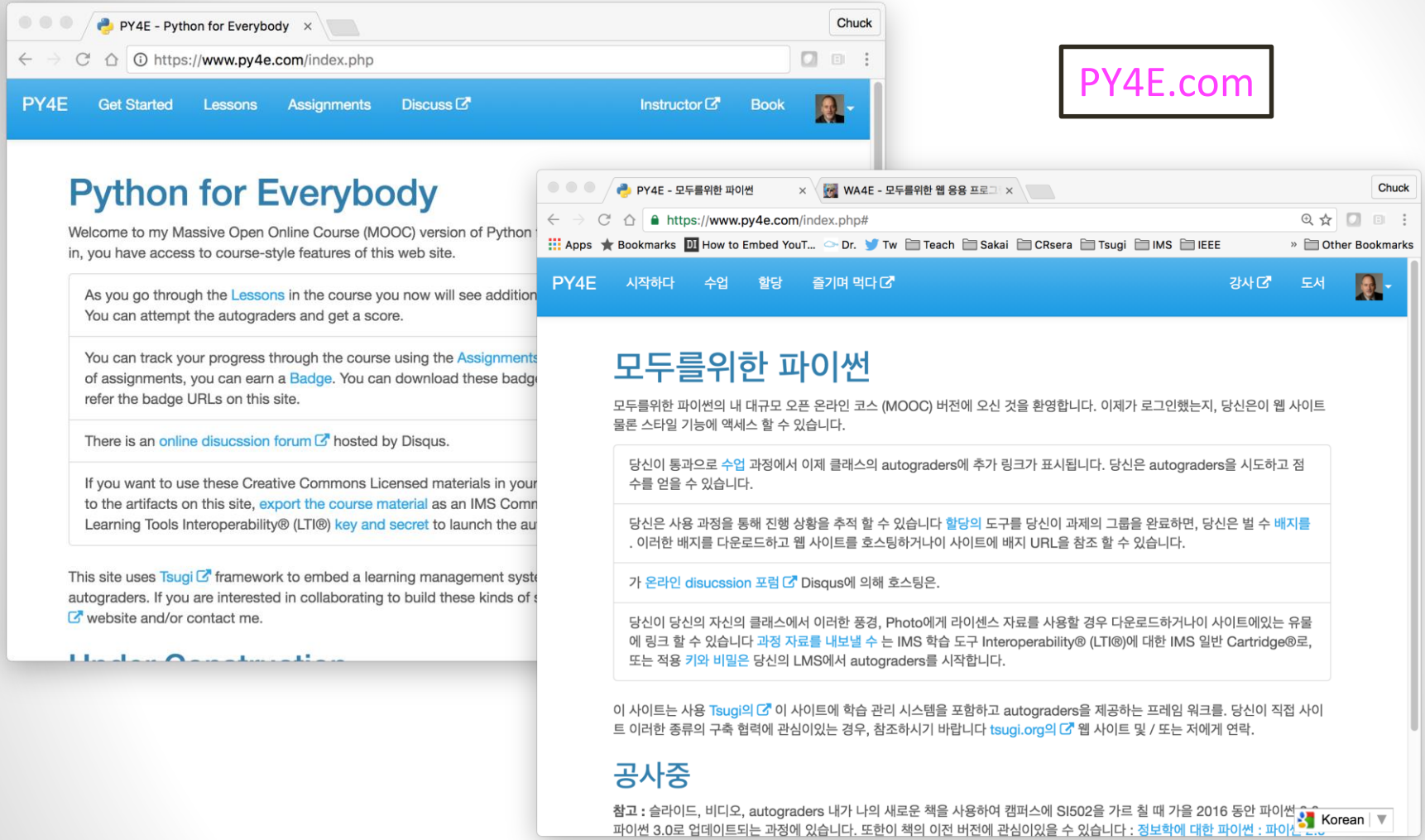
www.tsugi.org

What's in Tsugi?

- A Course-Oriented LMS
- App Store for Learning Applications
- Course-Oriented Content Repository
- API Libraries – PHP, Java, Python, Node...
  - Open source standards implementations
- Training for Developers (www.wa4e.com)


WA4E - Web Applications for E
Chuck
https://www.wa4e.com/index.php
WA4E
Get Started
Lessons
Discuss
Assignments
Instructor
Book
Web Applications for Everybod
Welcome to our Massive Open Online Course (MOOC). Now that you have logg
of this web site.
As you go through the Lessons in the course you now will see additional lin
attempt the autograders and get a score.
You can track your progress through the course using the Assignments tool
assignments, you can earn a Badge. You can download these badges and h
badge URLs on this site.
There is an online disucsson forum hosted by Disqus.
You can use these Creative Commons Licensed materials such as the lectur
export the course material as an IMS Common Cartridge®, or apply for an IM
key and secret to launch the autograders from your LMS.
This site uses Tsugi framework to embed a learning management system in
are interested in collaborating to build these kinds of sites for yourself, please
PY4E - 모두를위한 파이썬
WA4E - 모두를위한 웹 응용 프로그
Chuck
https://www.wa4e.com/index.php#
Apps
Bookmarks
How to Embed YouT...
Dr.
Tw
Teach
Sakai
CRsera
Tsugi
IMS
IEEE
Other Bookmarks
WA4E
시작하다
수업
즐기며 먹다
할당
강사
도서
모두를위한 웹 응용 프로그램
우리의 대규모 오픈 온라인 코스 (MOOC)에 오신 것을 환영합니다. 이제가 로그인했는지, 당신은이 웹 사이트 물론 스타일 기능에 액세스
할 수 있습니다.
당신이 통과으로 수업 과정에서 이제 클래스의 autograders에 추가 링크가 표시됩니다. 당신은 autograders을 시도하고 점수를
얻을 수 있습니다.
당신은 사용 과정을 통해 진행 상황을 추적 할 수 있습니다 할당의 도구를 당신이 과제의 그룹을 완료하면, 당신은 벌 수 배지를 . 이
러한 배지를 다운로드하고 웹 사이트를 호스팅하거나이 사이트에 배지 URL을 참조 할 수 있습니다.
가 온라인 disucsson 포럼 Disqus에 의해 호스팅은.
당신은 같은 이러한 크리에이티브 커먼즈 라이선스 재료를 사용하여 강의 자신의 클래스입니다. 당신은 또한 수있는 코스 자료
를 내보낼 수 는 IMS 일반 Cartridge®로, 또는 IMS 학습 도구 Interoperability® (LTI®)를 신청 키와 비밀 당신의 LMS에서
autograders를 시작합니다.
이 사이트는 사용 Tsugi의 이 사이트에 학습 관리 시스템을 포함하고 autograders를 처리하는 프레임 워크를. 당신이 직접 사이트 이
러한 종류의 구축 협력에 관심이있는 경우, 참조하시기 바랍니다 tsugi.org의 웹 사이트를.
교과서
나는 열려있는 교과서를 사용하고 누락 링크 : 웹 개발에 소개를 프로그래밍 마이클 멘데스의 글을 발표 OpenSUNY . 책의 전자 사본
은 모두 무료입니다. 책의 인쇄 사본에서 사용할 수있는 아마존 .
Korean

WA4E.com


PY4E - Python for Everybody
Chuck
https://www.py4e.com/index.php
PY4E
Get Started
Lessons
Assignments
Discuss
Instructor
Book
Python for Everybody
Welcome to my Massive Open Online Course (MOOC) version of Python
in, you have access to course-style features of this web site.
As you go through the Lessons in the course you now will see addition
You can attempt the autograders and get a score.
You can track your progress through the course using the Assignments
of assignments, you can earn a Badge. You can download these badg
refer the badge URLs on this site.
There is an online disucssion forum hosted by Disqus.
If you want to use these Creative Commons Licensed materials in your
to the artifacts on this site, export the course material as an IMS Comm
Learning Tools Interoperability® (LTI®) key and secret to launch the au
This site uses Tsugi framework to embed a learning management syste
autograders. If you are interested in collaborating to build these kinds of s
website and/or contact me.
PY4E - 모두를위한 파이썬
WA4E - 모두를위한 웹 응용 프로
Chuck
https://www.py4e.com/index.php#
Apps
Bookmarks
How to Embed YouT...
Dr.
Tw
Teach
Sakai
CRsera
Tsugi
IMS
IEEE
Other Bookmarks
PY4E
시작하다
수업
할당
즐기며 먹다
강사
도서
모두를위한 파이썬
모두를위한 파이썬의 내 대규모 오픈 온라인 코스 (MOOC) 버전에 오신 것을 환영합니다. 이제가 로그인했는지, 당신은이 웹 사이트
물론 스타일 기능에 액세스 할 수 있습니다.
당신이 통과으로 수업 과정에서 이제 클래스의 autograders에 추가 링크가 표시됩니다. 당신은 autograders을 시도하고 점
수를 얻을 수 있습니다.
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가 온라인 disucssion 포럼 Disqus에 의해 호스팅은.
당신이 당신의 자신의 클래스에서 이러한 풍경, Photo에게 라이센스 자료를 사용할 경우 다운로드하거나이 사이트에있는 유물
에 링크 할 수 있습니다 과정 자료를 내보낼 수 는 IMS 학습 도구 Interoperability® (LTI®)에 대한 IMS 일반 Cartridge®로,
또는 적용 키와 비밀은 당신의 LMS에서 autograders를 시작합니다.
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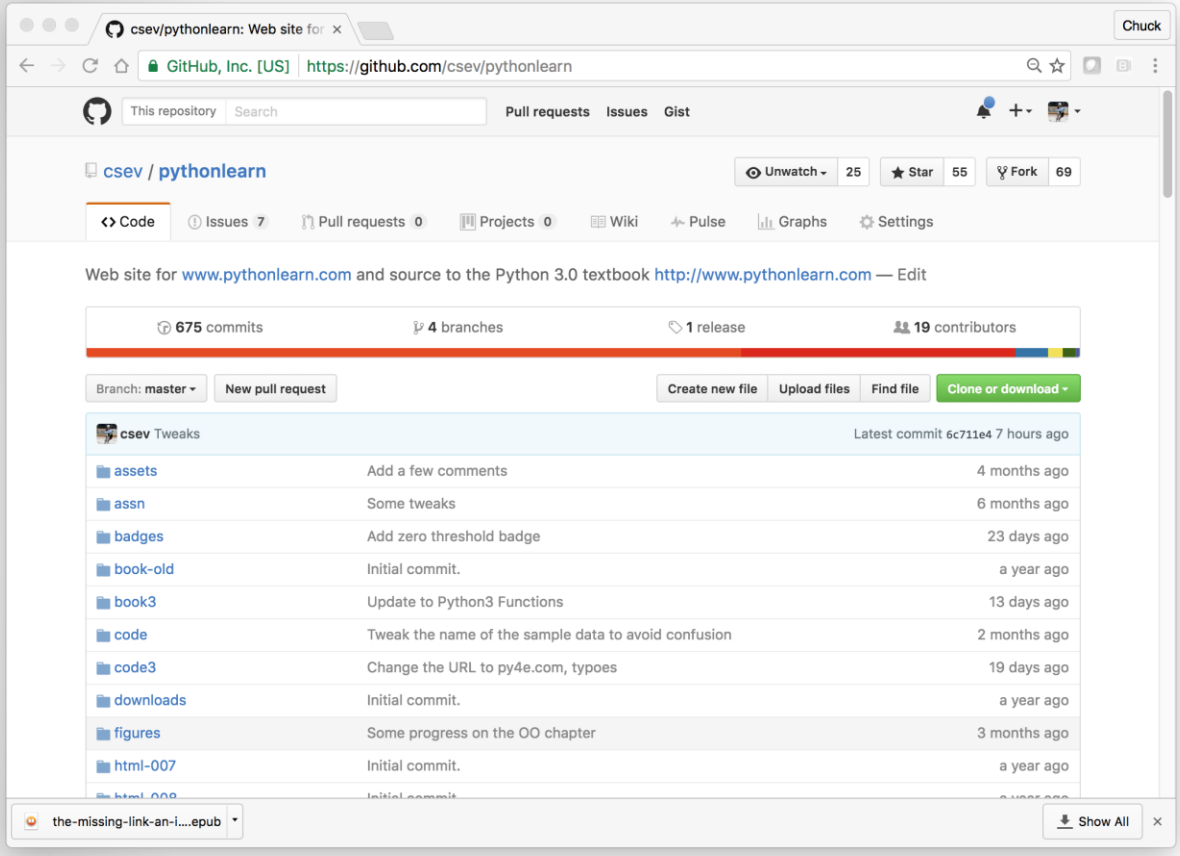
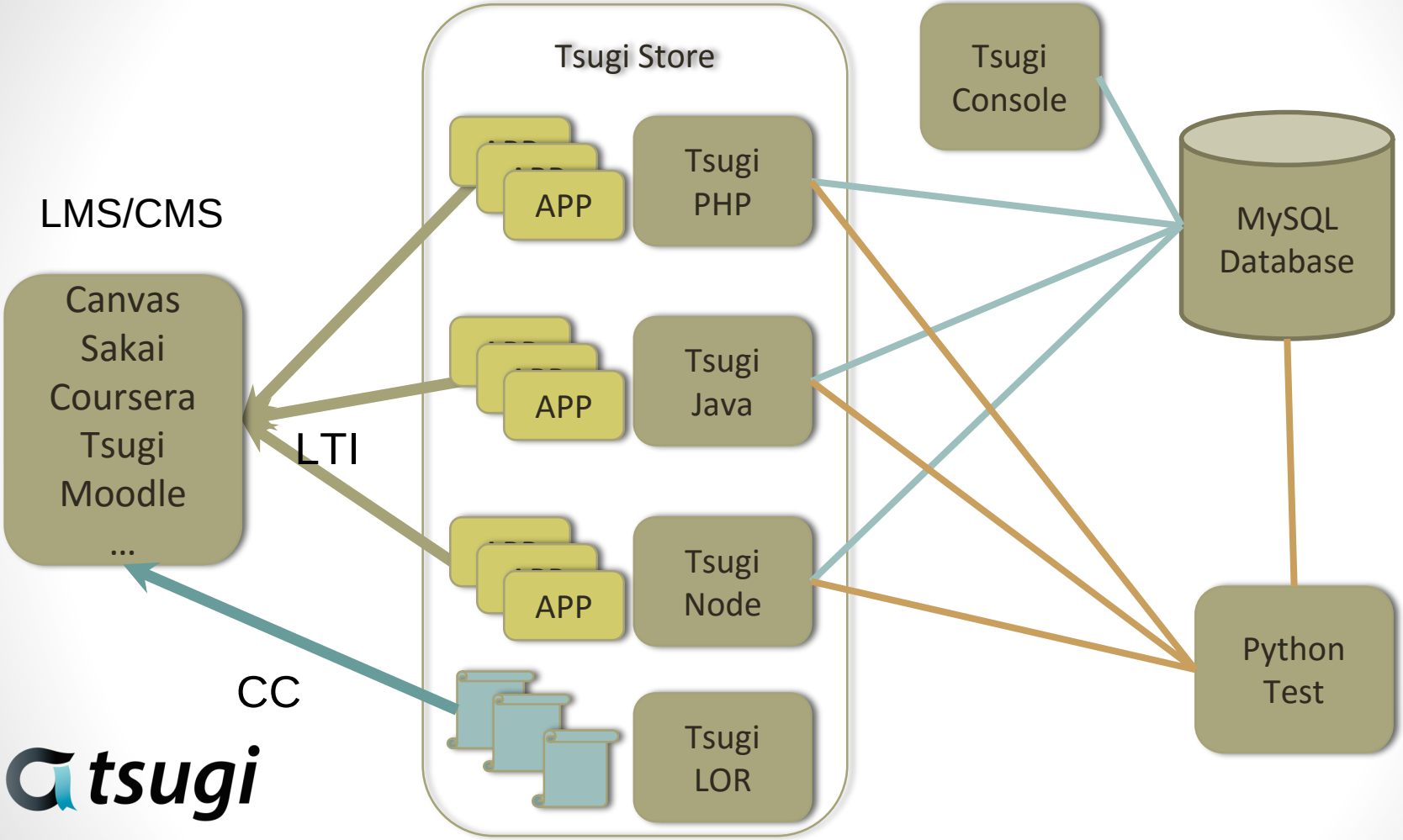
트 이러한 종류의 구축 협력에 관심이있는 경우, 참조하시기 바랍니다 tsugi.org의 웹 사이트 및 / 또는 저에게 연락.
공사중
참고 : 슬라이드, 비디오, autograders 내가 나의 새로운 책을 사용하여 캠퍼스에 SI502을 가르 칠 때 가을 2016 동안 파이썬
파이썬 3.0로 업데이트되는 과정에 있습니다. 또한이 책의 이전 버전에 관심이있을 수 있습니다 : 정보학에 대한 파이썬 : 파이
Korean

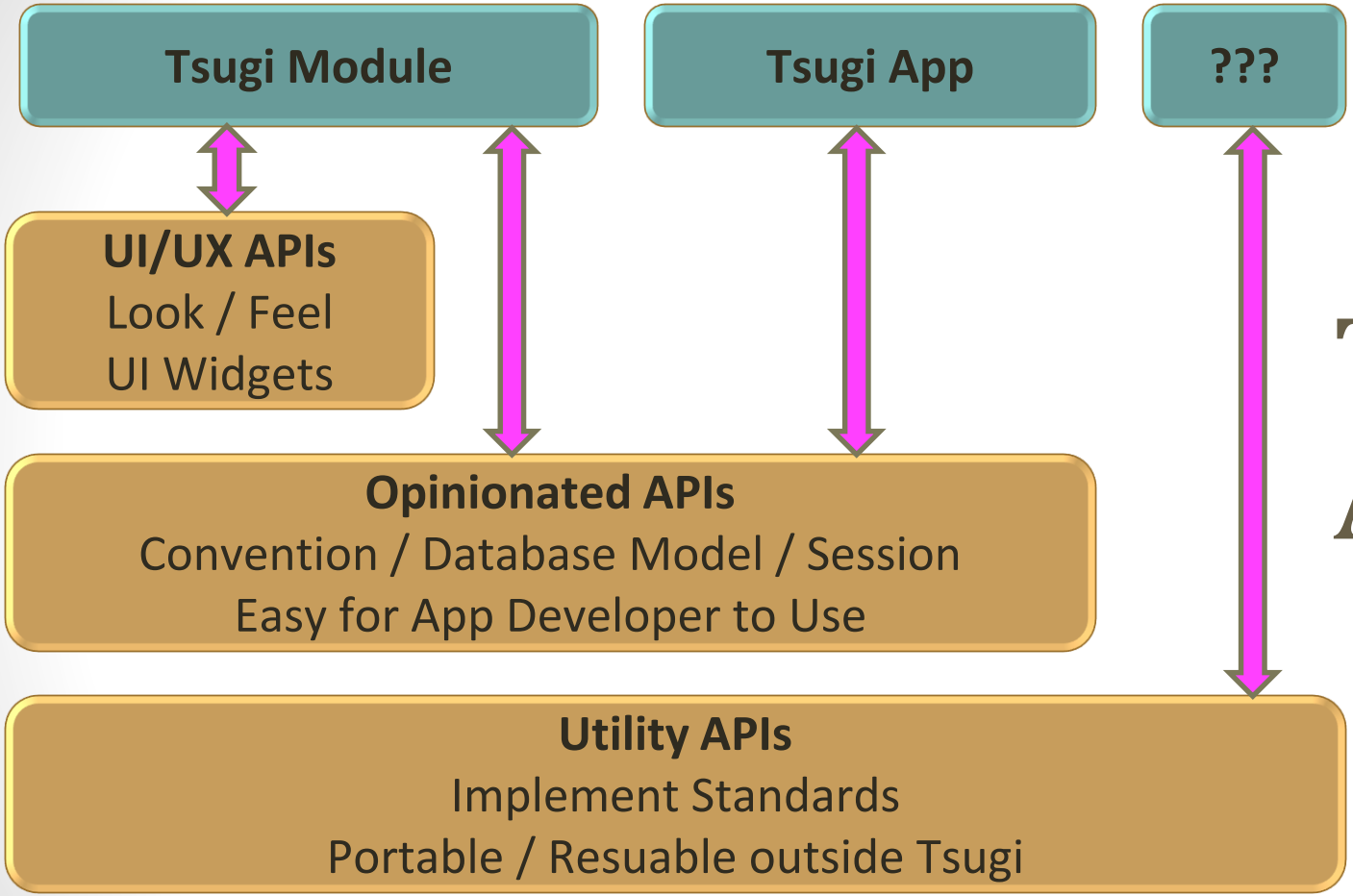
PY4E.com



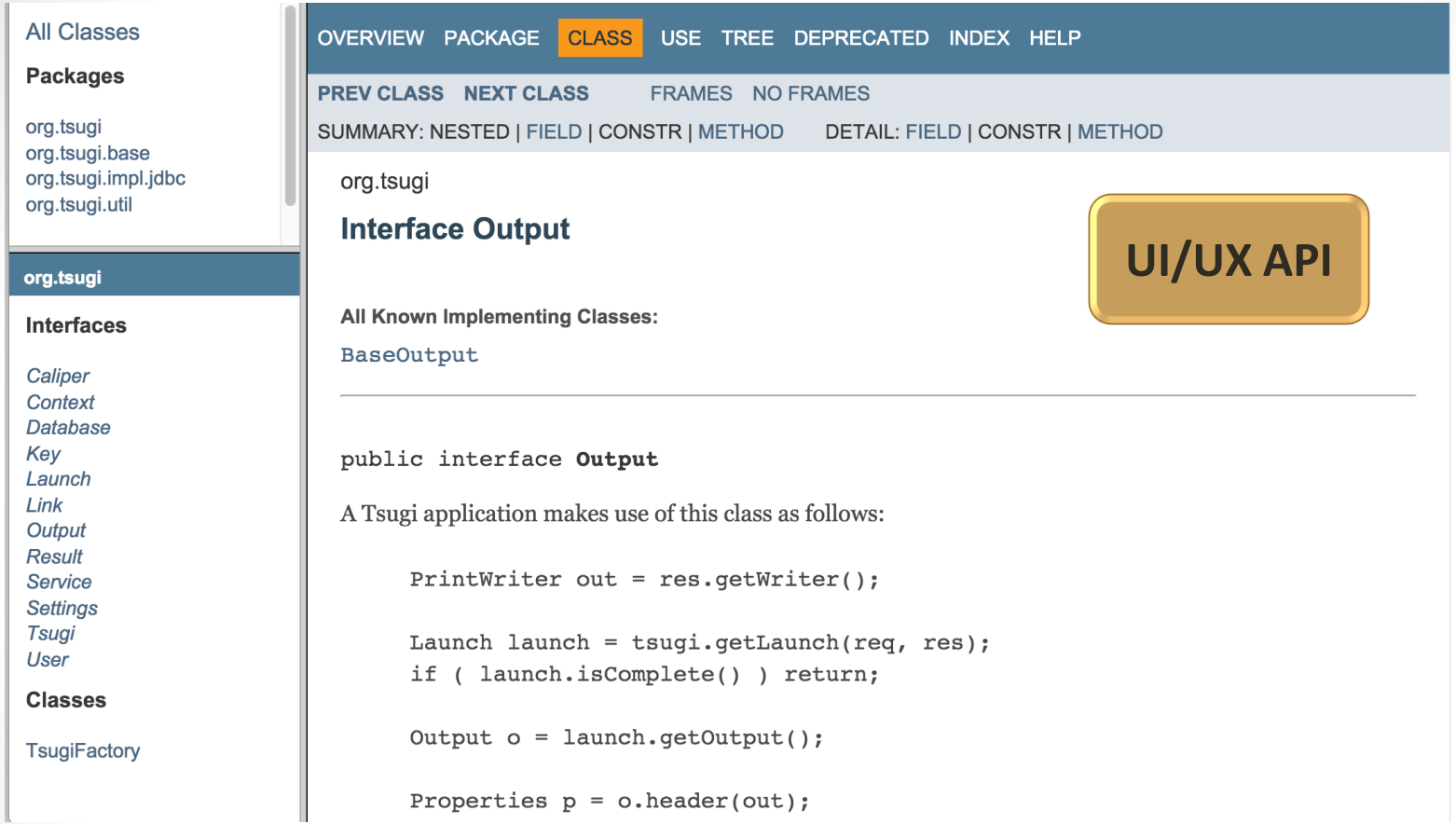
https://github.com/csev/pythonlearn

Inside Tsugi

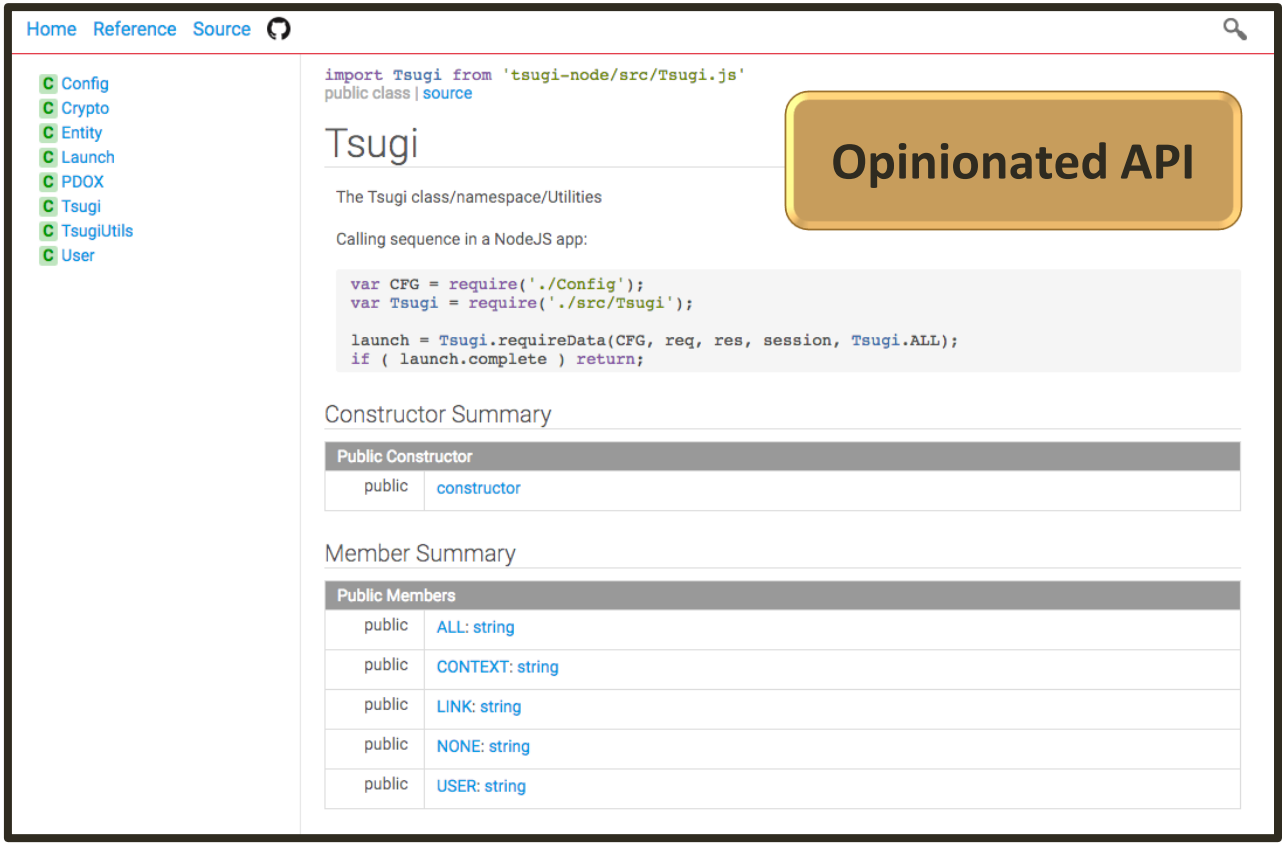

Tsugi Store
Tsugi Console
MySQL Database
LMS/CMS
Canvas
Sakai
Coursera
Tsugi
Moodle
...
APP
Tsugi PHP
APP
Tsugi Java
APP
Tsugi Node
Tsugi LOR
Python Test
LTI
CC
tsugi


Tsugi Module
Tsugi App
???
UI/UX APIs
Look / Feel
UI Widgets
Opinionated APIs
Convention / Database Model / Session
Easy for App Developer to Use
Utility APIs
Implement Standards
Portable / Resuable outside Tsugi

Tsugi APIs



http://csev.github.io/tsugi-java/apidocs/index.html



http://do1.dr-chuck.com/tsugi-node/esdoc/

\Tsugi\Util

\Tsugi\Util

CC

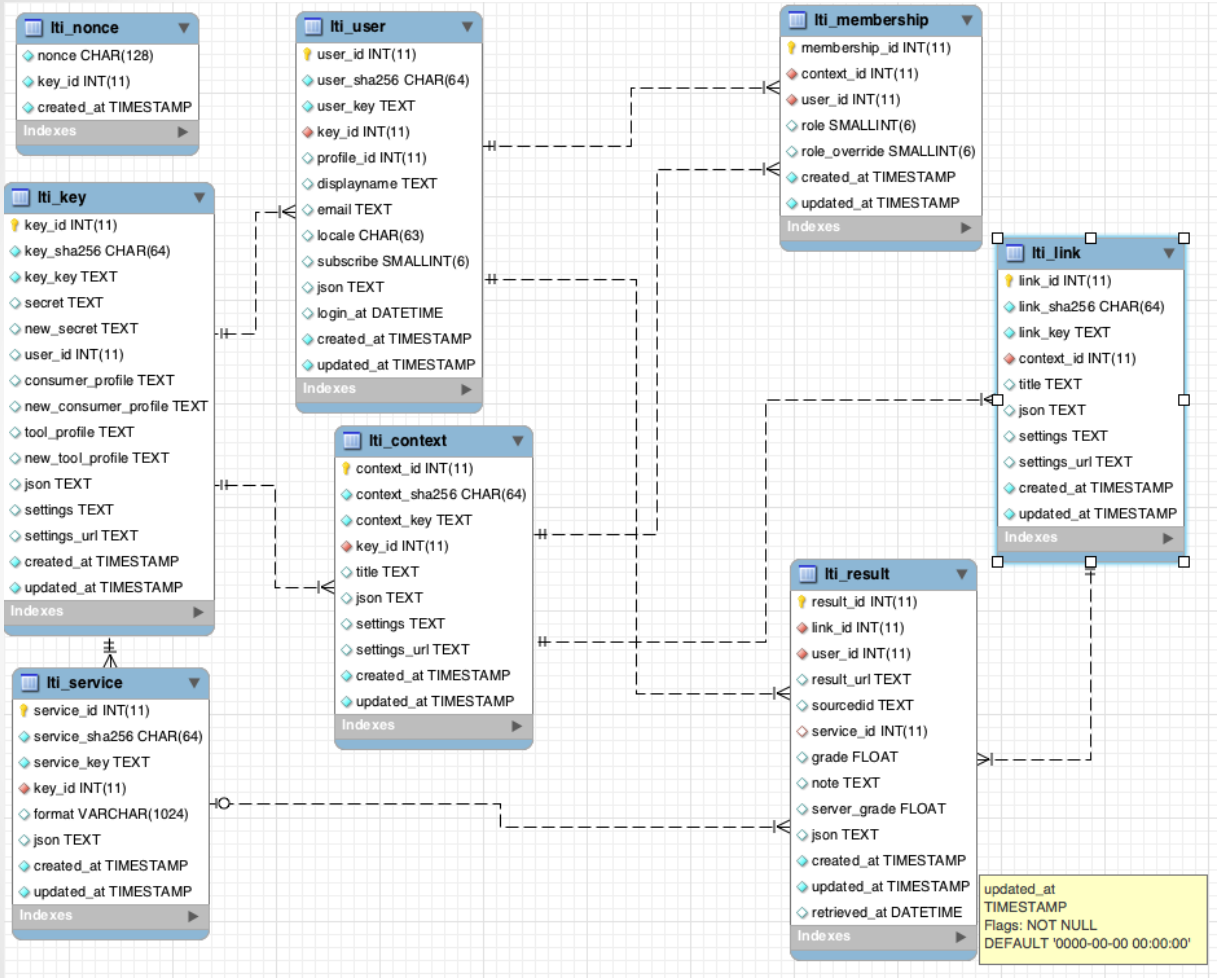
Utility API

This class allows us to produce an IMS Common Cartridge Version 1.2

Usage to Create a ZIP file:

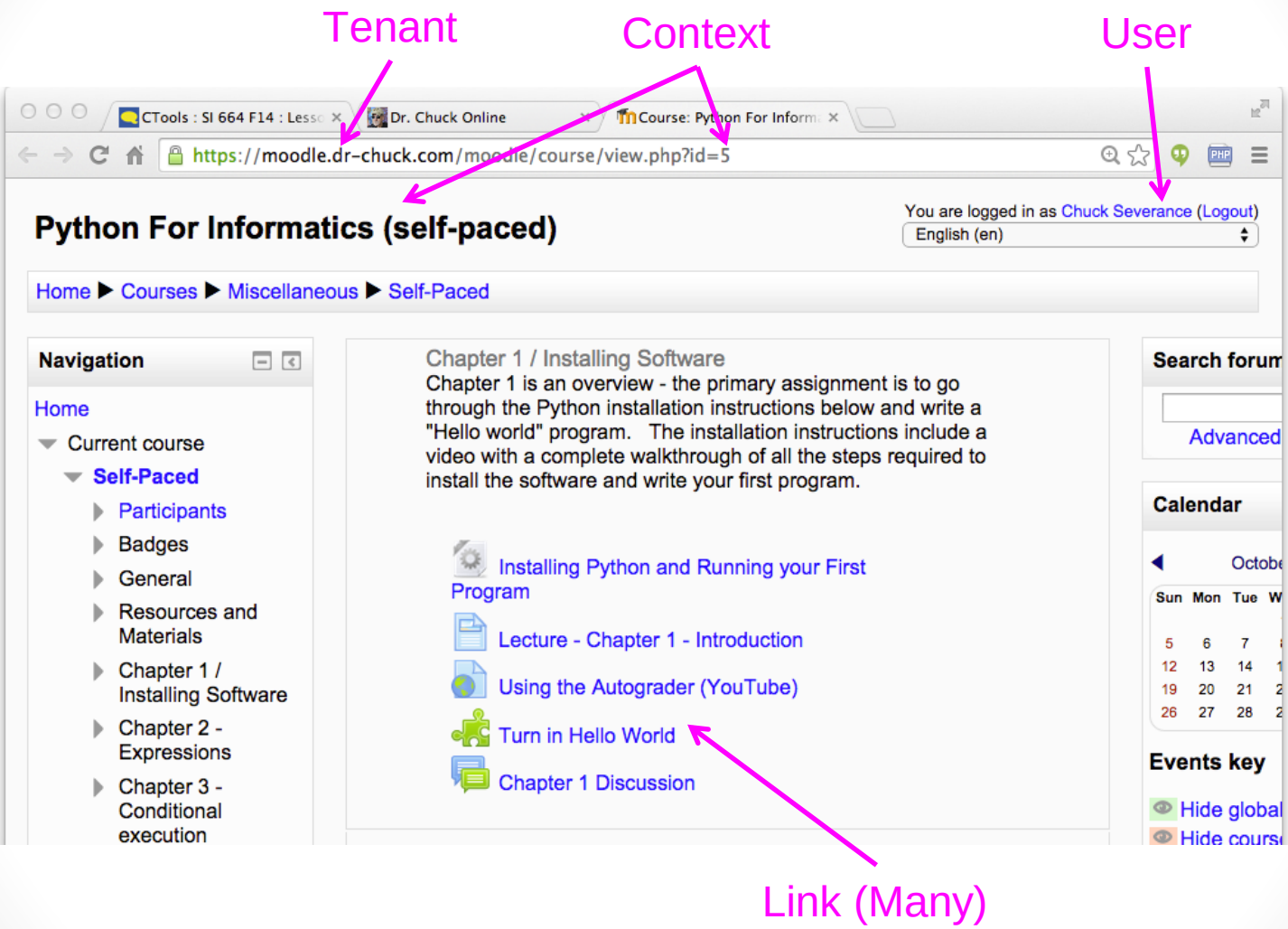
```
$zip = new ZipArchive();
if ($zip->open('cc.zip', ZipArchive::CREATE)!==TRUE) {
$cc_dom = new CC();
$cc_dom->set_title('Web Applications for Everybody');
$cc_dom->set_description('Awesome MOOC to learn PHP, MySQL, and JavaScript.');
$module = $cc_dom->add_module('Week 1');
$sub_module = $cc_dom->add_sub_module($module, 'Part 1');
$cc_dom->zip_add_url_to_module($zip, $sub_module, 'WA4E', 'https://www.wa4e.co
m');
$custom = array('exercise' => 'http_headers.php');
$cc_dom->zip_add_lti_to_module($zip, $sub_module, 'RRC',
    'https://www.wa4e.com/tools/autograder/index.php', $custom);
$zip->addFromString('imsmanifest.xml',$cc_dom->saveXML());
$zip->close();
```

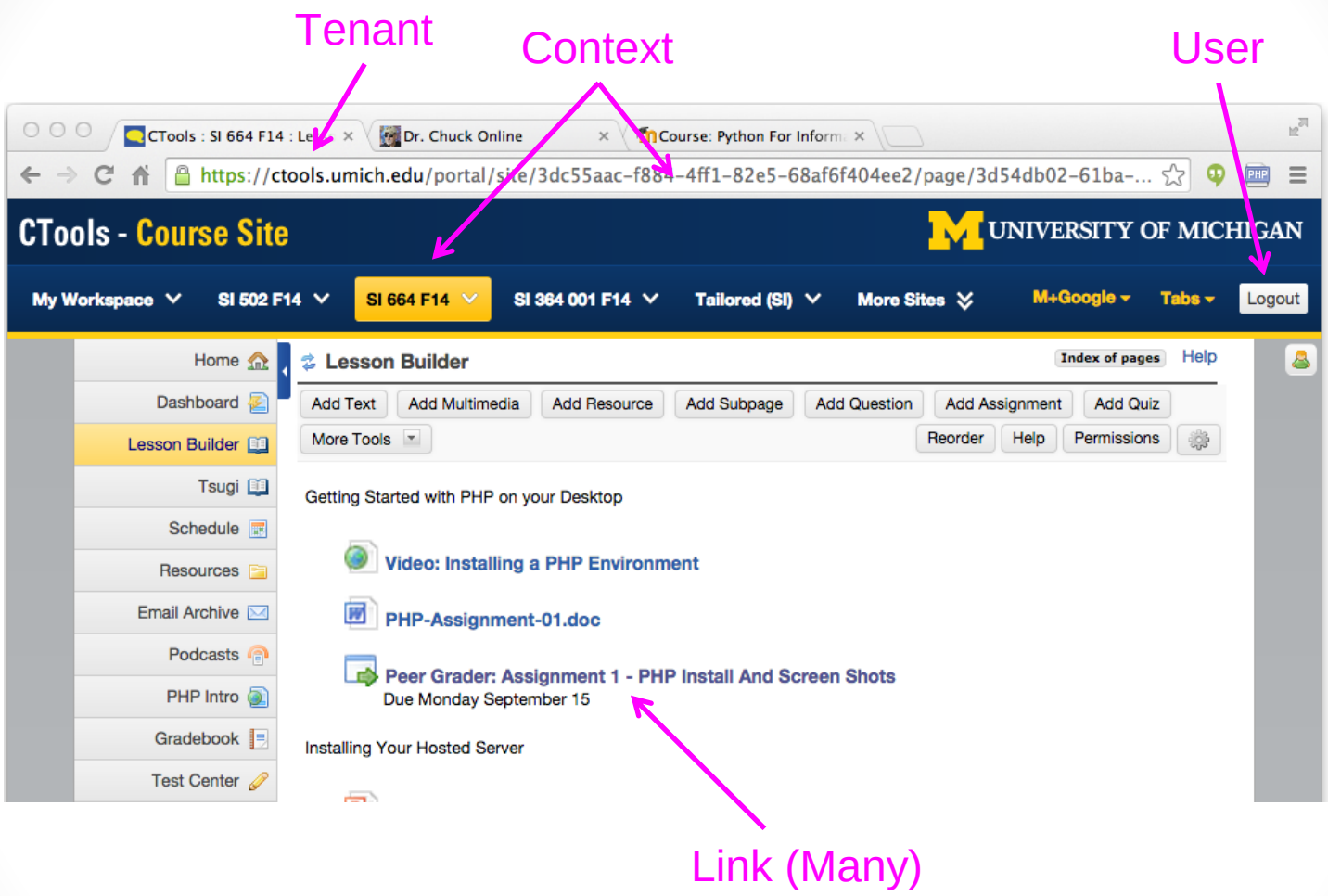
http://do1.dr-chuck.com/tsugi/phpdoc/classes/Tsugi.Util.CC.html



Tsugi Data Model

tsugi/docs/lectures/02-Data-Model-Workbench.mwb


Tenant
Context
User
CTools : SI 664 F14 : Less
Dr. Chuck Online
Course: Python For Inform
https://moodle.dr-chuck.com/moodle/course/view.php?id=5
Python For Informatics (self-paced)
You are logged in as Chuck Severance (Logout)
English (en)
Home ▶ Courses ▶ Miscellaneous ▶ Self-Paced
Navigation
Home
Current course
Self-Paced
Participants
Badges
General
Resources and Materials
Chapter 1 / Installing Software
Chapter 2 - Expressions
Chapter 3 - Conditional execution
Chapter 1 / Installing Software
Chapter 1 is an overview - the primary assignment is to go through the Python installation instructions below and write a "Hello world" program. The installation instructions include a video with a complete walkthrough of all the steps required to install the software and write your first program.
Installing Python and Running your First Program
Lecture - Chapter 1 - Introduction
Using the Autograder (YouTube)
Turn in Hello World
Chapter 1 Discussion
Search forum
Advanced
Calendar
Sun Mon Tue W
Events key
Hide global
Link (Many)


Tenant
Context
User
CTools : SI 664 F14 : Le
Dr. Chuck Online
Course: Python For Inform
https://ctools.umich.edu/portal/site/3dc55aac-f884-4ff1-82e5-68af6f404ee2/page/3d54db02-61ba-...
CTools - Course Site
UNIVERSITY OF MICHIGAN
My Workspace
SI 502 F14
SI 664 F14
SI 364 001 F14
Tailored (SI)
More Sites
M+Google
Tabs
Logout
Home
Dashboard
Lesson Builder
Tsugi
Schedule
Resources
Email Archive
Podcasts
PHP Intro
Gradebook
Test Center
Lesson Builder
Index of pages
Help
Add Text
Add Multimedia
Add Resource
Add Subpage
Add Question
Add Assignment
Add Quiz
More Tools
Reorder
Help
Permissions
Getting Started with PHP on your Desktop
Video: Installing a PHP Environment
PHP-Assignment-01.doc
Peer Grader: Assignment 1 - PHP Install And Screen Shots
Due Monday September 15
Installing Your Hosted Server
Link (Many)

Tsugi Tools To Date

- App Store
- Google Class Map
- GIFT Quiz Engine
- Grade book
- Attendance Tool
- Video Tracker (*)
- Clicker (*)
- HTML5 Autograder
- Python Autograder
- SQL Autograder
- DataMining Autograder
- PHP Autograder

https://lti-tools.dr-chuck.com/tsugi Developer -> "secret"

Tsugi Developer Training

- PHP / MySQL – www.php-intro.com
- Tsugi Recorded Lecture Series
  - http://lectures.tsugi.org/
- Lots of sample code
- Assignments for Developer Workshop
  - Grade, Chat, Map, Wisdom of Crowds
  - https://github.com/csev/tsugi-php-exercises

Tsugi Production

- Tsugi LMS – MOOC Of My Own
  - www.wa4e.com
  - www.py4e.com
- Auto grading and peer grading for Coursera
  - pr4e.dr-chuck.com – 214353 user accounts
- On campus Sakai/Canvas/Blackboard and demo accounts
  - lti-tools.dr-chuck.com
- Static assets on CloudFlare CDN
  - https://www.dr-chuck.net/tsugi

GitHub Structure

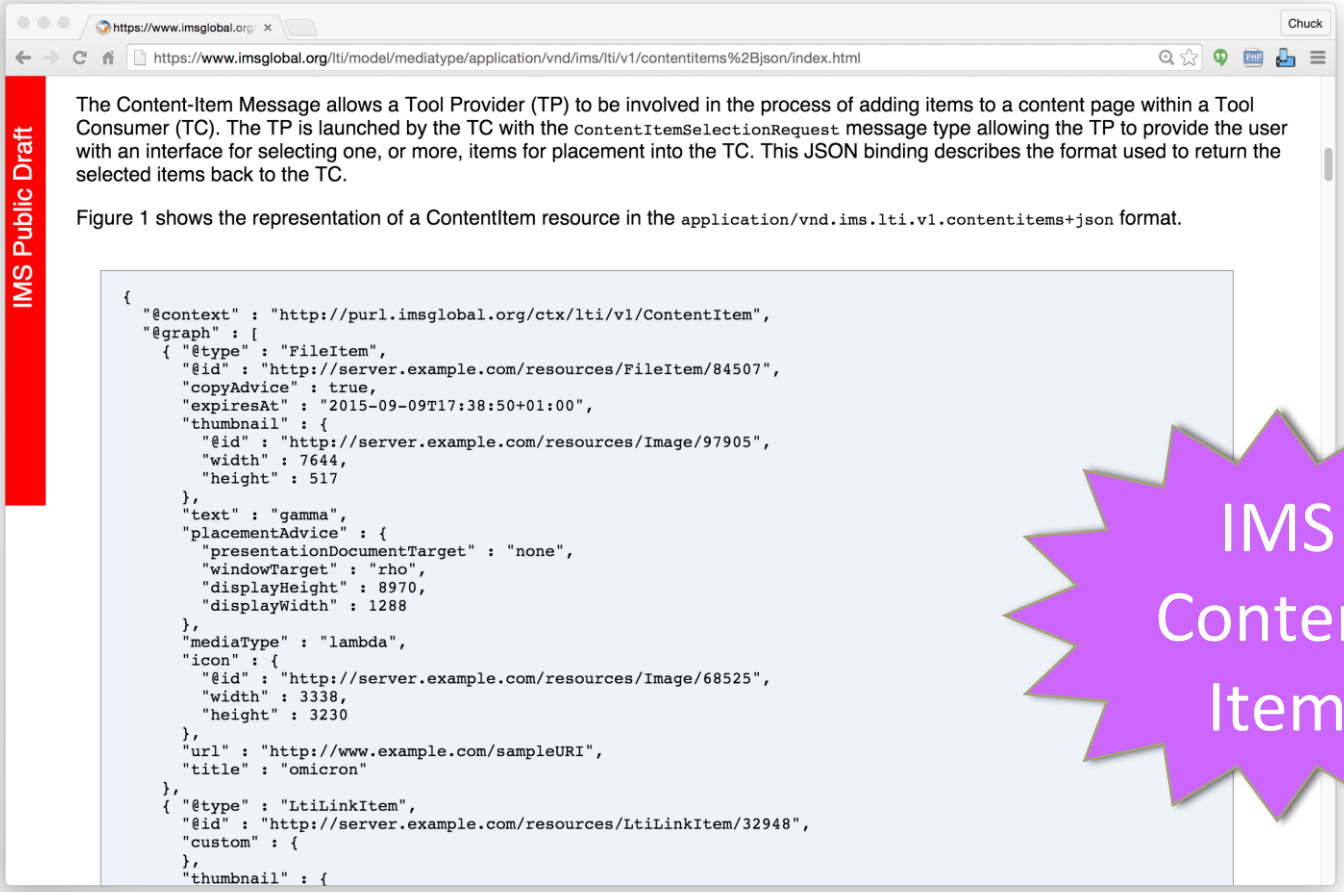
- Develop, Manage, Administration, App Store Console
  - https://github.com/csev/tsugi
- PHP Tsugi
  - https://github.com/csev/tsugi-php
  - Modules: https://github.com/csev/tsugi-php-mod
  - Sample Module: https://github.com/csev/tsugi-php-module
  - Sample App: https://github.com/csev/tsugi-php-standalone
  - Exercises: https://github.com/csev/tsugi-php-exercises
  - Application: https://github.com/csev/tsugi-php-slack

GitHub Structure

- Node Tsugi
  - Library: https://github.com/csev/tsugi-node
  - LTI Library: https://github.com/csev/tsugi-node-lti
  - Sample Application: https://github.com/csev/tsugi-node-sample
- Java Tsugi
  - Library: https://github.com/csev/tsugi-java
  - Sample Application: https://github.com/csev/tsugi-java-servlet
- Functionality Test (Python):
  - https://github.com/csev/tsugi-python-test

IMS Content Item and IMS App Store

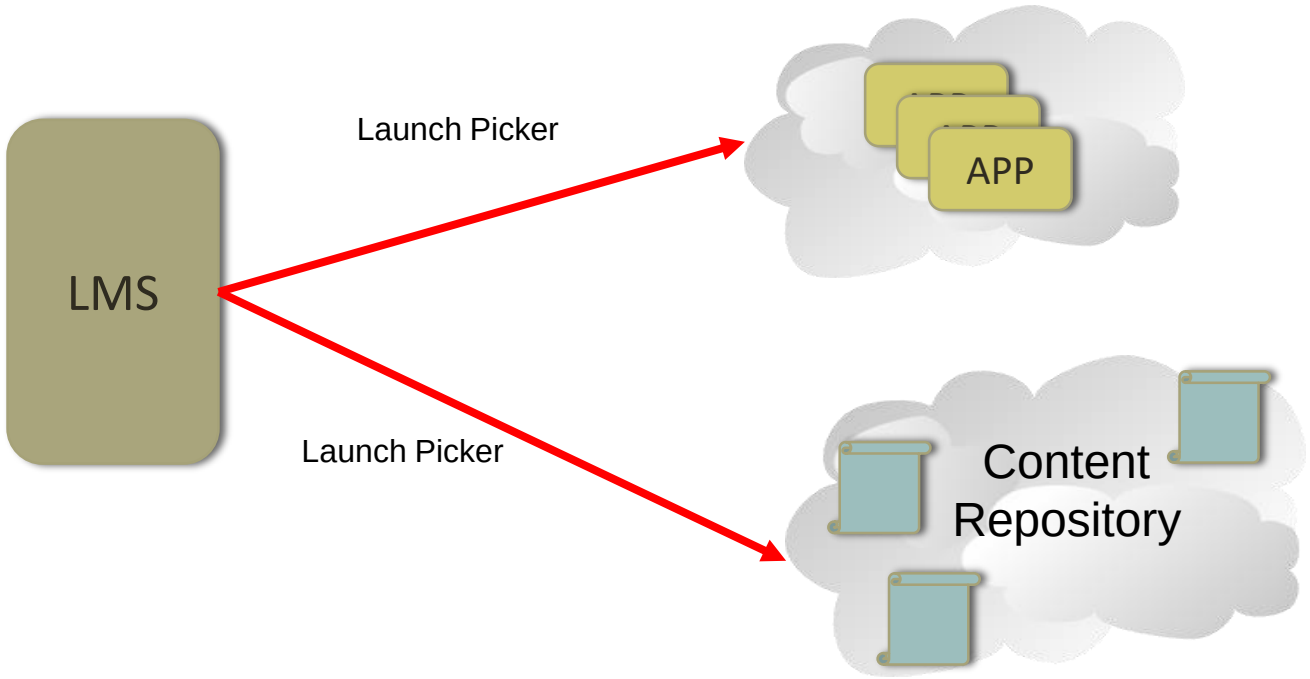
One of many of the upcoming new specifications



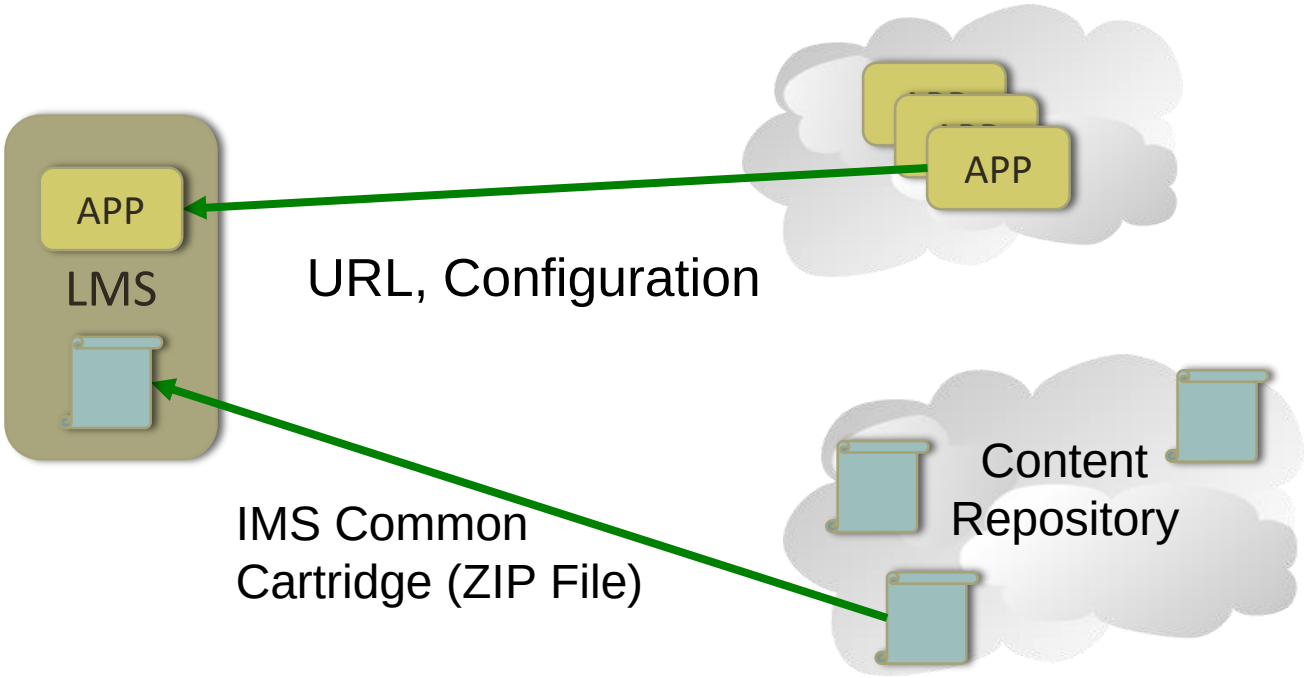
IMS Content Item

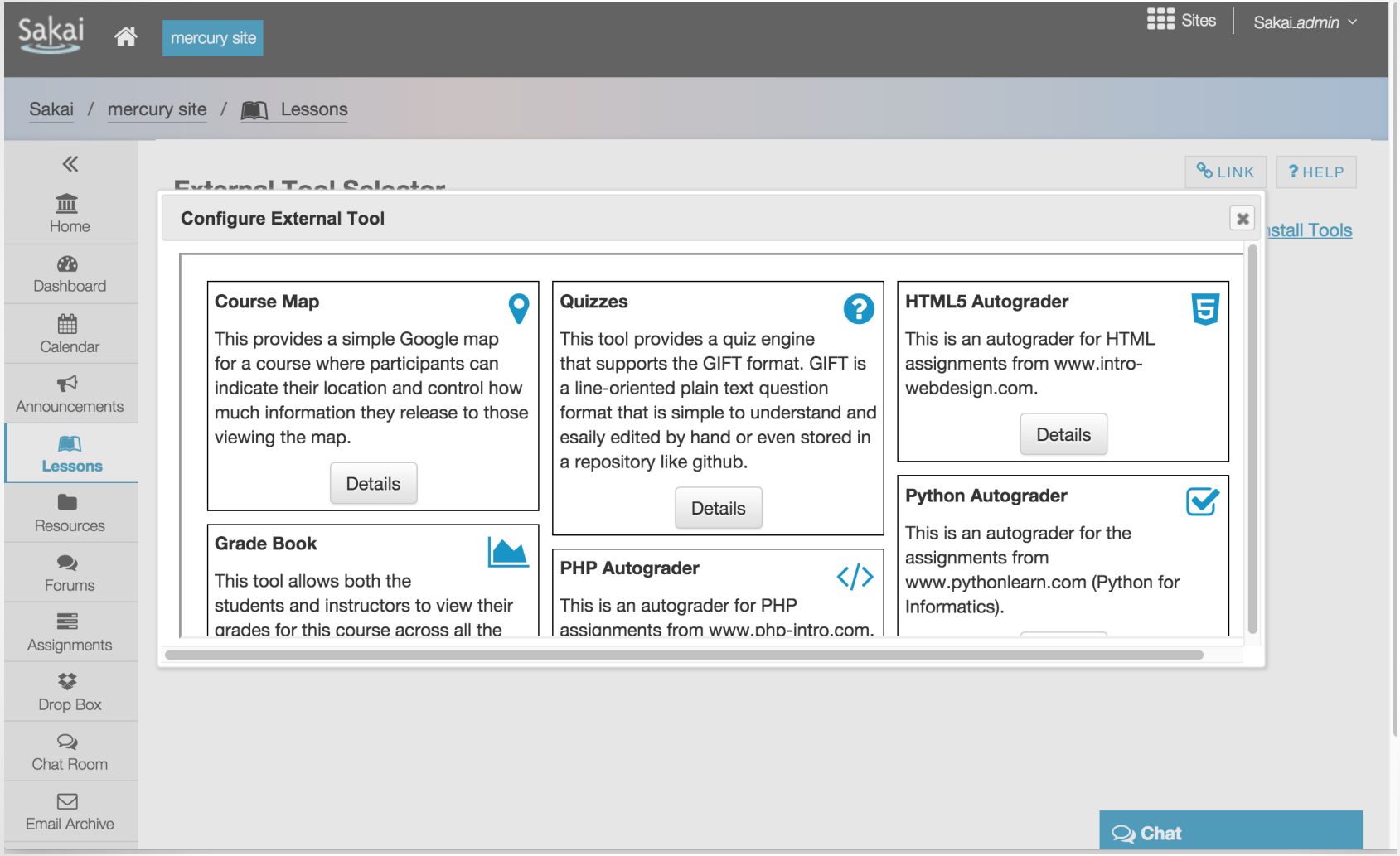
https://www.imsglobal.org/specs/lticiv1p0

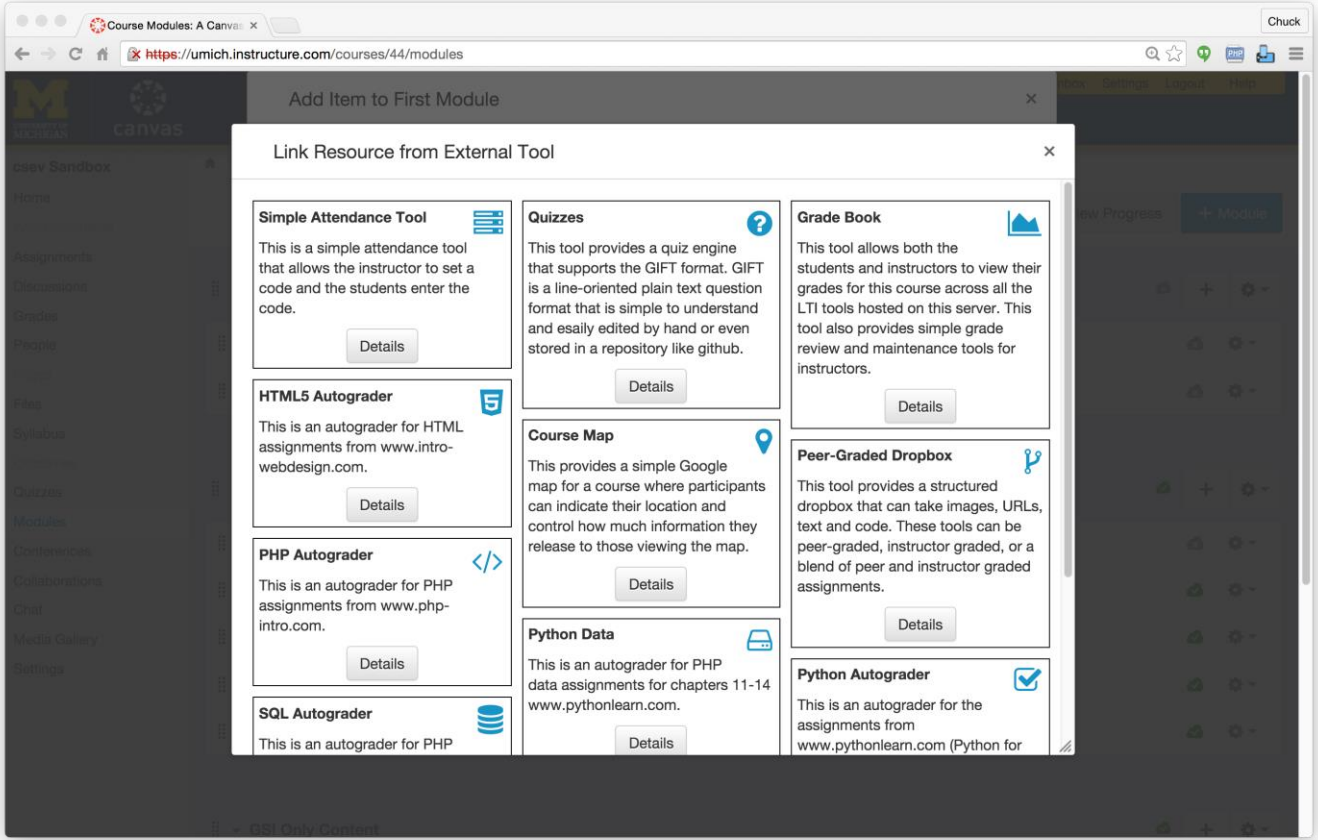
IMS Content Item Launch



IMS Content Item Return

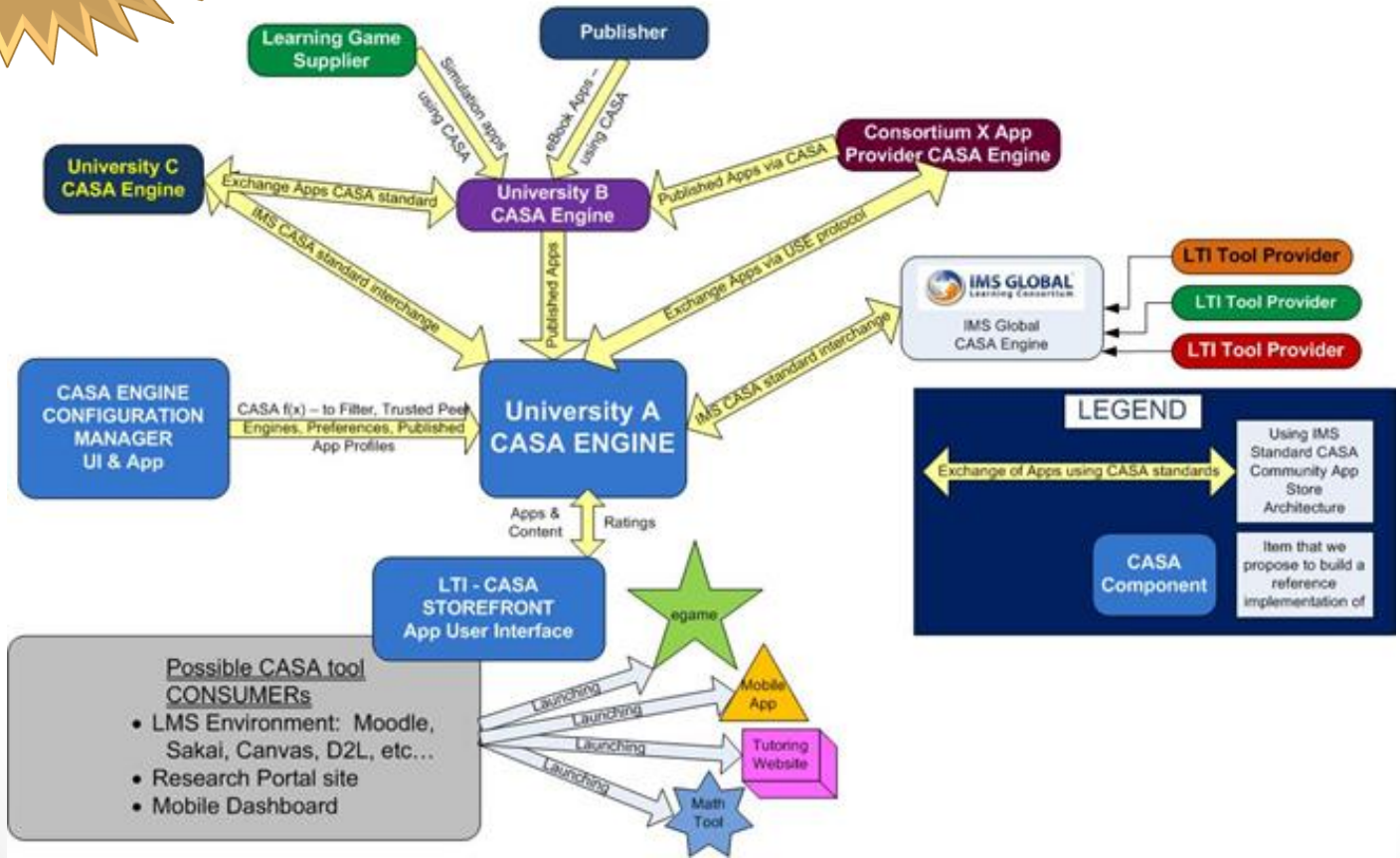


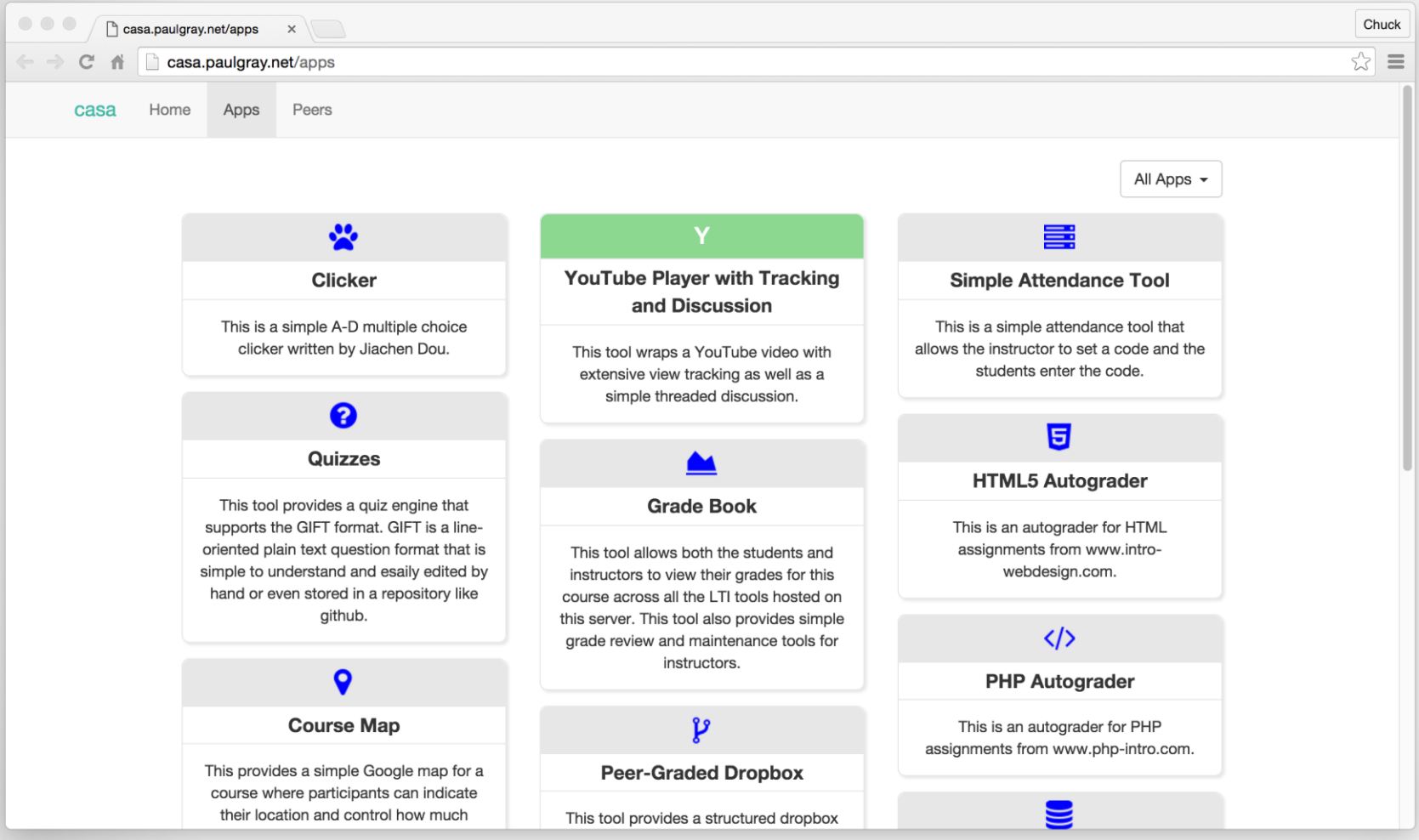

Sakai
mercury site
Sites
Sakai_admin
Sakai / mercury site / Lessons
LINK
HELP
Home
Dashboard
Calendar
Announcements
Lessons
Resources
Forums
Assignments
Drop Box
Chat Room
Email Archive
Configure External Tool
Course Map
This provides a simple Google map for a course where participants can indicate their location and control how much information they release to those viewing the map.
Details
Quizzes
This tool provides a quiz engine that supports the GIFT format. GIFT is a line-oriented plain text question format that is simple to understand and esaily edited by hand or even stored in a repository like github.
Details
HTML5 Autograder
This is an autograder for HTML assignments from www.intro-webdesign.com.
Details
Grade Book
This tool allows both the students and instructors to view their grades for this course across all the
PHP Autograder
This is an autograder for PHP assignments from www.php-intro.com.
Python Autograder
This is an autograder for the assignments from www.pythonlearn.com (Python for Informatics).
Chat

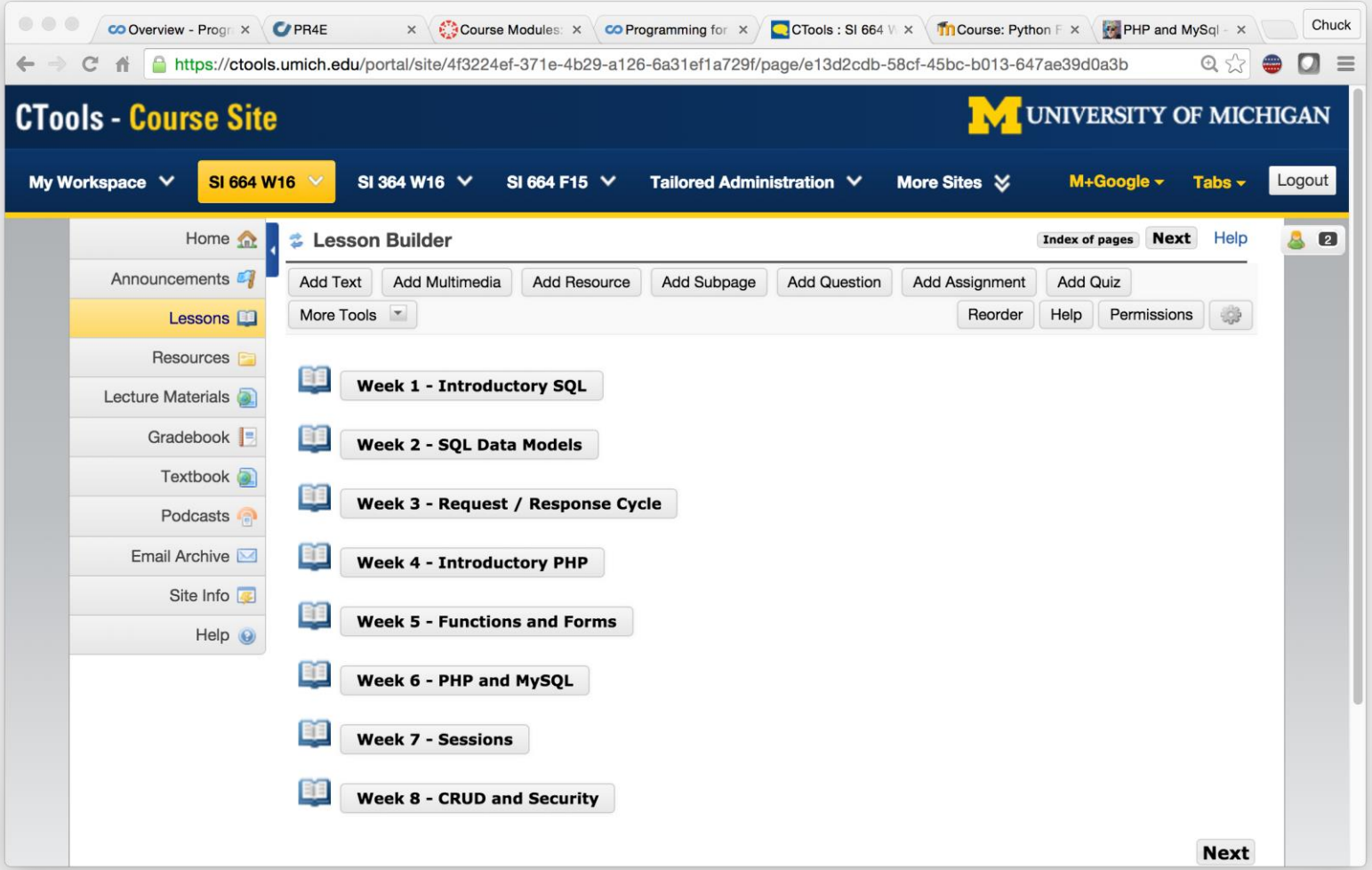

Course Modules: A Canvas
Chuck
https://umich.instructure.com/courses/44/modules
Add Item to First Module
Link Resource from External Tool
Simple Attendance Tool
This is a simple attendance tool that allows the instructor to set a code and the students enter the code.
Details
HTML5 Autograder
This is an autograder for HTML assignments from www.intro-webdesign.com.
Details
PHP Autograder
This is an autograder for PHP assignments from www.php-intro.com.
Details
SQL Autograder
This is an autograder for PHP
Quizzes
This tool provides a quiz engine that supports the GIFT format. GIFT is a line-oriented plain text question format that is simple to understand and esaily edited by hand or even stored in a repository like github.
Details
Course Map
This provides a simple Google map for a course where participants can indicate their location and control how much information they release to those viewing the map.
Details
Python Data
This is an autograder for PHP data assignments for chapters 11-14 www.pythonlearn.com.
Details
Grade Book
This tool allows both the students and instructors to view their grades for this course across all the LTI tools hosted on this server. This tool also provides simple grade review and maintenance tools for instructors.
Details
Peer-Graded Dropbox
This tool provides a structured dropbox that can take images, URLs, text and code. These tools can be peer-graded, instructor graded, or a blend of peer and instructor graded assignments.
Details
Python Autograder
This is an autograder for the assignments from www.pythonlearn.com (Python for

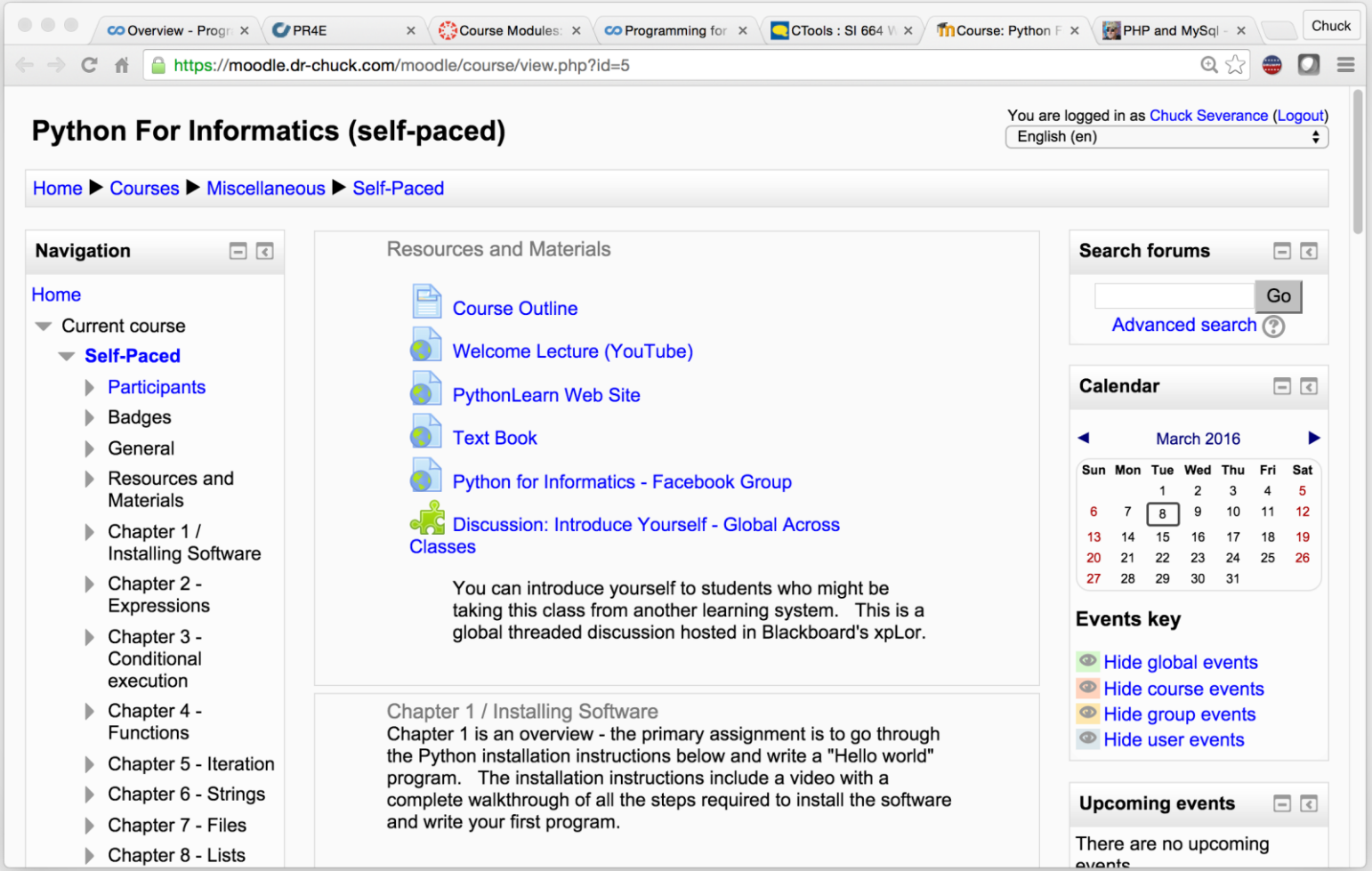
Relaunching

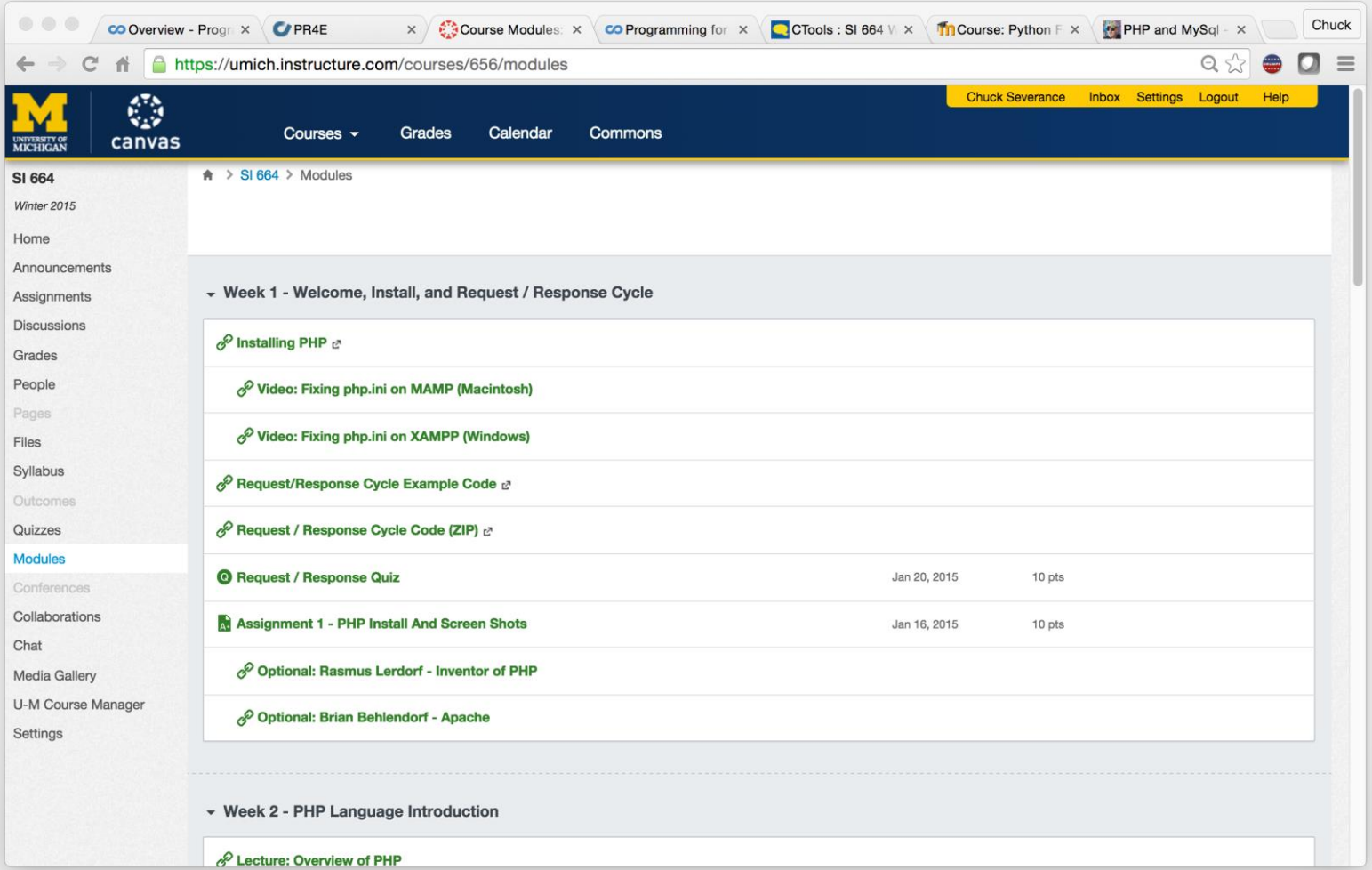
IMS-GLC INITIATIVE
CASA – COMMUNITY APP STORE
ARCHITECTURE DIAGRAM

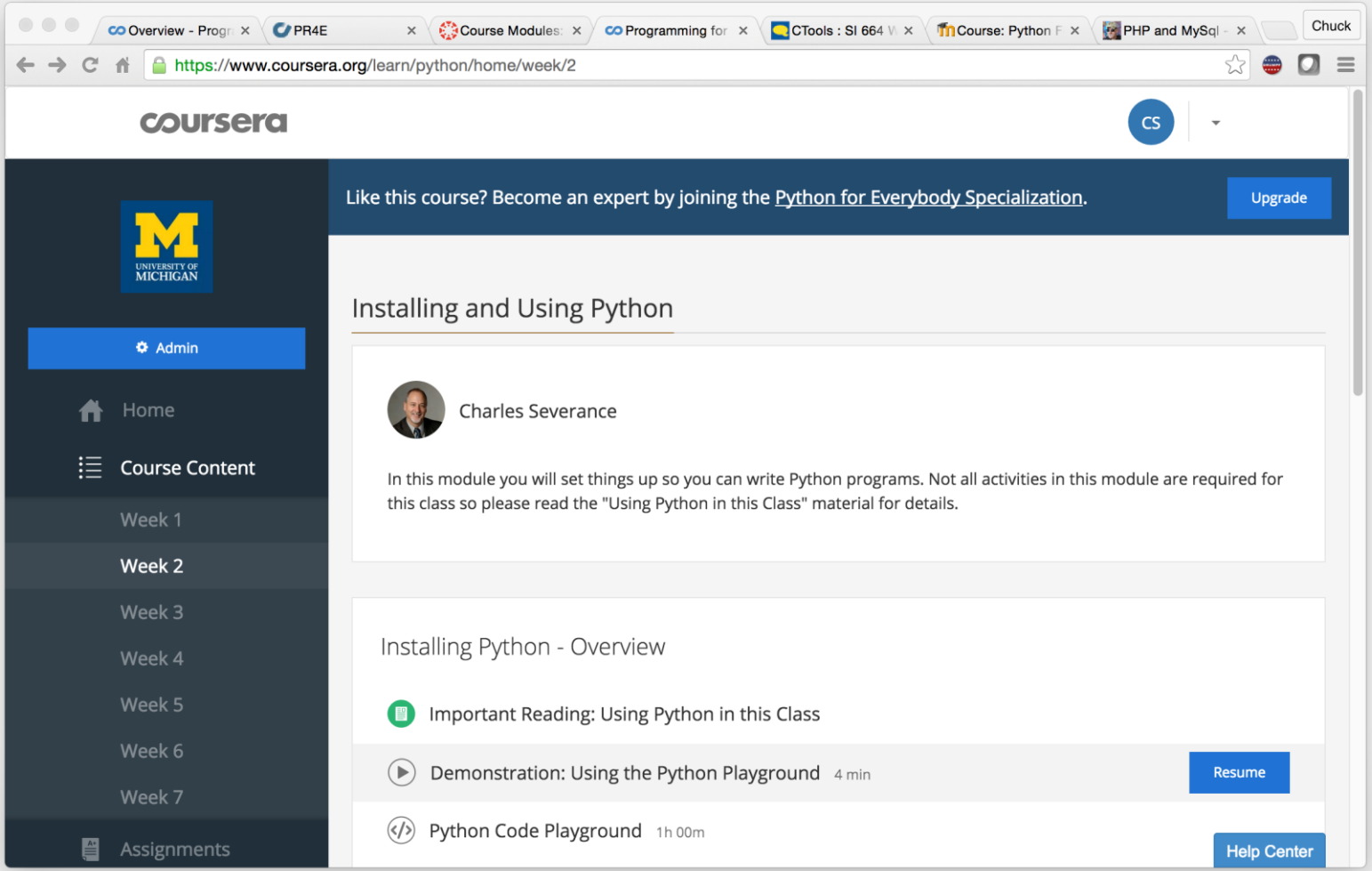


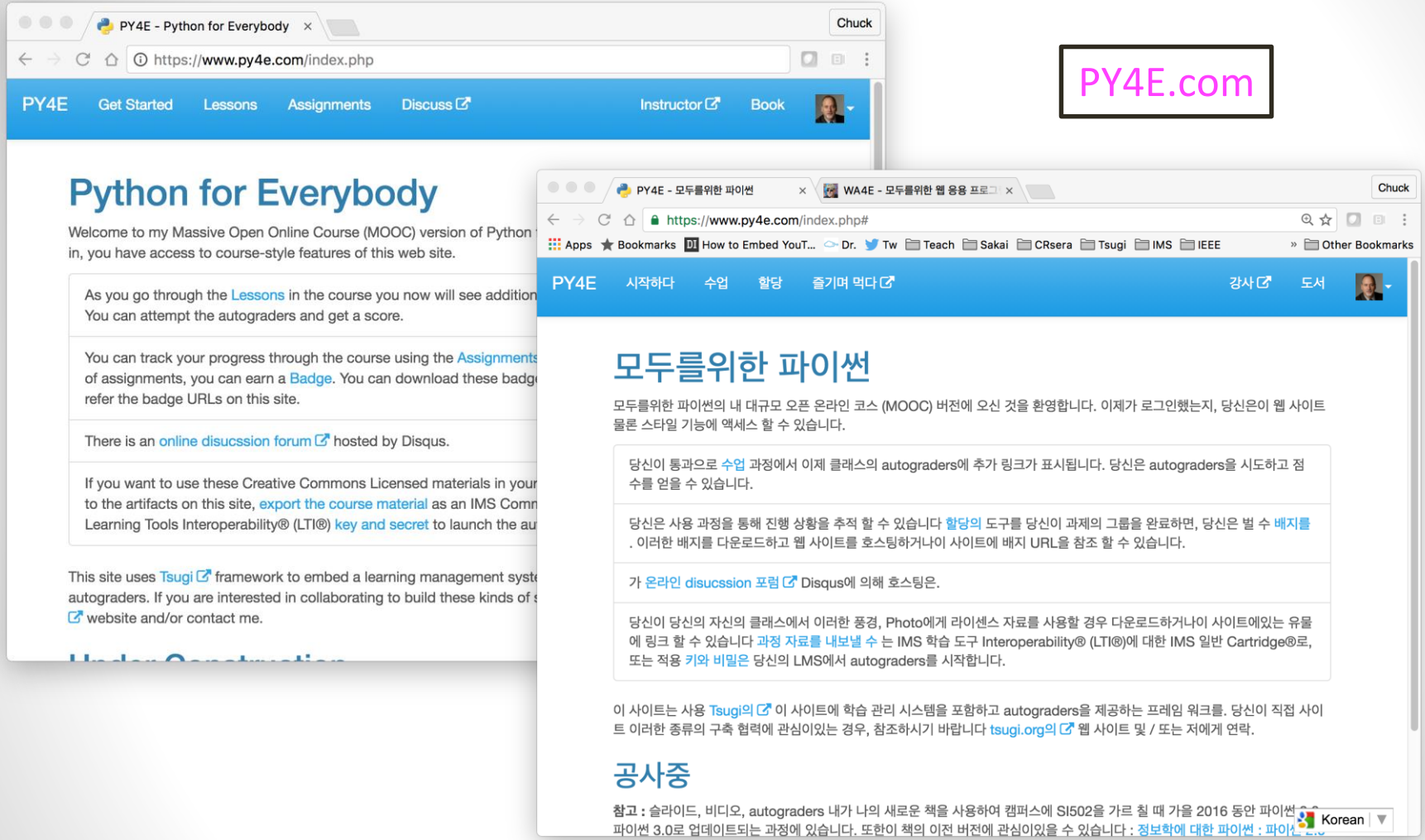

casa.paulgray.net/apps
Chuck
casa.paulgray.net/apps
casa
Home
Apps
Peers
All Apps
Clicker
This is a simple A-D multiple choice clicker written by Jiachen Dou.
Quizzes
This tool provides a quiz engine that supports the GIFT format. GIFT is a line-oriented plain text question format that is simple to understand and esaily edited by hand or even stored in a repository like github.
Course Map
This provides a simple Google map for a course where participants can indicate their location and control how much
Y
YouTube Player with Tracking and Discussion
This tool wraps a YouTube video with extensive view tracking as well as a simple threaded discussion.
Grade Book
This tool allows both the students and instructors to view their grades for this course across all the LTI tools hosted on this server. This tool also provides simple grade review and maintenance tools for instructors.
Peer-Graded Dropbox
This tool provides a structured dropbox
Simple Attendance Tool
This is a simple attendance tool that allows the instructor to set a code and the students enter the code.
HTML5 Autograder
This is an autograder for HTML assignments from www.intro-webdesign.com.
PHP Autograder
This is an autograder for PHP assignments from www.php-intro.com.


Overview - Progr
PR4E
Course Modules:
Programming for
CTools : SI 664 W
Course: Python F
PHP and MySql
Chuck
https://ctools.umich.edu/portal/site/4f3224ef-371e-4b29-a126-6a31ef1a729f/page/e13d2cdb-58cf-45bc-b013-647ae39d0a3b
CTools - Course Site
UNIVERSITY OF MICHIGAN
My Workspace
SI 664 W16
SI 364 W16
SI 664 F15
Tailored Administration
More Sites
M+Google
Tabs
Logout
Home
Announcements
Lessons
Resources
Lecture Materials
Gradebook
Textbook
Podcasts
Email Archive
Site Info
Help
Lesson Builder
Index of pages
Next
Help
Add Text
Add Multimedia
Add Resource
Add Subpage
Add Question
Add Assignment
Add Quiz
More Tools
Reorder
Help
Permissions
Week 1 - Introductory SQL
Week 2 - SQL Data Models
Week 3 - Request / Response Cycle
Week 4 - Introductory PHP
Week 5 - Functions and Forms
Week 6 - PHP and MySQL
Week 7 - Sessions
Week 8 - CRUD and Security
Next


Overview - Progr
PR4E
Course Modules:
Programming for
CTools : SI 664 W
Course: Python F
PHP and MySql
Chuck
https://moodle.dr-chuck.com/moodle/course/view.php?id=5
Python For Informatics (self-paced)
You are logged in as Chuck Severance (Logout)
English (en)
Home ▶ Courses ▶ Miscellaneous ▶ Self-Paced
Navigation
Home
Current course
Self-Paced
Participants
Badges
General
Resources and Materials
Chapter 1 / Installing Software
Chapter 2 - Expressions
Chapter 3 - Conditional execution
Chapter 4 - Functions
Chapter 5 - Iteration
Chapter 6 - Strings
Chapter 7 - Files
Chapter 8 - Lists
Resources and Materials
Course Outline
Welcome Lecture (YouTube)
PythonLearn Web Site
Text Book
Python for Informatics - Facebook Group
Discussion: Introduce Yourself - Global Across Classes
You can introduce yourself to students who might be taking this class from another learning system. This is a global threaded discussion hosted in Blackboard's xpLor.
Chapter 1 / Installing Software
Chapter 1 is an overview - the primary assignment is to go through the Python installation instructions below and write a "Hello world" program. The installation instructions include a video with a complete walkthrough of all the steps required to install the software and write your first program.
Search forums
Go
Advanced search
Calendar
March 2016
Sun Mon Tue Wed Thu Fri Sat
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
Events key
Hide global events
Hide course events
Hide group events
Hide user events
Upcoming events
There are no upcoming events


Overview - Progr
PR4E
Course Modules:
Programming for
CTools : SI 664 W
Course: Python F
PHP and MySql
Chuck
https://umich.instructure.com/courses/656/modules
Chuck Severance
Inbox
Settings
Logout
Help
Courses
Grades
Calendar
Commons
SI 664
Winter 2015
Home
Announcements
Assignments
Discussions
Grades
People
Pages
Files
Syllabus
Outcomes
Quizzes
Modules
Conferences
Collaborations
Chat
Media Gallery
U-M Course Manager
Settings
SI 664 > Modules
Week 1 - Welcome, Install, and Request / Response Cycle
Installing PHP
Video: Fixing php.ini on MAMP (Macintosh)
Video: Fixing php.ini on XAMPP (Windows)
Request/Response Cycle Example Code
Request / Response Cycle Code (ZIP)
Request / Response Quiz
Jan 20, 2015
10 pts
Assignment 1 - PHP Install And Screen Shots
Jan 16, 2015
10 pts
Optional: Rasmus Lerdorf - Inventor of PHP
Optional: Brian Behlendorf - Apache
Week 2 - PHP Language Introduction
Lecture: Overview of PHP


Overview - Progr
PR4E
Course Modules:
Programming for
CTools : SI 664 W
Course: Python F
PHP and MySql
Chuck
https://www.coursera.org/learn/python/home/week/2
coursera
CS
Like this course? Become an expert by joining the Python for Everybody Specialization.
Upgrade
UNIVERSITY OF MICHIGAN
Admin
Home
Course Content
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Assignments
Installing and Using Python
Charles Severance
In this module you will set things up so you can write Python programs. Not all activities in this module are required for this class so please read the "Using Python in this Class" material for details.
Installing Python - Overview
Important Reading: Using Python in this Class
Demonstration: Using the Python Playground 4 min
Resume
Python Code Playground 1h 00m
Help Center


PY4E - Python for Everybody
Chuck
https://www.py4e.com/index.php
PY4E
Get Started
Lessons
Assignments
Discuss
Instructor
Book
Python for Everybody
Welcome to my Massive Open Online Course (MOOC) version of Python
in, you have access to course-style features of this web site.
As you go through the Lessons in the course you now will see addition
You can attempt the autograders and get a score.
You can track your progress through the course using the Assignments
of assignments, you can earn a Badge. You can download these badg
refer the badge URLs on this site.
There is an online disucssion forum hosted by Disqus.
If you want to use these Creative Commons Licensed materials in your
to the artifacts on this site, export the course material as an IMS Comm
Learning Tools Interoperability® (LTI®) key and secret to launch the au
This site uses Tsugi framework to embed a learning management syste
autograders. If you are interested in collaborating to build these kinds of s
website and/or contact me.
PY4E - 모두를위한 파이썬
WA4E - 모두를위한 웹 응용 프로
Chuck
https://www.py4e.com/index.php#
Apps
Bookmarks
How to Embed YouT...
Dr.
Tw
Teach
Sakai
CRsera
Tsugi
IMS
IEEE
Other Bookmarks
PY4E
시작하다
수업
할당
즐기며 먹다
강사
도서
모두를위한 파이썬
모두를위한 파이썬의 내 대규모 오픈 온라인 코스 (MOOC) 버전에 오신 것을 환영합니다. 이제가 로그인했는지, 당신은이 웹 사이트
물론 스타일 기능에 액세스 할 수 있습니다.
당신이 통과으로 수업 과정에서 이제 클래스의 autograders에 추가 링크가 표시됩니다. 당신은 autograders을 시도하고 점
수를 얻을 수 있습니다.
당신은 사용 과정을 통해 진행 상황을 추적 할 수 있습니다 할당의 도구를 당신이 과제의 그룹을 완료하면, 당신은 벌 수 배지를
. 이러한 배지를 다운로드하고 웹 사이트를 호스팅하거나이 사이트에 배지 URL을 참조 할 수 있습니다.
가 온라인 disucssion 포럼 Disqus에 의해 호스팅은.
당신이 당신의 자신의 클래스에서 이러한 풍경, Photo에게 라이센스 자료를 사용할 경우 다운로드하거나이 사이트에있는 유물
에 링크 할 수 있습니다 과정 자료를 내보낼 수 는 IMS 학습 도구 Interoperability® (LTI®)에 대한 IMS 일반 Cartridge®로,
또는 적용 키와 비밀은 당신의 LMS에서 autograders를 시작합니다.
이 사이트는 사용 Tsugi의 이 사이트에 학습 관리 시스템을 포함하고 autograders을 제공하는 프레임 워크를. 당신이 직접 사이
트 이러한 종류의 구축 협력에 관심이있는 경우, 참조하시기 바랍니다 tsugi.org의 웹 사이트 및 / 또는 저에게 연락.
공사중
참고 : 슬라이드, 비디오, autograders 내가 나의 새로운 책을 사용하여 캠퍼스에 SI502을 가르 칠 때 가을 2016 동안 파이썬
파이썬 3.0로 업데이트되는 과정에 있습니다. 또한이 책의 이전 버전에 관심이있을 수 있습니다 : 정보학에 대한 파이썬 : 파이
Korean

PY4E.com

Tsugi is Ongoing Research

- Growing, evolving based on experiments
- In incubation as a open source project in the Apereo Foundation
- Participating in IMS Working Groups

www.tsugi.org

- Need adopters
- Need collaborators
- Need funding for grad students, travel, etc

Source: Ian Dolphin

In building the NGDLE, open source will be first to market..

Sakai

Tsugi
an Apereo incubating project

Workshop

Sep. 21 2:00pm – 5:00pm, Exhibition hall of Coex
Workshop I: Building the infrastructure for the Next Generation Digital Learning Environment using Tsugi

This workshop will introduce attendees to the Tsugi learning application framework. With Tsugi you can easily develop rich and powerful tools that plug in seamlessly to any LMS. Tsugi implements the IMS standards and provides easy-to-use APIs to allow developers to focus on building new and interesting tools. Tsugi tools support IMS Learning Tools Interoperability (LTI) 1.1, LTI 2.0, IMS ContentItem and IMS Community App Sharing Architecture (CASA) and can be served as part of an interoperable learning Tool App store. As new standards are approved such as those for analytics, Tsugi will support those standards as well.