Innovative Educational Technology and Educational Infrastructure at MIT

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Outline

- What are your interests?
- About Strategic Education Initiatives
- Options
  - Backstage: Educational Infrastructure
  - MIT's Approach to Educational Technology
  - Residential Experiments using MITx
- Open Discussion

Strategic Education Initiatives, Office of Digital Learning

- SEI **nurtures and manages education experiments** (projects) driven by MIT's and ODL's strategic priorities and mission.
- SEI works with national and international partners to advance the field of digital learning.
  - universities, foundations and trusts, non-governmental organizations and countries

Connecting within ODL and MIT

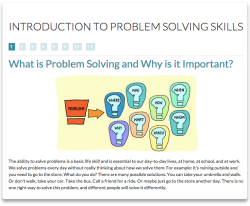
- SEI partners with MIT faculty, students, staff and alumni.
  - Leverage what's going on across MIT
- SEI's work builds upon MIT's digital learning assets.
  - MITx, MIT OpenCourseWare, MIT pedagogical approaches and other educational tools and services developed by MIT faculty and ODL

Current SEI Projects

Universities

- Leveraging MITx courses at other universities
- Course and curriculum design
- Professional development

Community Colleges

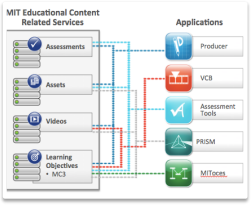


- Curriculum design
- Linking courses / competencies / labor market information (jobs)
- STEM Workforce Development

K-12

- K-12 Videos
- "MIT" STEM learning experiences in Grades 8-12
- Teacher education programs

Next Gen Technology



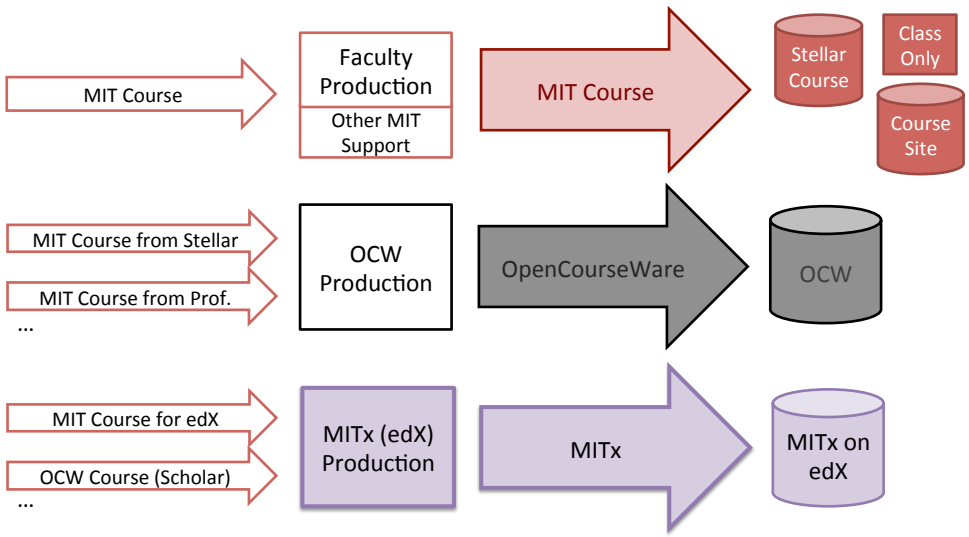
- "Backstage"
- Learning objectives & concepts
- Assessment authoring and management

BACKSTAGE: EDUCATIONAL INFRASTRUCTURE

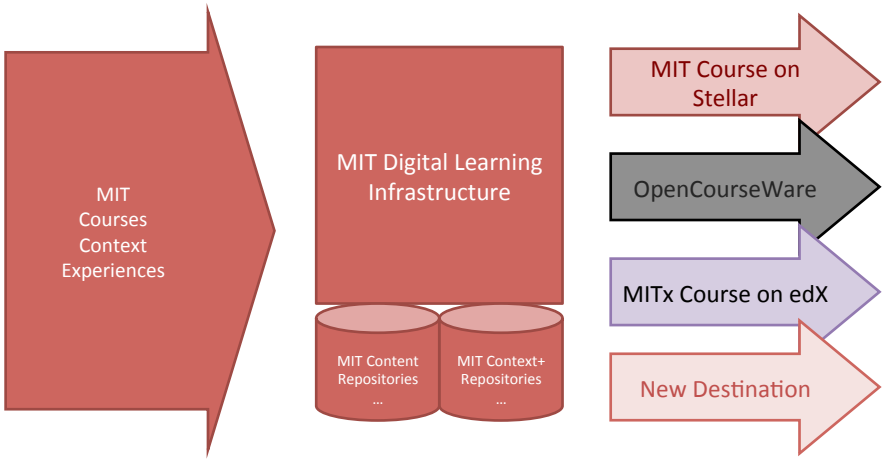
The Problem

- MIT Faculty are ***investing heavily in content development*** (notes, videos, assessments) for edX and OCW delivery.
- Ideally, MIT should ***manage these resources*** and make them available as needed to our community for re-use.
- Solution must…
  - Support integration with edX, OCW and others
  - Be adaptable to new technologies and market products

Current Development Workflows



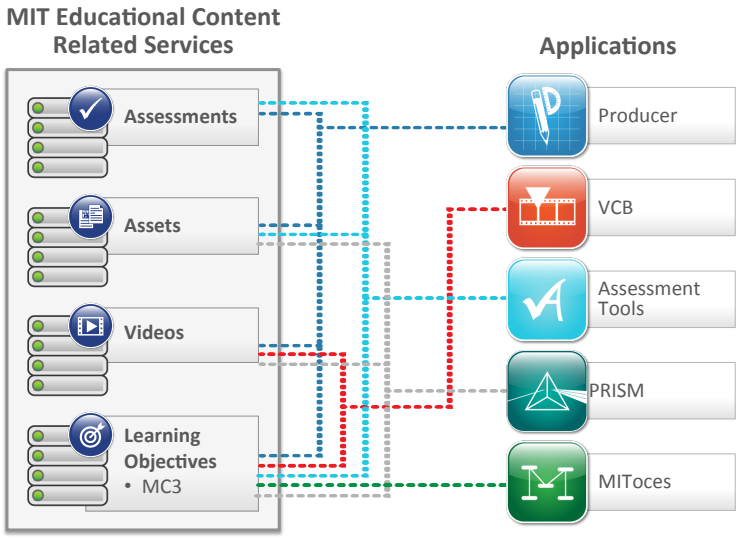
Possible Future



Proposed Solution – Backstage Services

- "Headless" content services with published APIs
  - REST, Python, Java
- Key applications using these services
- Support a developer community

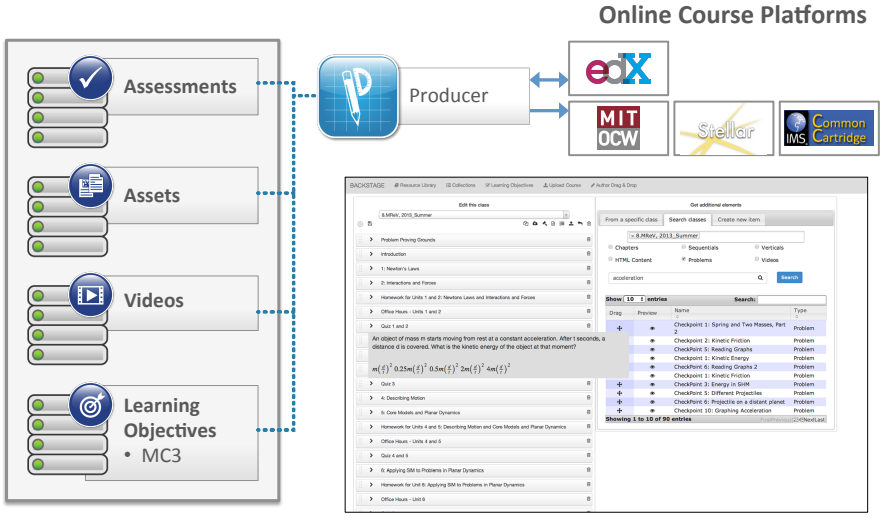
Backstage Core Service Suite



Producer – Asset Management for Reuse

- Motivation
  - Support content reuse in MITx (edX) content workflow
  - Ease content search and integration
  - Explore alternative authoring tools for edX delivery
- Status
  - Proof-of-concept being tested

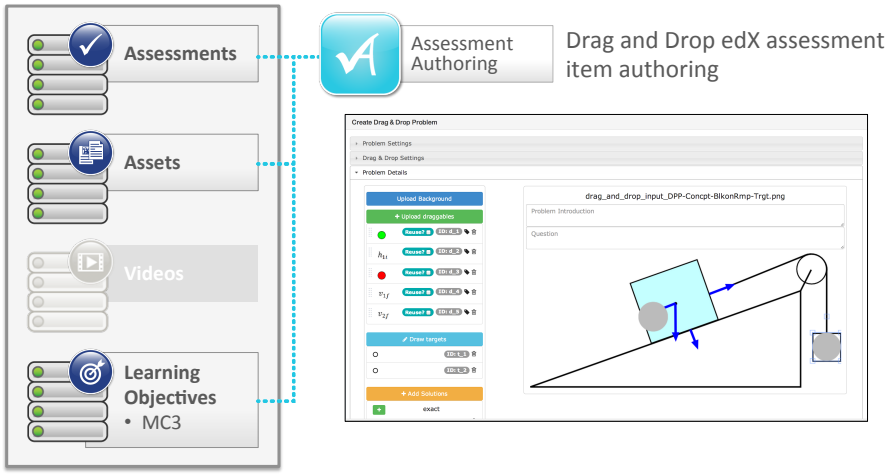
Producer and Backstage Services



Assessments

- Motivation
  - Manage, share and author assessment items
  - Track usage and IRT data across assessment offerings
  - Implement APIs for taking as well as managing/sharing
- Status
  - Proof of concept drag-and-drop authoring tool (demo)
  - App to Embed Assessments (QTI assessment items)
  - Physics Question Bank (PQB) under development

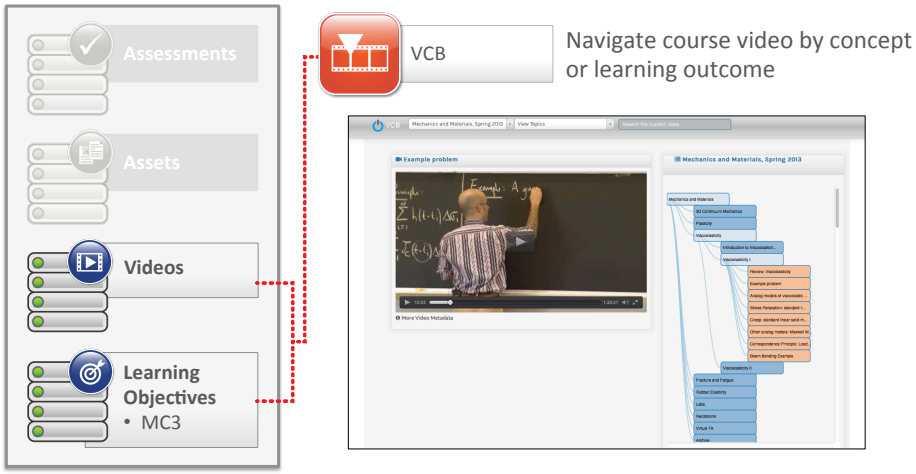
Assessment Backstage Services



Video Concept Browser – Browse Video by Concept

- Motivation
  - Enable better use of whole-class lecture video (60-90 minutes) by segmenting by concepts/topics
  - Pre-production for MOOC courses
- Status
  - App to browse lecture videos by concepts (demo)

VCB and Backstage Services



MIT'S APPROACH TO EDUCATIONAL TECHNOLOGY

MIT's Approach

Our approach is *technology* in the service of ***pedagogy***

EdTech Strategy at MIT

- Support faculty and students by experimenting and adopting innovative practices in teaching and learning
  - Innovative approach in delivering General Ed requirements
  - Make powerful tools and experiments accessible to students
  - Leverage content and resources across courses and programs
  - Facilitate hands-on learning in new ways
  - Develop educationally valuable software tools

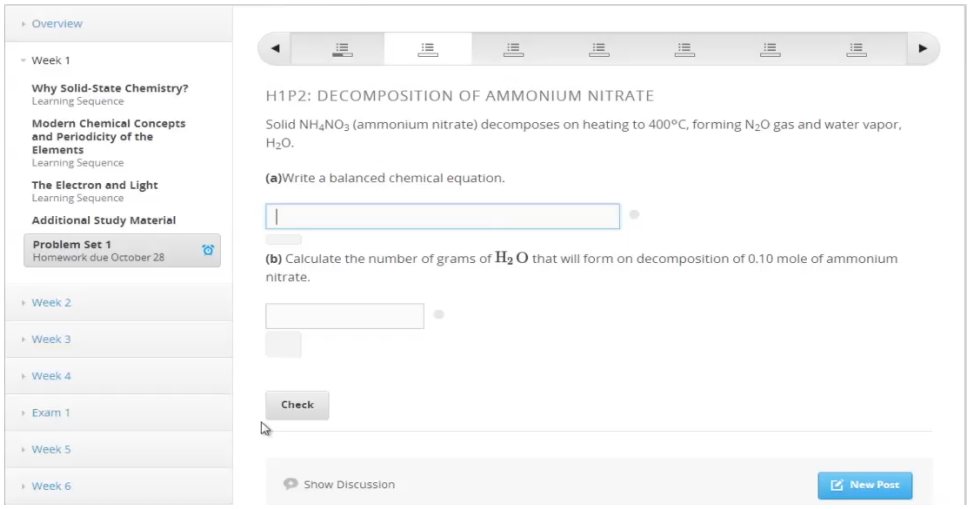
EdTech Strategy at MIT

- Inform development of educational infrastructure and services
  - Develop platforms (not one-offs) that render sustainability
  - Implement test-beds for promising educational technologies and new services, to advance teaching and learning
  - Develop plans for the incubation, early implementation, and the transitioning of delivery systems to long-term core service providers
  - Develop core infrastructure to support teaching and learning
- Support a shift to more blended and online learning

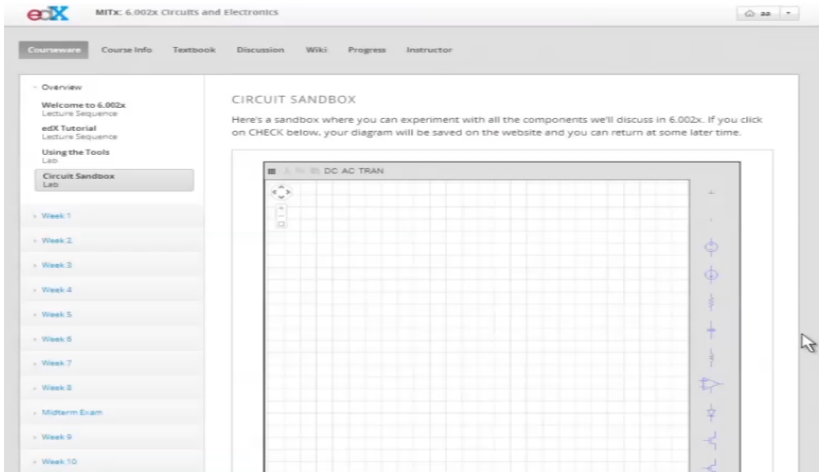
Improve Mastery of Concepts

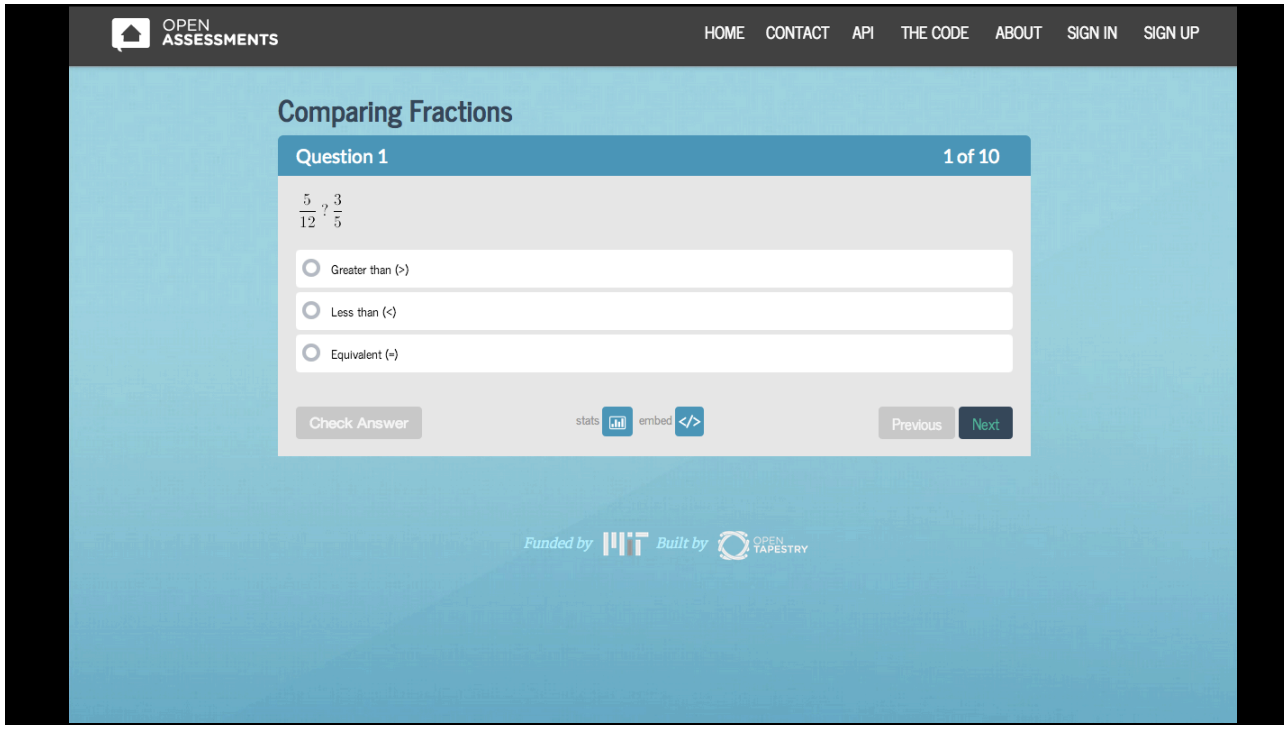
- Enable students to check their understanding / mastery of concepts directly in course materials
  - Primarily for formative (self-check, understanding) not summative (exams or formal assignments)
  - Strengthened by tie to learning outcomes, content
- "Embedded Assessment"
  - MITx Courses
  - Open Embedded Assessment: Assessments anywhere, anytime

Auto-scored Exercises: Chemistry



Virtual Laboratory: Electric Circuits



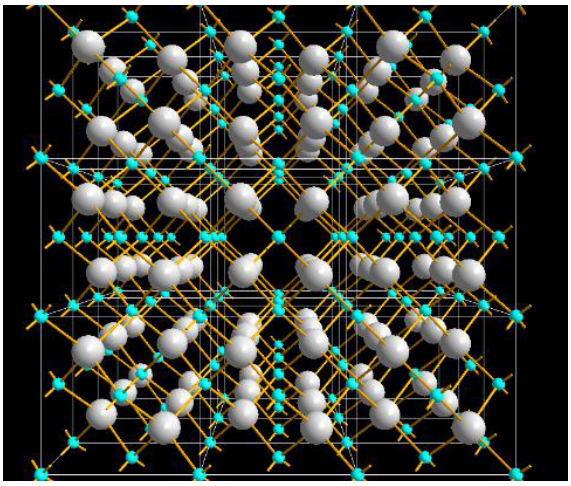


RESIDENTIAL EXPERIMENTS USING MITx

3.091: Solid State Chemistry, Fall 2013 & Fall 2014

- MOOC offered Fall 2012, on-campus class revamped in Fall 2013
- MIT students use MITx to do weekly online assessments in proctored classroom and get immediate feedback; students can repeat assessments without penalty for two weeks
- Grades now based largely on online assessments
- Measurable performance improvements over prior terms

- ***Experiment: weekly formative online assessments replace traditional exams***



Wrap-Up – Strategic Education Initiatives

- Technology, in the service of pedagogy
- Innovating, through partnerships
- Build upon core MIT values: Mens et Manus
- Sharing, at MIT and beyond

- Interests: Assessments & Tools, Modularity

MIT Office of Digital Learning
Strategic Education Initiatives

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