Traversing from CBT to MOOC

How did MOOCs come about?
What is mooKIT?

mooKIT is a lightweight MOOC Management System which aims to

- Make course creation and navigation very **simple**
- Be highly **customizable**
- Be **multi-platform** (supports phones, tablets etc)
- Be **efficient with server resources** (should not cost a lot to run)
mooKIT Architecture

**Instructors**
- TAs
- Tutors

**Browser**
- Desktop

**CMS**
- Drupal
- MySQL

**API Layer**
- node.js
- Auth, Caching, etc
- MongoDB

**LMS**
- Multi-platform Client
  - Ember.js/HTML/CSS

**Students**
- Desktop
- Mobile
- Tablet
Handles Course Content + User Data:
As a part of Drupal CMS, i.e. Database Schema is governed by Drupal.

Frequently Accessed Data + Ad-Hoc Storage:
A Schemaless database which primarily stores login sessions.
Architecture – Key Components

**API Layer:** A "communicator" layer which acts as a simple mediator between the databases and the client.

**Webapp:** JavaScript based interface. Complex calculations can be deputized to the client.
Advantages

- **Easy Customizability**
  
  Lack of a rigidly designed Database schema, Drupal as CMS, and a JavaScript API Layer allows administrators/developers to add new features even with a basic technical know-how.
Advantages

- **Multi-platform Support**

  The User Interface (i.e. the webapp) communicates with the server using standard protocols (JSON) and thus the interface can be a mobile app or even a desktop application.
Advantages

- **Scalability**

  Since complex calculations can be moved to the client’s machine, the server load can be reduced drastically thus supporting a large number of simultaneous users while not costing a lot.
Benchmarking (without performance optimization/tuning)

- **Server Configuration**
  - 1 Amazon EC2 m3.large instance: 7.5GB RAM, 2 vCPUs (2.5 GHz, Intel Xeon Family)

- **On this configuration, mooKIT supports**
  - At most 250 read requests per second (before RAM usage peaks)
  - At most 150 write requests per second (before RAM usage peaks)
  - Assuming 1% of the total students registered in a course are simultaneously online at an instant, mooKIT can support a course with 15,000-20,000 registered users

- mooKIT can support more requests per second using a server with more RAM
Benchmarking (without performance optimization/tuning)

- **Activities with High Server Resources Usage**
  - Jumping quickly from one forum topic to another
  - A chat session with 150-200 simultaneous users

- **Activities with Negligible Load on the Server**
  - Watching a lecture (served via YouTube)
  - Reading through a forum topic
  - Posting a comment
Future Plans

- mooKIT will be released under a valid Open Source Software License once it has been rigorously tested and stabilized. Users will be able to download and deploy the platform on their own machines.

- When would mooKIT be available for use?
  In approximately 3 months from now.