

Enhancement to the Open edX HTML Editor

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June 18, 2018

What is OpenEdx ?

An open source MOOC platform developed by professionals at Harvard and MIT. OpenEdx platform consists of modules called XBlocks. In short, EdX platform is "Xblock Runtime"

Main Components :

- LMS
- CMS
- Catalog
- Analytics
- Notes API
- Ecommerce

Why do we need HTML Editor ?

- Adding content to course
- Discussion Forums
- Email

Solutions adopted by OpenEdx :

- TinyMCE : WYSIWYG
- CodeMirror : Advanced editor for TinyMCE
- WMD : Mainly Email and Discussion Forums

Current versions :

- TinyMCE : 4.0.20
- CodeMirror : 3.27
- WMD : Unknown version from 2012

Issues :

- Editors are very old
- HTML code is not well indented and it is very hard to edit
- Internal CSS is not supported

Technologies

- **Python, Django** for web applications
- **MongoDB** database for courses
- **MySQL** for pre-learner data
- **Amazon S3/YouTube** for videos

Observations

- Latest version of CodeMirror has good features like code folding, indentation etc.
- **CodeMirror-For-TiynMCE** : A plugin for TinyMCE to replace TinyMCE's raw HTML Editor by CodeMirror

Our approach

The indentation problem in raw HTML Editor

- Download the latest version of TinyMCE , CodeMirror and CodeMirror-For-TinyMCE plugin
- Integrate and test the plugin on updated editors
- Use this updated editor as raw HTML Editor in OpenEdx system

Expected Result

TinyMCE opening the instance of latest codemirror as it's raw HTML editor

Alternative approach to indentation solution

- Trying other online editors such as brackets, quill, contenttools
- Porting the indentation logic from other editors such as Notepad++ to the current editor

Our approach

Supporting internal CSS

- Wrap the entire HTML content in an iframe
- Set the width of iframe to 100%
- Set the height of iframe equal to the height of content of iframe
- Set the border of iframe to zero/none
- Open all hyperlinks within the iframe in new tab

Expected Result

An invisible iframe holding our HTML content

Alternative approach for supporting internal CSS

- Use javascript to apply CSS
- Separate out CSS part from HTML content
- Wrap the entire content in a div with unique id
- Select each and every child of the div and apply styles to it

Expected Result

An invisible iframe holding our HTML content

Advantages of Approach #1 of both the problems

- Upgrading something is always better than integrating something new altogether
- The iframe approach also allows the course content creator to include third party CSS such as bootstrap, w3css which will make the course even more beautiful
- Wrapping data inside the iframes containerizes the data ensuring no mixing of CSS between 2 HTML blocks in LMS

Working over Approach #1

Steps for completing Approach #1

- Download the latest versions of both the editors
- Test each editor individually
- Integrate both the editors using *codemirror for tinymce* plugin. We call this integration as hybrid version of tinymce
- Test this hybrid editor
- Integrate this hybrid editor with django (Since EdX uses django as well)
- Test this django integration
- Set up a working environment of OpenEdx platform
- Integrate the hybrid editor with the OpenEdx platform
- Testing the complete product

Summary of local django integration

- Most of the HTML tags and their attributes work
- Most of the CSS styles and attributes work
- CSS animations and external CSS such as bootstrap works
- Report of this integration can be found [on this link](#)
- Source code of this integration can be found here [on this link](#)
- Wrapping content inside iframe(for internal CSS) is implemented in django backend(Check source code for more info)

Working over Approach #1

Preparing for the integration

- We keep the TinyMCE at it's same version
- We pull our CodeMirror plugin in the *edx-platform/common/static/js/vendor* without touching the current CodeMirror folder
- We configure the TinyMCE to use updated CodeMirror
- We modify the backend (exact location still unknown) to integrate our CSS solution

Working over Approach #1

Getting a working environment

OpenEdx can be installed in one of the following 3 ways

- Devstack
- Fullstack
- Native Ubuntu Installation

For developers, as the name suggests, devstack is suggested

Getting a devstack up and running

- Virtualbox + Vagrant system(Deprecated now)
- Docker based system

Issues we faced

- A LOT OF PROXY CONFIGURATION ISSUES !
- Docker installation and configuration
- Building ReactJS assets
- Docker container issues

Dealing with the issues

- **Proxy** : Just disable the proxy altogether and use a non-proxy network for downloading everything you need

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Getting a working environment

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- **Docker container** : Set the environment variables very very carefully and preserve them

Integrating our hybrid editor with OpenEdx Devstack

- The work on this is partially done
- We were successful in getting the devstack to open updated instance of CodeMirror
- The integration source code can be found [here](#)

Future Work

- Consult OpenEdX backend developer
- Completing the integration of hybrid editor
- Rigorous testing of the completed product
- Report making

THANK YOU!

Questions ?