***================***

***Direct User Perceptions***

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**Open Source LMS Comparison: Moodle vs OpenEdX vs Canvas LMS/** Michał Macura

* **Deployment type**: Cloud hosted Vs Self-hosted
* **CMS & branding** (i.e. Content management & branding the LMS as per the requirement of an organization)
* **Integrations** ( Not all LMS comes with everything right out of the box so to speak. There should be the ability to increase the power of your open-source learning management system even further through a range of LMS integrations that can make designing and delivering e-learning even easier and more fun)
* **Learning modes**: Adaptive learning, Social learning, Blended/Hybrid learning (Different institutions, classes or even teachers have varying methods of teaching and a one size fits all solution to learning doesn't work for everyone. This is where learning modes such as Adaptive learning, Social learning, Blended/Hybrid learning come into play)
* **Ecommerce** (One of the key features of any LMS is the ability to monetize its content and courses. So a decent learning management system should include the ability to generate revenue)
* **mLearning** (Not all students will be able to access courses from a pc but would still wish to learn even in transit or on the go. This is where mLearning comes into play, allowing for access on mobile devices and smartphones.
* **Learning Paths** (The ability to dictate a strategic pathway in which content is systematically disseminated gives the students a simple progression by which to pick up content relating to the overall goals)
* **Certificates** (Once a course is complete or at certain defined stages, the LMS should have the ability to give out certification of completion as a reward to the student)
* **Gamification/ Simulations technologies** (One of the key ways to increase engagement and promote completion of various tasks and activities is by adding gamification such as puzzles or quizzes to the course study. Teachers can even go one step further by integrating simulations to express certain ideas and scenarios to improve comprehension)
* **Assessment and Testing technologies** (Both the ability to progress to the next stage of a course or to graduate from a course depends on the comprehension of the subject matter. Hence a good LMS should include the ability to carry out assessments and test as needed)
* **Audio/Video Conferencing tools** (Distance learning is usually impersonal and "distant" but with the inclusion of conferencing tools into an LMS you take the learning experience to another level by allowing one-on-one or one-on-many video class sessions)
* **Learning outcomes technologies/ Grading functionality** (At the end of every learning experience, there is usually a Grade to determine how a student has performed or the degree to which they comprehend the subject matter. Having a grading system gives a direct visual representation of this)
* **Social & collaboration technologies/ chat tools** (A learning environment is always made better when the students are able to have social interactions with the instructor either on an individual basis or in a group setting and one of the ways of achieving this is through instant chat or messaging services within the LMS)
* **Functionality Customization**
* **Ease of Use**
* **Community Support**
* **Content Authoring tools**
* **Multilingual**
* **Offline learning**
* **Custom user interface**
* **SCORM Compliance**

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Comparing and Evaluating Open Source E-learning Platforms// Fakhreldeen Abbas Saeed// International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-3, Issue-3, July 2013

1. **Security**

Audit Trail

Email Verification

Granular Privileges

Login History

Some Authentication

Problem Notification

Sandbox

Session Command Management

Versioning

Advanced Caching

1. **Performances**

Database Replication

Load Balancing

Page Caching

Static Content Export

1. **Support**

Code Skeleton

Manual/Supp/Training

Develop Community

Online Help

Pluggable Api

Public Forum

Public Mailing List

Users Conference

1. **Interoperability**

Content syndic.rss

Ftp support

Ical calendar

Wai compliant

Webdav support

Xhtml compliant

Instrstandard compliant

1. **Flexibility**

Cgi-mode support

Content reuse

Extens.user profiles

Metadata support

Multi-lingual content

Multi-site deployement

1. **Easy of using**

Roxio™ drag&drop content

Email to discussion groups

Image resizing

Macro language

Mass upload

Server page lang.

Site setup wizard

Spell checker

Style wizard

Subscriptions

Template language

Ui throttling

Undo

Wysiwyg editor

Zip archives

1. **Management**

Advertising manag.

Asset management

Clipboard button located at

Content scheduling

Inline administration

Online administration

Package deployment

Themes (skins

Trash

Web statistics

Webstyle/template

1. **Communication tools**

Blog

Chat

Discussion groups (forum )

Mail form

Mypage (dashboard

File distribution

Groupware

1. **Administration tools**

Contact management

Data entry

Database reports

Helpdesk organizes bug report

Http proxy

Guest book

In/out board

1. **Course delivery tools**

Document management

Events

Events management

Faq management

Newsletter

Product management

Project tracking

Search engine

Tests / quizzes

Time tracking

User contributions

Link management

1. **Content development**

Graphs and charts

Job postings

Photo gallery

Search engine

Site map

Syndic.content rss

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Learning Management System User Requirements for the National Nuclear Security Administration's International Nuclear Safeguards Engagement Program// C. Carroll/2021

*The research team conducted a review on online resources to identify attributes that the team could use to describe LMSs.*

Communication Tools

White Board

Stream Video

Discussion Forums

Social / Experiential Learning – Communities

File Exchange

Communication Support

Administration Tools

Authentication

Course Authorization

Registration Integration

Student Profiles

Report Generation

Curriculum Design

Course Templates

Course categories and subcategories

Ability to allow students to pick courses from a course catalog

Ability to allow students to rate courses

Curriculum Management

Customization of Look-and-Feel

Instructional Design/Content Development Tools

Automated Testing and Scoring

Content Sharing and Reuse

Course Delivery Tools

Course Management

Instructor Support

Online Grading Tools

Student Tracking

Archives

Student Involvement

Group Work

Student Community Building

Self-assessment

Student Portfolios

Ability to share ePortfolio outside of the LMS

Productivity Tools

Bookmarks

Searching Within a Course

Calendar/Progress Review

Ability to Work Offline and then Synchronize

Orientation/Help

Pricing/Licensing

License Structure

Payment Methods

Free Trial Available

System

Hosting Location

Server OS

Client Hosting

Software Support

Integration

Content Standards

Embedded Support for Third Party Tools

Portal Organization and customization

Ability to create independent sub-portals (branches)

Ability to create groups of students, in order to assign common courses (groups)

Ability to customize and brand your portal and sub-portal(s)

Ability to add your own login domain

Ability to create automated events based on triggers

Ability to customize automated notifications based on triggers

Ability to configure user permissions

Security

Allow IP control and filtering?

Support double username access lockability?

Support secure password management?

Support encryption and user password per authentication?

Encrypt data during transmission?

Include an advanced antivirus check on all uploaded content?

Is the system compliant with ISO 27001 Certification?

Is there a protocol for conducting penetration test assessments?

Logging and Security Response

Log security events on networking, security device, or on server equipment?

Does the system's logging practices enable the identification of the IP Address of the

remote system in the event of an attack?

Maintain all security logs? If yes, indicate retention period.

Have documented and implemented security incident response procedures?

Have incident response processes in place to investigate potential security incidents in real-time? If no, specify time frame

Have processes in place to report security incidents to the customer? If yes, indicate

timeframe.

Send logs to a centralized log collection server?

Monitor logs for security events and intrusion attempts in real time?

Perform an automated correlation of security logs between the various device types

Enable the identification of internal personnel (specific user) in the event of an internal attack?

Network/Service Architecture

Deploy firewalls?

Deploy network Intrusion Prevention System (IPS) sensors? If yes, are all IPS sensors

updated within 24 hours of new signatures released?

Support the firewalls, IPS sensors, routers and switches on software and hardware

levels?

Patch all critical security issues on firewalls, IPS sensors, routers and switches within 1 month of release?

Encrypt data in transit on public or shared networks?

Secure Server

Have antivirus software installed and running optimally in the server?

Have measures in place to protect data from exposure when the service is executed on shared servers?

Have measures in place to protect from performance degradation when the service is executed on shared servers?

Have policies in place to ensure the integrity of any software prior to installation?

Have its servers built off a general network or on an isolated network?

Have security patches installed prior to the server being put onto the general network?

Backups

Are the servers backed up to external media (e.g. tape) on a daily basis or all data

replicated in near real-time to a secondary site?

Are backups tested regularly? If yes, please specify the frequency.

If data is backed up to external media, how often are full backups performed?

If data is backed up to external media, are the backups encrypted?

If data is backed up to external media, are the backups stored offsite?

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**A Comparison of Two Online Learning Systems**

**Mark Nichols//***Journal of Open, Flexible and Distance Learning, 20(1)*

Mark Nichols compared Moodle with iQualify, an indigenously developed lms for Open Polytechnic, the a single-mode provider of distance education in New Zealand. The comparison was based on student outcomes, high-level course evaluations, and student perceptions of the two lms. The student experience was based on .

1. **Usability**
2. **Accessibility**
3. **Instructions for use**
4. **Navigational facilities**
5. **Content**

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An Analysis of Some Learning Management Systems

Radoslava Kraleva#1, Mehrudin Sabani#2, Velin Kralev// *International Journal on Advanced*

*Science, Engineering and Information Technology*,// Vol.9 (2019) No. 4

Kraleva, Sabani **and** Kralev **developed a set of criteria for analysing the LMS platforms** in terms of their software specifications and functionalities **under three categories based on a survey of the state-of-art science research:**

1. **Learning skills tools**
2. **Communication tools**
3. **Productivity tools**