E-learning (Web + Mobile) Using MEAN Stack
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Abstract:
The e-Learning concept is based on the delivery of learning by using technology as the delivery platform. The guiding value is to provide the highest quality of education to the student. Content is delivered via the Internet, intranet/extranet, audio or videos. Main requirements of an educational web portal should fulfill to give students easy access to diversity of useful information and students services, to open lines of interaction among the community users, making it helpful for sharing common class activities with teachers and students, to provide a tool for students, faculties and universities to innovate teaching and a tool for students to experience various forms of learning. We are going to build our E-learning portal on Mean Stack, with Mean we have advantages: one language for your development journey (JavaScript), Performance, Support from community. We will be providing Responsive Web layouts so that it will work on any device. Application will be on client side technology so we are planning to create hybrid app in Android, iOS and for Windows using PhoneGap. For customer support activity, there will be live chat widget will be available in website. Website can be access from any Geolocation so we will be providing website with multilingual functionality. We are going to use Payment gateway of PayPal. Since users will be using their credit card information for payment, their identity and card information must be protected, so we will be using PCI compliance for avoiding credit card frauds. For application security, we are going to implement OWASP top ten. The OWASP Top Ten is a list of the 10 most dangerous current Web application security flaws, along with effective methods of dealing with those flaws.

Keywords: JavaScript, PhoneGap, Paypal, OWASP.

I. INTRODUCTION
E-learning is electronic learning, and typically this means using a computer to deliver part, or all of a course whether it’s in a school, part of your mandatory business training or a full distance learning course. In the early days, it was considered a bad idea, as many people thought bringing computers into the classroom would remove that human element that some learners need, but as time has progressed technology has developed, and now we own smartphones and tablets in the classroom and office, as well as using a wealth of interactive designs that makes distance learning not only engaging for the users, but also helpful and valuable as a lesson delivery medium [1]. Building partnerships with quality training providers, and combining this with a dedicated experienced technical team and support team, virtual College provides the perfect out of box learning environment, offering anyone the chance to take their online training to the next level. E-Learning exploits interactive technologies and communication systems to improve the learning experience. It has the potential to transform the way we teach and learn across the board. It will raise standards, and widen participation in lifelong learning. It cannot replace teachers and lecturers, but alongside existing methods it can enhance the quality and reach of their teaching. It can enable every learner to achieve his or her potential, and help to build an educational workforce empowered to change. It makes possible a truly ambitious education system for a future learning society. [2]

A) Not completely free: Even though there are still many free courses on Coursera, most of the high-demand courses are now "audit-only": a mode where non-payers don’t have access to graded assessments. B) Quizzes are too lenient: Quizzes have unlimited trials. Basically, this tempts people to trial and error to get the quiz answer right, instead of working through it properly. Thus, skill validation is quite doubtful. [3]

2. EDx: Founded by Harvard University and MIT in 2012, edX is an online learning destination and MOOC provider, offering high-quality courses from the world’s best universities and institutions to Learners everywhere. With more than 90 global partners, EDx is proud to count the world’s leading universities, non-profits, and institutions as our members. Although there are certain disadvantages like Variety of catalogue is not as wide as Cousera and are having introductory and intermediate courses, as well as many users have reported that the discussion forums on EDx are not much user friendly as Cousera and the old posts were not able to retrieve. [4]

III. TECHNOLOGY USED IN PROPOSED SYSTEM
We are going to build our e-learning portal using MEAN stack, so there will be only one language throughout the development journey that is JavaScript. MEAN stands for M- Mongodb, Express, Angular.js, N- Node.js

1. Mongodb: It is the no SQL database. It uses JSON style documents for the data representation. The reason of choosing Mongo is that, it lets you make the use of just one language the whole way through
2. Express.js: It is a HTTP server framework for web applications that give useful modules and components to work upon the common task for the website. This gives us the simplest interface so that you can make request endpoints and

cookie handling. Apart from that it is good at enabling the simple REST routes, handling automated HTTP header.

3. **Angular.js**: It is a frontend JS framework to develop complex client side applications with modular code and data binding UI. It is used to develop the single page applications with the use of the MVC architecture; and maintained by Google.

4. **Node.js**: It is a concurrent JavaScript environment for building scalable and fast web applications. It compiles the JavaScript code to native machine code before the execution of code. It is lightweight and perfect for the real-time applications.

5. **MongoDB**: It is the no SQL database. It uses JSON style documents for the data representation. The reason of choosing NoSQL Mongo is that, it lets you make the use of just one language the whole way through.

**Architecture Diagram (MEAN)**

1. This is MEAN so everywhere is JSON/JavaScript.
2. On Client Side we have Angularjs where we are going to build View Logic, App logic and client side validation. Angular has features like 2 way data binding so we can bind easily JSON data to view. With Angularjs routing we can create SPA and every page will have their own controller, view logic something like filter data, adding click handler, App logic is like give (Ajax) service call, Validation.
3. Angular will give http (Ajax) request to Node.
4. Node job is to validate request, server side validation and if everything is fine then create connection through mongoose and get data from Mongo Db
5. Express job is to create store token, Session information, create proper header/ Cookies, handle rest route. [5]
6. For making the portal using more secure, we are going to implement OWASP top 10. [6]

**IV. OUTPUT**

1. **Home page**

![MEAN Architecture Diagram](http://ijesc.org/)

7. For creating hybrid applications we are going to use Adobe PhoneGap technology as we are planning to build a client side portal so it is very easy to deploy mobile apps for iOS, Android, Windows Phone. [7]

Every Client server application work on token/ session: so node will generate token with valid login request and store that token in server session. Node will send that token to client (through cookies) and in every client request Client (angular) will pass that token to server. [8]
There are many existing learning systems. The existing e-learning system doesn’t have a variety of catalogue related to our current education system. We are going to build our e-learning app (Mobile + Web) with single technology i.e. JavaScript. The system will also take very rigorous quizzes so that students will complete their course in time. The students will be able to view their detailed dashboard of their courses and progress. With this system our more focus on involvement of teachers and students.

V. REFERENCES


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