MBOALAB PROPOSAL

DESIGN CHALLENGE

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Monday December 27th 2021

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1 .INTRODUCTION

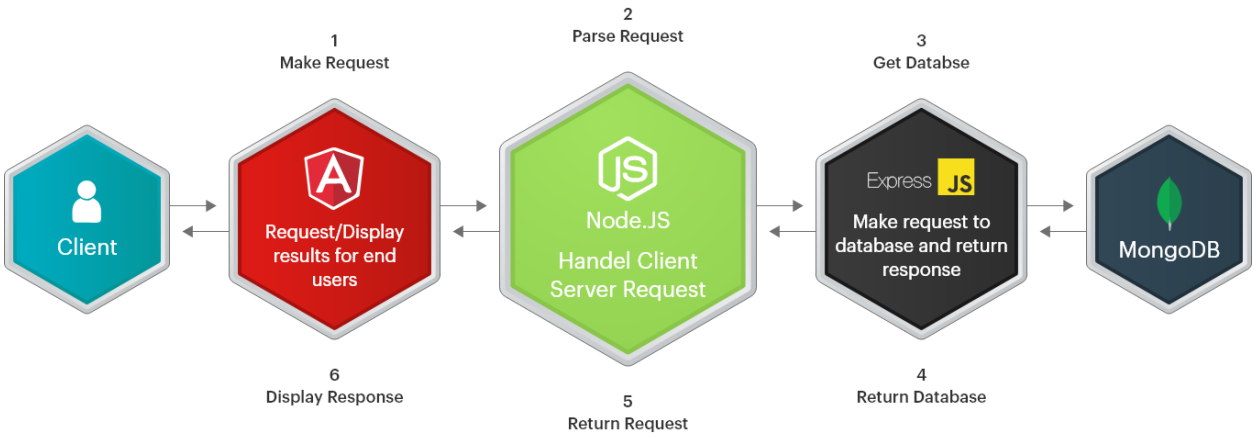
The purpose of this document is to list out some useful features for the Mboalab website and also come out with a concrete design which is aimed at suiting the specific needs of Mboalab. With the endless possibilities of expansion, there are many avenues which cannot be ignored. The solution will have to be very complete and be able to be easily maintainable, and more importantly stand the test of time. It sure has to be dynamic because nobody wants a platform which just doesn't change. It should be an active place where like minded people are always coming to acquire both information and knowledge as to the happenings around Mboalab.

1.1 Method of Approach

The method to approach this challenge is purely logical hence scientific. It takes into consideration most common design patterns which have existed for a very long time. In this light, all views are very simplistic and users go directly to where they want without being confused or lost. This will reflect in the way the dropdown menus for example, are displayed. There must be a feeling of smoothness and precision and the notion that being on the platform is something of importance.

2 ARCHITECTURE

The proposed architecture for the implementation is the MEAN stack.It is a collection of JavaScript technologies used to develop web applications. Therefore, from the client to the server and from server to database, everything is based on JavaScript. It is a full-stack development toolkit used to develop fast and robust web applications.It requires an API which is fully functional and built to handle all the dynamic data.



2.1 MongoDB

- MongoDB is the database manager to execute a NoSQL structure.
- It easily transfers data between the client and the server.
- It is a cross-platform and object oriented database.
- It supports multi-dimensional data types which helps provide high performance, availability and easy scalability.

2.2 Express

- Express.js is the framework to support and host Node.js applications. It plays an important role in the back-end.

- It factors in to help both single and multi-page web applications.
- It helps developers to contribute toward business objectives, while it handles monotonous tasks.

2.3 Angular

- Angular is a framework that builds the applications. It is a front-end layer of the MEAN Stack.
- It helps remove unwanted codes to help components smoothly collaborate with one another. Developers choose the framework as its structure helps build dynamic web applications which is key when it comes to speed.

2.4 Node JS

- Node.js is the final component that runs server applications in the back-end.
- It simultaneously executes multiple connections using the event-driven and non-blocking I/O model.
- It weighs less, is efficient, and flexible, which helps it run browsers apart from JavaScript applications. It is also a free, reliable, and open-source component.

2.5 Advantages of MEAN

Here are some reasons why this architecture is the best for the Mboalab use case:-

- **Effortless Swapping between Client and Server**

  Developers benefit a lot from using MEAN Stack since they build web applications with only a single language. A JS specialist can execute projects with the MEAN Stack formula application.It allows developers to deploy web applications immediately on a server. It avoids deployment to a standalone server first.

- **Simple Solution**

  MEAN Stack enables developers to create a simple and open-source solution. Developers need to know only one programming language, which is JavaScript.

- **Open Source Components:**

  The components in MEAN Stack are open source. The components are available for free for developers to build robust solutions and applications.

- **Cost-Effective:**

  MEAN Stack is lucrative for businesses. The components are all open-sourced and free. Companies only need to invest in a full-stack JavaScript developer.

- **Timer-Saving and Resourceful Tool:**

  One of MEAN Stack's major features is the enormous directory of modules libraries in Node.js. It prevents developers from creating modules from scratch.

- **Programming Language**

  JavaScript is the programming language in MEAN Stack. Developers comfortable with the language can easily adapt to new projects and schedules.As the web application develops it is easy to update and add features. It is a scalable programming language and benefits during deployment.

- **Maximum Flexibility**

  MEAN Stack is highly flexible during web application development. It is easy and quick to add new aspects while developing or post-development.

- **Compatible with Cloud**

MongoDB in MEAN Stack makes it highly compatible with the cloud. It helps execute cloud features with the MongoDB solution. It is easier for developing, testing, and deploying phases of the application with MEAN Stack.

- **JavaScript Object Notation**

  JavaScript Object Notation or JSON is a fine format that stores and transfers data. MEAN Stack components AngularJS and NodeJS, both use JSON. Even MongoDB utilizes JSON Format while storing data. MEAN Stack and businesses benefit from this while developing the web application. There is no requirement to reformat the data and is pivotal support for larger projects.

- **Worldwide Community Support**

  JavaScript is a universal programming language. Hence developing communities all across the globe that provide constant support from experts and leaders.MEAN Stack provides modern features in web development applications. For example, traditional web applications would require refreshing the web page.

3. FEATURES

In order to achieve a fully functional system, there must be certain aspects it has to address as a scientific platform focused on pushing academics, fostering healthcare of the world, and one who plays a major role in the tech research space.The proposed features for the Mboalab website are listed below.It should be noted that the features will mostly be handled by the API's logic to suit Mboalab :-

3.1 Admin

- Grant user roles; **Assign, Unassign;**
- Manage blog posts.
- Update page content where applicable
- Manage users, **add and delete.**
- Manage career/opportunities page
- Manage projects
- Manage talks and conferences data: **Add, update, delete**
- Send newsletter to subscribers.
- .. Manage anything with the tendency of being dynamic.

3.2 Authentication

- Users will be able to sign up and login to the platform
- The administrator will be able to assign roles to the user
- Users who login will be able to perform only the roles which they have been assigned to.

3.3 Blog posts

- Users will be able to post blog posts and update them
- Registered users will be able to comment on blog posts

3.4 Events/Conferences

- Users can register for events on the platform, so as to have specialized reminders sent to them, etc.

3.5 Donate

- Users or non users will be able to donate through paypal
- Other mediums of donation will be made available for convenience.Basically, an admin should be able to update a mobile money or Orange money contact.

3.6 Send emails

- Users or non users will be able to send emails directly from the platform using the contact page.

3.7 Chat bot

- Users will be able to interact with a Mboalab operative. This will be an admin, or can be integrated with facebook Messenger or whatsapp directly.

3.8 FAQS

- This will be a section where people can get answers to some usual questions Mboalab must have received in the past as to their activities and views on expansion, etc.

3.9 Subscribe to Newsletter

- Everyone, be it a user or not, should be able to subscribe to Mboalab's newsletter.

4.0 Internationalization

- The platform should be capable of being used and understood by anyone who browses through. This would be made possible by enabling that there should be internationalization.The two languages we would commence with are English and French.

The features listed are not exclusive, but they have been abstracted based on the best value the platform can provide to users. Usually, scientific websites are very boring and not much happens on them as they just display information for decades. With these, a lot of traction will be created and whatever is happening around Mboalab will always be on the forefront of discussions with all stakeholders and that can be seen through blogs, comments, and the whole dynamism of the platform.One might think creating an admin, users , is out of scope but down the line, it cancels the need to always look for the developer who built it to maintain and update, etc which in turn increases productivity on the Mboalab side of things. The whole design ensures that there will be less dependability on the developer and this is usually an important factor in my experience.

4. SAMPLES OF WORK

Throughout my career, I have worked in several IT companies and have learned a lot over time. These experiences gave me the opportunity to work on many platforms. Some of them which closely fall in line with the architecture I proposed include the following below;

4.1 Journal of Food Stability

This is a food science journal which manages authors,and lets them submit their papers to the journal to be published. Authors make payment out of the platform upon the request of the client who had limited funds to achieve the integration of a payment gateway.It was hosted in 2017 on DigitalOcean. Since then, it has grown with over 80 papers published.
URL: www.foodstability.com

4.2 Aswiftconnect

This is a platform for African tech talent. It has not been launched and is under development.It will bring together people from different parts of the world who are in search of jobs.
URL: https://freelancer.aswiftconnect.com

4.3 Blitzliga Videos Section

This is a platform for a football league. It is very straightforward and simplistic.I implemented the videos section for this and it was built with wordpress and is a platform with multiple developers. I personally don't like Wordpress but the client wanted that and there was no room for proposals. It displays as a simple blog with pagination, which Mboalab can borrow from, because over time, the blog posts will increase.
URL: http://blitzliga.com/match-videos/

4.4 Mboalab Online Blog platform

This was built during the application stage of the internship.It was developed with the MEAN architecture too, and the API hosted on heroku. It best portrays how Angular can be utilized to create wonderful user interfaces, and the API was built with node js, and the database, MongoDB
URL: https://choclawrence.github.io/mboalab/

4.5 Insurance Registration Platform

This platform is used to register beneficiaries, or those who want to subscribe under an insurance plan. I developed this and it's already been used by an insurance company in Ghana, and is also being used in Nigeria. It is proprietary, so I can only share with you the link to the login page.
URL: https://my.pether.io/login

5. COSTING

The costing for implementing the web platform with the features listed are shown below;

5.1 Cost Breakdown

SN	PHASE	COST
1	Backend and all basic features including Paypal payment integration Documentation	$1000
2	Subscribing to MongoDB Atlas [512MB to 5GB of storage limit] https://www.mongodb.com/pricing >> First ever payment may be after a year since data will not be expected to grow beyond 5GB in the first year. [$0.30/million reads]	$0
3	Frontend Implementing all functionality on documentation	$800
4	Hosting Frontend/backend on DigitalOcean or AWS/year [$20usd monthly for DigitalOcean] Digital Ocean Pricing Calculator	$240
5	Maintenance/year Feature updates Routine tests [$50usd monthly]	$600
TOTAL		$2640

5.2 Total Cost of Ownership

Estimated useful life **(EUL)**: 5 years

Operational Costs = (Hosting fees x EUL) + (Maintenance fees x EUL) + (MongoDB subscription x EUL)

= 240(5) + 600(5) + ~120(5)

= 1200 + 3000 + 600

= $4800

Estimated remaining value after **EUL** = $4000 (Strictly based on estimated user growth within the constraints of the estimated useful life)

Total cost of ownership = **Initial Cost + Operational Costs - Remaining value**

= $2640 + $4800 + $4000

= **$11440**

6. TIMELINE

A proposed tentative timeline for the implementation of these features is outlined in the table below.It will be subject to review based on the needs of Mboalab.

6.1 Timeline Breakdown

SN	STEP	DAYS
1	Setting up backend project	1
2	Implement Admin model	4
3	Implement User model	4
4	Tests and fixes	2
5	Hosting backend on server and running tests	2
4	Setting up frontend project	1
5	Implement Admin panel alongside features	5
6	Implement User features	5
7	Tests and fixes	2
8	Hosting backend on server and running tests	2
9	Share url for Review	0
10	Implement changes based on review	5
ESTIMATED TOTAL		33

7. CONCLUSION

The analysis was done step by step and all variables considered for the smooth delivery of the top-notch project. I am open to further discussions as to how this could possibly be carried out using Mboalab timelines.

7.1 Working Prototype

The working prototype can be found here. Feel free to look around and leave your comments. I believe the platform has a lot of potential and my goal is to deliver this smoothly and have it up and running just as expected.

“Design creates culture, Culture shapes values. Values determine the future”
-- Robert L. Peters

December 2021