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# EASYALLIES

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## ABSTRACT

The internet has been a platform for individuals, groups of people and companies to interact with one another through social media. Social media has truly aided interaction and even other business services through social networks, forums, blogs, etc. Forums are now being used as tools/platforms to create discussions, connect to people (mostly of similar interests) and as sources of relevant information. This work intends to make use of forums as tools in helping prospective university students to make the right decisions about their choice of career, choice of environment, etc.

Based on an in-depth review of some relevant literature, some key requirements have been considered in the development of a suitable web application. This online forum will be developed for students to cater for some of their needs and solve some of the issues they face with their choice of career, their course of study, the accessibility of relevant information about any institution, etc.

This Social Media Application helps to create a community by establishing connections between people who are interested in the same topic, passions and hobbies. It is a massive collection of forums where people can share news and content or comment on other people's posts. It can also serve as a debate platform where users can express their feelings and views on a shared interest.

It is a web application where people can share news and content or comment on other people's posts.

A debate is needed only when a course of action or a group-judgment is needed and it is used because it allows for all perspectives to state their best case and then rebuke accusations or clarify misunderstandings. The goal and hope being that one argument will show itself to be superior to the rest. Without the debate one is only given one's own perspective and the ones of those you talk to, who will very likely share many of your views already thus creating an echo chamber of one sidedness.

In this paper, we have started with the introduction to Full Stack Web Development and its technical characteristics. After that we have given a brief introduction about social media. Also, we have reviewed prior research that has already been done in this field. We will also talk about the available platforms that are being used for such purposes. We have also explained the methodology we have used while the development of the application. This paper also recommends some future work that can be done in order to provide better service to users.

Keywords- ReactJs, MongoDB, NodeJs, SocketIO, MaterialUI

## 1. INTRODUCTION

This Social Media Application helps to create a community by establishing connections between people who are interested in the same topic, passions and hobbies. It is a massive collection of forums where people can share news and content or comment on other people's posts. It can also serve as a debate platform where users can express their feelings and views on a shared interest. It is a web application where people can share news and content or comment on other people's posts.

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Communication is a basic human need and for that reason, man has always found a means of meeting this need. The media, which is an umbrella term for various means of communication, has become an integral part of human life around the world. The earliest forms of personal media, speech and gestures, had the benefit of being easy to use and did not necessarily need complex technology (Idakwo, 2011).

Through the social media, the internet community has drastically increased over the years. The social media has become a significant part of today's modern civilization. It is a defining trait of how integrated social interactions have become. The impact of the social media have been seen in basically five different contexts; news, interactions, political landscapes, learning and marketing (Guha, 2013).

With over 80 percent of teen Internet users frequenting social media sites, it's no wonder the real world social lives are seeing some changes. Social media is definitely changing the way people communicate, but in many ways it's for the better as we expand our social circles and explore new horizons through our online connections (Chopra, 2013).

Every age it has passed through has been based on beliefs and new technologies, responding to the needs of individuals anxious to adjust to new forms of socialization. A time of great change is a period in which society looks for meaning. Information is already a tool, the principal tool, which people use to perceive and understand their environment (Idakwo, 2011). The emergence of online forums has become hugely popular in recent times with interactions based on similar discussions, posts and threads (Xiaolin, et al., 2009) (Sumit & Prasenjit, 2010).

Online forums have become powerful tools for sharing information (Bedmar, 2010). Online discussion forums have also become one of the most popular places to ask and answer questions (Falls, 2012).

Online Forums, compared to the other social media sites, have various unique features like threads; where discussions and posts are made, RSS feeds, polls, etc. Online Forums provide a unique type of social environment that enables people to share and access information freely. Users can either start new topics or leave comments in the threads of existing topics (Xiaolin, et al., 2009)

## 2. AIM AND OBJECTIVES

To develop a web application that facilitates the creation of a social media application using ReactJs, MongoDB, NodeJs, ExpressJs, MaterialUI and SocketIO.

It would provide similar functionality as a Social Media application as well as a Debating Portal.

- People can share news and content or comment on other people's post.
- It can also serve as a debate platform
- It is used to establish connections between people.
- People can create connections and then can chat in real-time.
- It allows the user to create a profile and customize it.
- Allows posting pictures and giving reactions on them.
- User get the notifications regarding the new posts or messages shared in the community

#### 3. LITERATURE REVIEW

#### Introduction to social media concept

Social media is a form of electronic communication which facilitates interaction based on certain interests and characteristics. Social media are media for social interaction, using highly accessible and scalable publishing techniques. Social media use web-based technologies to transform and broadcast media monologues into social dialogues (Idakwo, 2011). A social media network platform is one that provides a medium for interaction by groups of people making it easy to share information (such as lecture materials, pictures and ideas) across a circle of people or groups. Statistics has shown that the use of social network such as Facebook, Twitter and LinkedIn is on the increase most especially among young individuals, the crop of which are students of tertiary institutions (Ikhu-Omoregbe, et al., 2012).

#### History of the Social Media

According to Idakwo (2011), The Social media started as a concept many years ago but has evolved into sophisticated technology. The concept of social media can be dated back to the use of the analog telephone for social interaction. The most recognizable use of social media was through innovative application, an online dialogue framework, created by Ward Christensen, a former IBM employee and Randy Suess. Initially, they envisioned a place where they could immediately contact their co-employees for announcements, i.e. meetings, reports, and other affairs, rather than making multiple phone calls, distributing memos, and the like. They were looking into creating a computerized bulletin board, which is why they named the program CBBS (Computerized Bulletin Board System). Soon enough, more and more employees contributed their ideas and comments in the said online community. That event was a momentous episode in the history of computers and the internet. It was the birth of online social networking. The CBBS platform was made known to other companies and has been used for specific purposes. The Bulletin Board System expanded largely and began breaking into the mainstream much sooner than it was planned to. It was during the rise of the Internet Service Providers in the early 1990s when social networking sites began to flourish. Along with the availability of internet service to people, many people rummaged to have

themselves acquainted with this new technology. With the fast response of people to the budding internet community, the bulletin boards which were usually used by companies have started to expand their roles by offering their service to more people around the globe. More and more people joined the online community with the innate goal of creating an identity in this space and at the same time exploring the vast place that is the internet. Because of this, many internet-savvy companies gave what people wanted- getting to know more people and sharing common interests and points of view; that is through websites where they can socialize, websites which are now referred to as social networking sites.

Social media attained a great measure of success with the launch of the then very popular friendster.com. Creator of Friendster, Jonathan Abrams concocted a perfect mix of popular features from earlier social networking predecessors. Friendster became an instant success and gathered about three million members who signed up in its early months of launch. As years passed, Friendster reached an overwhelming hundred million users from all over the globe. With much demand from its users, Friendster unfortunately got out of hand and suffered from too many glitches in the server. Today, Friendster has been announced as a newly owned entity of a Malaysian Company, and outshone by present social networking sites but still remains to be patronized most especially in Asia.

The conception of myspace.com opened the internet users to vast opportunities of self- expression which include wide control over a user's profile content. Practically different people from all walks of life have dedicated pages in MySpace. In MySpace, users experienced the best of creating unique identities to show to the online world. MySpace remained as the uncontested favorite among all the social networking sites until 2005 when it met its future competitor in the market. Soon enough, MySpace created additional features like mobile applications in order to keep up with the latest trends in the online community; and at the same time be at par with the growing popularity of contemporary social networking sites, more specifically the next thing in line

Facebook started as a local social network made for the students of Harvard. It was developed by sophomore, Mark Zuckerberg. Facebook was actually made by hacking Harvard's database containing identification images of students. The initial idea was actually to compare the faces of students with images of animals, for entertainment purposes. However, due to the potentially damaging contents of the site, the creators decided to put it down before it caught the attention of school authorities. Facebook has grown to become the biggest and most popular social networking site today with a population of above 500 million active users.

With the help of API (Application Programming Interface), microblogging sites like Twitter and Tumblr and other dedicated sites like Flickr, Photobucket and many others were able to connect with popular social networking sites, making an unending link of information in the World Wide Web (Idakwo, 2011).

#### What is an Online Forum?

Online forums provides a unique type of social environment that enables people to share and access information freely. Users can either start new topics or leave comments in the threads of existing topics. Usually, an online forum has tens or hundreds of distinct boards or communities. These boards or communities group hundreds to thousands of threads of similar related topics together. Because of the huge numbers of users and the high dynamics of online forums, this type of environment has a rich complexity (Vicenç, et al., 2008). An Online forum is also a system designed for the discussion of topics, with each topic separated into its own area, called a thread. A thread is begun by a user writing a short document, called a post, which introduces the topic or asks a question about the topic (Liu, et al., 2010). Internet users search online forums, generally, for two types of information. Some of them search the forums for subjective information such as different viewpoints, opinions, emotions, evaluations, etc., on specific problems instead of a single correct answer (Prakhar, et al., 2012)

#### Structure of an Online Forum

An Online forum as a whole contains various categories (broad subject areas), which themselves contain forums (more specific subject areas) which contain topics (threads or discussions) which are made up of individual posts (where a user writes something) (vBulletin, 2014). It is arranged in a very unique way/form i.e. From Categories to subforums, from subforums to more subforums and from these subfolders to threads, where members can start their discussions or Posts.

- Usergroups and Levels- Usergroups are groups of users that divide the community into manageable sections board administrators can work with. Each user can belong to several groups and each group can be assigned individual permissions. This provides an easy way for administrators to change permissions for many users at once, such as changing moderator permissions or granting users access to a private forum (phpBB, 2007). There are three major usergroups in a forum:
  - **Moderators:** They are individuals (or groups of individuals) who look after the forums from day to day. They have the authority to edit or delete posts and lock, unlock, move, delete and split topics in the forum they moderate. Generally, moderators are present to prevent users from going off-topic or posting abusive or offensive material (phpBB, 2007). Common privileges of moderators include: deleting, merging, moving, and splitting of posts and threads, locking, renaming, stickying of threads, banning, suspending, unsuspending, unbanning, warning the members, or adding, editing, removing the polls of threads (vBulletin, 2014).
  - Administrators: They are members assigned with the highest level of control over the entire board. These members can control all facets of board operation, including setting permissions, banning users, creating usergroups or moderators, etc., dependent upon the board founder and what permissions he or she has given the other administrators. They may also have full moderator capabilities in all forums, depending on the settings put forth by the board founder (phpBB, 2007). These are individuals who have been assigned to manage a forum. They can also be referred to as forum owners. There are also forums where administrators relate to each other to share their knowledge.

• Users: are individuals or members who have been given access to a forum or who have publicly registered to access the forum. These members do not have any special privileges unless otherwise given by the Forum Owner. Users can become Moderators or Administrators, if designated by the Administrator (IMS Global Learning Consortium, 2014).



- 2) Post: A post is a user-submitted message enclosed into a block containing the user's details and the date and time it was submitted. Members are usually allowed to edit or delete their own posts. Posts are contained in threads, where they appear as boxes one after another. The first post starts the thread; this may be called the TS (thread starter) or OP (original post). Posts that follow in the thread are meant to continue discussion about that post, or respond to other replies; it is not uncommon for discussions to be derailed (Beard, 2011).
- 3) Threads: A thread is started on some subject by an initiator. If they are interested in the subject of the thread, people post their opinions in reply posts. Because reply posts can reply to any preceding post, many branches (sub-threads) of discussion appear in a thread, and a thread ends up with a tree-shaped structure. We refer to this as a thread structure (Jangwon, et al., 2009). A thread starts with the publication of a post, which in turn triggers an amount of activity in the form of comments (Vicenç, et al., 2008). Threads are very important concepts in conversations on online forums.

#### **Applications of Online Forums**

- The world has given way to some great advancement on the internet, which has brought about the solution to different problems. In this context, online forums have served as "Q&A" web application; where individuals with any question about any topic can be answered, and a social network; where groups are formed and interactions are made. Online Forums have been applied in different spheres of the internet. These are the following applications of online forums today:
- Learning in schools through student interactions: Online forums have served as platforms for students to communicate with their fellow classmates, lecturers and other e-distance learning students. It has created e-learning opportunities for schools, which are having issues with student interactions within the class (Ikhu-Omoregbe, et al., 2012)(Halvorsen, 2012) (Kadir, et al., 2012).
- Discussions: Online forums have also facilitated different forms of discussions in schools, organizations and on other larger environments. For example, students given assignments over the holidays can ask for assistance and still receive their feedbacks. They also provide a means to interactively participate in discussions or obtain/provide answers to questions; the vast volumes of data contained in forums make them a valuable resource for "support sharing" (Xue, et al., 2007) (Mark, 2002) (Li, et al., 2011).
- Business Marketing: Organizations have started to make use of online forums for finding new customers or gaining insights from those they already have. Online forums can benefit business in several ways like crowd sourcing service and support, consumer research, social CRM (customer relationship management), etc. Online forums have created the opportunity where companies and customers can talk and it may even escalate to the manager of that company (Inc, 2010) (Belicove, 2012).
- Decision-Making support: It has been noticed that most online forum users have one decision or more to make at that point in time. This has led to scientists coming up with decision trees to understand the behavior of online forums. It can really be of use in schools, businesses, etc. (Xiaolin, et al., 2009) (Ikhu-Omoregbe, et al., 2012).

## 4. SYSTEM ANALYSIS

System Analysis is problem solving technique that entails the decomposition of the studied system into its component parts with the view of studying the various functionalities and how those component parts interact to accomplish the system's purpose (Whitten, et al., 2004).

It also involves the breakdown of a system and the study of how the various components work together.

The basic process of system analysis involves three steps:

- 1) Understanding the Existing Systems.
- 2) Identifying Improvements.
- 3) Defining Requirements for the new system

## 5. SYSTEM REQUIREMENTS

System Requirements are processes that specify what the information system must do or what property or quality the system must have. The requirements that specify what the system must do are frequently referred to as functional requirements and the requirements that specify what attribute the system must have are called non-functional requirements (Whitten, et al., 2004).

#### A. Functional Requirements

Student Hub is conceived in different interfaces for the different users; Students, Guest Students, Moderators and the Administrator. Each interface has been designed to meet different requirements. For the Guest Students, these are the requirements that have to be met:

- 1) Manage their account.
- 2) Post questions/topics under any category
- 3) Respond to their posts and other posts.

For the Students, these are the requirements that have to be met:

- Respond to posts from guest students.
- 2) Manage their account.

For the Moderators, these are the requirements that have to be met:

- 1) Manage their account.
- 2) Edit and View all posts.
- 3) Add News to the Moderator's Block.

For the Administrator, these are the requirements that have to be met:

- 1) Tracking the number of users at each time.
- 2) Add moderators and students.
- 3) Manage students, guest students and moderators personal accounts.

The above functional requirements will be carefully met in the development of this web application

#### **B.** Non Functional Requirements

- 1. Look and Feel Requirements
  - a) StudentHub should be presentable on low resolution devices (mobiles & tablets).
  - b) The toggle navigation will fit an Android device.
  - c) StudentHub should be compatible across browsers.

- 2. Usability Requirements
  - a) Ergonomic and clear usage.
  - b) Users will have no problem learning how to use this web application.
  - c) Convenience of usage.
- 3. Performance Requirements
  - a) Reliable storage of information.
  - b) Guest Students will be able to respond to their questions as a means of follow-up.
  - c) Posts will be placed in the right category for quick response by Students.
  - d) Quick response to user activities by either moderators or administrators.

## 4. Operational Requirements

- a) StudentHub should be able to work with relevant hardware devices.
- b) Not prone to crashing.
- c) StudentHub should be able to handle multiple users.

#### 5. Security Requirements

- a) Only a moderator has access to any posts.
- b) Sensitive information is hidden from non-users.
- c) Password sensitive.
- d) Only registered users can use the system except for the administrator.
- e) If anyone responds to any question, the user can know if they are a guest student or student.
- 6. Portability Requirements
  - a) StudentHub should operate on demand.
  - b) StudentHub should work on the browser of any operating system.
- 7. Legal Requirements
  - a) Personal information of users should be protected.
  - b) StudentHub should comply with quality assurance standards.
  - c) The Administrator is fully responsible for most operations in the forum.

## 6. SYSTEM DESIGN

The system design illustrates how the system will fulfill the objectives or requirements identified during the analysis of the system. In system design, the question 'How?' is always raised. It also illustrates the overall architecture of the system and the setting of standards, for example, for the design of an artificially intelligent system (Simon, et al., 2006). This project utilizes the Object- oriented analysis and design methods which are becoming the most widely used methods for computer systems design.

#### **Object Oriented Analysis and Design**

Object-oriented analysis and design (OOAD) refers to the use of object-oriented modeling (an approach where a system is modeled in terms of objects which have attributes and perform operations) in the analysis of systems or in modeling the system requirements and in the design of object-oriented systems fulfilling these requirements.

OOAD is a software engineering approach that models a system as a group of interacting objects. Each object represents some entity of interest in the system being modeled, and is characterized by its class, its state (data elements), and its behavior. Various models can be created to show the static structure, dynamic behavior, and run-time deployment of these collaborating objects.

#### Unified Modeling Language (UML)

Unified Modeling Language is a diagrammatic object-oriented modeling language. It uses diagrams to document an object-based decomposition of systems showing the interaction between these objects and the dynamics of these objects. UML aims to provide a common vocabulary of object-based terms and diagramming techniques that is rich enough to model any system development project from analysis to design.

This system is modeled with:

- 1. Use case diagram
- 2. Sequence diagram
- 3. Activity diagram

#### Use Case Diagram

Use case diagrams were used to perform requirements analysis in order to understand the core functionalities and usage scenarios associated with the identified requirements. A Use case diagram simply shows a look at the system from an outsider (e.g. user) point of view. The system is treated as a black box and one solely identifies what the system is used for. The components of a use case diagram include, Actors, Use cases, Associations and the system boundary.

- 1. Actors: represents the external entities of the system i.e. people or things that interact with the system that is being modeled.
- 2. Use Cases: are functional parts of the system. It is what an actor does e.g. a customer "browses the catalog", "chooses items to buy", and "pays for the items".
- 3. Associations: are shown between actors and use cases, by drawing a solid line between them. It links an actor with the use case it interacts with.
- 4. System Boundary: represents the scope of the system the actor is interacting with

The use case has four (4) actors and nine (9) use cases. The Administrator is the manager of the system and the Moderator, Student and Guest student are the main users of the system. The following use case diagrams illustrate the relevant subsystems of the system.





The Use-Case diagram for the Online Forum



Fig; The Administration and Interaction Subsystems



Fig: Registration Subsystem

Sequence Diagram:



Activity Diagram:



## 7. SYSTEM IMPLEMENTATION

#### Platforms and Tools Used for Implementation

- HTML and CSS: Hypertext Markup Language and Cascading Style Sheet are tools used in development and creation of web pages that run mostly on web browsers. They were used to develop the frontend design and user interface of the system.
- React: (also known as React.js or ReactJS) is a free and open-source front-end JavaScript library for building user interfaces based on UI components. It is maintained by Meta (formerly Facebook) and a community of individual developers and companies. React can be used as a base in the development of single-page, mobile, or server-rendered applications with frameworks like Next.js.

- MongoDB: It is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL).
- **Express.js:** or simply Express, is a back end web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.
- Socket.IO: It is an event-driven JavaScript library for real-time web applications. It enables real-time, bi-directional communication between web clients and servers. It has two parts: a client-side library that runs in the browser, and a server-side library for Node.js. Both components have a nearly identical API.
- Material-UI: It is simply a library that allows us to import and use different components to create a user interface in our React applications. This saves a significant amount of time since the developers do not need to write everything from scratch.
- VS Code: Visual Studio Code, also commonly referred to as VS Code, is a source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

		p	Redux	/Context Stat urrentuser
Home	•	P	rofile	
Topbar	Rightbar	Topbar	Rightbar	
Sidebar	Feed	Sidebar	Feed	
	Share		Share	
	Post		Post	
			<b>^</b>	

## 8. THE USER INTERFACE DESIGNS

	Email
EasvAllies	Password
Connect with friends and the world around you on EasyAllies.	Log In
	Forgot Password?
	Create a New Account

Login Page

	Username
	Email
EasyAllies	Password
Connect with friends and the world around you on EasyAllies.	Password Again
	Sign Up
	Log into Account

**Registration Page** 



Home Page



## 9. SYSTEM REQUIREMENTS

The system requirements consist of the various tools required from the point of design and development to the eventual deployment of the portal system. These requirement are presented in tabular form in the tables below.

The Software Requirements

Requirements	Software
Operating System	Microsoft 10, etc
Database Management System	MongoDB
Model Design Tools (UML Modeling)	Microsoft Office Visio 2007
Programming Language Used	ReactJs, NodeJs, ExpressJs, CSS, HTML
Integrated Development Environment	VS Code

## The Web Client Software Requirements

Requirements	Software
Operating System	Microsoft Windows 10.
Internet Browser	Internet Explorer 8, Google Chrome, Mozilla Firefox, etc.

### The Hardware Requirements

Minimum Requirement		
Minimum of 1GB, Random Access Memory (RAM)		
Minimum 32 Bit Video Graphics Adapter (VGA)		
Modem or Ethernet Card		
Keyboard and Mouse		
Uninterruptible Power Supply (UPS		

## 10. CONCLUSION

As the social media grows, online forums like StudentHub will be relevant to students and youths around the world. Even as other versions will be later developed, the activities and features on the site will increase because they will be built to meet the end-users requirements.

Online forums have presented students with systems designed for the discussion of topics, with each topic separated into its own area, called a thread. A thread is begun by a user writing a short document, called a post, which introduces the topic or asks a question about the topic (Liu, et al., 2010).

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