MySpace – A socio-academic site for students

FEASIBILITY REPORT

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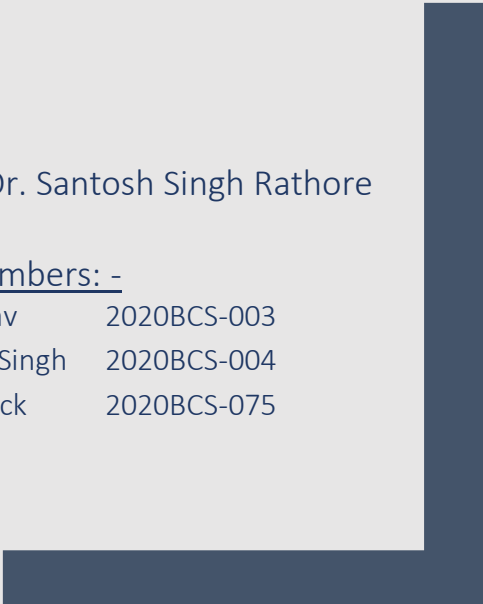Anamika Mallick   2020BCS-075

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1 INTRODUCTION

1.1 Overview of the Project

MySpace is a socio-academic portal for the students of ABV-IIITM Gwalior, where students can not only access helpful resources like books, notes, previous-year papers, etc., but also ask their academic, technical or carrier related doubts and get clarified by their seniors. Students can also read and post technical blogs and rate them.

To use the website students need to be logged in using their institutional email id. After a student is logged in he/she can access and download valuable academic resources, access Q&A forum, read, post and rate technical blogs, access their class schedules, view details of upcoming events organized by all college clubs.

1.2 Objective of the Project

The objective of this project is –

- To develop a central database of academic resources helpful for students
- To provide students, a forum where they can ask doubts to their seniors and hence develop a Question & Answer database.
- To develop a collection of technical articles, by and for students.
- To make it easier to check their recently updated class schedule.
- To provide a place where they can check the upcoming events organized by institute clubs.

1.3 The Need for the Project

As a consequence of covid-19 pandemic, students are forced to learn from their homes, away from their peers and faculties. We know for a fact that interactions with faculty and peers, both within and outside of classrooms, contribute to learning and engagement. Due to the lack of real life interactions with their peers and seniors, learning and the feeling of social belongingness is suffering[1].

This is where MySpace comes in. MySpace is a website where students can not only get organized with their class schedule, get informed with the upcoming college events organized by various clubs, access valuable resources, but also interact with their peers and seniors using Q&A forum and blogging forum. With this website we are trying to make the life of students simpler by organizing all the things they need in one place.

1.4 Overview of Existing Systems and Technologies

There is presently no existing system like this in our institute. However some colleges have portals like this like College Space - NSIT, but they do not have all the functionalities like Q&A section, blogging section. Unlike our website they do not provide a proper way for peer-to-peer interaction.

Main Technologies associated with MySpace

- Web Development Technologies
  - HTML
  - CSS
  - JS
  - React
  - Node js
  - Web API and more

- Database
  - MongoDB

- Diagram and Design Tools
  - Lucidchart
  - Microsoft Visio
  - Draw.io

1.5 Target Users

The students of our institute are the target users.

The use cases associated with them:-
- Access and download academic resources:
  - Class Notes
  - Books pdfs
  - Previous Year Papers
  - Lecture Slides
- Ask their doubts in Q&A forum
  - Seniors can answer the doubts of Juniors
- Share their knowledge in technical fields with their peers using blogs
- View their class schedule
- View upcoming college event details organized by clubs

1.6 Deliverables

A website for students for their socio-academic interaction. Also containing central database of academic resources and technical articles. Students can rate the resources and technical articles based on their usefulness. They will also be informed of their class schedule and of upcoming events organized by college clubs.

2 FEASIBILITY STUDY

2.1 Financial Feasibility

All the technologies associated with the proposed website are open-source and thus are available free of cost. Since the system will be developed with an intuitive interface, no training will be necessary to use it. We will be using free hosting service at development and initial maintenance phase. Thus, besides Human Resources and basic computer costs including internet and electricity, there is no other cost involved in the development of this system. Thus, it is financially feasible.

2.2 Technical Feasibility

The project is a simple website. The main technologies and tools associated are:

- HTML
- CSS
- JavaScript
- React
- Node js
- Express
- MongoDB
- Web API
- Software engineering Paradigms

Each of these technology is either open source or free to use and the technical abilities necessary are manageable. Time constraints and the ease with which these technologies can be implemented are synchronized and minimal. It is evident from this that this website is technically doable.

2.3 Resource and Time Feasibility

Resources that are required for the proper implementation of this project are:

- Programming devices like personal computers or laptops.
- Hosting space on the local domain (freely available)
- Programming tools for building the Website
- Web and Hosting services for client-server flow
- GitHub as a collaboration tool and version control.
- Visual Studio code Live Share- For collaboration between the developers at real-time.

2.4 Risk Feasibility

Risk feasibility can be discussed in several contexts:

2.4.1 Size

Risk Associated with size are:

- **Estimated size of the product in the line of codes:**
  Being a website with a friendly user interface, Q&A section, blogging section, resources section, the project will contain a significant amount of code lines.
- **Estimated size of product in storage size:**
  As the system doesn't contain a lot of multimedia and might contain only a few animations for the UI, the file sizes and the complete project size will not exceed 250MB.

- **Size of the database created or used by the product:**
  The database size will be limited by NoSQL constraints. Normalisation would be done on the relational database to ensure the most efficient storage and avoid redundancy.

2.5 Social and Legal Feasibility

MySpace builds a sense of community where students can clarify their doubts and contribute to community by sharing their knowledge and resources. Creation of an academic and professional community that is comfortable with working together can only aid the creation of new ideas and progress of social and technological advancement.

The project uses either open-source or freely available web development tools. So, the legal risks would be limited to ensuring privacy and security of the users. We would be taking appropriate measures like hashing their passwords in the database and using secure protocols to ensure the aforementioned.

2.6 Software Engineering Paradigms to be followed:

We will be using Agile software development methodology, specifically the **scrum** and **eXtreme Programming** methodologies which promotes adaptive planning, evolutionary development and delivery, a time-boxed iterative approach, and encourages rapid and flexible response to changes. We are using agile methodology considering the team and project size.

To ensure timely delivery of the software, extreme programming practices such as code review, pair programming, unit testing, continuous integration and testing, simplicity.

a) **Code review** is a systematic examination of software source code. It will be conducted to find bugs and improve the overall quality of the software and also to share knowledge among the team.

b) **Pair programming** essentially means that two members of the group will write code together. It is a very collaborative way of working and involves a lot of communication. **Visual Studio Live Share** helps teams to engage in Pair Programming without being physically present together.

c) **Unit testing**, a testing technique in which individual modules will be tested to determine if there are any issues by the developers themself. It is concerned with functional correctness of the standalone modules.

d) Considering Agile has a shorter software development cycle, communication with users can happen in a week rather than months. They get iterations of something that is extremely near to what they want, and they get it very quickly. The system adapts swiftly to changes in order to refine the successful user offering.

e) Communication among the team will take place through **SLACK** with dedicated channels for each subsection of the project. This collaboration and communication ensures that the process stays on track even as conditions change.

f) GitHub allows teams to build **KANBAN** boards which helps to visually portray works at various phases of the process. This facilitates planning and ensuring that the software development cycle runs smoothly.

2.7 OUTLINE PLAN

Milestone 1	Milestone 2	Milestone 3	Milestone 4	Milestone 5
User Authentication: To develop web-pages for user login and password reset. Students can only use their institute email ids to log into the website.	**Accessing Resources & Schedules:** To develop web-pages where students can search, access and download resources and view their class schedules	**Q&A Forum:** To develop a page where students can post their doubts and their peers can reply or comment.	**Blogging Forum:** To develop a page where students can create technical blogs and others can rate them.	**Pop-up links for events:** To develop a functionality to show the details of upcoming contests and events organized by various institutes clubs

2.8 FALLBACK PLAN

For student login Google Sign-In is preferred but if that feature can't be achieved then we can have a similar functionality using manual email login. If not all the functionalities like Q&A section or blogging section can be completely implemented in time then the website features will be limited to accessing resources only.

Further, in maintenance phase, if a user encounters a bug while using the website, they can report the bug to our official email provided on the website. This is our fallback plan to mitigate the risk for students who are unable to utilize the website properly.

3 CONSIDERATIONS

3.1 Performance :-

MySpace requires a very low bandwidth and hence the performance will not degrade with increasing number of potential students. Also the open-source technologies (React Js, Node Js) that we are going to use to implement the code are very fast and reliable. At the development stage, a free hosting service will be used. But with increase in traffic a more reliable and faster server can be used.

MongoDB supports field queries, range queries, and regular expression searches. Queries can return specific fields and also account for user-defined functions. MongoDB offers a broad range of indices and features with language- specific sort orders that support complex access patterns to datasets. MongoDB is the ideal database for this project[2].

Response time   :   Less than 0.02 seconds
Processing speed   :   2 Billion Documents A Day And 30TB A Month
Query and reporting times :   yet to be tested
Throughput   :   yet to be tested
Storage: yet to be tested

3.2 Security

- **User authentication**
  For user authentication, Google Sign-In using institutional account will be preferred, but in case of any fall back we will use login using their Institutional E-mail and password. This will ensure that the student belongs to this institute.
  In case user has forgot the password, he/she can reset password using reset link sent to directly to them via email.
  Further, passwords will be hashed in the database to ensure the security.

- **Login Details**
  Each user's login time and logout time along with Network IP Address will be recorded in the system, to make the tractability process easy in case of a faulty action.

- **Website-functional security**
  Users will have to login in order to post questions or reply to posted questions or access resources. Also, no student can access the details of any other student. This will ensure privacy and secure control for users.
  In Q&A and blogging forums, students can create posts and these posts will be listed with their name and year of study along with date of posting.

3.3 Usability and Ease of Use

The user interface of the website will be designed to be intuitive and friendly so that any student can easily become familiar with the website's functionality in few minutes. Thus, no additional training will required to use the website.

Moreover a student will be able to ask doubts related to its academics like coding problems, domain problems, career related issues, etc. Since these doubts will be visible to other students(preferably seniors) so, anyone can reply or comment. Students will be able to view their class schedules and details of upcoming events. They will also be able to search and download for the resources on the website using search bar.

3.4 Availability

The server on which we are going to host our website will work 24 * 7. MongoDB provides free monitoring up to 24 hours of data. Mean time to failure and mean time to repair will be decided to increase the availability. With a paid hosting space, the availability can be guaranteed to great precision.

3.5 Capacity and Scalability

MySpace website can accommodate many simultaneous users. Updates can be easily to integrate to our existing website. Our website can hold a significant amount of traffic that is sufficient for an organization. like in MongoDB the maximum BSON document size is 16 megabytes. The maximum document size helps ensure that a single document cannot use excessive amount of RAM or, during transmission, excessive amount of bandwidth. To store documents larger than the maximum size, MongoDB provides the GridFS API.

And the server(Git-Hub) on which we are going to host our website can hold have a soft bandwidth limit of 100GB per month.

3.6 Limitations and Challenges

Time limitation: One semester.

Due to heavy traffic it might be possible that the server goes down.
Two possible methods of mitigation are-
a. Scaling up on the server and other technological requirements.
b. Scaling down the scope of the project to basic resource related functionality.

4 REFERENCES

1. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251580
2. https://docs.mongodb.com/manual/introduction/