Enthem

Project report

submitted to D Y Patil International University, Akurdi, Pune in partial fulfilment of full-time degree.

BTech Computer Science and Engineering

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[Session 2019-23]

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CERTIFICATE

This is to certify that the project entitled **Enthem** submitted by:

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is the partial fulfillment of the requirements for the award of degree of Bachelor of Technology in Computer Science and Engineering is an authentic work carried out by them under my supervision and guidance.

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DECLARATION

We, hereby declare that the following report which is being presented in the Major Project entitled as **Enthem** is an authentic documentation of our own original work to the best of our knowledge. The following project and its report in part or whole, has not been presented or submitted by us for any purpose in any other institute or organization. Any contribution made to the research by others, with whom we have worked at D Y Patil International University, Akurdi, Pune or elsewhere, is explicitly acknowledged in the report.

Yashkumar Vispute (20190802099) _____

Pratik Jadhav (20190802050) _____

Shreyash Hire (20190802114) _____

ACKNOWLEDGEMENT

With due respect, we express our deep sense of gratitude to our respected industry guide and coordinator Mr. Makarand Bhatamrekar, for his valuable help and guidance. We are thankful for the encouragement that he has given us in completing this project successfully.

It is imperative for us to mention the fact that the report of major project could not have been accomplished without the periodic suggestions and advice of our project supervisor Dr. Bahubali Shiragapur and project mentor Mr. Yash More.

We are also grateful to our respected Director, Dr. Bahubali Shiragapur and Hon'ble Vice Chancellor, DYPIU, Akurdi, Prof. Prabhat Ranjan for permitting us to utilize all the necessary facilities of the college.

We are also thankful to all the other faculty, staff members and laboratory attendants of our department for their kind cooperation and help. Last but certainly not the least; we would like to express our deep appreciation towards our family members and batch mates for providing support and encouragement.

Yashkumar Vispute (20190802099)
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Abstract

During our internship at Wajooba LLC., we were lucky enough to work on the Enthem project. This experience has given us a challenging and valuable opportunity to explore unique technological tools and develop our skills. During the internship, we majorly used languages such as Dart, TypeScript, and Neo4j queries, which form the basis for the frontend and backend development of the project.

Each team member took on specific responsibilities, diving deep into backend development, API creation, database management, and deployment methods. We also delved into the integration of Flutter with the backend, application development, Docker CI/CD using GitHub Actions, API testing, server setup, and implementing robust security measures.

Initially, we focused on learning and exploring the intricacies of the Neo4j database and its query language. Through trial and error, we gained valuable insights by coding APIs and creating dummy databases. Simultaneously, we set up our CI/CD pipeline and established a remote server for hosting activities, laying the groundwork for the project's progress.

As a team, we held regular meetings to discuss our strategies, address any shortcomings in the application, and test and integrate the latest developments. With each passing day, we dived deeper into the codebase, implementing frontend and backend functionalities, constantly adapting to evolving requirements, and seeking opportunities for improvement.

As the project advanced, our code became more efficient, secure, and mature. Piece by piece, we added planned functionalities, integrating them seamlessly and preparing for an initial trial release on the Play Store. While the application worked flawlessly on our systems, it encountered challenges during testing. However, we embraced these setbacks as learning opportunities, iterating on the codebase and addressing specific cases to enhance its overall quality.

Looking back, this internship has been an incredible learning experience, and we are immensely grateful for the opportunity to collaborate with such talented peers and professionals in the software development industry. Our time at Wajooba exposed us to the development processes, cutting-edge technologies, and practical approaches prevalent in the industry, which will undoubtedly prove invaluable to our future careers.

We view this internship as an excellent starting point for our professional journey, equipping us with practical skills and knowledge that will set us apart in the competitive software

development environment. We sincerely thank the entire Wajooba team for their leadership, support, and trust in contributing to Enthem's success.

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1. INTRODUCTION

Enthem is a social media product built on graph databases, which provides an interconnected and inter-relations-driven solution in database structuring. Enthem supports user-user recommendations based on personalized data collections, conversations, and the formation of interest-focused chat rooms on a permanent/temporary basis.

1.1. Background

With the help of Enthem, users can interact with individuals in proximity and globally, through chat rooms or one-to-one recommendations. Additionally, they do so with people of similar interests which is possible by the recommendation algorithms and graph-based database used. A user interface for logging in or registering as a new user, a back-end system for handling recommendations based on interests selected and location shared, temporary seamless chat rooms, and end-to-end encrypted one-to-one chat conversations with bookmarked recommended users togetherly combine to make the resultant Enthem application. To safeguard users' information and conversations, the system employs encryption while transmitting all data from the user end to the backend and vice versa. The project's key advantages are greater user convenience, increased security for social media connectivity, and intelligent recommendations of peer profiles on the app. Overall, Enthem is an innovative solution that oversees the systematic use of graph technologies for unleashing their potential as a database in relation-driven applications.

1.2. Purpose

Enthem is designed to support the provision of a system where one can connect with a meaning and a purpose worth connecting for. These connections are not random but are personalized as per the locality, shared interests, and other involvements of any user on our app. Enthem finds a solution for the social connection problems that one might face in a real geographic location. To elaborate, here is an example, "Let's say it is the first day of ABC person as a student at DYPIU. He or she is interested in the poetry and literature side, thereby wishing to know any senior or peer with a similar inclination that too, around their campus. This is where Enthem comes into play and as a user on Enthem, he will thus, get recommended with those matching profiles and their approximate radial distance from their location. This will enable them to create their niche and communicate over chats for organizing different activities around the campus, as per their aspirations in their desired interests." This problem relates to all university fresher students, and even we as college

students realized the potential use of such an application. Similarly, in consideration of such cases of use and ease for the users, we have tried designing Enthem accordingly. Along with this use case from the user perspective, we have developed the application using technologies that optimize and efficiently place things in place. From the development perspective, Enthem is developed using a graph-based database to effectively use the rich features and systematic node-to-node relation-based database structuring. This fundamentally reduces time complexity, development, and maintenance costs involved concerning case scenarios and makes it easy to develop backend recommendations and other APIs, it also structures and visualizes the database thus, develop as users perform various activities on the application.

1.3. Objectives

We aim to achieve the objectives that align with the purpose of our development. Thereby, they scale from a range of learning to build the next big thing in this target space.

The main objectives are to provide:

1. Building easy networking possible
2. Proximity-based meaningful connections
3. Feasible and modern technologies for optimized development
4. Temporary, meaningful, secure, and group or individual conversations over niche topics or selective interests
5. Recommendations of peer profiles based on geospatial data, intersecting interests, and other personalized activities performed over the application.

1.4. Scope of Project

Our goals for Enthem for now, are to expand our reach to millions of individual users majorly who fall under the teenage range. These are college students, university folks, young professionals, and others. All though Enthem is generic and anyone can avail it for use, the primary audience to whom we aspire to cater remains from the above categories who are generally believed to be searching for peers to network for meaningful casual and professional reasons. The scope is wide and can be distributed into below mentioned points.

1. Facilitating connections and networking with nearby peers: Enthem aims to create opportunities for users in proximity to connect and communicate. This feature intends to

enhance networking possibilities and foster relationships among individuals who share similar interests.

2. Ensuring user security through the implementation of protective measures: Enthem recognizes the significance of safeguarding users' personal profiles and communication. By incorporating encryption and user authentication, the platform prioritizes the protection of user data and strives to maintain a secure environment for its users.

3. Integrating innovative technologies to enhance functionality: Enthem embraces the adoption of cutting-edge technologies to improve the performance and functionality of its application. This commitment reflects a dedication to continuous improvement and staying abreast of the latest industry trends.

4. Conducting comprehensive tests, security checks, and quality assurance: To ensure a reliable and stable system, Enthem places great emphasis on rigorous testing, security assessments, and quality assurance. These measures are essential in creating an error-free and robust application suitable for larger-scale usage.

2. LITERATURE REVIEW

2.1. Literature review

Enthem is a social media application designed to connect and facilitate communication among individuals nearby, with a particular focus on the teenage demographic, including college students, university attendees, and young professionals. The platform aims to enhance networking opportunities and foster relationships among peers who share common interests. One of Enthem's key priorities is the implementation of robust security measures to ensure the privacy and protection of users' profiles and communications. By incorporating encryption and user authentication, Enthem strives to create a safe and secure environment for its users. Additionally, the application embraces the integration of new and efficient technologies, indicating a commitment to continuous improvement and staying relevant to industry advancements. Thorough testing, security checks, and quality assurance procedures are also emphasized to ensure a reliable and error-free system, suitable for broader usage. Enthem's utilization of the Neo4j graph database enhances its capability to manage and analyze connections between users, further contributing to its functionality as a social media platform.

2.2. Existing Solutions/Competitions

To mention a few well-known and can be considered present competitors in our target space are:

1. Meetup: Meetup is a well-known social networking platform that connects individuals based on shared interests, facilitating in-person gatherings and events.
2. Yubo: Yubo is a social networking app specifically designed for teenagers and young adults. It enables users to meet new people, connect with peers, and discover common interests through features like live streaming and group chats.
3. Nearify: Nearify is an app that helps users discover local events and activities aligned with their interests. It allows individuals to find and connect with like-minded people attending the same events.
4. Viber Communities: Viber Communities, a feature of the Viber messaging app, enables users to join or create groups centered around specific interests. It provides a platform for engaging in discussions and activities with other community members.

5. Wylo: Wylo is a social networking app that caters specifically to book enthusiasts. It provides a platform for connecting readers, offering features such as virtual book clubs, personalized recommendations, and engaging discussions centered around literature. Wylo aims to foster a community of book lovers and enhance the reading experience through its book-centric features.

There are a few dating applications that too enable match-making features, but their purpose and objective of use are not in alignment with our target niche. We thus, include here a couple of relevant competitors present in the space.

2.3. Drawbacks/Gaps of existing system and Enthem's Solution

- **Meetup:**
  - **Drawback:** Meetup requires users to physically attend events, limiting participation due to time constraints or location barriers.
  - **Enthem's Solution:** Enthem overcomes this limitation by providing a virtual social media platform. Users can connect and interact with like-minded individuals nearby without the need for physical meetups, offering convenience and flexibility in connecting with others.
- **Yubo:**
  - **Drawback:** Yubo's focus on teenagers and young adults may restrict its user base and limit the range of connections for older demographics.
  - **Enthem's Solution:** Enthem targets a wider range of age groups, including college students, university attendees, and young professionals. By catering to a broader demographic, Enthem expands the potential for connections and networking opportunities among individuals in proximity beyond a specific age group.
- **Nearify:**
  - **Drawback:** While Nearify helps users discover local events, it may not provide an interactive platform for ongoing communication and connection among attendees.
  - **Enthem's Solution:** Enthem not only facilitates event discovery but also offers a platform for continuous engagement and interaction among users with shared interests. Through features like proximity-based matching and temporary chat rooms, Enthem creates an immersive social experience that fosters ongoing connections beyond event attendance.
- **Viber Communities:**

- **Drawback:** Viber Communities operates within the Viber messaging app, requiring users to switch between different interfaces and platforms.
- **Enthem's Solution:** Enthem provides a standalone social media application, offering a dedicated and streamlined user experience. Users can connect with like-minded individuals nearby without the need to switch between multiple interfaces, ensuring a seamless and efficient networking process.

- **Wylo:**
  - **Drawback:** Wylo's exclusive focus on book enthusiasts may limit its appeal to a niche audience and restrict the range of connections for individuals with diverse interests.
  - **Enthem's Solution:** Enthem goes beyond niche interests like books and encompasses a broad spectrum of shared interests. By offering a platform for connecting users based on various hobbies and passions, Enthem expands the potential for meaningful connections and diverse interactions among individuals with varied interests.

By addressing these drawbacks, Enthem provides a versatile and inclusive platform for users to connect, communicate, and engage with like-minded individuals in a convenient and meaningful way.

2.4. Objective

We aim to achieve the goals that align with the purpose of our development. Thereby, they scale from a range of learning to build the next big thing in this target space. The main objectives are to provide:

1. Building easy networking possible
2. Proximity-based meaningful connections
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4. Temporary, meaningful, secure, and group or individual conversations over niche topics or selective interests
5. Recommendations of peer profiles based on geospatial data, intersecting interests, and other personalized activities performed over the application.

3. PROPOSED METHODOLOGY

3.1. PROPOSED METHODOLOGY

The Enthem project followed an Agile approach, which is a widely adopted project management methodology that prioritizes collaboration, adaptability, and delivering value to customers efficiently. By implementing Agile methodologies, organizations aim to improve the quality of their software development processes and deliver products to customers more quickly.

Agile methodologies emphasize continuous testing and integration, which helps identify and address issues early in the development cycle. This approach leads to higher-quality products that meet customer expectations. Additionally, Agile methodologies promote teamwork and communication within the development team, fostering a productive and innovative work environment.

In simpler terms, the Enthem project was divided into several phases that involved continuous collaboration between the development team and stakeholders. These phases included planning, execution, evaluation, and iteration. The team worked closely together, incorporating feedback and making adjustments throughout the project to ensure the final product met the desired objectives.

The Agile approach allowed the Enthem team to respond effectively to changes and evolving requirements. It provided a flexible framework that allowed for adjustments and refinements during each phase of the project. Regular communication and collaboration with stakeholders ensured that the end product aligned with their expectations and needs. Overall, adopting an Agile methodology facilitated efficient project management, enhanced the development process, and resulted in a high-quality product. The iterative nature of Agile methodologies allowed the team to continuously improve and refine Enthem, ensuring that it met the dynamic demands of users and provided a seamless social networking experience.

In the development of Enthem, an Agile approach was followed, which encompassed several key phases to ensure the successful creation of the tech product.

1. Planning: The first phase involved thorough planning, where the Enthem team focused on understanding user needs and requirements and also, defining the scope of the product. This included identifying necessary resources, establishing a timeline, and creating design documents such as wireframes and user flows. By careful planning, we in Enthem had aimed to lay a strong foundation for the development process.

2. Execution: The next step was the execution phase, where the Enthem team began coding, designing the user interface, and integrating the product with other systems and services. Agile methodologies, like Scrum, were utilized to ensure efficient development practices. The team embraced iterative and incremental development, allowing for flexibility and adaptability to evolving project needs.

3. Evaluation: Following the development phase, Enthem underwent a rigorous evaluation process. This involved comprehensive testing to ensure that it met customer requirements and adhered to high-quality standards. Both automated testing tools and manual testing procedures were employed to identify and resolve any bugs or issues. Feedback from users and stakeholders played a crucial role in this phase, helping to refine and improve the product.

4. Iteration: Based on the evaluation and user feedback, and new development requirements in the codebase, Enthem underwent iterative cycles of refinement and enhancement. Insights gained from data analytics tools enabled the team to gain a deeper understanding of user behavior and preferences. This information was utilized to make informed decisions for further improving the product. By embracing continuous iteration, Enthem aimed to deliver an exceptional user experience and exceed customer expectations. Throughout these phases, collaboration among the Enthem team members, help to achieve desired outcomes and result expectations. Regular communication and effective teamwork facilitated the smooth progression of the project. By following this agile approach, Enthem strived to ensure that the final product met customer needs, provided a seamless user experience, and had the potential to evolve and grow in the future.

The agile implementation in Enthem's development process allowed for efficient project management, enhanced collaboration, and continuous improvement. It enabled the team to adapt to changing requirements and market dynamics, resulting in a high-quality tech product that fulfilled user expectations and stood out among its competitors.

3.2. Block diagram

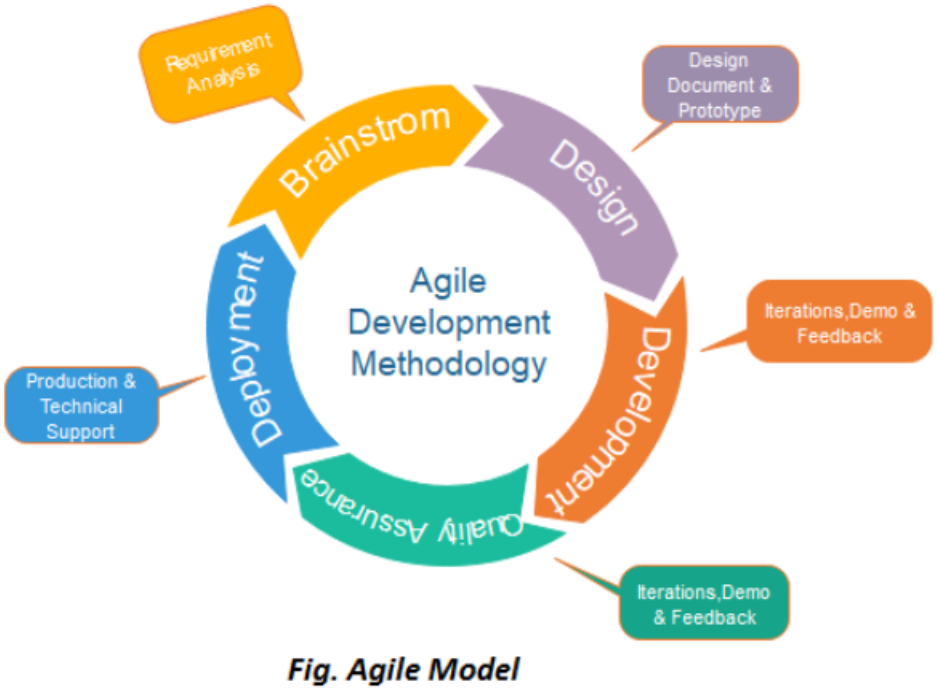

Figure 3.1: Agile Methodology Model Representation

3.3. Tools Used

The Enthem Application is built on Typescript/NodeJS for (Backend) and Dart/Flutter for (Frontend), here Typescript/NodeJS has a strong, static type system that ensures type safety and reduces the likelihood of runtime errors. This helps developers write more reliable and maintainable code. Typescript/NodeJS is a helpful language for developing APIs which makes it easy and feasible to develop efficient and secured APIs for integrating the front with the backend. This can result in seamless and faster program execution and and improved memory efficiency. Flutter/Dart has a strong footprint in the application development zone, as they make it possible to create cross-platform applications through the same code.

Flutter is modern, scalable, easy to use, efficient, and with a large community base present online to reach out in need. This helps developers write more reliable and maintainable code. Now, talking about databases this project is powered with Neo4j which is an open-source graph-based relational database that makes it efficient and easy to manage such social media applications.

It is used to store and manage large amounts of data in an organized, graph-based structured and efficient way. Finally, we used git for integrating developers' contributions, hosting the project

files, and using VSCode as IDE for the development with Insomnia for API testing.

More about the technologies used, as follows:

1. Dart Flutter: Dart, a programming language developed by Google, serves as the foundation for building Enthem's mobile app using Flutter, a versatile cross-platform framework. This combination allows for the creation of visually appealing and high-performance applications across multiple platforms.

2. Typescript NodeJS: TypeScript, a typed superset of JavaScript, enhances Enthem's backend and frontend development by adding static typing and improved scalability. Node.js, a server-side runtime environment, empowers Enthem's backend development with its event-driven, non-blocking I/O model, enabling efficient server-side logic, API integrations, and real-time communication.

3. Neo4j: Neo4j, a powerful graph database, manages Enthem's user-to-user interactions, leveraging graph structures to store and query connected data efficiently.

4. MongoDB: MongoDB, a flexible NoSQL database, stores chat room details and other essential information, ensuring reliable data management.

5. GitHub: Enthem utilizes GitHub as a collaborative platform for version control and code repository management, promoting efficient teamwork and code sharing.

6. Socket.io: Additionally, Socket.io, a JavaScript library, enables real-time bidirectional communication, facilitating instant messaging and interactive chat room functionality within Enthem.

These technologies collectively provide Enthem with a robust development stack, encompassing cross-platform app development, secure data storage, real-time communication, and collaborative code management.

3.4. Implementation Environment

The Enthem application is implemented on a flutter application that is integrated with Neo4j and Typescript i.e. NodeJS framework based backend. The development environment includes code editors such as Visual Studio Code and version control tools such as Git for code management. The application will be hosted on a cloud-based service such as Linode Servers for scalability and reliability. We have also used Docker and GitHub Actions to manage the DevOps CI/CD pipeline, these are popular tools used by software development teams to automate and implement continuous integration and continuous delivery. Some other tools like

Miro and Notion were used for task management and maintaining the project flow for development cycles.

3.5. Coding Standards

To promote maintainability, readability, and consistency, Enthem uses standard code practices and conventions and assures us to use them further as well. The code is largely written in Javascript-based frameworks like NodeJS using Typescript programming. Dart is used for Flutter Application development. This help to improve the application's scalability, dependability, and security. To improve code reusability and eliminate redundancy, the code will be modularized. The API too is based on the same architecture which helps make easy updates and adaptable backend systems. Variables, functions, and classes have consistent, descriptive, and meaningful names for easy understanding. Standard industrial practices and codes are implemented for using status codes in API and other programming functions. Code reviews are been performed regularly pre and post each commit made to the GitHub repo after any code changes made. These factors and precautions practiced guarantee compliance with coding standards and best industrial practices, which helps developers easily understand the codebase for further changes in the future.

3.6. Security Features

Security is crucial for any application as it protects user data, prevents unauthorized access and cyber threats, and maintains the confidentiality and integrity of sensitive information. Robust security measures establish trust, enhance user confidence, and minimize risks of data breaches. Implementing encryption, authentication mechanisms, access controls, and regular security audits mitigate vulnerabilities and safeguard user privacy. By prioritizing security, applications create a safe environment, earn user trust, and protect valuable data from potential threats. Below are key points, of how Enthem uses security measures to safeguard user information it hosts and processes:

1. Encryption: Enthem application uses encryption to protect user data during transmission. This includes messages on group chat and one-to-one conversations. This ensures that sensitive information, such as personal information, messages, and user profiles sensitive information cannot be intercepted or accessed by unauthorized users.
2. Tokenization: Tokenization is a process that replaces sensitive data with a unique identifier or token. In Enthem, we use JWT WebTokens for the authorization which enhances the user security as authentication is double-checked for each user during each request of any kind is made from our user's side to the application.

3. Multi-factor authentication: Along, with the google-account verification required for sign-in activity, the application uses the pre-mentioned tokenization which further adds an extra authentication layer to avoid unauthorized access in any case.

4. Standard Methods: Enthem utilizes standard status codes in its APIs to enhance security by indicating authentication and authorization failures, restricting access to sensitive resources. Additionally, Enthem empowers administrators with the authority to remove chat messages and users and allows users to report abusive or inappropriate content, ensuring a secure and harmonious environment for users and safeguarding them from disruptive peer accounts.

3.7. Testing

The testing plan for the application includes both manual and code-compliant testing. The testing has been carried out at different stages in development, starting from unit testing to integration testing, system testing, and user experience tests. The test stages were like once during development, then during integration, then by testing through security ways, and finally by a few users who helped us with feedback and application UI/UX tests. This is why, we were able to test the system with real-time data from the users, for which it was designed.

For API testing with different data information and edge cases, we have also used Insomnia Software Tool. It provided great assistance in API and backend testing while development cycles. We experimented and did basic unit testing using the JEST tool for writing unit test codes. Though for now, it was satisfactory we plan to make a full-scale unit test code environment and thus, have not included it currently in our main release project. It will thereby, help to automate the backend unit testing operations. Security tests were conducted to test encryption/decryption and it's working, along with other API-related concerns. Along with this, while the database deployment and development, Neo4j database model testing was performed on the Aura DB platform which is likewise hosted for the application's use. So, we thereby, have tested the code and it's working, from the prospects of code, security, and user experience.

3.8. Advantages of Enthem over Others

Enthem stands out from other social media apps with its advanced matching algorithms, offering personalized and relevant connections based on interests and proximity. It strikes a balance between local interactions and global communication, providing a passport to explore diverse cultures and perspectives. The user experience is seamless, with a secure interface and exciting features like temporary chat rooms. Enthem goes beyond networking by promoting community

engagement and social impact, inspiring users to make a difference. If you seek meaningful connections, global adventures, and a chance to create positive change, Enthem is your go-to platform. Embrace a new social experience that combines technology with purpose. To break down this further, Enthem provides these fundamental advantages of mentioned categories:

1. Data Security: Unlike some of its competitors, Enthem prioritizes data security through strong encryption techniques, robust access controls, and regular security audits. User data, including sensitive information like login credentials, is encrypted to ensure secure transmission. This commitment to data security sets Enthem apart, providing users with peace of mind and a safe environment for their personal information.

2. User Convenience: Enthem focuses on user convenience by offering an intuitive interface, time-saving features, and flexible accessibility. Unlike other platforms that may have complex navigation or limited accessibility options, Enthem ensures a seamless and user-friendly experience. Users can easily navigate the platform, access features effortlessly, and engage with others without any hassle, enhancing their overall satisfaction.

3. Profile Customization: Enthem goes beyond basic profile features by offering extensive customization options. Users can personalize their profiles with unique profile pictures, engaging bio descriptions, and creative profile names. This level of customization sets Enthem apart, enabling users to express their personalities, interests, and individuality in a visually appealing and engaging way.

4. Peer Accessibility: Enthem stands out by providing enhanced peer accessibility through its intelligent recommendation system. Unlike some platforms that may have limited or random connection suggestions, Enthem's recommendation system suggests relevant connections based on shared interests, proximity, and mutual connections. This targeted approach helps users easily discover and connect with like-minded individuals, expanding their social networks and fostering meaningful connections.

5. Forever Open Default Global Chat Rooms: Enthem's provision of forever open default global chat rooms for each interest genre sets it apart from its competitors. Unlike other platforms that may lack dedicated spaces for specific interests or rely solely on private messaging, Enthem's chat rooms provide a convenient and inclusive platform for users to initiate conversations, interact with others, and explore diverse topics. This feature encourages engagement, helps break the ice, and fosters a vibrant and dynamic community within Enthem.

By integrating these solutions into its platform, Enthem offers a unique and compelling social networking experience that surpasses its competitors. The focus on data security, user convenience, profile customization, peer accessibility, and the provision of forever open

default global chat rooms highlights Enthem's commitment to delivering a functional, engaging, and personalized social networking platform for its users.

4. ANALYSIS AND DESIGN

4.1. Project Analysis

In the Analysis and Design phase of Enthem, a comprehensive examination of the project's requirements and objectives was undertaken. This involved analyzing user needs, conducting market research, and studying industry best practices. The information gathered was then used to design the architecture, user interfaces, and overall system flow. This phase served as a crucial foundation for the subsequent development and implementation stages, ensuring that Enthem meets the expectations of its users while aligning with industry standards and practices.

4.2. Getting Started and User- Onboarding

Enthem simplifies the onboarding process with a user-friendly approach. Users can easily download the Enthem mobile application from the trusted Google Play Store for Android. After installation, they are seamlessly guided through registration, creating a profile by entering basic information, and uploading a profile picture.

During onboarding, Enthem employs intelligent algorithms to suggest relevant connections based on user interests, proximity, and mutual connections. This facilitates the discovery of like-minded individuals, nurturing meaningful connections from the outset.

To enhance the onboarding experience, Enthem prioritizes user convenience and simplicity through its personalized and intuitive user interface. New users can navigate the platform effortlessly, guided by a user-friendly design that ensures a smooth onboarding process.

Enthem also promotes interactive and engaging conversations through its universally open chat rooms. Upon onboarding, users have the option to select their interests, granting them access to dedicated chat rooms for specific topics or genres. These chat rooms serve as a hub for like-minded individuals to connect, break the ice, and exchange ideas. As users become more acquainted with the platform, they gain the flexibility to create their chat rooms or join existing ones, expanding their network and fostering meaningful connections.

By prioritizing user convenience, Enthem creates a welcoming environment that encourages exploration and engagement from the moment users join. The combination of an intuitive interface and interactive chat rooms ensures that users can seamlessly connect with others who share their interests, promoting a vibrant and engaging social experience.

4.3. Minimum Viable Product(MVP) Items

The Minimum Viable Product (MVP) for Enthem which is developed and released so far, is focused on delivering essential features to provide a functional and engaging social networking experience. This MVP will help the users to know the services Enthem intends to provide and will also give us an opportunity to know what new can be done or is needed by the users. MVP helps to achieve this, by enabling development and deployment but with the ability to adapt required changes in the product much faster.

The current application MVP items included:

1. User Registration and Profile Creation: Enthem prioritized enabling users to easily register and create their profiles by providing basic information, uploading a profile picture, and customizing their preferences.
2. Connection Recommendations: The MVP incorporated intelligent algorithms to suggest relevant connections based on user interests, proximity, and mutual connections. This feature aimed to enhance the discovery of like-minded individuals and fosters meaningful connections.
3. Chat and Messaging: Enthem MVP includes a chat and messaging functionality that allow users to communicate with their connections in real-time. This feature aims to facilitate seamless and interactive conversations within the platform.
4. Profile Customization: Enthem MVP provides users with the ability to customize their profiles, allowing them to add personal details, interests, and preferences. This feature aimed to enable users to express their individuality and enhance their profiles' appeal.
5. Community Engagement: The MVP focused on creating a vibrant community environment where users could join and participate in various interest-based communities, events, and discussions. This feature aimed to promote engagement and foster a sense of belonging among users.
6. Universal Chat Rooms for initial engagement: Additionally, Enthem's MVP introduced universally open chat rooms for each interest topic or genre. As new users select their interests and onboard the platform, they can immediately start conversations in these permanently active rooms to interact and break the ice with other users who share similar interests. Over time, users also have the opportunity to create their chat rooms or join existing ones, further expanding their connections and fostering meaningful interactions.

By prioritizing these MVP items, Enthem aimed to deliver a functional and engaging social networking platform that fulfilled the core needs of its users. The incorporation of universally

open chat rooms added a layer of interaction and community-building, enhancing the overall user experience and encouraging meaningful connections.

4.4. MVP Application Workflow Diagram

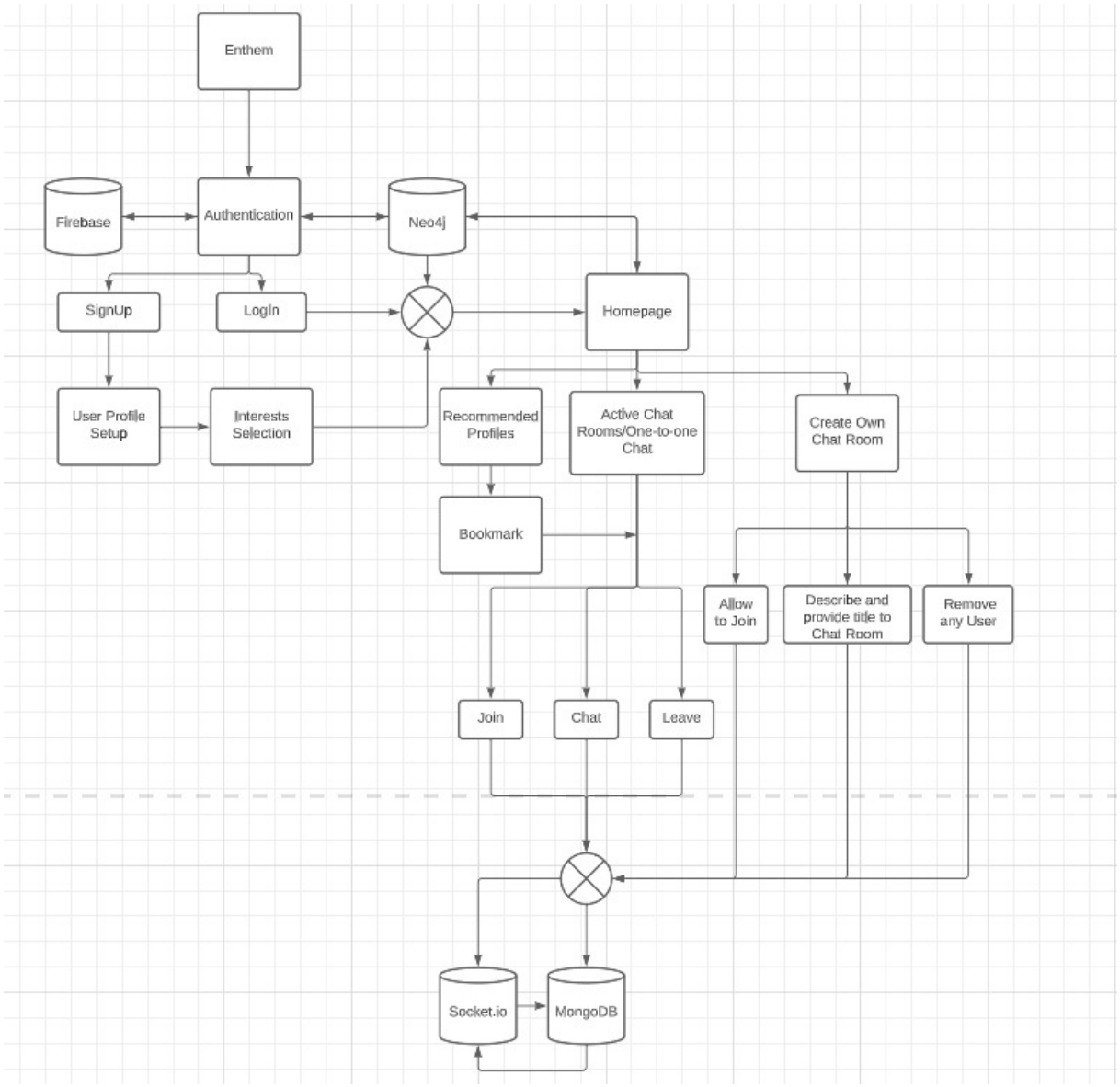

Figure 4.1: Enthem Application Flow Diagram

4.5. Database Design and Neo4j Graph Database

In Figure 4.2, we understand the fundamental working of our recommendation system. Here, User A represents any user on our application. From the interface, the respective user requests recommendations of peer profiles. In the backend, we execute a get API call which at first retrieves User A's latitude and longitude stored in our Neo4j database. Then User A's interests

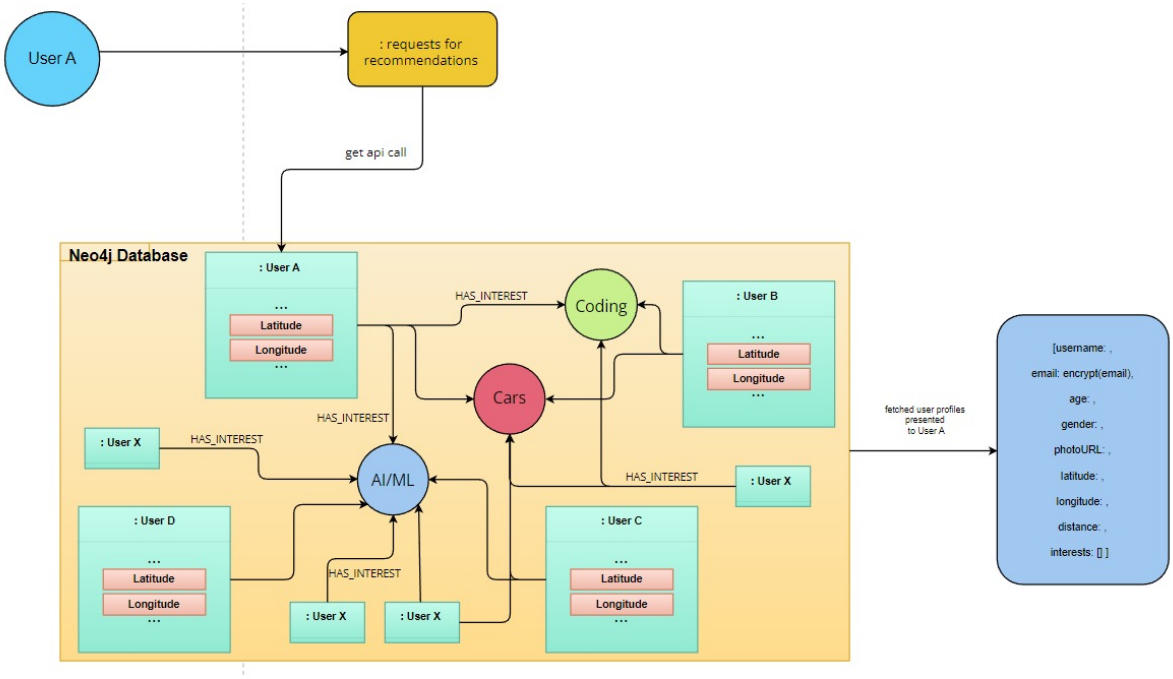

Figure 4.2: Recommendation API working Flow Diagram

are realized by our algorithm and other user connected to those interests are also retrieved. Then their latitude and longitude are collected thereby, to calculate the distance between User A and those so far collected user profiles. If this distance is less than the threshold geospatial radius that we set for nearby recommendations, our API broadcasts such profiles to the Flutter application. In case, if user requests for interests-based compatibility recommendation is irrespective of geographic location, the algorithm works similarly, except for calculating the differences of latitude and longitude. i.e. location, this algorithm calculates the percentage of similar interests and returns the most similar user profiles.

Note: The distance between user profiles is calculated using the Haversine Formula.

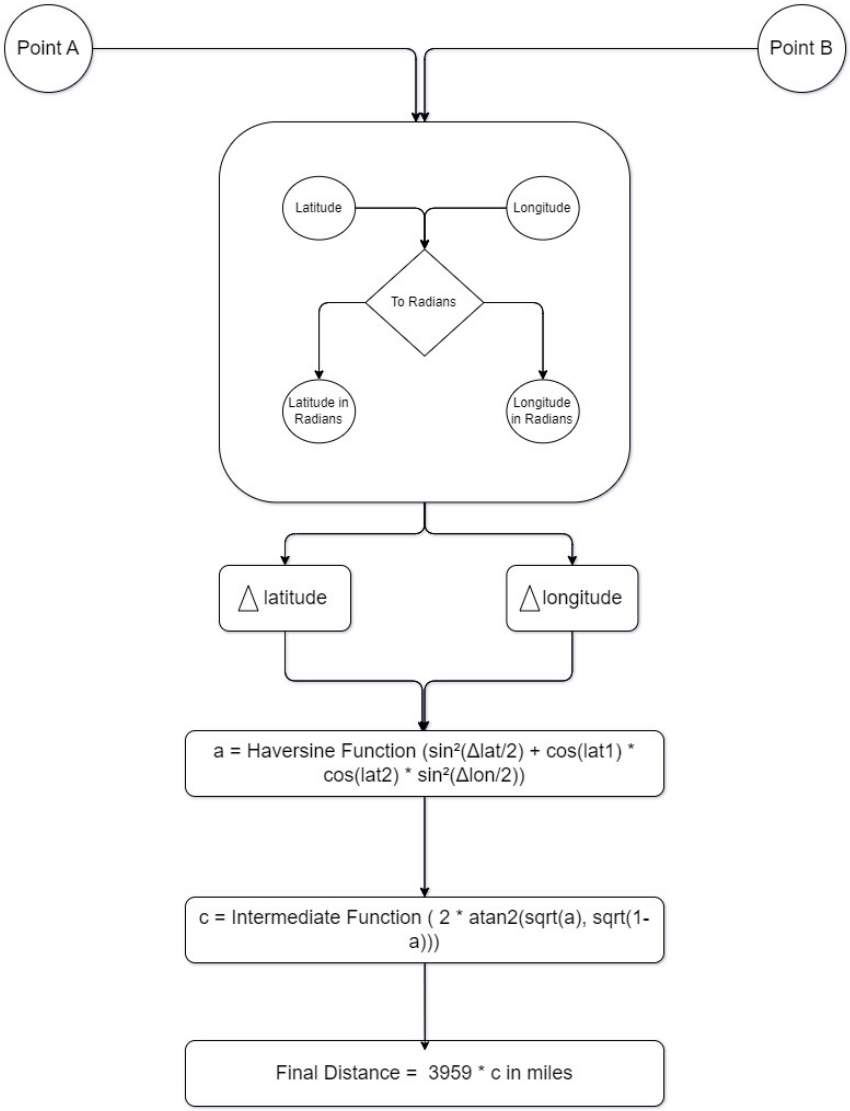

Figure 4.3: Logical Representation of the Haversine Formula

5. FUTURE ENHANCEMENTS

1. Enhanced User Experience: One of the key areas for future enhancement is to further improve the user experience of Enthem. This can be achieved by incorporating user feedback and conducting user research to identify pain points and areas of improvement. Streamlining the user interface, optimizing performance, and providing intuitive navigation will enhance user satisfaction and make Enthem stand out from its competitors.

2. Advanced Matching Algorithms: To provide more accurate and personalized matching, Enthem can leverage advanced matching algorithms. By incorporating machine learning and artificial intelligence techniques, Enthem can analyze user preferences, behavior, and interests to make highly relevant suggestions and connections. This will further enhance the networking capabilities and increase user engagement. We have already implemented one AIML model for identifying chat titles of chat rooms under segregated categories that can help know user interest for interactions to cross-recommend more peers to such users. Additionally, for the enhancement of recommendations we planned an thereby, tried embedding AIML in Neo4j. By adding the cosine similarity in Neo4j through this, eventually, will help to know the similarity between two users by finding out their past interactions with different chat rooms. Thus, to recommend them better accordingly in the future.

3. Expansion of Features: Enthem can expand its feature set to offer a comprehensive social networking experience. This can include the integration of multimedia-sharing capabilities, allowing users to share photos, videos, and other media within the app. Additionally, introducing features like event planning, group discussions, and interest-based forums can foster a sense of community and provide additional avenues for interaction.

4. Global Connectivity: While Enthem primarily focuses on connecting users within proximity, there is potential for global connectivity. By incorporating language translation capabilities and expanding the reach of connections beyond geographical boundaries, Enthem can attract a wider user base and provide opportunities for cross-cultural interactions. This expansion will make Enthem a unique platform that bridges local and global connections.

5. Social Impact Features: To differentiate itself from competitors, Enthem can introduce features that promote social impact and community engagement. This can include partnerships with local organizations, campaigns for social causes, and opportunities for volunteering or community service. By aligning with the values and aspirations of its

target audience, Enthem can position itself as a platform that goes beyond just networking and fosters a sense of social responsibility.

6. Gamification Elements: Introducing gamification elements can enhance user engagement and create a more interactive experience. Enthem can incorporate features such as achievements, leaderboards, and challenges that encourage users to actively participate and connect with others. By adding a competitive and fun element to the platform, Enthem can further differentiate itself and attract a loyal user base. By implementing these future enhancements, Enthem can solidify its position as a leading social media application. The combination of improved user experience, advanced matching algorithms, expanded features, global connectivity, social impact initiatives, and gamification elements will set Enthem apart from its competitors. These enhancements will not only attract a larger user base but also foster a vibrant and engaging community of like-minded individuals, making Enthem a go-to platform for connecting, networking, and socializing. improve the quality of writing and keep things the same.

6. RESULTS AND DISCUSSIONS

Enthem, a social media application designed to connect individuals within proximity, has shown promising results in enhancing networking opportunities and fostering meaningful connections among users. The application's primary goal was to cater to the teenage demographic, including college students, university attendees, and young professionals.

The implementation of Enthem's features and technologies has yielded positive outcomes. The integration of the Neo4j graph database has proven effective in managing and analyzing user connections, enabling personalized and proximity-based matching. This feature enhances user engagement and facilitates connections with like-minded peers.

The focus on security measures, such as encryption and user authentication, has successfully protected users' personal profiles and communication from potential threats. This emphasis on privacy and security has contributed to creating a safe and trustworthy environment for users to interact and share their interests.

Enthem's utilization of efficient technologies, including Dart, Flutter, TypeScript, Node.js, and Socket.io, has resulted in a user-friendly interface and seamless functionality. These technologies have improved the performance and responsiveness of the application, providing users with a smooth and enjoyable experience.

Feedback from a few users has been predominantly positive, highlighting the ease of use and the ability to connect with individuals who share similar interests and are nearby. The temporary chat rooms and group chat features have encouraged lively discussions and allowed users to discover new connections within their local communities.

Furthermore, Enthem's global communication feature has provided users with the flexibility to connect with individuals beyond their geographic range as well, thus, broadening their social networks and expanding their perspectives.

However, there are areas for potential improvement. Some users have expressed the desire for additional customization options and enhanced search functionality to further refine their matches. Incorporating these features could provide users with more personalized experiences and improve overall user satisfaction.

In conclusion, currently, the results obtained from Enthem indicate its effectiveness in connecting individuals, fostering networking opportunities, and facilitating meaningful connections among users nearby. The integration of advanced technologies, emphasis on security measures, and the incorporation of user feedback have contributed to the development

of a reliable and user-friendly social media platform.

Further refinements and updates based on user feedback will continue to enhance Enthem's performance and ensure its continued relevance in the rapidly evolving landscape of social media applications. With its potential for widespread adoption and positive user experiences, Enthem is well-positioned to become a go-to platform for individuals seeking to expand their social networks and connect with like-minded peers.

7. CONCLUSION

Thereby, in conclusion, Enthem is a dynamic social media application that effectively connects individuals within proximity, fostering meaningful connections and enhancing networking opportunities. The development team behind Enthem conducted extensive market research and engaged with the target audience to understand their needs and pain points in social networking.

Throughout the development process, the team learned valuable lessons that influenced the final product. They recognized the importance of privacy and security, leading to the implementation of robust measures such as encryption and user authentication to protect users' personal profiles and communication.

Additionally, the team understood the significance of staying technologically advanced and integrated new efficient technologies into Enthem's framework. This commitment to innovation ensures that the application remains up-to-date and offers users a seamless experience.

Thorough testing, security checks, and quality assurance procedures were prioritized to guarantee the reliability and stability of the system. By conducting these rigorous procedures, Enthem can provide a secure and error-free platform for its expanding user base.

Furthermore, Enthem's utilization of the Neo4j graph database enhances its functionality in managing and analyzing connections between users. This feature that allows for personalized and proximity-based matching, enhancing user engagement and interaction.

Overall, Enthem is a remarkable achievement that reflects the team's dedication to creating a user-centric social media application. It positions Enthem as a leading platform for individuals seeking to connect with like-minded peers within their local communities. With its continuous development and commitment to user feedback, Enthem is likely to remain a popular choice for individuals looking to expand their social network and engage with others who share their interests.

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The references are used for the development of the project, writing the report and for the other learnings.

Internship Project - Enthem!

2 messages

Rohit Singla <rohit@wajooba.com> Tue, 13 Jun 2023 at 08:09
To: vinayak.sathe@dypiu.ac.in <vinayak.sathe@dypiu.ac.in>
Cc: yashvispute544@gmail.com <yashvispute544@gmail.com>, shreyashabc75@gmail.com <shreyashabc75@gmail.com>, pratik.jh2017@gmail.com <pratik.jh2017@gmail.com>

Dear **Professor Vinayak**,

Good Morning.

It has been wonderful working with you and your students.

With great pleasure, we want to share that the following Students have successfully completed their *internship project* **Enthem** from **15th Feb 2023 to 08th June 2023** at Wajooba.

1. **Yashkumar Vispute,** BTech 4th year (VIII Sem) CSE (Computer Science and Engineering), PRN No. 20190802099
2. **Pratik Jadhav,** BTech 4th year (VIII Sem) CSE (Computer Science and Engineering), PRN No. 20190802050
3. **Shreyash Hire,** BTech 4th year (VIII Sem) CSE (Computer Science and Engineering), PRN No. 20190802114

We, thereby, issue this provision to them to present their work for the **Final Evaluation** at their Institution, **D. Y. Patil International University, Akurdi, Pune**.

Thank you once again.

Regards

Rohit

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