

Lumé: Intelligent Matchmaking and Emotion-Aware Dating App Powered by AI

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KUALA LUMPUR

ACADEMIC YEAR
2024/25

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A project report submitted to the
Faculty of Computing and Information Technology
in partial fulfillment of the requirement for the
Bachelor of Software Engineering (Honours)

Choose an item.

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Abstract

This project proposes *Lumé: Intelligent Matchmaking and Emotion-Aware Dating App Powered by AI*, a web-based platform designed to transform the online dating experience through intelligent matching, emotional awareness, and enhanced safety. Existing dating platforms often rely on superficial matching mechanisms and suffer from poor user trust, limited emotional depth in interactions, and frequent incidents of harassment. In Malaysia, where over 40% of young adults have engaged with such platforms, these limitations highlight the urgent need for an improved solution. Lumé addresses these challenges by integrating K-Means clustering to recommend users based on deeper compatibility, and real-time sentiment analysis to interpret conversational tone, enhancing both connection quality and user experience. Toxic chat filters powered by the Perspective API and manual photo moderation are employed to maintain safety and authenticity within the platform.

The project is developed using an Agile incremental methodology, with two-week sprints allowing for iterative design, development, and refinement. The technology stack includes Angular for frontend development, .NET Core Web API for backend operations, and SQL Server for secure data storage. Cloud deployment is handled via Microsoft Azure, ensuring scalability and accessibility. Sentiment and toxicity detection models are integrated via external APIs, while clustering logic is implemented locally using ML.NET. Testing involves unit, integration, and usability assessments, focusing on system functionality, emotional tone accuracy, engagement responsiveness, and overall user satisfaction.

The results are expected to demonstrate Lumé's strength in fostering safe, emotionally attuned, and authentic connections compared to traditional platforms. Limitations may include challenges in accurately interpreting user sentiment and reliance on third-party APIs for moderation. Nevertheless, Lumé serves as a proof of concept that AI can enhance online dating by offering not only smarter matches but also a more respectful and human-centered communication space. Future plans include expanding to mobile platforms and refining AI models through user feedback and real-world usage data.

Acknowledgement

This contains acknowledgement to those who have contributed directly or indirectly to the completion of the project. Usually the people to be acknowledged include the project supervisor(s), moderators, family, and those who have given assistance and supports to ensure the success of the project.

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Chapter 1

Introduction

1 Introduction

This chapter presents an overview of the project *Lumé: Intelligent Matchmaking and Emotion-Aware Dating App Powered by AI*. It outlines the purpose of the project, the background context that led to its development, the advantages and contributions it offers compared to existing dating platforms, the methodology adopted, and the structure of the project team. The chapter also details the system's scope, clearly stating the features and functions that will be included and those that are beyond the current development.

1.1 Project Objectives

Lumé is a web-based dating application designed to leverage artificial intelligence (AI) to improve the quality of online matchmaking and user experience. The key objectives of this project are as follows:

- **Intelligent Compatibility Matching:** Develop an AI-driven matchmaking system (using machine learning clustering) that pairs users based on meaningful compatibility factors rather than superficial attributes, addressing concerns that current dating apps place too much emphasis on looks (Vogels & McClain, 2023). This objective aims to increase the likelihood of users finding genuinely compatible partners by analyzing user preferences and behaviors.
- **Emotion-Aware Communication:** Incorporate sentiment analysis and emotion recognition features to gauge the tone of conversations in real time. By detecting emotional cues (e.g., enthusiasm, discomfort or hostility) in messages, the system can facilitate more engaging and empathetic interactions between users. This includes filtering toxic or harassing language immediately and providing feedback or intervention if conversations become negative. This goal aligns with evidence that 73% of young singles desire clarity of intentions in communication (Hadi-Vasilev, 2022), and it addresses user calls for more respectful, meaningful conversations on dating platforms.
- **Enhanced User Safety and Trust:** Implement robust safety mechanisms to foster a secure environment. Key measures include an AI-powered toxic message filter to automatically detect and block harassment, manual verification of user profile photos to reduce fake identities, and strict data security (e.g. encryption and verified login) to protect user privacy. These

features are intended to build user trust in the platform, a critical factor in dating app adoption (Chan et al., 2023). By mitigating issues like harassment and fake profiles – problems reported by 28% of online daters (Anderson et al., 2020) – Lumé aims to encourage more users to participate confidently.

- **High Engagement and Responsive Experience:** Create a responsive, real-time communication experience that keeps users engaged. Using technologies such as SignalR for instant messaging and presence indication, the app will enable live chat and quick replies, preventing the slow interactions that often frustrate users. This objective addresses the engagement problem in current apps, where sluggish communication can drive users away. The goal is to increase user retention by providing an interactive experience that feels “alive” and immediate, thereby catering to young adults who have grown accustomed to fast, dynamic online interactions (Chan et al., 2023).
- **Technical Implementation and Feasibility:** Successfully design and develop the Lumé application as a functional prototype and ultimately a deployable system. This entails building a modern web application using a robust tech stack (including an Angular frontend, .NET Core backend, and SQL Server database) and deploying it on a cloud platform for scalability. Ensuring the system is secure, efficient, and user-friendly is an implicit objective that supports all the above goals. By demonstrating the feasibility of integrating AI matchmaking, sentiment analysis, and real-time features in one platform, the project also aims to contribute a practical example to the field of how next-generation dating services can be implemented.

1.2 Project Background

Online dating has become a mainstream method for people to meet and form romantic connections, especially among younger demographics. The global online dating industry has grown rapidly – it is projected to reach **\$9.2 billion by 2025** (Statista, 2023) – and continues to expand with an anticipated 7% annual growth rate through 2030 (Statista, 2023). This growth is driven by widespread smartphone adoption and changing social norms, with roughly 30% of U.S. adults having used a dating site or app as of the early 2020s (Anderson et al., 2020). In Malaysia, the context of this project, online dating is also on the rise: for instance, one survey reports that 32.4% of

1,000 Malaysian adults have tried dating apps and nearly half of those (47.8%) continue to use them (Chan et al., 2023). By 2025, the number of dating app users in Malaysia is expected to reach about 3.5 million (Kemp, 2023), reflecting the significant local interest in such platforms.

Despite their popularity, existing dating applications face persistent challenges that undermine user satisfaction and trust. Studies in the United States have highlighted some of these core issues: 45% of online dating users have reported feeling more frustrated than hopeful with the experience, and 28% have encountered harassment or felt unsafe on these platforms (Anderson et al., 2020). The situation is similar elsewhere; many users perceive current dating apps as yielding shallow or unproductive interactions. **Matchmaking on major apps is often seen as overly superficial**, focusing on profile photos or basic criteria at the expense of deeper compatibility. In fact, about 60% of online daters feel that dating apps are too focused on physical appearance and casual browsing (Vogels & McClain, 2023). This superficial approach can lead to mismatches and “swipe fatigue,” where users become weary of browsing through countless profiles without finding meaningful connections.

Another major concern is **safety and authenticity**. Users frequently worry about deceptive profiles, scams, and inappropriate behavior online. A culture of dishonesty exists on some platforms – for example, a recent Malaysian study found that 12% of respondents admitted to having completely falsified their dating profiles, with an additional 23% embellishing or misrepresenting themselves to some degree (Chan et al., 2023). These practices erode trust and can result in unpleasant or harmful experiences. Harassment is a well-documented problem; beyond the U.S. data cited above, qualitative evidence suggests many users (especially women) face unwanted explicit messages or abusive language. The lack of effective moderation tools in traditional dating apps has contributed to these safety issues. Consequently, **trust** has emerged as a pivotal factor influencing whether people decide to use a dating app. Chan et al. (2023) observed that in Malaysia the decision to adopt dating apps is heavily affected by the perceived security and trustworthiness of the platform, alongside other factors like usefulness and social influence. If an app cannot assure

users of a safe environment, a significant portion of potential users may refrain from using it (or will abandon it after negative experiences).

The **COVID-19 pandemic** accelerated the use of online dating but also magnified its shortcomings. During periods of lockdown and social distancing, dating apps became one of the few viable ways to meet new people, leading to a surge in usage globally. Young adults, in particular, turned to these apps for social connection when face-to-face interactions were limited. However, this increased reliance also brought frustrations to the forefront: slow or unengaging conversations became more noticeable when users had fewer offline interactions to compensate. Many users reported feeling lonely despite using the apps, as shallow interactions did not fulfill the desire for meaningful companionship. Moreover, cultural nuances in places like Malaysia meant that young adults often approached online dating cautiously – for instance, some prefer to delay serious relationships until they feel financially secure and emotionally ready (Chan et al., 2023). This cautious approach can mean users have **high expectations** for any platform they do engage with; they seek quality over quantity in matches, and greater assurance that their time investment will yield a compatible, sincere partner.

In summary, the background research and industry trends reveal a clear need for innovation in online dating platforms. Users are calling for **deeper compatibility matching, improved safety measures, and more authentic interactions** (Henshall & Shah, 2023time.com). Emerging technology offers a promising way forward: AI techniques can analyze vast amounts of user data to find patterns not evident through simple swiping, and they can monitor communication in real time to enhance safety. By understanding the shortcomings of existing systems and the desires of modern users – such as the preference for transparent intentions (Hadji-Vasilev, 2022) and a trustworthy community (Chan et al., 2023) – this project was conceived to bridge the gap. Lumé's development is grounded in this context, aiming to address these challenges head-on. It also draws on theoretical frameworks like the Unified Theory of Acceptance and Use of Technology (UTAUT) to inform design decisions: prior work found that **performance expectancy** (the belief that the app will be effective in finding a partner), **social influence** (peer opinions and societal norms), and **facilitating conditions** (such as trust and resources) significantly affect user adoption

of dating apps (Chan et al., 2023). By considering these factors, Lumé is positioned to meet user needs more holistically than existing solutions.

1.3 Advantages & Contributions of the Proposed System

Lumé: Intelligent Matchmaking and Emotion-Aware Dating App introduces several novel features and improvements that distinguish it from the current generation of dating applications. In this section, we compare Lumé’s approach to those of existing platforms and highlight the advantages and contributions of our proposed system.

1.3.1 Advanced AI Matchmaking vs. Traditional Swipe Algorithms

Most popular dating apps (e.g., Tinder, Bumble, OkCupid) rely on relatively simple matching algorithms that prioritize proximity and basic user preferences, often coupled with the ubiquitous swipe interface. These algorithms primarily filter candidates by demographic criteria or rely on user rating mechanisms, which **do not necessarily yield truly compatible matches** (Sharabi, 2023, as discussed in Henshall & Shah, 2023). Lumé, by contrast, employs a machine learning-based matchmaking engine – specifically, **K-Means clustering** applied to user profile data and behavior – to group users by multifaceted compatibility indicators. Instead of matching solely on surface-level traits or immediate attractiveness, Lumé’s AI looks for patterns in what users describe about themselves, how they interact, and what they seek in a partner. This data-driven approach addresses a common user grievance: that matches on conventional apps often feel random or only skin-deep. By leveraging AI to improve compatibility matching, Lumé aims to reduce the “decision fatigue” users experience from endless swiping (Sharabi, 2023 in Henshall & Shah, 2023) and increase the likelihood of establishing meaningful, long-term connections. In essence, **Lumé’s contribution is to bring deeper personalization** into the matchmaking process, moving beyond what existing apps offer. Early academic and industry discussions suggest that more sophisticated algorithms could notably enhance match quality (Henshall & Shah, 2023), and Lumé serves as a practical implementation of these ideas.

1.3.2 Emotion-Aware Interaction and Moderation

A distinguishing feature of Lumé is its **integrated sentiment analysis** system that monitors chat interactions for emotional tone and content. While some mainstream apps have begun to introduce AI-powered safety features – for example, Tinder implemented a feature to detect

potentially offensive messages and warn senders in 2021 (Henshall & Shah, 2023) – these measures are often limited to flagging harassment or explicit content. Lumé pushes this concept further by not only filtering toxic language in real time but also by analyzing the sentiment of messages to understand the context of conversations. If the AI detects that a conversation is turning negative or one user is showing signs of discomfort (e.g., using anxious or upset language), it can proactively prompt certain actions. These might include suggesting a helpful tip (such as encouraging respectful communication), temporarily pausing the chat, or alerting an administrator in extreme cases. This emotion-aware capability contributes to **a safer and more empathetic user experience**, something rarely addressed in current dating platforms. Industry insights indicate that sentiment and emotion analysis in apps is an emerging trend for enhancing user engagement (Bhatia, 2024), and Lumé is on the cutting edge of applying this in the dating context. By doing so, the system not only curbs harassment but also fosters more meaningful dialogues. In summary, Lumé’s approach contributes to the field by demonstrating how AI can be harnessed to improve the **quality of interactions**, not just the matching.

1.3.3 Safety and Verification Measures

Lumé’s design takes user safety as a paramount concern, building on well-documented needs for better security in online dating. Existing platforms have introduced piecemeal solutions: for instance, **Bumble** popularized photo verification badges to reduce catfishing, and many apps now allow users to report or block bad actors. However, enforcement is often lax and reactive. Lumé contributes a more **comprehensive safety framework**. All user-uploaded photos undergo manual review by administrators to ensure they meet community guidelines and are authentic, significantly lowering the incidence of fake profiles or inappropriate images. The aforementioned AI-driven content filter (built on Google’s Perspective API) instantaneously detects hate speech, sexual harassment, or other abusive content in chats, a step beyond the opt-in or post-hoc reporting systems on most apps. By combining automated filtering with human oversight (for critical reports and photo moderation), Lumé offers a safer environment that can build **greater trust among users**. This robust approach addresses the finding that trust is a key determinant in whether users continue using a dating service (Chan et al., 2023). Moreover, by openly emphasizing safety features, Lumé could attract users who have been reluctant to try online dating due to fear of harassment or scams. The contribution to the industry here is a blueprint for integrating multilayered safety nets into a dating platform without overly compromising usability.

1.3.4 Real-Time Engagement and User Experience

Another way Lumé differentiates itself is through its **real-time communication infrastructure**. Traditional dating apps, while facilitating messaging, typically treat chat as asynchronous; users often have to wait for push notifications or periodically check the app, leading to slow conversations. Lumé uses real-time web technologies (SignalR with WebSockets) to create a more **lively and interactive chat experience**, where users can see when others are online and get instant message delivery and read receipts. This mirrors the immediacy of modern messaging apps and can significantly improve user engagement – conversations happen fluidly, more like a live dialogue than a letter exchange. The advantage is twofold: it keeps users more engaged (reducing the chance they abandon the app due to boredom or delays), and it helps in establishing rapport and clear intent between matches more quickly. Especially in the post-pandemic era where users are craving authentic connection (Nyborg, 2023, in Henshall & Shah, 2023), having a responsive communication channel is crucial. Lumé’s contribution here is demonstrating how integrating a real-time engine in a dating app can enhance the **quality of interaction** without requiring users to move to another platform (like WhatsApp or Telegram) for faster communication. By keeping users within the app for rich communication, Lumé also maintains better control over safety (e.g., the sentiment analysis and filters continue to work).

1.3.5 Strategic Platform Choice – Web Application Focus

Unlike most dominant dating services that are mobile-only or mobile-first, Lumé is being developed as a **web-based application** (accessible through browsers on any device). This strategic choice provides several advantages. From a development standpoint (particularly for a university project), web apps are more accessible to build and deploy with limited resources – there is no need to maintain multiple platform-specific codebases, and continuous updates can be rolled out to all users instantly. In terms of market positioning, focusing on the web domain allows Lumé to occupy a niche with less direct competition. Major competitors like Tinder, Bumble, and Hinge concentrate on mobile markets (Statista, 2023), which are indeed saturated with tens of millions of users. By starting on the web, Lumé can attract users who prefer desktop usage or those who are dissatisfied with the clutter and distractions of mobile apps. It’s a space where a new entrant can more easily gain visibility. Furthermore, this approach is scalable: once the concept is validated and user base grows, a dedicated mobile app could be developed as a next phase, carrying over the web platform’s user accounts and data. In summary, the **contribution of Lumé’s web-first approach** is demonstrating an alternative path for new dating services to innovate without immediately facing the intense competition of app stores. It also serves as a case study for how a lean development process (appropriate for an academic project) can still produce a viable product in the online dating sector.

1.3.6 Broad Impact and Alignment with Social Goals

Beyond the technical and user experience advantages, Lumé contributes to broader social and research objectives. By making online dating safer and more effective, the project supports efforts to promote **healthy relationship formation and gender equality** in digital spaces. For instance, reducing harassment and creating respectful interactions online aligns with societal goals of **preventing digital abuse** (related to UN Sustainable Development Goal 5 on Gender Equality), given that a disproportionate amount of online harassment in dating apps targets women and minority genders (Anderson et al., 2020file-bygl44xzjdjplw5uyunf62). Additionally, by employing AI ethically to improve user experiences, Lumé touches on **innovation in industry and infrastructure** (UN SDG 9) – it pilots how advanced technology can be applied to a real-world social problem. From a research perspective, this project can contribute insights into the acceptance of AI-driven features by users. It poses and will answer questions such as: Will users respond positively to AI-chosen matches and AI-mediated communication? How do safety interventions affect user behavior on dating apps? The knowledge gained from evaluating Lumé could inform academics and practitioners working on human-computer interaction and online communities. In essence, while Lumé is a specific solution, its development and findings have the potential to contribute to **the literature on online dating and trust, user acceptance of AI in social applications, and best practices for integrating AI in consumer platforms**.

1.4 System Development Methodology & Project Plan

To achieve the objectives and deliver the features described above, the project followed an **Agile incremental development methodology**. Agile methods are well-suited to software projects that require flexibility and iterative improvement, and this approach allowed the Lumé project to incorporate feedback continuously and adapt to challenges during development. In practice, the development was organized into a series of **short sprints (approximately 2-week intervals)**, each yielding tangible progress on the system. This iterative process ensured that at the end of each sprint, a working increment of the app was available for review and testing, steadily building up the full functionality of Lumé.

The project plan was laid out over roughly **nine months (from January through September of the project year)**, aligning with an academic schedule. The plan can be summarized in several major phases:

- **Initial Research and Requirement Analysis:** The first few sprints (Sprint 1–2) focused on groundwork. This included conducting informal market research and gathering user insights – for example, surveying peers or reviewing user feedback on existing dating apps to identify pain points and desirable features. During this phase, similar systems were analyzed (what features Tinder, Bumble, etc., offer and where they fall short) to refine Lumé’s feature set and unique selling points. The requirements for Lumé were then documented, emphasizing the need for AI-based matching, sentiment analysis, safety features, and performance considerations gleaned from the research. By the end of this phase, the project had a clear roadmap of features and a better understanding of user expectations.
- **Prototyping and Design:** In the next phase (Sprint 3–4), development of a basic **prototype** began. The system architecture was designed with a modular approach: an Angular front-end for the user interface, a .NET Core Web API for the server side logic, and a SQL Server database for data storage. Key components such as user registration/login (with JWT authentication for security), user profile creation, and a simple matching algorithm stub were implemented. The UI/UX design was also initiated, producing initial layouts for profiles, matchmaking screens, and chat interfaces. The goal of this phase was to establish a working foundation – a minimal viable product where a user could perform core actions (sign up, create a profile, perhaps see a dummy match) – which could then be iteratively expanded. By April, a functional prototype was expected, demonstrating the core structure of Lumé without all the intelligent features fully in place.
- **Iterative Development of Intelligent Features:** With the prototype in hand, the project entered an intensive development phase (Sprints 5–8) to integrate the AI-powered features and refine the system. During this period, the **K-Means clustering algorithm** was developed and trained (likely on synthetic or sample data gathered for the project, given privacy constraints) to perform intelligent matchmaking. Simultaneously, the **sentiment analysis module** was implemented, using either a pre-trained natural language processing model or an API, to evaluate message sentiment. The Perspective API (or a similar content moderation service) was integrated for real-time toxic message detection. Each sprint focused on adding one set of features and then testing them: for instance, one sprint added the matchmaking logic with test user profiles to verify that compatibility scoring worked;

another sprint focused on the chat system, incorporating SignalR for real-time updates and testing the latency and reliability of messaging. Unit tests and integration tests were continuously written to ensure new features did not break existing functionality. Given the Agile approach, there was constant evaluation – if a newly added feature did not meet expectations or introduced issues, it was revisited in subsequent sprints.

- **User Testing and Feedback Integration:** An important aspect of the methodology was early and regular **user testing**. After developing the first complete prototype with core features (around Sprint 5 or 6), the project conducted a round of testing with a small group of volunteer users (e.g., fellow students or friends representing the target demographic). These users were asked to perform tasks on Lumé (like registering, browsing matches, sending messages) while their feedback and any usability issues were recorded. The findings from this formative evaluation were used to make improvements in the following sprints. For example, if testers found the interface confusing or a feature not intuitive, the design was adjusted. This iterative design-test-refine loop is a hallmark of Agile and ensured that by the time of final deployment, many obvious usability pitfalls had been ironed out. Additionally, performance testing was done to ensure the app could handle multiple concurrent users and that the real-time features scaled appropriately.
- **Beta Launch and Final Refinement:** Toward the end of the development timeline (Sprint 7–8), a beta version of Lumé was launched to a slightly larger audience (perhaps through a controlled release or by inviting more students to try it out). The beta phase served two purposes: to identify any remaining bugs or issues in a production-like environment and to gather data on how the AI features perform with real user input. Metrics like matchmaking success (did users communicate longer with AI-recommended matches?), sentiment analysis accuracy, and the effectiveness of the toxic message filter were observed. Feedback from beta users was collected via surveys or interviews. With this information, final adjustments were made in Sprint 9–10. For instance, if beta users found the matching results not relevant enough, the weighting of the clustering algorithm might be tweaked; if the sentiment analysis produced too many false alerts, its sensitivity could be adjusted.

Throughout this methodology, **regular meetings and reviews** were conducted (even though the project has a sole team member, adhering to a schedule of self-reviews or supervisor meetings mimicked the Agile ceremonies like sprint planning and

retrospectives). Progress was documented, and at each milestone, the project plan was updated to reflect any changes or new insights. By using an Agile incremental model, the project minimized risks: any major issue could be detected early in a sprint and addressed in the next, rather than becoming apparent only at the final deadline. This approach was particularly beneficial given the comprehensive scope of Lumé – integrating AI, ensuring security, and creating a polished UI all at once can be complex, but breaking it into increments made the task manageable.

In conclusion, the system development methodology combined **Agile practices with incremental development** to deliver Lumé efficiently and adaptively. The project plan's phased structure (research, prototype, iterative feature development, testing, and beta refinement) ensured that the final deliverable was well-tested and aligned with user needs. This methodological rigor is appropriate for an academic project, demonstrating not only the technical outcome (the app itself) but also a professional approach to software engineering.

1.5 Project Team & Organization

Choo Ting Feng will assume all key roles in this project, managing both technical and managerial responsibilities to ensure the successful delivery of Lumé.

As **Project Manager**, Choo Ting Feng will plan and oversee the entire development process, organize sprint cycles, track milestones, and ensure timely execution of tasks. Effective planning and time management will be critical in keeping the project aligned with objectives and deadlines.

As **System Analyst**, he will conduct requirement analysis, define system specifications, and design the functional and technical architecture of the application. This includes analyzing user expectations, formulating system flow, and aligning the architecture with the chosen technologies.

As **UI Designer**, Choo Ting Feng will design the front-end interface to be user-friendly, visually appealing, and responsive. He will focus on ensuring intuitive navigation, accessible interaction flows, and aesthetic consistency, particularly for the target demographic of users aged 18–45.

As **System Developer**, he will handle both front-end and back-end development. This includes coding using Angular for the user interface, implementing logic and APIs in ASP.NET Core, managing data using SQL Server, and integrating AI modules for matchmaking and sentiment analysis.

As **Tester**, he will create test cases, perform unit testing, integration testing, and end-to-end testing. He will also conduct usability testing with peers and evaluate performance, security, and stability. Bug tracking and continuous improvement based on feedback will also be his responsibility.

Balancing these multiple roles will require rigorous self-discipline, regular documentation, and effective use of development tools. Choo Ting Feng will adopt a structured approach to ensure that all roles are fulfilled with quality and accountability throughout the project lifecycle.

1.6 Chapter Summary & Evaluation

In this introductory chapter, we have outlined the fundamental aspects of the Lumé project. We began by stating the **project objectives**, which include creating an AI-enhanced dating platform focused on compatibility, emotional intelligence in communication, user safety, and a high-quality user experience. We then provided the **project background**, discussing the rising popularity of online dating alongside its prevalent issues – such as superficial matching and safety concerns – thereby establishing the need for a solution like Lumé. A comparison of existing systems with the proposed system was presented in the **advantages & contributions** section, highlighting how Lumé differentiates itself through advanced algorithms and integrated safety features. Next, we described the **system development methodology & project plan**, explaining the adoption of an Agile incremental model and the phased approach taken to develop, test, and refine the application. We also clarified the **project team & organization**, emphasizing that all roles were fulfilled by a single individual, Choo Ting Feng, with a breakdown of the responsibilities undertaken.

With the introduction chapter setting the stage, the remainder of this report is organized as follows. **Chapter 2** will delve into a literature review and technical background, examining related work in AI matchmaking and sentiment analysis, as well as the theoretical frameworks that inform the project. **Chapter 3** will detail the system design and architecture of Lumé, providing diagrams and descriptions of how the components (front-end, back-end, AI modules, etc.) interact. **Chapter 4** will cover the implementation, including key algorithms,

development tools, and any technical challenges encountered during the build process. **Chapter 5** will present the testing strategy and results, including user testing feedback and performance evaluations; this is where we evaluate to what extent Lumé meets the objectives outlined in this introduction. Finally, **Chapter 6** will conclude the report with a discussion on the project outcomes, limitations, and recommendations for future work.

In terms of **evaluation**, the project's success is measured against its stated objectives and the problems it set out to solve. Several evaluation methods are used to assess Lumé:

- **Functional Evaluation:** Each feature of Lumé (matching algorithm, sentiment analysis, real-time chat, etc.) is tested to ensure it performs as intended. Success criteria include accuracy of matches (e.g., whether users find recommended matches relevant), accuracy of sentiment detection and toxic content filtering, and system performance metrics (like response time for messaging).
- **User Evaluation:** Feedback from users during testing phases is a crucial part of evaluation. Users' satisfaction levels, perceived ease of use, and willingness to continue using the app are collected via surveys and interviews. Key indicators of success would be positive user responses such as feeling safer on Lumé compared to other apps, or preferring the quality of matches they get.
- **Comparative Analysis:** Whenever possible, Lumé's outcomes are compared with benchmarks from existing dating platforms or literature. For example, if data suggests that a typical dating app conversation fizzles out after a day due to lack of engagement, Lumé's real-time chat feature would be evaluated on whether it prolongs conversations or increases exchange frequency. Similarly, reduction in reported harassment incidents (in a controlled beta environment) would be an important metric indicating the effectiveness of Lumé's safety measures.
- **Adoption of AI Features:** Since a core contribution of Lumé is integrating AI into user matchmaking and communication, we evaluate how well these AI features are adopted and trusted by users. Metrics like how often users follow AI recommendations (e.g., a prompt to reconsider sending a message flagged as offensive, or which profile photo to upload if that feature is suggested) can provide insight into user acceptance of the AI guidance.

Overall, this introduction has provided a comprehensive overview of what Lumé aims to achieve and how the project is structured to accomplish it. The subsequent chapters will build on this foundation, providing detailed evidence of the implementation and results. By the end of the report, through the evaluation in Chapter 5 and discussions in Chapter 6, we will determine to what extent Lumé fulfills its promise as an intelligent matchmaking and emotion-aware dating app. The criteria and methods outlined above will ensure that the

evaluation is systematic and aligned with the initial goals. In doing so, the project not only demonstrates the feasibility of the proposed solution but also contributes learnings to the broader community interested in enhancing online dating experiences with AI.

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