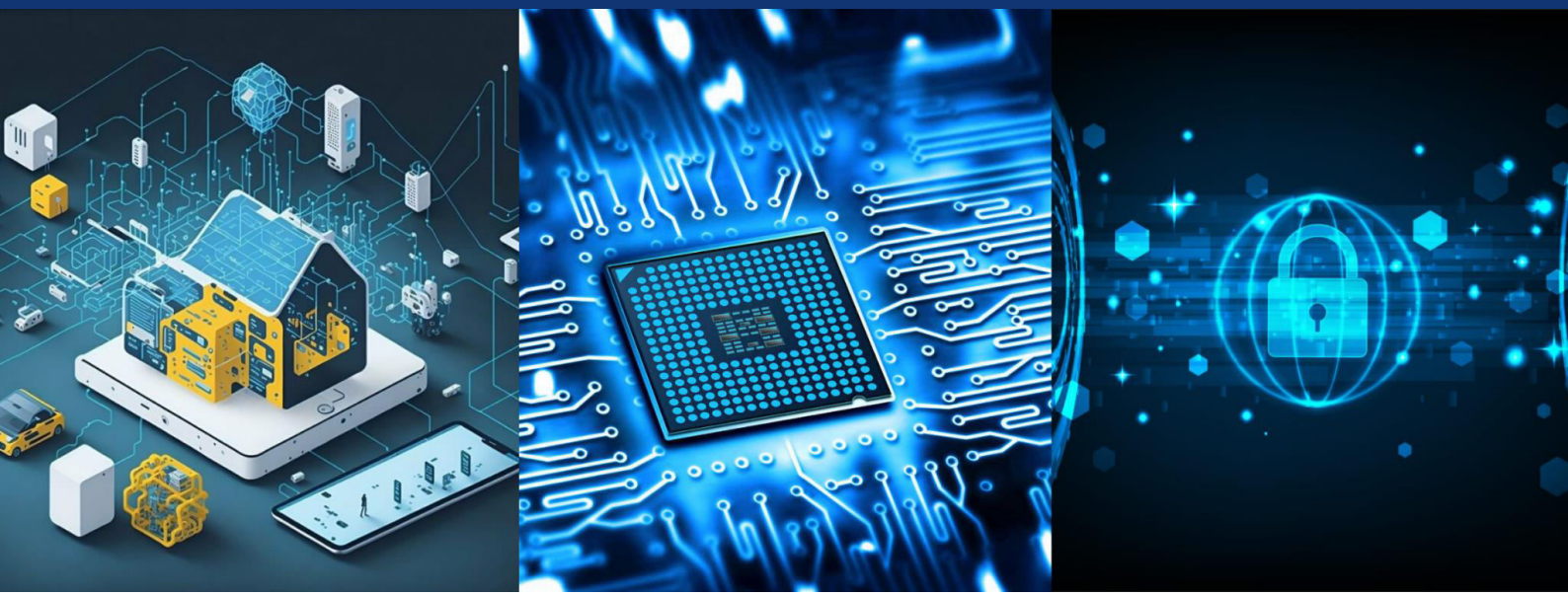
IJIRCCE

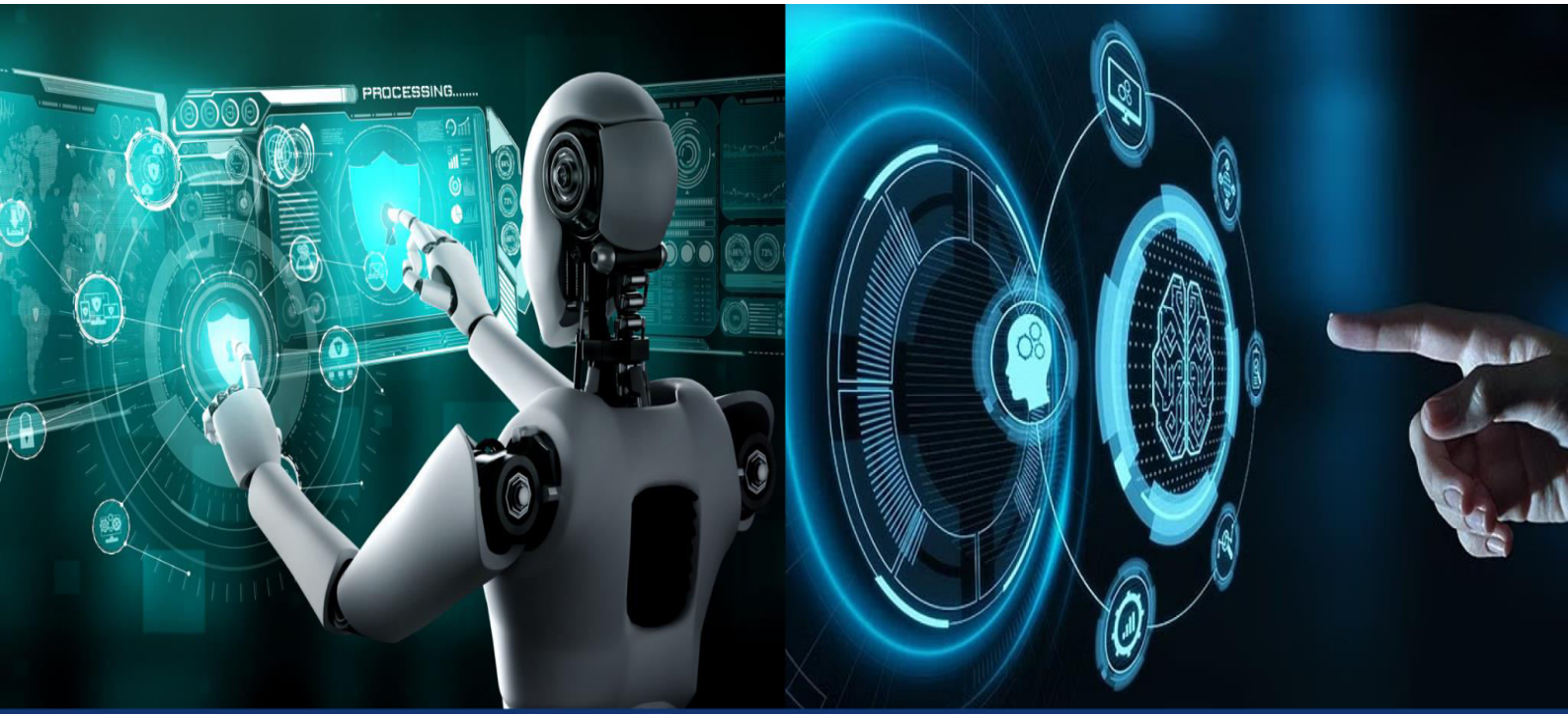
ISSN(O): 2320-9801

ISSN(P): 2320-9798



International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 9.927

Volume 14, Issue 6, June 2026

© 2026 IJIRCCE | Volume 14, Issue 6, June 2026 DOI: 10.15680/IJIRCCE.2026.1406007

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Expresso: A Web-Based Experience Sharing Platform with Public/Private Posting, Anonymous Interactions, TagBased Filtering, User Reporting, and Safe Moderation Mechanisms

Yogesh Padole, Mohit Ingale, Harsh Gandhi

Department of Information Technology, NBN Sinhgad School of Engineering, Pune, India

ABSTRACT: This paper presents Expresso, a youth-centric webbased platform designed to facilitate anonymous storytelling and meaningful digital interaction. In contrast to traditional social media platforms such as Instagram and Reddit, which often emphasize identity and social validation, Expresso prioritizes emotional safety, privacy, and authentic self-expression. The system enables users to share personal experiences either anonymously or with identity, explore content through tag-based categorization, and engage via reactions and comments in real time.

The platform is developed using React.js for building a dynamic user interface and Firebase Firestore for real-time data synchronization, ensuring scalability and responsiveness. Additional features such as saved posts, personalized dashboards, and an administrative moderation panel enhance usability and platform safety.

The study highlights the system architecture, implementation strategies, and key challenges, including content moderation and scalability. Results demonstrate that Expresso effectively fosters a secure and inclusive environment for youth to express themselves freely while maintaining community guidelines. The proposed platform contributes to the growing need for safe digital spaces that encourage emotional well-being, peer support, and creative expression.

The system is built using React.js for the frontend, providing a responsive and modern user experience, while Firebase Firestore serves as the real-time backend, ensuring instant synchronization of user-generated content across devices.

KEYWORDS: Anonymous Storytelling, Social Media Platform, RealTime Systems, React.js, Firebase Firestore, Firebase Authentication, Content Moderation, User Engagement, Web Application, Cloud Computing, NoSQL Database, Tag-Based Filtering, Online Communities, Digital Expression, Youth-Centric Platform, Privacy Preservation, Human-Computer Interaction, Scalable Systems, Interactive Platforms

I. INTRODUCTION

A. Background and Motivation

In the contemporary digital landscape, social media platforms have become essential tools for communication, self-expression, and community interaction. Applications such as Instagram and Facebook allow users to share content and connect with others globally. However, these platforms often emphasize identity, popularity metrics, and curated self-presentation, which can discourage individuals—especially youth—from sharing personal or sensitive experiences openly.

Many users hesitate to express their true thoughts due to fear of judgment, social pressure, or concerns about privacy. While platforms like Reddit provide partial anonymity, they may lack structured moderation and emotionally safe environments. This creates a significant gap in the digital ecosystem for platforms that balance anonymity with meaningful engagement and safety.

This combination of anonymity, interactivity, and safety makes Expresso a promising solution for youth-centric digital storytelling.

© 2026 IJIRCCE | Volume 14, Issue 6, June 2026 DOI: 10.15680/IJIRCCE.2026.1406007

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

B. **Problem Statement**

Despite the widespread adoption of social media platforms such as Instagram, Facebook, and Reddit, there remains a significant gap in providing a secure and emotionally safe environment for users—particularly youth—to share personal experiences. Most mainstream platforms emphasize identity visibility, social validation through likes and followers, and curated content, which can discourage individuals from expressing genuine thoughts or sensitive issues. fail to integrate real-time responsiveness and personalized user experiences, which are critical for maintaining user engagement in modern web applications.

II. LITERATURE REVIEW

In recent years, a wide range of social platforms have emerged, each designed to cater to different forms of online interaction. Platforms such as Instagram and Facebook are primarily image-driven and encourage curated self-presentation, which may discourage users from expressing vulnerable or deeply personal experiences. Reddit offers community-based discussion and anonymity, but its broad and often unmoderated scope can lead to negative experiences, trolling, or a lack of emotional safety. Whisper, while focused on anonymous sharing, is limited in terms of engagement features and long-term community building. Similarly, Medium provides a rich space for article-style storytelling but does not specifically target the quick, reflective, or emotionally-driven narratives often sought by youth audiences.

III. PROPOSED METHODOLOGY

The proposed system, Expresso, is designed to provide a secure and interactive platform for anonymous storytelling and realtime user engagement. The methodology focuses on integrating anonymity, structured interaction, and scalable cloud-based technologies to ensure a seamless and safe user experience. The system leverages modern web development tools such as React.js for the frontend and Firebase Firestore for backend data management.

A. System Approach

The core approach of the system is based on enabling users to share experiences either anonymously or with identity while maintaining data privacy and platform safety. The methodology follows a modular design, where each component performs a specific function such as authentication, content creation, interaction handling, and moderation. The system adopts a client-server architecture with real-time data synchronization. User actions are processed through cloudbased backend services, ensuring minimal latency and efficient data handling.

B. Function Modules

The proposed system is divided into the following functional modules:

1. Authentication Module:

This module manages user login and registration using Firebase Authentication. It allows both authenticated and anonymous access, ensuring flexibility and privacy.

2. Post Creation Module:

Users can create and publish stories with optional anonymity. The module supports tagging and categorization to improve content discoverability.

3. Community Feed Module:

Displays all user-generated content in real time. The feed is dynamically updated using Firestore, ensuring instant visibility of new posts.

4. Interaction Module:

Enables users to engage with posts through reactions, comments, and saving features, promoting community interaction.

5. Moderation Module:

Includes reporting mechanisms and administrative controls to filter inappropriate content and maintain platform integrity.

C. Data Flow and Processing

The data flow in the system follows these steps:

1. User submits data (post, comment, or reaction) through the frontend interface.
2. The request is processed by backend services and validated.

© 2026 IJIRCCE | Volume 14, Issue 6, June 2026 DOI: 10.15680/IJIRCCE.2026.1406007

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

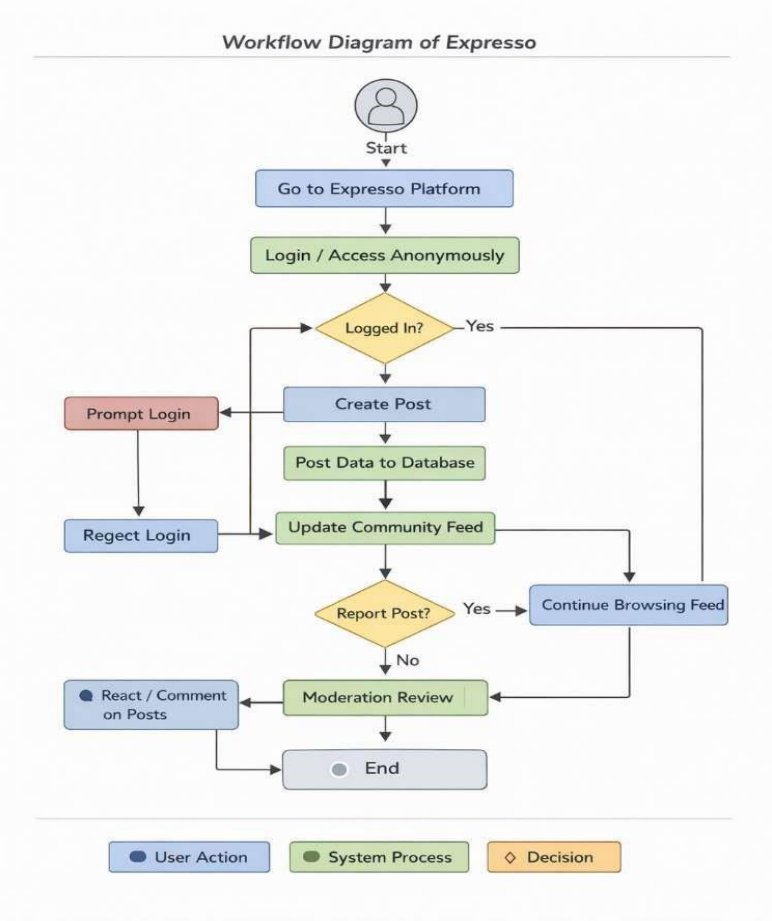
International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

3. Data is stored in the Firestore database.
4. Real-time listeners update the community feed across all users.
5. Moderation checks are applied where necessary to ensure compliance with guidelines.

D. Key Methodological Features

- Anonymity Support: Allows users to share content without revealing identity
- Real-Time Interaction: Ensures instant updates using cloud-based synchronization
- Scalability: Serverless architecture supports growing user base
- Security & Privacy: Authentication and database rules protect user data
- User Engagement: Tag-based filtering and interactions enhance usability



The workflow diagram of the proposed system, Expresso, illustrates the sequence of operations and interactions performed by users and the system to enable anonymous storytelling and real-time engagement. The process begins with the user accessing the platform through a web interface developed using React.js.

IV. IMPLEMENTATION

The implementation of the proposed system, Expresso, focuses on developing a scalable, responsive, and real-time web application using modern technologies. The system is built using a full-stack approach, integrating frontend, backend, and cloud-based database services to ensure seamless performance and user experience.

A. Frontend Implementation

The frontend of the system is developed using React.js, which provides a component-based architecture for building dynamic and responsive user interfaces. The application is designed with reusable components such as login forms,

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

post creation modules, and feed displays. State management is handled efficiently to ensure smooth rendering and real-time updates.

The user interface is styled using HTML, CSS, and JavaScript to provide a clean and intuitive experience. The responsive design ensures compatibility across different devices, including desktops and mobile platforms.

B. Backend Implementation

The backend logic is implemented using serverless architecture through cloud functions. These functions handle various operations such as user authentication, data validation, post submission, and moderation processes. This approach eliminates the need for dedicated server management and improves scalability.

The backend is tightly integrated with Firebase services, allowing efficient handling of API requests and asynchronous operations.

C. Database Implementation

The system uses Firebase Firestore as a NoSQL real-time database. It stores structured data such as user profiles, posts, comments, and interactions in collections and documents. Firestore enables realtime synchronization, ensuring that any changes in the database are instantly reflected in the user interface.

Efficient indexing and querying mechanisms are used to optimize performance and reduce latency during data retrieval.

D. Authentication and Security

User authentication is managed using Firebase Authentication, which supports both registered login and anonymous access. Security rules are implemented at the database level to control read and write permissions, ensuring that user data remains protected.

Additional validation mechanisms are applied to prevent unauthorized access and malicious activities.

E. Real-Time Data Handling

Real-time functionality is a core feature of the system. Firestore listeners are used to monitor changes in the database and update the community feed instantly. This ensures that users can view new posts, comments, and interactions without refreshing the page.

F. Deployment and Hosting

The application is deployed using Firebase Hosting, which provides a fast and secure environment for web applications. It supports continuous deployment and ensures high availability and low latency.

G. System Integration

All components of the system are integrated to ensure smooth data flow and interaction. The frontend communicates with backend services through APIs, while the backend interacts with the database for data storage and retrieval. This integration ensures consistency, reliability, and efficient performance of the application.

V. PERFORMANCE ANALYSIS

The performance of the proposed system, Expresso, is evaluated based on key parameters such as response time, real-time data updates, and system scalability. The platform is designed using modern technologies like React.js and Firebase Firestore, which contribute significantly to its efficiency and responsiveness.

A. Response Time

Response time refers to the duration between a user action and the system's corresponding output. In Expresso, operations such as user authentication, post creation, and content retrieval are optimized to ensure minimal delay.

The use of Firebase's cloud-based infrastructure reduces server-side processing time, while React.js efficiently handles UI rendering. As a result, most user actions, such as posting content or loading the feed, are executed within a few milliseconds to a few seconds, depending on network conditions. This ensures a smooth and uninterrupted user experience.

© 2026 IJIRCCE | Volume 14, Issue 6, June 2026 DOI: 10.15680/IJIRCCE.2026.1406007

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

B. Real-Time Updates

Real-time data synchronization is one of the core strengths of the system. By utilizing Firestore's real-time listeners, any changes made to the database—such as new posts, comments, or reactions— are instantly reflected across all active users.

This eliminates the need for manual page refreshes and enhances user engagement by providing live updates. The integration of realtime functionality ensures that users always have access to the latest content, making the platform highly interactive and dynamic.

C. Scalability

Scalability is a critical factor for any modern web application. Expresso is built using a serverless architecture, which allows it to scale automatically based on user demand.

Firebase services dynamically allocate resources such as database capacity and processing power, enabling the system to handle increasing numbers of users and data without significant performance degradation. However, as the user base grows, considerations such as database read/write limits and operational costs must be addressed to maintain efficiency.

Overall, the system demonstrates strong scalability potential, making it suitable for both small-scale deployments and large user communities.

VI. SECURITY ANALYSIS

Security and privacy are critical aspects of the proposed system, Expresso, especially due to its support for anonymous interactions and user-generated content. The platform incorporates multiple layers of security to protect user data, prevent misuse, and maintain a safe digital environment.

A. Authentication and Access Control

The system uses Firebase Authentication to manage secure user authentication. It supports both registered login and anonymous access, ensuring flexibility while maintaining controlled access to system resources. Authentication tokens are used to verify user identity and prevent unauthorized access.

Role-based access control is implemented to differentiate between regular users and administrators. While users can create and interact with content, administrative privileges are restricted to moderation and content management tasks.

B. Data Security and Privacy

User data, including posts and interactions, is securely stored in Firebase Firestore. Firestore security rules are configured to control read and write operations, ensuring that only authorized users can access or modify specific data.

The system emphasizes privacy by allowing users to post content anonymously. Sensitive user information is not exposed publicly, and anonymity is preserved throughout the interaction process.

C. Secure Communication

All data communication between the client and server is encrypted using HTTPS protocols. This ensures protection against data interception, man-in-the-middle attacks, and unauthorized data access during transmission.

D. Content Moderation and Abuse Prevention

To prevent misuse of anonymity, the system integrates content moderation mechanisms. Users can report inappropriate or harmful content, which is then reviewed through the admin panel. This helps in identifying and removing offensive posts.

VII. RESULTS AND DISCUSSION

The proposed system, Expresso, was successfully developed and tested to evaluate its functionality, performance, and user experience. The system integrates modern technologies such as React.js and Firebase Firestore to provide a responsive and real-time storytelling platform.

A. Practical Deployment Considerations

The deployment of Expresso is carried out using cloud-based services such as Firebase Hosting, ensuring high availability and secure access. The system is designed to be scalable using Firebase Firestore, which can handle increasing user data and interactions efficiently.

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Performance optimization is achieved through efficient frontend design using React.js and optimized database queries. Security is maintained using Firebase Authentication and database rules to protect user data and ensure controlled access.

Additionally, content moderation mechanisms and regular system maintenance are essential to ensure a safe, reliable, and efficient platform in real-world deployment.

B. Limitations

While Expresso presents a novel approach to youth-centric digital storytelling, it is not without challenges and limitations. One of the most significant issues is content moderation. Since the platform allows anonymous posting, there is always the risk of misuse through offensive, inappropriate, or harmful content. Ensuring a balance between freedom of expression and maintaining a safe environment requires efficient moderation strategies, which are currently limited to manual or community-driven reporting. This creates the need for more advanced solutions such as automated filtering or AI-based moderation in the future.

Another limitation lies in scalability and cost management. Expresso relies on Firebase's real-time database services, which work seamlessly for small to medium-scale applications. However, as the user base grows, the Firebase free-tier may face restrictions in terms of database reads, writes, and storage. This may lead to increased costs or performance challenges when handling large volumes of user interactions.

C. Ethical and Privacy Considerations

The proposed system, Expresso, prioritizes user privacy and ethical use of digital platforms. By allowing anonymous posting, the system enables users to express themselves freely without revealing personal identity. However, this feature also requires responsible handling to prevent misuse.

The system aims to balance freedom of expression with user safety, ensuring a secure, respectful, and privacy-focused environment for all users.

VIII. FUTURE ENHANCEMENT

To strengthen its impact and ensure long-term sustainability, Expresso can integrate several future enhancements. One of the most important planned improvements is the use of AI-powered content moderation. Machine learning models can help detect inappropriate language, harmful behavior, or sensitive content in real-time, reducing reliance on manual reporting and ensuring a safer environment for users. This would also improve scalability as the platform grows.

Another enhancement is the development of a recommendation system By analyzing tags, categories, and user engagement patterns, Expresso could suggest relevant stories or communities to users, making content discovery more personalized and engaging.

A mobile application is also a key future direction. While the web version is responsive, a native mobile app with offline support would improve accessibility, allowing users to share and read stories anytime, even without constant internet connectivity.

IX. CONCLUSION

Expresso highlights how React.js and Firebase can create scalable and socially valuable platforms. By enabling anonymous storytelling with real-time interaction, it fosters creativity and safe digital expression. Beyond its technical merits, Expresso demonstrates the importance of building digital spaces that prioritize empathy, inclusivity, and emotional safety, ultimately supporting youth in meaningful personal growth.

X. ACKNOWLEDGMENTS

The author expresses sincere gratitude to the faculty of the Department of Information Technology, NBN Sinhgad School of Engineering, Pune, for their guidance, encouragement, and institutional support throughout this research. The author also thanks the broader academic community whose published work provided the theoretical and empirical foundations upon which this study builds, and the anonymous reviewers whose constructive feedback improved the clarity and rigour of the manuscript.

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 9.927| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

REFERENCES

1. Keipi, T. (2018). Relatedness Online: An Analysis of Youth Narratives Concerning the Effects of Internet Anonymity. Sage Publications. — Essays from youth (mean age ~15.5) exploring how anonymity affects relationships, self-expression, trust, and risk. SAGE Journals
2. "The Social Value of Anonymity on Campus: A Study of the Decline of Yik Yak." (2019). Learning, Media and Technology, 44(2), 92–107. Bayne, S., Connelly, L., Grover, C., Osborne, N., Tobin, R., Beswick, E., Rouhani, L., Lilinaz. — Mixed method study on anonymous student communities (Yik Yak) and what is lost socially when anonymity declines. SearchWorks
3. Çimşir, E., Akdoğan, R., & Akbayrak, A. (2024). Turkish Adolescents' Anonymous Use of Social Networking Sites (SNSs): A Phenomenological Study. Psychology in the Schools. — Lived experiences of adolescents using SNSs anonymously; motivations, risks, and developmental aspects
4. G. Wang et al., "Whispers in the Dark: Analysis of an Anonymous Social Network," Proc. Internet Measurement Conf. (IMC), 2014researchgate.net (first large-scale study of the anonymous social network Whisper, DOI:10.1145/2663716.2663728).
5. W. Yang et al., "What Makes Digital Support Effective? How Therapeutic Skills Affect Clinical Well-Being," Proc. ACM Human–Computer Interaction, vol. 8, no. CSCW1, Article 190, 2024par.nsf.gov (analysis of counselor skill use in online peer support chats and effects on depression/anxiety, DOI:10.1145/3641029).
6. M. Kim, K. Saha, M. De Choudhury, and D. Choi, "Supporters First: Understanding Online Social Support on Mental Health from a Supporter Perspective," Proc. ACM Human–Computer Interaction, vol. 7, no. CSCW1, Article 92, 2023experts.illinois.edu (study of emotional/informational support in Reddit mental-health communities, DOI:10.1145/3579525).

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INNO SPACE SJIF Scientific Journal Impact Factor

doi crossref

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details