



BULK EMAIL BLOCKING AND UNBLOCKING SYSTEM

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Abstract - In today's digital era, educational institutions must efficiently manage student email access. Time-consuming and lacking in bulk processing, traditional email blocking methods cause administrative inefficiencies. This study proposes a Bulk Email Blocking and Unblocking System to automate email access control. Using a web-based platform with HTML, CSS, JavaScript, and a Visual Studio backend, administrators can upload Excel files to block or unblock student emails efficiently. The system has an upload function for multiple files, a dashboard organized by academic year, and a secure admin/user login. Upon upload, student email data is extracted for bulk blocking. Blocked students receive real-time mobile notifications via Firebase Cloud Messaging (FCM), detailing their status and reasons. This automation enhances real-time communication, reduces manual errors, and boosts administrative efficiency. Compared to manual methods, it ensures faster execution, accuracy, and scalability while being cost-effective. FCM eliminates SMS cost constraints, making the system more sustainable. Its seamless integration into institutional frameworks makes it a valuable tool for student email management.

Key Words: Real-time Alerts, Automated Email Control, Bulk Email Blocking, Firebase Cloud Messaging, Student Notification System, Web-Based Administration

1. INTRODUCTION

In Modern Technological era, email communication is essential for student-teacher interactions, academic updates, and administrative notifications. However, managing email access remains difficult, particularly for a large number of students. Manual email blocking is often inefficient, time-consuming, and prone to errors. This study presents a Bulk Email Blocking and Unblocking System that automates email access control for students, simplifying the process. As the student population grows, managing email access manually becomes increasingly difficult. Due to the lack of automation in existing systems, administrators have difficulty handling bulk requests for blocking and unblocking. Furthermore, the absence of a centralized system causes delays and inconsistencies in email management. Institutions also require a cost-effective way to notify students about changes to their email status, as traditional SMS alerts are expensive and

inefficient. The requirement for a simplified, scalable, and automated solution is made clear by these difficulties. A simplified email blocking system is crucial for universities and colleges. Email access restrictions may be necessary for disciplinary actions, academic policies, or security concerns. Likewise, students may need access reinstatement upon graduation or course completion.

An automated bulk processing system ensures institutional policies are enforced consistently while reducing administrative workload. By restricting email services to authorized users, the system also enhances compliance with cybersecurity policies.

Educational institutions often need to block emails for various reasons, such as disciplinary measures, course completion, or security concerns. However, manually handling thousands of requests is impractical. The proposed system simplifies this process by enabling bulk email blocking/unblocking through an automated web-based platform. This improves efficiency, accuracy, and policy enforcement, reducing errors in email access control.

1.1 Background of the Work

Email access management in educational institutions is typically handled through manual processes, requiring administrators to restrict access on an individual basis. This conventional approach leads to inefficiencies, delays, and a higher probability of errors. Additionally, the current systems lack real-time communication features, making it difficult for students to receive immediate email status notifications. The proposed Bulk Email Blocking and Unblocking System addresses these limitations by incorporating an automated, web-based solution that leverages HTML, CSS, JavaScript, and a backend running in Visual Studio. It enables administrators to perform bulk blocking and unblocking operations with a single action by uploading Excel files containing student email data. Additionally, the system integrates Firebase Cloud Messaging (FCM) to send real-time notifications, ensuring that students are immediately informed about changes to their email access status.

1.2 Motivation and Scope of the Proposed Work

The motivation for this study is the system improves institutional security by preventing unauthorized email access. Automated blocking mechanisms ensure that cybersecurity policies are enforced consistently across all users, helping institutions comply with data protection



regulations. Institutions can mitigate risks related to data breaches, phishing attempts, and cyber threats by using a structured email access control system.

1.3 Automation and Efficiency in Email Access Control

By automating the process of blocking and unblocking student email access, the system is intended to reduce administrators' manual workload. It ensures that email access control is handled quickly and accurately by integrating features for bulk processing. This automation helps institutions streamline administrative processes, allowing staff to focus on more critical academic and student-related activities. Scalability becomes an essential consideration when selecting an IT solution for educational institutions as they continue to expand.

1.4 Proposed Work

The proposed system is designed with scalability in mind, allowing institutions to handle increasing numbers of students and email access requests without performance degradation. Whether an institution manages hundreds or thousands of students, the system can efficiently process bulk operations, ensuring that email blocking and unblocking actions are completed swiftly. The system architecture supports cloud-based deployment, enabling institutions to scale their infrastructure as needed. Flexible storage and processing power are made possible by cloud integration, ensuring that the system is responsive even during peak usage times. This approach eliminates concerns related to hardware limitations and allows institutions to expand their operations without requiring extensive IT investments.

Additionally, the system is designed with adaptability in mind. While student email access is the focus of the current implementation, faculty and staff email accounts can be managed using the same framework, making it easier to use across the entire institution. Future enhancements could include role-based access control, where different levels of permissions are assigned to various user groups, further improving security and operational efficiency.

To accommodate technological advancements, the system is designed to support updates and feature expansions. As cybersecurity threats evolve, the system can incorporate artificial intelligence-driven monitoring and automated threat detection mechanisms. These enhancements would allow institutions to proactively detect suspicious email activity and enforce security measures before breaches occur.

2. METHODOLOGY

The ability of an email access management system to control email access, process bulk requests, and improve security through automation is critical to its effectiveness. According to the literature review, traditional email access control methods are ineffective, do not provide real-time notifications, and frequently necessitate extensive manual intervention. The proposed work aims to address these challenges by developing an automated Bulk Email

Blocking and Unblocking System with advanced features, including AI-driven predictive analytics and cloud-based notifications. The proposed system's objectives are explained in detail in this chapter, along with the methodological approach, the system's flow diagram, and the tools, techniques, and testing methods used in its creation.

2.1 Implementing real time Notification

The system will incorporate Firebase Cloud Messaging (FCM) to instantly notify users of changes to email access, enhancing communication and user experience. This will ensure that students are promptly informed whenever their email accounts are blocked or unblocked, reducing confusion and disruptions (Johnson et al., 2020). In order to ensure that students receive timely updates and avoid unnecessary disruptions to their academic activities, real-time notifications are critical. Email alerts, push notifications, and, where applicable, SMS integration will all be supported by the notification system. Depending on the method of communication they prefer, users will be able to customize their notification preferences. This feature will particularly benefit institutions with diverse student populations by accommodating different accessibility needs. Additionally, students will be able to confirm receipt of notifications through the system's acknowledgment mechanisms, ensuring efficient communication and minimizing disagreements regarding email access restrictions.

2.2 Cloud based Notification

To In the proposed Bulk Email Blocking and Unblocking System, real-time notifications play a crucial role in ensuring seamless communication between administrators and students. The system leverages Firebase Cloud Messaging (FCM) to provide instant alerts whenever an email access change occurs. As a result, confusion and unnecessary delays are reduced and students are promptly informed of their email status. The integration of FCM with the backend is a key feature that enables automated notification triggers. When an administrator initiates an email blocking or unblocking action, the backend system communicates with Firebase servers to push notifications to the affected users. Students are guaranteed to receive timely updates regardless of the device they are using because these notifications can be sent across a variety of platforms, including desktop computers, mobile applications, and web browsers. In addition, the notification system is built to support individualized alert settings, allowing administrators to set up various types of messages based on the severity of the action taken. For instance, a warning message might come from a temporary email restriction, while a permanent block might send a more in-depth message with instructions on how to fix the problem. Moreover, the system incorporates acknowledgment mechanisms, where students can confirm receipt of notifications. This feature is particularly useful for tracking communication effectiveness and ensuring that critical messages are not missed. If a student does not acknowledge a notification within a predefined timeframe, the system can escalate the alert by sending additional



reminders through alternate channels, such as email or SMS.

2.3 User Interface

The frontend of the Bulk Email Blocking and Unblocking System is a crucial component that makes sure administrators and students have an easy-to-use experience. HTML, CSS, and JavaScript, which provide the structural foundation, styling, and interactivity, respectively, are used to design the system's user interface (UI). With the help of these technologies, a user-friendly and responsive interface that makes navigation and interaction easier for users can be developed. The system makes use of React.js, a well-known JavaScript framework for creating interactive web applications, to create a frontend that is contemporary, dynamic, and scalable. The component-based architecture of React.js makes it easier to maintain and expand the system by allowing for the modular development of UI elements. By using React.js, the application benefits from features such as virtual DOM for efficient rendering, reusable UI components for consistency, and state management tools to handle user inputs and data updates smoothly.

and unblock multiple students instantly reduces manual workload and ensures seamless communication with affected users. Testing has demonstrated that this system processes bulk operations five times faster than traditional methods, making it ideal for large institutions. Additionally, its scalable architecture ensures easy adaptation for future enhancements. With real-time alerts and a user-friendly dashboard, administrators can manage student email access effectively. The flexibility of unblocking features and confirmation safeguards prevent accidental actions. The system significantly reduces errors, increases transparency, and optimizes institutional policy enforcement. Overall, it presents a cost-effective and scalable approach to handling student email access control.



Fig -1- Flowchart

3. CONCLUSIONS

The Bulk Email Blocking and Unblocking System provides an efficient, automated solution for managing student email access in educational institutions. The system improves accuracy, security, and administrative efficiency by combining real-time notifications, bulk file processing, and role-based authentication with FCM. The ability to block

Suggestions for Future Work

1. Advanced Role-Based Access Control (RBAC) – Introduce Super Admin and Sub-Admin roles for better delegation and security.
2. Student Appeal Mechanism: Set up a self-service portal where students can justify their requests for unblocking.
3. Integration with Student Databases – Automate real-time student record retrieval to reduce manual file uploads.
4. Automated Scheduled Blocking – Enable rule-based blocking/unblocking based on criteria like semester completion or fee status.

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