HoosHub: Enhancing Student Organization Through a Centralized CIO Web Application

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Abstract

The process of discovering and joining student organizations at the University of Virginia is currently fragmented across multiple platforms, making it confusing and inefficient for both students and club leaders. To address this issue, our team developed HoosHub, a centralized mobile application designed to streamline club discovery, communication, and management for UVA's Contracted Independent Organizations (CIOs). HoosHub allows students to browse and join clubs, RSVP to events, and engage with organizations through a single unified interface, while providing CIO leaders with tools to create and manage club pages, post announcements, organize events, and handle membership requests. We conducted structured beta testing with both normal users and CIO leaders to evaluate the usability, clarity, and effectiveness of core features. Findings from these sessions informed targeted improvements focused on validation feedback, CIO profile completeness, feature discoverability, and interface clarity. Overall, HoosHub demonstrates the potential to significantly improve student engagement and reduce friction in the club-joining experience by replacing scattered systems with a cohesive, user-centered platform.

1 Introduction

According to Astin's Student Involvement Theory, student learning and personal development are directly proportional to the quality and quantity of their participation in educational and extracurricular organizations [1]. In practice, student organizations play a vital role in fostering community, leadership development, and personal growth on university campuses. Through participation in clubs and student-led organizations, students are able to explore interests outside the classroom, form meaningful social connections, and develop professional and interpersonal skills. At the University of Virginia, Contracted Independent Organizations (CIOs) represent a wide range of academic, cultural, recreational, and service-oriented groups that significantly shape student life. Despite the importance of these organizations, the process of discovering, joining, and staying engaged with them remains unnecessarily fragmented and difficult for many students.

Currently, information about clubs and student organizations at A is scattered across multiple platforms. Students are often introduced to clubs through QR codes and flyers at the annual Activities Fair, but once the event ends, following up becomes challenging. Additional information is distributed through emails, GroupMe chats, Instagram pages, and outdated websites, with no single authoritative source of truth. This fragmented ecosystem makes it especially difficult for first-year students, transfer students, and students who decide to explore new interests later in the semester to find organizations that align with their goals. As a result, many students report missing clubs they were interested in or feeling overwhelmed by the process of figuring out where to go and who to contact. At the same time, club leaders face their own challenges, struggling to communicate tryout dates, meeting times, and announcements efficiently across multiple platforms.

To address these challenges, our team developed HoosHub, a centralized mobile application designed to unify the club discovery and management experience for UVA's CIO ecosystem. HoosHub provides students with a single, consistent platform where they can browse and search for clubs, view standardized organization profiles, follow or join CIOs, RSVP to events, and receive timely announcements. By replacing scattered communication channels with a unified interface, HoosHub simplifies the student experience and reduces the cognitive overhead associated with staying involved in campus organizations.

In addition to supporting students, HoosHub was designed with CIO leaders in mind. The platform offers administrative tools that allow leaders to create and customize club pages, manage membership and interest requests, post announcements, and create and manage events. These features reduce reliance on external tools such as GroupMe, email lists, and social media for core organizational tasks. HoosHub also introduces structured workflows—such as "Join" versus "I'm Interested"—to better support clubs with selective processes, helping leaders manage recruitment more transparently and efficiently.

HoosHub was developed using a user-centered and iterative design approach, with a strong emphasis on usability, clarity, and accessibility. Structured beta testing sessions were conducted with both normal users and CIO leaders to observe real interactions, identify points of confusion, and gather qualitative feedback. Insights from these sessions directly informed improvements to validation messaging, information visibility, feature discoverability, and overall interface clarity. This report presents the motivation behind HoosHub, describes the design and testing process, and discusses how user feedback guided refinements to better address the challenges of club engagement at UVA.

2 Related Work

2.1 University Club Management Platforms

Many universities employ centralized platforms to manage student organizations, primarily focusing on administrative registration and compliance rather than active engagement. At the University of Virginia, Presence serves as the official platform for Contracted Independent Organizations (CIOs), allowing clubs to register annually, list officers, upload governing documents, and post limited event information. While Presence provides a centralized and institutionally supported record of student organizations, its functionality is largely static and does not support ongoing interaction between students and clubs. [2] Club pages often lack up-to-date information, and the platform offers minimal tools for communication, personalization, or event engagement.

Similar systems are used at peer institutions, where student organization platforms are designed primarily for oversight, funding eligibility, and record-keeping rather than discovery or usability. These systems frequently present dense interfaces, limited search functionality, and little support for student-driven exploration. As a result, students often interact with these platforms only during mandatory processes, such as joining a club at the start of the year or when completing administrative requirements. This design focus contributes to low adoption rates for continuous use and leaves gaps in how students discover organizations after initial recruitment events.

The limitations of these platforms disproportionately affect first-year students, transfer students, and students who seek new communities later in the academic year. Without intuitive discovery tools, standardized club profiles, or centralized announcements, students must rely on informal networks or prior knowledge to find organizations. HoosHub was developed in response to these shortcomings by emphasizing continuous engagement, intuitive navigation, and up-to-date club information rather than serving solely as an administrative registry.

2.2 External Communication and Event Platforms

Due to the limitations of university-supported systems, student organizations frequently adopt third-party platforms such as GroupMe, Discord, Instagram, Facebook Groups, and Eventbrite to manage communication and events. These tools offer familiar interfaces and real-time interaction, making them appealing for quick announcements and informal engagement. However, each platform serves a narrow purpose and requires students to opt into multiple channels to stay informed, resulting in a fragmented experience.

While messaging platforms like GroupMe and Discord enable fast communication, they are not optimized for structured information such as event details, membership status, or long-term announcements. Social media platforms prioritize visibility and engagement metrics rather than accuracy or completeness, often burying important information in feeds. Event-focused tools like Eventbrite handle RSVPs effectively but exist entirely separate from club discovery and membership management. As a result, students must piece together information from several disconnected sources, increasing the likelihood of missed events or confusion about club processes.

This fragmentation also creates significant overhead for club leaders, who must duplicate announcements, manage attendance manually, and respond to repeated questions across platforms. Additionally, these external tools lack integration with university authentication systems and official organization records, limiting their ability to support role-based access or institutional oversight. HoosHub seeks to reduce this fragmentation by consolidating discovery, communication, and event management into a single, university-specific platform that aligns with existing student workflows while preserving the usability of modern applications.

3 Our Solution: HoosHub

To address the fragmentation and inefficiencies in the student organization ecosystem at the University of Virginia, we developed HoosHub, a centralized mobile application designed to unify club discovery, communication, and management for both students and Contracted Independent Organization (CIO) leaders. HoosHub replaces the current patchwork of QR codes, messaging platforms, social media pages, and static websites with a single, consistent interface that supports the full lifecycle of student engagement—from discovering a club to maintaining long-term participation.

HoosHub's system architecture relies on a React Native frontend coupled with a NodeJS backend, following a client-server model that separates application logic from presentation logic. This separation enables both frontend and backend development to function independently, speeding up development. Data storage is handled entirely through cloud-based services, using Google Firebase's scalable NoSQL database service to store essential entities such as users, CIOs, events, and announcements, and Amazon Web Service's Simple Storage Service (S3) to manage large media assets such as profile pictures and CIO announcement attachments. These services were chosen to prioritize development speed and scalability, enabling rapid iteration and reducing infrastructure overhead.

At its core, HoosHub provides students with an intuitive discovery experience. Students can browse and search for CIOs by name, category, or interest, allowing them to explore organizations beyond those encountered during the Activities Fair. Each CIO is represented by a standardized profile page that includes a description, interests, announcements, and upcoming events. This structure ensures that essential information is presented consistently across organizations, reducing confusion and lowering the barrier to entry for students unfamiliar with campus clubs. By consolidating information into one platform, HoosHub enables students to revisit and discover organizations at any point in the semester rather than relying on time-limited recruitment events.

HoosHub also streamlines how students express interest and engage with organizations. Rather than forcing all clubs into a single "join" model, the platform supports both open-membership and selective organizations. Clubs with tryouts or interview processes can use an "I'm Interested" workflow, allowing students to signal interest without prematurely joining. This distinction clarifies expectations for both parties and reduces uncertainty about next steps.

Students receive confirmation feedback for actions such as joining a club, asking a question, or RSVPing to an event, addressing common usability issues identified during testing.

For CIO leaders, HoosHub provides a suite of administrative tools designed to reduce organizational overhead. Leaders can create and customize their CIO pages, manage interest and membership requests, post announcements, and create events directly within the app. Event creation includes structured fields for location, time, visibility, and descriptions, allowing information to remain accurate and centralized. Leaders can review RSVPs, track attendance, and manage members without relying on external spreadsheets or messaging platforms. By integrating these workflows, HoosHub minimizes the need for duplicate communication across email, GroupMe, and social media.

A key design goal of HoosHub is clarity and feedback. Throughout the platform, actions are paired with validation messages and confirmations to ensure users understand the outcome of their interactions. Beta testing revealed that users often felt uncertain when completing tasks such as joining a club or submitting a question, so the system was refined to include clearer messaging and visual confirmation. This focus on feedback reduces user error and increases confidence in the platform, particularly for first-time users.

HoosHub was developed using an iterative, user-centered design process informed by direct observation and interviews with both students and CIO leaders. Structured beta testing sessions were conducted to evaluate onboarding, navigation, and core workflows. Feedback from these sessions guided improvements to feature discoverability, terminology clarity, and profile completeness. For example, refinements were made to clarify the purpose of the "My Questions" feature and to improve the visibility of key CIO information such as meeting times and dues.

Overall, HoosHub addresses the core problems of fragmentation, inefficiency, and missed opportunities in UVA's club ecosystem by providing a unified, purpose-built platform. By supporting both students and CIO leaders within a single system, HoosHub reduces friction, improves communication, and promotes sustained engagement across campus organizations. The result is a more accessible, transparent, and user-friendly approach to student involvement that better reflects the needs of a modern university community.

4 Methods/Evaluation

We evaluated whether our solution worked by creating a Test Plan Overview, which contains five main parts. The first part was defining our testing goals and user groups. We began by deciding on our two crucial user groups, who are regular students who are a part of CIOs and want to find events, and CIO owners. For each user group, we assigned specific key tasks. The key tasks that were delegated to the regular students included making sure they can log in properly, evaluating the functionality and UI of the dashboard, the club exploration tab, and the profile customization page, as well as the event interaction flow from RSVPing to an event and viewing it on their dashboard. The key tasks that were delegated to the CIO leaders included making sure they are able to log in properly, creating a new CIO, customizing the CIO page, creating and managing announcements, creating new events, reviewing, managing, and accepting new members, handling RSVPs and attendance, and stress testing CIO permissions. By splitting the users into two groups, we were able to capture a full range of user experiences rather than only one perspective of the user experience.

The second section focused on creating scripts for each user group. Separate scripts were created for regular students and CIO leaders, outlining step-by-step interactions for each of the key tasks listed above.

The third section involved conducting these interviews using the scripts to record any issues. Testing was conducted with 7 participants from both user groups to ensure balanced representation across roles. Each participant was observed while using the app, encouraged to think aloud, and asked to complete core workflows while we recorded actions, confusion points, and verbal feedback for later analysis. Success was measured by task completion rates, error frequency, and the amount of assistance required by participants during each key task.

The fourth section centered on collecting more generalized feedback about the application. After testing, participants completed a short questionnaire, allowing us to compile both measurable responses and detailed user insights about the clarity, usefulness, and intuitiveness of the app.

We then finalized the findings and identified actionable improvements. We reviewed all notes, behaviors, and recurring themes across beta testers to determine which UI issues, feature gaps, and clarity problems needed to be addressed in the next development cycle.

5 Results

Participants	Feedback
Normal User 1	Add validation & confirmation toasts Enrich CIO pages (photos, meeting times), Clarify "My Questions"
Normal User 2	Add show/hide password toggle, Skill icons, CIO officer lists, Stronger success animations
Normal User 3	Add louder confirmations, Define CIO for first-years, Structured CIO info (dues/officers), URL validation
Normal User 4	Fix the scrollbar, Add RSVP cancel/edit visibility, Email confirmations, Validate profile links
Normal User 5	Highlight cancel RSVP option, Add CIO dues info
CIO Leader 1	CIO leader tools hidden, Limited announcement formatting, Weak member/RSVP tools
CIO Leader 2	Hard to find Create CIO/Event CIO leader menu unclear, Basic announcements

Table 1: Summary of Beta Testing Feedback

For our beta testing, we recruited a total of seven participants to evaluate our application. Five participants followed the normal user script, while the remaining two tested the application using the CIO leader script.

Beta testing revealed several consistent positive usability patterns across both standard users and CIO leaders. However, our beta testers frequently expressed uncertainty when features lacked clear confirmation or feedback on submission, such as on joining clubs, RSVPing to events, submitting questions to CIOs, or submitting a password when logging in (as mentioned by Users 1, 3, and 4 in **Table 1**). The lack of confirmation feedback was particularly impactful, as it caused multiple testers to repeat or pause certain actions, questioning whether their input had been recorded. Users also struggled with unclear or incomplete CIO information; many expected to see meeting times, officer contact details, dues, and photos directly on each club's page. Additionally, potentially due to these issues, several beta testers unknowingly scrolled past key content on the dashboard and CIO pages. The lack of key information on CIO profiles was pertinent at the time, but after conversing amongst ourselves, we determined that this issue and the scrolling issue were both due to flaws in the testing environment setup (but were still addressed regardless).

Some remarked on the lack of certain quality of life features, like a show/hide password toggle on the login page, autocomplete for searches, and richer formatting tools for announcements, This revealed that we need to, in the future, improve visual emphasis on submission and confirmation, fix unclear GUI elements to make them more intuitive, and re-examine our features to figure out if we need to either clarify what they are, what they are used for, or refine them as needed.

6 Limitations

The project's timeframe constrained development to producing a minimally viable product. As such, multiple planned features were scrapped or are missing key features, such as the barebones group chat feature, the lack of a notification system, and the lack of a designated CIO action and management page for executives.

Many key issues with beta testing were primarily due to low prototype fidelity and the absence of full backend integration. At the time of beta testing, assets in features such as CIO profile pictures and announcements were represented by either placeholders or nothing at all, rather than content served from an implemented Amazon Web Services S3 bucket. This limitation reduced the visual fidelity of CIO homepages, and as a result, some confusion around features may reflect prototype limitations rather than flaws in the final intended system's behavior. Additionally, since we rely on third-party services like Amazon Web Services and Google Firestore, it can introduce availability or cost limitations in the future.

Additionally, beta testing was completed under a time-constrained environment, which does not accurately reflect organic usage patterns. Participants were asked to complete tasks from a set of instructions rather than explore the website themselves, which limits our ability to observe potential long-term engagement with the platform. Because of this, we cannot evaluate whether HoosHub meaningfully improves CIO visibility, student participation, or event attendance relative to existing platforms.

While HoosHub was initially designed with a mobile-first approach, the current implementation exists solely as a web application. Although the interface moderately adapts to smaller screen sizes, it lacks access to native mobile features like push notifications and background processes, limiting the platform's ability to support real-time engagement.

This project lacks major security features beyond the basic protections provided by the backend's framework. Although users are required to register using a valid email ending with @virginia.edu, the platform does not perform any form of verification. There are no safeguards like multi-factor authentication, rate limiting, or formal input validation, which leaves the platform vulnerable to misuse and unauthorized access.

7 Conclusion/Future Work

In the future, we would like to implement many of the planned features that we did not have time for, such as the notification system, a designated CIO management page, an email verification system, and other UI fixes mentioned by the beta testers. Also, we would like to port HoosHub to a native mobile application, which allows us to implement push notifications, improving the usefulness of the platform by notifying users about upcoming events. Finally, we would like to do live testing where CIOs and CIO members use this application and give us feedback on what works and what does not.

This work sought to fill a specific communication niche at the University of Virginia by providing a centralized, accessible platform for CIOs to share events and information with the greater student body. By simplifying event discovery and improving visibility, we aim to boost student engagement and foster a more connected community on Grounds.

Acknowledgments

To Professor Sheriff and Jack Heavey, for supporting and guiding us throughout the project.
To beta testers for giving feedback about our application.

References

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