Vision Document

**Software Design & Architecture**

Course Instructor  
**Sir Khubaib Amjad**

Submitted By  
**Abdul Raffay(22i-2546)  
Waqas Shahid(22i-2469)  
Kaif Anwar(22i-2668)**

Section  
**E**

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**Department of Computer Science**

FAST – National University of Computer & Emerging Sciences

Chiniot-Faisalabad Campus

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# 1 Document Version

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| --- | --- | --- | --- |
| **Version** | **Date** | **Description** | **Authors** |
| V1.0 | 2/21/2024 | Initial Vision Document | Waqas, Abdul Raffay & Kaif Anwar |
| V2.0 | 2/22/2024 | Refined Vision Document | Waqas |

# 2. Introduction

## Purpose

This document outlines the high-level needs, features, and objectives of Campus Connect (CC), a social networking platform exclusively designed for the students of FAST NUCES Islamabad. It aims to foster a vibrant, interactive, and supportive campus community by integrating academic, social, and logistical aspects of university life.

## Scope

Campus Connect (CC) will be developed to serve as a centralized digital hub for FAST NUCES Islamabad students, facilitating interaction, collaboration, and engagement within the university community. It will include features such as campus news, study groups, marketplace, event management, and more, tailored to enhance the campus experience.

## Definitions, Acronyms, and abbreviations

Campus Connect (CC): The proposed social networking platform for FAST NUCES Islamabad.

## References

TBD

# 3. Positioning

## Business Opportunity

Campus Connect (CC) addresses the need for a centralized digital community and information hub at FAST NUCES Islamabad. By offering a suite of tailored features, it presents an opportunity to improve student engagement, academic collaboration, and access to campus resources, ultimately enriching the university experience.

## Problem Statement

|  |  |
| --- | --- |
| The problem of | isolated student communities and information silos |
| Affects | students, faculty, and staff at FAST NUCES Islamabad |
| The impact of which is | a lack of cohesion, missed opportunities for collaboration, and underutilization of campus resources |
| A successful solution would be | an intuitive, secure, and comprehensive platform that connects the university community, promotes academic and social interaction, and streamlines access to campus services |

## Product Position Statement

|  |  |
| --- | --- |
| For | students of FAST NUCES Islamabad |
| Who | require a unified platform to connect, collaborate, and access campus resources efficiently |
| Campus Connect (CC) | It is a social networking platform |
| That | integrates academic collaboration, social interaction, and campus services |
| Unlike | general social media platforms or fragmented university services |
| Our Product | is tailored specifically for the FAST NUCES community, offering features designed to enhance the university experience for students, faculty, and staff |

# 4. Business Case & Target Audience

## Business Case

Campus Connect (CC) addresses the crucial need for a cohesive, interactive, and engaging community platform within FAST NUCES Islamabad. Despite the presence of various communication channels and platforms, there remains a gap in a centralized system that connects all aspects of campus life, including academic collaboration, social engagement, campus services, and information dissemination. This gap leads to fragmented student experiences, underutilized resources, and missed opportunities for collaboration.

**Investing in Campus Connect (CC) offers several key benefits:**

* **Enhanced Student Engagement**: By providing a single platform for all campus interactions, students are more likely to engage with campus life, leading to increased satisfaction and a stronger sense of community.
* **Improved Academic Collaboration**: Facilitating study groups, project collaboration, and academic discussions can enhance learning outcomes and academic performance.
* **Streamlined Campus Services**: Integrating access to campus services through a single platform can improve utilization and efficiency, from booking facilities to accessing library resources.
* **Increased Safety and Well-being**: A dedicated section for mental health, safety features, and emergency contacts ensures students have quick access to important resources.

**Primary Target Audience:**

**Students of FAST NUCES Islamabad:** All enrolled students, including undergraduates, postgraduates, and doctoral candidates, are the primary users. They will benefit from comprehensive features tailored to their academic, social, and personal needs on campus.

**Secondary Target Audience:**

**Faculty and Staff:** While the platform is student-centric, faculty and staff can use it to disseminate information, engage with students, and manage academic activities.

**Campus Service Providers:** Entities providing campus services such as the library, cafeteria, and transportation will benefit from direct communication channels and service feedback mechanisms.

**Alumni:** Graduates can stay connected with the university, participate in mentorship programs, and contribute to the alumni network.

Tertiary Audience:

**Prospective Students and Parents:** Providing a glimpse into campus life, academic opportunities, and the vibrant community at FAST NUCES Islamabad.

# 5 Problem Statement

The problem of: isolated student communities and fragmented information channels

Affects: students, faculty, and staff at FAST NUCES Islamabad

The impact of which is: a lack of cohesion, missed opportunities for collaboration, and underutilization of campus resources

A successful solution would be: Campus Connect (CC) is a comprehensive, user-friendly, and unified platform designed with the FAST NUCES community in mind. By combining social interaction, academic collaboration, and campus services, it creates a lively campus community and improves the overall university experience for all stakeholders involved.

# 6 Summary of Features

1. Campus News: Regular updates and announcements related to campus events, activities, and important information.

2. Study Groups: Functionality for students to create or join study groups for collaborative learning and academic discussions.

3. Marketplace: A platform for buying, selling, or exchanging goods and services within the university community.

4. Event Management: Tools for organizing and managing events, including scheduling, RSVPs, and event promotion.

5. Academic Collaboration Tools: Features to facilitate academic collaboration, such as document sharing, discussion forums, and project management.

6. Social Interaction Features: Elements designed to encourage social interaction among students, such as messaging, forums, and interest-based groups.

7. Campus Services Integration: Integration with campus services such as library resources, cafeteria menus, and transportation schedules for easy access and utilization.

8. Safety and Well-being Section: Dedicated section providing resources for mental health support, emergency contacts, and safety features.

9. Mentorship Programs: Platform functionality for alumni to engage in mentorship activities with current students.

10. User Profiles: Customizable user profiles allowing students, faculty, and staff to showcase their interests, academic achievements, and professional affiliations.

11. Feedback Mechanisms: Tools for users to provide feedback on campus services, events, and platform features.

12. Prospective Student Portal: A section designed to provide information to prospective students and parents about academic programs, campus facilities, and student life.

13. Resource Booking System: Facility for booking campus resources such as study rooms, labs, and sports facilities.

14. Community Polls and Surveys: Tools for conducting polls and surveys to gather feedback and opinions from the university community.

15. Virtual Campus Tour: A feature allowing prospective students to take a virtual tour of the campus facilities and infrastructure.

1. Augmented Reality (AR) Filters and Spaces: Integrate AR for more engaging posts and interactions. Users could create or join AR spaces for virtual meetups.
2. Voice-Controlled Navigation and Interaction: Allow users to navigate the app and interact with content through voice commands, enhancing accessibility.
3. Project Collaboration Spaces: Offer dedicated spaces for users to collaborate on projects, share files, and manage tasks, focusing on community-driven initiatives.
4. Local Community Engagement: Encourage engagement within local communities through features that promote local events, businesses, and news, facilitating real-world connections.
5. Smart Event Suggestions: Utilize AI to suggest events to users based on their interests, past attendance, and the popularity of the event among their network.
6. Integrated Event Planning Tools: Provide tools for event hosts to plan, manage invitations, and interact with attendees directly within the app.
7. Fully Customizable UI: Allow users to personalize the look and feel of their profiles and feeds, far beyond the basic theming options currently available on most platforms.
8. Community-Driven Moderation: Implement a transparent and community-driven approach to content moderation, where users can participate in the moderation process through a structured and fair system.
9. Blockchain for Data Ownership: Use blockchain technology to give users ownership and control over their data, ensuring transparency and security.
10. E-Learning Spaces: Integrate e-learning modules or courses, allowing users to learn new skills or hobbies from within the social platform.
11. Campus Feed: A real-time feed where students can post updates, share news, and engage with content specific to their campus life. This feature could include filters for academic departments, clubs, or interest groups.
12. Study Groups and Project Collaboration: Enable students to create and join study groups or project teams. Within these groups, members can share resources, schedule study sessions, and collaborate on documents or projects directly within the platform.
13. Marketplace: A campus-specific marketplace where students can buy, sell, or exchange textbooks, electronics, and other study materials. This can also include a space for services like tutoring, note-sharing, or carpooling.
14. Event Planning and Organization: A feature for organizing, promoting, and managing campus events. This could include integration with the academic calendar, RSVP functionality, and custom notifications for upcoming events relevant to the user's interests.
15. Campus Services: Direct access to campus services such as the library catalog, dining hall menus, shuttle schedules, and emergency contacts. This feature could also include real-time updates or changes to these services.
16. Alumni Network: Connect current students with alumni for mentorship, networking, and career opportunities. This could facilitate mentor-mentee relationships and offer insights into various career paths.
17. Feedback Forum: A moderated space where students can anonymously share their thoughts, confessions, or constructive feedback about campus life, fostering an open and supportive community atmosphere.
18. Customizable Profiles: Allow students to customize their profiles with academic interests, extracurricular activities, and personal achievements. This can help in networking and finding students with similar interests or course studies.
19. Integration with Academic Systems: Seamless integration with the university's academic systems for easy access to course schedules, grades, and registration services directly from the platform.
20. Mental Health and Wellness Resources: A dedicated section for mental health and wellness, offering resources, support contacts, and information about on-campus mental health services.
21. Class Schedule Integration and Study Reminders: Allow students to integrate their class schedules into the platform and set up study reminders or deadlines for assignments. This feature could also suggest optimal study times and quiet locations on campus.
22. Campus Navigation and Room Finder: Implement an interactive map feature that helps students and visitors navigate the campus. Include functionality for finding specific classrooms, facilities, or event locations, possibly augmented by AR (Augmented Reality) for a more immersive experience.
23. Skill-Sharing and Workshop Platform: Create a space where students can offer or sign up for workshops and skill-sharing sessions. This could range from academic skills, like coding or writing, to hobbies and life skills, such as photography or cooking.
24. Sustainability Initiatives: Promote campus sustainability efforts by featuring initiatives, events, and competitions focused on environmental awareness. Include a platform for sharing ideas on sustainability projects or improvements.
25. Campus News and Achievements: A dedicated section for highlighting campus news, student and faculty achievements, and research breakthroughs. This can help keep the community informed and celebrate successes together.
26. Mental Health Check-In Feature: Develop a check-in system where students can regularly assess their mental health and receive personalized resources or suggestions for support services based on their input.
27. Virtual Campus Tours: For prospective students or those unable to visit in person, offer virtual tours of the campus using 360-degree videos or VR (Virtual Reality) technology. This could also be a valuable resource for new students orienting themselves with the campus.
28. Carpooling and Ride-Share Board: Facilitate a safer and more environmentally friendly way for students to travel to and from campus by sharing rides. This feature could include scheduling options, preferences for drivers or passengers, and a feedback system for safety.
29. Gamification and Rewards: Integrate gamification elements to encourage participation and engagement on the platform. Students can earn points or badges for contributing to forums, participating in events, or achieving academic milestones, which can be redeemed for campus perks or discounts.
30. Personalized Academic and Career Advising: Use AI to offer personalized academic and career advice based on the student's interests, performance, and goals. This could include course recommendations, internship opportunities, and career planning resources.
31. Language Exchange and Cultural Exchange Forums: Encourage cultural exchange and language learning by connecting students interested in practicing languages or learning about different cultures. This feature could support language partners, cultural exchange events, and international student integration.
32. Health and Fitness Tracker: Incorporate a feature that allows students to track their physical activities, join fitness challenges, and find workout buddies. This could be linked to campus sports facilities and events to promote a healthier lifestyle.
33. Peer Tutoring and Academic Support Network: Develop a platform section dedicated to peer tutoring, where students can offer or seek academic assistance in various subjects. This could include a rating system to ensure quality and reliability of support.
34. Personal Safety and Campus Security Features: Integrate safety features such as an SOS button, safe walk services, and real-time campus security alerts. This could also include a feature for students to report suspicious activity or safety concerns anonymously.
35. Interactive Event and Lecture Live-Streaming: Allow for the live streaming of campus events, guest lectures, and seminars. Include interactive elements such as Q&A sessions, polls, and live chats to engage remote participants.
36. Digital Student ID and Wallet: Implement a digital student ID that can be used for access to campus facilities, events, and transactions. This could be integrated with a digital wallet for cashless payments at campus cafeterias, bookstores, and vending machines.
37. Student-Led Content and Publication Platform: Provide a space for students to publish articles, blogs, and other forms of content related to campus life, academic interests, or personal development. This could include peer-reviewed student research journals or creative writing platforms.
38. Dynamic FAQ and AI Chatbot for Campus Information: Use AI to offer a dynamic FAQ system and chatbot that can answer student inquiries about campus services, policies, and events, reducing the workload on administrative staff and improving information accessibility.
39. Mentorship Program Matching: Create an automated system to match students with faculty or professional mentors based on academic interests, career goals, and personal preferences, facilitating meaningful mentorship relationships.
40. Custom Group and Societies and Club Management Tools: Offer robust tools for managing campus groups and clubs, including membership management, event scheduling, budget tracking, and communication tools, simplifying club administration and enhancing student involvement.
41. Crowdsourced Campus Improvement Suggestions: Implement a feature where students can submit suggestions for campus improvements, which can then be voted on by the community. High-ranking suggestions could be reviewed by university administration for implementation.
42. Augmented Reality (AR) for Learning and Exploration: Leverage AR technology for educational purposes, such as virtual lab simulations, historical tours of the campus, or augmented reality art exhibitions, enhancing experiential learning opportunities.
43. Time Management and Productivity Tools: Integrate time management and productivity tools specifically designed for students, including a customizable planner, deadline trackers, and study timer techniques like Pomodoro timers.
44. Wellness and Recreation Activity Finder: Help students find and participate in wellness and recreational activities on campus, from yoga classes to intramural sports, encouraging a balanced and healthy lifestyle.
45. Community Service and Volunteering Portal: Connect students with community service and volunteering opportunities within and around the campus, aligning with their interests or academic goals, and track their contributions and impact.
46. Virtual Exchange Programs: Facilitate virtual exchange programs with other universities globally, allowing students to attend online courses, seminars, or workshops offered by partnering institutions and interact with international peers.
47. Portfolio and Project Showcase: Enable students to create and showcase their academic and extracurricular portfolios, including research projects, art pieces, coding projects, and more, fostering a culture of sharing and collaboration.

Top of Form

# 7 Stakeholders

Students: The primary users of Campus Connect, as they will actively engage with the platform for various academic, social, and personal purposes.

Faculty and Staff: Although secondary users, they play a crucial role in disseminating information, managing academic activities, and engaging with students.

Campus Service Providers: Entities such as the library, cafeteria, and transportation services, who will directly interact with the platform to communicate with students and gather feedback.

Alumni: Graduates of FAST NUCES Islamabad who can use the platform to stay connected with the university community, participate in mentorship programs, and contribute to the alumni network.

Prospective Students and Parents: Tertiary users who may explore the platform to gain insights into campus life, academic opportunities, and the overall environment at FAST NUCES Islamabad.

Got it! Here's the list of stakeholders categorized into user stakeholders and non-user stakeholders for Campus Connect, including the non-user stakeholders you specified:

User Stakeholders:

1. Students: The primary users of Campus Connect, engaging with the platform for academic, social, and personal purposes.

2. Faculty and Staff: Secondary users who play a vital role in managing academic activities, disseminating information, and interacting with students.

3. Campus Service Providers: Entities such as the library, cafeteria, and transportation services, directly interacting with the platform to communicate with students and receive feedback.

Non-User Stakeholders:

1. System Analyst: Responsible for analyzing the requirements and functionalities of the platform from a technical perspective.

2. Requirements Specifier: Defines and documents the functional and non-functional requirements of Campus Connect based on stakeholder needs.

3. Technical Reviewer: Evaluates the technical aspects of the platform, ensuring compliance with technical standards, scalability, and security.

4. Software Architect: Designs the overall structure and architecture of Campus Connect, including database design, system components, and integration points.

5. Project Manager: Oversees the planning, execution, and monitoring of the Campus Connect project, ensuring timely delivery and adherence to budget and quality standards.

6. Market Analyst: Conducts market research to understand user needs, preferences, and trends, informing feature development and strategic decision-making for Campus Connect.

7. Quality Assurance (QA) Team: Responsible for testing the platform to ensure it meets quality standards, including functionality, usability, performance, and security.

8. User Experience (UX) Designer: Designs the interface and user experience of Campus Connect to ensure it is intuitive, user-friendly, and accessible to all stakeholders.

9. Database Administrator (DBA): Manages the database infrastructure supporting Campus Connect, including data storage, security, and performance optimization.

10. Legal Counsel: Provides legal advice and guidance on issues such as data privacy, intellectual property rights, and compliance with relevant regulations and laws.

11. Financial Controller: Oversees the financial aspects of the Campus Connect project, including budgeting, expenditure tracking, and financial reporting.

12. External Consultants: Subject matter experts or consultants brought in to provide specialized knowledge or guidance on specific aspects of the Campus Connect project, such as technology selection, security auditing, or regulatory compliance.

# 8 Dependencies and Constraints

When developing a comprehensive social platform for a university campus, there are several dependencies and constraints to consider:

1. **Technological Dependencies:** The platform's development and functionality may depend on specific technologies, frameworks, and programming languages. For instance, integrating augmented reality (AR) features may require compatibility with AR development kits and libraries.
2. **Data Security and Privacy Constraints:** Ensuring compliance with data protection regulations such as GDPR or CCPA imposes constraints on how user data is collected, stored, and processed. Implementing robust security measures and encryption protocols is essential to safeguard user privacy.
3. **Integration with External Systems:** The platform may need to integrate with existing university systems, such as student information systems (SIS), learning management systems (LMS), or campus resource portals. Compatibility and interoperability with these systems are critical for seamless user experiences.
4. **Scalability and Performance:** As the user base grows, the platform must be capable of handling increased traffic and user interactions without sacrificing performance. Scalability considerations include database optimization, load balancing, and efficient resource allocation.
5. **Accessibility Requirements:** Meeting accessibility standards ensures that the platform is usable by individuals with disabilities. Compliance with WCAG guidelines and accessibility testing are essential to accommodate users with diverse needs.
6. **Cross-Platform Compatibility:** The platform should be accessible across multiple devices and operating systems, including desktops, laptops, tablets, and smartphones. Achieving cross-platform compatibility may require responsive design techniques and native app development for different platforms.
7. **User Experience Design Guidelines:** Adhering to user experience (UX) design principles and best practices enhances usability and engagement. Considerations such as intuitive navigation, clear typography, and consistent branding contribute to a positive user experience.

# 9 Licensing and Installation

1. **Open-Source vs. Proprietary Software:** The choice between open-source and proprietary software affects licensing requirements and development costs. Open-source solutions offer flexibility and transparency but may require adherence to specific open-source licenses. Proprietary software often involves licensing fees and restrictions on source code access.
2. **License Compliance:** Ensuring compliance with software licenses is crucial to avoid legal implications and license violations. Developers must carefully review and adhere to license terms and conditions, including distribution rights, usage limitations, and attribution requirements.
3. **Installation and Deployment Procedures:** Documenting installation and deployment procedures facilitates seamless setup and configuration of the platform. Clear instructions, system requirements, and troubleshooting guidelines help users and administrators navigate the installation process effectively.
4. **Automated Deployment Tools:** Leveraging automated deployment tools such as Docker, Kubernetes, or Ansible streamlines the installation and provisioning of the platform. Automation reduces manual intervention, minimizes deployment errors, and accelerates the deployment lifecycle.
5. **Version Control and Release Management:** Adopting version control systems like Git and implementing robust release management practices enable efficient collaboration, version tracking, and software updates. Tagging releases, maintaining changelogs, and managing dependencies enhance transparency and traceability.
6. **Testing and Quality Assurance:** Rigorous testing and quality assurance procedures validate the integrity, functionality, and performance of the platform before deployment. Automated testing frameworks, regression testing, and user acceptance testing help identify and rectify issues early in the development cycle.
7. **Documentation and Support Materials:** Providing comprehensive documentation, user guides, and support materials aids users and administrators in installing, configuring, and troubleshooting the platform. FAQs, knowledge bases, and community forums foster user engagement and self-service support options.

# 10 Cost Table

|  |  |  |
| --- | --- | --- |
| Cost Category | Description | Estimated Cost |
| Development Costs | Includes salaries for developers, designers, and project managers; costs for software tools and development environments. | TBD |
| Software Licensing | Costs for proprietary software licenses required for development, including operating systems, development frameworks, and databases. | TBD |
| Hardware Expenses | Servers, networking equipment, and any other hardware necessary for development, testing, and deployment. | TBD |
| Cloud Services | Fees for cloud hosting, storage, and computing services necessary for deployment and operations. | TBD |
| Integration Costs | Expenses related to integrating CampusConnect with existing university systems (e.g., SIS, LMS). | TBD |
| Security and Compliance | Costs associated with ensuring data protection, privacy compliance (e.g., GDPR, CCPA), and cybersecurity measures. | TBD |
| Maintenance and Support | Ongoing costs for maintaining the platform, providing user support, and implementing updates and upgrades. | TBD |
| Marketing and Promotion | Expenses for marketing activities to promote CampusConnect within the university community. | TBD |
| Training and Documentation | Costs for creating user manuals, help guides, and training sessions for students, faculty, and staff. | TBD |
| Contingency Fund | A reserve fund to cover unforeseen expenses or overruns in other categories. | TBD |