



CS-319

Deliverable 4

Team 06

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1. Design Goals

1.1. User-friendliness:

The foremost design goal is prioritizing usability, ensuring a seamless and intuitive user experience. Users should be able to explore the platform effortlessly. The initial manifestation of coherence designed to fulfill this objective is that users will have persistent login sessions, eliminating the need to log in anew upon each return to the platform. Moreover, the user interface will be designed for easy navigation so that all core functionalities, including item posts, should be accessible within three clicks. This emphasis on usability aims to create a user-friendly and welcoming platform, encouraging active engagement. Furthermore, by allowing users to subscribe to specific product types (tags) and receive real-time updates regarding purchases and rentals, the app aims to cater to their individual preferences and interests. This enhances the user experience by providing personalized and relevant information.

1.2. Reliability:

The secondary design goal focuses on reliability, ensuring the robustness and stability of the CampusConnect platform. Users should be able to rely on the system for consistent performance and trustworthy transactions. The system should be engineered to proactively mitigate the occurrence of simultaneous purchases or rentals of the same product by two distinct users. In alignment with this objective, the system has the incorporation of a moderator role within the system that serves as a safeguard against unexpected circumstances, bolstering its overall reliability. CampusConnect aims to build user trust by prioritizing reliability and providing a dependable platform for second-hand sales, donations, borrowing, and related activities.

In tandem with this reliability focus, the implementation of a strategic design choice further enhances authenticity and trustworthiness within the community. Users can only rate each other after completing genuine transactions, promoting feedback based on real experiences and adding credibility to the ratings. By tying ratings to tangible transactions, the design minimizes the risk of manipulative or biased feedback, fostering responsible evaluations. This approach not only contributes to building a reliable reputation system but also mitigates potential retaliatory ratings, creating a positive and authentic community environment where users can rely on the rating system for informed decision-making.

1.3. Flexibility and user engagement

Introducing a bidding system for purchases is a strategic implementation aligned with our platform's design goal of fostering a dynamic and competitive marketplace. By allowing sellers to set a minimum price for their products and enabling interested buyers to place bids, we enhance the flexibility of transactions and empower users to actively participate in determining the value of items. This approach promotes a sense of engagement, as buyers can assess various bids and choose the offer that best aligns with their preferences (i.e., prices and rental periods). Moreover, it encourages sellers to competitively price their products, contributing to a more dynamic and responsive marketplace. Overall, the bidding system not only adds an interactive element to the buying and selling process but also aligns

with our goal of creating an adaptable and user-driven platform that reflects our community's diverse preferences and negotiation styles.

1.4. Functionality

The strategic division of the app's lost and found forum into two windows significantly amplifies its functionality. This deliberate separation streamlines user navigation, simplifying the search process for lost belongings and eliminating unnecessary complexity. The design prioritizes a more efficient and user-friendly experience by minimizing cognitive load, ensuring that users can effortlessly locate and contribute to the relevant sections. This enhanced functionality not only optimizes the user experience but also underscores our commitment to providing a platform tailored to our community's specific needs and interactions.

2. Design Trade-offs

2.1. Limited Two-Factor Authentication (2FA):

Two-factor authentication is selectively applied during the initial sign-up phase rather than for every login. While continuous 2FA enhances security, implementing it at each login could introduce user friction. This approach strikes a balance, ensuring an added layer of protection during account creation without compromising user convenience during subsequent logins.

2.2. Selective Data Encryption:

CampusConnect employs selective data encryption, focusing on sensitive information such as passwords rather than encrypting all user data. While comprehensive encryption enhances security, it can introduce performance overhead. The app balances heightened security measures and optimal system performance by prioritizing encryption for critical data, notably passwords. This trade-off acknowledges the importance of security while considering practical implementation factors.

2.3. Exclusion of integrated online payment

Our decision to exclude an integrated online payment option in our buying and selling app is rooted in a strategic balance between user experience, security, and development efficiency. We prioritize user privacy and minimize security risks by avoiding storing sensitive financial information within the app. This choice also simplifies regulatory compliance, reducing complexity and potential obstacles. Allowing users to handle payments privately enhances trust within the university community and respects individual preferences in financial transactions. The decision not to implement online payments streamlines development efforts, enabling a more focused and efficient delivery of core app features. This approach aims to provide users with a flexible and secure platform while maintaining a user-friendly and community-driven environment.

2.4. Rapid Development vs. Enhanced Functionality - Advanced Search System (Elastic Search):

CampusConnect has adopted an advanced search system, specifically Elastic Search, to offer its users comprehensive search capabilities, moving beyond a basic search and filter approach. This strategic decision is a trade-off, emphasizing enhanced functionality at the expense of the speed and simplicity favored in rapid development. Adopting Elastic Search brings numerous advantages: it provides a powerful and feature-rich search experience, can handle complex queries, and offers scalability and high performance. This ensures that the platform can adapt and grow according to user needs. Additionally, it includes advanced features like real-time data indexing, significantly enhancing the overall user experience. However, this approach comes with certain drawbacks in terms of development. The integration and fine-tuning of Elastic Search could extend the development timeline, as it requires specialized expertise and thorough testing. This integration adds a layer of complexity to the development process, necessitating ongoing maintenance and regular updates to the search system. Furthermore, ensuring seamless integration of Elastic Search with other platform components, such as filtering systems, presents additional challenges, potentially impacting the development workflow and resource allocation.

3. Subsystem Decomposition

