

UniSwap: A Sustainable Exchange Platform for University Communities

Group name: TheSix

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Team Agreement

Team name: TheSix

Team members:

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Communication method: Discord mainly, email if necessary

Communication response times: 24h

Meeting Frequency:

- ✧ 1 meeting per day during heavy workloads, and 1 meeting every 2-3 days otherwise.
- ✧ Meetings are mandatory unless in the case of an emergency.

Meeting Format:

- ✧ Meetings are mostly held online, typically at 9 PM.

Meeting Notes:

- ✧ Note-taking responsibility is shared by everyone.

Preparation:

- ✧ Determine topics, tasks to complete, and the estimated meeting duration in advance.
- ✧ Be prepared to share ideas and task progress during the meetings.

Work Division:

- ✧ Work will be equally divided among team members, if specified.

Task Completion:

- ✧ Everyone should finish their assigned tasks on time.
- ✧ If a team member cannot complete their task by the deadline, they must inform others at least 12 hours in advance.

Work Submission:

- ✧ Complete the work and submit it at least 24 hours before the deadline to allow for modifications if needed.
- ✧ Shanni Li and Xinyu Liu will handle the final submission, but everyone must review it beforehand.

Contingency Plan:

- ✧ If a team member drops out, is ill for an extended period, or is academically dishonest, we will promptly seek help from the TA.
- ✧ If a team member consistently misses meetings, we will first contact them to remind them of their responsibilities. If the issue persists, we will seek assistance from the TA.

Signature:

Cheryl Zhang, Yuqi Gao, Qiushi Chen, Siyun Gu, Xinyu Liu, Shanni Li

Project Proposal

UniSwap is a secure, university-based platform designed to streamline the exchange of reusable items among students and staff. By centralizing listings for lightly-used goods such as kitchenware, textbooks, clothing, and furniture, UniSwap fosters a sustainable, community-driven system that reduces waste. The platform's login system, tied to university credentials, ensures only verified users can participate, maintaining a trustworthy and safe environment. University students often accumulate items they no longer need, but due to frequent moves and limited storage, these items are often discarded or left unused. At the same time, other students could benefit from these items but lack an efficient way to connect with sellers. This results in wasted resources and unnecessary consumption. UniSwap resolves this issue by offering a centralized, secure platform where users can easily exchange items using a point-based system, bypassing monetary transactions. Its secure login ensures only authorized students and staff have access, safeguarding user information and reducing the risk of unauthorized entry. By promoting item reuse within the university, UniSwap reduces waste and enhances resource circulation. The app aims to create a sustainable and efficient exchange system that lowers both financial burdens and waste. UniSwap offers multilingual support and accessibility features such as voice and keyboard navigation, adjustable font sizes, and contrast settings, ensuring usability for students with disabilities. The platform also includes a tutorial section to guide users through the listing, acquisition, and point system, ensuring that all students, regardless of technical proficiency, can easily navigate and benefit from the platform. By fostering inclusivity and resource-sharing, UniSwap creates a safe, user-friendly environment that maximizes community benefits.

Addressing the diverse needs of the target users, UniSwap is designed to cater to a diverse array of users within the university community, emphasizing sustainability, affordability, and community engagement. The primary target audience for UniSwap includes:

1. ***Students on a Budget:*** Many students need to manage expenses carefully and are looking for cost-effective ways to obtain necessary items. Research shows that many college students face financial challenges that limit their ability to purchase new items. A report by the National Student Financial Wellness Center highlights that nearly 70% of students experience financial stress, impacting their ability to buy essentials (National Student Financial Wellness Center, 2020). UniSwap offers a platform where they can acquire items at minimal or no cost, helping them save money while still getting what they need.
2. ***International Students:*** These students often require temporary or lightly-used items due to frequent moves between countries or living spaces. UniSwap provides a practical solution for accessing and passing on items like furniture, kitchenware, and textbooks without the need for new purchases.
3. ***Eco-conscious Students:*** These individuals prioritize sustainability and seek opportunities to reduce waste. By participating in UniSwap, they can ensure items are reused and recycled within their community, aligning with their environmental values.
4. ***Students with Special Needs:*** Recognizing the unique challenges faced by students with disabilities, UniSwap specifically targets this group to ensure equitable access to necessary resources. Many students with special conditions require adaptive technologies to fully engage with digital platforms. UniSwap addresses this need by

offering enhanced accessibility features, allowing these students to participate independently and effectively in the exchange of goods. This focus not only aligns with inclusive educational practices but also enhances the usability of the platform for all users, reinforcing UniSwap's commitment to a supportive, community-driven environment.

5. ***New or Incoming Students (Freshmen and Transfer Students):*** Setting up new living spaces can be daunting and expensive. UniSwap allows these students to outfit their accommodations affordably by acquiring gently-used items from their peers.
6. ***Student Groups and Non-Profit Organizations:*** Student organizations dedicated to supporting vulnerable populations, can utilize UniSwap to source donated items that aid in their missions.

By focusing on these user groups, UniSwap not only supports individual students and community members in managing their resources but also fosters a culture of sharing and sustainability within the university environment.

With targeting specific user groups, UniSwap effectively addresses diverse needs, paving the way for our comprehensive app solution that revolutionizes how students exchange goods. Our app enables users to post and purchase items using a gamified in-app point system. Users earn points by listing and transferring items, which can then be used to acquire other necessary items. The platform incorporates a robust point-based system, ensuring transactions are not monetarily based but instead reward participation and contribution. This gamification strategy leverages extrinsic motivation—receiving points—which encourages sustained engagement and makes using our app a rewarding and enjoyable experience, as noted by Deterding et al., 2011. And to ensure safety and trust, our app requires student verification through school accounts, similar to platforms like Crowdmark. This verification process is vital as cognition-based trust is crucial in online interactions (Nah & Davis, 2002), helping to establish the integrity of our platform and mitigate risks associated with scams that are prevalent in second-hand transactions on social media platforms like Facebook.

Apart from the qualities mentioned above, UniSwap's app design includes structural search capabilities, detailed item listings, notifications and communications tools, user profiles, ratings, and comprehensive accessibility features, accommodating all users and enhancing usability across the board. Our structural search is multifaceted, considering that a significant portion of consumer-to-consumer (C2C) customer journeys occur offline (Ryskeldiev, et al., 2022). By integrating a location-based filter, UniSwap simplifies the search process, also offering a campus-based search option with student verification for increased convenience and safety. Additionally, the app caters to the need for low-cost items with a pricing filter (i.e., points), and categorizes items—such as textbooks, kitchenware, and furniture—ranking them based on transaction frequency to streamline user searches. And the ease of uploading images, creating descriptions, and specifying item types enhances user engagement, allowing other users to view and purchase items using in-app points. This approach aligns with scenario-based design principles, promoting systems that are developed around actual user scenarios to boost usability and relevance (Carroll, 2000). By designing with user interactions like posting, buying, and transferring goods in mind, UniSwap ensures the platform is tailored to meet user needs effectively.

UniSwap's interactive features enhance user engagement by providing timely notifications for listing activity and purchase approvals. Direct messaging facilitates negotiations between sellers and buyers, enhancing the transaction process and making it easier for users to communicate directly and securely (Miles, et al., 2000). Supported by user profiles that display essential information and average ratings, these features aid in decision-making and ensure compliance with community guidelines (Nah & Davis, 2000). With all users being verified students who can view each other's locations, our platform also fosters new friendships among campus members, enhancing the social value of our community-driven marketplace.

To ensure that UniSwap is accessible to everyone, the app includes numerous features designed for users with varying needs. High contrast color schemes meet WCAG 2.1 standards for users with visual impairments, and the font size is adjustable for better readability. The platform supports multiple languages to cater to a diverse user base (Hiller, 2003), and includes voice input for those who prefer voice commands or have limited mobility. Additionally, automated audio descriptions help users with visual impairments and dyslexia navigate our platform more effectively (Kusano, 2023).

The philosophy behind UniSwap is aligned with the principles of collaborative consumption, a practice gaining traction globally as evidenced by the success of community-based platforms like Facebook Marketplace. As outlined in *What's Mine is Yours: The Rise of Collaborative Consumption* (Botsman et al., 2011), our app promotes non-monetary exchanges, encouraging the reuse and redistribution of goods. This model not only supports sustainability but also resonates with the values of younger generations, who are increasingly committed to environmentally responsible behaviors.

References:

Alam, M. D. (2015). Factors that Influence the decision when buying second-hand products. This reference studies the factors influencing students' decision when purchasing second-hand items, and emphasizes the importance of cost control for international students.

<https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A839612&dswid=-2946>

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness. Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments, 4, 9–15. <https://doi.org/10.1145/2181037.2181040>

This paper explores the concept of gamification, defining it as the use of game design elements in non-game contexts to enhance engagement and motivation. It outlines how gamification can make activities more rewarding by incorporating elements like points, badges, and leaderboards to encourage sustained interaction.

Carroll, J. (2000). Making Use: Scenario-Based Design of Human-Computer Interactions. *Making Use*, 45–70. <https://doi.org/10.7551/mitpress/4398.003.0004>

Carroll presents scenario-based design as a user-centered approach to system development, where real-world scenarios are used to understand and address users' needs. By focusing on how users interact with systems in specific contexts, this method ensures that designs are practical and relevant to actual user goals.

Botsman, R., Rogers, R., & Foley, K. (2011). What's mine is yours: The rise of collaborative consumption. Distributed by OneClick Digital : Tantor Media.

This book examines the shift from ownership to access, highlighting how collaborative consumption allows communities to share resources. It discusses the rise of non-monetary exchanges, where trust and sharing economies help reduce waste and build connections among users, emphasizing sustainability and resource-sharing.

Nah, F. F. H., & Davis, S. (2002). HCI research issues in e-commerce. *Journal of Electronic Commerce Research*, 3(3), 98-113.

This article highlights some of the challenges faced by users in browsing Web sites and conducting searches for information, and suggests several areas of research for promoting ease of navigation and search. It also discusses the importance of trust in the online environment, and provides guidelines for integrating trust into Web site design.

Miles, G. E., Howes, A., & Davies, A. (2000). A framework for understanding human factors in web-based electronic commerce. *International Journal of Human-Computer Studies*, 52(1), 131-163.

The authors briefly introduce the electronic commerce tasks from the perspective of the buyer, and then review and analyze the technologies, and propose a framework to describe the design dimensions of electronic commerce.

Ryskeldiev, B., Hara, K., Kobayashi, M., & Kusano, K. (2022, October). Investigating Accessibility Challenges and Opportunities for Users with Low Vision Disabilities in Customer-to-Customer (C2C) Marketplaces. In *Proceedings of the 24th International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 1-4).

The authors investigate challenges people with visual impairments (PVI) are facing on customer-to-customer(C2C) marketplaces through online questionnaires and remote interviews and reveal both previously known general accessibility issues of online shopping and C2C specific issues.

Kusano, K. (2023). Towards Immersive Inclusivity for C2C: How Immersive Multimodal Interactions Can Make Online Customer-to-Customer Shopping More Inclusive. In *Special Proceedings of Asian CHI Symposium* (pp. 1-8).

The article discusses the issue of C2C platforms being lacking multiple alternative forms of interaction with content, unified display for description, and item quality. The author builds a prototype application that uses a voice-activated assistant for item search and purchase and evaluates it in a pilot study which suggests the importance of efficiency in C2C shopping and immersive multimodal interfaces.

Hillier, M. (2003). *The role of cultural context in multilingual website usability*. *Electronic Commerce Research and Applications*, 2(1), 2-14.

This paper shows the relationship between languages, cultural context and usability by drawing evidence from anthropology, worldviews and systems design literature. The problem of current translation practices on multilingual web sites and its impact on HCI is also discussed and a corresponding model is proposed.

Ohio State Research Team. (n.d.). National Student Financial Wellness Study National ... National Student Financial Wellness Study. <https://cssl.osu.edu/posts/documents/nsfws-national-descriptive-report.pdf>

It is a comprehensive research initiative that examines the financial attitudes, behaviors, and challenges faced by college students across the United States, such as student debt, financial stress, spending habits, and financial literacy.