Group Project Proposal

Group 2: Toffy Chen, Mingyang Li, Allen Zhang, Drew Beamer
February 22, 2023

1 Introduction

What is the title of your project?
Our project title is named "*WildCart*".

What is the goal of the project?
This project aims to build a web-based goods trading application for the Davidson College campus. Our current scope of work is prioritizing information sharing and connecting users with potential trading partners rather than facilitating direct communication.

What is the motivation for this project?
We have three motivations for building this project.

1. **Resources Re-use**: We aim to minimize the number of abandoned items when students change dorms, move out, or graduate, promoting sustainability and reducing waste.
2. **Convenience**: This app enables users to save money, time, and effort by facilitating item exchanges and reuse within the campus community, eliminating the need for purchasing items elsewhere and avoiding shipping fees.
3. **Community Building**: Given the diversity in the student community, we want to provide an avenue for users to discover new items and facilitate a sense of community by participating in the trading platform.

Who are the customers/users?
Our target users are currently enrolled Davidson College students. In the context of our platform, students can choose to exchange or directly pay for posted goods

What development process will you be using?
To build the system, we plan to use the Scrum method to guide our development process because we want to engage with customers throughout the whole process.

2 Novelty

Describe the novelty of the project.
WildCart differentiates itself from existing platforms through a focus on community-based item exchanges within Davidson College, introducing several novel features designed to optimize user experience, enhance security, and foster a sustainable trading environment. There are two main novelties of our project.

1. **Innovative Trading Mechanism**: In addition to the traditional sell and buy mechanism, our platform allows users to exchange items to satisfy the needs of both parties and

contribute to resource reuse. Recognizing the need for convenience and safety, especially in the context of the current health and safety guidelines, our platform also introduces a non-contact trading method that allows users to exchange items without direct personal interaction through cooperating with the Davidson Campus Post Office.

2. **Levelling System for Trust and Rewards:** To combat common concerns associated with online trading platforms, such as scams and untrustworthy users, WildCart implements a user-leveling system in addition to the common rating/credibility system. This system assigns levels to users based on their activity, successful trades, and feedback from other users. High-level users gain benefits such as increased visibility for their listings, priority support, and other incentives that encourage positive participation in the platform. This gamification element aims to reduce scams by promoting a culture of trust and accountability.

Comparison with existing platforms.

While platforms like Craigslist, eBay, and Facebook Marketplace offer vast marketplaces for buying and selling, they lack the community-focused, trading-centric approach of WildCart. Unlike these platforms, WildCart:

- Prioritizes trades over sales, encouraging a circular economy within the Davidson community. Its non-contact trading option is tailored to the needs and safety of college students.
- Employs a level experience system to enhance trust and reduce scams, a feature not found in the mentioned platforms. which rely heavily on user discretion without a formal incentive for positive engagement.

These innovations position WildCart as not just another marketplace, but as a community-centric platform that facilitates sustainable exchanges, fosters trust among users, and adapts to the evolving needs of the Davidson College community. Through these novel features, WildCart aims to redefine the experience of campus-based item trading, making it safer, more convenient, and more rewarding for all participants.

3 Customer Needs

Who is the primary customer outside the team?

Our primary stakeholders outside the team are current Davidson College students.

Who are the secondary stakeholders?

We want to involve Davidson Campus Post Office as our secondary stakeholder, as they provide an intra-campus mailing service that may allow students to drop off their items without contacting their trading partners.

What do the stakeholders want? Why?

Based on conversations with our conversation with our primary users (current Davidson College students), we conclude the following user needs:

1. **Cost Savings**: They seek to save money by avoiding shipping fees and acquiring items at lower costs.

2. **Resourcefulness**: They want to avoid wasting items and gain value from old items by trading them instead of throwing them away.
3. **Trustworthiness**: They want to know about the trustworthiness of another user when deciding whether they want to trade. They also want to ensure that traded goods meet their expectations and are in satisfactory condition.
4. **Price evaluation**: They want to see all the offerings made to them so that they can evaluate and choose the best deal.

What is their desired overall experience?
Overall, we propose that our users want a convenient, cost-effective, and trustworthy trading experience.

3.1 User Requirements

Write at least 5 SMART user stories based on the stakeholder's needs and wants: As a < role > I want < action > so that < benefit >

1. As a user, I want to see all the offerings made to my post so that I can evaluate and choose the best deal for my items.
2. As a user, I want to know and see the estimated condition of the item, so I can avoid products that are completely broken.
3. As a user, I want to know the trustworthiness of another user, so that I can make informed decisions and avoid potential scams during trades.
4. As a user, I want to be able to choose no-contact trade, so that I can avoid unnecessary contact with another person.
5. As a user, I want to be able to set a time constraint for accepting offers, ensuring that trades are finalized within a specified timeframe.

3.1 Acceptance Test

Write at least 5 acceptance tests for the user stories using the template: Given < some context > when < triggering event > then < expected outcome >

1. Given a user is logged into the platform, when they navigate to their account dashboard, then they should see a list of all offerings made to them.
2. Given a user is browsing items, when they view a product listing, then they should see the estimated condition of the item clearly stated with pictures.
3. Given a user is interacting with another user, when they view the profile, then they should see their trustworthiness rating and reviews from previous trades.
4. Given a user is initiating a trade, when they fill out the trade details, then they should be able to choose a no-contact option and be instructed accordingly.
5. Given a user has listed an item for trade and received an offer, when they set a time constraint for accepting the offer, then the offer should remain valid until the specified deadline, and if the deadline passes without acceptance, the offer should expire automatically.

4 Project Goals

4.1 Customer Problems and Benefits

What customer problem have you chosen to address? In implementation-free terms, what user benefit will the system provide?

Through our platform, we aim to address three main user problems to enhance the overall trading experience.

1. **Uncertain Trustworthiness**: We understand the uncertainty users may face regarding the condition of traded items. To tackle this, we implement both a level and a credibility system to allow users to view others' trustworthiness ratings, experience scores, and reviews from previous trades. We also emphasize users' ability to check items before acceptance. These methods will reduce uncertainty and foster trust in the trading process.
2. **Inflexibility**: We recognize the homogenization often associated with other good trading platforms. To offer more flexibility and better accommodate user needs, we provide two trading modes - users could either exchange goods or pay directly. At the same time, both parties related to a potential offer can evaluate prices and update the offer. This will allow users to engage in trades that best suit their preferences and needs.
3. **Unnecessary Costs**: We aim to reduce costs and address the issue of waste for our users. By enabling them to gain value from old items through trading instead of throwing them away and eliminating shipping fees, we promote sustainability and cost-effectiveness.

How will the benefit support the customer's desired overall experience?

The benefits provided, including enhanced trust, flexibility in trading modes, and sustainability, directly support the customer's desired overall experience by ensuring transparency, customization, and cost-effectiveness in their trading activities.

4.2 Measure of Success

Who outside the team have you tested the idea on?

We have tested the idea on graduating seniors, and friends (current Davidson students) with a lot of idle items. They think the idea is great especially when approaching the time for changing dorms (summer) and they want to try it.

How will you know whether the customer got their desired benefits?

1. **Trade Volume**: We will keep track of the number of trades completed successfully. This metric will help assess the platform's effectiveness in facilitating exchanges and reducing item abandonment.
2. **Post and Trade Activity**: We will evaluate the number of postings weekly. A higher number of postings per day will demonstrate the platform's utility and efficiency.
3. **Trust and Security**: Assess the community's trust in the platform through feedback on the credibility system and the security measures implemented for trades. Improvement in trust levels over time will signify success in creating a safe trading environment.

4. **Community Impact**: Gather qualitative feedback on the platform's impact on reducing waste and promoting sustainability within the Davidson community. Success stories or case studies highlighting significant reductions in abandoned items and enhanced community engagement will underscore the platform's beneficial impact.

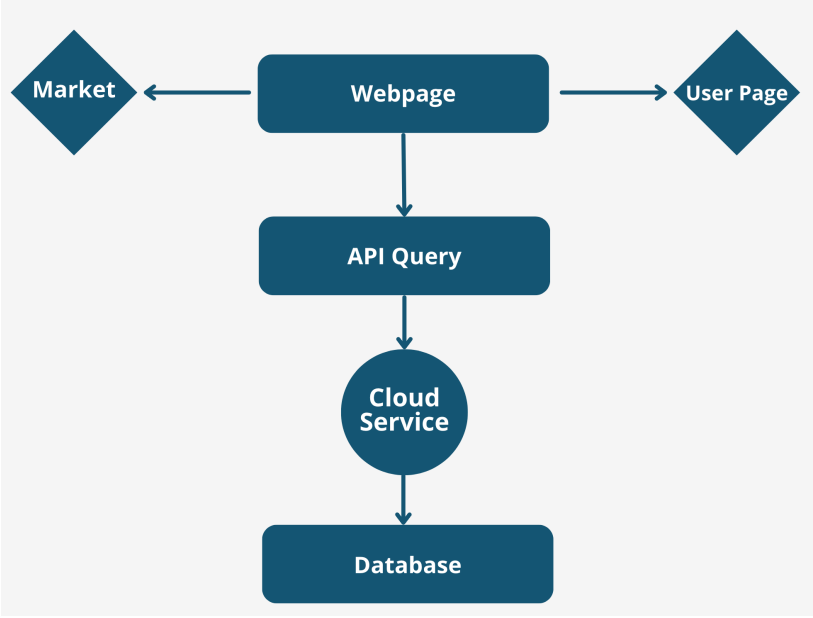
What are your customer-centric measures of success?

1. **User Engagement**: Track the number of active users on the platform, including both buyers and sellers. An increasing trend in active users will indicate the platform's growing popularity and acceptance within the Davidson community.
2. **User Satisfaction**: Conduct periodic surveys to gather feedback on users' trading experiences. This will include satisfaction with the trading process, item condition accuracy, and the overall exchange outcome. High satisfaction scores will indicate the platform's success in meeting user expectations.

Throughout the development process, we aim to actively engage with users through questionnaires or feedback sessions to identify areas for improvement, ensure the platform continues to evolve based on user needs and experiences, and implement changes.

5 System Description

Draw a block diagram to show how the proposed system will interact with external services, databases, etc. Clearly mark the boundaries of the system.



Block Diagram

Use the above diagram to introduce the system. What are the main elements of the proposed system?

We will develop a web application with a main frontend web page and a backend database. There are two main components of the web page: a market and a user page. In the market, users can browse posted trade requests with filters and react to them. They can also post their own request on this page. On the user page, users can check their current level score and view the trades they are involved in. The frontend web application will interact with the backend database through API queries (and potentially server actions). The backend database will store information about each single trade and users' profiles.

6 Solution Approach

What technologies (platform, tools, libraries, programming languages) will you use and why?

We plan to implement our front-end web application in Next.js and coding in Javascript. For the database, we will need to decide between MySQL and MongoDB: our choice will depend on the data format we want to store. We plan to host the web application using Vercel. Since our target users are Davidson college students and faculty, we plan to use NextAuth and either Google or Microsoft OAuth to authenticate users' email addresses. We may potentially need to use Twilio or some third-party email API to verify Davidson email addresses by sending authentication emails.

Briefly describe how the system will work.

The main functionality of our system is trade. There are two main ways users can be involved in a trade.

- **Post a trade**: When posting a trade, users need to include the required information about their posted item like its category, condition, and estimated price. They will also need to set an active time for the trade. After users enter this information, the system will store them in the backend database for future reference.
- **React to a trade**: When users browse the market page, the server will fetch trade posts that satisfy the filter from the database in batches. The front-end web application will display the information in a user-friendly format. If the user is interested in a certain trade, they can click into the trade and enter their items with similar required information described in the above section. This information will also go into the database, and there will be relationship tables that record the relational information.

How will you test and measure the adequacy of your test strategy?

We will have acceptance criteria for each feature we plan to implement. For user-facing features, we will conduct usability testing to ensure that our product is usable and intuitive. For more programmatic features, we will ensure that functions work as expected, and can handle potential edge cases.

7 Project Management

What development process will you use (Scrum, XP, Scrum+XP, etc.)? What are the reasons behind your choice?

We will use the Scrum model for development. We want to get the product off the ground and accomplish as much as we can within the timeframe of the project. While we will perform testing, we find that the Scrum+XP or XP model might be too constraining for the scope of this project, and limit our velocity and the end product we are able to deliver.

Describe your (brief) goals for each iteration (Proposal-Report 1, Report 1 - Report 2, and Report 2 - Final).
For Proposal to Report 1 (Feb.22-Mar.21), we aim to have much of the organization and basic functionality for the product completed. This includes database schemas, a basic backend, and enough on the front end to complete a basic demonstration of capabilities, including user login and basic trading system (filter, post, respond, communication, comment/rating).

For Report 1 - Report 2 (Mar.21-Apr.4), we want to improve the design and functionality of the application. This likely includes adding branding to the website, developing and maintaining rules of trading and posting, improving the user experience, and a focus on the interfaces around both making an offer and viewing offers made for an item.

For Report 2 - Final (Apr.4-Apr.25), we aim to finish any functionality we have yet to implement and dig into any potential bugs that may have come up that we were previously unable to fix. This phase also likely includes improving the UI for the final presentation of the application.

8 Team Management

8.1 Roles

What are the planned roles for the team members? What are the reasons for your decision?
Toffy will serve as our Project Manager as she studies psychology, which helps us gain more insight into user needs. We believe that this will help us create a more user-friendly and usable product. Drew will serve as Scrum Master, as he has prior experience developing in a Scrum environment and has familiarity with associated processes and tools (e.g. Jira). We will all engage in development, however Jerry and Allen will lead development efforts.

8.2 Scheduling

How often will the team meet? How will you meet as a team? Zoom? In-person?
We will meet at least once a week to perform Sprint Review, Retrospective, and Planning. These will be completed as a full team, and ideally in person if circumstances permit. We will complete daily standup in a Discord channel using a standup bot so that we are able to perform this at our convenience with differing schedules.

8.3 Background

Toffy Chen: has experience developing database projects using SQL for the backend and Javascript for the front end. Also proficient in Python and Java.

Jerry Li: has experience developing full-stack web applications using the React.js framework and SQL database, and worked on ML research in the last two summers. Currently working as an

intern at Aitou implementing Lambda functions on AWS. Proficient with JavaScript (including HTML/CSS and various libraries), Python, and Java. Has worked with relational databases.

Allen Zhang: has experience developing full-stack web applications using the Next.js framework. Proficient with Python and Java.

Drew Beamer: has experience developing full-stack web applications using the Next.js framework, and completed a front-end internship working on healthline.com last summer. Proficient with JavaScript (including HTML/CSS and various libraries), TypeScript, Python, and Java. Has worked with MongoDB and relational databases.

9 Constraints and Risks

What are the social and ethical Constraints?

- ***User Privacy***: Ensuring the privacy of users is paramount. The platform must protect sensitive information, including contact details and location, to prevent misuse. Ethical handling of data, adhering to strict privacy policies, and implementing robust security measures are essential to maintain user trust.

What are the policy and legal Constraints?

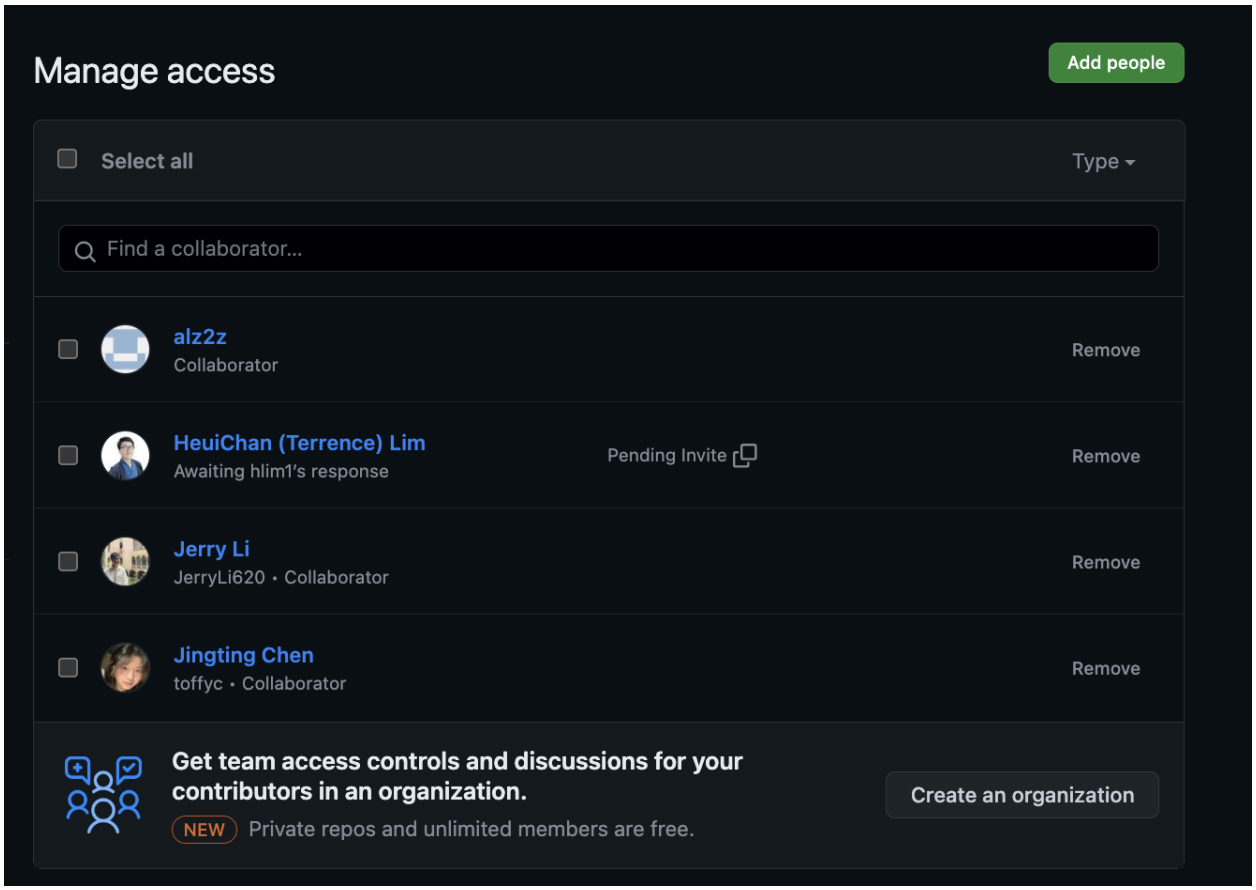
- ***Compliance with Data Protection Laws***: Adhering to relevant data protection regulations, such as GDPR (applies to any company processing data of an EU citizen) or local privacy laws, is necessary to operate legally and ethically. This includes obtaining user consent for data collection and ensuring users' rights to access, modify, or delete their personal information.
- ***Transaction Legality***: Ensuring that all traded items comply with legal standards and are not prohibited items. For our future scope, the platform should have a system to monitor and remove listings for illegal or restricted items to avoid legal repercussions.

What are the current risks?

- ***User Safety*****:** Even with non-contact trading, ensuring the safety and security of users during the exchange process is a concern. A successful collaboration with the Davidson Post Office can mitigate this risk.
- ***Scams and Fraud***: Despite the leveling system, the risk of scams and fraudulent activity may still exist. Continuous monitoring, user education, Davidson honor code, and a responsive reporting system will be essential to manage this risk.
- ***Adoption and Engagement***: Convincing users to adopt a new platform and maintain functionalities over time can be challenging. Strategic marketing and interactions with users, such as demonstrating clear value over competitors, and fostering a strong user community are necessary to overcome this risk.
- ***Technical Challenges***: Developing a secure, user-friendly platform requires significant technical expertise. Challenges such as data security, effective implementation of the leveling system, and maintaining a seamless user experience are potential risks that could impact the project's success.

10 GitHub

Follow the instructions below: 1. One person creates a GitHub repository. 2. Add other members to the repository as collaborators. 3. Update your README.md file with the title of your project, group number, and group members with roles. Example below: 4. Add me (username: hlim1) to the repository as a collaborator. 5. Create a folder called “Reports” in the main branch. 6. In the folder, add this proposal. You will add all the reports to this folder in addition to the submission to Moodle. 7. Take a of the ‘Collaborators’ page and add it to this section.



(Drew is the owner of the repo)