Project Description

EcoBridge is a digital platform designed to bridge the gap between the youth, particularly millennials, and the agriculture sector in the Philippines. By providing a comprehensive interface, the system aims to educate the youth about agricultural practices, empower farmers with access to vital information and technology, and support the general public's interest in sustainable farming and local produce. Key features include educational resources, an interactive marketplace, and forums for knowledge sharing, all tailored to enhance engagement and participation in the agricultural sector.

Requirements Summary

Software Specification Table

		Android	IOS
Minimum Requirements	Processor	Single Core	Apple A9
	OS	Android 4.4 (KitKat)	iOS: 10.0
	RAM	2 GB	2 GB
Recommended Requirements	Processor	Quad Core	Apple A11 Bionic
	OS	Android: 8.0 (Oreo)	iOS: 13.0
	RAM	4 GB	2 GB
Other requirements	Permission	Notifications and Storage	

The app is designed to work with Apple and Android phones to reach a wider audience. The minimum requirements were set to allow the app to work with older models but also it maintains necessary functionalities. However, a smoother user experience is expected for devices with the recommended specs.

Prototype Specification

1. Accessibility - The system must be usable by individuals with varying levels of technological literacy.
2. Educational Resources - Provide high-quality, regularly updated educational videos and articles on modern farming techniques, sustainable practices, and technological advancements.
3. Communication and Knowledge Sharing - Implement robust forums where farmers and agricultural experts can share knowledge, ask questions, and provide advice.
4. Marketplace Feature - Develop an efficient marketplace for buying and selling agricultural products, ensuring a user-friendly interface for seamless transactions.
5. Reliability and Accuracy - Ensure that all information provided within the app is accurate, reliable, and sourced from credible agricultural experts and institutions.
6. Localized Content - Tailor content to reflect the diverse agricultural practices and needs across different regions of the Philippines.

Overview of Evaluation Plan

To evaluate the prototype the developers used three different methods, which are the usability testing based on the 5 e's, Heuristic Evaluation, and a user survey and feedback.

1. *Usability Testing based on the 5 E's*: The usability testing will measure how well users can achieve their goals, the speed and ease of task completion, the overall satisfaction and engagement with the interface, the system's ability to prevent and recover from errors, and the ease with which new users can learn to use the system.
2. *Heuristic Evaluation*: The evaluation will systematically review the UI against established usability principles to identify potential usability issues.

3. *User Survey and Feedback*: The surveys will incorporate demographic profiling, 5-point scale evaluations for specific UI aspects, and open-ended questions to capture detailed user experiences and suggestions

Usability Testing Based on the 5 E's

Data Presentation

Criteria	Mean	Interpretation
Effective. Rate how well the interface enables you to complete your tasks successfully.	4.55	Satisfactory
Efficient. Rate the speed and ease with which you can complete tasks using the interface.	4.52	Satisfactory
Engaging. Rate how enjoyable and satisfying your interactions with the interface are.	4.74	Satisfactory
Error Tolerant. Rate the system's ability to prevent errors and help you recover from any mistakes.	4.35	Satisfactory
Easy to Learn. Rate how quickly and easily you were able to learn to use the interface.	4.68	Satisfactory

Data Analysis

The results of the usability testing based on the 5 E's indicate that the user interface (UI) of the system is highly effective across all key usability criteria, meeting and exceeding usability requirements.

1. Effective - The high mean score indicates that users are able to complete their tasks successfully and with relative ease. This suggests

that the interface supports users in achieving their goals effectively, with minimal obstacles.

2. Efficient - Users have rated the interface as highly efficient, highlighting that tasks can be completed quickly and easily. This demonstrates that the UI is designed to streamline user interactions, minimizing the time and effort required to accomplish tasks.

3. Engaging - The very high score for engagement suggests that users find the interface enjoyable and satisfying to use. This implies that the UI is not only functional but also provides a positive user experience, likely contributing to user retention and satisfaction.

4. Error Tolerant - The error tolerance score indicates that the system effectively prevents errors and provides adequate support for users to recover from mistakes. This is crucial for maintaining a smooth user experience and minimizing frustration.

5. Easy to Learn - The ease of learning score reflects that users can quickly and easily learn to use the interface. This is indicative of an intuitive design that reduces the learning curve, enabling new users to become proficient with minimal training.

Design Implications

Does your prototype need to be altered in order to address the results of the analysis, or was it completely successful?

Based on the results of the analysis, the prototype does not require significant alterations as it was highly successful in all aspects of usability. The high mean scores across all 5 E's criteria—Effective (4.55), Efficient (4.52), Engaging (4.74), Error Tolerant (4.35), and Easy to Learn (4.68)—indicate that the interface effectively supports users in completing their tasks with ease and satisfaction. However, while the overall success suggests that major changes are unnecessary, minor refinements could be considered to further enhance error prevention and recovery, given that Error Tolerance, though successful, had the lowest relative score.

What improvements could be made to the design to address any shortcomings?

To address the relatively lower score in Error Tolerance, improvements could focus on enhancing error prevention mechanisms and providing more robust support for error recovery. This could include implementing clearer and more informative error messages, adding undo functionalities, and improving guidance during error recovery processes. While the overall design is successful, these targeted enhancements will further minimize user frustration and improve the overall user experience by ensuring that users can recover smoothly from mistakes and maintain their workflow with minimal disruption.

Did you discover any major flaws that would suggest a completely different type of design?

The analysis did not reveal any major flaws that would suggest the need for a completely different type of design. The high mean scores across all 5 E's criteria indicate that the current design is fundamentally sound and meets the usability requirements effectively. While there are areas for minor improvements, particularly in enhancing error tolerance, the overall design is successful and well-received by users.

Heuristic Evaluation

Data Presentation

1. Visibility of System Status – The prototype shows users what is currently happening in the app
2. Match between system and the real world – The prototype uses simple language in its interface to ensure that users know what is happening within the app, making it easier for them to navigate the features. However, in some forums and pages, agricultural jargon may make it confusing for users who are not that knowledgeable with agricultural terms.

3. User control and Freedom – The prototype allows users to move in and out of features, ensuring a smooth and frustration-free experience.
4. Consistency and Standards – The prototype prioritizes consistency by using the same look and feel across all features.
5. Error Prevention – The prototype shows clear instructions and confirmation prompts for posting content to avoid any mistakes and to ensure users correctly post what they intend to post.
6. Recognition rather than recall – The prototype shows relevant options and information directly within the interface. Users won't need to memorize complex steps or terms as the app will guide you with clear choices and prompts.
7. Flexibility and Efficiency of Use – The prototype is catered for both beginners and experienced users. Beginners can benefit from the app's straightforward design and frequent users can utilize more advanced features for a better app experience.
8. Aesthetic and Minimalist Design – The prototype uses a minimal design by only displaying relevant information allowing users to focus more on what is important.
9. Help Users Recognize, Diagnose, and Recover from Errors – The prototype has instructions and message prompts that guide users whenever they commit an error.
10. Help and Documentation – The prototype has a help page that answers possible questions from users.

Data Analysis

The evaluation of the prototype using Nielsen's heuristics reveals a generally positive user experience with a few areas for potential improvement. The prototype excels in providing visibility of system status, user control and freedom, consistency, error prevention, recognition rather than recall, and aesthetic design. These strengths suggest that users are well-informed about what is happening within the app, can navigate

smoothly without getting stuck, and benefit from a visually appealing and consistent interface that prevents errors and simplifies interactions.

However, the analysis identifies a notable area for improvement in matching the system with the real world. While the interface uses simple language to enhance navigability, the use of agricultural jargon in some forums and pages may confuse users who are not familiar with these terms. Addressing this issue by either simplifying the terminology or providing explanations for specialized terms could improve the accessibility and usability for all users. Additionally, while the help and documentation features are present and functional, continuously updating these resources based on user feedback and emerging issues will ensure they remain effective. Overall, the prototype demonstrates strong usability with specific areas for refinement to enhance the user experience further.

Design Implications

Does your prototype need to be altered in order to address the results of the analysis, or was it completely successful?

The prototype is largely successful but needs some alterations to address specific areas identified in the analysis. While it excels in visibility of system status, user control, consistency, error prevention, and aesthetic design, there is a need to improve the match between the system and the real world.

What improvements could be made to the design to address any shortcomings?

To address the identified shortcomings in the prototype's design, several improvements could be implemented. Firstly, simplifying or providing tooltips for agricultural jargon in forums and pages would enhance clarity and accessibility for all users, regardless of their familiarity with agricultural terms. This adjustment would align the system more closely with users' real-world knowledge and improve overall comprehension. Additionally, ensuring that the help and documentation sections are

comprehensive and regularly updated will help users recognize and recover from errors effectively.

Did you discover any major flaws that would suggest a completely different type of design?

No major flaws were discovered that would necessitate a completely different type of design for the prototype. The identified areas for improvement, such as clarifying agricultural jargon and enhancing help documentation, are more about refining existing features rather than requiring a fundamental overhaul of the design approach.

User Survey and Feedback

Data Presentation

UI/UX Design Evaluation		
Question	Mean	Interpretation
Layout of the interface is well-organized and easy to understand	4.52	Satisfactory
Color scheme and typography are neat and work well together	4.42	Satisfactory
Visual elements (icons, buttons) enhance the understanding and use of the interface	4.45	Satisfactory
It is easy to find specific features or information within the interface	4.65	Satisfactory
The interface is visually consistent across different sections and screens	4.68	Satisfactory
Navigation within the interface feels natural and intuitive	4.55	Satisfactory
The interface efficiently minimizes the number of steps to complete a task	4.52	Satisfactory

There are hardly any features or elements that I found particularly difficult or confusing	4.26	Satisfactory
The input methods are easy to use and efficient for completing tasks	4.58	Satisfactory
It is easy to recover from errors (undo actions, error recovery steps)	4.26	Satisfactory
Total Rating	**4.49**	**Satisfactory**
Screen-Specific Evaluation		
Title Screen	4.77	Satisfactory
Sign in Screen	4.68	Satisfactory
Log in Screen	4.77	Satisfactory
Home Screen	4.71	Satisfactory
Edit Profile Screen	4.68	Satisfactory
Marketplace Screen	4.71	Satisfactory
Chat Inbox	4.68	Satisfactory
Chat Screen	4.65	Satisfactory
Videos Screen	4.65	Satisfactory
Forum Screen	4.65	Satisfactory
Calendar Screen	4.65	Satisfactory
News Screen	4.71	Satisfactory
Settings Screen	4.71	Satisfactory
FAQs Screen	4.68	Satisfactory
Total Rating	**4.69**	**Satisfactory**

Notable Feedback and Suggestions

- What did you like most about the interface?
  - "I appreciate the clean and intuitive design of your app's user interface and organization of features and easy navigation make it effortless to explore the app's functionalities."
  - "I like the design and how it is similar to well-known social apps, so that the farmers can also learn quickly with how they can use it."

- o "I like how easy it is to go through everything on the application. I'd like to put an emphasis on how efficient everything is due to the familiar type of user interface that is being used in the application."

- What do you like least about the user interface?
  - o "The main screen should also reflect important bits of information from other sections, for instance if there are any activities for the day which can be extracted from the calendar section."
  - o "Highly dependent with the contrast of Green, White elements could be integrated better rather than light green."
  - o "There's nothing much that I want to point out as I think that everything goes well with each other. However, I think that you can work on the color palette of the application."

- Do you have any suggestions for improving the user interface?
  - o "Include an option for Dark & Light theme"
  - o "If you're going to add the create post button for forum, it would be nice to put something like Facebook's "what's on your mind", it would totally be on point for the forum section"
  - o "The menu icons are already understandable, but intuitiveness can be improved by rearranging the order of the icons."

Data Analysis

The survey results show a highly successful user interface (UI) and user experience (UX) design. Key aspects such as the layout (4.52), color scheme (4.42), and visual elements (4.45) were well-received. Users found it easy to locate features (4.65) and appreciated the visual consistency (4.68) and intuitive navigation (4.55). The interface efficiently minimizes task steps (4.52), though error recovery (4.26) and certain feature clarity (4.26) could be improved. Screen-specific evaluations were also positive, with the Title Screen and Log In Screen receiving the highest scores (4.77). Other screens, including the Home Screen, News Screen, and Settings Screen,

scored 4.71, indicating consistent satisfaction across sections. The data highlight a robust UI/UX design with minor areas for enhancement, particularly in error recovery and feature simplification. Overall, the high ratings affirm the design's effectiveness and positive user reception.

User feedback highlighted the clean, intuitive design and efficient navigation as the most appreciated aspects of the interface. Users valued the familiar design, which resembles well-known social apps, making it easier for them to learn and use the app. However, some users suggested improvements such as integrating important information from other sections into the main screen and enhancing the color palette to better integrate green and white elements. Additional suggestions included adding options for dark and light themes, introducing more intuitive prompts in the forum section, and rearranging menu icons for improved intuitiveness. These insights point to targeted enhancements that could further improve the user experience without requiring major design changes.

Design Implications

Does your prototype need to be altered in order to address the results of the analysis, or was it completely successful?

Based on the analysis of the prototype using the three methods, the results were very positive. From the surveys, it yielded impressive results as each question had an average rating higher than 4. For the UI/UX design evaluation, it had an average rating of 4.49, suggesting that the design is generally effective, visually appealing, and it provides a good user experience. And for the Screen-specific evaluation it got an average rating of 4.69 implying that users were particularly satisfied with the design and usability of individual screens within the prototype. The rating also suggests that each screen is well-designed, intuitive, and meets user needs effectively. However, even though the rating was high, there is still room for improvement as some users offered valuable suggestions and constructive criticism.

What improvements could be made to the design to address any shortcomings?

Based on the suggestions, a feature implemented was the light mode option, as this was a recurring response. By adding this option, users can switch between dark and light mode based on their preferences.

Another feature suggested was the addition of a share button in the forums to allow users to share their favorite forums with others in the app or other social media platforms. This would help to increase engagement and spread awareness of the forum content.

Did you discover any major flaws that would suggest a completely different type of design?

No major flaws were seen on the design as the suggestions and comments were more about the layout and the color scheme of the app.

Critique and Summary

Overall, the development of the EcoBridge prototype was successful as it got positive feedback and results from the evaluation metrics, and it was able to achieve its primary objectives. By utilizing three evaluation metrics, the developers gained a well-rounded understanding of the design's effectiveness and usability. When it comes to evaluation, one thing the developers would have done differently is to have experts or design-focused individuals conduct a heuristic evaluation of the prototype. Using their expertise can be useful as the developers can gain insightful feedback that can potentially improve the design. Also, sending out the forms to more experienced individuals can also provide a wider range of perspectives and a deeper evaluation on the prototype. Having different perspectives would have helped in identifying possible usability issues and design improvements the ordinary users might not see.

In terms of the design, given more time, the developers may improve and add on the current features like a dashboard page that shows the sales

statistics of a user. This can be especially useful for farmers and sellers as this can help them visualize and manage their sales performance. Another useful feature would be adding a short walkthrough on how to use the app for every new user to ensure that all users will have smooth experience in using and navigating the app. To enhance accessibility, we will also introduce an option to increase font size, making the app more user-friendly for those with visual impairments. Lastly, we plan to add social features such as the ability to add friends. This will foster a sense of community among users, encouraging them to connect, share, and learn from each other.

These enhancements will significantly improve the user experience and functionality of EcoBridge, helping us achieve our goal of revolutionizing agriculture, technology and education.