



Part 3.2 System Prototype

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Human Computer Interaction

CS152

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I. Project Description

Pawnquest is an application that aims to resonate with the hearts of serviceable obtainable Filipinos of around 1.9M in our first year by providing a service such as an appraisal of jewelry and electronics, a fake detection mechanism to determine the authenticity of an object by 3D capturing the item and if device uploads its software details in the cloud to be determined by our model. It also aims to provide a pawnshop locator near you that makes an offer for an item, subsequently being able to message them and exchange another type of media.

II. Requirements Summary

		iOS	Android
Minimum Requirements	Processor Cores	Dual-core (2 cores)	Quad-core (4 cores)
	OS	iOS 12 or later	Android 8.0 (Oreo) or later
	RAM	2 GB	3 GB
Recommended Requirements	Processor Cores	Quad-core (4 cores)	Octa-core (8 cores)
	OS	iOS 14 or later	Android 10.0 (Q) or later
	RAM	4 GB	6 GB
Other Requirements	Item Appraisal	Camera Access	Camera Access
	Pawnshop Navigation	GPS Access	GPS Access
	Messaging and Video Calls	Internet connectivity, Microphone & storage	Internet connectivity, Microphone & storage

Table 1: System Requirements

To ensure seamless navigation for users, as seen in Table 1 PawnQuest for iOS requires at least a dual-core processor, iOS 12 or later, and 2 GB of RAM, with better performance on a quad-core processor, iOS 14 or later, and 4 GB of RAM. On Android, the minimum requirements are a quad-core processor, Android 8.0 (Oreo) or later, and 3 GB of RAM, with the recommended setup being an octa-core processor, Android 10.0 (Q) or later, and 6 GB of RAM. The app uses the device's camera for item appraisal, GPS for finding nearby pawnshops, internet, microphone, and storage for messaging and video calls. These capabilities enable features like 3D capture for accurate item pricing, cloud-based detection of counterfeit items, and seamless communication with pawnshops.

III. Overview

To reach a wider range of audience, the team would communicate physically at Mapúa Malayan Colleges Mindanao or online using Microsoft Teams, Discord, and Google Forms for

evaluation. This hybrid approach is done to efficiently cater to a larger audience while seeing a live feed of the prototype and responses.

The evaluation is split into three separate parts: System Usability, Heuristics Evaluation, and Participant Survey and Feedback.

Technique	Description
System Usability Scale	System Usability Scale (SUS) is a questionnaire that is used to evaluate the usability of products and services. The questions from this survey are used as a quantitative method to evaluate and get valuable insights into a system. The users are tasked to answer 10 questions with a formula to be used.
Heuristics Evaluation	Heuristics Evaluation aims to identify design problems in a user interface. To assess usability,
Participant Survey and Feedback	A survey will be given to participants after successful prototype usage. The survey will contain qualitative questions in the form of feedback. To ensure no biases will be made in the evaluation.

Table 1: Data Gathering Methods

The tasks for this Prototype are split into different sections: account registration and details task, menu and dashboard task, and appraisal and messaging task. Below are the tasks the participants will partake in performing to showcase the prototype's functionality:

- Account Registration (**Account registration and details task**)
- Logging in and out (**Account registration and details task**)
- Exploring the main menu from the dashboard and exploring its functionalities (**Menu and dashboard task**)
- Object appraisal (**Appraisal and messaging task**)
- Pawnshop locator (**Appraisal and messaging task**)
- Pawnshop listing and messaging (**Appraisal and messaging task**)
- How easy the users will be able to navigate the prototype

IV. Data Presentation

IV.I Data Presentation and Analysis

IV.I.I System Usability Scale

During the mixed evaluation of online and physical with the participants, the users were able to grasp the flow of navigation easily with almost all of them being able to accomplish the task at ease. However, some icons or buttons were unresponsive which puzzled the user for a moment, however, they ultimately reached their desired goal by going down another path.

With the System Usability Scale criteria, the developers subtracted 5 to the sum of odd numbers and 25 to the even questions. Afterward, the developers got the sum of the two and multiplied it by 2.5.

$$\text{SUS Score} = x + y * 2.5$$

SUS Formula

Scores below 50% indicate serious deficiency in usability and suggest the need for substantial improvement with 68% being the average, and 70% being considered as good. With the data from the survey, Pawnquest was able to manage to get a rating of 85%, which is considered good, suggesting a decent level of usability.

IV.I.II Heuristics Evaluation

Pawnquest was evaluated qualitatively through Jakob Nielsen's 10 general principles for interaction design, below are what most of the users say:

Visibility of System Status

The prototype was able to inform the users of the outcome of their actions through easy-to-understand icons, making them informed of what were the processes within the prototype.

Match Between System and Real World

The prototype was easily understandable since it used basic English grammar that could be understood by people of all ages from our participants. The language and concepts were already familiar to the users.

User Control and Freedom

The prototype has a back button on almost all pages that enables users to go back whenever they misclick a specific icon or button, it also has a cancel option from some of the prompts within the system.

Consistency and Standards

The prototype had a consistent design from all views with the navigation bar being placed in the same place, the buttons, icons, and text also had consistent color palettes from varying views.

Error Prevention

There were some error preventions in place such as verification of details first before proceeding with a transaction, a prompt appearing if a user would like to log out, and following a procedure on the integrated online payment transaction before committing to an action.

Recognition rather than recall

The participants were satisfied as the pawnshop information such as number and location were already viewed before they could message them coming from the dashboard and object appraisal.

Flexibility and Efficiency of Use

The menu buttons on the sidebar navigation allowed quick access to significant app features making the participants satisfied.

Aesthetic and Minimalist Design

The prototype was an appealing design that captured the eyes of the users as it was fit for the user's standard of "aesthetic". It also revolved around a small number of colors with green being the major one and revolved around it.

Help Users Recognize, Diagnose, and Recover from Errors

From the prototype in account registration, when a user is prompted to verify their account with a contact number or email, there exists a "next" button below even though you should only click the email and mobile number in the middle which confused users as it also didn't have an error prevention when they clicked the next button directly.

Help and Documentation

The prototype had a Frequently Asked Questions page that answers some of the common questions that may arise when users use the prototype.

IV.I.III Participant Survey and Feedback

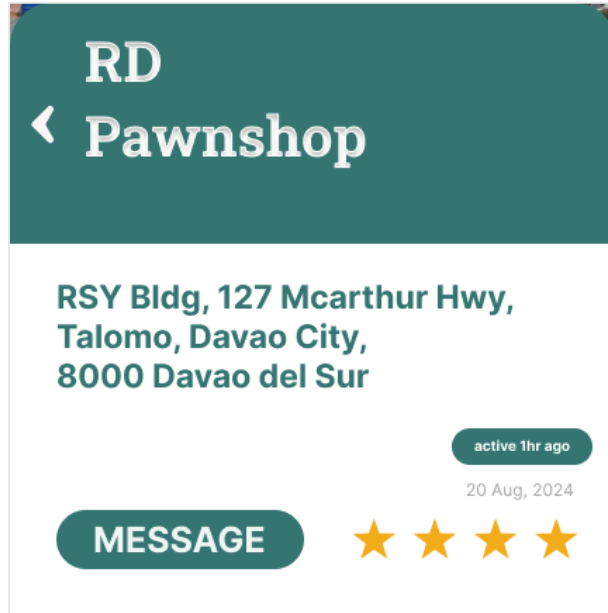
Section 1			
Question	Mean	Interpretation	Classification
On a scale of 1 to 5, how would you rate your experience with the Pawnquest prototype?	4.80	Highly Acceptable	Successful
On a scale of 1 to 5, how was the UI design of the prototype?	4.90	Highly Acceptable	Successful
How easily were you able to follow the tasks provided?	4.40	Acceptable	Successful
Section 2			
Interface Design	Mean	Interpretation	Classification
Account Registration	5.00	Highly Acceptable	Successful
Account log-in	4.90	Highly Acceptable	Successful
Editing of account details	4.70	Highly Acceptable	Successful
Object appraisal	4.50	Acceptable	Successful
Pawnshop Listing	4.30	Acceptable	Successful
Pawnshop navigation	4.20	Acceptable	Successful
Pawnshop Messaging	4.40	Acceptable	Successful
Section 3			
Task	Mean	Interpretation	Classification
Account registration and details task	4.90	Highly Acceptable	Successful
Menu and dashboard task	4.70	Highly Acceptable	Successful
Appraisal and Messaging task	4.50	Highly Acceptable	Successful
Average	4.63	Highly Acceptable	Successful

Table 2: Survey Data Interpretation

Table 2 presents the gathered data of the Pawnquest prototype after online and physical testing. The results have shown that the prototype is highly acceptable and is considered successful. The developers noticed that users were highly interested in the application due to its uniqueness and realization of ease of use.

IV.II Design Implications

Although most of the feedback was positive, some of it was keen on some issues within the app. This includes pawnshop navigation, as some users were hesitant to buy from a pawnshop due to lack of credibility, although star ratings were present, others still found it lacking.



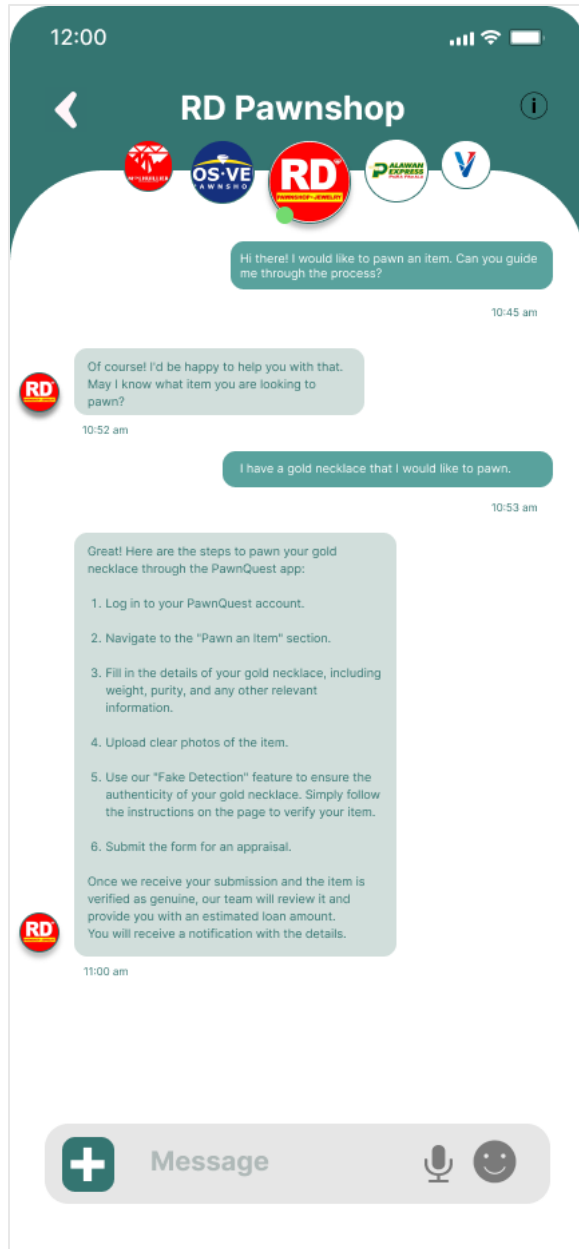
Before alteration



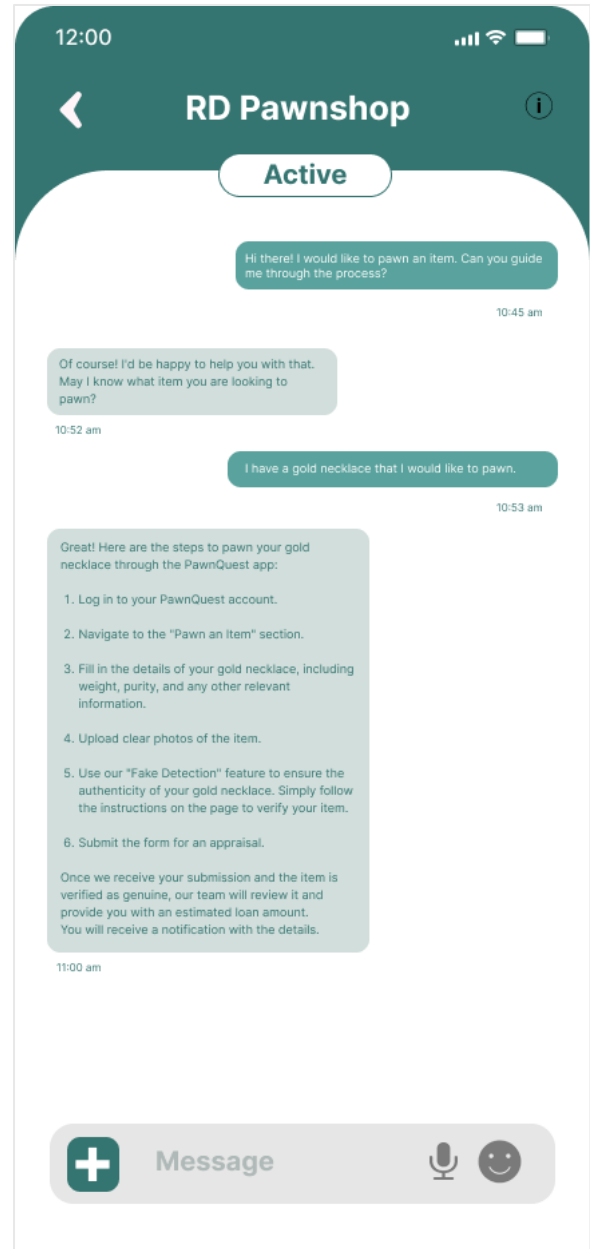
After alteration

Pawnshop navigation would greatly affect the profitability of Pawnquest as it boosts users' willingness to buy. Displaying the total number of transactions a pawnshop has completed, along with contact information such as phone numbers and emails, increases users' trust in the pawnshop, making them more likely to make a purchase.

Another design that has been criticized by users is the messaging feature, as the icons from the previous design seem to close to another confusing other users.



Before alteration



After alteration

Pawnshop messaging is where deals are being made and closed, thus, the developers had listed to the advice of its participants to redesign and declutter the repetitive images of a pawnshop's logo in the left and list of pawnshops logo to be messaged on top.

IV. Critique and Summary

Evaluation Advantages

The advantage the developers had was their way of handling the evaluation, they approached participants online and physically to cater to more people. This was done from school or their respective desk at their house, subsequently, through physical interviews, the developers were able to let the participants borrow their laptops to experience the prototype fully. The developers used Google Forms to collect and analyze data from physical and online participants as this platform helps streamline data collection and analysis.

Evaluation Disadvantages

The disadvantage the developers had was that the internet connection was unstable for some users leading to a slow loading of assets in Figma, it also didn't fully immerse the users as the textbox wasn't fillable, and the contents within it was already predetermined making it a less immense experience for the participants, and lastly, some devices of the participants taking the evaluation had a smaller screen size leading to bugged features of the prototype. Given more time, the developers would like to have collected more data or reach a larger survey population to further identify specific functionality within the app that needs more improvement

Conclusion

The developers had concluded that the development of Pawnquest was a success with positive feedback and decent evaluation scores from the participants. The concerns the participants had were well received by the developers with them updating it to a different design to further emphasize details of a pawnshop and provide future users with a clean and minimalistic messaging view. Evaluation tasks were easily accomplished by participants without developer assistance, thanks to intuitively designed buttons guiding users through their next actions.

Pawnquest has a huge potential to aid Filipinos in pawning wisely, due to its simple and easy-to-use interface. It includes a wide range of features such as item appraisal through 3D capture, fake detection, pawnshop navigation, messaging and video calls, personalization options, and enhanced security measures that ensure a streamlined and secure pawning experience. The app not only facilitates seamless transactions but also builds user trust through transparency and authentication, promising a significant impact on the pawning industry in the Philippines.