UpShot

Archery Tournaments Anytime!

User Testing Report

MOBILE APPLICATIONS MODULE

UFCF7H-15-3

Word Count: 1498

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GitHub

1. INTRODUCTION.

This document is an analysis and reflection on the user testing and associated user feedback sessions carried out on the newly created IOS app UpShot. For more information on the app and its design please see the design documentation.

2. ABSTRACT

User testing was performed via in person, paper-based questionnaires, and informal interviews with potential end users. This was done at archery clubs and archery tournaments. A survey questionnaire was given to potential users before the design phase, at the end of each sprint, and to a final small focus group after the end of development.

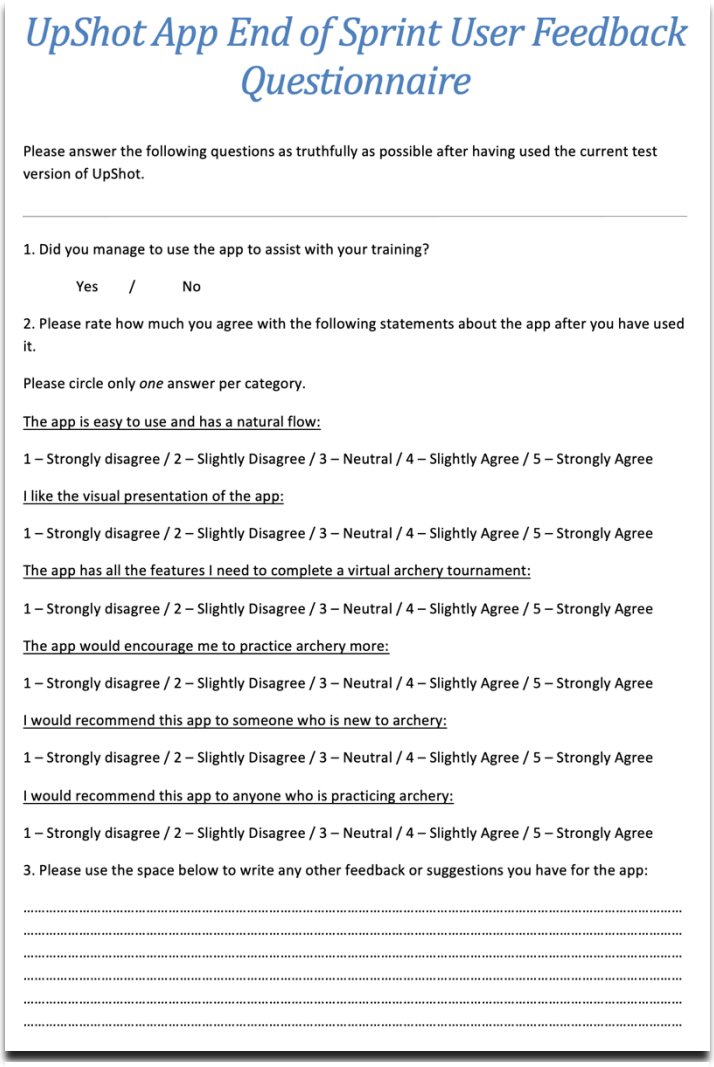
The user testing data collected helped create the initial design and guide design decisions throughout the iterative development cycles. Overall, the testing data showed an improvement in the app's ratings throughout development, however, more detailed inspection of the testing data showed that some areas of development regressed over subsequent development cycles.

3. USER TESTING METHODOLOGY

Initial potential user feedback was gathered prior to the project design phase, using informal interviews at two local archery clubs in the Southwest of England. In addition, potential user questionnaires (appendix 1) were handed out at these same clubs as well as a national level archery tournament in the East Midlands. The initial survey consisted of 5 simple yes/no questions and was designed to get a basic profile of users who might be interested in an app such as UpShot. The survey questionnaire was completed by 44 total respondents and the locations at which the survey and informal interviews took place ensure that archers of all experience levels were represented when gathering user data for the design phase.

The development phase of the app followed the Agile development methodology and was split into three sprints of two weeks each. At the end of each sprint a user feedback session took place to track and gather criticism on the current state and direction of the app development.

The questionnaire used for this end of sprint feedback is shown opposite (Figure 1). The questions are primarily designed to be quantifiable on a scale of 1-5 so that useful datasets can be produced based on this feedback (see results section). The first question is a qualifier question designed to filter out anyone who did not actually use the app, as some people were found to have just flicked through a few screens and never truly interacted with the design or functionality of the app. The data from any respondents who answered no to question 1 was discarded for the datasets in this report and subsequent feedback analysis.



UpShot App End of Sprint User Feedback Questionnaire

Please answer the following questions as truthfully as possible after having used the current test version of UpShot.

1. Did you manage to use the app to assist with your training?

Yes / No

2. Please rate how much you agree with the following statements about the app after you have used it.

Please circle only *one* answer per category.

The app is easy to use and has a natural flow:

1 – Strongly disagree / 2 – Slightly Disagree / 3 – Neutral / 4 – Slightly Agree / 5 – Strongly Agree

I like the visual presentation of the app:

1 – Strongly disagree / 2 – Slightly Disagree / 3 – Neutral / 4 – Slightly Agree / 5 – Strongly Agree

The app has all the features I need to complete a virtual archery tournament:

1 – Strongly disagree / 2 – Slightly Disagree / 3 – Neutral / 4 – Slightly Agree / 5 – Strongly Agree

The app would encourage me to practice archery more:

1 – Strongly disagree / 2 – Slightly Disagree / 3 – Neutral / 4 – Slightly Agree / 5 – Strongly Agree

I would recommend this app to someone who is new to archery:

1 – Strongly disagree / 2 – Slightly Disagree / 3 – Neutral / 4 – Slightly Agree / 5 – Strongly Agree

I would recommend this app to anyone who is practicing archery:

1 – Strongly disagree / 2 – Slightly Disagree / 3 – Neutral / 4 – Slightly Agree / 5 – Strongly Agree

3. Please use the space below to write any other feedback or suggestions you have for the app:

.....

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.....

.....

.....

Figure 1: End of Sprint User Feedback Questionnaire

This ongoing feedback during development was again carried out at two local archery clubs. The number of respondents to the questionnaire varied each two-week cycle, however, the data was normalised to give an accurate and comparable set of data for each set of feedback data. This ongoing testing directly contributed to the direction of the development during the next sprint cycle. Suggestions from question 3 (Figure 1) were also directly considered for the subsequent stages of development, directly leading to changes in the ways some features were implemented from the design document.

Finally, once the app was feature complete, an intensive in person user testing session was held. During this session the app was used by three experienced archers who had shown a desire and commitment to test the final app at an in-depth level for an extended period at a real club training session (consent forms for these three testers are shown in appendix 3). Their feedback was gathered in the form of final verbal feedback and a final opinion questionnaire was completed by each tester in the same format as the end of sprint questionnaire (Figure 1).

Unfortunately, the app was running on an iOS simulator on a laptop during all live feedback sessions as a sideloading capable iPhone could not be sourced for the duration of these sessions, however, the app was still functional and usable in this form so, besides making the feedback sessions have a larger time commitment, it is not anticipated that this significantly affected user feedback.

4. RESULTS

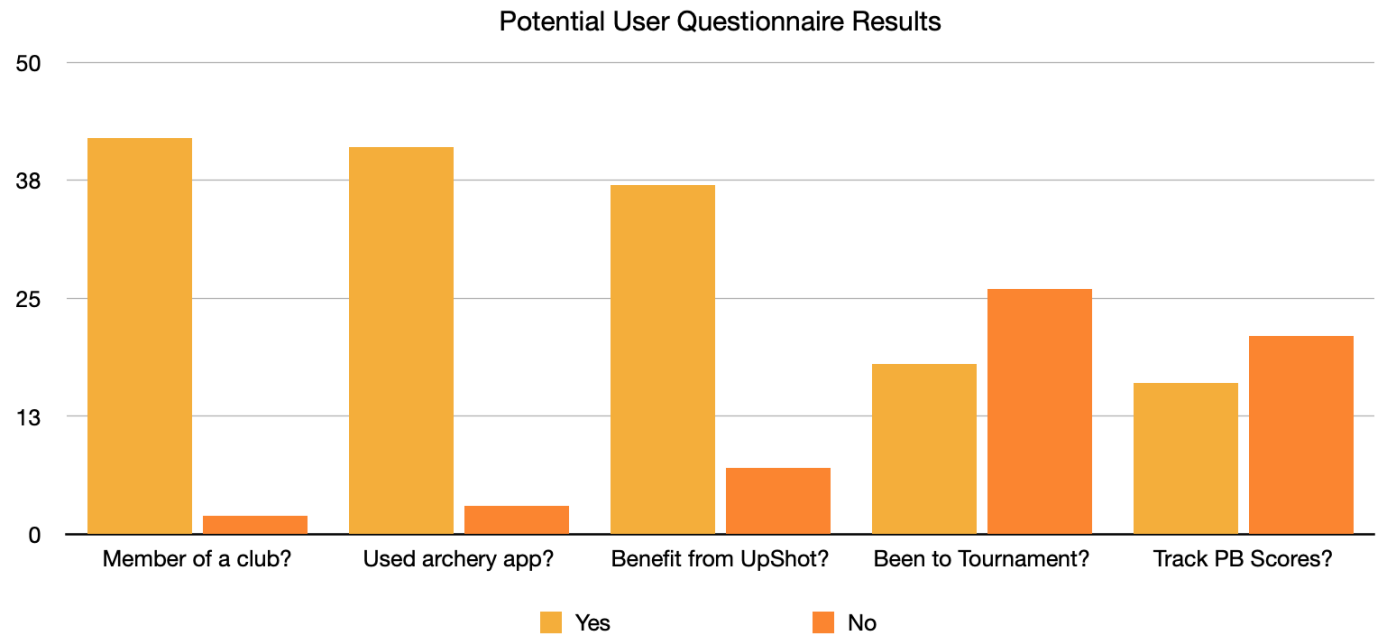


Figure 2: Potential User Survey Results Graph

The graph (Figure 2) and table (Table 1) represent the results from the initial user survey completed prior to the design phase of the app. This data was used to create a profile of the average app user, to assist with the design of the app, but also to guide user testing and ensure a rigorous testing strategy was enacted to keep the app relevant and appealing to this type of user. The significance of these results, along with others, is examined in the discussion section of this report.

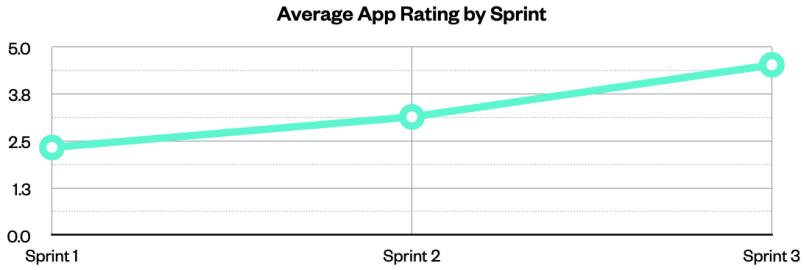
Potential User Questionnaire Results

	Yes	No
Member of a club?	42	2
Used archery app?	41	3
Benefit from UpShot?	37	7
Been to Tournament?	18	26
Track PB Scores?	16	21

Table 1: Potential User Survey Results Table

Total Rating by Sprint

Sprint	Responses	Total Rating
Sprint 1	69	2.3
Sprint 2	35	3.1
Sprint 3	59	4.5



Sprint 1

Question	Responses	Average Rating
A - Ease of Use	14	2.3
B - Visual Look	14	4.6
C - Features	13	1.8
D - Encourage	14	1.2
E - Recommend	14	1.7
	69	**2.3**

Sprint 2

Question	Responses	Average Rating
A - Ease of Use	7	1.9
B - Visual Look	7	4.5
C - Features	7	3.6
D - Encourage	7	3.2
E - Recommend	7	2.5
	35	**3.1**

Sprint 3

Question	Responses	Average Rating
A - Ease of Use	12	4.7
B - Visual Look	12	4.1
C - Features	12	4.9
D - Encourage	12	4.7
E - Recommend	11	4.2
	59	**4.5**

Figure 3: The Combined Results from the End of Sprint User Testing.

The above figures represent the combined results from the three end of sprint user feedback questionnaires. Each of the five questions in the questionnaire had a value of 1-5 assigned to each answer, with 5 being a positive response and 1 being a negative response. This data allows for the overall rating evaluation of the app to be tracked along with the five individual feedback categories during the ongoing development sprints.

Finally, the feature complete focus group results are displayed across, right (Figure 4). These results are from three experienced archers who reported, during previous user testing sessions, that they would be likely to make extensive use of the app. This data can provide a more in depth look at how an advanced user rates the app. The same survey was given to these three users as the ones above (Figure 1), however, they had much more time and access to the app to make their judgments.

Note: All data in the above section has been rounded to 1dp.

Focus Group

Question	Responses	Average Rating
A - Ease of Use	3	4.0
B - Visual Look	3	4.7
C - Features	3	3.3
D - Encourage	3	4.3
E - Recommend	3	4.7
	15	**4.2**

Figure 4: Results from Final Focus Group

5. DISCUSSION

Having extensive data before designing an app is a very important aspect of any app's success (Annanpera *et al.,* 2018). In addition, extensive user feedback and testing during, and after, development is key to ensuring that the final app is one which as many users as possible will find both useful and engaging (Black, 2018).

The goal of this user testing was to ensure that, within the limitations of a student project and the associated time and budget constraints, the final app would be as high quality as possible.

The data gathered revealed some very interesting insights and trends, which directly affected the direction of development and the final design and implementation of the project.

For example, an interesting insight from the initial potential user survey was that many more people than expected had already used archery apps (Table 1), with over 93% of respondents reporting mobile app usage specifically for the sport of archery. It is possible, however, that due to the large range of ages present at the archery clubs/tournament at which the survey was taken, and the clearly advertised fact that the survey was about a mobile app, that younger or more technology proficient archers may have self-selected to take the survey as it was of more interest to them. This has been shown to be an issue by previous studies in the area (Sedgwick, 2013), however, studies have shown that using a paper questionnaire should mitigate this confounding variable and much as possible, as was the case here (Ebert *et al.,* 2018). Even with these considerations, the higher-than-expected tech literacy/experience amongst potential users was an interesting insight design-wise. This allowed for the initial design to make some assumptions when it came to UI/UX design elements, for example. The opponent selection screen assumes that users will be familiar with swipe gestures and, therefore, forgoes any prompts about the feature. Later informal

user feedback during testing would show that this was a popular feature and felt natural and intuitive to use. This initial user testing guided design decisions and ensured that later user testing was better focused on fine tuning the app's design and functionality.

Interestingly, the further information provided on the questionnaire about this question revealed a gap in the market. Over 84% of the reported archery app usage was only for score recording/analysis apps (figure 5). It is hoped that this data represents a gap in the market for a good training aid app, as it is clear that archers are keen on mobile apps, but it would appear that there are currently few good app options in this area.

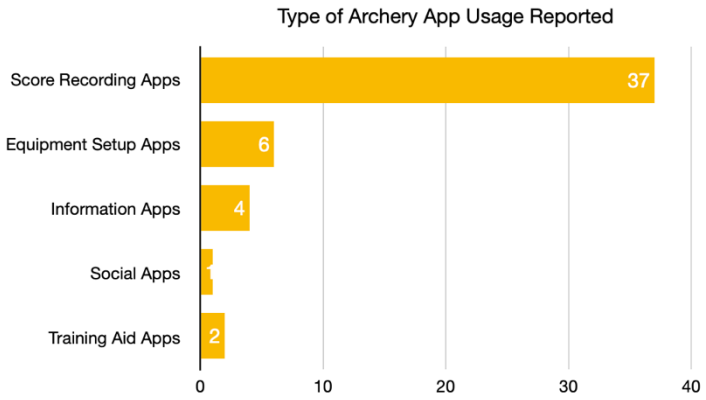


Figure 5: Archery App Usage Distribution.

The agile design process, followed here, gives excellent ongoing opportunities for user testing, with working prototypes of the final project available for user testing at regular intervals. Thankfully archery clubs also meet at regular intervals, providing a perfect environment for regular user testing and feedback.

As has been seen in the previous results section, and as would hopefully be expected, the app's average user rating increased appropriately over the development cycles. This is, of course, very positive, however the devil is often in the detail. When looking at answers to specific questions within the end of sprint user questionnaire (figure 1) some interesting trends and development anomalies can be seen.

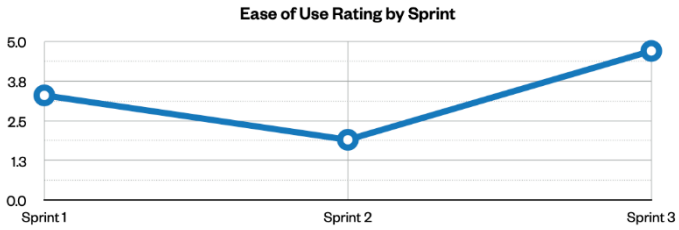


Figure 6: Average Ease of Use User Ratings.

For example, left (Figure 6) shows the average user rating for each end of sprint survey for the category of 'ease of use'. Interestingly, this started relatively high, with the basic app created during sprint 1 at 3.3, but dropped dramatically to just 1.9 during sprint 2. Upon further discussion with users who had taken the survey (thankfully opportunity was ample due to regular club evenings) it was revealed that the match view, of which an early version had been added during sprint 2, was confusing and difficult to use. Although the overall app rating had gone up, this was clearly an area of concern found in the finer details of the testing. Eventually, further testing would show that colouring all of the scoreboard numbers relative to the colours on an archery target, as per the original composite (figure 8) was making the view appear 'messy' and making it difficult to see the scores.

This led directly to a redesign of the final match in progress screen which can be seen in figure 7 (right). This view design endeavoured to be less confusing with the specific archery related arrow score colours only present on the user input, where it can help users pick out the correct score quickly and easily, but no longer present on the score cards where it just added visual clutter and confusion, according to user testing data.

This led to a sharp rise in average ease of use rating from the user testing in sprint 3, and revealed a much better design philosophy, which was also applied to other aspects of design used throughout the app.

This iterative testing data led design process was responsible for much of the apps final look and design. Unfortunately, further detailed discussion is beyond the scope of this report.

Note: Please see appendix 2 for other individually categorised user rating graphs similar to figure 6.

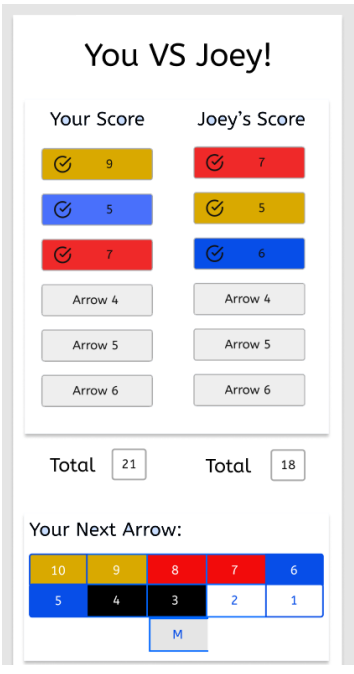


Figure 8: Match Screen Composite

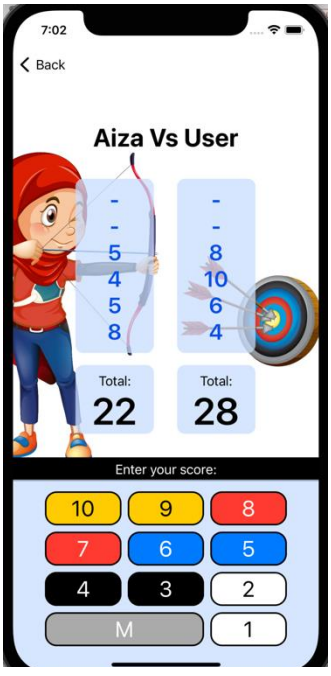


Figure 7: Final Match Screen

6. CONCLUSIONS

Thorough and regular user testing is usually essential to good app development. The user testing documented here has directly guided the incremental development of the app and led to a, hopefully, robust and highly user-focused app. Although the app is relatively simple, the user testing shows a gap in the market and, with future expansion in mind, this app may have a very exciting future indeed.

8. REFERENCES

Annanpera, E. Yli-Kantola, J. Sauvola, T. Heinonen, S. Siira, E. (2018) Testing methods for mobile game development a case study on user feedback in different development phases. *IEEE.* [online] pp. 1-8 [Accessed 14 May 2022].

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Ebert, J.F. Huibers, L. Christensen, B. Christensen, M.B. (2018) Paper- or Web-Based Questionnaire Invitations as a Method for Data Collection: Cross-Sectional Comparative Study of Differences in Response Rate, Completeness of Data, and Financial Cost. *Journal of medical Internet research.* [online] 20 (1), pp. e24-e24 [Accessed 14 May 2022].

Sedgwick, P. (2013) Questionnaire surveys: sources of bias. *BMJ.* [online] 347 (1), pp. 176 [Accessed 14 May 2022].

APPENDIX

APPENDIX 1: USER QUESTIONNAIRE

UpShot App Potential User Questionnaire

Please answer the following questions as truthfully as possible. Imagine you are a potential user of the new UpShot archery app.

The app is designed to give you a virtual opponent to shoot against in training sessions. Allowing you to have some fun battling against various opponents and gain a sense of achievement by winning matches and progressing your scores.

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1. Please indicate if you are currently a member of an archery club who shoots regularly.

Yes / No

2. Have you ever used an archery app before?

Yes / No

If yes, please specify which app: .....

3. Do you agree that you would benefit by more guidance in your training, such as a virtual opponent, tracking your scores and receiving rewards/achievements?

Yes / No

4. Have you ever shot in a real-life archery tournament?

Yes / No

5. Do you currently keep track of your personal best scores?

Yes / No

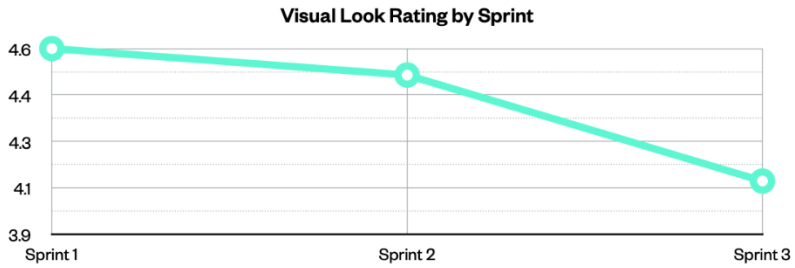
6. Please use the space below to write any suggestions for the app, such as ways in which you might like to use it, anything you would like to see in the app and anything that you think might spoil the experience of using the app:

.....
.....
.....
.....
.....
.....
.....
.....

APPENDIX 2: END OF SPRINT INDIVIDUAL CATEGORY USER DATA.

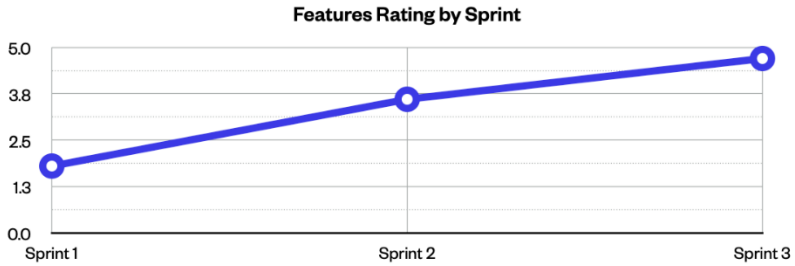
Visual Look Rating

Sprint	Total Rating
Sprint 1	4.6
Sprint 2	4.5
Sprint 3	4.1



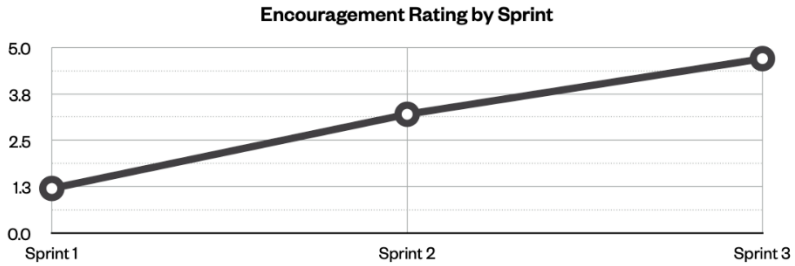
Features Rating

Sprint	Total Rating
Sprint 1	1.8
Sprint 2	3.6
Sprint 3	4.7



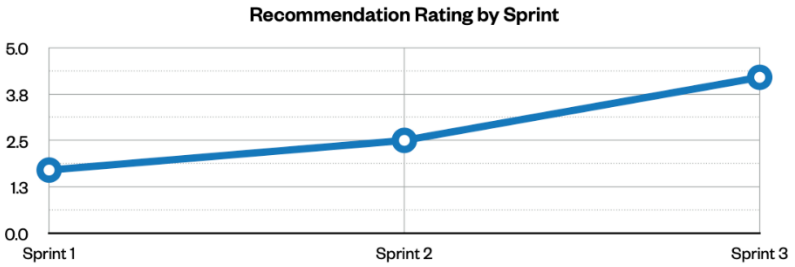
Encouragement Ration

Sprint	Total Rating
Sprint 1	1.2
Sprint 2	3.2
Sprint 3	4.7



Recommendation Rating

Sprint	Total Rating
Sprint 1	1.7
Sprint 2	2.5
Sprint 3	4.2



Mobile Applications User Testing Consent Form

Mobile Applications (UFCF7H-15-3):

User Testing and Feedback of a Mobile Application in Development

This consent form contains the Participant Information Sheet (above). Please ensure that you have read and understood the information contained in the Participant Information Sheet and asked any questions before you sign this form. If you have any questions please contact a member of the module team, whose details are set out on the Participant Information Sheet.

If you are happy to take part in testing and providing feedback on the "in development mobile application", please sign and date the form. You will be given a copy to keep for your records.

- I have read and understood the information in the Participant Information Sheet (attached below) before asked to sign this form.
- I have been given the opportunity to ask questions about the study.
- I have had my questions answered satisfactorily by the research team.
- I agree that anonymised quotes may be used in the final Report of this study.
- I understand that my participation is voluntary and that I am free to withdraw at any time until the data has been anonymised, without giving a reason.
- I agree to take part in the research

User Number... 25

Name (Printed)... MARK JOYCE

Signature... M. J. ... Date... 03/05/22

V.1 Lloyd Savickas: Module leader (09th December 2020)

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User Number... 24.....

Name (Printed)... Jayne Large.....

Signature... Large..... Date... 03/05/22

V.1 Lloyd Savickas: Module leader (09th December 2020)

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- I agree to take part in the research

User Number.....23.....

Name (Printed).....Megan Proctor.....

Signature.....Meg M..... Date.....03/05/22.....

V.1 Lloyd Savickas: Module leader (09th December 2020)

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