Final Report –

Prototype Design

CREATING MEANINGFUL EXPERIENCES

Applied Data Science & AI

Date

Breda University OF APPLIED SCIENCES

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Task 4.1: Create a Wireframe Prototype

V-1 Figma Wireframe

Final Presented Wireframe- https://www.figma.com/design/Luxg6iIuRrlPn3orn7v0j9/A-B-Nail_Classifier_Wireframe_235585_Kade_Widler?node-id=49-5167&t=hfwzJHu0gFwjDZru-0

I created my Figma wireframe prototype incorporating human-centered AI design principles by prioritizing user autonomy, transparency, inclusivity, and ease of interaction.

After opening the application, a clear entry screen welcomes users. I give users multiple options to engage (continuing as guests or registering) offering flexibility based on users' comfort levels and willingness to share information (or not).

Additionally, I include several disclaimers throughout the application. The disclaimer about medical advice provides transparency, aligning with ethical AI practices, and clearly communicates limitations to manage user expectations and build trust.

Next, the design emphasizes simplicity and clarity, using straightforward navigation with clearly labeled buttons ("Analyze," "Causes," "Solutions," "Symptoms"), enhancing usability, especially among older demographics who might prefer simpler interfaces.

Moreover, incorporating visual confirmation and confidence scores in the diagnostic results empowers users with clear understanding of AI predictions, improving interpretability. Providing actionable follow-ups, like contacting professionals or learning more about nutrition, aligns directly with user needs and promotes informed decision-making, emphasizing user-centered utility rather than technical complexity.

Overall, These design choices collectively ensure that the app respects users' contexts, provides valuable insights transparently, and maintains usability—fundamental to effective human-centered AI.

Task 4.2: Think-Aloud Study

A. Method

Paper Wireframe

I created a Wizard of Oz wireframe based on my previous Figma wireframe and brainstormed ideas. I used the information I have learned from research to implement a basic paper wireframe that served as the best application for my business objective. I have developed the paper wireframe and have evaluating questions I will conduct after the user completes all tasks. I will record this, transcribing in teams.

I will conduct the think aloud session first, by giving a basic explanation of the app:

“My app NutraNail analyzes nail images and provides information relating. I’m evaluating how intuitive and useful my nail classification app is. Please verbalize your thoughts clearly as you perform each task interacting with the paper wireframe as if it is a real app.”

I will then give a clear explanation of what I expect from the user:

1. Explore all aspects of application.
2. Explain thought process as you use application.
3. I will not interact unless very necessary (outside of flipping pages based on interaction).

To start, I will have the user read out the user definitions and understand who they will identify as. Based on this wireframe I have prepared two user definitions of my target market. These definitions serve as a starting point for the user (my peers) to understand and utilize the thinking of these users.

User 1-
“Dorothy. Yep, 40 week pregnant mom, aged 33, is getting ready to adjust her life greatly with her fun, goofy hospital. A life of a lot of partying, fun and diverse experiences. Dorothy and her husband are now transitioning into a new stage of life. They want to prioritize health and care for the new family member, enjoying their new lives.”
(Transcribed)

User 2-
“Gail, Seventy three year old grandmother who lives by herself in a quiet suburban home. Gail has started to feel to real her age with new aches and aches and pains. Gail wants to improve her health, longevity in order to observe more of her beloved grandchildren’s lives. She has a lot of free time and intense to experiment with new healthy practices.”
(Transcribed)

Next I have developed the paper wireframe with specific tasks for the users (my peers).

Task 1: Submit picture as guest for analysis.

Task 2: Find information about zinc deficiency, supplements, and diets.

Task 3: Register account and explain why you chose a free or paid account.

Task 4: Explore premium features.

After conducting the tasks, I will ask the following questions:

Usability and Clarity:
Was there anything unclear or confusing?
Did you feel stuck while using the application if so where?

Business and Monetization:
What made you choose or not choose premium prescription?
Do premium features justify the cost?

User and Trust:
What information would you share?
Would you trust the app’s information?
If you were diagnosed what would you do?

B. Data

(Jeroen User 1)

Transcript Notes:
User intuitively navigated application.
Initially confused by iPhone home screen (will remove)
Liked confidentiality and disclaimer. Saw it is not 100% effective said he expected it would be (might remove this specific wording but include other disclaimers).
Liked how model showed how it made decisions.
Demonstrated strong trust in the app’s diagnosis due to the clearly displayed accuracy/confidence scores.
Would act on high-confidence predictions; skeptical if accuracy scores were low (specifically changing diet)
Comfortable sharing all information (age, gender, diet, medical history), believing it directly impacts accuracy.
Liked comparisons in deficiencies and how sources were present (should include all on one page).
Really liked premium particularly highlighting the health progress tracking feature and communication with real doctors. (“Would definitely choose” premium especially if health is declining or has bad health in general).

How to improve:
Will remove home screen.
Remove 100% wording.
Stronger emphasis on diet.
Illustrate or explain that providing information improves predictive capabilities.
Stronger premium awareness of features and ability to purchase.

(Omar User 2)

Transcript Notes:
Could easily navigate app.
Uses gallery instead of taking a new image within the app.
Likes feature of transparency showing how image was predicted.
Really likes Premium features and chooses to chat with AI doctor.
Confused with differences between zinc and what supplements are.
Thought price was really good and was main reason he said he would get premium. Especially the feature to talk to an actual doctor was very impressive.
Would provide information that would increase model performance and trusted the model (would act on the models analysis).

How to improve:
Should introduce the various deficiencies to begin.
Spread information over more pages, might of been cluttered (make easier to use).
Increase cost of premium or more realistic features.
Illustrate clearly increased information improves performance.

(Stan User 3)

Transcript Notes:
Understood and navigate app easily.
Would want to know how app made decisions.
Liked confidentiality and disclaimers.
Used gallery didn't take new picture and appreciated the transparency on how app made decision.
Prioritized Accuracy and would trust more if higher accuracy or with additional professional opinion.
Would not purchase premium without initially trying apps features a few times.
(Premium features' value propositions should be clearly and visibly communicated.)
(Trust was cautiously optimistic, emphasizing the app as a preliminary tool rather than a standalone diagnostic method. Explicit accuracy scores and severity indicators effectively reinforced trustworthiness and clarity in the app's supportive nature.)

How to improve:
Clearly articulating premium subscription benefits upfront.
Ensuring explicit labelling of app limitations (not standalone diagnosis) to reinforce user trust.

Similarities in observations:
1. The navigation and UI was intuitive but contained cluttered screens.
2. The confidentiality of personal information, including disclaimers of medical applications, strong premium features, transparency of how model formulated analysis with accuracy metrics were critical in user confidence, and the ability to upload image of gallery were stand-out, positive features.
3. Users would submit additional info to improve model performance.

C. Results

1. Clear and Transparent Communication is Crucial:

Users highly valued transparency in the app, especially concerning diagnosis confidence scores. Clearly presenting accuracy, limitations, and the supportive role of the app significantly improved user trust and acceptance.

2. Premium Features Need Strategic Positioning:

Users perceived premium offerings as valuable but hesitated without a thorough evaluation period. Thus, clear demonstrations, free trials, or explicit explanations of benefits would strongly enhance premium adoption.

3. Initial User Experience Needs Simplification:

Reducing clutter and increasing clarity on initial screens significantly impacts user confidence and reduces initial confusion. This refinement will boost intuitive navigation, user satisfaction, and overall usability of the application.

D. Discussion

Based on the findings from this study, I have identified three areas for improvement: clearer and more transparent communication is needed to increase user trust, presentation of premium features should be adjusted to encourage user interest, and the user experience needs simplification to reduce clutter.

To start, the feedback clearly indicated a need for a more simplified and intuitive interface. To address this, I will focus specifically on decluttering the initial screens, reorganizing buttons and features more clearly, and refining the layout to reduce any initial confusion users encounter.

Second, users highlighted the value and attractiveness of premium features, yet expressed hesitation due to uncertainty about committing without fully understanding their value. To address this, I'll enhance transparency and more clearly communicate premium benefits. Specifically, I plan to incorporate an introductory free trial or demo of premium features, which will allow users to experience the full value before subscribing.

Lastly, users expressed a strong willingness to share personal information if it directly improved the accuracy of the model. Based on this, I'll clearly emphasize within the application how providing additional user information (e.g., age, diet, or medical history) directly enhances prediction accuracy and personalization. By explicitly illustrating this link, I aim to further enhance user trust and encourage active engagement, thereby significantly improving the app's performance and user experience.

Overall, I will improve on the findings of this study to validate or improve my design by decluttering screens, including stronger emphasis on premium features adjusting the features, price, include a free trial, and illustrate specifically that providing more information will increase model performance,

Task 4.3: A/B Testing

A. Method

Based on the results of the think-aloud, I made changes several changes to my design including decluttering, awareness that information provided will increase accuracy, and increased transparency with the model showing how it makes predictions. I believe these changes would increase both user experience and trust in the application.

However, due to mixed feedback on the premium features, it was important to test possibilities here specifically. On one hand, there was a lack of awareness of premium features, on the other, users would like to try out the app before buying a premium. The implementation of premium features is essential to creating feasible business value, while it is equally valuable to provide users with a professional experience focusing on medical solutions. I must implement changes to the premium features that improve user experience, not decrease the quality of support they receive. Thus, it is important that I implement the pop-up for premium features correctly.

In order to do this, I decided to implement changes to the premium and free account features: unpaid users can only access image analysis. If an unpaid user chooses to learn more (or any other premium feature), they will be transported to a screen showing premium features, encouraging users to subscribe.

I chose to implement this change to reduce clutter and change how the premium features are introduced to users. This change in accessibility between premium and free accounts makes premium features clear and decreases clutter for free users. Overall, this change tests whether users prioritize a strong emphasis on premium

features. I hypothesize that users users will find the hypothesized version more structured, easier to navigate, and will be more likely to understand and consider premium features after the change.

Plan-

I have created two identical surveys (only difference is link to respective wireframe):

Version A- https://forms.office.com/Pages/ResponsePage.aspx?id=m1gzCjYA6E-oKT7Qkmr4hlziVVIH8pJJtA1RxDjk8UtUMUVIRkMxNk9GOUMzTjRPMjJPUVFOTzVVQS4u

Version B- https://forms.office.com/Pages/ResponsePage.aspx?id=m1gzCjYA6E-oKT7Qkmr4hlziVVIH8pJJtA1RxDjk8UtURUMxUDM4RlRNM0VXNkk0OVczWkNPVEtTVy4u

Instructions include:

Thank you for participating in my A/B test! Please go to the following wireframe (respective link) and execute the following tasks: Act as someone concerned about their nail health:
1) Open the app, continue as a guest, and upload an image for diagnosis
2) Continue as a guest and learn more about your diagnosis
3) Repeat the steps with a paid account.

Please answer the questions below:
Note that 1 is completely disagree, 4 is neutral, and 7 is completely agree I have asked the following questions:

I have asked the following questions:
1) I understood what I could use the app for.
2) I found the application intuitive to use.
3) I thought the application was useful.
4) I enjoyed using the application.
5) I understood what features were included in the premium version.
6) I would consider using this app in the future.
7) I felt confident in the diagnosis given by the app.
8) I would recommend this app to someone concerned about nail health.

B. Data

Folder- https://github.com/BredaUniversityADSAI/2024-25c-fai1-adsai-KadeWidler235585/tree/main/AB_test/AB_test_results
a-https://github.com/BredaUniversityADSAI/2024-25c-fai1-adsai-KadeWidler235585/blob/main/AB_test/AB_test_results/AB-test_HCAI_Version_A(1-14).csv
b-https://github.com/BredaUniversityADSAI/2024-25c-fai1-adsai-KadeWidler235585/blob/main/AB_test/AB_test_results/AB-test_HCAI_Version_B(1-14).csv

I first removed outliers from the data set. I did this through inspection of individual inspections, removing instances where time spent was less than 30 seconds. These submissions did not inspect my wireframes and would provide noise to the results.

I downloaded the data, and without accessing the descriptive data, I noticed higher overall scores for the hypothesized wireframe. The most surprising was the results of question 5: I understood what features were included in the premium version, which yielded the lowest scores. Due to these questions aligning most significantly with the variable I was testing, I further evaluate this data.

Based on this initial observation, I hypothesize the timing of premium features is not the issue, but the specific content on this page could be confusing or misleading.

C. Results

T-test notebook- https://github.com/BredaUniversityADSAI/2024-25c-fai1-adsai-KadeWidler235585/blob/main/AB_test/AB_test_results/W8-T-Test-Student-Notebook.ipynb

Based on my A/B test analysis, the difference in means between Version A and Version B for the question "I understood what I could use the app for" is statistically significant.

In calculating the ShapiroResult statistic, all questions except "I understood what features were included in the premium version" (I ran the Independent Samples T-test) were not normally distributed. Due to these results, I ran the bootstrapped version for these questions.

After conducting these additional tests, only the results of "I understood what I could use the app for" was statistically significant.

Normality tests:
Version A: ShapiroResult(statistic=0.7226825126004124, pvalue=0.0006411046699304922)
Version B: ShapiroResult(statistic=0.42848107310775296, pvalue=1.7121153687553384e-06)
These results showed the data is not normally distributed, thus making the normality assumption violated.

Bootstrapped Independent Samples T-test due to assumptions being violated:
TtestResult(statistic=-2.3709959134552756, pvalue=0.025434764470257352, df=26.0).
The p-value below 0.05 means that I reject the null hypothesis that there is no difference between the means of the two groups for this particular question.

D. Discussion

A p-value of 0.02543 indicates that there is only about a 2.5% probability of observing a difference as extreme as shown if there were no difference between Version A and Version B. This means that the means between the two versions of this specific question are different enough to exclude the chance of being the cause. So, because the hypothesized version has a higher average score and is statistically significant, then it works better for this measure—users are significantly more likely to understand what they could use the app for.

Based on these results, my original hypothesis that users would find the hypothesized version more structured, easier to navigate, and more likely to understand and consider premium features after the change was somewhat true. I believe the tested separation between features in the free and paid versions made the app's use more obvious. Users who were able to perform multiple app functions (paid version) were more aware of the app's features compared to free users. The data concludes the app became significantly more useful due to this change. However, the connection between app usefulness and premium features is not conclusive.

After conducting A/B testing and analyzing the results, I will implement the hypothesized version as my functional wireframe. However, due to a small sample size of 14 instances for each test, a relatively low average time spent on the tests (~4 minutes with outliers), and an uncorrelated hypothesis and statistically significant question, the results could be biased and unrepresentative.

Task 4.4: Create a Final Demo Video

https://github.com/BredaUniversityADSAI/2024-25c-fai1-adsai-KadeWidler235585/blob/main/Final/Nail_Demo_235585_Kade_Widler.mov

References

(ChatGPT, 2025)

Games

Leisure & Events

Tourism

Media

Data Science & AI

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Logistics

Built Environment

Facility

Mgr. Hopmansstraat 2
4817 JS Breda

P.O. Box 3917
4800 DX Breda
The Netherlands

PHONE
+31 76 533 22 03
E-MAIL
communications@buas.nl
WEBSITE
www.BUas.nl

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