# Fish! Prototype Evaluation

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## Usability Heuristics

**1. Consistency and Standards:**
The game will be implemented on an Android watch. It will follow the criteria for consistency provided by the Android developers (like Material Design) so that it looks consistent with the other Android watch applications.

**2. Visibility of System status / Feedback / Design for responsiveness:**
The main aim of our system is to provide immediate feedback whenever the user bites his nails. This will be achieved by the watch vibrating whenever the water level in the game decreases that is as soon as the user bites his nails. When the user opens the game on watch he can clearly see the number of times he bit his nails in that day versus the limit he set and also his score till that day by swiping right. When the fish dies that is the user fails to meet goal the watch vibrates three times. Thus the user is always aware of the system status.

**3. User control and freedom**
The game will give the user the freedom to set his own goal of maximum number of times nail biting is allowed for the day. This is because each user will have different frequency of biting nails. Also the user can turn off the notifications and vibrate mode for this application whenever he wants. This puts the user in control.

**4. Match between system and the real world / Consistency with User Expectation**
The game app is easy to understand and its theme matches many games that are currently available. The water level decreases every time user bites his nail and if all water is depleted (when the user fails to meet set goal) the fish dies which matches the real world. The application will need to have clear, easy to understand instructions which are as concise as possible as the game is implemented on a watch rather than a computer screen.

**5. Error prevention**
This standard refers to error prevention on part of both user and developer. The game will be tested to make sure that it doesn't crash or give error on all edge cases. The game has only one user input where user can specify the goal for the day. The user will be asked for a confirmation to make sure that this input was not an error

before committing. If the user forgets to set a goal till a particular time like 11 am, the user will get a notification asking to set a goal. Also, error message will be generated if the user sets the limit above a certain value (max limit allowed will be 20). For instance, if the user tries to set limit as 100, it is most likely a mistake and an error message will be generated.

**6. Recognition rather than recall**

As the game is in a watch it will have as few instructions as possible. In case the user wants some more information it will be provided in the menu. The current score and number of incidences of nail biting will also be accessible by swiping right. The user will not have to remember these details.

**7. Flexibility and efficiency of use / Universal usability**

Flexibility and efficiency of use refers to the requirement that all types of users should be able to use the application easily and efficiently. The game will be very basic so that all users can easily understand. To reduce user input and effort, the game will have only one user input and four screens which require swiping right. (There cannot be links for the screens on each page as the watch has very small screen)

**8. Aesthetic and minimalist design / Simplicity**

As mentioned before, implementing the game on a watch requires that there be as few instructions and dialogue as possible. The game will try to convey the information through images. For instance, the performance of the user for the month is given through a color coded chart as shown rather than the actual scores.

**9. Help users recognize, diagnose, and recover from errors / Reversible actions**

The user will get the option to change his set goal till 11 am for that day so that he can recover from error. All notifications and confirmation messages will be shown in an easy to understand language and color scheme.

**10. Help and documentation**

Due to space issues in a watch, the detailed instructions for the game need to implemented in a website. The link to the website will be shown in the settings. The instructions on how to play the game and the information and functionality that each screen wants to convey will also need to be included in website.

# Usability Metrics

**1. Task Performance metrics:**

- Task success:
  The goal of our project is to reduce nail biting by providing immediate haptic feedback (watch vibrating) and also encourage the user by using a game that provides both positive reinforcement (the fish grows and more customizations become available) and negative reinforcement (the fish dies if the user goes beyond set goal). Since we cannot yet determine if the user wearing the watch is biting his nails or just lifting his hand using the apple watch, we will be using a wizard of oz approach to determine the task success. This way we will be able to observe whether the immediate haptic feedback works or not too.
- Time taken to reduce nail biting:
  We can determine the number of days required to reduce the instances of nail biting to certain amount like 50 % and so on by taking average of all the user experiences.
- Learnability:
  We can determine how the effectiveness/performance of the app or game varies over time. For instance- Does the app help to reduce nail biting to 60% very quickly and then reduce the nail biting at a much slower rate? or Is it only effective when the user is new to the game and then stops producing results as user gets used to the haptic feedback and negative reinforcement.

**2. Issue-based metrics**

As mentioned earlier, our experiment will be wizard of oz and hence there needs to be an observer that watches the user interact with the prototype. The severity of an issue could be high, medium or low based on how much it affects the user experience and how many of the users are affected.

*The observer from our team will look for the following issues:*

o What creates confusion for the user: Can the user understand the aim of the prototype and the game?

(Medium severity as not many users will be confused by the same functions)

o What prevents the user from using the game: The game requires that the user set a goal for the day or it produces a notification asking the user for one. What causes the user to stop playing the game and ignore these notifications?

(High severity- Anything that causes the user to stop using the app needs to be addressed immediately)

o What produces an error: Is there any case when the app crashes or the game behaves in a way it is not supposed to?

(Medium severity- depending on the error the severity could be medium or severe)

o What happens when user performs a wrong action? Is there a way to undo such mistakes?
(Low severity- The app has only one user input and there are not many chances for the user to perform a mistake)
o Can the user understand how to navigate the various screens in the game?
(Low severity- Navigation of this game is similar to other apps on Android watch. Hence there will be very few users who will face this problem)
o What are the various possible misinterpretations or misconceptions of the users?
(High severity- The app will not work if the user doesn't understand that the water level in the app is proportional to the number of nail biting instances)

**3. Self-reported metrics:**
These metrics are subjective to the user and depend on what the user feels about the prototype rather than on actual data collected by an observer.

- User satisfaction:
  The user will report his/her satisfaction with prototype. Does he enjoy the game? Is it pleasing and fun or does the user get bored after a few days? Instead of the observer guessing why the users seem interested/uninterested in the game, the users could provide their own suggestions.
- Effectiveness:
  The observer can only count the number of times the user bit his nails but only the user can report how many times the user stopped biting his nails midway because of the haptic feedback or because he was worried that he would lose in the game. Which of these two is more effective can also be decided by the user only.
- Efficiency:
  The users could have tried other methods to overcome their nail biting. They could then report how efficient and effective this prototype is compared to the other methods.