

Aesthetics of Interaction - Individual Pictorial



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INTRODUCTION

The concept of aesthetics of interaction is more than mere visual appearance in design. It is a way of designing where the interactions and functionality of a product are central. For example, it uses the Frogger framework [3] to couple action and information through feedforward and feedback systems, claiming that enough interaction couplings result in an intuitive design, which allows a design to convey its affordances [1]. It also makes use of a variety of methods and techniques to test and discover these affordances, such as experience prototyping [2], interaction labelling [4] or Soma design [5].

DESIGN PROCESS AND FINAL DESIGN

First iteration

The first iteration of the design process was a rain box combined with an umbrella (figure 1). The idea was that users would wake up to the sound of rain falling on the umbrella imitating rain falling on your tent. This was because the chosen setting was in a forest. The first iteration did not have any interactions besides closing the umbrella, so it greatly lacked functional feedforward using the Frogger framework [3]. Users also could not set the time yet in this prototype given that it was overall very low-fidelity. After testing this concept using experience prototyping [4], it showed that the design lacked feedback mechanisms for interaction confirmation [3], as nothing happened when one closed the umbrella.

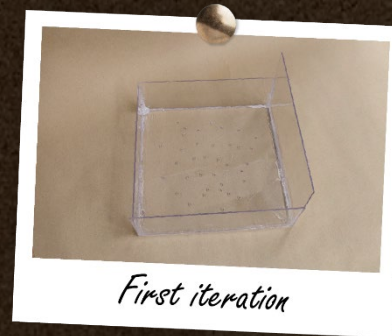


Figure 1. First iteration – rain box with umbrella

Second iteration

The second iteration was an alarm clock with an integrated wake-up scene selector (figure 2). Users could choose between waking up to the sounds and scents from either the forest, city, beach or none (off). It was a simple rectangular box with a digital screen including two knobs: on the front users could set the time by rotating and pushing the knob, and the one on the side was used to select your wake-up environment. Considering the lack of functional feedforward and lack of interaction in general, the design now made use of these knobs showing not only functional, but also inherent and augmented feedforward [3].



Figure 2. Second iteration – environment selector alarm

Small exploration

Based on the first two iterations, an extreme character was created [2]. This extreme character is a nature enthusiast who loves adventure and going camping in the woods. This persona was used to create a small exploration (figure 3) into the possibilities of an open-and closing flower concept. This concept is considered an exploration rather than an iteration because of its low fidelity and lack of sophisticated interactions. However, it is important to mention that this design explored the affordances [1] which results were used in next iterations. This design consisted of a flower-like alarm clock mounted on either a wall or ceiling. Users could turn the flower to set the time and fold the petals together to turn it on or off. The affordance discovered in this exploration was the interaction of rotating the flower to set the time. To make the turning more intuitive, cut-outs were made in the petals of the flower indicating its spinning ability.

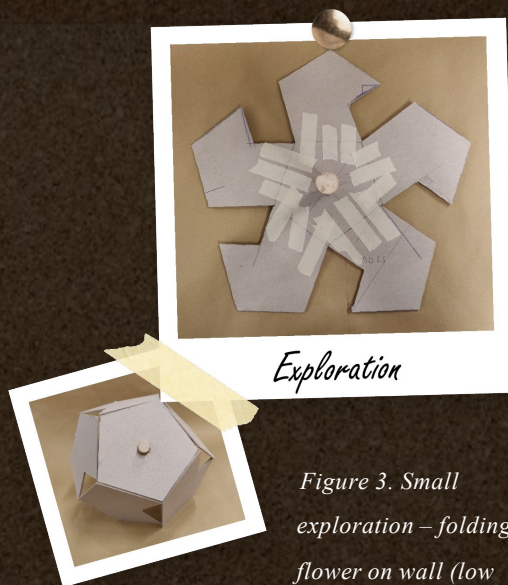


Figure 3. Small exploration – folding flower on wall (low fidelity)

Third iteration

The third iteration was a combination of the first and second iteration and the first small exploration (figure 4). For this design, the physical rain element was used again as well as the flower-like shape with its petals having the ability to open and close. This design would hang from a ceiling to allow the water to fall. A digital interface was once again used to show the time. Using interaction labelling [2] to explore its functionalities, it turned out that the design lacked inherent feedforward [3] that the flower could be turned, as the flower hanging from a ceiling with wire showed to be counter-intuitive to the fact that it could be rotated to set the alarm. The cut-outs from the small exploration were dropped because it compromised the functional feedforward of a flower too much. Another important learning point was that the digital alarm clock did not match the extreme character.



Figure 4. Third iteration – folding flower with rain element (hanging)

Fourth and final iteration

In the final iteration (figure 5), the extreme character was used again this time keeping in mind the preference for analog interactions. To translate this into the final design, a sun dial was created instead of a digital screen, capturing the naturistic experience from a nature enthusiast. Besides, the flower now turned into a calathea plant, having the natural ability to open its leaves during the day and closing them during the night. The extreme character created would be familiar with this plant, so the affordance of the shape changing interface [1], being the closing and opening of the leaves suggesting the ability of turning it on or off, would be clear to this persona. Besides, the element of waking up to sounds used in the previous iterations was used again. Users could select the sounds by folding the leaves separately, ranging from rustling leaves to rainy weather. However, it became clear during demo day that the leaves lacked feedforward showing that they could be used to select the sounds, as there was no augmented feedforward indicating that it had something to do with sound. Also, the interaction of rotating the plant to set the time did not have the most obvious affordances, but this would become clear once the light petal was flipped up to set the time. This made it a discoverable interaction which suited the adventurous character of a nature enthusiast. On the next page the final design will be shown with a bit more detail.

Figure 5. Final design
- Sun leaf shining on sundial

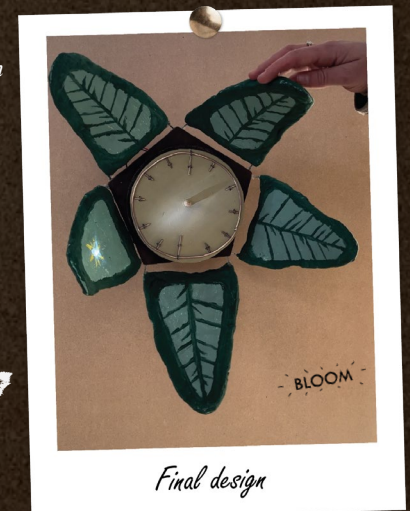


Figure 6. Calathea plant –
Used as inspiration for final
design.



Figure 7. Folded Bloom –
Bloom in a closed state in
the night. You can see the
electronics for the light leaf
on the back.

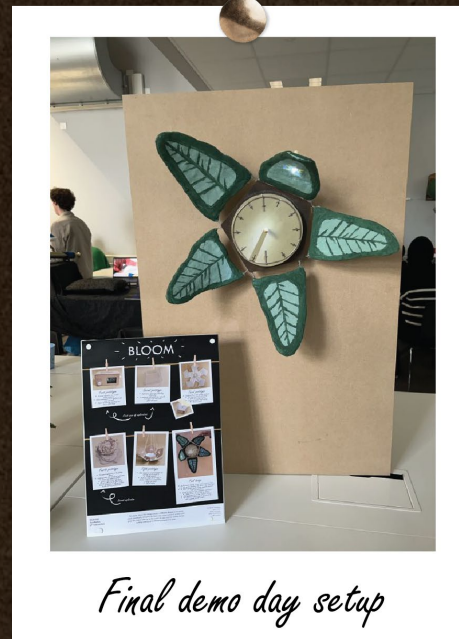


Figure 8. Final demo day setup – You can
see the light leaf casting a shadow on the
sundial. To set the sounds, users need to
play with the angle of the other leaves.



Figure 9. Light leaf – Light leaf
with augmented feedforward [3]
to show its functionality.

CONCLUSION

I believe that the “Aesthetics of Interaction” is not just about integrating visual cues, intuitive interactions or affordances. I believe it is also about creating experiences that are not only functional, but also meaningful and delightful. It encompasses the emotional aspects of how users perceive and engage your product. A well-designed product in my opinion not only functions smoothly, but also elicits (positive) emotional responses from users. In the case of Bloom, the design perfectly fit the naturistic characters from a nature enthusiast, creating a holistic experience related to the emotions of the user. It makes the user really feel as if they are waking up in a green environment.

LINK TO VIDEO

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=BUELBRWJ4OI](https://www.youtube.com/watch?v=BUELBRWJ4OI)

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REFERENCES

- [1] Marianne Graves Petersen, Majken Kirkegaard Rasmussen, and Johan Tretvik. 2020. Affordances of Shape-Changing Interfaces: An Information Perspective on Transformability and Movement. In Proceedings of the 2020 ACM Designing Interactive Systems Conference (DIS '20). Association for Computing Machinery, New York, NY, USA, 1959–1971. <https://dl.acm.org/doi/10.1145/3357236.3395521>
- [2] Marion Buchenau and Jane Fulton Suri. 2000. Experience prototyping. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '00), Daniel Boyarski and Wendy A. Kellogg (Eds.). ACM, New York, NY, USA, 424-433. DOI: <https://dl.acm.org/doi/10.1145/347642.347802>
- [3] Stephan Wensveen, Tom Djajadiningrat, and Kees Overbeeke. 2004. Interaction frogger: a design framework to couple action and function through feedback and feedforward. In Proceedings of the 5th conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '04). ACM, New York, NY, USA, 177-184. DOI: <https://dl.acm.org/doi/10.1145/1013115.1013140>
- [4] Tom Djajadiningrat, Bill Gaver, and Joep Frens. 2000. Interaction relabeling and extreme characters: methods for exploring aesthetic interactions. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '00), Daniel Boyarski and Wendy A. Kellogg (Eds.). ACM, New York, NY, USA, 66-71. DOI: <https://dl.acm.org/doi/10.1145/347642.347664>
- [5] Vasiliki Tsaknaki, Madeline Balaam, Anna Ståhl, Pedro Sanches, Charles Windlin, Pavel Karpashevich, and Kristina Höök. 2019. Teaching Soma Design. In Proceedings of the 2019 on Designing Interactive Systems Conference (DIS '19). Association for Computing Machinery, New York, NY, USA, 1237–1249. <https://doi.org/10.1145/3322276.3322327>