

Ghibbles

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Studio Ghibli is a renowned Japanese animation film studio known for its distinctive animation style, storytelling and themes. Our webapp has been created to tackle the lack of information accessibility of movies, even on official websites. By creating an interactive webapp, we have aimed to provide a visually engaging way to gain more knowledge about the contents of Studio Ghibli movies. With our project, users were satisfied with the visually pleasing interface and found it informational, as intended.

1 Introduction

Studio Ghibli is an animation studio based in Japan, founded in 1985 by various filmmakers. The company is renowned for its distinctive hand-drawn animation style, storytelling and themes. Not many outlets spread knowledge of Ghibli Studio's phenomenal works, including Ghibli Studio's website. Therefore creating a webapp that visualizes different parts of Ghibli movies while also showing how separate Ghibli movies connect would help people appreciate Ghibli works further. Even people simply wanting to introduce themselves to the movies would achieve the goal if the users learned something new about Ghibli.

In the dynamic landscape of multimedia and information dissemination, the Ghibbles project aims to present a new way of exploring and experiencing Studio Ghibli's cinematic universe. This paper delves into the core principles, methodologies, and innovative design choices that underpin Ghibbles, a web-based interactive information visualization platform dedicated to Studio Ghibli enthusiasts and curious minds alike.

About Ghibli Studio

Studio Ghibli, renowned for its enchanting animated films, holds a special place in the hearts of audiences worldwide. However, the conventional ways of accessing comprehensive information about the studio's vast cinematic repertoire are limited, as

observed through Ghibli Studio's official websites (Tvorun & Pascaru, 2023). A lot of the information also relies on fan-made contributions or is not accessible to the public outside of Japan. This not only limits the accessibility of information regarding the movies for both regular viewers and fans but might also overwhelm anyone wanting to get to know the franchise.

Our Solution

How can we enhance the accessibility of information regarding Studio Ghibli movies to provide a more seamless and enjoyable experience for casual viewers and dedicated fans? Through our proposed solution, we aim to address the limitations observed in conventional access methods, ensuring that individuals interested in exploring the magic of Studio Ghibli can do so effortlessly. By streamlining the information retrieval process and minimizing reliance on multiple unstable sources, our goal is to create a user-friendly platform that caters to a diverse audience, fostering a deeper connection between fans and the captivating world of Studio Ghibli. Considering the above problems with accessing information about Studio Ghibli movies we have identified, we formulated the following main research question:

Which design elements/strategies should be implemented in an interactive webapp to help recommend users specific Studio Ghibli movies?

To help answer this main research question, the following sub-questions were made:

- *How can an interactive webapp dedicated to Ghibli movies be designed to enhance user engagement and promote a deeper understanding of Studio Ghibli's films and their content?*
- *What are the different ways in which a user can interact with virtual bubbles?*
- *What kind of interactivity in webapps works best for engaging with film-related content?*

The primary target audience encompasses two distinct user groups: Studio Ghibli enthusiasts and individuals curious about the studio's cinematic universe. The platform is designed to cater to a broad age range, embracing those with varying levels of familiarity with the studio—from avid fans to newcomers.

We created Ghibbles to close the information gap, aiming to create an immersive, user-friendly, and visually engaging platform where users can explore intricate connections with a focus on characters in our project. In order to contribute new knowledge to users and fit Ghibli Studio's atmosphere, we have used a visual representation technique wherein data is presented through 'bubbles'. This choice aligns with standard network visualization practices, using circles to represent data relationships intuitively. By mimicking Ghibli's recurring bubble theme, we enhance visual appeal and integrate seamlessly with the studio's unique aesthetic, resulting in a visually engaging and conceptually resonant platform for knowledge dissemination.

The design goals for Ghibbles include creating an inclusive and accessible platform that accommodates diverse needs, preferences and technical proficiencies of users, fostering exploration, learning and enjoyment. The main intention of Ghibbles is to expand users' knowledge of Ghibli Studio by allowing them to find links between Ghibli movies and to experience and interact with a product that fits Ghibli Studio's atmosphere, all in one place.

2 Material & Methods

We used a mix of waterfall and circular methodology. Therefore, we first started researching and brainstorming solutions for our product. Then, we started designing and implementing. We did this procedure three times, where we thought of new solutions and improved the design and implementation after the user evaluations.

To design, we used Figma. This way, we could collaborate online. Furthermore, Figma is widely used in web design, and since Ghibbles is a webapp, we thought it would suit accordingly.

As our coding program, we used JavaScript, primarily with P5.js and jQuery. HTML with CSS was utilized to handle other parts of the code. This is because we wanted to base the webapp online and through a URL for easy accessibility.

Google Sheets was used as a database to store all the data shown in the webapp. This was because it made collaborating on the database most accessible to the team and because a more intricate database would require more extensive Javascript backend code, which was considered excessive considering the project's constraints.

3 Results and Evaluation

3.1 User Evaluation Process

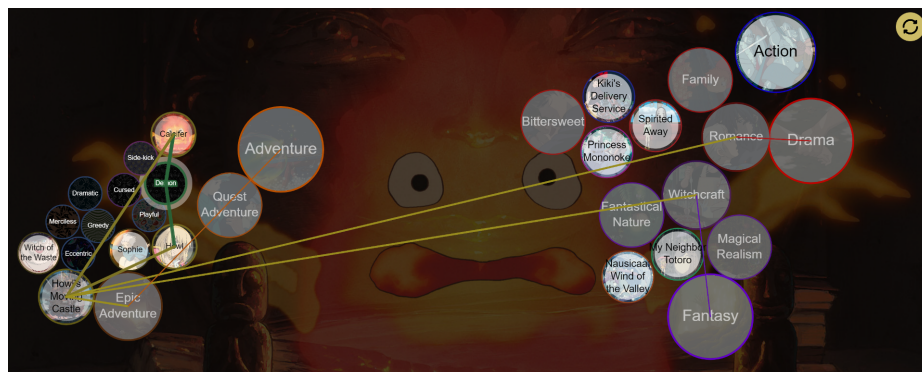
Evaluating the prototype was done through usability tests and surveys. Specific criteria were created using Nielsen's Ten Principles (Aela Editorial, 2022) in which there was one of the following principles to focus on: *suitability* of Ghibbles functions about their outcome, *learnability* of Ghibbles function in how to use specific functions and *error tolerance* of making mistakes in Ghibbles' functions.

Each criterion was classified as usability testing, survey, or data analysis. For the data analysis criterion, it is through an analysis of both usability tests and surveys that a conclusion was drawn up. A criterion could be: "Time Spend Correcting Errors", for example. Through these criteria, usability tests and surveys were conducted and analysed to understand Ghibbles' strong and weak points. Usability tests had tasks

Discussion of improvement came through multiple sources: feedback from users, brainstorming, and literature inspirations. Ideas for users are helpful to get ideas, however must be critically thought over to see their feasibility. Brainstorming often leads to final decisions about what should be implemented. Moreover, the final literature inspiration would show what had been implemented in the industry and what should generally work as a standard.

1. Initial User Evaluation (December 5-8.12.2023)
2. Second User Evaluation (December 15-18.12.2023)

This section will highlight specific interactions and usability components seen through the evaluations and what has been done to address specific problems. *Figure 1* shows Ghibbles after having implemented feedback from the Initial User Evaluation.



In all User Evaluations, users noted that Ghibble's interface was visually appealing without interacting with it. In the survey, all users who have watched Ghibli movies noted how Ghibbles matched Studio Ghibli's atmosphere, while the remainder had not watched any Ghibli movies and therefore could not compare.

The left-click interaction to pop bubbles was easily grasped. Users explained it was due to the left-click being a universally used action, and the front screen's instruction

clearly instructed them to use the left-click. The right-click interaction to remove bubbles was less understood, as the survey shows an average of 88% comprehension. To tackle this, two features were implemented before the Second User Evaluation: the cursor changes icon when hovering over different bubbles and the beginning instructions were made more explicit through bigger sizes and better contrasting colours.

Users expressed increased interaction usability, as seen through how the observation tasks took less time between the two User Evaluations. For example, finding specific bubbles went from a 21-second average to 14 seconds. This could be due to the later mentioned improved user satisfaction, but also to the introduction of the reset button and beginning tutorial features implemented after the Initial User Evaluation.

Users also expressed increased satisfaction through less frustration with their faster task completion and visual interactions. They have said the application was fun to use, especially with the newest auditive 'pop' sounds implemented in Ghibbles and the more vibrant colours applied to each bubble. This noted how these new implementations contributed to the overall improvement in usability and navigation.

The educational aspect of the web app was mostly well-received, where all users noted in the survey felt they had learnt something new, even if it was not by much. The observations and survey showed that users could distinguish groups of bubbles with their sizes and colours, but primarily through their retention of knowing which bubbles came from which bubble through their clicks. Most clearly, however, were the coloured lines between the bubbles. All users understood that the links signified connectivity between the bubbles, especially with how the colours suited the bubbles. However, this came at the cost of visibility, as prominently pointed out in the survey.

The most significant point of improvement received related to accessibility and clutter. Distinct colours grouped bubbles together and showed relations, which makes less accessible to colour-impaired persons. While this was improved in the Second Prototype through the change of colour brightness and sizes, this feedback persisted after the Second Evaluation. The task users found most problematic was finding a link between two bubbles. Through observations, it was seen that this task took the longest due to how cluttered the web app would become after the user would make many bubbles appear. The bubbles would move around, and since there would be many of them, it would overwhelm users and make them unable to focus on the task.

4 Conclusion and Discussion

4.1 Conclusion

The first sub-question was answered by portraying themes of Ghibli Studio in Ghibbles, the product. Therefore, the theme of bubbles was used, as that is portrayed

in Ghibli movies, and was consequently confirmed after user surveys. Looking deeper into Ghibli Studio's atmosphere showed other themes of Ghibli, including vibrant colours and expressiveness, which were implemented through the bubble's colour outlines and movement.

The second sub-question was answered by looking at the possible interactions with the Bubbles. At first, all different keyboard interactions were considered: right and left mouse clicks, swiping, button pressed, and holding down buttons. However, to keep the system's learnability high, the system had to stay simple, which concluded with the system utilising mouse movement and left and right mouse clicks. Therefore, finding ways to group similar bubbles using Gestalt's rules, but also by ensuring that users could click and have visual feedback, and keeping the users engaged by allowing the bubble to have movement. The user feedback of using auditory feedback was well perceived and implemented to increase interaction.

The third sub-question was answered by understanding how data should be appropriately portrayed on screen. Therefore, the linked lines had different line thicknesses and colour brightnesses. What data would be used was also researched, as we want to show the users enough information about the movies and not overwhelm them with too much data. Therefore, information about Ghibli movies was restricted to their characters.

To answer the main research question, design strategies that correlate with Studio Ghibli movies were found. Users look for Studio Ghibli's distinctive style when it is included in the theme of the web application. The results from user evaluations showed that the Ghibli-inspired designs were effective, shown primarily through the bubble interface metaphor, which was positively validated by users who found the web app's interaction enjoyable and agreed that it coincided nicely with the freeing and fantastical atmosphere associated with Studio Ghibli.

4.2 Discussion

The user evaluations were useful to see if certain design elements met expectations. Using bubbles as a data and aesthetic element worked, as users could read the information from the circle and understand their function as 'bubbles'. However, they were less reinforced than expected. Therefore, finding ways for the bubbles to seem more 'bubble-like' and the data to be clearer had to be improved, which was how their colour outlines became more vibrant and their movement algorithm was re-implemented.

Remarks on the interaction visualisation, accessibility and readability were received throughout the user evaluation process, notably regarding the bubble's text legibility and clutter. A dark overlay was set on the bubble's images to ensure the bubble's text was legible. It took considerable time to find a good opacity range because the

bubble's images had to be visible to keep the system aesthetically pleasing. The bubble's movement was considerably slowed down to keep the clutter down.

Appendix 1 displays the initial requirements and feature list. *Appendix 2* shows the updated list after some features were removed or added due to time constraints, limitations in abilities or feedback received from user evaluations. Removed features included bubble trembling, menu tab, link modes and progress management. Bubble trembling was removed to declutter the system. The idea of using a menu tab was scrapped entirely. Instead, a beginning instructions screen was used despite how it was noted that a menu tab would make the system easier to use. This decision was made because no menu tab would allow Ghibbles to become more immersive once the user is in the main web app and not be distracted by side buttons, and also because the beginning screen was a more intuitive and straightforward manner to teach users the ropes of how to use the web-app.

The goal of Ghibbles was two-fold: to educate users and to make them appreciate Ghibli's works. Through the evaluations, Ghibbles successfully allowed users to interact with Ghibli's works and subsequently appreciate them. However, educating users on the intricacies of Ghibli's works was lacking. This may be because the bubbles have limited space to show information, and therefore, complex understandings of Ghibli's works cannot be explained to users with such constraints. Therefore, the interactivity and fun aspect of Ghibbles came at the cost of educating users more profoundly about Ghibli's works. Due to time constraints, Ghibbles' data was restricted to solely Ghibli movie characters. If Ghibbles extended its data to include bubbles about objects, symbols, and environments of Ghibli movies, that could educate users more about Ghibli. This would need to address Ghibble's clutter issue, as more data and, therefore, more bubbles would need to be utilised.

5 Future Work

In our Project Plan, more intuitive information about Studio Ghibli movies was to be included, such as themes, motifs and symbols which are a central parts of the movie franchise. However, due to time limits, we decided to focus only on just characters. This decision enabled us to focus on another crucial element in the franchise with greater detail but, at the same time, let go of an interesting data set. This allowed us to perfect the software and background technical mechanics first, therefore heading to a "quality over quantity" methodology. In the future, more approaches considering the themes, motifs and symbolism in the Studio Ghibli franchise should be considered.

Furthermore, in our design document, we aimed to create a save state for an interface that makes it easier for the user to follow their progress and be up to date with the progress of their interaction. This would have been a nice addition to our web application, but unfortunately, due to time constraints, we could not implement it.

Future iterations could also explore additional features based on user feedback. This includes improved bubble movement, color contrast issues and, most importantly, cluttering issues. With more time, we would have liked to implement a smoother bubble movement by finding the optimal moment of numerical fields contributing to the movement or completely re-implementing the algorithm. By more exploration into color contrast issues, we would have enhanced visibility further to help the bubbles have further distinction, which in turn would help users interpret the displayed data. We also would have liked to improve cluttering issues on the screen with features like automatic popping, zooming in or out, links and clarity with bubble pop-ability features. These features would allow the visible bubbles to become less intrusive and therefore be less overwhelming to users.

Lastly, collaboration with Studio Ghibli or other official platforms could enhance the web app's credibility and expand its potential user base.

References

1. Editorial Aela. (2022, September 2). Nielsen's Heuristics: 10 Usability Principles To Improve UI Design - Aela School. Aela School - Where Ambitious Designers Thrive. <https://aelaschool.com/en/interactiondesign/10-usability-heuristics-ui-design/>
2. Tvorun-Dun, M., & Pascaru, N., (2023). Environmentalism polluted: consumerism and complicity in Studio Ghibli's media mix. *Journal of Cultural Economy*. DOI: 10.1080/17530350.2023.2225548

Appendix

Appendix 1. Requirements and feature list

Feature	Description
Bubble	
Bubble holds data	Bubble Id, Name, Image, Color
Bubble has different states	Popable (active), un-popable (inactive)
Bubble can pop children bubbles	Genre, subgenre, movies, types, instance, attribute
Bubble can unpop children bubbles	Reset
Bubble has links between other bubbles	Link is shown through a (dotted) line
Bubble moves around as a bubble	Dynamic movement around the platform
Bubble can tremble	Natural inclination towards a specific direction
Bubble can be linked	A line can be drawn between two bubbles
Linked bubble can tremble towards each other	
Bubble stay somewhat close to one another	A specified anchor point of bubbles around the parent bubble
Parent/child bubbles are	

close to each other	
Related bubbles use gestalt principles	
First bubble pops into the genre bubbles	
Menu/interface	
Menu tab / legend	All possible data/color/lines is specified here
Dynamic menu tab	Menu tab dynamically shows what is currently on screen
Menu tab has clickable items	Clickable items affects what happens to the bubbles
Can set different link modes	1. See all link 2. See no links 3. See links only when hovering above a bubble
General	
System has beginning tutorial	Start bubble will show all possible actions that can be done to a bubble
Save progress	User clicks through bubbles, exits webpage, and when they come back, the same bubbles are popped
Bubble progress	Shows all bubbles that were popped to lead to certain bubble

Appendix 2. Current Feature List

Feature	Description	Enhancements
Bubble		
Bubble holds data	Bubble Id, Name, Image, Color	• Increasing text size and improving color contrast. • Implemented line breaks for titles with multiple words to enhance visual clarity. • Applied only relevant photos for each bubble category • Characteristic state does not show the photo on the background for clear visual indication • Considering the aim of our web application is to create connections between movies and finding more information, we have prioritized the inclusion of additional movies in our database. Furthermore, we have decided to focus on main and supporting characters only, to optimize data quality and relevance, This strategic emphasis aims to enrich the user experience by offering a more comprehensive and relevant selection for exploration and analysis.
Bubble has different states	Popable (active), un-popable (inactive)	Clearer visual cues for understanding states between bubbles and whether they are unpopable or poppable

Bubble can pop children bubbles	Genre, subgenre, movies, types, instance, attribute	
Bubble can unpop children bubbles	Reset	Implied strategies for reducing bubble clutter Clear indication of reset and unpopping/popping states by more emphasis on these features in the beginning tutorial
Bubble has links between other bubbles	Link is shown through a line	Color coded links between bubbles for clear distinction
Bubble moves around as a bubble	Dynamic movement around the platform	Optimized the design to minimize excessive movement of bubbles, contributing to a more user-friendly interface.
Bubble has interaction sounds	Audio Feedback	Auditory feedback with distinctive sounds associated with bubble interactions to augment the user experience.
Related bubbles use gestalt principles		• Addressed color contrast issues to enhance distinction between bubbles • Addressed hierarchy clarification by changing colour brightness and saturation per bubble level and the bubbles' sizes. • Assigned unique and distinguishable colors to each bubble border for improved

		recognition
First bubble pops into the genre bubbles		
Bubble stay somewhat close to one another	A specified anchor point of bubbles around the parent bubble	
Parent/child bubbles are close to each other		
Linked bubble can tremble towards each other		
Menu/interface		
Reset button	Erase progress and reset status	In the event of excessive visual complexity, the user has been equipped with a reset button, facilitating a streamlined means of initiating a fresh start within the interface. This feature serves to minimize cognitive overload and enhance the overall user experience by promptly restoring the system or application to its

		initial state, thereby optimizing usability and reducing potential confusion arising from information overload
General		
System has beginning tutorial		Introductory bubble to guide users through the interface