Unfathomed Voyager: The Design of Real-Life Cooperation Game

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Abstract. Unfathomed Voyager is a real-life cooperation game. Three guests are in a group, and each guest has a control panel with different functions. Unlike most collaboration games appearing on the AppStore, Steam, or other platforms in which players get the same information from an instruction and try to solve the problem together, our guests will receive different instructions that may or may not belong to their own control panel from their monitors, so they need to share the instructions they have with their teammates rapidly in an intense game environment. Information exchange is the key point in this game. There is also some physical cooperation in the game, such as switching stations. By doing it, they can complete the mission and find the blobfish in the deep ocean.

Keywords: Transformational playground · Real-life game · Cooperation game

1 Introduction

There are millions of people who play video games every day on PCs or smartphones. It seems that playing video games with each other makes them get closer. However, the truth is that they rarely talk to each other after the gameplay. It's a significant problem of video games that players are actually isolated with their friends and the real world by the screens. It is a common agreement that the goal of a good game is to let guests reinforce the relationship between each other and also have fun in their real life. So, Unfathomed Voyager aims to reinforce the relationships between players in the real world and let them have fun. As for reinforcing the relationship in the real world, we strongly agree with the idea that people can learn how to communicate and collaborate with others in a game which is also the instinct of human beings. In daily work, people always have different information and ideas, so how to share the information they have with others efficiently is essential to a team. Also, people always have a better relationship with people who communicate more with them. People also choose to trust the people who share the correct information with them. So, our guests can actually get closer through continuously talking and responding to each other. As for letting our guests have fun, we provided a pretty intense game environment so that the whole gameplay is in chaos! We designed to show instructions to our guests just for 15 s each. So they need to respond quickly and then yell out the instruction or operate the

panel as soon as possible. Through the observation, every play-tester got more and more excited during the gameplay.

2   Related Works

People have often compared Unfathomed Voyager to Spaceteam [1], a popular mobile game with a similar gameplay system. In Space Team, players work together to fly a spacecraft. To do so, they all have a unique set of buttons and switches along with one instruction. The instruction tells the player to set one button or switch to a desired value, but that button or switch may or may not be their responsibility, and therefore they must communicate to make sure that instruction is followed quickly. Buttons in Spaceteam don't make sense. Although each button has a different name, but the name has no connection to the game scene. There is no end state to Spaceteam; there are only ends to stages, giving players some sense of progress and reward.

To research more possibilities of physical interaction, we also played Spaceteam Card Game [2], a card game version of Spaceteam. In Spaceteam Card Game, besides exchanging cards, interactions like switching positions, pulling one player back to table and muting one player were actually inspiring for us.

3   Design Method

3.1   Brainstorm

From the start, we knew we wanted to use Phidgets as our platform, mostly because our team was lacking in programmers compared to other teams, and knew Phidgets were simpler to work with than AR, VR, or the like. Phidgets are simple pieces of electrical hardware, like buttons, switches, dials, and keypads, which can detect real-time input and feed that into a computer. There are dozens of different kinds of Phidgets, ranging from simple ones like switches and touch sensors to more complicated ones that can measure ambient temperature or infrared reflective sensors. We wanted to use a variety of different types of Phidgets, so as to make as lively a gameplay experience as possible, but figuring out a good way to put those Phidgets to work was more tricky. Ultimately, we found that a gameplay experience like the one presented in Spaceteam would translate best to a variety of Phidgets.

Spaceteam was definitely a starting point for much of our design, but we wanted Unfathomed Voyager to have an endpoint, since the play experience is different for the two games; Spaceteam, as a mobile app, may be played any number of times, but Unfathomed Voyager, as a game existing only in a festival, would likely only be played once or twice per person. With Spaceteam, players can keep playing and see themselves last longer and longer the more they played, but if we did the same with Unfathomed Voyager, players would be less likely to know if they did well or not after leaving the game. It wouldn't be immediately apparent to them whether the average team made it to stage two or five or ten, and so it would be harder for them to feel a sense of triumph as they left. Thus, creating a state of success and a state of failure

would be much better at communicating to the guests whether or not there truly was cause for celebration.

Another key differentiation from Spaceteam was the input. In Spaceteam, most of the input comes in the form of buttons with a handful of sliders and dials thrown in. We knew that if we wanted Unfathomed Voyager to really be successful, we'd have to embrace the Phidgets, which suggested more varied and engaging input, even if all the symbolism and teamwork were stripped away. Therefore, we gave each player a wide variety of different types of input with no more than two controls using the same device per player, and no more than three with the same device across all players. We also decided not to give every player the same set of Phidgets so the game would feel different depending on which set of Phidgets they received. Also, many of the input devices in Spaceteam would follow the form of an instruction saying something that ordinarily wouldn't be solved with a button, yet there is a button somewhere with a label that makes sense. For example, one instruction in Spaceteam is "Entertain passengers," which requires one player to find a button labelled "passengers" emblazoned with the word "entertain." This input wouldn't work in Unfathomed Voyager, since the Phidgets are too small to write on, and thus the verbs in the instructions would have to be much more indicative of the relevant input device, like push, set, or change, not entertain.

We also wanted Unfathomed Voyager to tell a story, and we considered many options, like that of a barista taking complicated coffee orders or a mad scientist bringing a monster to life. Eventually, we were set on using a submarine to fetch something. We settled on fetching a blobfish because two of the team members who worked together previously meant to use a blobfish in a prior game, but had to cut the blobfish due to scope. Thus, the two felt compelled to avenge the blobfish species by bringing one here. This also fit the fun, silly tone of the game, but it presented a potential issue: what if the players felt bad capturing a blobfish and taking it from its home? The story would have to be constructed in such a way that players would feel like capturing the blobfish was a win-win scenario, so the dialogue was written to portray that the blobfish was bored of living in the sea and eager to start a new life as a crazy oceanographer's companion.

3.2   Player Transformation

According to The Transformational Framework [3], there are some types of transformation, such as knowledge, skill, behavior, belief, relationship and so on.

Unfathomed Voyager focuses on the relationship between players. Can they have a stronger connection after playing Unfathomed Voyager? Do they communicate more? Are they in a better status after playing the game? How can we achieve the transformation? These were questions we asked ourselves when we developed and playtested the game. One of our main purposes in building Unfathomed Voyager was to incentivize guests to communicate more so that they were able to have a good relationship with each other. The basic requirement of the game we designed is that players need to communicate and exchange the information, and by doing that, they can win. There are two kinds of communications in the game: the first is talking about the strategies to win, the second is sharing the instruction. We created a platform to let our guests talk to

each other and change their relationship. Through observation of players during the ETC festival, we found it was interesting that nearly all of the guests couldn't stop talking after playing the game. Some of them talked about how to cooperate, and some of them talked about the strategies. Nearly thirty percent of them wanted to play again. And also, our guests could be divided into two different kinds, the first kind of guests were strangers, and they didn't know each other before playing the game; another kind of guests were friends, and they were familiar with each other. In the beginning, we hoped that our design could let them trust each other and strengthen their relationship. But how can they trust each other? Sharing the one hundred percent correct information is the key. Every guest in the game needs to follow the instructions from other guests, even though they don't know each other. During the gameplay, nobody doubted that the information from others was wrong, and they all chose to trust. We designed the mechanic to transmit the information secretly, so that everything people said was correct.

3.3   Storyline and Interest Curve

What's more, to design this game, we created a clear storyline that an old oceanographer needs three warriors to achieve his dream: catching a blobfish. The interest curve [4] was also considered (see Fig. 1).
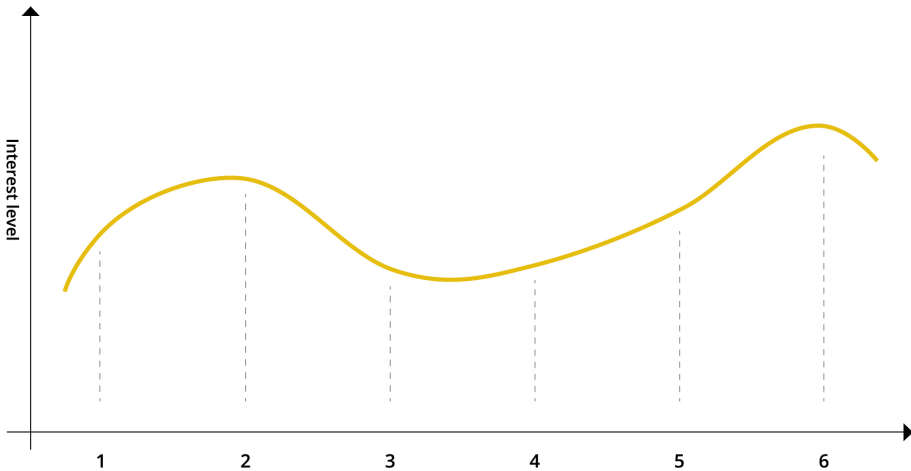

Fig. 1. Interest curve

1. We designed to let the oceanographer tell the background story to our guests by using funny animations and a humorous script. This is the first impression we deliver to our guests and raise their interest in the coming gameplay.
2. After guests choose their avatars, they need to create a team name which aims to let them know that they are a team from now on.

3. According to the playtest, we found that at the beginning, most of the playtesters were overwhelmed by the complicated control panels. So, we designed to give them some time to get used to their control panels before the instructions show up.
4. The difficulty of the game is from normal to advanced. In the beginning, the interface is very clean and polished, but if the players make too many mistakes, the screens become cracked and red and water starts to seep in.
5. We designed a common task which needs to be done simultaneously: Switching the stations. At the transition between the first and the second plot, guests need to switch the stations and get familiar with another control panel as quickly as possible. Switching stations and the melting interfaces push the game to its climax.
6. Finally, they find the blobfish and return her to the oceanographer, and that is the end of the interest curve.

3.4 Playtesting and Iteration

In very early versions of Unfathomed Voyager (see Fig. 2), players had different roles; some would see instructions but not be able to carry any out, and others would never see instructions, but be able to follow instructions.

Fig. 2. Initial version/Playtest

We quickly found that depending on each player's personality type, there would be one role they'd enjoy, and one role that would either bore them or make them anxious, and it wasn't apparent to players before starting which role would appeal to them more. Since this led to half the players having a bad experience, we redesigned the game so that every player could both see and follow instructions (see Fig. 3).
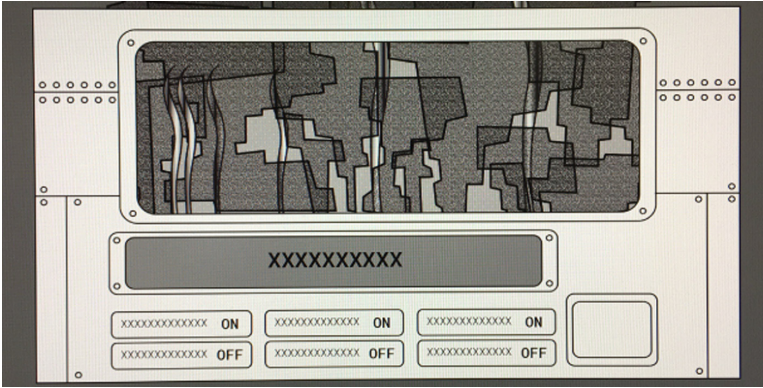
Fig. 3. Iteration

Another problem we had noticed was that many players either didn't realize that not all instructions they saw applied to them or that not all players saw the same instructions. We altered some instructional text to mitigate these issues.

Players also weren't noticing the vast majority of their screens during the main gameplay, because they were so focused on the instruction bar. They were so focused to the point that if they saw the game when they weren't playing it, they'd barely recognize the main gameplay screen, aside from the one instruction bar. This meant that they didn't notice the indicators of the current values of all their controls or the bar that showed the current health state of the submarine, which can provide great clarity during the game (see Fig. 4).
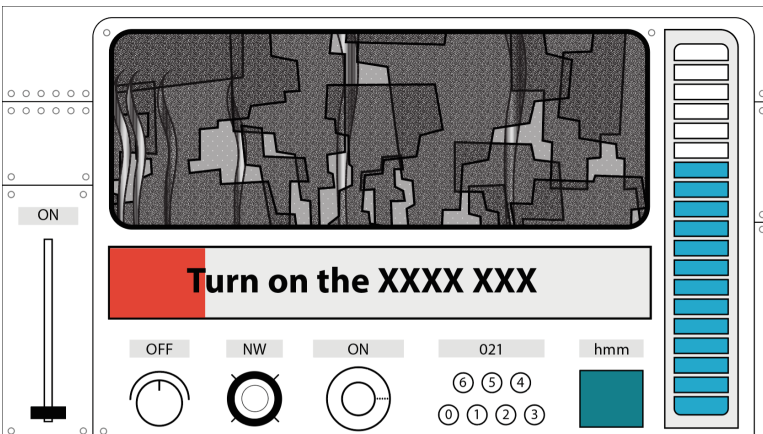

Fig. 4. Iteration (Health bar)

To solve this, we added a period in the beginning of the gameplay when players are encouraged to explore their controls and the interface without consequence, which solved the problem.

We realized that during the gameplay period, the interest curve was getting a bit flat halfway through, which prompted the inclusion of the intermission period in the middle and the station switching, which gave players a new station to look at, keeping the gameplay fresh. We also liked the collaborative tasks of Spaceteam, but felt like a task that required everyone to act should feel more impactful, which is why we made sure that starting the autopilot (which triggers the intermission and the end state) was a collaborative task, asking all players to do one thing that everyone had on their control panel: press the zero button, representing the amount of work they'd have to do in the next 15 s. Not only did this create more variation in the gameplay, but also the act of running to a new gameplay was often a source of smiles and laughter, which was very refreshing after a minute of players screaming at each other to set the piezogauge to 0.7, push the life support, or spin the spinning thing.

4   Implementation

We used Phidgets as the input and combined all the elements in Unity3D with three monitors for guests and one big screen for the audience. The monitor for guests shows the status of the control panel and the instructions. The audience screen shows the real-time score and the whole process of gameplay, which can let the audience engage in the gameplay. We also used laser-cutting to make the control panels. Each control panel contains five or six phidgets.

The main game uses a list of scriptable objects, each representing one task. Each task object contains a task message, corresponding Phidget, type of variation (range of values, cardinal direction, list of words), and all the variations possible (e.g. integers between 0 and 3, the eight main cardinal directions, or minimum/average/maximum). For example, a task may have the message "Set the exhaust gas temperature to _", Phidget slider 2, variation is a list of words, and those words are minimum, average, and maximum. Tasks are chosen semi-randomly (tasks that were completed via operating a Phidget shaped like a box that had to be rotated to a correct orientation came up twice as often as any others, since we learned that this was the most fun Phidget to operate), and the game checks for their completion by storing Phidget input as a variable showing the value of the control, and compares the value of that variable to the value the task demands. For example, if the task from earlier required the exhaust gas temperature to be set to average, the program would first take in slider 2's value, which is a float between 0 and 1, 0 being all the way down and 1 being all the way up. It would convert that to an enum for relative exhaust gas temperatures (0–0.03 → minimum, 0.03–0.4 → low, 0.4–0.6 → average, 0.6–0.97 → high, 0.97–1 → maximum), and checks to see if the resulting enum is average, as the task requested. If it was, the task would be completed, the submarine would get a temporary speed boost, and a new task would be chosen. If the task wasn't completed within 15 s, the submarine would shake, the instruction bars for the player who was supposed to operate the exhaust gas temperature and for the player who was supposed to

communicate that the exhaust gas temperature needed changing would flash red, showing they did something wrong in the one part of the screen they're most likely to look at.

The reasoning behind the names of the different controls was twofold: firstly, they had to make the players feel like they were really piloting a submarine, and secondly, they had to contribute to the humorous tone of the game. Most of the controls have names that sound like very technical pieces of equipment, but are actually fake words. The piezogauge is one example of this. In reality, there's no such thing as a piezo-gauge. However, piezo - as a prefix means pressure, and the suffix - gauge means measure, and a device that measures pressure would likely be right at home in a submarine. This also created some fun moments for players who didn't speak English as their first language, who would often remark that their English wasn't good enough for this game, but when they found out these names weren't words in any language, they'd usually be very surprised and amused. Also, every control panel had at least one control that didn't appear particularly useful, such as attitude, paint color, and the 'spinning thing'. These were added mainly to break some tension that may be caused by three players shouting at each other; having your two teammates scream at you to carry out different tasks can be stressful, but if they're screaming at you to "change your attitude to freaking out," the absurdity of that demand took away some of the anxiety. Overall, the names of all the controls were made to make the game seem real, but still make the journey feel more humorous than hardcore.

To emphasize the game experience, we focused on the word "submarine" and integrated game content, user interfaces (see Fig. 5), control panels (see Fig. 6) and the decorations of the game room.
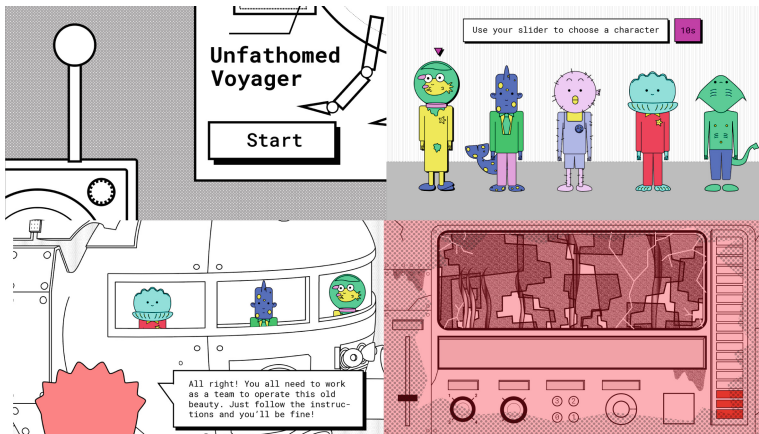
Fig. 5. User interfaces

The story happens in an old submarine, so that all the elements we put into this game have the sense of a submarine. To simulate and amplify the feeling of being in the submarine, the interfaces we designed look like the windows in the submarine. And
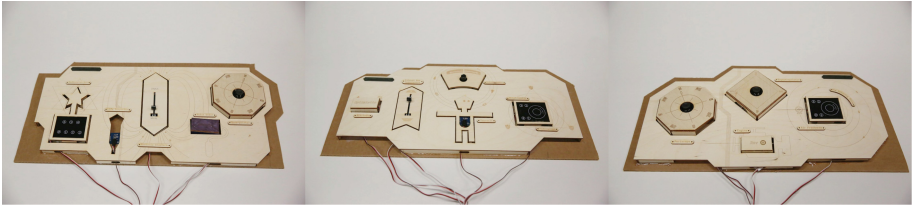
Fig. 6. Control panels

also, we used the same windows to decorate the game room. All the decorations, game interfaces, and animations have the same art style. As for control panels, all of the functions are related to operating a real submarine. We linked the operations with the interfaces by showing the status of control panels on the players' screens, which also makes the game more like driving a submarine in real life.

5 Conclusion

We followed a rigorous pipeline to design Unfathomed Voyager, through research, brainstorming, paper prototypes, iterations, and final presentation. We refined the interaction in gameplay and gave all the operations meanings. During the process, we did a lot of playtests. Playtests are always the most helpful tool to let us know the details which need to be improved.

After three rounds of playtests and iterations, we brought the unconventional and innovative experience to nearly 200 people at ETC festival 2018. For ETC Festival, we introduced experience design methodology and location-based entertainment theory into our game and decorated an ETC office as an submarine (see Fig. 7).

Fig. 7. Room decoration

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