Interpersonal Communication using AR Avatars Affects the Digital Gifting Experience

A design research how interpersonal communication using AR Avatars affects the digital gifting experience. A paper for the course Design <> Research, at Eindhoven University of Technology, by Industrial Design students from group E4.

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In the current pandemic caused by COVID-19, physical contact is avoided as much as possible. The digitalization of certain processes and services arise rapidly which has its societal benefits and drawbacks. In this paper, we have researched how interpersonal communication using AR Avatars affects the digital gifting experience. A mixed methods research was used starting with quantitative research in the form of a survey followed by qualitative research in the form of semi-structured interviews. In conclusion, the AR avatar positively affects the interpersonal communication within the digital gifting experience. However, the physical gifting experience is still preferred over the AR avatar variant of digital gifting.

Additional Keywords and Phrases: Digital gifting, Interpersonal communication, AR avatar

1 INTRODUCTION

Our study investigates how the addition of interpersonal communication to digital gifting can make digital gifts a shared and engaging experience for both the giver and receiver. We will tackle this topic using a research through design approach. A prototype has been designed to mimic the two stages out the five key stages of the model of the gifting experience as explained in sociological literature [1]. The five key stages are preparation, exchange, reveal, use, and reflection. We will focus on the exchange and reveal stage using an AR Avatar that visualizes the giver and the receiver. Using this prototype, we hope to bridge the gap of how digital gifting is less engaging than physical gifting for both givers and receivers due to the lack of their presence, hence the lack of interpersonal communication and personalization.

Our Research Question: How does interpersonal communication using AR Avatars affect the engagement of the digital gifting experience?

2 RELATED WORKS

In this section we review related work that fall under the following topics: comparison between physical and digital gift giving, digital gifting specifically, interpersonal communication and hybrid wrapping. We identify deficiencies in literature and reflect on the reached conclusion. In order to fuel our research in the right direction and build on others' pervious work, to generate novel and useful knowledge.

2.1 Comparison physical gift giving and digital gift giving

In Proceedings of the 2017 ACM Conference [1] the level of engagement of the physical and digital gifting experience is compared. There is a significant difference in engagement between the two. People tend to be less excited about digital exchange. The participants thought several elements of the original physical gifting were missing in the digitalized version. Time and effort showing purposefulness, personalization and one of a kind-ness, passed ownership, collocated exchange and wrapping were missing. Our design case is an opportunity to increase the excitement with digital gifting. We mainly focus on the personalization through AR Avatar.

2.2 Digital gifting

The market size of global digital gift cards continues to grow, one of the reasons for this is that SNS (Social Network Services) have made gift giving way easier and faster. The four biggest factors that influence customer decision are: the convenience of SNS gifting, relationship support of SNS gifting, pleasure of SNS gifting and the SNS gifting norm, these four factors are in line with customer value theory [2].

This study indicates that the most common reason for digital gifting is the convenience of SNS gifting, with 36.47% of respondents giving this as their reason, which in turn indicates that the ease of digital gifting influencing customers decision making [3]. This study also stands in contrast to findings of previous research which indicated that symbolic representation of SNS gifting might have influence on decision making, as this study could not find any significant symbolic effect. Perhaps because of the lack of a social presence within SNS gifting.

2.3 Interpersonal communication

Previous work of Eddy compares computer-mediated communication (CMC) to face-to-face interactions [4]. This comparison is made by asking participants to reflect on their communication in real-life and virtual environment. The outcome of this research shows that the overall interpersonal communication in real-life environments is significantly better than in a virtual environment. From this research we can conclude that CMC is not able to transfer certain aspects of interpersonal communication as good as face-to-face communication. Think of empathy, nonverbal cues, and emotional embodiment, for example. The paper suggests that addition of real emotions in a virtual environment can have the potential of making CMC more personal.

2.4 Hybrid wrapping

This paper introduced the concept of "hybrid wrapping" [5], they experimented with digital gifts wrapped in physical materials and vice versa. Their key design aspects of effortful interactions through wrapping and

unwrapping and their focus on HCI has allowed them to reach the following conclusions for future researchers and designers to consider when conceptualizing nuanced ways to tackle the gifting phenomenon. The first consideration is to give space to users to creatively expend efforts in both giving and receiving the gift. Secondly, the importance of enhancing the remote co-presence of both parties was highlighted. In addition to the advice to avoid the creation of a socially awkward interaction.

3   DESIGN CASE

3.1 Methodolgy

For this study, a mixed methodology has been used to conduct the research. First a quantitative questionnaire was sent out. This questionnaire consisted of various statements regarding the engagement of digital gift giving with and without AR avatars. The two digital gifting experiences are compared through statements. There is one independent variable, the AR avatar, that affects the dependent variable, namely the engagement. The results of this questionnaire were later used to gain more in-depth insights during qualitative interviews. The 8 interviewees did not fill in the previous questionnaire and were therefore completely new to our research, to give the most reliable results. During the interviews, the interviewees were asked more in-depth questions, related to their feelings, interpersonal communication and engagement of the digital gift giving process with and without the use of AR avatars. By combining the results of both quantitative and qualitative research the results were most reliable.

3.2 Prototype

3.2.1 First iteration

In the first iteration, we designed an interactive gift box shown in figure 1. An AR avatar appeared when the box was opened to convey a personalized message and present the digital gift. The idea aimed to mimic the tangibility of the physical gifts while adding an interpersonal communication method. On top of that, the strength of digital gifting is that from a long distance or time difference, people are still able to gift. Also, not everyone who wants to give someone a gift is able to physically meet due to government restrictions in these times, or more generally because of busy schedules. Due to the possible time difference and people having different schedules it was decided not to implement a live interaction between the giver and receiver.

Figure 1 First prototype: interactive gift box

Due to the COVID-19 restrictions preventing physical meetings with participants and the time frame of the project, it was decided to discard the tangibility aspect and focus on interpersonal communication using AR avatars. This had the reason that the AR avatars could be tested completely online, whereas it is rather difficult to test tangibility through a screen.

3.2.2 Second iteration

The second iteration of the prototype became completely digital, which was presented as an AR avatar as demonstrated in figure 2. The requirements to visualize this concept were the ability to create an augmented reality avatar and to customize clothes and appearance. It should also use the voice and gestures of the recorded video. The app vTag [6] perfectly suited the concept and therefore it was used, as the limited time frame from the course did not allow for fully developing an app for the research.

The AR avatar will come with a digital gift card and will be shown through the user's screen. The person sending it will be able to personalize a message, by recording a video with audio, that can be sent out to the receiver. The avatar mimics the movement, gestures and facial expressions of the user shown in figure 2. The AR avatar allows the giver and receiver to create a 2-way communication channel. Fabricating interpersonal communication between both parties to share the experience through an array of cues that come from the voice, body language, facial expressions, and gestures, to enrich the digital gifting experience.

Figure 2: compilation of visuals on the prototype

4 QUANTITATIVE METHOD

The purpose of this design research was to see how interpersonal communication affects the level of engagement between the giver and the receiver. This survey provided quantitative statistical data which was analyzed to gather knowledge on the effect of AR avatars on the engagement in the digital gifting process. In the qualitative research, which was done through interviews, a more elaborate interpretation and clarification of the results was gathered.

4.1 Purpose of the study

The aim of this questionnaire was to get an insight on how people perceive digital gifting with and without the prototype, to find out if the addition of interpersonal communication using AR Avatars affected the engagement level of the digital gifting experience from the participants point of view. Answering the question: Will the

participants establish a differentiation in the level of engagement between the current digital gifting experience and the designed digital gifting experience?

4.2 Questionnaire setup and procedure

Figure 3:Quantitative and qualitative research diagram

This explanatory research study will start off with a quantitative study, that was structured in three stages. Introductory stage, the participants were given a short explanation about the study and were asked for consent and informed with the amount of time it will take. During the second stage, the participants were asked to watch a video of the already existing digital experience and the prototype of the AR avatar gifting process. In the final stage they were asked to answer a series of Likert scale questions. This process can be seen in figure 3.

4.3 Participants

This research recruited its participants by convenience sampling. The procedure for sampling these participants was that the research group asked friends and family to fill in a questionnaire. A pitfall of these participants is that they are biased, and this could give unreliable results. As the participants are friends and family and this could result in less serious interviews, they were asked to be critical and serious, as that would be beneficial to the results. There were 25 participants involved in the quantitative research to make the results more reliable. At first a pilot survey was conducted with one participant to find if we needed to adjust our questions. Besides, this pilot, the data of the survey was collected in a cross-sectional manner. The timeline for administering the survey was a week, in order to give the participants sufficient time to fill in the short survey.

The digital gift giving experience is for everyone that can use a smartphone, luckily this is a large group of the population. So, one of the requirements for our participants was that they are comfortable with using a smartphone. Regulating this is done by starting the survey with a question asking if they are comfortable using a smartphone, this will help identify and filter out outliers later on.

5 QUALITATIVE METHOD

5.1 Purpose of the study

The goal of the in-depth interviews was to investigate the level of engagement of the participants in the different gifting experiences. This let the interviewers have more insight into the emotions and feelings of the participants, which will help in answering the design research question. The questions that will be asked will be focused on several aspects of their engagement with the gifting process, these will be linked to their excitement, feeling of involvement and more.

5.2 Interview setup and procedure

The interviews were held online through MS Teams and were recorded, to analyze the participants' behavior afterwards and to transcribe the interviews. Every participant was interviewed once, the duration of the interview was approximately thirty minutes. The first few minutes were used for an introduction with the purpose of putting the participant at ease and informing them about the project. In the mid-section of the interview the participant was asked to first watch videos and then answer questions related to the videos they had watched. The questions were formatted in an interview, but will be analyzed by the interviewer, which will be done by writing them down in a questionnaire format for a structured overview and then analyzing the answers. The last few minutes of the interview participants commented and reflected on the interview. They gave feedback on how the interview went as well as on the concept.

The participants were first asked to watch a video of the state of the art in terms of gift giving. Then they were asked questions that specifically focused on sending a digital gift. They were then asked to watch the video on receiving this gift, which was again followed by specific questions, this process is also seen in figure 3. The videos allowed them to experience the level of engagement throughout the various stages of the current gift giving process and enabled them to answer the questions with their own experience.

The next step in the interview was to introduce the participants to the concept of AR avatars. To measure the effect on the engagement with the gifting process, they will be shown the prototype through some more videos in the same format as previously. Then they will be asked the same questions, focused on the giving first and after a second video again on the receiving. This will give a clear overview of their change in answers. These answers will then be analyzed in order to answer the research question and support the findings from the questionnaire.

5.3 Participants

For the qualitative research, eight participants were asked to participate in an interview. These eight participants are new participants, that have not answered the survey. This was done to get the best results from the interviews, since the participants weren't introduced to the concept yet. Every researcher got two participants, this allowed us to have a diverse group of people to achieve a good balance of opinions and keep the results more representative

of the target group for the prototype, which is anyone who wants to send and receive digital gifts and therefore is comfortable using a smartphone.

6 DATA ANALYSIS

The data analysis is used to answer the research question "How does interpersonal communication using AR Avatars affect the engagement of the digital gifting experience?". The kind of analysis depends on whether it is quantitative or qualitative data.

The quantitative data in the form of a questionnaire is based on statements comparing the two digital gifting experiences including one variable, the AR avatar. In this way, the two experiences are already compared with each other. Therefore, we can look at the dependent variable, the engagement, and draw some conclusions. On top of this, we investigate the features of the AR avatar and how it can be improved.

The qualitative data in the form of the semi-structured interview will give in depth information of their engagement with the two gifting experiences. They will be shown multiple videos on which they give their reaction and comments. The content analysis method will be used [7] to determine the affect AR avatars have.

7 PRELIMINARY FINDINGS

7.1 Quantitative research findings

All participants of this survey are comfortable smart phone users. The majority of this survey's participants fell under the 18-25 age group. Their experience in digital gifting varied, refer to appendix A.3.
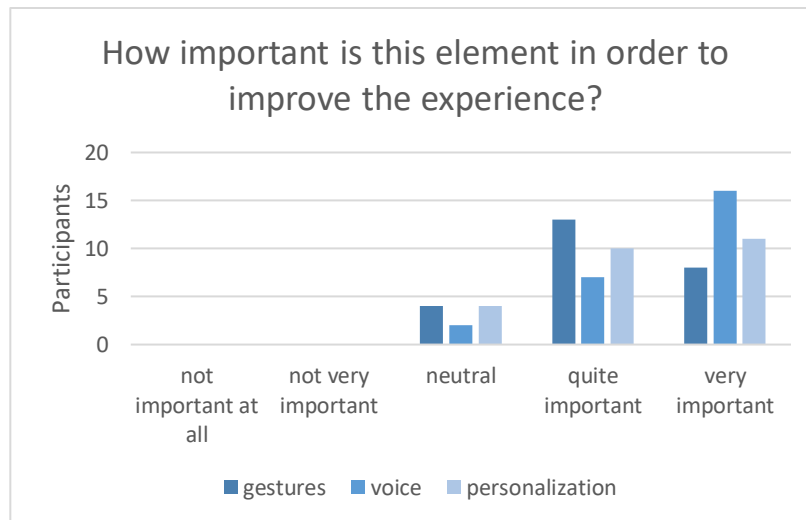

Figure 4:Importance of elements AR avatar

In terms of the engagement level the results show that the addition of the AR avatars made the experience more engaging for both parties. Evaluating the various aspects that create an interpersonal communication channel,

the users' scores ranked its importance in the following order, from most important to least important: voice of the avatar, gestures of avatar and appearance of the avatar, as seen in figure 4. This shows that the participants put a lot of value in the voice of the avatar, whereas this was something that was not expected to be the most important.

The participants were almost all neutral or positive on the statement about how adding AR avatars is beneficial. It is noticeable that one person thought it was not very important to do so. However, this is probably not related to the engagement aspect, as there were no participants who thought the AR avatars didn't add any engagement. There were again some answers that suggested they were neutral about it. These results are visible in figure 5.
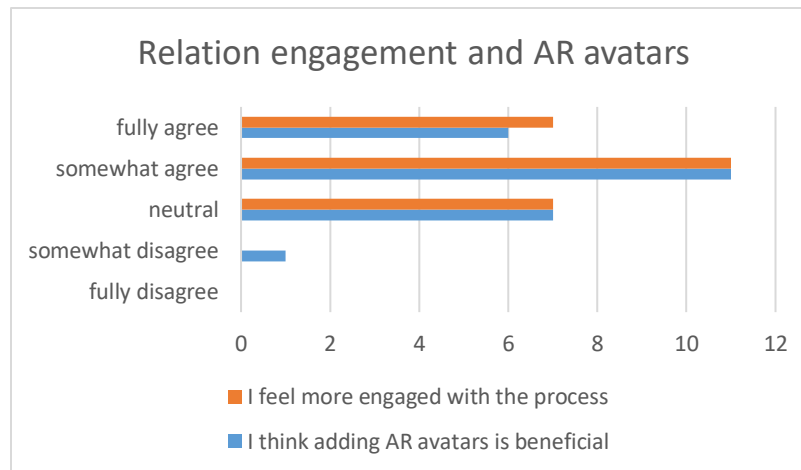

Figure 5: Relation engagement and AR avatars

Another interesting finding relating the engagement was that 10 percent felt more engaged on the receivers side of the process than on the senders side, refer to appendix A.3 for the graph.

The quantitative data showed us clear data on the importance of the AR avatars and how the engagement gets improved. There also seems to be a relation between the two. However, in order to be sure of this connection, the qualitative data should be combined with the quantitative to check the results.

7.2 Qualitative research findings

7.2.1 Current digital gifting process giver

After watching the video on the current process of gift giving, the first reaction was mostly neutral, as the interfaces looked boring, and it was not very personal. "It seems easy, but not that personal, so I don't think I would do it." However, they often mentioned how it was a very smart way to send someone a gift, as it is quick and easy. "Easy", "simple" and "fast" were words often brought up when talking about the process. "It looks like regular shopping." This shows how it is not necessarily bad, as it complies with its supposed function, but it is not something that excites many of them.

The amount of engagement with the digital gifting process was described as "Not that much. You don't put in the effort." and "Less engaged than physical gifting.". Many also felt no connection to the receiver, although 25 percent still did feel that connection. As suggestions for improving this process, without having seen our concept

yet, they mentioned personal additions like a message or "something visual like pictures or stickers". The majority would not send a digital gift like this, as they would much rather give it in real life. The ones who would send one had the reason that it is handy in the current situation with lockdowns and regulations and someone also argued: "if they want a gift card, it is just as easy". This again feeds into it not being a bad process, but it simply not fitting people's standards. The engagement with the gift is what the research is all about, so this shows that there is a lot of improvement possible within this area and helps pinpoint it to where the problems currently are. These have shown to mainly be personalization and seeing the receiver's reaction. This bring along the effort people put into it.

7.2.2 Current digital gifting process receiver

After seeing the receiving end of the gifting process, the first reaction was often a little more positive, as the interviewees like getting gifts and it is "nice that someone didn't forget your birthday". However, most of them also mentioned that it was quite boring and feels distant. The words they used to describe it were "surprised", "thankful", "little disappointed" and "boring". Many would be very happy to receive this gift, as it "is still a gift", but also mention they would prefer a physical gift and/or something more personal. "I don't think I would like the idea of someone putting so little effort in me." Only one out of eight would enjoy receiving a gift like that. Compared to the amount of people who would want to send one, which was 3 out of 8, this is lower. This gives the information that the receiving end is more disliked by the interviewees than the sending of the gift.

When responding to the gift card, they would send back a chat or a call, some preferred to call whereas others didn't feel like the other put enough effort in to receive a call back. On a positive note, it was also said that digital gifting can make getting in touch with someone easier. After having experienced the entire gifting process as it is currently, there were some suggestions for improvements.

7.2.3 AR avatar gifting process giver

Then the interviewees were shown the video on how sending a digital gift would work with AR Avatars, although the concept often needed to be explained afterwards as the video was a bit unclear. The initial reaction was more positive, they found it more personal, but also perhaps a little awkward to film it. Someone said they felt more of a connection, and another said they would be curious about the person's reaction. The words mainly used to describe it were "innovative", "fun" and "personal" although it was also mentioned that it is still very easy and quick to do. These words show improvement related to their suggestions of making it less boring and more personal to create more of a connection.

Having to actually do it and send a digital gift was something many of them initially were skeptical about, but after thinking about it, they would do it for a friend even though you must perform in front of a camera, and it's considered funny. Compared to 3 people willing to send a digital gift, this method raised it to 7 people who would want to send one. They still showed more liking to physically gifting someone, but also said they "would be more likely to send a digital gift like this". It also depends on the situation, as it is sometimes very difficult to give or send a physical gift. They reasoned that if they were to send a digital gift, it is more personal with the AR avatars, which improves the connection between giver and receiver.

The humor that comes with recording the video also awakens more engagement, "I would probably laugh about myself, about doing a little dance in front of a camera. I guess you can count that as being more engaged." The amount of people feeling a connection with the receiver of the gift was raised from 2 to 5. One of the reasons for not

feeling this connection is because there is still no response back, they had not seen the part where the receiver can send an AR video back.

7.2.4 AR avatar gifting process receiver

They were happily surprised when seeing how the receiver gets the gift and how you can send back a video. There were some doubts as to why it is an AR avatar and not just a video. Someone else argued that it is nice to be able to see the emotions and reaction of the person you are sending it to. The most used words to describe this process were "surprised", "happy" and "exciting". Some of them were quite excited to send a video back and others would be happier and feel connected to the sender through the back-and-forth videos. They all felt more engaged with the gifting process, although some only a little more. With the current gifting process, only one person felt a connection with the sender, with the AR avatars included all of them felt this connection. The recommendation for making it even better is by adding a live experience. This is something that could be considered as a function in the application. There was, just as with the quantitative research, more of a connection felt on the receivers' side of the process. This confirms that this wasn't just a mistake and one of the reasons the participants gave for this was: "Because you as a giver are sending something out, but don't get a respond back". This answer was however given before they were shown that the receiver can send a video back, so they may have changed their mind on this.

7.2.5 Conclusion Qualitative research

In conclusion, the AR avatars made the gifting process more personal and engaging, however many would still prefer to give a physical gift. They would rather use the AR avatars than the current version of gift giving. There is some tweaking needed to give everyone enough options to be satisfied, like adding a live option or adding a physical element, in future development. In relation to the quantitative data, this confirmed the results and makes both more reliable.

8 DISCUSSION

The quantitative and qualitative method have given us valuable insights regarding our research. The results of these methods helped us answer our research question: How does interpersonal communication using AR Avatars affect the engagement of the digital gifting experience? In our quantitative research we found that the participants ranked the voice of the avatar as the most important aspect of interpersonal communication, in order to improve the digital gifting experience. This was, however, not something we expected to be so important. On the second place came the gestures of avatar and lastly the appearance of the avatar. Based on the research done by Eddy [], which suggests the addition of real emotions in a virtual environment, we assumed the gestures to score highest.

The quantitative research also showed us that the addition of AR avatar made participants feel more engaged with the gifting process. This insight was confirmed in our qualitative research. Our interviews confirmed the statement done by Choi [3], that the most common reason for digital gifting is the convenience it. During the interviews, participants made clear that they would only send digital gifts if they had to buy a gift last minute, since it was quick and easy. We found out that the current digital gifting experience had a lot of room for improvement, in order to make the process more engaging. The addition of the AR avatars made the gifting process already a lot more engaging, as implied by our participants. The level of engagement was higher in the process with the AR avatar, since this was more personal. The ability to send AR video back and forth between giver and receiver also resulted in a higher level of engagement. The possibility of adding nonverbal cues and emotional embodiment in

the AR avatar, results in better interpersonal communication, as already mentioned in the research done by Eddy [4].

The participants did, however, still prefer to give physical gifts over sending a digital gift, even with the addition of AR avatars. This is something we already assumed, since this was also found in the research done by Kwon [1]. In that research they found out that the level of engagement of digital gifting was lower than physical gifting. This had to do with the fact that time and effort were missing. In our research we also found that people value the effort and time put into the gift, which was something our participants found more visible in a physical gift. Researching if the addition of a physical component would influence the level of engagement was something we wanted to research, however due to time limitations and Covid regulations we weren't able to research this. That is why we decided to focus on the addition of AR avatars.

A live moment between giver and receiver was also something our participants missed. Since the communication between giver and receiver would still not be a live moment, in our case of adding an AR avatar.

When it comes to the validity of our research, we have found some bottlenecks. First of all the research was done with 25 participants, who filled in the questionnaire, and 8 participants, who participated in the interviews. This amount of participants incorporated in this user study, the validity of the results can be disputable. A bigger user study would make the results more accurate. Next to that the participants who participated in the user studies were personally known by us. This could lead to bias, since the participants do not want to be seen as rude, by us researchers. This could lead to participants not answering honestly or saying everything they want to, since they feel some kind of personal connection towards us. The acquiescence bias could also have occurred during the quantitative questionnaire. Since some questions were formulated in leading way, towards the positive aspect of adding an AR avatar to digital gifts. This could lead to participants agreeing to a statement, without properly considering the pros and cons. In the end this could lead to systematic errors that could affect the validity of the research.

In our interviews we also found out that some of the questions asked appeared to be quite repetitive. This led to not much added information being gathered from the duplicate questions. There could also have been more comparison questions present for better analysis, since it was quite difficult to create comparisons in clear graphs. Letting the participants experience and use the prototype would also have been a significant improvement. The participants had to watch an explanation of the addition of AR avatars and weren't able to test the sending and receiving of AR avatars. This was the case because of the Covid regulations that applied at the time of the research.

As discussed before, the validity of the results of this research can be questioned. However, we think the results of this research can be seen as reliable. Since the methods used and the study set up are very well explained, the research can easily be repeated. We think repeating the research will result in the same outcomes as this research shows, so that is why we would say this research could be seen as reliable.

9 CONCLUSION

So, how does interpersonal communication using AR Avatars affect the engagement of the digital gifting experience? After analysing the data gathered, we found that the interpersonal communication using AR Avatars increases the engagement of the digital gifting experience by making it more personal and creating a better connection between giver and receiver through the AR videos.

The findings of this research can suggest actions for future research. For instance, doing the study on a bigger scale. Future research into making the digital gifting experience more engaging should focus on making digital

gifting more personal. As concluded from our research, the addition of AR avatars does increase the engagement between giver and receiver. However, the participants still found physical gift giving more engaging, this was the case because it was more personal. Furthermore, the effect of adding a tangibility aspect to digital gifting should be researched. Adding a tangibility aspect was the initial plan, but this got discarded due to the Covid restrictions and time frame of the research. However, during the study adding a tangibility aspect was suggested multiple times by our participants. So it would be interesting for future research to look into adding a tangibility aspect and the effect on the engagement of the giver and receiver.

10 ACKNOWLEDGEMENTS

REFERENCES

[1]   H. Kwon, B. Koleva, H. Schnädelbach, and S. Benford. 2017a. It's not yet a Gift: Understanding digital gifting. In Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (pp. 2372–2384). ACM.

[2]   Sheth, J.N., Newman, B.I. and Gross, B.L. (1991), Why we buy what we buy: a theory of consumption values, Journal of Business Research, Vol. 22 No. 2, pp. 159-170.

[3]   Choi. S., Kim. H., Lee. S. 2019. What makes people send gifts via social network services? A mixed methods approach. Vol. 30, Issue 1. (August 2019).

[4]   Anneli Eddy. 2019. Is Technology Killing Human Emotion? How Computer-Mediated Communication Compares to Face-to-Face Interactions. In Proceedings of Mensch und Computer 2019 (MuC'19). Association for Computing Machinery, New York, NY, USA, 527–530. DOI:https://doi.org/10.1145/3340764.3344451

[5]   Boriana Koleva, Jocelyn Spence, Steve Benford, Hyosun Kwon, Holger Schnädelbach, Emily Thorn, William Preston, Adrian Hazzard, Chris Greenhalgh, Matt Adams, Ju Row Farr, Nick Tandavanitj, Alice Angus, and Giles Lane. 2020. Designing Hybrid Gifts. ACM Trans. Comput.-Hum. Interact. 27, 5, Article 37 (August 2020), 33 pages. https://doi.org/10.1145/3398193

[6]   vTag (1.6.10). (2015). ["Mobile app"]. App Store.

[7]   Anon. Content Analysis. Retrieved January 17, 2022 from https://www.publichealth.columbia.edu/research/population-health-methods/content-analysis

A   APPENDICES

A.1   Consent forms

A.1.1 Quantitative research

Survey Digital Gifting

˅ ⋮

Before filling in the survey, it is important that you carefully read our consent form and fill it in.

Consent form

The goal of this survey is to improve the experience of digital gift giving. This project is done by Ameena Arafa, Sanne Korpel, Eva Veldhorst and Puck Verbeek, all four of us are Industrial Design students of Eindhoven University of Technology.

Your participation in this study is completely voluntary. If you decide to participate in this survey, you can withdraw from the survey at any time without having to give a reason. If you decide not to participate in this study or if you withdraw from the study at any time, there will be no adverse effect.

The survey involves completing an online survey. That takes about 10 minutes. Your answers will be processed anonymously and cannot be traced back to you. No personal data will be asked, such as name, email, address, etc. The survey questions are about the current digital gifting and our adjusted version of it.

All data from the research is securely stored in a place that others outside our research team cannot access. To protect your privacy, no information is requested that can be traced back to you as a person. If you have any questions about the research, you can contact Eva by email (e.j.v.veldhorst@student.tue.nl).

Clicking the "Agree" button below indicates that:

· You have read and understood the above information.
· You know that participation is completely voluntary and you can stop or withdraw at any time from the study without adverse effects. You don't have to give a reason for that.
· You are at least 18 years old and agree to participate.
· You agree to the collection, storage and processing of the data as above has been described.

If you decide that you do not want to participate in the study, you can decline participation by clicking the "disagree" button.

I agree to the consent form *

◯   Agree

◯   Disagree

A.1.2 Qualitative research

The goal of this survey is to improve the experience of digital gift giving. This project is done by Ameena Arafa, Sanne Korpel, Eva Veldhorst and Puck Verbeek, all four of us are Industrial Design students of Eindhoven University of Technology.

Your participation in this study is completely voluntary. If you decide to participate in this interview, you can withdraw at any time without having to give a reason. If you decide not to participate or if you withdraw from the interview at any time, there will be no adverse effect.

The interview involves answering at least 24 questions. Your answers will be processed anonymously and cannot be traced back to you. No personal data will be asked, such as name, email, address, etc. The survey questions are about the current digital gifting and our adjusted version of it.

All data from the research is securely stored in a place that others outside our research team cannot access. To protect your privacy, no information is requested that can be traced back to you as a person. If you have any questions regarding the interview, you can contact the person who will conduct the interview.

Signing below indicates that:

• You have read and understood the above information.

• You know that participation is completely voluntary and you can stop or withdraw at any time from the interview without adverse effects. You don't have to give a reason for that.

• You are at least 18 years old and agree to participate.

• You agree to the collection, storage and processing of the data as above has been described.

If you decide that you do not want to participate in the study, you can decline participation by not signing and informing the interviewer.

Signature: _____   Date: _____ / _____ / _____

A.2 Quantitative research; Survey questions

Do you feel comfortable using a smart phone? *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Do you have any experience with digital gifting? *

	1	2	3	4	5	
no experience	○	○	○	○	○	A lot of experience

How old are you? *

○ 18-25 years

○ 25-30 years

○ 30-35 years

○ 35-40 years

○ 40-45 years

○ 45-50 years

○ 50-55 years

○ 55-60 years

○ Above 60 years

Please watch this video of the current digital gifting experience

Please watch the video of the AR Avatar digital gifting experience

The following statements are comparisons between the current digital gifting process and the AR avatar gifting process.

Beschrijving (optioneel)

It is beneficial to add the AR avatar to the already existing digital gifting experience. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I feel more engaged as a giver with the AR avatar experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The giver puts more effort into the gift with the AR avatar experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

I feel more engaged as a receiver with the AR avatar experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The receiver feels more special with the AR avatar experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The receiver gets more excited to open the gift with the AR avatar experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The AR Avatar creates a better connection between the giver and receiver *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The amount of personalization (like appearance, gestures and voice) of the avatar is important * to the experience

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The gestures of the AR Avatar improves the experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The voice of the AR Avatar improves the experience *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The personalization of the avatar should look alike the giver/receiver. *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

The avatar should be displayed full body on your screen (not only face) *

	1	2	3	4	5	
Strongly disagree	○	○	○	○	○	Strongly agree

Do you have any remarks how to improve the AR avatar gifting process?
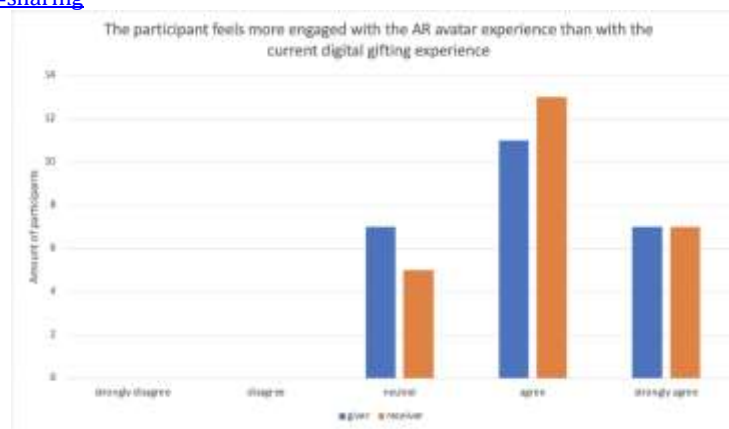
Tekst lang antwoord

Do you have any other feedback regarding the survey? Thank you for participating!

Tekst lang antwoord

A.3   Quantitative research; Survey Results

Excel sheet results quantitative
https://docs.google.com/spreadsheets/d/1dl3IU2888TUaNrESyDxHdbHnUfw6f4nKaJ-nvXJgQbg/edit?usp=sharing

The participant feels more engaged with the AR avatar experience than with the current digital gifting experience

Digital Gifting Experience

A.4   Qualitative research; Questions

1. After experiencing this digital gifting process, what is your first reaction?
   a. What three words would you use to describe this gifting process?
   b. How would you feel if you were to send someone a digital gift and this is what you saw?
   c. How do you think the receiver of this gift will feel?
   d. Would you be willing to send a digital gift more often if this is how the process went?
2. How engaged do you feel with the digital gifting process on the sender's side?
   a. Do you feel a connection with the receiver of the gift?
        i. How is this compared to your experience with gifting people physical gifts?
   b. How and what do you think the receiver will communicate with you after receiving this gift?
3. How do you think this gifting process can be improved?
   a. What will improve your level of engagement?
   b. What will make you feel better emotions?

4. After experiencing the receiving end of the gifting process, what is your first reaction?
   a. What three words would you use to describe getting this digital gift?
   b. How would you feel if someone sent you this gift and this is how you got it?
   c. Do you feel the same as you expected the receiver to do?
   d. Would you enjoy receiving a gift more often like this?
5. How engaged do you feel with the digital gifting process on the receiver's side?
   a. Do you feel a connection with the sender of the gift?
        i. How is this compared to your experience with getting physical gifts?
   b. How would you communicate back to the sender after getting this?
   c. What emotions do you feel when receiving a digital gift like this?
6. How do you think this gifting process can be improved?
   a. What will improve your level of engagement?

A.5   Qualitative research; Results

Excel sheet results qualitative:

https://docs.google.com/spreadsheets/d/1jMIUe6_TOHCuXzkl0GsagKskrzsbZChE77_vnW4VZ8E/edit?usp=sharing

A.6   Qualitative research interviews summary

Interview 1
This interviewee always put in a lot of effort into gifting gifts. They really like receiving gifts that are well thought of and are very personal. They like to write personal cards for other people and like to give and receive something to experience together with the other person, such as high tea together. This came up a lot of time during the interview.
For the first part the interviewee was not enthusiastic at all. They did not feel any connection with sender and receiver and would not give someone a digital gift in this way. They would also not enjoy receiving a gift like this. When asking about communicating back to the sender she said: 'I would not call them, because I think I would get the feeling they did not put in that much time into me gifting me a gift. So why would I return the favour and call them to say ''Thank you''.' They thought this process could be improved by making it more personal with a video message or if there would be something physical, like a card.
For the second part, the interviewee was a bit more enthusiastic. They thought it was more engaging and personal, compared to first process. But they would feel a bit awkward sending a video message. They were really in doubt whether they would be willing to send a digital gift in this way, but if with current corona situation they would or if they

would be living on other countries. Also, about the connection with the receiver they were really in doubt. As a receiver they were more exited, but still would not enjoy receiving a gift more often like this, since a lot of things are currently online, they prefer physical gifts. They did feel a connection with sender and felt more engaged, since they were able to send back videos.

They thought it could be improved by personalization, that you can see that the sender put in some time and effort and maybe a physical component.

They did not really understand why we used and AR avatar instead of just normal video.

Interview 2

For the first part of the interview, the interviewee was not enthusiastic about the process. They found it very general, just like shopping, and found it very impersonal. They did not feel engaged with the digital gifting process, on both sides. As a receiver they would feel kind of obligated to buy something from the site of the gift card, even though they might not usually shop from there. As a receiver they were thankful they got something, but they were confused why they got it in this way and felt a bit weird. They thought this process could be improved by making it more personal and creating more connection between sender and receiver. To make it more engaging they thought making it more celebratory would also be a good option.

The interviewee did not really understand the new concept with the AR avatar at first, so I explained it a bit before answering the questions.

For the second part of the interview, the interviewee was more enthusiastic that previous method. They were more likely to send a digital gift in this way since you could make it more personal. They also did feel a bit more engaged, but they thought this mainly had to do with the dancing in front of a camera part. Compared to previous method they did feel a connection with the receiver in this method. As a receiver they would feel happier receiving their gift like this. They also felt way more engaged, since you see that a friend is putting in effort into the gift, making a video. They also felt a connection to the sender, whereas that was not the case in the first scenario.

They did still prefer the physical gifting and receiving experience over the digital one with AR avatar.

Interview 3

The interview would prefer to have physical gifting because than the experience is there and the **meaning behind the gift can be explained**. However, he thinks that our concept is innovative and is already more engaging than the old digital gifting process. He thinks that creating a **life moment** between the giver and receiver is key and also a way in which the giver can give some explanation. As a giver, he did not feel more engaged with the process since making the avatar is still not engaging. As a receiver he was surprised because he did not expect it to be an avatar.

Interview 4

The interviewee finds the digital gifting more accessible, easier, and better for people you do not know that well or see not often. He sees it as an opportunity to get in contact with someone. The engagement is less than with physical gifting and is shorter. He likes physical gifting better because he likes the experience of it and the effort someone put in their physical gift. He would add a review form for the giver and receiver in order to collect data. With the use of artificial intelligence, he could than match the kind of digital gift cards better. He thinks by adding a personal message in the form of an avatar is more engaging. When he receives a digital gift in the form of an avatar, he is curious and wants to send a similar message back.

Interview 5

For the first part of the interview, without knowing our concept, the interviewee was quite positive on the current gifting process. They stated that they would be happy to send and receive a gift either way as they "like gifts", however, they did describe it as boring and appeared to be worried if the gift arrived or not. Since they are not very experienced with sending digital gifts, they also would be happy when sending it worked, no matter what it looks like. Comparing it to physical gifting, they felt more of a connection when seeing the reaction of the receiver when it is handed to them in real life. As a response to getting the digital gift, they would send back a chat or call the giver. To improve the process, they suggested making it look less boring or adding a personal note.

On this note, after seeing the video of the AR avatars, they were even more positive. Although the video didn't communicate the concept very well and it had to be explained. The interviewee was happy that they could make the gift more personal. As response, they would send an AR video back, as this is an included feature in the app and would be relatively easy.

Interview 6
For the first part of the interview, the interviewee was not very enthusiastic about sending a digital gift that way and would much rather give them something in real life. On the receiving end, they did enjoy receiving a gift, as it is still a gift, but they felt like the sender did not put much time and effort into it and "did it at work and forgot". And effort is something they put a lot of value in.
After seeing the video about AR Avatars, they were a little more enthusiastic about sending a digital gift but would still much rather give a physical gift. This is because digital gifting with AR avatars is still not live and as personal. However, they would consider giving a digital gift with the AR avatars, which was not likely without them.

Interview 7 & 8
The current gifting process was described as an easy, fast, and simple way of gifting. In addition to finding the gifting process not engaging at all. When participant A was on the receiving end, he found the experience to be boring and not fun. They appreciate the thought but found that it "lacked any sentimental value" as participant B mentioned.
 In general, the feedback was positive the use of AR avatar was seen as "Simple innovative fun" and when compared to current digital gifting experience" I like it more than the first one it feels like you are talking to the person it gives the gift a more personal value" unlike the current digital gifting experience which was described as "Very boring and not fun" as well as "impersonal". One participant even said that it would be "disappointing "to receive an email as gift as it felt like 'it is like someone is sending me a tikkie".
For the conclusion they found that the incorporation of the AR Avatars made the gifting experience more engaging but one participant argued that "Physical gifting giving is better as you spend time together and this is just a 15 second interaction" while the other was still missing the tangibility aspect, she suggests that "a gift that you can unwrap even digitally and be surprised. the main thing missing is the element of surprise" would be an improvement.

A.7   Videos prototype

Current process giver: https://www.youtube.com/watch?v=Gkl60zWGJCw

Current process receiver: https://www.youtube.com/watch?v=Je8icVspWmI

AR avatar giver: https://www.youtube.com/watch?v=-BdOEC0aszo

AR avatar receiver: https://www.youtube.com/watch?v=GAyu_7g8XVI