

Appendix

A- Brief

B- Question list - user research

C- Thematic analysis of user A- research

D- Question list- user evaluation

E- SUS Form

F- Thematic analysis of user evaluation

Appendix A: Brief

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name	<u>Mei</u>	Your master programme (only select the options that apply to you):
initials	<u>Y</u> given name <u>Yanni</u>	IDE master(s): <input type="radio"/> IPD <input checked="" type="radio"/> Dfl <input type="radio"/> SPD
student number	<u>4798481</u>	2 nd non-IDE master: _____
street & no.	_____	individual programme: <u>- -</u> (give date of approval)
zipcode & city	_____	honours programme: <input type="radio"/> Honours Programme Master
country	_____	specialisation / annotation: <input type="radio"/> Medisign
phone	<u>+</u> _____	<input type="radio"/> Tech. in Sustainable Design
email	_____	<input type="radio"/> Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair	<u>Huib de Ridder</u>	dept. / section: <u>TUD-IDE</u>
** mentor	<u>Pablo Cesar</u>	dept. / section: <u>CWI & TUD-EWI</u>
2 nd mentor	<u>Jie Li</u>	
	organisation: <u>Centrum Wiskunde & Informatica</u>	
	city: <u>Amsterdam</u>	country: <u>Netherlands</u>
comments (optional)	Pablo will coach me in the aspect of immersive media technology, while Jie will offer advice on user experience and research methodology.	

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..



Second mentor only applies in case the assignment is hosted by an external organisation.



Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.



APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Huib de Ridder date - - signature _____

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC YES all 1st year master courses passed

Of which, taking the conditional requirements into account, can be part of the exam programme _____ EC NO missing 1st year master courses are:

List of electives obtained before the third semester without approval of the BoE

name _____ date - - signature _____

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED NOT APPROVED

Procedure: APPROVED NOT APPROVED

comments

name _____ date - - signature _____

Design a SocialVR tool for remote co-design of customized cakes project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 10 - 02 - 2020 26 - 06 - 2020 end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

Motivation:

Co-design is progressively popular in the context of product development (Binder, Brandt, & Gregory, 2008), especially in the area of customized retail services. Co-design involves users and potential customers into the whole process of product design, from ideation to final design. In this way, the design outcome fits more into people's needs, since users are "the experts of their experience" (Sanders & Stappers,2008). Therefore, co-design has potential in supporting customization in retail, which aims to offer a personalized customer experience based on the individual needs and behaviors.

Challenges:

However, traditional way of co-design requires face-to-face interaction, to which physical co-presence is essential. This requirement cannot always be met in the current world where people live in a way of flexible mobility. Additionally, it might be challenging for users to act as "co-designers" (Sanders & Stappers,2008) who share equal autonomy and agency with professional designers, in the process of co-design, since most consumers lack expertise in the field of design.

What to do:

Therefore, a tool is needed to support remote co-design and empower the non-expert users for cooperating with designers. In this project, we propose that, SocialVR, an emerging mediated social interaction technology in the medium of Virtual Reality, has a potential in supporting a remote and interactive co-design (McVeigh-Schultz, 2019). First, Social VR technology enables users in different locations to interact with virtual representations of other users in a collaborative Virtual Environment (VE). Second, within a shared VE, users communicate with each other with a maximized immersive experience through the medium of real-time audio, 3D-visual and haptic cues. For example, in the most cutting-edge SocialVR platform such as Facebook Horizon (<https://www.oculus.com/facebookhorizon>), the facial expression, voice, body gesture of users will be collected and simulated in VE to optimize immersive experience. Thus, the primary task is to explore how to integrate these features and technologies of SocialVR for supporting the primary interactions of co-design such as ideation, idea embodiment, negotiation and decision making in VE. In this project, I choose the use case of collaborative cake-making between cake-makers and clients for the purpose of customized retail.

Project Outcome:

The final outcome of this project will be a medium-fidelity VR prototype, which allows two users collaboratively design cakes in VE wearing head-mounted displays (HMDs). This graduation thesis is in collaboration with Centrum Wiskunde & Informatica (CWI) Distributed and Interactive Systems Group. CWI will provide technology support and facilities of VR, and the guidance of research methodologies. For user research and prototype evaluation, I will collaborate with Cake Researcher, a dessert cafe based in Delft. This project will help them to explore a novel and interactive approach to share and exchange ideas on cake-making for food designers and clients through the medium of VR.

space available for images / figures on next page

introduction (continued): space for images



image / figure 1: Remote collaboration with 3D models in SocialVR.



image / figure 2: Collaborative cake making

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

This project aims to design and evaluate a VR tool for remote co-design on customized cakes between two users. The use case of cake-making is selected, due to the access to the target groups.

- * General Goal: Explore in which aspects and to what extent we can recreate co-creation by means of SocialVR.
- * Experience: Understand the current interaction features and user journey of cake-making co-design activity, and envision the desired interaction and user experience for the future.
- * Technology: Explore which technologies (for example, teleportation methods, 3D artifact manipulation, share viewport and how to integrate visual, audio and haptic interaction cue, in order to achieve the proposed interaction and experience.
- * Prototype: Develop a VR prototype in Unity3D which allows at least two users to collaborate for virtual cake-making.
- * Evaluation: Compare the experience of using this VR collaboration tool with other communication channels, such as face-to-face conversation and message application. Reflect on the advantages and limitations of SocialVR in the use case of collaborative co-design on customized cakes.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

Design a SocialVR tool for remote co-design of customized cakes. The goal is to explore a novel method for a desirable VR collaboration in the context of customized cake making. The main tasks will be envisioning the desired interaction and experience, and exploring how to utilize VR technology to realize the expected user experience.

- * Research: Initially, the research is divided into two parts: literature review and generative user research (Sanders, 2012). First, literature will be reviewed from several perspectives: methodology of co-design (especially in negotiation and decision making), customization retail, utilization of VR in remote collaboration, remote communication on 3D models. Second, in the generative user research, 6 to 8 interviews will be conducted on cake makers and customers, who have experience in remotely communicating the information for the creation of customized cakes. By this means, we will gain the knowledge of the current interaction and experience. In addition, a context mapping (Stappers & Sanders, 2003) session will be conducted on the target groups, so as to explore new possibilities for future experience.
- * Design: Based on the research results, the new user journey and experience will be envisioned. We will focus on the interaction in which users exchange ideas and embody their ideas with the aid of visual, audio or haptic cues. After that, initial tests will be conducted with a low-fidelity prototype, in order to quickly validate and iterate design ideas. Then, a digital VR prototype will be built in Unity3D, so that users can experience it on HMD. In the tests, we will try to involve cake makers and people who have experience in customizing cakes.
- * Evaluation: 6 to 8 pairs of participants will be invited to final evaluation. They will do virtual collaborative cake cake-making on HMD. Questionnaires and semi-structured interview will be conducted. The usability and experience of this VR tool will be evaluated and compared with face-to-face collaboration. Additionally, participants' satisfaction of co-design outcome will be evaluated.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 10 - 2 - 2020 26 - 6 - 2020 end date

Date	2.10-2.14	2.17-2.21	2.24-2.28	3.2-3.6	3.9-3.13	3.16-3.20	3.23-3.27	3.30-4.3	4.6-4.10	4.13-4.17	4.20-4.24	4.27-5.1	5.4-5.8	5.11-5.15	5.18-5.22	5.25-5.29	6.1-6.5	6.8-6.12	6.15-6.19	6.22-6.26
Calendar Week	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10
Project Week	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20
Kick-off Meeting	█																			
Literature Review	█	█																		
Interview with target group		█	█	█																
Analysis for research results					█	█	█													
Design proposal								█	█											
Mid-term Review									█											
Prototype iteration									█	█	█	█	█	█	█	█				
Prototype building in Unity3D										█	█	█	█	█	█	█				
Prepare for greenlight meeting																				
Greenlight Meeting																	█	█		
User tests																	█	█	█	█
Prepare for presentation																				█
Presentation																				█

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

Competence:

With a background of on environmental design, I have gained solid skills in 3D modelling and developed spatial perception, which are significant elements when designing immersive media. I am working on a health-related storytelling research project in persuasive game lab in IDE. Through this project, I have a deeper understanding in interactive storytelling. I think there is great potential to combine my insights in interactive narrative and VR technology, to innovate co-creation with immersive media. In addition, I accumulated practical experience in qualitative and quantitative research in the storytelling project: from study design, test facilitation, data analysis to final evaluation. Thus, I am capable of managing a coherent research process in this SocialVR project.

Ambition:

- Through this project, I want to achieve:
- * Explore which technique of VR has more potential in supporting remote co-creation, in the context of collaborative building 3d artifacts.
 - * Understand the current context of co-creation and empathise the target group, gain essential knowledge of their mindset by generative research approaches (Stapper, 2008).
 - * Based on the research results, I will envision a virtual environment for co-creation, and explore natural and intuitive interaction concerning social convention, spatial awareness, cognitive cost, enjoyment, etc.
 - * Improve prototyping skills for developing a VR application, including Unity and C#.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Appendix B: user research question list

Kick-Off

- **Intro:** Hi, I am Yanni. I am a design student, working on my graduation project. I want to **create a VR tool for cake makers and their clients to communicate about the customized cake and design it together**, when they are in different locations.
- **Aim:** I want to know **how you usually communicate** the information about the customized cake, what you usually **do**, how do you **feel** about this kind of communication.
- **Privacy:** I want to make an audio record of this interview, and take some photos, for future analysis in this project. Your face will never be exposed in these photos. All the information about you and this interview will be kept confidential. And it is only used for the research project. So, am I allowed to make an audio record, and take pictures?

Question List (Cake Maker)

Retrieve one experience:

- What are your two most memorable personalized cake making experiences? Please describe one easy case and one difficult case, and answer the following questions based these two cases.
- Who are involved? Are their other cake makers involved? Who are your clients (e.g., single person or a couple)?
- For whom did he/she want to order the cake? For what event did he/she want to order the cake?
- Did he/she have some special requirements that impressed you?
- In which communication tools (e.g., face to face, skype, WhatsApp) did you communicate when ordering the cake? What type of media do you use to assist the discussion (e.g., texts, pictures, video)? How many times of discussion/meetings did it take? How long did it take (e.g., how much time in advance did the clients contact you)?
- Were the communication tools efficient for you to communicate with your clients? Why? Do you think it helps you understand the requirements from your clients, and clearly present your ideas?
- What kind of information about the cake were you talking about?
- How did she/he express the ideas? How did you show your ideas? Do you think it worked well?
- Did you feel that you inspire each other? Did you give him/her some advice, if so, what kind of suggestion is it? Do you think both of you equally contribute to the cake idea?
- In general, how do you experience this communication?
- Which part did you think is the most important and the most difficult for communication with your clients on customized cakes?
- What special equipment do you need to make the cake? Did you buy new tools/equipment for this cake? Did you use some Apps/wesites for getting inspiration?
- So, finally, what kind of cake did you make for him/her? (if possible, show picture, then ask some questions based on this picture)? How did you design the cake to meet his/her requirements?

- Does the cake satisfy your clients? What feedback did you get from them in terms of look, taste and process of designing, making and delivering?
- Have you ever communicated about personalized cake in another medium/way?
- If so, Do you like the new medium/new way? Compare it with the previous way you mentioned earlier

- **Knowledge in Cake-design & making:**

- Can you show me a cake which you are most proud of?
- Can you memorize the whole process of making this cake? From idea generation to finalize the making? (Tool1)
- Did you have some difficulties in putting this idea into practice?
- What do you like/dislike most in this process?
- What do you think is most important and most difficult when designing a cake, and making a cake?

Question List (Client)

Retrieve one experience:

- When was your latest/most memorable/most difficult customized cake ordering experiences (choose 1-3 to describe)?
- Which bakery did you choose? Why did you choose this bakery?
- Why did you want to customize a cake?
- For whom did you order the cake? For what event did you want to order the cake?
- Did you have some special requirements?
- In which communication tools (e.g., face to face, skype, WhatsApp) did you communicate when ordering the cake? What type of media do you use to assist the discussion (e.g., texts, pictures, video)? How many times of discussion/meetings did it take? How long did it take (e.g., how much time in advance did you start contacting the cake maker(s))?
- How did you express the ideas? How did the cake maker show his/her ideas?
- What kind of information about the cake were you talking about?
- Did you feel inspired by each other? Did the cake maker give you some advice? Do you think both of you equally contribute to the cake idea? Do you like that?
- Did you like/dislike the medium in which you communicate with each other? Why? Did it help you express your cake design ideas, understand the cake maker, and have a mental or on-paper visualization of the designed cake?
- Which part did you think is the most important and the most difficult for communication? What do you think could be improved?
- So, finally, What kind of cake did you get? (if possible, show picture)? Do you like/dislike that? Why?
- Do you think it is original/unique? Do you think this factor is important? What do you value most in a customized cake?
- Did the real cake fit your expectation?
- Which part of the cake came from your idea?
- How did you feel about that overall experience? Will you order a customized cake next time?

Knowledge in Cake-making:

- If you have a chance to design a cake, how would you do that? (Tool2: LEGO, clay, maybe)
- Can you describe your cake?

- What kind of outcome do you expect to achieve? (Tool3, I will show different cake pictures to interviewee, to figure out what do "lay-designer" value most in designing a cake)
- Did you have experience to DIY something? Tell me more!

Appendix C: Thematic analysis of user research

- 所以他不是一个自然的 motivated user
- And it's 525 for each person's and then if they want fruits or flowers on the dance like 20 cents a person extra.

Cake maker- client interaction

- 我希望你们提要求是可以，但是我我也希望我是这个过程中我可以主导的
- 他们会有有一些很 brilliant 的 ID，只是有些 id 我是想不到的
- 而且在我蛋糕做的过程中，其实没有客人参与过，我也不喜欢有客人参与。
- usually they have also idea. So together we came to the design.
- What do you like? I don't copy cakes from others. But I like to know what they they're expecting
- they show a couple pictures and then I say I can do that or I can't do that
- it's my decision that I'm going to make the game or not.

requirement
<ul style="list-style-type: none"> • make a replica of one of the largest yachts in the world • to be big, • The name of the of the ship and brokerage firm. • heir preferences for two flavors also on the inside. And they wanted a little figurine of the new owner next to it. • 比如说他是看到过这个那个或者是网上的样子。然后他就问你这个行不行，那个行不行哦 • 妈妈，就是比如说他生日蛋糕，就是给小朋友定做一个有主题的蛋糕 • 他会单号给一些关键词，比如说他想要一个 line friends brown 蛋糕 • 他是想说多少人吃。他想要什么口味的？ • 那个有客人说我能不能换奶油啊，我不能换水果啊。 • 我们婚礼现场那个放蛋糕的桌子有多大 • 所以他想知道你的蛋糕和他的背景是否融合，婚礼的主色调 • Scale of stairs • 造型上其实我就觉得简单大方就好了 • send me a video to describe a possible way to make a triangle or mix different screen and insert a super inspirational I think to try that out created the kind of flower like patent case • 因为这一切蛋糕的时刻就是一个象征性，所以他一直要有一个看起来是主角的一个造型在，然后旁边有陪衬的几个小的蛋糕，有主跟从的关系 • 他很喜欢森林，很喜欢抹茶的，他想要这个数字方阵在蛋糕上 • pictures card of the wedding card, or the invasion • 婚礼邀请卡的颜色 • theme they have • . So we thought it would be nice if the cake would also be colorful and if possible also have triangles.

- 还说我的颜色不要太鲜艳的，然后那怎么样才叫，对就是这种东西就还是很抽象
- 宾客们方便取拿
- The image when bride to cut cake
- but they had a story on how they met.
- Blue cake for guess the gender of baby
- 数量以及活动当天要怎么样的配送，然后他需要有如何的现场的布置，比如说他的桌子要多大，然后他会希望怎么摆主要蛋糕摆在哪里，然后其他的付的蛋糕在哪里，然后可能需要有餐盘等等
- there were some people with allergies or preferences like my sister for example, she's vegan.,

Level of requirement
<ul style="list-style-type: none"> • A lot of them when they come they have an idea of this is going to be my favorite. • The other extreme is either they have no idea at all. And I have to try to gather information about the style of their wedding, their own personalities, their wishes, all those things. And then to To throw some ideas at them to see if if they like it or not. • 大家也不知道自己要什么

LEVEL OF CUSTOMIZATION
<ul style="list-style-type: none"> • 既定样子上他会选它的颜色这种特征 • 就这种层面的定制。只有在一个既定的基础上做一些改进 • 他们就是一个被子，只不过上面的设计会稍微变化

LIMITATION OF CAPABILITY
<ul style="list-style-type: none"> • 以他就只能说是有一个具象的东西在那他才能想象。很难是凭空像一个东西 • 所以他们他们就把那个蛋糕整个的示意图画给我，就是我们就要这样子的一个造型，然后我就会就一目了然。我一下子就可以想这部分我要怎么做，但是很多时候客人并没有这个能力

- What do you like? I don't copy cakes from others. But I like to know what they they're expecting This the topper of this cake I like this is for from from this cake I like the decorations on the side, this gay guy and then I combine it to a new one.

time

- we had two days between confirmation and delivery of the project. So it was very complicated but very fun.
- six months in advance. So we have all the time to go over all the details.
- send a picture today before when you're done with the cake. We don't do that because first of all, it stresses them out.
- 我觉得非常难的一个地方就是，我的蛋糕不可以提前十天半个月左右，我所有的蛋糕最多提前两天左右
- 因为我用奶油，我要保证上新鲜嘛，人吃的时候还是新鲜的。
- because they're fresh you meet you make them the morning
- it's also like the time is really important. Sometimes you've come to a place they don't have any fridge or they have a fridge but it doesn't fit inside.
- matcha 可能就是放酒的时候它颜色会比较暗，这种我们可以先心里知道这样
- I prefer to do with like that you have the time to talk about the design and to about a taste.
- 所以这就是为什么很多店最后就会使用照片拼凑，因为他不想花时间跟你从零开始聊。而且他很可能是吃力不讨好
- They want to change every five minutes things.
- But those were very last minute things that we couldn't do because we already were working to the max.
- Which day in while we were making it, they still try to change that.
- costs money costs time for me and it's just two weeks before no changes is your definition.

BUDJET DILEMMA

- when people have a clear idea of what they want, but their budget doesn't allow for it.
- Nate sometimes people come in they are they such fancy pictures. I want to have this one. Like a really nice Chanel cake. You know? Yeah I can make it was but it was like 330 I guess. Oh, I always ask what's your budget most of the time to say 10 euros? 15 years?
- they think they can really get a really nice gate for cheap.
-

How and what to negotiate

- And we tried to avoid that as much as possible by asking from the very first beginning, give us an indication of what you feel comfortable with spending, just so we can indeed prevents them having ideas about this new 60 year cake. Well, they only have money for a two tier cake or all these details.
- if they have a certain ID, but their budget doesn't allow for it to try to come up with an idea that resembles the first one but also falls within their budget limitation,

Cost of cake

- we try not to because it's indeed Yeah, and a lot of things like silicone molds can be expensive and if you only use them for one cake then you need to charge the entire amount to that one cake
- 你花这时间沟通这个时间成本要加到蛋糕价格上去

Dont understand the invisible cost

- 就是因为他不能理解你的人工（的花费
- They only want to pay for the materials and ingredients and a bit, But before the design and the time you may you spend on it. They don't want to.

event

- a catering company to come up with this cake so they wanted to give it us a present for the client

FIT BG

- if it's a large castle, like we're, we use this cake for fairs, and then you want something that's really eye catching and big. But this is taller than normal cake. So every like you can see every cake has different heights and different widths
- 比如说他想要他的主蛋糕，上面有装饰的花，有几何的图案，因为他的整个婚礼的主题就是几何，然后他会在一艘船上来办，所以他要有红色的元素，因为那个船是红色的，
- The location itself was also very colorful and bright and colors and I think most people were as well.

logistics

- Fridge
 - How far away
 - Size of table
 - 你的桌台是长这样，然后你的餐厅的动向，人会从这边走过来这边去
 - 针对活动方面的资源，是不是有能够达到让当时一切都很顺利这样。所以你很注重整个体验
 - 所以说在我100%觉得一定很好吃的状况下，那剩的就是我们怎么样把它顺利的送到大家的嘴巴里面
 - 风很大会倒什么之类
 - 有一个服务员在旁边帮忙配送
 - what our location would be and how easy it would be reachable so that she could also check if there will be feasible for her.
- 蛋糕会不会看起来太孤单，是不是要把一个花在什么旁边

UX-CAKE MAKER

- so this was not a regular order in any sense of the word but it was definitely a cool one.
- I'm not Jesus, I can't make everything
- this is really outside my comfort zone.
- some colors are are disgusting on the yellow

What they like

- are very determined to make things work and to research and to find tutorials or to find examples
- my wife won't stop thinking about something until indeed she knows how to do it.
- we're just very creative in finding solutions in that regard.
- 我最喜欢的是那种我不被人打扰啊，然后我就一直在就在脑子里从有想法到想法慢慢沉淀，然后你慢慢做出来，他就这个过程我很 enjoy
- The best thing about making a cake that you came up with the idea together, and then I can make it for them and then you can put it there and there All the faces that you see and the gratitude that you get, that's the best part of making the cake
- I'm excited of making it because it's the most. Yeah, the challenging cakes.
- well, there's couples that come in here fully prepared and they have a

picture they say this is my dream cake. I want this. That's generally the easiest for us

- 其实对方也会希望我们提供给他更多的要求，让他能够更快速的做决定

FREEDOM OF CAKE MAKER

- And those, we generally really have the Our own rarely creative freedom to make something we work with wedding couples in the ncf to make what they want to make, and very rarely they say like, we like what you do, just do whatever you want.
- 如果说有的话就可以试试看一些创意的发想，对吧？完全以他为主这样。
- 他还是对蛋糕这份比较了解
- 因为我觉得我设计不会比这些设计好看，
- 因为我觉得我们强弱就有太多的想法，或者是太过想要干涉很多事情的话，其实两方面压力都会太大
- 会不会也并不会想要过多的主导这些事情，因为越主导就越多，责任在自己身上，对吧
- I didn't want to have the stress of making something myself
- I think we all gave them input but also the freedom to express their own work of art and it's in a certain way

Cake making

Vilabiliy

- 因为我就不会做一个，我觉得做不出来的东西。
- I always know what I'm going to make.
- 但是我的蛋糕就有很大的局限性。比如我在夏天很热的时候，我没有办法做。因为奶油在二十多度的时候，他就会化掉。
- So if you put it on the table and it's like 30 degrees outside, and it's like one hour, then you're gonna got it. It just finished it just melts away.
- 然后我就会就一目了然。我一下子就可以想这部分我要怎么做
- if I'm sketching a cake then I'm thinking about Will this work
- 就像你在白颜料里面加黑色，永远调不到纯黑色啊
- Structure: I fill it up, and then I'll put sticks inside and in every layer.

- yeah make beautiful cakes. Yeah, yeah, but I don't think you can eat the cake
- 说当时有什么样的材料比较好，购买到的话，就用那个时候的材料就可以了

difficulty

- 等于蛋糕对我来说，压力就是在于不到最后一刻好他都是有风险的
- 每一步都不能错
- 因为小猪佩奇是 2d 然后你在做的时候变成 3D 的了，就是纯想象的，远比你看到的是 2d 的图案，所以你完全就要把他们 2d 给 3d 化
- 所以这个对我来说，如果我也能有一套工具，可以事先得让我可以 visualize 了一次话。但我觉得我在犀牛里建模也可以
- Trial and error: Do it a lot longer than I thought it would be.
- I got into shape and then I fucked it up so I need to bake them again
- I don't have an idea how big the dummy should be. Yeah, I did some calculations, it turns out to be correct..
- I don't buy the special equipment and I think about a different way to make it.
- Try to do all the decision in on f2f meeting

UX-CLIENT

- couples will only see the final
- 还有就是他们要求的装饰和我能实现的不匹配

FREEDOM CLIENT GIVE

- couples are in Holland are not very adventurous and they don't like to go for things that they don't know yet or that they think like I'll be like it but other people look at it a certain way.
- people really want to see it first 10 times 20 times before they think like, oh, maybe it's accepted to do that for our wedding.
- I love that cake, but not for us.
- all we can do with that is indeed, those photo shoots and show in a nice setting that it's, it doesn't have to be traditional when it can be something

new.

MOTIVATION OF CLIENT

- 他可能是他也想参与到这个拼装的感受，对吗？那这个客人一定是有兴趣
- 它整个活动有很多的环节是我都要去注意的，所以我没有办法花太多时间在比如说挑选蛋糕上面这花是要粉色还是要蓝色
- you have to let go of those things on your wedding day.
- I wasn't exactly sure what time you would come but I just expected you to be the professional Be on time and effort everything set up on time.

TRANSPORTATION

- They wanted at least one helicopter on it because it had to helicopter Pat's on the boat and have helicopter

COMMUNICATION WAY

Preference on email (team work, track info, single tool in control, info in overview and order)

- We try to avoid WhatsApp as much as possible because we work with several people here and what's up conversation or Instagram is also something that we get messages through Instagram. It's difficult to track in checking information and agreements.
- I have a lot of orders, it's for me it's easier to have everything via email.
- I forget your WhatsApp
- I know I'm up to date and if I have to check in Gmail and Instagram and Facebook and WhatsApp then I lose the control

CONTRACT

- We have all the information we need to come up with an entire quote. And then we send them a quote by email and they can sense adjustments are questions by email.

- we make a quote just in a PDF with all the details of delivery time, location, flavors, design, everything that we need to produce and deliver the cake and that goes to them by email.
- We include as many pictures as possible also, to really try to avoid any miscommunication

F2F

- we ask them first to give us some information about their wedding so we have an idea of what they're looking for. So we can advise them as well as possible. And with that, we also asked them for some flavor preferences and then we prepare tasting plate with two flavors of cakes and fourth fillings. And we present that in the shape of in total eight mini cupcakes that they can mix and match them just so they can try all the different combinations.
- It's a better example to talk about because it's more standard.
- They tried flavors that they want to try. And after that, we go into all the deep details about the design about logistics, and in generally, more than an hour.

text!

- 邮件吧，我也会往回倒的文字就是，而且你打字的时候你会想。因为你好像打电话说我自己都忘了说了
- 那我打字就会出现打很多很多

REMOTE

- wedding couples that come from abroad or have busy jobs

LESS OPTION

- Presentation of a cake that we can give them. Because if we would make many cakes, it would be very time consuming and also very limited in what you can offer them.
- 他明明这件事五分中能做出决定。给他了十个选项，之后是能墨迹一天，然后那样最后就放弃了，就说你来帮我决定吧

INSPIRATION

- inspiration for that comes from Instagram and Pinterest where cake makers in the US
- So we follow a lot of different people and get ideas from there and then make it our own.
- learned at a workshop
- I studied I followed a lot of courses to for cake decorating.
- one generally planted and makes mood board and an idea of what they want to show. And then they everyone puts in their own products. So you get more material for your own promotion and to show what you can do.
- Collaborate with: stealth shoots, where photographer location wedding planner, florists, cake maker, makeup artist, they all come together,
- 其实灵感一半是来自客户的
- I love to make these cakes and talk to my clients and I get energy from it.

STICKNESS TO ID

- And generally they're not stuck on like, Oh, I really wanted this one or this one.
- the biggest thing that that they have in mind, such as aesthetics
- 我们也很少遇到客人，说很执着，一定要跟他想一模一样

Baker philosophy (requirement)

- We try to make sure that the inside and the outside are both perfect. So not that it's just visually pleasing. But there's also remember when you eat it,
- we tried a lot to to reshape and to modernize the entire industry when it comes to winning cakes here.
- 但对我来说，我就觉得我看到那个视频，我就觉得他太糙了，就不太符合他这个婚礼蛋糕有点精致的那种样子。
- 你就是你觉得你非要不可。我们不用色素，只有我们天然的东西，颜色就很局限了
- 由我本人不喜欢用翻糖
- 那就是想让客人他在喜欢巧克力同时也也有一些健康的成分。在蛋糕里面谈的也比较少。恩。对就是有很多用心在里面吧
- I make all my cakes personal
- But I don't like to make just a cake you can get from the Hema or to the bakery, I think well, if you're like some cake like that, go there. I don't have to make it because there are a lot of people who can make
- What do you like? I don't copy cakes from others. But I like to know what they

they're expecting

- I don't want to make a cake where people say, Well, I only have to pay I don't want to pay too much and I say you say it will go somewhere else.
- Well, I need a cake next week, and they get sorry, that's too short of time and then I have them. I don't have the time to make it or they think it's not important enough.
- I think that's because they, it's their cake. So they have to like it

Expectation

SIZE

- we try to point them as much as possible to a cake that has decisive what they can expect. But it's because a lot of people are surprised by sometimes a small case for four layers. That's
- 就是我发现很多人的尺寸没有概念啊，例如他之前你之前做蛋糕样子，那个蛋糕其实是二十个吃的，他很喜欢但是只有两个人，他想说你能不能给我做一个小的一模一样的，但是我不能把一个草莓等比例的缩小，然后太不理解，说为什么就不能做一个长得一样，但小个子的，
- 因为他会想象，他以为这个蛋糕很大，却收到很小的。
- 那这么大是多少厘米，他们就会没有概念
- ，如果有大概 1515 公分到底多大
- 一人份要怎么算？哪些人吃两片，还是认识三片还是认识一片，
-

- I didn't know really what kind of configuration do cake rolls

NO FIT- why

- you can always find something wrong with everything.
- But they didn't say said that in advance.
- Cake maker's mistake sometimes
- Sometimes they don't understand what's what's it like to make a cake.
- Maybe in my head I would have expected them to be mixed but doesn't really matter.

promise

- 因为他们后来定做的话。差不多已经在沟通过程中已经接受了这个蛋糕不可能完全一样。对所以说，你跟他沟通的时候，你不能把话说得很满，说一定是这样子
- And I'm saying, I'm going to try it, but I'm not guarantee that it's going to

work because it needs to be a nice cake.

TRUST - SECURITY

- 他肯定就是已经接受我们的 random，我们就会有自己发挥的空间了。就是建立在信任之上吧。
- 他一定知道它的直径和高度，然后他才会有安全感啊。
- 就是你要喜欢我，你相信我你就找我。但如果你要很挑剔的话，你就不是我的客户
- 现在要监督你，你你做的什么样子的呀？
- 是信任上的程度是一定没有问题。对，因为我本来就没有太过担心，也不会因为事先没有看到所有的细节的担心
- 我觉得跟期望的差不多，对一个算是我觉得蛮安全的感觉得
- I think I just trusted the cake designer in defining what was needed for this amount of people.
- she had the experience so it just and in the end it worked out perfect.
- I trust the person and what they're creating and because I've known her for a couple of years and I've seen her portfolio I think coming by in my social media streams every week or so,

- HIGH EXPECTATION: but they see video in like five minutes and they come here and they think that I can make it
- 然后也会不停的给你发新的图片说我们可以改成这样啊
- 就他们会有很高的期待，然后对会在这个过程中不停的给你施加压力，
- usually they say it's okay because we came up with an idea together so.
- 因为你会大概知道说他的风格，他的方向是在哪方面。他不会跟你的期望落差太大，
- 有图，但是帮助是非常大了

(designer)Present way

- Now we did it all the way in the beginning but it was incredibly time consuming
- Sketch didn't give the same feel as a cake.
- So you don't get the full visual idea of the cake, but you get the exact details of what they want (combine image)
- 草图不可能一模一样呢，
- (dummy with people on that) to present the amount and configuration
- 蛋糕中都用讲的好像每个人想法都很抽象

SIZE

- 我就会用手比划。这个蛋糕有多大，然后比如说每个人拿到手里的，
- 他们也会问那我切到每人手里是多大。那这个时候我就觉得啊，我怎么说呢，或者比个这样的三角形，用这些手指
- I don't have the problem because I show them the dummies
- 蛋糕模具
- sometimes people want like 30 persons but they want them three layers but that's that's impossible. Because why? Well, this one is done.

on it. So I don't think anyone else in the world has a similar one or one that looks like

- we are creating a lot of things ourselves. So for example, the invitation and decorations and poster and things like that, because I also like to do some graphic design if I make time for it

Tech recommendation

- Size could be something that you can load certain exact size
- Experimental: that's just two tier cake. You can add dummies underneath and then like it becomes bigger.
- How big each slice can be
- wanted the cake to look good when the couples need to slice to cut the cake
- put a background on it, make them feel that they're already there.
- how to look like in your wedding.
- you can just drag that in there and the cake comes to life.
- if you can do that that would be amazing at the database of pictures and different colors how to adjust that.
- 他如果能帮我节省时间，那我可以考虑用这个工具
- calculate the cost that's hard if you calculate your price, and you have to calculate all your hours you spent on the cake in the price of the cake that nobody wants to pay it.
- Client: 活动的预算要怎么计算
- see the perspective right to be able to compare it to something else.
- in terms of color, it would be a bit more difficult because you cannot see screens always look a bit different from reality
- the whole composition of the cake
- turn it around

ORIGINAL

- 独特性当然是有了，因为有 jieje 他自己的风格在
- I think we all gave them input but also the freedom to express their own work of art and it's in a certain way
- we were able to put our own ideas into it and then also have a cake designer work

Appendix D: Question list of user evaluation

After Question List

[investigate social behavior]

- Can you compare the socialVR setting with your previous experience of f2f meeting (customization / co-design),
 - What is similar and what is different? How do these elements (similarity or differences) influence your experience?
 - What do you like and dislike? How do these elements (likes or dislikes) influence your experience?
- Quality of interaction
 - Are you engaged in communication and tasks?
 - Do you feel you proactively respond to your partners' action and words? (behavioral interdependence, mutual assistance, dependent action)
 - Do you think you can freely convey your ideas?
 - Do you think you can easily understand your partner?
 - What do you think of the quality of collaboration?
- Social meaning
 - Mental connectedness
 - Do you think it helps you to maintain a customer-supplier / co-worker relationship?
 - Do you think you have a shared understanding with your partner, with regards to what you are collaboratively working on?
 - How well do you sense the emotion /intention/ attitude of your partner
 - Physical connectedness
 - Do you think you are staying together with your partner in the same virtual space?
- Presence and togetherness
 - Do you feel you are actually in the virtual bakery, and virtual garden?
 - Do you have awareness of the real-world surroundings when you are wearing the HMD?
- How do you think the product can be improved in the future?
 - What kind of activities do you think you can do, with whom in this setting
 - What do you think is the next generation of remote cooperation system?

[validation of design requirements]

- The way to present images
 - What do you think about this function?
- The virtual environment of the "cake-context"
 - What do you think about this function?
- 3d sketch
 - What do you think about this function?
- 3d shape in one-in-one scale
 - What do you think about the perception the 3d shapes?
 - Can you feel the size and configuration of the cake?
- Gesture-based 3d manipulation

- Is it easy for you to learn to operate the 3d object?
 - Is it an easy task for you to build what you want?
- Pre-set model database
 - What do you think about the preset 3d model database?
- Visual cues of cake
 - What do you think about the quality of the food texture?
 - Does it help you to imagine the real cake?
- Capture images
 - What do you think about this function?
- Automatically generate data
 - What do you think about this function?

Appendix E:

SUS Form

System Usability Scale

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	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
2. I found the system unnecessarily complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
3. I thought the system was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
4. I think that I would need the support of a technical person to be able to use this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
5. I found the various functions in this system were well integrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
6. I thought there was too much inconsistency in this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
7. I would imagine that most people would learn to use this system very quickly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
8. I found the system very cumbersome to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
9. I felt very confident using the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1	2	3	4	5

Appendix F: Thematic analysis of user evaluation interview

