Scaling Consultative Selling with Virtual Reality: Design and Evaluation of Digitally Enhanced Services

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Abstract. Virtual, augmented, and mixed reality technologies allow creation of powerful customer experiences and illustrative demonstrations especially in use cases that benefit from spatial visualizations. Our study focuses on the natural resource management sector and digitalizing of consultative selling process. More specifically, we look at how to improve customer engagement with the use of virtual reality (VR) and thus digitally scale consultative selling. In this process, a VR application is used to demonstrate various management operations and their economic results. Design research methodology is applied to a pre-development phase and three application development iterations between 2016 and 2018. Data consists of user interviews and video observations (N=129) during various development iterations and three application development plans. The results show that VR offers an emotionally engaging and illustrative tool in consultative selling. Further, it opens a novel way for interaction between the salesperson and customer and possibilities to scale consultative selling digitally, emphasizing the role of trust.

Keywords: Consultative Selling · Design Science Research Methodology · Framework for Evaluation in Design Science · Virtual Reality.

1 Introduction

Tightening competition pushes companies to develop services that create memorable events to their customer, and the ability to create positive customer experiences helps companies in differentiating [1]. Because of their recent technological advancements, various visually immersive computer-mediated realities such as virtual reality (VR), augmented reality and augmented virtuality have attracted attention in research and media. Currently available VR-technologies in the consumer markets allow the creation of personal and strong emotional experiences [2]. This enables novel paths for companies to create customer experiences to interact with a firm. However, it is not known how to systematically design these digitally supported services to be a natural part of a customer journey aiming to increase customer value and sales for firms.

Gaining an ability to create strong customer experiences has become a leading management objective in many firms [3]. Customer engagement constitutes touch points

along the customer journey [3] and it is a psychological state that occurs by virtue of interactive, co-creative customer experiences [4]. For companies considering how to increase the scalability of their business models, customer engagement is a central mechanism as it concerns the value proposition the firm offers to its customers [5]. A decision about the level of customization is usually related to scalability and it is closely related to the degree to which a firm's operations or customer's experiences are made possible by digital technologies [5].

In this research, we focus on customer engagement in consultative selling utilizing a novel VR application in visualization and scalability of this service. Currently, VR content platforms are still on their way towards institutionalization [6] and they should currently be considered as tools for improving customer and employee interaction and business performance [7].

In this research, DSR methodology is used to describe and evaluate the development process [8] of a VR application currently under development – the described process consisting of a pre-development phase and three application development iterations implemented between 2016 and 2018. The digitally supported consultative selling of forest management services was selected as the use case. The application is aimed to increase scalability in a market environment in which the currently dominating consultative sales process is challenged by e.g. long physical distances and fragmented customer base [9]. The main challenge of the application in the use context was recognized to be related to the user acceptance, i.e., how to a fit new technological solution into the sales situation. In this research, customer engagement as a service scalability mechanism [5] is selected as the main guideline for application development evaluation.

2 Literature

2.1 Design Science Research Process and Evaluation

Design science in information technology is a research approach aiming to create and evaluate artifacts to solve identified organizational problems [10]. In this research, organizational problems arise from the need to digitalize personal selling practices to improve scalability and to offer engaging customer experiences. DSR – a popular framework for planning and evaluating service development especially in information systems research [8] – is applied. The framework provides a nominal model for doing design science research consisting of six steps: 1) problem identification and motivation, 2) definition of the objectives for a solution, 3) design and development, 4) demonstration, 5) evaluation, and 6) communication.

To ensure the usability of the application it is important that it is tested in the real use situations [11] and design can be integrated as a major component of research [12]. Evaluation of design artifacts and design theories have become a central part of DSR [10, 13] and it may be tightly coupled with design itself [14]. Venable et al. [14] argue that because design artifacts and design theory evaluation are used to actually design, develop, or 'build' new artifacts, they are more relevant, important, and specific to DSR than other research paradigms.

Venable et al. [14] have developed a DSR evaluation framework, FEDS, to complement the existing evaluation frameworks and to offer a new evaluation design process

for applying that framework. FEDS is designed to give an answer to the question of "What would be a good way to guide the design of an appropriate strategy for conducting the various evaluation activities needed throughout a DSR project and to bridge the gap between evaluation goal and evaluation strategies?" [14]. DSRM, in turn, describes purpose of the DSR evaluation as whether the purpose is to help 1) formatively to improve the outcomes of the process under evaluation or 2) summatively to judge the extent that the outcomes match expectations. What's more, Peffers et al. [8] argue that we should also see whether the DSR evaluation is 1) artificial and tests the research hypotheses nearly always in a positivist and reductionist way [15] not excluding the possibility to use interpretive techniques or 2) naturalistic and explores the performance of a solution in its real environment [14].

Firstly, FEDS helps in concretizing, why an artifact is evaluated, in other words, whether the reason is to support decision making formatively by concentrating expected consequences or to evaluate the meaning of an artifact to support the selection of the evaluand [16]. Secondly, FEDS describes the timing of when to evaluate, whether to predictively evaluate the impact of future situations, or to assess the value of the implemented system [15]. FEDS provides four steps for evaluation: 1) explicating the goals, 2) choosing strategies for the evaluation, 3) determining the properties to evaluate, and 4) designing the individual evaluation episodes [14].

2.2 Scaling Consultative Selling with Virtual Reality

Consultative sales behavior is a practice of a salesperson trying to help their customers to make purchase decisions that will satisfy customer needs [17]. Consultative selling is defined to be a "process of providing information in a professional fashion to help customer take intelligent action to achieve their business activities" [18]. More broadly, consultative selling is recognized as one of the value-related salesperson's behaviors that aim at understanding the customer's business model, crafting the value proposition and communicating customer value [19].

Zhang et al. [5] have proposed that three mechanisms are central for the scalability of digital business models: engaging both paying and non-paying customers, organizing customer engagement to allow self-customization, and orchestrating network value chains. Sources of scalability for these mechanisms are proposed to originate from dynamics of 1) learning by using, 2) network externalities, 3) economic scale in production and distribution, 4) informational increasing returns, 5) technological interrelatedness [20,21,22] and 6) distributed resourcing [5]. Requirements for customization and human interaction in consultative selling are high compared to many entirely digitally realized services. Therefore, the focus of our research at the current development level of the application is more on mechanisms engaging customers than orchestrating network value chains.

This research aims at digitalizing a part of consultative selling in a business case that has two perquisites for potentially benefitting from it: the case relies on consultative sales tradition and is challenged by digitalization that increases business performance requirements. For this purpose, we build on customer experience and engagement literature and VR technologies.

Customer experience is a multidimensional construct that can be defined as the internal and subjective response that customers have to any direct or indirect contact with the company [23, 24]. The experience is customer's personal and emotional reaction to an event, interaction with a brand or a firm [25]. By adopting the interpretation of representative heuristics [26], total customer experience is composed by a customer judging events not by the entirety of an experience, but by prototypical moments. Firms are broadening their thinking about marketing by designing and managing the entire processes the customers go through in more systematic ways [3] and tracking experiences at customer touch points helps in developing understanding how an experience can be enhanced for the customer [27]. The design, delivery, and management of the customer experiences can be divided into multiple perspective including for instance the firm's point of view, customer's point of view, and the co-creation perspective [3].

Customer engagement, in turn, focuses on the extent to which the customer reaches out and initiates contact with a firm [3]. Customers can be cognitively and affectively committed to an active relationship with the brand as personified by computer-mediated entities that are designed to communicate brand value [28]. Customer engagement attempts to distinguish customer attitudes and behavior beyond purchases and it can be classified into 1) cognitive, 2) emotional, and 3) behavioral responses to the firm's offerings on the part of the customer [4]. For companies, the value of customer engagement is measured in forms of purchasing behavior, referral behavior, influencer behavior and knowledge behavior [29].

Finally, mixed reality encompasses both augmented and VR technologies largely covering concepts that mix virtual and real-life experiences [30]. More specifically, VR covers computer technologies that use software to create realistic sensations that represent an immersive environment and simulate user's physical presence in this environment [31]. Scholz and Smith [32] also point out that these technologies can prompt interaction between various parties, even between users and bystanders. Thus, VR aims at creating sensorial stimulations while trying to avoid awareness of intrusion, in other words, the presences of experience in another world is accepted naturally [2]. Presence is related to the emotion of 'being there' [33] VR technologies allow illusion of immediately to be transported into the computer world beyond the head mounted displays [34] and the creation of personal and strong emotional experiences [2]. Interaction in VR is becoming an increasingly important research topic. People in VR can understand and empathize when they comprehend another person's subjective experience and environment allowing people to understand each other [35]. This justifies the use of VR in studying how to scale consultative selling.

3 Methodology and Data

3.1 Research Approach and Structure

Methodologically, this paper follows the DSRM [8] analyzing the performance of the application in a naturalistic way in its real environment [14]. FEDS is used to evaluate the development outcomes focusing on customer engagement as a service scalability mechanism [5]. The development process consists of a pre-development phase and

three iterations that all include a software development cycle resulting in an 'artifact', which is tested by users and evaluated by the researchers. The user experience research phases were implemented empirically and they were artificial and summative in their nature. Results of the user tests were used to formulate development proposals for managerial purposes in each development iteration. They were naturalistic and formative in their nature with an aim to improve the outcomes of the service design process.

The main challenge of this VR application is related to the user acceptance, i.e., that the application will not fit well into the sales situation. Therefore, our goal for evaluating the artifacts with a focus on customer engagement as a mechanism by which a business model attempts to gain scale. Scalability in terms of economic scales in production and distribution at this point of the development are marginal, even though not dispensed. Therefore, emotional customer experiences and perceived usability were recognized as the most central features to evaluate. These are related to emotional and cognitive customer engagement. Factors related to behavioral customer engagement such as social context and word-of-mouth became important when testing the application with real customers. Finally, behavioral customer engagement was recognized to be even more important making the role of the application as a part of the customer journey focal (Figure 1).

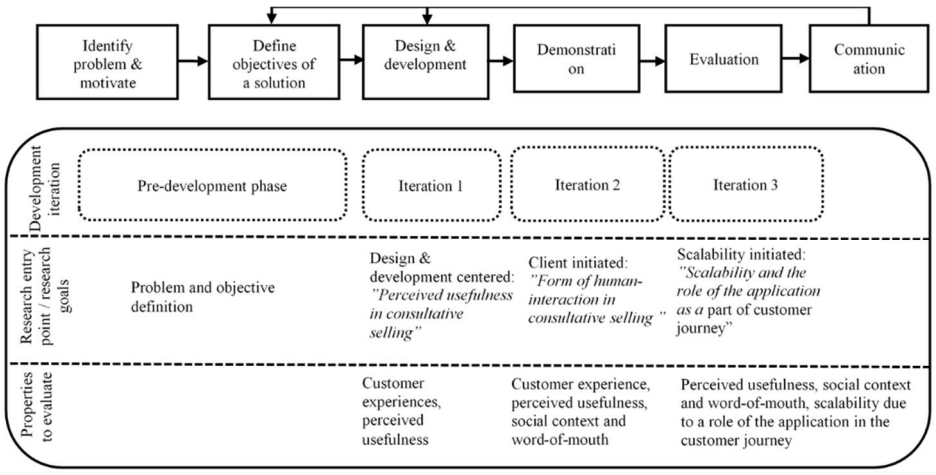

Fig. 1. Evaluating customer engagement and scalability of VR enhanced consultative selling.

Our DSR evaluation efforts – summarized in Table 1 – consists of user interviews, observations, and open-ended survey questions of altogether 129 users, and three research and development plan documentations. In all the phases, the interviews were recorded on audio and transcribed. Further, we applied Biocca's [36] approach to study people both in a virtual world observed simultaneously as avatars in a virtual world but also their person in the physical space. This allows the study of participant's behavior without interrupting them [37]. Also the recorded video data was transcribed. Further, iteration two included also multiple quantitative survey questions where the user was asked to rate perceived realness of the environment, usefulness, learning and behavioral

intentions of e.g. sharing the experience by using a five-point Likert scale. Here, the effects of the form of presence of the service person was tested by using Mann-Whitney U-test [39]. In addition, an e-mail address of a friend or a relative was asked and it was coded as yes/no -answer in the analysis to indicate actual willingness to share the experience when comparing remote and present appearance of the service person.

Table 1. Summary of the data

Development iteration and time	Form of interaction	Data	Customer engagement approach (E=emotional, C=cognitive, B=behavioral)	N
Iteration one, autumn 2016	Present	User interviews and video observations + research & development plan	Customer experiences (E), perceived usefulness (C)	50
Iteration two, autumn 2017	Present vs. remote	Customer interviews and video observations + research & development plan	Customer experience (E), perceived usefulness (C), social context and word-of-mouth (B)	64 (37 + 27)
Iteration three, spring 2018	Individual use, present in sales situation	Customer interviews and video observations + research & development plan	Perceived usefulness (C), social context and word-of-mouth (B), scalability due to a role of the application in the customer journey (B)	15 in pre-test 6 of them in-depth (each user participating 3 test rounds)

The interviews allowed the participants to reflect on the use of the application from his/her own perspective [40]. The user experience interviews and managerial research and development plans were analyzed qualitatively by using Atlas.ti-software. By following the interpretations by Kahn [41] and Hollebeek [42], the user experiences were categorized into emotional (E), cognitive (C) and behavioral (B) elements and depending on the case into customer experience, perceived usefulness, social context and word-of-mouth, and scalability due to a role in the customer journey. To improve the reliability of an interpretive analysis by ensuring that the observation represent the practices they claim to represent [43] the team had expertise in service and land owner research. To improve the validity of the findings, the researchers met multiple times to discuss the themes and the empirical evidence.

3.2 Pre-development phase

Before starting the application development, three business meetings and one workshop were organized in the spring 2016. As there was no relevant content available in the natural resource management context, twelve professionals of that specific topic were familiarizing themselves with the VR technology and existing applications in the fields on architectural and industrial maintenance.

In the pre-development phase, it was recognized that emerging mixed reality technologies will have various use cases in the natural resource management context and more specifically, in consultative sales. The main potential value drivers were related to the good availability of the natural resource inventory data to support scaling the

application, and traditions of the consultative selling simultaneously suffering from high travelling costs. As a result of these discussions, VR application to land owners' decision making process was seen as a potential and feasible use case to develop a VR application.

3.3 Iteration One – Design and Development Focus

The first version of the application was created in the autumn 2016 in a research project of two universities. The objective was to determine whether it is possible to develop an environment in virtual reality that could be used to visualize various management operations. The solution needed to fulfill sufficient visual and functional quality requirements of the users. To open paths for possible further development, it needed to demonstrate that an environment based on real natural resource inventory information can be modeled, if the first requirement was fulfilled.

A land site was captured by using a stationary terrestrial laser scanner and 360-degree photos to help the users to evaluate and compare the virtual experience with an experience in nature. This resulted in a colored 3D point cloud representing 25 x 25 meters precisely scanned area. One 360-degree photo and a simplified point cloud were imported to a gaming engine and the environment was generated based on this data by using basic terrain textures and simple assets. This enabled an interactive environment where the user was able to gain money by removing trees and explore the area by either taking a few physical step or by teleporting. In addition, a bear was placed to wander around the area. The main gaming area was surrounded by a larger space allowing free movement but only plain terrain. Besides interaction with the asset-based environment, the user was able to watch the 360-degree photo and visit the point cloud where it was possible to move by walking physically in 2.5 x 2.5 meters area and to see the scene before any trees were removed. Figure 2 presents three sample views of the application with an overview from a hill, laser-scanned point cloud visualization and a 360-degree photo. A VR-headset with two controllers was used as a user interface and there was a computer running the system.

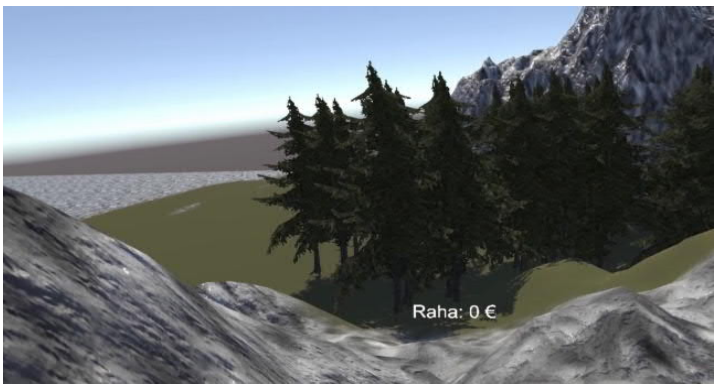

Fig. 2. Screenshot of the application on the development phase 1.

During three demonstration days, 50 users consisting mostly of invited business managers tested the management application and were interviewed. All the use tests were recorded on video resulting to 13 hours of video material and interviews after the experience were recorded and transcribed resulting in 6 hours of audio material and 96 pages on transcribed interview material. The form of the interview was open and followed the customer engagement framework starting from asking the user to describe the experience which led to a description of emotional experiences and functionalities that were possible to conduct in the application. The interviewee then continued by asking the user to more cognitively reflect the usefulness and utilities the user would feel, the interviewer continued by asking how these kinds of experiences could be derived to values or goals related either to this application or in interviewee's own business. This interview process was continued until the saturation point of the interviewee having nothing more to say. The transcribed interview material was analyzed by classifying the comments whether they were covering emotional experiences or cognitive analysis covering utilities the application could offer either in user's own business or related to the tested application. Finally, this material was coded based on emotional customer experiences or cognitively perceived usefulness [42]. Further, a research plan and development proposal for the next application development phase was created.

3.4 Iteration Two – Demonstration Focus

The second version of the application was created in the autumn 2017 in collaboration with a technology development company, a university and an industrial company. During this iteration, a land area covering 10 hectares was captured by using a portable terrestrial laser scanning and 360-degree photos. Based on the point cloud data, open access terrain data and existing natural resource inventory information, an interactive 3D model of the area was created by using a gaming engine. The user interface was the same as in the previous iteration, i.e. a virtual reality headset with two controllers and a computer running the system. The application allowed the users to examine detailed information about trees, gain money by cutting single trees and making large-scale management operations such as clear cutting, move by physically walking or teleporting by using the controllers (Figure 3) and visit 360-images. The user was able to use these functionalities in three areas. Each area represented a different kind of nature and included an information sign telling about the area and providing a management proposal. The user was able to choose whether to test any of the management operation and to compare the revenues of these actions in monetary terms. Finally, the user was able to cancel all the operations already done.

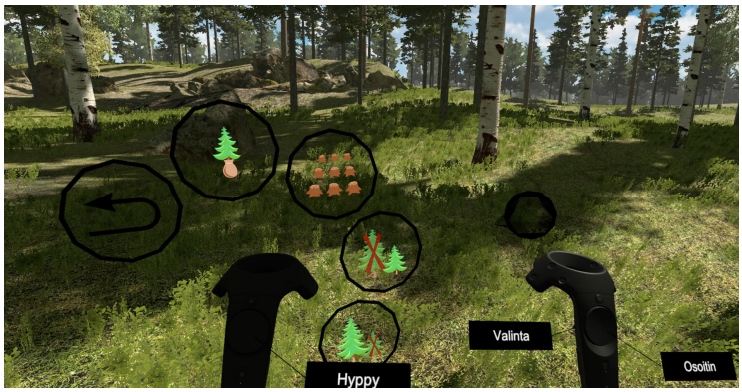

Fig. 3. Screenshot of the second version of the application

Seven days of demonstrations were organized and altogether 64 users tested the application; 19 females and 45 males. This number includes 10 pre-testers who were service personnel of the industrial company. The rest of the users were landowners. The age of the users varied between from 25 to 90. The user tests were recorded by using 360-degree cameras capturing both the user actions in the real world and in VR [36] resulting in 11 hours of video material. In addition, this iteration included a comparison of customers using the application with a salesperson guiding 37 users in-person and 27 remotely. In remote contact, a web camera view and screen presenting the view in VR were shared via a voice over internet protocol application. The users were interviewed shortly before the use and more comprehensively after the experience using open ended survey questions. The interviews were recorded resulting to 8 hours of audio interview recordings. A total of 140 pages of observation notes and interview recordings were transcribed and analyzed by focusing on customer engagement as follows: emotional customer experience, cognitively perceived usefulness, and behavioral social context and word-of-mouth. Based on the results, a research and development proposal was formulated for the next development phases.

3.5 Iteration Three – Evaluation Focus

Third version of the application was implemented in 2018. During this iteration, an ethnographic research approach will be applied to analyze the use of this application in persuading current customers to make wood trade in an acquisition of new customers. This research phase will be focused on deeply understanding users who represent the selected customer segments of the industrial company. Data collection and analysis for this phase will be finished by autumn 2018.

At the first stage, 15 users were recruited from a seminar targeted to land owners and the interested ones were briefly interviewed to identify willing test subjects for the next stage. Two users from each customer segments will be selected, one of them representing a current customer and the other a prospect customer recruited from the first stage. The application versions to be tested are 1) an improved version of the second research

phase, and 2) a mobile version of the application. The mobile version is an updated mobile version of the previous one with modified visuals and features. For this iteration, a smartphone with a virtual reality headset and one controller will be used. From the customer engagement point of view the focus is on cognitively perceived usefulness, and behavioral social context and word-of-mouth and scalability by considering the role of the application in the customer journey.

4 Findings and Discussion

The results open various interesting development paths considering the future and scalability of VR tools for consultative selling. Even though there are other applications available for participative planning, VR was considered as a very useful and illustrative tool. Considering the version 2, in which the usefulness of the system was asked, 82% agreed or strongly agreed that the system would be useful with no statistical difference whether the service person was present or the instructions were given remotely. 36% of the users of version 2 commented that the way of visualizing different management operations was illustrative, concrete or helped them to understand the results. VR also makes it easy for the user to concentrate on the content.

By allowing customers to participate the process, the company can learn about their preferences. In line with Zhang et al. [5], as the customer is doing a part of the production work themselves, the costs of satisfying their specific need are minimized. Starting from the development version 1 it was found out that communication during the interaction was easy. By offering possibilities for a customer to participate in planning by trying out various scenarios, it becomes easy for a salesperson to observe the user and to discuss in order to – by following Terho et al. [19] – understand customer's value model, craft the value proposition and communicate customer value. This increases understanding of the products, its value, adaptation and scale [5]. During all the development iterations, users were active in participating idea generation of how to improve the application. Willingness to participate in development can be interpreted being behavioral engagement to interact with the firm [44].]. What's more, during development iteration two, it quickly became clear that the close service contact made the opportunity for fruitful discussions as the users were actively telling about their feelings during the use. Majority of the users were talking or commenting something during the use and right after removing the headset.

When considering network externalities, this willingness to participate can be utilized when the adoption of the technology still requires human interaction VR [7]. By helping customers to participate in co-creation in their own social network opens ways for scaling the service. In iteration three, the use of the application in various parts of the customer path was explored by giving the mobile devices to users. This may help them to make decisions with the larger group of stakeholders which is the practical case in land owning where the estate is often owned by a group of owners only one of them able to meet a salesperson of the company. From the scalability point of view, the company could use key contributors – such as active landowners or entrepreneurs – to help diffusing the service [5]. In line with Scholz and Smith [32] on behavioral engagement,

technology was prompting interaction between users and bystanders, as the users were active in persuading the next users to put the headset on to share the experience and hence to increase network externalities [5].

Even though the users expressed much positive emotion by e.g. laughing and talking during the use, based on the video observations, the users testing the interaction remotely were the most reserved which was expressed by not talking and joking as much as the users in the other group. Interestingly, only 19% of the users who were served via the remote connection gave the contact information of their friends or relatives compared to 51% in face-to-face service which may be interpreted as an indication or mistrust. However, we argue that building trust in multiple ways [45] is the key where the most obvious one could be e.g. offering a familiar service person to lower this effect. In line with Hirschman and Holbrook [46], the emotional aspects of decision-making and experience should be recognized more broadly when designing the customer experience. From the company perspective, it is also easy to remind customers from strong emotional customer experience later. Some users in case one took photos of others using the system in iteration 1. Considering technological interrelatedness, the expressed high willingness to share the experience can be scaled easily e.g. by videoing the use and sharing in social media.

Remote consultation was rather easy to implement and it works well especially when the focus of the interaction is in transmitting information. Therefore, scalability potential by e.g. establishing call centers is good. This is also related to economic scale in production and distribution as well as to technology interrelatedness [5]. The quick development in multiplayer features and possibilities to easily make recordings in VR also open paths for various network-marketing strategies. Further, integrating data queries from databases including up-to-date information about prices and volumes of timber help in scaling the service when considering of orchestrating network value chains.

5 Conclusions and Further Research

The application is targeted to create value in a expertise service sales in a case that is challenged by long physical distances. In line with Elbamby [47], scalability of VR-services are still limited by factors such as availability of the equipment and high broadband speed among consumers, and technical incompleteness of the equipment. Base on the results of iteration one, it was found out that in marketing use such as in trade shows, it is crucial to keep a continuous flow of users to test the system is crucial for success. When the headset is not in use and it is not possible to observe other using the system beforehand, the setup is easily considered bizarre creating a social barrier to be the first one to test the system. These findings are in line with the notions of Sharafi et al. [48] about modes of negative engagement that are related to the user's avoidance or hesitation because of the user's feeling of lack of skills. Currently, beyond professionals and enthusiastic users, guidance is still often needed to ensure a good user experience. The need for help when using the headset also makes physical contact natural. This can be used to increase trust and to make the experience more enjoyable. Despite the rapidly

developing multiplayer features, there are still many technological challenges to be refined, such as haptic feedback and eye contact, before an interaction of avatars in VR feels natural.

We are currently working on how to test new levels of social use context and service scalability by providing the VR enabled smartphones to the land owners so that they can use and familiarize themselves with the application in other social context with their friends and family. With this research, the interplay of scalability, trust and engagement will be further investigated [49]. By giving better tools to a customer for decision-making may increase customer engagement and simultaneously help in scaling the service by empowering the customer(s) to participate to the co-defining the solution. With future research, we are planning to investigate how scaling consultative selling with VR can be adapted to retail sales setting and more specifically furniture sales for built-to-order high-end condominiums. With this study, we are also interested to evaluate the developed artifacts based on their effects on the actual sales performance of VR enabled consultative selling vs. traditional retail store based consultative selling. In other words, we aim to evaluate the artifacts by real sales figures for the client firm.

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