Creating a New Experience of Livestream and Augmented Reality

– A Case Study of Nokia Corporation

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Laurea University of Applied Sciences **Abstract**
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In this thesis, a service concept of the Next Generation Arena Experience for the Nokia Corporation was created as a part of Laurea's Design Sprint workshop. The Concept focuses on the new experiences offered remotely in a different platform and with included augmented reality experiences locally in the arena and at home. The project aimed to provide a concept to Nokia's customers, that they could offer to their consumers remotely or on-site.

Nokia corporation has been developing a giga-speed network that can simultaneously upload vast amounts of data. That enables them to give a new experience for customers visiting Nokia Arena and possibilities to stream for home users new stunning experiences. Nowadays and in the future, streaming data or video-on-demand is one of the viable solutions to offer more multichannel experience in homes and locally. Offering consumers, a new experience with more content will allow Nokia's customers to achieve more benefits with the new incoming technology.

The main concept of this service was to give home users a platform where there is a possibility to buy, for example, VIP packets for ongoing events in the arena. The second concept of this service is an augmented reality experience that users can use at home or locally in arenas. The knowledge base for this thesis was gathered using literary and online sources, like technology needed for service, benchmarking, customer profiles, and analysis. Customer insight into the process was collected by using a survey which helped to clarify the produced concept. Service design methods, like customer profiles, benchmarking, and analysis were also used during the process.

As a result, a prototype of the concept was created. With this prototype, Nokia has the possibility with their technology to offer Nokia's customers a concept that they can use in their products and marketing. The main concept of this service is to give home users a platform where they can buy VIP packets with new experiences for ongoing events in the arena. The second concept of service is an augmented reality experience that users can use at home or locally in arenas.

Keywords: Nokia, Service Design, Stunning Experience, Sprint, Livestream

Table of contents

1 Introduction

This thesis was implemented as a teamwork during Laurea's Design Sprint period. The client for the thesis was Nokia Corporation. The aim of the project was to develop a service design model based on the client's wishes from the given subject areas. The main benefit for the client was to have an innovative service model, which could be utilized either shortly or as a more distant vision. The aim of the project was to provide a new concept to Nokia's partners that opens them a new possibility to offer home users stunning experiences easily and on the other hand to enable Nokia's partners to offer more profitable solutions.

First there was a review of the target company's operations and the key development methods of this thesis. During the development work, the client provided support for the development of the service model. The development method of the thesis was agile project development, the benefits of which are discussed in more detail in the presentation of the working environment of the thesis.

The theoretical framework of the report discusses the most important development and technical methods that will enable the implementation of the service model shortly. The knowledge base discusses the earning opportunities planned on a commercial basis for the various players that Nokia can present to its partners.

In the design of the concept, the solution proposals developed for the customer are reviewed in their entirety and how they can be utilized in the future. The design used the techniques discussed in the theoretical framework and their use as a basis for design. The result was a solution proposal for Nokia and modeling with solutions.

The presentation of the prototype will cover the concept that was designed and presented during the sprint week and what could be offered to end users in the future, as well as the commercialization opportunities offered by the concept. The prototype illustrates as an example how micropayments could be utilized as a part of the shipment offered to entice potential customers to purchase additional packages as wake-up purchases. The example goes through the possibilities offered by augmented reality at home.

The conclusion consists of the entire process, how the results of this thesis were achieved and how the concept was designed. Possible innovative solutions for the future are envisioned, as well as new development proposals based on the technology developed by Nokia, which they could offer to their partners.

2 Nokia Corporation

The client for the thesis project has been Nokia Corporation. Together with various partners, Nokia has developed high-speed 5G connections in Nokia Arena, which makes it possible to transfer data over a fast connection to the outside world. Nokia's business idea is to create technology where the aim is to connect the world. This is achieved through continuous innovation and by aiming for technology leadership in network infrastructure and cloud networks. Nokia is committed to the highest safety standards and is part of building a sustainable and diverse world. (Nokia 2022a.)

Over the past year, Nokia has increased its R&D investments in the development of 5G networks by up to eight percent compared to previous years. In line with its business idea, Nokia increased cloud and network services in addition to 5G core networks. (Nokia 2022c, 1-2.) Nokia's sought-after technology leadership in certain segments requires Nokia to anticipate, design, and invest in the next technology window. Nokia intends to use different business models to move from monolithic systems towards the production of software and services. (Nokia Corporation 2021, 18–19.)

Nokia's business groups today include mobile phone networks, network infrastructure, core networks for cloud and network services, network software and cloud services, as well as a technology unit that, among other things, licenses patented inventions and brands in various Nokia product areas. (Sajari 2022.)

The company's current innovations include the ReefShark chipset and Nokia's open machine learning technology, which aims to save up to 30 % of total costs. Nokia is also currently working with NASA to build the first 4G/LTE network on the moon. Nokia has also patented, for example, the image recognition method with the help of two-dimensional probability grammar already in the early nineties. (Nokia Bell Labs 2022a.)

Nokia's future innovations will be produced by Nokia FutureWorks and will include Bell Labs, which has been transferred through the Alcatel-Lucent business acquisition and has developed, among other things, a laser, and a transistor. Nokia's future innovations will focus on the creation of the 5G standard and, as the latest development project, the construction of 6G architecture. Future innovations also include the 5G motorway, future networks, IoT systems, and machine learning. (Nokia Bell-Labs 2022b.)

Nokia's slogan "Connecting People", which was in use for a long time, has taken a back seat in marketing today and has been replaced by the slogan "Making miracles", which is prominent in the Nokia arena, for example. Nokia's future innovations and technologies contribute to a more environmentally friendly and cleaner development of businesses, which is why Nokia's main sustainability priorities are: climate, responsible business, and culture (Nokia 2021, 90–108).

When talking about the innovations of the future, one can think about the future development of the 6G network and thus the goal of launching it as the first in the world for public use (Nokia Bell Labs 2022c). Nokia has released a new era of broadband that can deliver massive-scale high-speed services on fiber networks (Nokia 2022b). This will enable operators to offer more extensive network services in the future. Nokia's views on the outcome of the 6G network are already around 2030, and according to Nokia, smartphones will not necessarily be the means of communication in the future, but wearable technologies will be in the future (Nokia 2022d).

2.1 Nokia Arena

Nokia Arena opened in December 2021 in Kansikatu 3, Tampere. It is Europe’s leading multifunctional entertainment, business, and sports venue. It is supposed to host over a million visitors annually, supported by state-of-the-art digital technology. The venue is situated right in the heart of the city and is the first next-generation arena. The venue has 15,000 seats which exceed the example Hartwall arena in Helsinki. This next-generation arena will be a home for innovative digital experiences and various major entertainment, culture, sports events, and conferences. The arena also includes a wide array of commercial services such as fancy restaurants, shops, a hotel, and a casino. Nokia Arena offers state-of-the-art digital experiences for customers regardless of age or genre. The digital screens in the venue altogether encompass 1.2 billion pixels, creating a particularly immersive customer experience. (Nokia Arena 2022.)

Nokia and Elisa have worked together to deploy a 5G network in Nokia Arena based on Nokia's latest technology. It enables the creation of an engaging and exquisite customer experience and provides 5G services for businesses and customers alike. (Elisa 2022.) In a stadium environment, the ability to distribute enormous network capacity and low latency is essential. Having thousands of people simultaneously navigating and broadcasting their personal user experience, 5G is more than sufficient for the need. The incoming 6G network will allow in the future more complicated massive AI, sensing holographic videos and sensing environments (Nokia 2022d).

2.2 Collaboration with Nokia

The cooperation with Nokia was carried out as a five-day Design Sprint collaboration. The Design Sprint method is a five-day process in which solutions to the problems of the concept being developed are sought by prototyping and testing ideas with future consumers of the final product. Sprint allows companies to get a gaze into the future. They can see the finished product and future customer reactions beforehand, with fewer investments and resource expenses in the company. Even if the case that the concept designed during a sprint ends up as

a failure, the process only takes five days. That can save the company from much greater expenses if the project was conducted using some different method. (Knapp 2016, chap. 1.)

Our sprint was conducted in one working week. Our project team consisted of five people, among whom the work was shared. During the sprint, all meetings within the group and contacts with Nokia representatives and teachers were held remotely using Microsoft Teams. For our sprint week, outline goals and tasks were set for each day. The purpose of the first day was to brainstorm and delineate the developed objects. The goal of the first day is to finish the vision of the product to be developed. The second day was reserved for the further development of the idea, solving potential problems, and benchmarking. The third day, or so-called field day, was reserved for validating and evaluating the concept through surveys and/or interviews. On the fourth day, the aim was to complete the prototype and prepare for the presentation of the outputs. On the fifth and final day of the sprint, the outputs of the sprint were presented to Nokia representatives as well as other project groups from Laurea UAS. During our sprint, we also received sparring from representatives of our partner on the first three days. The purpose of the sparring sessions was to get confirmation of the feasibility of our own and instructions from experts on how we could further improve and develop our original idea.

The sprint period was carried out within normal working hours, and cooperation meetings were used to keep the group's work progressing. The selection of the group's idea began the previous week and during this sprint period, the work was finalized in presentation condition. Even though the week's period was heavy in terms of workload, the group managed to put together a showable pitch.

3 Technology and Merchandising Concept

The theoretical framework discusses the key concepts of this thesis with which the presented service design could be implemented and what it would require technically. These issues discussed are the most important for this concept and are a prerequisite for its functionality. With the help of these technologies, the concept can be further developed and commercialized.

The first section discusses the prerequisites for the technology needed to provide the services and what 5G technology is that would enable the service to be provided today. Next, we will discuss the principles of augmented reality and how the presented concept could be commercialized. Commercialization includes different types of micropayments and unplanned purchases what could be used in concept.

3.1 Streaming and Bandwidth

The technology for streaming is called OTT which stands for “over-the-top.” It differs from traditional broadcasting by using wireless internet for video content broadcasting. With OTT users are not restricted to television or satellite connection. It allows watching live broadcasts and on-demand content with any internet-capable device. With OTT streaming broadcasters can offer more content and more accessibility for viewers. The only thing viewers need is a device with an internet connection. In the year 2021 over 2.38 billion people were watching online streams or downloaded video-on-demand content. There is enormous potential in live streaming because over 75% of people that were watching a stream used mobile devices. (Wilbert 2022.)

Bandwidth tells the capacity of a network and how much there is a possibility to upload and download data. When talking internet bandwidth, which is measured in time how much it would be possible to send and receive information, and capacity is calculated with megabits per second (Mbps). For streaming video, there is a need for upload bandwidth, and it is the main key to the quality of the broadcasted stream. How much bandwidth there can be dependable on the router and connection type. (Epiphan 2022.)

Nowadays modern connections can offer high bandwidths like over 1 Gigabit like 5G. For streaming, it is important to have maximum upload speed. Speed is measured by how fast data is factually uploaded or downloaded and for stream having ample upload speed is important. For high-quality video streams, there is a need for a high bitrate which then depends on the upload bandwidth of the connection. (Epiphan 2022.)

By the content of the stream, there is a unique need for bitrate. The more motion there is in the video stream the higher the bandwidth needed to keep video quality high. Also, for higher resolution requirements there is a high bitrate for sending the stream. If upload bandwidth is limited, there is no possibility to send quality streams to end users and there is a need for reduced resolution and bitrate. (IBM 2022.)

3.2 5G Technology

5G refers to the so-called fifth-generation technology standard for data connection in mobile network technology. 5G is the successor to the 4G networks currently used to provide most mobile telecommunication services. 5G technology can provide about ten times faster data transfer rate and much lower latency than current 4G technologies. These features will allow the adaptation of more advanced services in wireless environments. 5G can support the higher capacity demands needed for many connected consumers and machine-to-machine devices. (Penttinen 2019, chap. 1.2.)

Thanks to 5G technology, it is possible to implement many features that were not possible with the speeds of previous generations' technologies. It will provide consumers with new ways to experience virtual reality and ambient intelligence of autonomic IoT communications. One of the enabling features of the new system is the ability to control large volumes of simultaneously communicating devices. (Penttinen 2019, chap. 1.2.) With the help of 5G, it will also be possible to produce new, bigger jumps with the development of artificial intelligence, and then it will be possible to modify traditional network management." The transition includes a machine - learning abilities combined with self - aware, self-configuring, self-optimizing, self-healing, and self-protecting networks." (Penttinen 2019, chap. 7.5.)

3.3 Augmented Reality

Augmented reality can be used to create new experiences for people with the help of apps on mobile devices and to provide consumers with a wide range of information combined with the camera view of mobile devices. In augmented reality, everything happens through the camera, and in it, the user sees in the camera image the image created by the software added to the view. Augmented reality (AR) is a combination of reality and digital information. The difference between AR and VR (virtual reality) is that VR creates fully artificial reality instead of AR which combines these two realities. AR can either amend existing reality or add something completely new to it, such as images or sounds. It can be used on multiple devices, for example, smartphones, tablets, and glasses. Some of the most popular examples of AR are Snapchat (filters) and Pokemon Go. (Techtarget, 2022.)

The use of augmented reality in various applications and objects has increased recently, as well as its utilization has been included in the future of many companies. The possibilities of utilizing augmented reality will increase as applications increase, although one might think that this would become a problem in the future as the number of different applications used increases. AR can also be used for many purposes other than games. For example, it can help with decision-making, visualization, measurement, and navigation. (Techtarget, 2022). AR can also be utilized in the learning process using tablets and smartphones which are already becoming more popular in the school environment. Using AR students can combine virtual elements with real elements which can help with the learning process. Using different gadgets and AR features is also more fun for the students and increase their motivation to participate. It also makes the learning experience more memorable. (Jerry & Tavares-Jones, 2019).

There are also some problems regarding AR, one of them being its cost of it. Customizing already existing applications to have AR features can be more affordable for the companies but building a brand-new application can have, for example, a price tag of 60 000 dollars. With the quite modern technology, there are also concerns about cybersecurity, regulations, and skill gaps. (Cgs 2021.) AR technology keeps on growing and many companies (such as Ikea) are working on their AR apps. The popularity of AR is predicted to increase with innovative

technologies in the future. (Techtarget, 2022.) One theory is that in the future AR and VR could combine and become a mixed reality. That means that users would be mostly connected to AR but could switch to VR features when needed (for example to complete certain job-related tasks or just for entertainment). That way users would not need face-covering devices that are now used with VR and only a pull-down visor would be enough. These types of devices are still in the prototyping phase now, but AR will certainly be utilized more in the future. (Peddie, 2017.)

3.4 Micropayments

The technology futurist and philosopher Ted Nelson created the term “Micropayment” in the 1960s to pay for individual copyrights on online content. With these micropayments, users can pay for online content and there is a possibility of creating low-cost network payment content. Micropayments are small payments that consumers can make online. The size of the transactions is usually less than one euro. With the help of micropayments, the internet can be used to facilitate such things as digital rights, royalties, and in-game purchases. (Frankenfield 2021.)

One way to handle micropayments is for a seller to establish an account with a third party. The third party is a micropayment provider, who collects, stores, and distributes the payments made. Another way to handle small transactions is through a digital wallet. The payments in a digital wallet are stored until they grow to a larger amount and after that, the payments will be paid to the buyer. Micropayments can also work through a prepaid system, which means that a user sets up an account with a micropayment processor and pays a freely selectable sum of money into the account. If the service provider is also used the same e-commerce platform as the user, it is easy for the provider to debit the payment amount of the purchase. For example, PayPal provides this type of service. (Frankenfield 2021.)

3.5 Pay-per-view

Wilbert (2019) states, that customers are willing to pay for video content they find valuable and appealing. Creating compelling material, that viewers want to see, is the key to success in the video monetization market. The main methods of monetizing a video that is used are advertising, subscriptions, and pay-per-view. (Wilbert 2019.)

Pay-per-view is the simplest way to price a digital service because you only pay when you watch. Every part of the content the customer wants to see costs money. The pay-per-view method can be used for instance in events, like sports, concerts, conventions, trade shows, and conferences. The pay-per-view is also well suited for monetizing entertainment content libraries. (Wilbert 2019.)

3.6 Unplanned Purchases

The consumer often purchases services or products that she/he does not originally intend to buy, these are so-called unplanned purchases. The term unplanned purchase indicates that the purchase is irrational, but it does not have to be true, because the consumer does not necessarily know which products or services are possible to buy. (Best, Hawkins & Mothersbaugh 2007, 617.) In Figure 1 there is a table of unplanned purchases that have been studied.

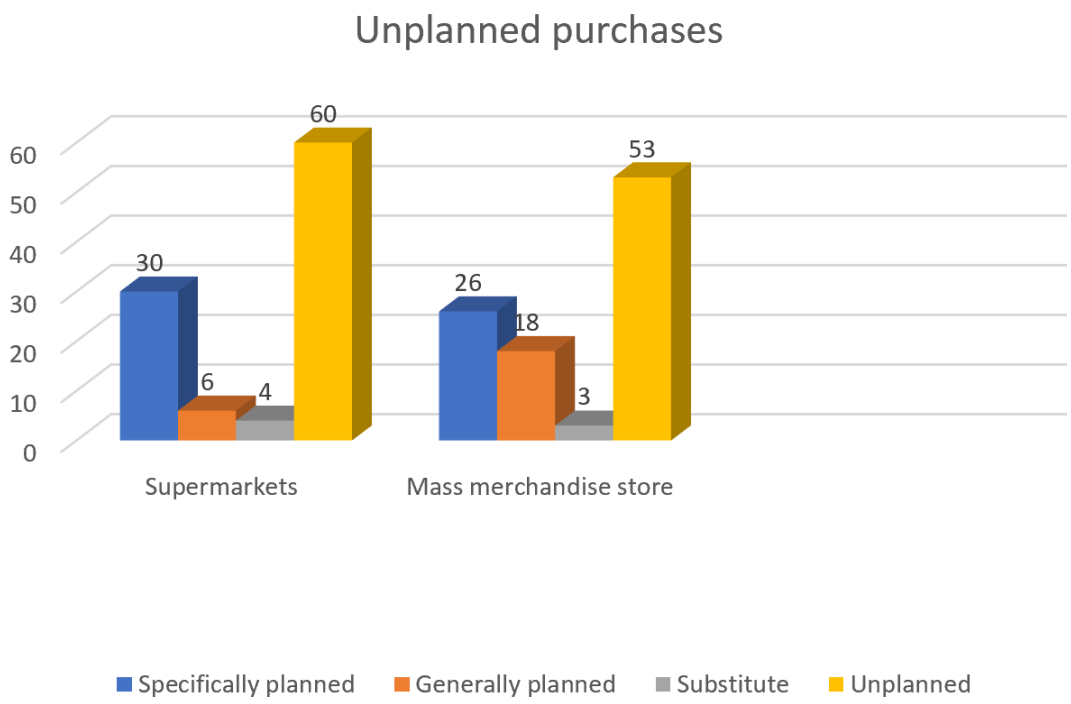

Figure 1: The POPAI Consumer Buying Habits Study (Best etc. 2007, 618)

Unplanned purchases can be divided into reminder purchases and impulse purchases. A reminder purchase can happen when the consumer notices an advertisement in a store or an online shop when the consumer is almost finished with their purchase. An impulse purchase can occur when a consumer gets a sudden powerful urge to buy a product from the store, such as a chocolate bar. (Best etc. 2007, 618.)

4 Concept Design

The first issue to be discussed is the most relevant methods for service design to refine an idea and its utilization. Next, we will discuss the research methods that can be used to delimit the development area of this thesis. Thirdly, the interview body of the study is processed, and based on interviews and surveys, profiles of potential consumers and their customer journeys are compiled.

With the help of the customer journey, it is possible to start developing the concept presented to Nokia, i.e., the so-called prototype, with the help of which the development of the idea can be marketed. The prototype developed during the sprint week was pitched to Nokia and based on it, a development proposal report will be written up for Nokia. Lastly, the principles of augmented reality and, on their basis, the possibilities of commercialization are discussed.

4.1 Idea Wall and Idea Selection

An idea wall or mind map is commonly used to design service design, which is used to map out ideas to be developed. The idea wall provides a visual picture of ideas and provides a better understanding of the issues. Usually, in the idea wall, the basic idea is placed in the middle, from where we start refining a new entity and combine them with lines into a single whole. (Tuulaniemi 2011, 60.)

According to Mindomo (2022): “a mind map is also known as a spider diagram”. A mind map is simple to use, it generates ideas, and it has a simple and hierarchical structure. A mind map consists of three main elements: topics, subtopics, and connecting lines. Topics are made by single words or images. The ideas are connected to the central topics. The subtopics are connected to the topics. A mind map can include several levels of subtopics. A subtopic can be described as single words or short phrases. The connecting lines are drawn between topics and subtopics. The lines can be straight or curved.

Mind maps are good tools for brainstorming, planning, organization, problem-solving, studying, structuring courses, structuring a CV, making book summaries, structuring essays, taking notes, making lists, presentations, etc., look figure 2. Mind mapping can be used by everybody from children to grownups. A mind map helps to better understand and remember a complicated topic. A mind map can also improve imagination and organization. (Mindomo 2022.)

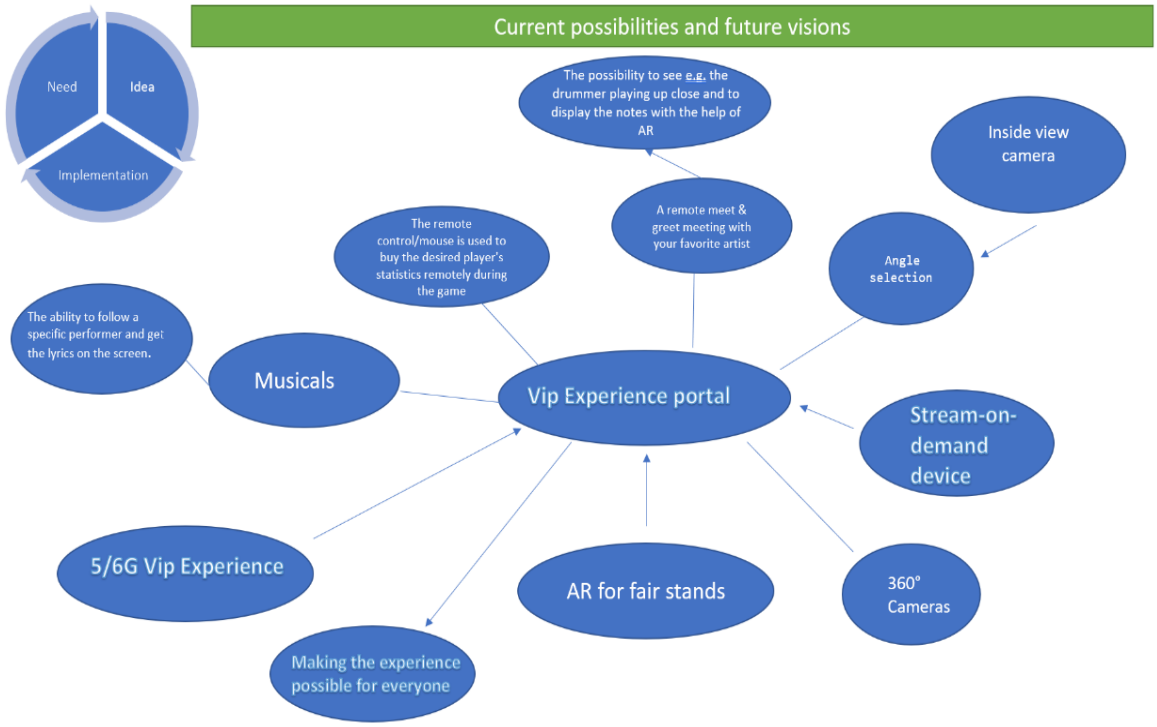

Figure 2: Idea Wall of Concept Design

The workgroup started with a vague vision to improve customer experience for Nokia arena. The arena was a point of interest because there had not been such an opportunity before. We took advantage of this and started brainstorming various ideas around different elements of the idea: The venue, technology, and audience.

Basic concepts of multiple services emerged. Some ideas were excluded right away, and some survived for further development. The illustration below shows the final mind map. The team sparred with people from Nokia and ended up on these ideas. Nokia's representatives encouraged the team to select a cohesive collection from the ideas. From these selected points the team started the creation of MVP – minimum viable product.

4.2 Benchmarking

The benchmarking method can be used to compare our activities with those of other companies and organizations. The purpose of the method is to learn good practices from others, as well as to question one's actions. Things to be compared are, for example, strategy choices, products, services, and working methods (Tuulaniemi 2011, 59.).

When benchmarking can be used to identify good practices used by others, it can also be used to avoid mistakes made by others. Based on benchmarking research, it is also easier to become familiar with other actors and activities in the operating field. This allows companies to make strategic choices more confidently. (Tuulaniemi 2011, 59.) However, the purpose of

benchmarking is not to copy things that work in other organizations directly, but based on the results obtained, the activities are developed and applied to suit the needs of one's organization (Sauristo & Parikka 2014).

For the further development of our original idea, we compared our preliminary concept with other products and operators offering similar services. The aim of this benchmarking was to verify the feasibility of our concept and to gain a new perspective on what kind of features have been implemented in other equivalent products. Research conducted was done, and the public data available was used from the companies' websites as well as materials provided to us by Nokia. Initially, the idea was to find at least five possible competing companies which could offer similar services. We found companies that offered the same services that were listed in the original idea. In the end, Verizon was chosen as the main target of our comparison, as this company's offered augmented reality experiences and different camera views, and their services were closest to the original vision of the team. The same elements, like augmented reality and 360-degree cameras, were found in the services as in our own, but there were also differences between the services offered.

As a result of the study, we found out that the features like augmented reality experience and 360-degree camera angles that were designed have been successfully used elsewhere. It revealed that the use of 360-degree cameras, freely selectable camera angles, as well as some AR features, have already been utilized in other services. It also revealed that none of the compared services offered a completely similar service that combines all the features present in our concept.

4.3 Researching

With the help of qualitative research, a new phenomenon can be understood, which answers the question of what this is all about. The qualitative research process includes planning, data-gathering, analysis, and interpretation phase. (Kananen 2010, 36.) According to Moilanen, Ojasalo, and Ritalahti (2015, 105), qualitative research examines topics that are not well-known and that one wants to understand better. Qualitative research includes all such studies that do not deal with numbers and the relationships between them (Kananen 2010,37).

In qualitative research, usually, three to five people are studied for the research (Kananen 2010, 38). Theme, open-ended, and group interviews as well as participant observation are usually used in qualitative research methods. The purpose is to acquire enough relevant information about a narrow object. The object of the study has been carefully selected, in other words, a deliberate sample. The researcher is often remarkably close to the researchable and participates in the activities of the research and makes his reasoned conclusions about the phenomenon. (Moilanen etc. 2015, 105.)

The less is known about the phenomenon under study, the more likely it is that qualitative research is used to study the phenomenon. Qualitative research is best suited to situations where the phenomenon is unknown, a more in-depth view of the phenomenon is desired, a new theory is created, triangulation is used, or a good description of the phenomenon is desired. Triangulation means that different methods are used to understand the phenomenon. In practice, a parallel study is conducted using qualitative methods, which seeks to confirm the research results obtained with quantitative methods. (Kananen 2010, 41–42.) With the help of triangulation, a phenomenon can be studied from multiple different perspectives, using several varied materials, data collection methods, and several researchers (Moilanen etc. 2015, 105).

The qualitative methods were used to analyze our survey answers and how it is possible to enhance ideas of the concept. Because of the brief time limit, the survey was conducted with Google forms on team members' social media accounts as an open survey. In the survey, approximately a hundred answers were analyzed with the qualitative methods of what services could be interesting, and the last ideas were modified to the service concept. It was impossible to know in advance how interested people would be in the new arena experience because the whole idea will be a future development.

4.4 Brainstorming the Ideas and Analyzing the Results

Brainstorming creates ideas that are not necessarily feasible or desirable. Furthermore, implementing all ideas at once is not technically rational. To optimize the order and the eventual success of each feature there is a need to gather data from potential users. As we do not know any certain segment of those users, a survey is to be conducted on a random population by residence, age, gender, and profession. For such a random group of people, essential elements regarding their affections would be at least: overall interest to use any or specific features presented, willingness to pay, and as a mixture of aforementioned factors, respondents referenced order. By quantitative data, it would be possible to deduce statistically what the distribution of each element is. A quantitative survey would require a large database of potential respondents. This would lead to rationed conclusions if the questions were based on a fact. It means that a certain event has already happened, and the answer is the respondent's reflection of that event. (SurveyMonkey 2022.)

However, in this case, it is a matter of opinion or first impression, which cannot be measured as reliably as events by this method. Instead, as we have a variety of novelties, and the respondents would not have any previous experience with them, a survey would bring different kinds of results, thus showing the desired variation of choices. In this case, a brief description is displayed, which simulates the reaction to the first impression. That is in other words no complete variable (compared to a known event) is at stake, but the study is based on the chosen primary characteristics of the elements. (SurveyMonkey 2022.)

As acquiring or purchasing the final product is often an unplanned purchase, a qualitative questionnaire tries to imitate the momentary inner thought process of the customer. While questioning, the respondent is exposed to a feeling that something new and exciting is coming. The results would then reflect these impulsive reactions. The two research methods are not in conflict with each other. They work much better together. In the Big Data world, statistics and figures form a solid foundation from which to make conclusions. However, this foundation is not complete without data collected from real individuals, which gives meaning to figures. (SurveyMonkey 2022.)

With conclusions, the prospects can be more clearly designated, and separate price research may even lead to the already rejected features could be restored if necessary. The main goal of the survey is to enable decisions to deploy at least one minimum viable product. It imitates a market research product testing template (SurveyMonkey 2022.)

While selecting the final features one should bear in mind the elements that build value. Tuulaniemi refers to a book by Osterwalder and Pigneur, which lists those elements by which value building process can be planned in more detail. (Tuulaniemi 2011, 34) Especially accessibility and novelty value are the most suitable for our case. Furthermore, the symbiosis of customer understanding, and business goals is worth considering. It combines ideas and concepts from business and customer angles resulting in a successful service. (Tuulaniemi 2011, 103)

In that context, we have combined data from a larger group of respondents than is usually used in qualitative surveys. The actual questions were more unspecified and open than in quantitative surveys typically. Based on this, the types of open questions were a better option, considering the target group, based on which an indicative assessment of the need for services could be obtained.

Feature	Willingness to use	Willingness to pay
X	Value 1	Value 0
Y	Value 2	Value 1
Z	Value 3	Value 0
Summary	Descending order	Multiplying order: Value 0 rejection

Table 1: The Comparative Matrix for Main Objectives

First, the order of the willingness to use initially points out the most interesting therefore most successful prospects. However, having commercial goals, and a negative willingness to pay would significantly decrease the final selection, and even lead to rejection. However, the price was indicated only by the non-specific attribute “Small” payment. Among the atypical features the factor of “willingness to pay” can also be separately observed, and the small distribution of zeroes would lead to further exploring of the actual price tag, because “small,” or “nominal” could have different meanings in the eyes of the respondent.

In this case, the results provided the following findings:

The age factor was evenly distributed, but the gender factor was overrepresented by women. The respondents were mostly working or studying, which reflects their ability to pay. The most appealing events are concerts, fairs, and sports. Overall, almost all respondents attend events on-site occasionally or more often, and half attend also remotely. A quite alarming fact appeared, that the respondents did not overall feel a need for additional services. If any, such a need is critical to be created by marketing means.

Furthermore, most respondents were interested in attending the events remotely if such an opportunity is provided. A good portion was also willing to pay for remote events and try augmented reality features. As an observation, a negative willingness to pay for such additional services was quite high, though a promising portion of one-quarter of the respondents indicates potential in that regard. In the end, based on the survey, it was possible to select the most interesting services, which were: free-choice camera angles, a remote meet & greet experience, 360-degree videos, and song lyrics and notes.

4.5 Customer Profile of a Consumer

Customer profiles are a key method of summarizing and presenting customer information obtained from customer surveys. A customer profile is a portrait of a specific group that emerged from the research group. (Tuulaniemi 2011, 67.) The portrait includes specific needs and experiences that the customer is supposed to have within a business. The profiles differ a lot from research and insights because the needs and the experiences are customer-specific and not comprehensive. (Brand Flu, Lavrans, Lavrans & Reason 2015, 129.)

Customer profiles summarize the information and findings obtained in customer surveys about the customer's behavior patterns, motives for action, values and fears, and obstacles that guide the action as a description of the tribe. (Tuulaniemi 2011, 68.) Profiles are created based on testimonies like customer interviews, discussions, or shadowing and can be developed for both consumers and business customers. A profile describes what the customer is like and what is important to them. Concretely you produce a name for your customer profile, describe a short bio, and make a brief description of what he thinks or what he does. (Brand Flu etc. 2015, 129.)

Customers' insights include their needs, experiences, behaviors, and motivations. Prior experience, data about customer behavior, or first-hand observation and testimonies help to understand customers' insights. Customer insight can reveal what the customer finds most frustrating, needs to do their job, or does not understand. Insight is a way to tell a customer's story. (Brand Flu etc. 2015, 131.)

Based on the results of the survey analysis, three different personas were created. In the survey, the age groups were evenly divided between the ages of 20 and 80, and the interests were clearly like what kind of services would be expected or ready to be acquired. Information gathered from the survey helped to create personas, which opens the idea of how Nokia's customers could sell the new service concept to their consumers. Next is introduced the personas were created based on the results.

The first person is named David Homeplanner, he is 38 years old, single, and works as a construction worker. David lives in Brighton, England, and is a bench athlete. David is a huge sports fan. He likes motorsports and rock concerts. He attends few times a year to sports events and concerts. He also wants to watch events at home, mostly on the internet-TV and from the tablet. David is enthusiastic about learning new tech and likes to use new applications at home. David is frustrated about the money he spends when going to events and concerts.

The second persona is named Marjo Gustavsberg. She is 50 years old and married. Marjo is work driven and she is the CEO of a large company. She lives in Helsinki, Finland, and likes nature. Marjo likes to travel outdoors with the family. She likes to attend many fairs and she also likes wine and food. Marjo appreciates her employees and wants to give them opportunities to have VIP experiences at concerts and events. Marjo does not have enough time to attend all the fairs and other events in which she is interested.

The last created persona is called Jennifer Longtide. She is a 21-year-old student from Long Beach, California, and lives in an open relationship. She is a true party animal and loves to attend concerts and musicals with her friends. When Jennifer goes out to party, she doesn´t think about how much everything costs. She doesn´t have much money and she easily spend money on unplanned purchases.

4.6 Customer Journey Map

A customer journey map is a visual tool that is used to describe the customer's experience with a company's product or service. Its purpose is to describe all the customers' most important touchpoints, experiences, and thoughts during the process of buying the company's product or service. The map begins with the customer finding out about the company and ends with using the product or service and covers everything that happens between these two steps. (Delighted, 2022.)

The reason for a company to use a customer journey map is that the map will help the company to empathize with customers and understand their experiences better. Covering all the important steps in a customer's buying journey can help the company to find any foreseeable problems and produce a solution that would work best from the customer's perspective. Using the customer journey map, the company can for example find out if their online interface is working as it should or if customer support is easy to contact and provides answers to customers' problems fast enough. (Delighted 2022.)

Creating the customer journey map begins with creating the customer profile that is covered in the previous chapter. After that, the company needs to decide what they want to find out about the customers' journey. If the company has more than one goal to achieve with customer journey mapping, it can create multiple journey maps. The next step is to organize key steps and touchpoints. The first step can be, for example, finding out about the company from advertisements and the last step can be the customer giving feedback to the company. All the steps should be written out and explained on the customer journey map. The steps can be covered based on assumptions, but to make the map even more accurate the company can also have surveys as research material. (Delighted 2022.)

After creating the customer personas, the team continued to create the customer journey map that was also used in the pitching. The customer journey map is based on results from the survey analysis and different elements from the customer profiles created in the previous step combined with assumptions about how the finished product would work. Using this base, the team brainstormed together to create one imaginary scene where the customer persona is using the product. The result shows every step that the customer takes including one problem with the solution to it.

Phase of journey	Awareness, consideration	Purchase, usage, customer support	Repeat purchase
Actions What does the customer do?	The customer finds out about a concert that they would be interested in. They live far away from Nokia Areena and can't attend the concert live.	The customer decides to purchase the regular online stream. During the concert they decide that they would also want to meet the artist using the AR experience and purchase the "meet & greet" feature. The customer is not sure if the feature works on their device and asks customer support about it.	The customer decides to purchase online VIP tickets to the next concert they are interested in.
Touchpoint What part of the service do they interact with?	Nokia Areena website	Nokia Areena website, online stream, payment options, customer support	Nokia Areena website
Customer Thought What is the customer thinking?	The customer decides to attend the concert online but is thinking about if they should purchase the regular stream or try one of the VIP features.	The customer was happy that they could purchase the vip experience feature during the stream. They are exited to meet their favourite artist. They are also pleased that the customer support answered fast.	They are satisfied with their experience and are looking for more VIP experiences from home.

Figure 3: Customer Journey Map (Miro, 2022)

The customer journey map is based on a customer that finds out about an interesting concert but cannot attend it at the Nokia Arena. The customer would like to attend the event online and decides to try out the online stream. During the stream, the customer decides that

he/she would also like to have a meet & greet with the artist using the AR features. The customer is not sure if the feature will work on their device and decides to contact the customer support online chat that answers immediately. The customer finds out that the meet & greet feature works on their device and decides to purchase it and meet their favorite artist in their own living room using the AR. In the final phase the customer is so satisfied with their experience that they decide to buy online tickets to the next interesting event too. They are interested in trying the rest of the VIP experience packages' features and might purchase them next time.

5 Prototyping

The first step in prototyping is to recognize the reason for prototyping and what is wanted to be achieved. The three reasons why prototyping is used in service design are: to explore, evaluate and communicate and present. To create new options and innovative solutions explorative prototyping is used based on, for instance, a previous prototype. With the help of an evaluating prototype, it is possible to understand how people experience the future based on the suggested prototype. (Hormess, Lawrence, Schneider & Stickdorn 2018, 211-213.)

In practice, the prototype is evaluated based on hypotheses in formal and informal testing. It is easiest to start a service design with an evaluated prototype because it is easier to find a suitable technology model when the value proposition is already strong. Communicative prototyping means that important aspects of the project are communicated to selected audiences. Presentational prototypes are used for well-rehearsed storytelling presentations. The presentations are given to a wide audience. The presentational prototypes are usually polished to inspire management and stakeholders. (Hormess, Lawrence, Schneider & Stickdorn 2018, 211-213.) The definition of the different prototypes is not strict, and it is possible to mix the activities of the prototypes even in a single prototyping session (Hormess etc. 2018, 211).

In this project, the team used a combination of all the different prototypes. The prototype planning started to be worked on based on the suggestions given with the help of a mind map. The final idea was home experiences and augmented reality experiences on-site. In the first phase, possible existing services and their providers were examined. According to a preliminary study, a few of Nokia's partners only offered augmented reality experiences at events. The extended experiences offered for the home were not directly available anywhere.

In the shadow of this information, a small-scale survey of event experiences was carried out remotely in two days with Google forms for known people of teammates, and based on this information, the idea was further refined and clarified. Based on these results, it was possible to build a potential buyer persona, on which the customer journey could be built.

The data obtained from the survey were used to design the prototype, and on this basis, two diverse types of service proposals were designed according to the model. The first service model was a more versatile use of augmented reality in events on-site or as a remote experience at home. Another service model was to supply additional features for remote broadcasts during transmission or purchased in advance, such as simultaneous camera views, 360-degree camera views, and getting the lyrics and notes of the song displayed on the user's screen.

Enticing the customer to buy additional services with micropayments with the help of pop-up windows that appear on the screen during broadcasts. As additional paid services, various functions could be offered, such as song lyrics with the help of AR technology, different camera broadcasts during the event, and opportunities to watch slow-motion replays from match events such as goals and penalties. Remote features work on all major devices, including TVs, tablets, and phones.

5.1 Prototype Examples

When broadcasting or augmented reality is in progress, the customer can be offered more features through so-called micropayments, which may not have been pre-purchased by the customer. These other features can be, for example, "meet & greet" with the artist (Pictures 4 and 5).

Figure 4: Example Picture of Micropayments Pop-up Window (Hoffrén 2022).

The purpose of this project is to open new possibilities for home users to buy stunning experiences easily and on the other hand to enable Nokia´s partners to have profitable solutions in the future. Based on the survey about remote event experience, the respondents are most interested in selecting different camera angles, viewing 360-degree cameras, and getting the lyrics and notes of the song displayed on the user´s screen (Appendix 1). The easiest way to make these wishes come true is with micropayments. The user is enticed to click on a pop-up window that appears on the screen during the broadcast.

Figure 5: Example Picture of AR Experience at home (Thyng 2022).

The respondents are also interested in the meet & greet experience with their favorite artist by using an AR application (Appendix 1). The meet & greet experience can be bought inside the AR application or by clicking the pop-up window on stream. Price is dependable on the royalty fees that the artist would like to have. Nokia could concentrate its marketing on house consumers, who do not yet know what they want to buy, by designing pay-per-click advertisements that are as attractive as possible.

Based on this, Nokia's partners would have the opportunity to finance their products with micropayments with the help of pay-per-click advertising cheaply and securely. Even if the payments were small, income would be generated from mass payments. In addition, digital marketing would be cheaper than traditional marketing.

5.2 Delivering the prototype

The NABC method helps to present an idea. NABC is also called pitching. Pitching can be defined as trying to sell an idea in a precise and concise way. NABC stands for need, approach, benefit, and competition. An idea needs a practical need. The approach comes after the need, and it is a description of an idea. The benefit includes the uniqueness of an idea. The factor competition concentrates on competition in the area where the conception functions. According to the NABC method, It is good to have an interesting idea, but it is more important to focus on the importance of an idea. (Christian 2012.)

The presentation of a pitch should always be short. In a pitch, it is important to mention how the idea is unique and describe the value of the proposition. The presentation can include pictures or PowerPoint slides. It is also important to practice the pitch before the actual presentation. The pitch should not be over 8 minutes long. After the pitch, it is time to get feedback and some questions about the proposition. The idea of a pitch is to attract the audience to ask relevant and specific questions about the presentation. (Christian 2012.)

When the prototype was completed, it was presented to the customer with a short pitch. In the pitch, the whole concept was presented from a theoretical base to concept selling. The

prototype of the concept design was assembled into a PowerPoint presentation where the solutions and examples offered to the customer were presented. The presentation was held remotely via Teams directly to the customer. After the presentation, the customer gave feedback on the presentations, and based on the feedback, the team started to work on a final report on the concept and the benefits it brings to the customer.

6 Conclusions

The project aimed to provide a concept to Nokia's partners, in which the products offered by Nokia enable the partners to offer new experiences to their customers remotely or on-site. The project created a service model that can be presented for the development of services in cooperation with different partners. The result was two diverse types of service models that could potentially be offered to Nokia's partners in the future. At the base of all this, the functionality of the 5G technology that Nokia has developed with Elisa in cooperation, and the remarkably high transmission speed it offers towards the network is a prerequisite.

Based on a short research survey, there could be a demand for the activities presented in the project in the future when technology allows it. For example, the greatest interest was aroused by the possible free choice of camera angles, "meet & greet", as well as the possibility of live song lyrics and statistics using augmented reality, either on-site or remotely. Based on these results, it is easy for Nokia to approach new partners, as the technology they develop can be used to offer end customers new experiences at low cost and globally with simple solutions.

In the future, it would be an innovative idea to commission a more extensive quantitative study on the subject to verify the accuracy of the results produced by the first survey. The biggest challenge here is to model the yet unpublished concept and to get the real prototype to the end customers to test and thus first the results of a larger qualitative study, based on which a broader survey could be prepared.

With this concept, the consumer can be offered a wider range of experiences than the current similar services are capable of offering. The technology would allow for more simultaneous transmissions outwards and would therefore increase the possibility for consumers to choose the content of their choice from the broadcasts they prefer. With augmented reality remotely or on-site, it would be possible for the consumer to have great experiences live.

For further development, there is the possibility to inspect the new ways to deliver on-demand streams from cameras. This would allow for a more efficient allocation of the bandwidth used on the server and by resourcing bandwidth where there is more use. By taking advantage of this, more cameras can be placed at events in the future, and they will only be

awakened when necessary. With this, equipment could be kept inactive when there is no need for it and energy can be saved, but services can still be provided despite this.

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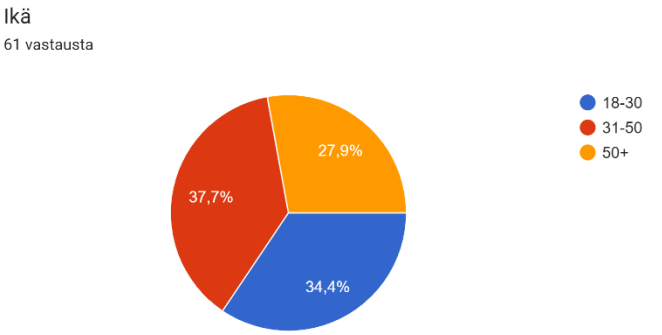
Figures

Appendices

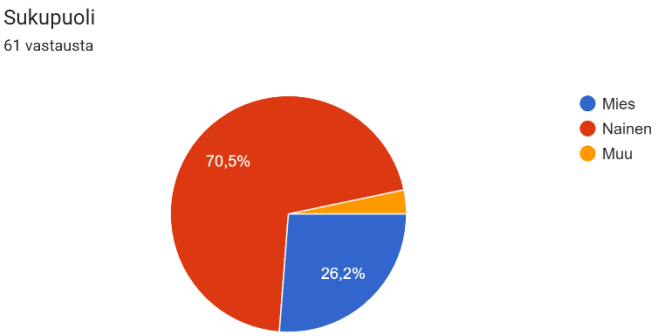
Appendix 1: Survey Questions and Answers

N= 61 (Yes=kyllä; No=ei ; not wish to say= ei halua sanoa)

Age

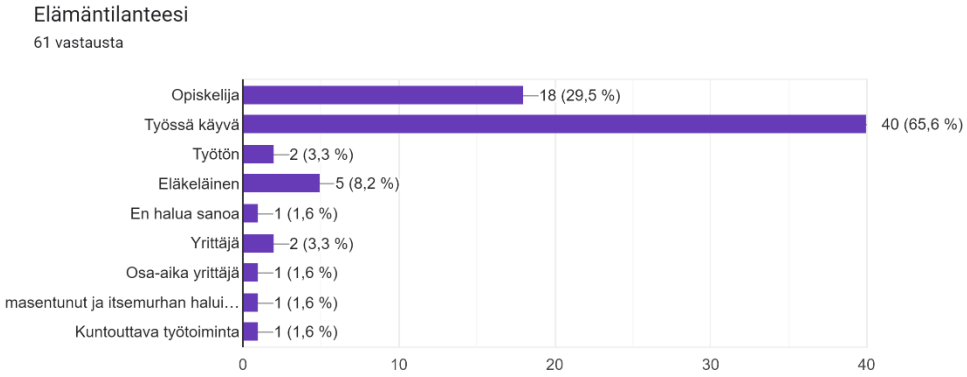


Gender (male, female, other)



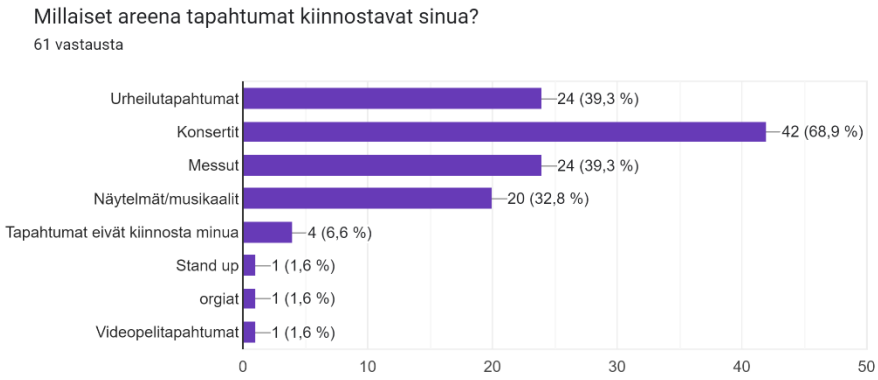
Life situation (free text)

(Student; working, unemployed; retired; not wish to say; entrepreneur; part-time entrepreneur; depressed; rehabilitation)

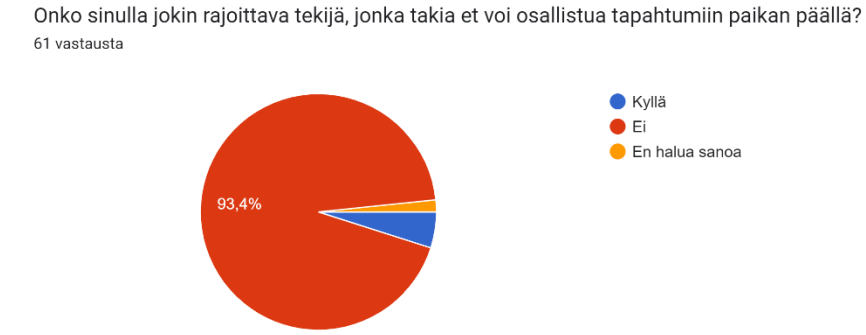


What type of arena events would you be interested in? (Free text)

(Sports, concerts, fairs, plays/musicals, not interested in events, stand-up, video game events)

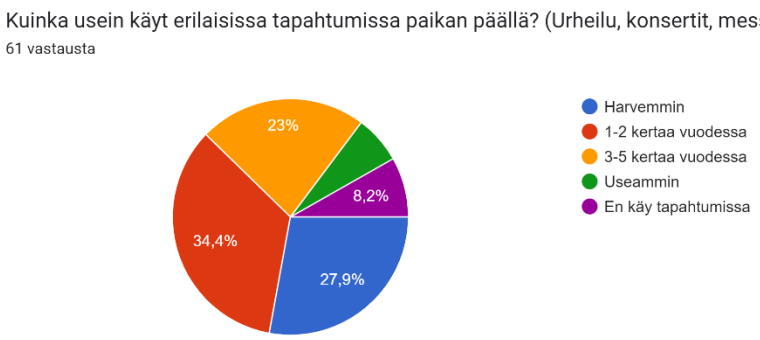


Have you got a handicap restricting you to attend on-site?



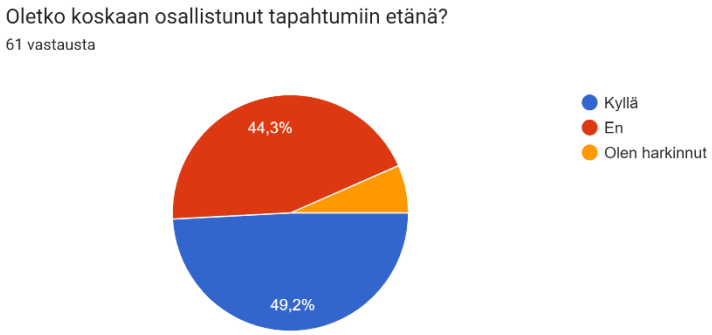
How often do you visit different events on-site? (Sports, concerts, fairs, musicals)

(Seldom, 1-2 x yr; 3-5 x yr, more often. I do not attend events)



Have you ever attended events remotely?

(Kyllä= Yes; En = No; Olen harkinnut = I have considered)

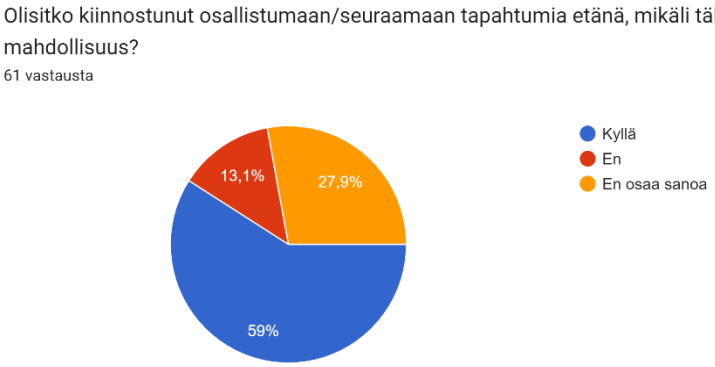


If you answered yes to previous, what type of event did you attend? (Free text)

(Ballet, concert, [also mistyped], fair, student event, seminar, work meeting, sports, business forum, other)

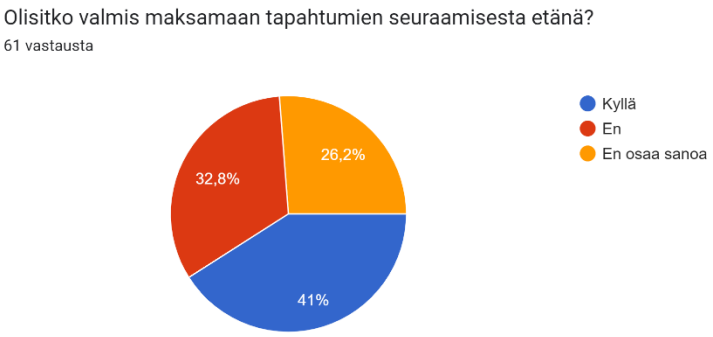
Would you have wished additional services, functions to remote event?

Would you be interested in attending or watching remotely if there was an opportunity?

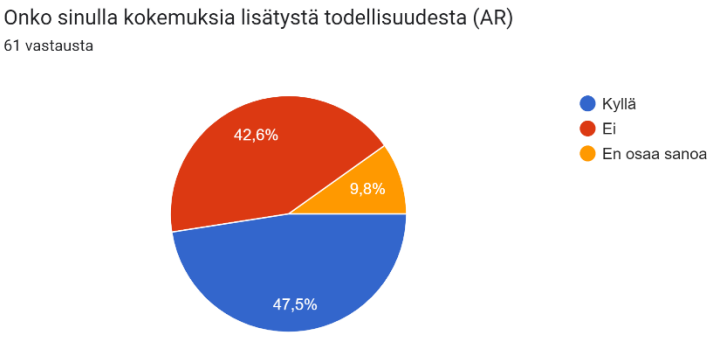


Would you be willing to pay to follow events remotely?

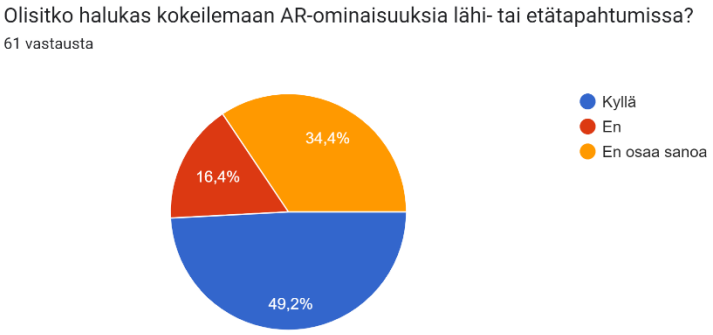
(Kyllä= Yes; En = No; en osaa sanoa = cannot say)



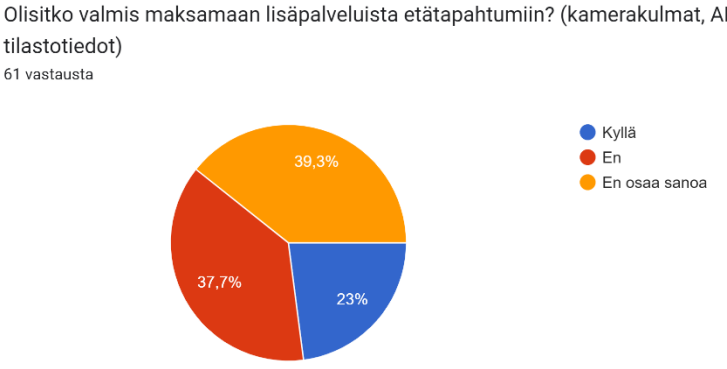
Have you got any experience in Augmented Reality (AR)?



Would you be willing to try AR-features in on-site or remote events?



Would you be willing to pay for additional services in remote events? (Camera angles, AR-features, statistics)



Which three additional services provided remotely would you find the most interesting?

(Possibility to enter also free text)

(camera angles at free choice, 360 degrees video image, additional or statistic information regarding the event, lyrics/ notes in concerts, meeting the artist remotely (meet & greet), VIP experiences within the event, not needed…)