UNIVERSITY OF PELOPONNESE
FACULTY OF HUMAN MOVEMENT AND
QUALITY OF LIFE SCIENCES
DEPARTMENT OF SPORTS ORGANIZATION
AND MANAGEMENT

MASTER'S THESIS

"OLYMPIC STUDIES, OLYMPIC EDUCATION, ORGANIZATION AND MANAGEMENT OF OLYMPIC EVENTS"

VIRTUAL REALITY AS A TOOL FOR THE OLYMPIC MOVEMENT – AN ANALYSIS OF MARKETING OPPORTUNITIES, CHALLENGES AND ADDITIONAL BENEFITS

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MASTER Dissertation submitted to the professorial body for the partial fulfillment of obligations for the awarding of a post-graduate title in the Post-graduate Programme, "Organization and Management of Olympic Events" of the University of the Peloponnese, in the branch o "Olympic Education

SPARTA, 2021

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Abstract

This study is carried out to examine and present the potential of Virtual reality as a tool for the Olympic movement and there especially for Olympic marketing, within its stakeholder network. The study is based on a mixed method approach. 58 people participated in a questionnaire developed for this thesis, containing quantitative, as well as qualitative questions. An expert interview was held, with the director of media of the Olympic Broadcasting Service. The findings were separated into topics and then analyzed with descriptive statistics, Pearson correlation and content analysis. Results showed that Virtual Reality can influence the Olympic movement, if approached in a holistic concept, in a positive way. It is recommended that the IOC or researchers further develop the holistic concept, with the purpose of minimizing data errors and maximizing the potential and benefits created through the use of Virtual reality.

Keywords: Virtual Reality, Olympic marketing, Olympism, Olympic movement

Acknowledgement

This Master Thesis and this research project would not have been possible without the support of many people. I would like to express my gratitude:

- To the International Olympic Academy and the University of Peloponnese for having developed this Master Program and for giving me the opportunity to take part on it;

- To professor Georgiadis that from my first day in Olympia was a reference and a point of support;

- To my supervisor professor Peña ;

- To professor Chappelet and professor Seguin my advisory committee;

- To Matt Millington thank you for taking your time and your insights you gave me

- To our study group, thanks for holding up the motivation and developing and discussing new ideas and approaches

- To my cohort, thanks for making this unique experience even more special

- To Mateus and Sandun – thanks for being more than just friends, for all the memories & amazing moments

- To everyone who helped me in one way or another to reach this objective.

- To my wife Maria, thank you for supporting me in this unforeseen and tough times. Without you there won´t be a finished thesis, nor anything else working. You are the anchor of our lives.

- To my son Leonidas, you are the motivation and the light of my life! Thank you for showing me that even the worst day can bring out a smile

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Introduction

Sport has the ability to be a powerful tool, to change, teach and include. Nelson Mandela said in 2002: *"Sport has the power to change the world. It has the power to inspire. It has the power to unite people in a way that little else does. It speaks to youth in a language they understand. Sport can create hope where once there was only despair. It is more powerful than governments in breaking down racial barriers. It laughs in the face of all types of discrimination."* (Laureus, 2019)

The Olympics as one of the major sporting events of our time, have a huge leverage to follow these words and create change. It is by fact one of their main goals, "[…] to contribute to building a peaceful and better world by educating youth through sport practiced without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with a spirit of friendship, solidarity and fair play" (IOC, 2020a).

To reach this objective a brand has to be unique and valuable. Uniqueness is one of the strongest attributes of the Olympic brand (Seguin, Richelieu & O´Reilly 2008; O´Reilly & Seguin, 2009). The five interlaced rings are one of the most known logos worldwide. Supported through stakeholder communication and huge media coverage, the brand is known by approximately 94% of the world's population (Ferrand, Chappelet & Seguin 2012). The Olympic brand is one of the most sophisticated and valued brands (Seguin et al. 2008). A main driver of the Olympic brand is its marketing. Marketing has to adapt iteratively, to prevent stagnation and maintain the relevance of a brand.

The Olympic system faces criticism and is questioned towards its relevance in our modern times (Lenskyj, 2012). Thus, it is important that Olympic marketing, even though one of the best sport marketing programmes in the world (Ferrand et al. 2012), progresses. The currently ongoing Covid – 19 pandemic enhanced the ongoing digital changes. These changes lead to new customer experiences and ways of thinking towards products and services. Consumers can easily share information, hence increase, or decrease brand value within a short time. In response to these (digital) developments organizations or companies must enhance their "digital capabilities skill […] in order to remain relevant and competitive (Boyd & Koles, 2019).

A new technological tool, being used more and more and still not having reached its peak is Virtual Reality (VR). VR can help to generate new experiences and to modernize Olympic

marketing. Therefore, VR can be helpful to strengthens the relevancy of the Olympic movement and help to achieve their claimed objectives.

Research question

The research question of this thesis is as follows: Can Virtual Reality as a tool implemented in Olympic marketing, strengthens the Olympic movement?

Significance of study

This is the first study in the field of Olympics regarding the implementation of VR with a holistic approach. Although literature is increasing towards VR and the Olympic movement is well researched, there is a lack of combining both fields. This research should serve as a starting point for both a holistic concept, as well as more research in this direction. Recommendations made might be used for future operations and strategic planning for the use of Virtual reality not only in the Olympic system, but for sports in general.

Objectives of study

The general objective of this study is to examine and develop a possibility of using VR as general tool to increase value for the Olympic movement. In detail the objectives are as follows:

1. To review and examine literature in order to understand the Olympic system
2. To review and examine literature to understand Virtual Reality
3. To examine VR as a tool for Olympic media
4. To examine VR as a tool in order to promote Olympic values
5. To examine VR as a tool to enhance training
6. To examine additional benefits and challenges of VR in the Olympic movement

Research hypotheses

H1: The use of Virtual Reality helps to develop athletes (coaches, officials) abilities.

H2: Gamification with VR significantly influence the understanding of Olympism.

H2a: The Olympic Movement is directly connected to values embedded in Olympism.

H2b: The motivation of learning about Olympism is high.

H3: Sport involvement enhances the Virtual Reality experience.

H4: Olympic Virtual Reality events enhance the customer’s experience.

H5a: Broadcaster can generate more revenue due to offered Virtual Reality events.

H5b: Customers are willing to pay more for VR if one of their already paid events was cancelled, due to Covid-19.

H5c: The more people are willing to pay for live events, the less they pay for VR events.

Olympic Marketing

In order to answer the research question, it is necessary to understand how the Olympic System works, especially regarding its marketing and where it differs to casual ones. Thus, marketing has to be understood and put in the frame of the Olympic Movement. As stated by the American Marketing Association (2017), "Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large." It is about generating value for all included stakeholders, by managing decision-making dimensions, in the most complete possible way.

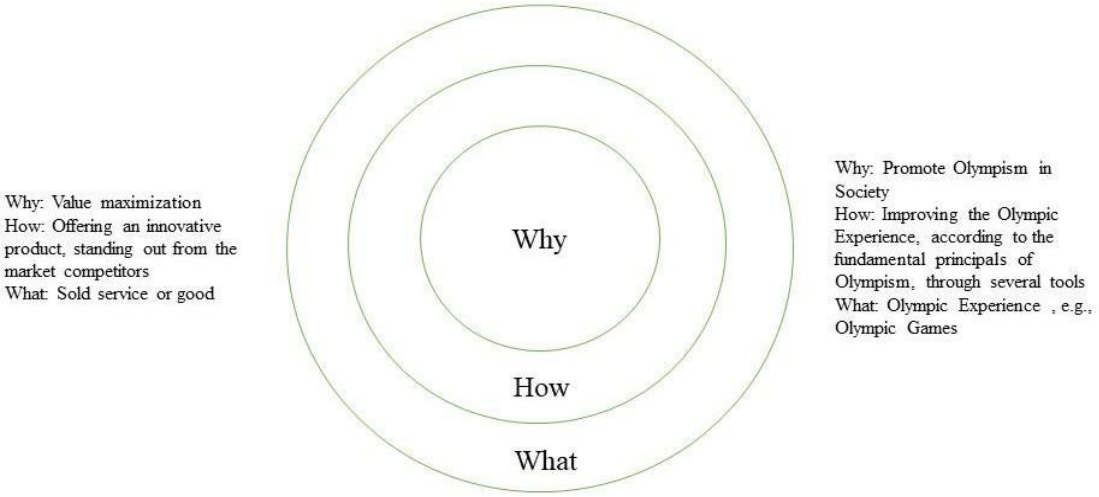
These dimensions are defined as the four P´s by McCarthy (1987): product, price, place and promotion. The product is an attribution mix, containing characteristics, benefits and purposes. It can be a good or service, which is exchanged with the aim to satisfy individual and organizational goals (American Marketing Association, 2017). The price describes the amount needed to acquire the product. The place is defined as the way or act of distributing the product to consumers. Promotion is about strategies to increase short and long-term purchases (American Marketing Association, 2017). To build a comprehensive fundament of Olympic Marketing, including its Marketing Mix (4Ps), the next step is examining and describing the Olympic System. According to the Olympic Charter (IOC, 2020a) the main objective of the Olympic System, as a whole, is the promotion of Olympism in society. Every stakeholder included in this system must follow this objective: "[…] To contribute to building a peaceful and better world by educating youth through sport practiced without discrimination of any kind and in the Olympic spirit, which requires mutual understanding with a spirit of friendship, solidarity and fair play."

Anchored in the Olympic Charter, the seven fundamental principles serve as a code of conduct for every stakeholder to achieve the before mentioned objective. Summarized in the principles, there are several aspects of humanism and especially sports as a human right. The universal aspect of sports and its effect on societies is taken into consideration for all decision and actions made by the IOC. Solidarity programs exist with the aim of creating effective help for upcoming

issues. Promotion of sustainability in the area's economy, social and environmental development, is an essential task for the Olympic Movement, fostered through the Olympic Agenda 2020. The Olympic Charter also aims at building an alliance between sport, education and culture while enabling practice of sports without any form of discrimination. All these aspects are the base of promoting the spirit of Olympism (IOC, 2020a) and one driving force for this implementation is the Olympic Marketing programme.

Looking at the definition of marketing, this programme needs to generate value for all stakeholders, by offering a product. These products are the sporting events, like Olympic Summer, Winter and Youth Games, as well as Olympic education. In business models, the company's objective are often the maximization of revenue (Dutta, 2015). In the case of the OM, this would mean, that the maximization of value is the maximal promotion of Olympism Therefore, trade-offs have to be made, leading to competing interest among the stakeholders. To make the difference between the Olympic Marketing and the usual clearer, we shall apply the Golden Circle Concept by Simon Sinek. This concept examines why an organization is doing what it is doing. How this will benefit their stakeholder, mostly consumers, and what is being offered. Figure 1 shows the main difference between a value maximization approach and the Olympic system approach. The most common approach is to create and sell a good or a service and tell the consumer how it helps. The focus is on What. However, following the Golden Circle Concept, the focal point is Why (Sinek, 2011). Looking at the Olympic Charter (IOC, 2020a) and the Olympic Fact File (IOC, 2020b) it can be assumed that the Olympic Movement focuses on Why. Even though the Golden Circle Concept is not namely used by the Olympic Movement, their lessons help us understand the IOC marketing.

Figure 1. Value maximization vs. Golden Circle Concept the case of the Olympic System



(Source: Adapted from Sinek, 2011)

This method leads to direct implications for the Olympic Marketing. Every stakeholder included in the brand must follow the Olympic Why. Thus, its aim is to co-create value inside the stakeholder model (Ferrand et al. 2012). This can be achieved through a stakeholder-marketing or a relationship-marketing approach. Relationship-marketing has the development of longtime relationships in a network as the main objective (Ferrand et al. 2012). Stakeholder-marketing furthermore aims in the inclusion or affection of other, non-immediately targeted, consumers (Bhattacharya & Korschun, 2008). To promote Olympism in society, its definition and goal must be clear. "Olympism is a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind […] Olympism seeks to create a way of life based on the joy of effort, the educational value of good example, social responsibility and respect for universal fundamental ethical principles. […] The goal of Olympism is to place sport at the service of the harmonious development of humankind, with a view to promote a peaceful society concerned with the preservation of human dignity" (IOC 2020a, p.11). To co-create value, stakeholders have to compliance with the Olympic Charter (IOC 2020a, p.12).

Figure 2 Olympic Brand Model

(Source: Adapted from Ferrand et al. 2012)

The Olympic System contains numerous stakeholders, and each of them plays an important role in achieving its objectives. In terms of marketing (brand model) there are several key stakeholders, who are essential for the brand value, as shown in figure 2. Regarding the research topic, the focus in this paper will be at these stakeholders, even though others play an equally important role in promoting Olympism. It must be said that the Olympic marketing, as a whole, is a complex system and cannot be fully explained in the frame of this work, but we aim to present a broader vision so that readers commonly understand the outputs of the thesis, in order to transfer knowledge regarding the use of VR in Olympic marketing.

So far, it was pointed out the objective of the Olympic Movement and how the Olympic Marketing helps the movement. In addition to that, key stakeholders were shown and mentioned how co-creation value is an objective of the Marketing program. Following it is important to get into a more detailed level regarding the Olympic Brand and Marketing. It is essential to point out that the mentioned and examined results about the OM, are based on the IOCs own understanding of it. At a later point in this study, critics of Olympism and the system will be mentioned.

The Olympic Brand

The Olympic Brand is significantly influenced by all stakeholders because the exchange with them creates value (Jones, 2005). A brand itself goes way beyond a name or a logo. It is, or it aims to create an emotional interrelation with its consumers, by triggering stimulus, like memories, attributes, community thinking or simply some images (Aaker, 1991; O´Reilly & Seguin, 2009; Kotler & Armstrong, 2005). In the case of the OM, the brand is connected to one of the world's most known and powerful events (Ferrand et al. 2012). The core of the brand are the Olympic values excellence, friendship and respect, which is also a core part of Olympism (Seguin et al. 2008; IOC 2020a). Since the promotion of Olympism is a key part of the OM and its marketing, it is important that the stakeholder include these values in their actions in order the achieve the goals of the movement.

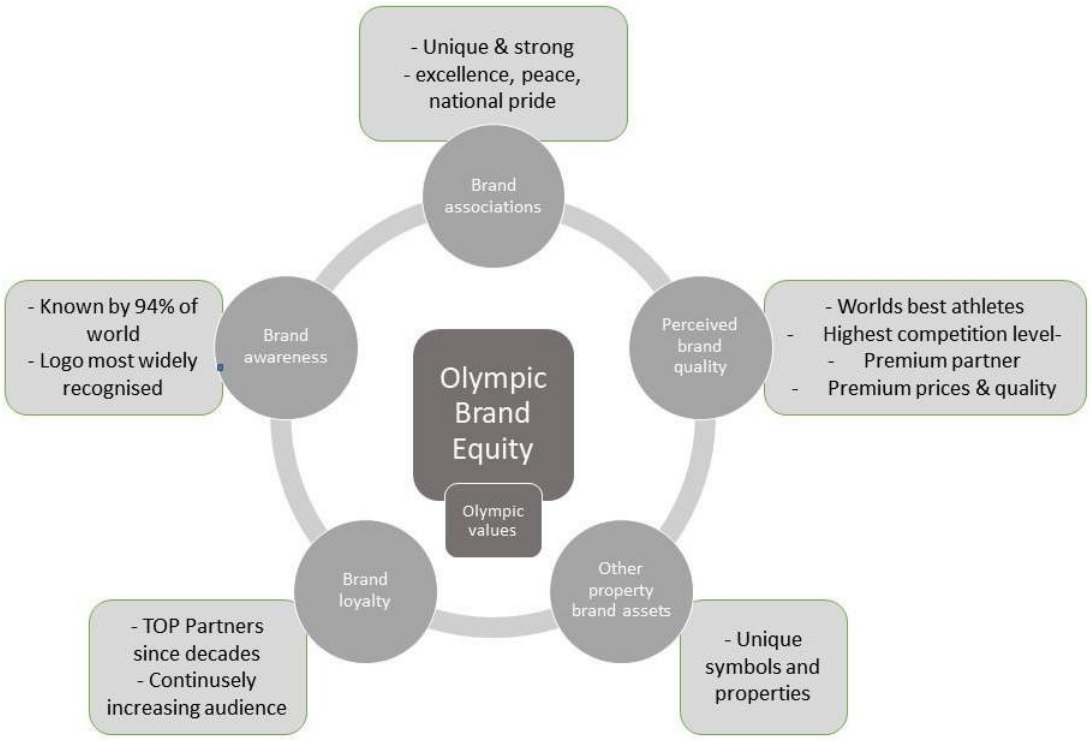
Brand equity consists of awareness, associations, perceived quality, loyalty and other assets. Equity offers value for the consumer and the company or institution. This leads to an opportunity of increasing product prices and margins, due to a stronger brand loyalty, which also can turn to a higher purchase satisfaction from the consumer (Aaker, 1991). The unique associations created with a brand are their identity. It represents the objectives of a brand and focuses on the establishment of a stakeholder relationship, by generating emotional, functional

and self-expressive advantages which are leading to a value proposition (Keller, 2003; Ferrand et al. 2012).

Based on Aaker´s brand equity model (1991), Ferrand et al. (2012) developed an overview of the Olympic brand equity. As already mentioned, the Olympic brand is one of the world's most known, driven by the interest in athletes, including their backgrounds, accomplishments and stories. Leading to an emotional connection between stakeholder, especially customer, and the brand (Ferrand & Torrigani, 2005). This is one of the most outstanding attributes of the Olympic brand, increasing its uniqueness (Seguin, Richelieu & O´Reilly 2008; O´Reilly & Seguin, 2009). The fundament of the awareness are the five interlaced rings, representing one of the most recognized logos worldwide. Supported through stakeholder communication and huge media coverage, the brand is known by approximately 94% of the world's population (Ferrand et al. 2012). Associations made are especially with excellence, peace, competition, national pride and friendship. Having its core in the Olympic values and a connection dating back to the ancient Olympic Games enables the brand to deliver benefits, like entertainment, fair-play, peace and more (Seguin et al., 2008).

Following these delivered ideals and benefits, the IOC was able to build a strong network and relationships (Chappelet, 2008), being able to sign sponsoring contracts with leading multinational companies for decades and reaching millions of customers all over the world (IOC 2020b). Thus, the Olympic Movement has an extraordinary strong brand loyalty developed over years, leading to an increasing on-site and off-site audience. The Olympic brand is also offering several other properties, like the oath as a relic of the ancient Olympic Games or the flame and its torch relay, as reminders of its heritage. All of them are symbols connected to the Olympic Movement, bringing joy and a special atmosphere and experience to the customer, which furthermore increases the brand value. The torch relay, in particular, allows the Olympic brand the possibility to be present all over the world, like it happened on the relay to the 2004 and 2016 Games. Another essential asset to strengthen the value is the perceived brand quality, which is supported through the quality of the broadcasting services, the connection to world leading companies, the premium merchandising article and pricing, as well as the quality of athletic performances in the Games (IOC 2020b; Ferrand et al. 2012). All the mentioned parts of the Olympic brand, summarized in figure 3, are building a strong and unique brand value, that also lead to a high value preposition.

Figure 3. Olympic brand equity model



(Source: Adapted from Ferrand et al. 2012)

Olympic marketing objectives

One main driver of brand value is the Olympic marketing programme. As examined before, the marketing programme follows a value of co-creation approach inside its stakeholder network. Since it's at the center of the marketing configuration (Ferrand et al. 2012) it is important to further investigate the most important value creating stakeholder (figure 2), as well as Olympic marketing itself. It has to be said that the system contains way more stakeholders, all of which have an influence, but for a better understanding of the topic we will not provide a more detailed description of all stakeholders.

IOC Marketing started 1980 when former IOC President Samaranch brought it to the Olympic sphere. It is responsible for the management of partnerships, broadcasting & new media, staging Olympic Games and corporate branding (Ferrand et al., 2012). The objectives of their marketing programme are written down in the Olympic-Marketing-Fact-File (IOC, 2020b):

- To generate revenue to be distributed throughout the entire Olympic Movement – including the OCOGs, the National Olympic Committees (NOCs) and their continental associations, the International Federations (IFs) and other recognized

international sports organizations – and to provide financial support for sport in emerging nations;

- To build on the successful activities developed by each Organizing Committee for the Olympic Games (OCOG) and thereby eliminate the need to recreate the marketing structure with each Olympic Games;
- To ensure that the Olympic Games can be experienced by the maximum number of people throughout the world principally via broadcast coverage;
- To protect and promote the equity that is inherent in the Olympic image and ideals;
- To control and limit the commercialization of the Olympic Games;
- To create and maintain long-term marketing programmes;
- To enlist the support of Olympic marketing partners in the promotion of the Olympic ideals.

In summary, the objective of Olympic marketing is to generate revenue to be distributed in the OM, by enhancing the equity through promotion of the Olympic values and ideals to the widest possible audience. It should be reached in and off-site, also carried out by partners in order to successfully build a marketing structure and long-term marketing program to provide financial stability of the OM. Some key points can be found in the objectives above, such as the generation of revenue, the promotion of the idea of Olympism and the delivery of the Olympic experience to people all over the world. By following them, the IOC was able to build on of the most impressive and successful sport marketing programs (O´Reilly & Seguin, 2009), which made them financially independent and stable (IOC 2020b; Ferrand et al. 2012).

Value Co-Creation

Normann, Ramirez & Wiley (2005) showed that an interaction between the firm and its stakeholder system is essential to build value. Thus, the IOC uses value co-creation as the middle of their marketing program to be successful. On top of that, Ferrand et al. (2012) showed that Olympic marketing is experiential in order to give this unique framework a fundament to reach the aims. The success of value co-creation is highly dependent on the stakeholders and their cooperation. The implication is that value co-creation is about a determined creation of value, which is assessed and delivered by the partner. Through the assessment, an iterative process can be created and with it, a constantly improved system. Partners can offer different kinds of values, such as societal, environmental and / or financial ones.

Under consideration of the marketing objectives of the IOC, an Olympic experience is created and based on the shared Olympic values, functional and socio-emotional benefits. All of that is generated throughout the stakeholder system. This experience is essential for the brand equity and is created for and with the help of the stakeholder. Collaboration is translated into activities and relationships are built and strengthened (Ferrand et al. 2012). The complete Olympic System contains over 20 stakeholders and each one is following the general as well as its own objectives and with it the main goal of promoting Olympism. As already mentioned, some stakeholders are more important for the brand equity than others (Figure 2).

This study aims to understand the value co-creation. Sponsors can be local ones or TOP partners. They are actively involved in marketing programs and reinforcing Olympic value through advertisement or customer communication. They are allowed to use the Olympic symbols, during the Games or inside of their own countries. The OM furthermore provides a platform to essential markets. It is the biggest stage not just for the athletes but also the promotion of ideas. NOCs, IFs, and OCOG´s are building the base to deliver the Olympic Games. Under the brand power, educational programs have been created so they can promote Olympism. "OCOGs develop an identity for the Games that is branded through the look of the Games" (Ferrand et al. 2012). They are one of the main stakeholders regarding the brand and value co-creation. Being a main player in the middle of the organization of a main product of the IOC, a strong relationship to all included partners is part of their identity and their decisions influence the action of others. The intersection between interconnection and dependencies, while still being independent is a major attribute of this value co-creation. Brand values are, in the best-case scenario, reproduced and shared all over the world especially when they also sponsor athletes.

To help athletes to qualify and compete at the Games, governments help to connect to the OM. They for example build the necessary infrastructure. Two other important and significantly connected stakeholders are media and consumer. Media or broadcaster are essential for the goal of reaching the maximum possible audience (IOC 2020a) and the brand offers a platform in which media can explore new media in order to enhance the customer experience and possibly gain more revenue. The Olympic experience is carried by the images done by media, especially nowadays (2020 and 2021), when the public is not allowed or strictly restricted to enter the stadiums. This is essential if the IOC wants to achieve the set goals of the Charter. A created experience will enhance consumer satisfaction, which leads to a positive connection with the

brand, a higher customer lifetime value and positive multiplication. This multiplication helps to promote Olympism and reach people which are not directly connected to sports. How to influence these experiences will be shown in one of the following chapters.

Stakeholder marketing

As shown in the last chapter, value co-creation is built on strong relationships inside a stakeholder network. According to Bhattacharya & Korschun (2008), stakeholder marketing aims to target the inclusion of consumers that are not the immediate targets of the product. Thus, the marketing activities go deeper, in order to affect a wider range of people. Pointing out the main goal of the Olympic System, promoting Olympism in the society (IOC 2020a), stakeholder marketing seems to be a good fit.

Even though most of the people in the world know the Olympic brand, also thanks to their own programs and equity model, not all of them are immediately targeted by their main products, their different Games. The Games focus on spectacle and sporting achievements and help to build a strong brand equity, but they also promote Olympism, especially if a consumer has none or just a little interest in sport. According to the Olympic Charter (IOC, 2020a) Olympism is a way of life with the goal "to place sport at the service of the harmonious development of humankind with a view to promoting a peaceful society concerned with the preservation of human dignity".

To follow this big goal, the IOC's activities need to activate people beyond their immediate targeted consumers. Otherwise, only a limited amount of people could be reached to promote the aforementioned idea and philosophy, but the goal is to reach the maximum possible audience. What other benefits does an organization create with stakeholder marketing? It creates marketing activities, including their design, implementation, and assessment, in order to provide the highest possible benefit to all stakeholders (Smith & William, 2011).

According to Bhattacharya (2010) there are several more points which can be observed by using this approach. Besides the maximization of stakeholder value, an organization adopting this approach tries to fully understand the impact of its marketing program on each immediate stakeholder and beyond. To provide it in the best way, the relationships inside the network are examined and a way of dealing with conflicts and shared ideas is going to be developed.

One main difference to other approaches is the fact that the shareholder value maximization is not their main objective. Pursuing the stakeholder approach, the Olympic system aims to

generate value under the guidance of their own fundamental principles. The Olympic marketing is following this approach, as well as the organizations of the Olympic system (Ferrand et al. 2012).

Experiential Marketing

So far, this research has pointed out the most important points about the Olympic brand equity, which is influenced by the stakeholder marketing approach and the value co-creation concept. As described, the Olympic brand was able to build one of the world's strongest brand equities. The high quality of the brand is fostering trust from its stakeholders, by increasing the perceived quality. This is especially done by delivering the Olympic experience. By doing so, social, functional and largely emotional benefits are created (Ferrand et al. 2012: IOC 2020 a; IOC 2020b).

Developed by Holbrook and Hirschmann (1982 as cited in Ferrand et al. 2012) experiential marketing aims to establish a consumer reaction on the emotional, as well as the rational level. Integrating emotion in the concept was a new approach to the old concept of a totally rational consumer, not influenced by the emotional level. According to Holbrook (1999 as cited in Ferrand et al. 2012) consumer value is defined as "an interactive relativistic preference experience". The interaction stem from the process of consuming the product, in the case of the Olympic system e.g., by watching Olympic sports, or enjoying Olympic education or buying merchandise. It is relative because the consumer compares between the actual and an old experience and preferential due to a contained personal judging. To convey benefits like emotions and others, it needs to be experiential. Though one of the main goals is to deliver the Olympic experience, with its unique character, to all stakeholders. This is done by providing emotional, socio-cultural and symbolic benefits combined with functional ones (Ferrand et al. 2012).

According to O'Reilly and Seguin (2009) just a small number of sport brands can create an emotional connection with the customer, like the Olympic one does. This is reinforced by creating images, building a strong community for everyone, unique memories and moments that goes beyond the specific event (Keller, 2003). Following Schmitt´s (1999) explanation about experiential marketing dimensions included are: feel, think, act and relate. Ferrand et al. (2012) put the dimension in context to the Olympic Games.

First of all, The Olympic Movement, better than many other institutions, has the ability to foster a strong emotional connection linked to the Olympic system, through several activities that

develop this feeling (O'Reilly & Seguin, 2009). The "think" dimension is activated with the relevance of the Olympic experience and the sense of excellence and quality. The next dimension "act" is an expression of the consumer by taking part or being involved in the Games or the system. And "relate" is done by the promotion of Olympic ideals and values, experienced and taught through the experience, to the immediate environment.

When one exams this module, critical points naturally arise. First of all, in a crisis like the ongoing (as of the time of writing) covid-19 pandemic, there is no or at least a minimal chance for people to experience all this in person. The Tokyo 2020 Summer Olympics will not host spectators from other countries than Japan (McCarriston, 2021). Thus, a huge part of this concept is taken away from many people all over the world. Secondly, excellence is one of the main values promoted by the IOC (IOC, 2020a), therefore it has to be the aim to excel in every section. This also leads to higher ticket and merchandising prices, which furthermore create boundaries regarding the maximum range of people who can afford the experience. It goes against one objective of the IOC media policy, which is to make the games available to the greatest amount of people possible (Real, 1996). Lastly, Seguin et al. (2018) worked out that "failure to live up the brand promise" is a significant threat to the Olympics. Putting this in context with the experiential marketing approach, "failure" could lead to an implausibility towards the customer, which then do not relate to the Olympic experience and the ideals are not promoted. There is a need to rethink the way the experience can be brought to the consumer, in order to follow the approach and achieve the objectives by creating the best possible customer experience (CX).

Customer Experience

According to Homburg, Jozic & Kuehnl (2017), customer experience, also known as CX, is a marketing approach, with many positive features. It is a promising approach, due to its commitment to the affective level of consumer. It can be followed in to maximize your value. It can be defined as a customer journey with the organization or company, including interaction between both at several stages.

Starting at the pre-experience and ending with post experience, the interaction includes the product itself, the design, brand elements -like logos or symbols-, communication and more. Digital improvements add new interaction points to the customer journey. Especially social media is a new, fast moving touchpoint, which makes the journey even more dynamic and interactive as it already had been (Lemon & Verhoef, 2016). The different responses of the consumer during the experience are another approach to CX, with the focus less on the

interaction, but more on consumer responses. According to Pallot, Eynard, Poussard, Christmann & Richir (2013), user experience activates cognitive, affective and psycho-motor domain of the user. It contains "user emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and accomplishments that occur before, during and after the use of a product, system or service". These attitudes can be seen in Schmitt´s (1999) experiential marketing model.

Strong pictures and storytelling are a need to activate the consumers affective domain. As an authentic brand, by adding value to the customer experience, it helps to maximize the brand equity (Wintzen, 2019). As shown in the previous subchapter, the Olympic System and its marketing are based on their unique experiences brought to the stakeholder. The Olympic brand has a great advantage to be one of the most sophisticated and valued brands (Seguin et al. 2008), which helps it to remain relevant. The last decades changed the way on how consumers think about their experiences. Comparisons are done easier and faster, due to the digital possibilities of media. Therefore, consumers can share information easily and interact and communicate in a matter of seconds. In response to these (digital) developments organizations or companies must enhance their "digital capabilities skill […] in order to remain relevant and competitive (Boyd & Koles, 2019). By "shaping the technology-based interactions in a customer-centric way" new values can be emerged (Pallot et al. 2013). One of the new emerging technologies is VR. In accordance with the literature, VR can be used in order to create stakeholder value for Olympic stakeholder, especially for consumer, by exploiting the unique Olympic experience, through offering a valuable (experiential) CX.

Stimulus-Organism-Response

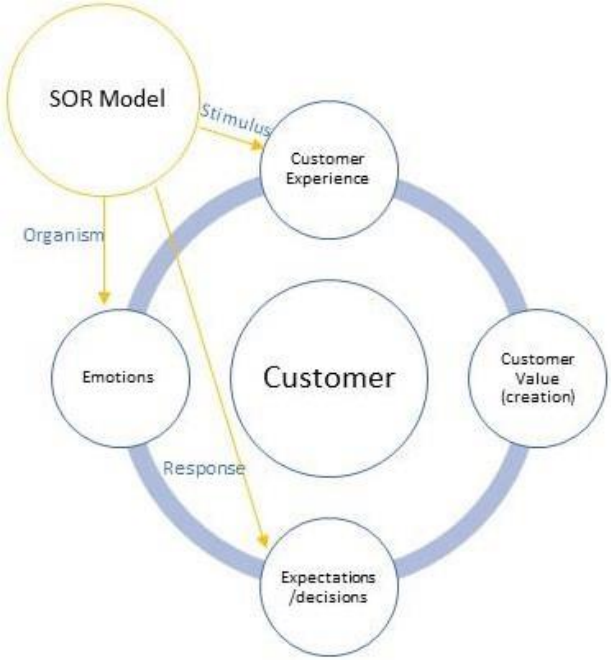
To better understand how to analyze and develop the worth of customer experience, it is better to review an important theoretical base first, the Stimulus-Organism-Response (SOR) model. Introduced in 1929 by Woodworth, this model examines consumer behavior or decision-making. A controlled or uncontrolled stimulus can affect the customer. Through a customer experience, the act of buying or using a product or service, creates memories or expectations, thus leading to an intrinsic (Organism) emotional response.

A certain decision is being made by the consumer, depending on these emotions, at the various stages of consumption: at first, information research; then the purchase; and finally, a positive or negative feedback, in private or in public" (Waehlert, 1997). A positive emotional connection must be created with the aim to influence a consumer decision. Emotions are temporary states of feeling, which can be perceived as positive and negative, hence influencing the organism

positively or negatively (Hüttner et al., 1994 in Waehlert 1997). The increased desire for customer experience is characterized by the need for emotional experiences. Customers search for additional benefits, that go beyond the actual benefits that come with the experience.

According to Mark Zuckerberg, after Facebook acquired Oculus, VR "… opens up the possibility of completely new kinds of experiences." The mission of oculus "is to enable you to experience the impossible" (Russel,2014). In the context of experiential marketing stimuli and according to SOR new unique experiences can be created with VR and with them new positive stimuli can influence consumers decision-making and enhance the perceived (brand) equity. This enhancement will lead to a stronger connection between consumer and brand and a more likely positive sharing of their experience. "Imagine sharing not just moments with your friends online, but entire experiences and adventures." By doing so a positive influence on the perception of a brand can be transferred inside the own social construct, which then fosters positive emotions regarding the brand. In the best-case scenario, the consumer value is increased and simultaneously, a value is co-created. Figure 4 illustrates the connection of SOR and the consumer itself.

Figure 4. Customer Experience



(Source: Own illustration)

SOR is facing some critics in literature, since it is difficult to explain humans, with all their individuality in a model. A main issue is the "Black Box", which occurs due to the intangible

emotional reaction to a stimulus. Stimulus and response are tangible and thus, normally easy measurable. Emotions (organism) cannot be measured simply (Waehlert, 1997). Therefore, it need to be clarified that this model, is not able to explain the complexity of human, but it offers a theoretical base for a better understanding of customer behavior and actions to be taken. With this purpose it is going to be used in this thesis.

Virtual Reality as a tool offers potential upgrades in the marketing system of the Olympic movement. Before transmitting the findings of this thesis to VR as a tool in the Olympic system, a foray to criticism about the Olympic Movement and Olympism will be settled. Continuing with a critical approach regarding the Olympic system offers the chance to examine potential areas in which VR can contribute to additional benefits, going beyond the actual experience.

Foray: Criticism of Olympism & its movement

According to the Olympic Charter, "Olympism is a philosophy of life, exalting and combining in a balanced whole the qualities of body, will and mind". It continues, "Olympism seeks to create a way of life based on the joy of effort, the educational value of good example, social responsibility and respect for universal fundamental ethical principles". One also reads in the Charter that "the goal of Olympism is to place sport at the service of the harmonious development of humankind, with a view to promoting a peaceful society concerned with the preservation of human dignity". And also „to contribute to building a peaceful and better world by educating youth through sport practised in accordance with Olympism and its values" (IOC 2020a, p.11).

The IOCs claim to promote Olympism as a fundamental mission is not unanimous and has found criticism. Olympism is defined as a philosophy for a way of life; thus, it has to be universal to be implemented. Parry (2003) argues that this is not the case, and that conception is culturally relative and depending on the context. This is what is filling the philosophy of Olympism with character. For him Olympism is a fundament to provide a positive development all over the world. Teetzel (2012) as well as Wamsley (2004) see problems with the implementation of Olympism on modern times, thus they challenge the concept and call it Utopian, an old-fashioned principle, without modern influences. Going back to the starting days of the modern Olympic movement, in the end of XIX century, we must remember that the Olympism is basically eurocentric, containing the ideas of a small geographical area, legitimizing the political capitalist powers of the time (Wamsley 2004; Teetzel 2012; Lenskij 2012). Wamsley adds that Olympism and the Olympic Games are too connected to politics and economy, and due to that the Olympic Movement is not able to achieve its objectives. In

addition to that, stakeholders in the Olympic system not consistent with the ideas of the Olympic Charter are a serious threat to the movement (Seguin et al. 2008).

A tendency can be pointed out while examining these criticisms. In most of the critics, Olympism as a concept is not the main issue, but its implementation driven by the IOC and their programs, e.g. the marketing program, seem to fail their own mission. In contrast to that, the Olympic marketing program and brand are a success story (ibid), as it was mentioned earlier. This contradiction can be solved, if historical and current issues are considered in future steps, in order to include Olympism in the core of the brand and their programs. Following the critics, the philosophy needs to be offered in a more experiential, vivid and immersive way. Olympism if the core, will help to develop human individuals to provide a better world (Lenskij, 2012).

Virtual Reality

The Russian novelist Fyodor Dostoevsky once said, “Times of crisis, of disruption or constructive change, are not only predictable, but desirable. They mean growth. Taking a new step, uttering a new word, is what people fear most”. The ongoing Covid-19 Pandemic is a crisis of unknow and unforeseen situations and with it changes. It is in fact effecting many parts of the everyday life throughout every society. Sport without live audience is a common picture around the world for now. The IOC postponed the Olympic Games of Tokio 2020, a decision never made before (IOC, 2020c). Games have already been canceled, but the postponement was a new way of handling a crisis, done by the IOC. This is one example of changes, triggered by a crisis.

Especially Covid-19 with all its strict lockdowns all over the world, led to major changes. It accelerated digital changes in many sectors. According to LaBerge, O´Toole, Schneider & Smaje (2020) it promoted the digitalization of customer interactions globally up to 3 years. Furthermore, it speeded up the share of digital products and services fully or partial, up to 7 years. Companies and people took the chance of being held at home to digitalize their way of working and living. Digital Meetings in virtual environments were barley used some years ago, now being used at a daily level. Thus, being part of a virtual environment is adapted all over the world.

The purpose of this chapter is to examine and develop an understanding of Virtual Reality in general, to create a base understanding in order to evaluate if the potential of VR as a tool can be used in the Olympic System.

VR has a huge growth potential since entering the market (Richter, 2016), but it never reached the mass market as it planned. Until the midst of 2020, about 26 million VR Headsets were sold (Magloff, 2020). There are still barriers in the adoption, for example hardware costs (McCarthy, 2019), but Magloff points out that Covid-19 has the ability to boost VR. A big increase in demand of VR Technology and interest in high-end VR hardware could be seen, since the beginning of the Pandemic. On top of that consumer adopted the digital lifestyle, a part in which VR is a perfect fit. Due to this development Virtual Reality could be a useful tool for the Olympic Movement, by helping to make a step into a more diverse digital future.

This chapter is going to define and explain VR for an understanding of the following research. "The term virtual reality refers to an immersive, interactive experience generated by a computer" (Pimentel & Teixeira, 1993 p.11). This also applies to Augmented Reality and Mixed Reality. All of them are virtual environments or virtual worlds, which are simulated 3D worlds, generated by a computer (Waehlert, 1997 p.9). Literature is offering several definitions of these virtual environments, also called Extended Realities, using VR as a generic term often including other realities.

The general concept of these realities is the same, but there are some differences. The main concept is about convincing participants they are at a different place, whereby the user can perceive and move in this world (Kittel, Larkin, Elsworthy & Spittle, 2019). It is a computer-generated 3D environment of the real or a virtual world, in which the user is able to interact, leading to a real-time stimulation of at least one of the five senses, characterized by three main attributes (Sutherland, 2017; Guttentag, 2010; Burdea & Coiffet, 2003). These key elements are namely visualization, interactivity and immersion. Visualization is the capacity of looking around in the virtual environment (Yung & Khoo-Lattimore, 2017), by reorganizing perceptions at a qualitative level to strengthen the addressed senses (Wang, 2012).

Interactivity is distinguished by the control of the environment by the user. This can be the capacity to modify sensors, to move the point of view, or the ability to directly modify the virtual environment (Zeltzer, 1992; Williams & Hobson, 1995, Wang, 2012). Immersion, another essential element of extended realities, is the psychological state of "being there" or the feeling of diving into the reality (Brill, 2009). Murray (1997) describes immersion in her book.

> "The experience of being transported to an elaborately simulated place is pleasurable in itself, regardless of the fantasy content. Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or

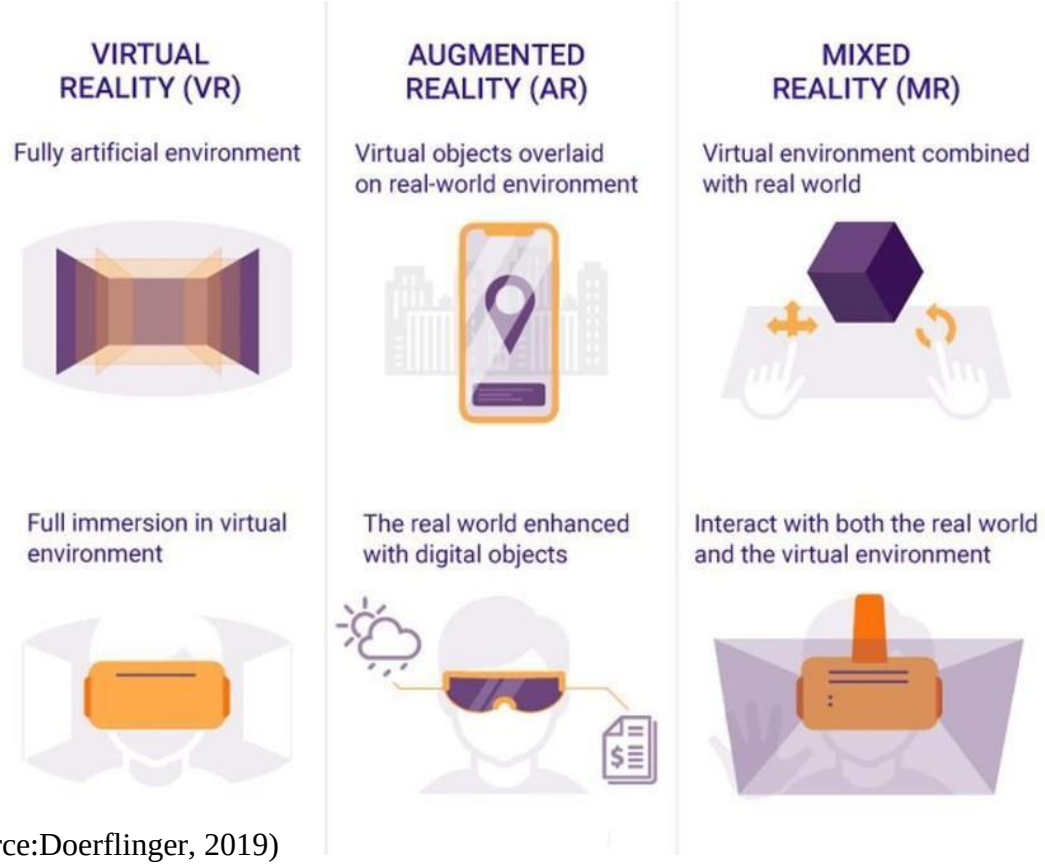
> swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus."

The experience is a crucial part of immersion, which is created through VR. Murray pointed out, that immersion is about changing your reality for a completely different one. The three described key elements of Extended Realities take part in every one of them, but the degree of every element is what they differ at. The next part is going to describe the differences between the three common Extended Realities (EX), VR, Augmented Reality and Mixed Reality, before defining VR for the use of the following research. For expositional ease, the terms "customer," "consumer," and "user" are used interchangeably throughout the thesis.

Definition of Virtual Reality

As described before all EX have the same key elements. They differ in the degree of every of them. The differences are shown in figure 5. VR is a fully immersive environment, which is artificial. The user is immersed in a completely new reality that takes her or his full attention and senses (Murray, 1997). Augmented Reality (AR) has a lower immersion, and a different visualization. With AR the user overlays the real world with virtual objectives, and interact with them, still being present in the real world. One of the most popular AR examples is the interactive game Pokemon GO (Doerflinger, 2019). Mixed Reality (MR) is a combination of all (Milgram, Takemura, Utsumi Kishino, 1995). Real and digital elements are brought together, and users are able to manipulate both of them. Using the own hands to interact inside the virtual environment is a main difference to the other EX. Users immerse in the virtual environment, by still staying in the real world (Doerflinger, 2019).

Figure 5. Extended Realities



(Source:Doerflinger, 2019)

The following research is using VR as a generic term, as done in literature and media, to describe Extended Realities, which namely can be AR, MR or VR. Even though there are differences between the several options, the main attributes of the EX are the same. All "refer to an immersive, interactive experience generated by a computer" (Pimentel & Teixeira, 1993 p.11). Using the term VR to describe all of them will help to understand the overall concept.

Function and Technical Requirements of VR

Technical requirements and specific function need to be used to create the immersive experience. There are several hardware components which can be used for the experiences. Furthermore, a VR-Engine including software and database is essential. This engine should be able to handle a large amount of data, to create a high-end experience. Data is received by the engine, which then is directly, in real-time, turned into action to change the Virtual Environment. Since everything is happening in real-time, a high-end processor is essential for the best possible experience.

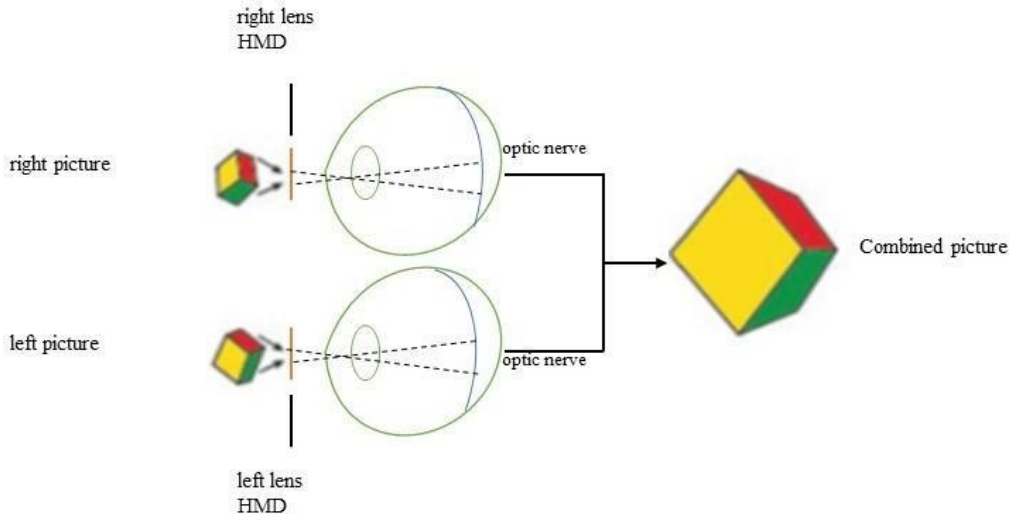
The command for action is triggered by the user, by using peripheral data entry devices, like a Playstation Controller (Intel, 2019; Petri & Witte, 2018 p.104 ff.). There are several other

Hardware possibilities like smartphones, which can help to create AR content (Pokemon GO) or can be used as a low-tech Head-Mounted-Display (HMD). The focus of this paper will be on HMD as a VR Hardware, because they generate the best user experience, which is a main part of VR as a tool for the Olympic Movement. Thus, the function of HMD should be examined at a more detailed level.

To engender a virtual three-dimensional visual experiences two display pictures need to be simulated and created in front of the user's eyes. The pictures differ slightly, to force the brain to calculate the three-dimensional image. Figure 6 represents the function graphically. It is essential, that the used lenses can create a sharp picture at the retina. These pictures are dependent on the frame rate. The higher the rate, the better the picture, but the more power is needed from the engine as well (Petri & Witte, 2018 p. 106).

To get the full immersive experience, three-dimensional audio localization is needed. Therefore, the device needs to measure the heads movement and combine it with the local sound source. Thus, the sound feels real, and the immersion is higher (Burdea, Richard & Coiffet, 1996). The manipulation of the senses hearing and seeing is an important part of creating an immersive, virtual environment. Perception of the surroundings is done 80 percent by seeing and 11 percent by hearing. Combined 91 percent of the human perception is done by two of the five senses (Chrisoph, 2019; Waehlert, 1997). This lead to the fact, that these senses are essential generating an immersed environment, in which the user feels like being there.

Figure 6. Function HMD



(Source: Adapted from Petri & Witte, 2018 p.105)

Challenges of VR

As it was shown above, VR has the potential to take the customer to another world, without feeling unreal. To fulfill this potential, VR has to overcome challenges. First, as mentioned before, the hardware, as well as the software, must be high-end to get the maximal possible immersion. High-end technology is more expensive than normal technology. The high costs are a main barrier despite a growing interest in VR (McCarthy, 2019). McCarthy (2019) figured out that this barrier did not change from 2017 to 2018 in the United States. According to Magloff (2020) the ongoing Covid-19 Pandemic, has the ability to boost interest in VR and to reduce barriers. This is going to be examined in a survey later in this thesis. It will also show, if the barrier of costs can be transferred to 2021 and several countries. Another main challenge are health issues. The most important one is the so called Cyber,- or Motion sickness.

There are several theories on the causes of such illness. LaViola (2000) researched these theories. The first one is the Vergence-accommodation conflict. As the received distance and the actual distance do not match the brain receives wrong cues, which leads to headache, fatigue and eye effort. The second one is called Mismatch theory. Latencies between the actual user movement and the visual movement trigger incongruencies, not processable for the brain, leading to malaise. The next theory is the poison theory, an evolutionary point of view, making references to the consumption of poison, provoking dizziness and vomiting to get rid of the poison. Following this theory VR is poison for the body, and for this reason the symptoms occur. The fourth and last theory is the embodiment approach by Storch (2006). Body and soul are one unit, and if a process or stimulus is influencing the user's psychology, the whole body reacts as a result.

To enable a highly immersive and positive VR experience, these challenges must be approached. Especially the combination of body, soul and mind, mentioned in the embodiment approach, is an essential part of Olympism, because it's the description of excellence, one of the three Olympic values (Ferrand, Chappelet & Seguin, 2012). This concept dates back to the ancient Greece and the beginning of the Olympics, which is the base for the modern Olympic System. The concept of Arete describes the excellence of each person him or herself. Excellence means being the best of yourself. "Arete existed, to some degree, in every ancient Greek and was, at the same time, a goal to be sought and reached for by every Greek" (Miller, 2004). Being able to reproduce this concept in the consumer, by using VR Technology, would connect costumer directly with the Olympic Brand. Therefore, the challenges surrounding the technology have to be removed or weakened.

Potential of VR

Examining the challenges of VR is important for the purpose of reaching the full potential of VR. This Part of the thesis will briefly present the fields of use, as well as some statistical data about the market potential of VR. VR is a modern narrative medium and the next step in the technical evolution (Chertoff & Schatz, 2014). It is already used in architecture, prototyping, training situations, especially in dangerous or expensive areas (Waehlert, 1997; Kulpa, Multon & Argelauget 2015) as well as in sports.

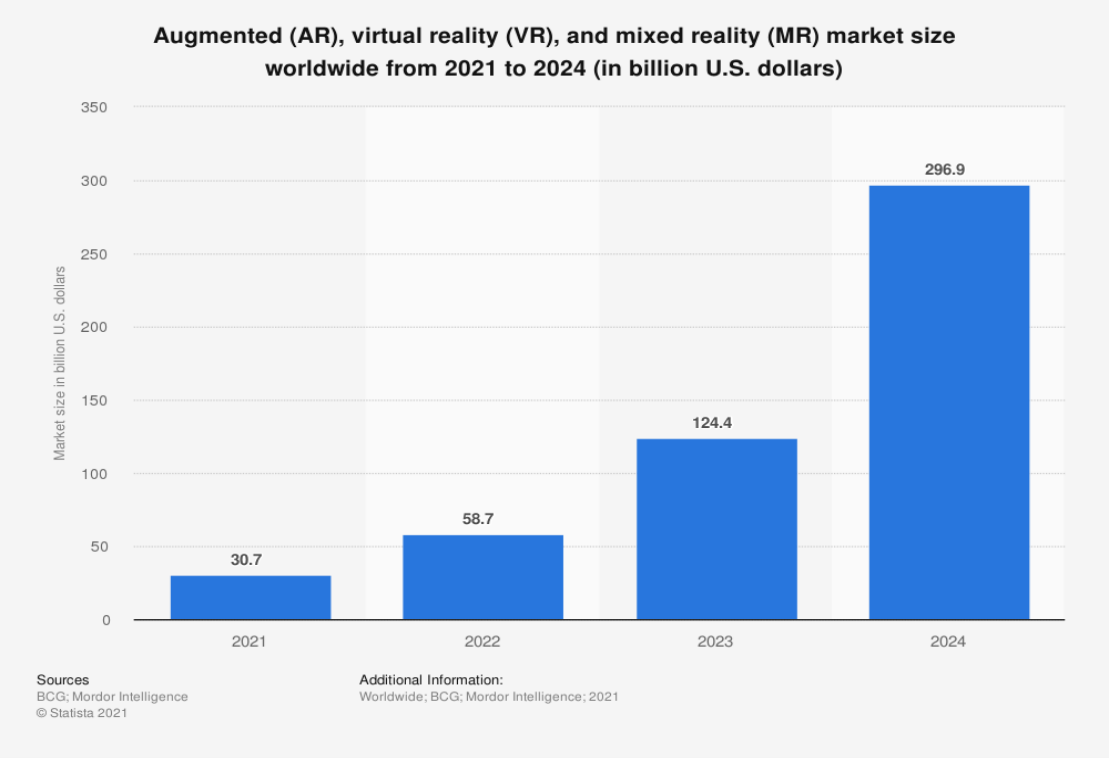
The Olympic Broadcasting Service (OBS), for example, used it in 2018 for the Winter Games of PyeongChang (Kshetri & Rojas-Torres, 2018) and is planning to use it again in Tokyo 2021. Major American sport leagues, like the National Football League or the National Basketball Association are using it or are exploring opportunities in order to implement it as a tool (Deveny 2020; *Microsoft HoloLens: So schauen wir Football in Zukunft*, 2016). The NBA and Oculus, a VR platform under the wings of Facebook, closed a long-term marketing partner contract in summer 2020, in which Oculus got the exclusive VR broadcasting streaming rights (Dixon, 2020). Signing a long-term partnership deal in times of crisis, within a fastest moving business area, is a sign of trust and believe in VR as a tool to maximize value.

A major advantage for the IOC is that Intel, one of their TOP Sponsors, is significantly involved in implementing VR as a mass media tool (Intel, n.d.). VR can be used broadly in the field of sports and the Olympics. Training and data analysis for athletes, referees, coaches and sport scientists is one possibility of use. Another one is virtual stores. Gamification in order to deliver emotional or socio-cultural benefits is also an area of use. The other essential sector is media, including traditional and new media. All these fields will be examined in this thesis regarding their usage for the Olympic Movement. Before doing so, the market potential of VR will be shown and the Olympic marketing system examined, with the intention of building a base of understanding.

Looking at Figure 7, the potential market size of VR, AR & MR was predicted from 2021 until 2024. The predicted growth from 2021 until 2024 is approximately 867% (Statista, 2020). This statistic is a forecast, which should be taken carefully, but even though the growth comes up shorter than predicted, it shows the potential of VR. Adding to that, the findings which shows historic and forecasted future market revenue of immersive systems from 2018 until 2023 (see figure 8), present a constant growth, with the exception of 2020 in which the Covid-19 pandemic led to a decreasing revenue (Statista, 2021). The uncertainty at the beginning of the

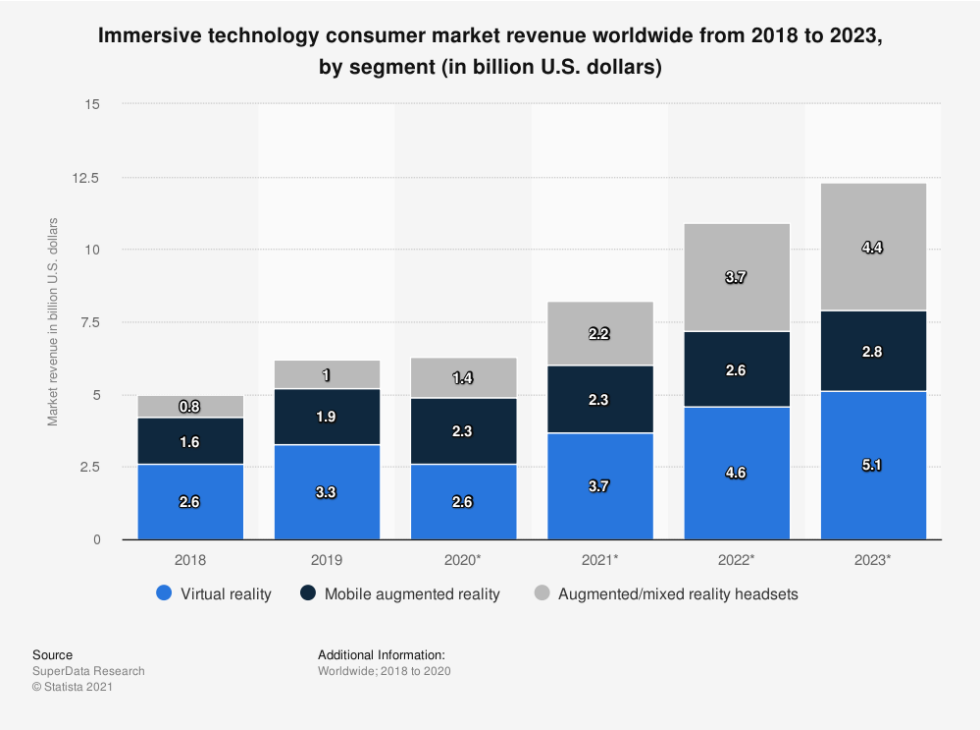
crisis, paired with new, often worse income situations were main reasons for the decrease. But as pointed out in the beginning of this Chapter, Covid-19 has a realistic chance to boost VR and help to reach its potential and satisfy the "increasing appetite for immersive applications", by offering a virtual interactive world (Prasad, Uusitalo, Navrátil & Säily, 2018). Creating immersion is a key attribute of VR, offering a solution for customers need.

Figure 7. Predicted worldwide market size of Extended Realities



(Source: Adapted from Statista, 2021)

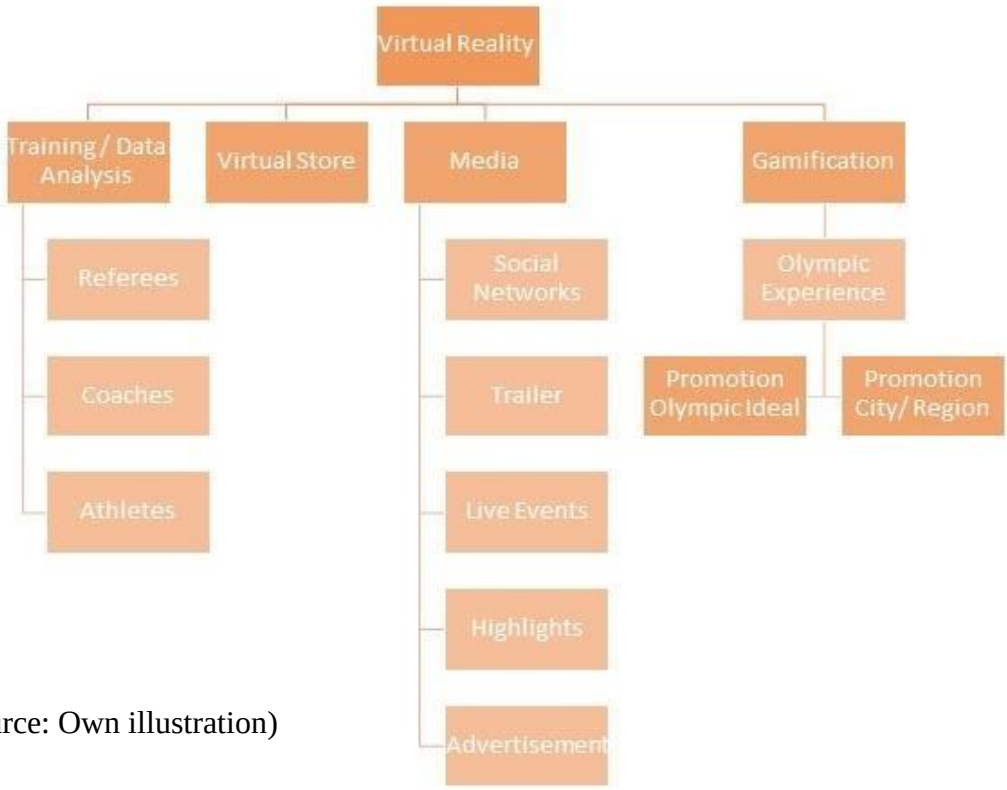
Figure 8. Market revenue immersive technology 2018 to 2023



(Source: Adapted from Statista, 2020)

Virtual Reality as a tool in the Olympic system

Figure 9. Virtual Reality as a tool in the Olympic Movement



(Source: Own illustration)

Reviewing the last subchapter, the goal was to build a basic understanding of VR and Olympic marketing, despite the complexity of the Olympic system. In regard to VR as a tool for the marketing and movement this basic understanding will help to show dependencies. VR is a new technology, which was not able to fulfill its potential and forecasts but it has potential in a fast-growing market. According to Boyd and Koles (2019) companies must enhance their digital skills if they want to stay competitive. Figure 9 shows possible fields of use for VR in the Olympic Movement.

This chapter examines these fields and puts them in context to the Olympic brand and its stakeholder. As shown in Figure 9 there are some key fields to apply VR within, but we shall concentrate on VR in Olympic media, as well as VR in gamification, because it is seen that these are the most favorable fields. In addition to that, the collected data focuses on mentioned areas. The other fields are important to it but will be seen as additional benefits and could be researched at a later point. One of the main reasons for a use of VR is the immersive situation, teleporting the consumer into a virtual world, helping her or him to experience a situation (Murray, 1997). This immersion can be a huge advantage for data analysis and training in sports.

Data analysis & training with VR

According to Jeremy Bailenson who developed STriVR Labs, a VR training or learning solution and platform,

> "Virtual reality replaces your senses with ones generated by a computer, so when virtual reality is done well, we measure exactly how the body moves, and we replicate the senses for those movements. … VR is a constant technological system that tracks body movement and updates the sights, sounds and touch based on those movements; you feel like you're mentally transported into a different place" (Zorowitz, 2015).

This part of the thesis briefly examines potential benefits of VR training and analysis in order to create value for stakeholder in the Olympic movement. "Progress is impossible without change, and those who cannot change their mind cannot change anything" (George Bernard Shaw). Striving for excellence, one of the main Olympic values and a concept implemented since ancient times (IOC, 2020a; Miller,2004), is a driver of development of new techniques

and training approaches. Stagnation means regression, thus new technologies can play an intriguing role in the progress of athletes. Bailenson (Zorowitz, 2015) uses presence as a key word for their VR Training tool. This presence goes so far, that the user´s brain experience it as a real presence. This is especially important for training sessions. Being as immersed as possible prepares athletes in the best possible way for real time situations. Especially in a situation like nowadays, with lockdown and quarantine being enforced during the covid-19 pandemic, a real environment sensation helps to navigate athletes through the crisis. The halt in the sporting world as a direct impact of the coronavirus led to the use of new technology and ways of working.

The event can foster remote coaching and training, because it offers a real chance of digitalization especially by dealing with the restrictions of the current time (McCaskill, 2020). This renewal pushes sportswomen and sportsmen to their limits. A huge advantage to reach excellence and develop, true to the Olympic motto citius, altius, forties – faster, higher, stronger (IOC 2020a). Even though competitions are back on track, there is still a lot of uncertainty in the society. VR as a tool can help to reduce the uncertainty by offering the opportunity to train from everywhere. Back to 2015 when STriVR was implemented coaches and officials used it in order to develop new opportunities. The VR experience was, even 6 years ago, immersive at a degree that it was way more than sitting in the facility and watching game tape (game tapes are watched in order to analyze your own game and the game of your opponents. It is widely used in sports, but especially in team sports). Arkansas head coach of the football program describes VR like this:

> "You can sit in a chair and take 20 [repetitions] of practice and walk through plays as if you were on a practice field. It literally changes the dynamic of trying to teach someone on a learning curve in a short amount of time; it allows you to process and learn the game without actually playing." (Zorowitz, 2015).

The mentioned advantage of not being at the field, though learning real time situation, is especially beneficiary in dangerous or expensive areas (Kulpa et al.2015). A controlled environment can be created in which a failure does not come with high costs. Looking at high speed sports like skeleton or skiing which are part of the Winter Games, or biking which is part of the Summer Games, athletes can train without the risk of getting seriously injured. It will not replace on side training, but athletes and coaches can learn and analyze the routes and train

difficult parts of the track in order to reach more awareness. Dangerous and unforeseen things cannot be completely prevented, but the chance of reducing them should be used as often as possible. The tragedy of the Georgian luger Nodar Kumaritashvili, who died at a training run at the Vancouver Olympic Winter Games is still a devastating day in the Olympic history. Speculating if this accident hasn't happened due to VR sessions in advance, would be too much uncertainty, because a racing failure or a difficult track can happen anytime. But the chance of recognizing the difficulty and probable accidents in advance could have helped to solve issues, e.g., by raising the wall at this track point before and not after this accident (Segarra, 2018). Awareness of the ambiguity and sensitivity of this topic is present, but that topic draws attention to the opportunities offered via VR.

The effectiveness of VR training can be fostered through motion capture, a way to implement data of real motion into the virtual environment. Each sport has special requirements, but the control of the VR world helps to take care of it (Qiu, Kai-Hu, Luo, 2013; Kulpa et al.2015). Data analysis is also a huge part of every training. Through VR, a collection of athletes data is done very easily. It offers data from the biochemical, physiological and even psychological site, which can be turned in to graphical analyses within nearly no time lap. With it, a better understanding of every sport can be reached (Qiu et al. 2013). Complex motor tasks can be repeated as often as possible in order to train them adequately (Kulpa et al. 2015). A key attribute in every sport is decision making. In the space of one second, athletes have to decide what to do. According to Kittle et al. (2019) this can be taught through constant training session via VR. Looking at the example of STriVR and its development over time, the author can underscore these findings.

In football, a Quarterback has to learn complex plays, including many variations. Learning them is one thing but implementing them with pressure in order to performance as wanted is another. Decision-making is essential. Making a failure could lead to a long-lasting injury, which should be prevented in the best possible way. VR offers the chance to play those snaps, in a virtual but real-feel environment, without physical contact. Thus, a Quarterback or any other player minimizes the injury potential in training session. Bielema underscores that this tool is valuable at any position. "You can have a guy view the opposing side of the ball, analyzing his footwork and his steps and techniques against an oncoming rush lineman," said Teevens. "Or he can try and anticipate his own read or his own cut. "There is a comfort level acquired, and you understand what's happening next – seeing that a situation is not advantageous and reworking it into an advantageous opportunity." "I put on the goggles and the headpiece, and it was our

video with our players, and I could hear the audio and the plays being called," he said. "When the ball was snapped, I literally moved to catch the ball, and there was only me and a computer in the room. That's the thing that blew me away." (Zierowitz, 2015). By now more than seven NFL teams use VR tech of STriVR to prepare their athletes and analyze data. And the customer base is growing, as the US Ski & Snowboard athletes used VR as a preparation tool for the 2018 Winter Games, due to an on-side preparation being difficult since time restrictions was a huge issue. The result with more than 10 medals overall, validates the training success. VR could not replace real sessions, but it significantly helped in order to get used to the track. According to Troy Taylor, the High Performance director at U.S. Ski & Snowboard "The athletes are using 360 degree video and VR in multiple ways in competition, from inspections of the race course, helping athletes learn the lines they will race through, to helping athletes rehabilitate from injuries." (StriVR, n.d.). These attribute and learning can be applied to the training of officials. Kittel et al. (2019) pinpoint that decision-making is an essential feature in order to deliver a fair judging of sports.

As shown before, VR offers the opportunity to improve decision making. The mentioned benefits have to be taken with caution. Like already mentioned it will not replace a real time situation or prevent real time failure or unforeseen actions. Thus, it is not a tool to get rid of injuries or wrong decisions. Furthermore, as shown in the chapter VR and its requirements it is examined, that VR is still in its development. Technical challenges are not utterly solved, which can hinder the perfect implementation. On top of that, the VR training situation needs to be chosen carefully in order not to train in wrong situations or environments and hinder the decision making (Kulpa et al. 2015). Used in the right way, VR offers an impactful additional tool with the purpose of developing athletes, coaches and official to help them in their pursuit of excellence. Therefore, hypothesis 1 is suggested.

Virtual Stores

Olympic licensing is a more than just a revenue source for the Olympic Movement. Even though selling of the products generate economic benefits at first sight, the IOC contributes to their own goals by selling licensed products (IOC, 2020b).

> The IOC aims "to create a tangible connection to the Olympic Games and Olympism through merchandising programmes that are aligned with the Olympic image and enhance brand value and goodwill. The objective is to strengthen and promote the

> Olympic brand, not only during the Olympic Games, but between Games as well." (IOC, 2020b)

There are three core programmes, The Olympic Heritage Collection, The Olympic Collection and The Olympic Games Programme. This study focuses on The Olympic Games Programme, because its target group are the Olympic fans being present at the Games or media consumer, "looking for a souvenir of their Olympic experience" (IOC, 2020b). Examining the IOC´s objectives of their licensing products and the chosen words, the programmes offer products which are a direct, tangible connection to the OM in order to create an intangible connection to the Games. Values and ideals incorporated in products, to maximize the Olympic brand equity, is a main driver for the IOC but what drives consumer to buy Olympic merchandise? Buying memorabilia from the Olympic Games is essential for many of them (Belardinelli, 2021). According to Apostolopoulou, Papadimitriou & Damtsiou (2010) the memory regarding the Olympic Games is a primary motive for purchasing the products.

The unique Olympic experience of this "once-in-a-lifetime event" should be remembered with something tangible. As the IOC states this experience contains the on-site, as well as the off-site experience (IOC 2020b). As shown in literature the aim of the IOC to extend the customer experience by adding an intangible connection can be reached with licensing products (Apostolopoulou, 2002). In their study Apostolopoulou et al. (2002) were able to show, that the purchase as memorabilia was even more fostered for on-site audience, to take a part of the Games back home.

Another important finding were the excellent perceived quality and unique features of the product, found in the Olympic merchandise. Adapted to the high-quality brand of the Olympic system, these products aim to create high quality at every level. As shown in the chapter Olympic brand, the perceived quality of products is significantly correlated to the brand equity. The quality of the product furthermore influences the equity vice versa (e.g. Aaker 1991). Thus, the IOC uses its worldwide known brand, including its branding elements in the design of the merchandise (Ferrand et al. 2012; Apostolopoulou et al. 2010).

The marketing programme of the IOC is based on an experimental approach (Ferrand et al. 2012). Findings of Apostolopoulou et al. (2010) showed that "Olympic licensed products were also viewed as sources of meaning that appealed to consumers' emotions,". The consumption created meaningful positive feelings towards the unique Olympic experience, and the customers' way of perceiving the attendance of the "once-in-a-lifetime experience".

Furthermore, they found that this feeling triggered “extraordinary emotions” regarding the Games.

Examining these findings, it can be shown, that the IOC is able to create an intangible connection by triggering emotions and promoting their values and ideals. Emotions play an essential role in the action behavior as shown in the chapter about SOR. With the aim to influence a consumer decision, a positive emotional connection must be created, as done by the IOC. The increased desire for customer experience is characterized by the need for emotional experiences. Customers search for additional benefits, that go beyond the actual benefits that come with the experience. In the context of experiential marketing stimuli and according to SOR new unique experiences can be created with VR and with them new positive stimuli can influence consumers decision-making and enhance the perceived (brand) equity (Russel, 2014). Due to Covid-19 foreign visitors are not allowed to attend the Tokyo 2020 Games (IOC, 2020c). Thus, this part of the Olympic experience is not existing in this Summer Games. But it offers the opportunity to concentrate and push the renewal of the off-side experience, which is also a very important, if not the more important part.

Rogge the former IOC president underscored this by stating, "We need spectators at the Games, but the IOC does not insist on 100,000-seat stadiums. The Olympics are primarily put on for television." (Barney, Wenn & Martyn, 2002: 278 in Peña, 2009). VR can be the tool to enhance the experience, for all people not taking part in the host city. With the use of virtual stores an immersive, onsite experience can be created for customers following the Games via television.

According to Wintzen (2019) the higher the immersion in an experience the higher the emotions created. VR is by now the most immersive tool offered at the market. The customer would be part of the unique experience without having to be there. This can also be implemented to the merchandising stores. VR stores are part of V-Commerce a new e-commerce platform, for example used by Alibaba, one of the TOP sponsors of the IOC. The IOC just currently announced, that Alibaba creates the first ever Olympic e-shop (IOC,2021). Combining this e-store solution with the VR solution of Alibaba could be a chance to implement VR stores for the IOC. Another TOP partner of the IOC, Coca-Cola is one of the global companies, which actively pushing VR in their marketing activities, because it has “significant potential to change existing marketing practices and the way people shop” (Lombart, Millan, Normand, Verhulst, Labbé-Pinlon & Moreau, 2020). The authors point out some other significant advantages of VR:

(i) it is closer to the real-world shopping experience, and thus more familiar to the buyer, (ii) it supports buyer's natural shopping actions such as walking, and looking around the store, (iii) it can satisfy emotional needs of buyers, by providing a more immersive, interactive, and visually attractive experience, (iv) it can satisfy social needs of buyers, by allowing them to meet and interact with people (e.g., other buyers or salespeople)

Putting these advantages in the context of VR, the IOC could use this tool for their Shops, in order to sell the licensed products and create tangible, as well as intangible connections to the Olympic Games and Olympism. Another main advantage is the data analysis of customer decision making, which is significantly upgraded through a VR approach (Farah, Ramadan & Harb 2019). The potential of VR stores for the IOC is high and due to their TOP partner, Coca-Cola and Alibaba the access could be easy. Thus, the IOC should use the VR approach to sell their merchandise, in order to reach their main objective, promote Olympism and bring the unique Olympic experience to the widest possible audience (IOC 2020a; IOC 2020b). Regarding the brand equity and the created value, Virtual Stores are mainly influencing customer. Following the SOR theory and the expected decision-making, due to a positively influenced customer experience, the customer lifetime value will be increased and with it the brand equity of the Olympic brand. This could create more interest and attention of potential new or existing sponsors and governments because revenue can be generated e.g., through sales taxes or a new and more loyal audience. This would further enhance the Olympic brand, as shown in the previous chapter.

Gamification with VR in the Olympics

The third area of interest including VR in the Olympics is gamification. Gamification is a relatively new field of research. It is used in several areas, like education, business, science, sport and more. According to Rodrigues, Oliviera & Rodrigues (2019) it consists game characteristics in contexts which are not games related. This "game design is a non-game environment improvement, to promote products or services, through the creation of software applications that are more enjoyable to the users, motivating, captivating and influencing them to use most often the so-called gamified site". Huotari and Hamari (2012) define gamification as "a process of enhancing a service with affordances for gameful experiences to support user's overall value creation".

Sports media coverage, including the Olympic Games media coverage, already uses Gamification in order to improve the readers' (consumer) understanding of particular sports. A common understanding provides a base for an increased interest. This is especially important in the area of the Olympics, because many events taking place in the Games are unknown to the general public (Rojas-Torrjios, 2020). Explanations about rules, facts and past of the events creates a context in which the customer experience is significantly influenced, and athletes earn more credits for their performances. According to Rojas-Torrjios (2020) gamification can be useful due to the combination of "two purposes". Firstly, filling the lack of knowledge with "data about sportspeople participat[ing] in the Olympics", with the goal of storytelling for consumers. This helps in order to activate consumers' affective domain (Wintzen, 2019). This domain moreover is needed to influence the decision-making process, as explained in the SOR-model (Waehlert, 1997). The second is bringing the action to the customer. Inviting them to "take part as if they were Olympians and so to compete against their own sports heroes." (Rojas-Torrjios, 2020). The experience of competing against idols and sport heroes, is a once in a lifetime one, like visiting the Olympic Games.

According to Loureiro, Bilro & Angelino (2020) gamification is supported through several motivational theories. The key findings were, that intrinsic and extrinsic motivation are fostered for the sake of achieving goals. Thus, a growing process is triggered, which releases a kind of addiction to extrinsic motivations. Another part is self-regulation, which is a motivating factor for success (Bandura, 1991 in Loureiro et al. 2020).

The last theory influencing gamification as proposed by the authors is the flow theory by Csikszentmihalyi (1990 in Loureiro et al. 2020). As claimed by this theory, users experience an" optimal psychological state" in challenging environments, influenced by intrinsic motivation as a key determinant, resulting in an immersive experience. Kim, Kim, Kim & Koo (2019) found out that the concept of flow experience is enhancing the perceived quality of consumption in the sport area. Looking at some examples already using gamification in the Olympics it can be seen that VR is missing as a supporting tool. Many Quizzes around the Olympics have been done, which already enhanced the user's involvement and engagement. Traced back to the psychological factors of motivation consumers learn new facts about Olympic sports, without feeling set back in a learning environment (Rojas-Torjios, 2020).

Literature and other sport fields offer examples of gamification with VR as a tool, which are shortly explained in order to transfer this to possible usage opportunities for the IOC. The

National Football League offered an experience, the so called NFL Experience in New York, where consumer were able to jump “into the game for an interactive exploration of football.“ Customer were able to interactively examine facts about the sport, it´s history. On top of that, skills could be tested and were compared to the athletes’ (NFL Communications, 2017). Football is one of the most popular sports in America, and well known, gamification still offered the opportunity to reach consumers’ affective and cognitive domain with the purpose of creating emotion and knowledge. This influences their decision-making. Transferring this to the Olympic movement and its goal “to contribute to building a peaceful and better world by educating youth through sport practiced in accordance with Olympism and its values” (IOC, 2020a), it would be possible to achieve a knowledge transfer regarding Olympism through gamification, as long as the user’s intrinsic motivation is high enough (Loureiro et al. 2020).

Using the experience of the NFL, the IOC could create an Olympic Experience, which is implemented in the hosting city and educates visitor and citizen about Olympism and the Olympic brand. Facing the reality with Covid-19, the IOC should also contemplate the implementation of off-site VR gamification experiences. Even though until now not many households own a VR device, the growth potential and forecasts turn into the right direction (Richter, 2016). These offsite experiences could also enhance the image building of the city. Since the timespan in which the Olympic Games take place is limited, the city has to find a way to maximize the promotion of itself in order to build a long-lasting tourism legacy. A combination of value education and city promotion can easily be implemented with VR gamification. As shown in Drengner, König & Wiebel (2018) the city image can be significantly influenced through the use of a gamification tool. The examined event offered a tool, explaining unknown details of the city, which increased customer knowledge about the area and led to growing tourism.

Another example can be found in Wintzen (2019). Participating users got points for activities they did. At the end a light show based on the collective number of points was shown. The learning effect was underscored with the statement, “your energy can change the world”. This “thrilling experience” was supported through VR. The high immersion of VR offered a real life feeling with a high emotional integration. This as shown in the chapter about VR, leads to a strong loyalty of customer towards the organization or company (ibid). The IOC could use these approaches in order to let the consumer learn about values and actively include this in the gamification process. VR is the next step in storytelling, which is essential in order to create an experience beyond the actual product (Keller, 2003). According to Wintzen (2019) a

combination of immersion, which is best delivered by VR, and gamification leads to a "cognitive immersion". This kind of immersion leads to the learning environment the IOC needs to create to achieve their objectives. The existing approaches offer knowledge and facts about more unknown sports and are promoted by media and news.

The IOC itself is not pushing a gamification approach by now, although huge potential to help fulfilling main objectives of the IOC can be found in the use. Gamification has the potential to contribute to a better understanding of sports and its contributions to a better world (Loureiro et al. 2020). Putting this in the context of the Olympic Games it can further enhance the brand value, by offering a new perspective to customer, creating a new environment of interest for sponsors, supporting the image building of host cities and countries and thus the legacy of the Games and supporting the main goal of the IOC, promoting Olympism through education in a gamified approach. Supporting gamification with VR, leads to a higher flow state than in 2D environments, which increases the positive results of gamification.

Media and VR in the Olympics

The last described area in this thesis, regarding the implementation of VR as a tool, is media. Media and the Olympics have a strong connection since the renewal of the Games. Especially TV broadcasting played a huge role in Olympic history, as well as in present times. Dating back to the beginning in Berlin 1936, the number of broadcasted countries grew during nearly every Olympiad until Sydney reached a global reach for the first time. As important as the global reach is the revenue gained from broadcasting rights. Since the first broadcasting revenue gained from Rome 1960, the amount increased continuously.

Broadcaster (Media) are a main stakeholder of the IOC and they play a key role in promoting Olympic ideals. The importance of this connection is traced back to the IOC's goal "[…] to ensure the fullest coverage by the different media and the widest possible audience in the world for the Olympic Games." (IOC, 2020b; IOC, 2020a). Being one of the biggest events the Olympic Games, millions of people enjoy the Olympic experience using media. A global reach across all continents could be reached thanks to media, offering the IOC the possibility to spread its values to hundreds of millions of homes and offers revenue for broadcaster. During the last decade Television rights and sponsoring made the majority of the IOC´s revenue. The IOC is dependent on Media as much as it is dependent on sponsors (Peña, 2009). This underscores the findings of the Marketing chapter, which showed dependencies and value co-creation within the Olympic system.

In addition to media broadcasting and other traditional media, new media plays an important role. According to Peña (2011) new media are all communication platforms "based on the Internet protocol". It is device independent, hence smartphones, PC´s , Smart TV´s and VR can be used in order to experience new media. New media "fundamentally" changed the perception of brands, products and partners (Batra & Keller 2016). Customers are not forced to watch their content live in front of a TV. Recorded and played on- demand or a specifically chosen live event, instead of the offered TV content, change customer experience profoundly. For instance, if there are two Olympic events at the same time, the customer can choose what to watch and is not forced to watch the offered TV event, which is normally the more popular one. In addition to that the social nature of new media builds an interactive base, which is distinguished by new communication systems. Customers share opinions, information, ideas and experiences easily. Furthermore, information can be searched easily and adds another level to customers' experience, as well as communication. Every user is potentially influencing many other users. Thus, companies or brands can reach a broader audience faster and deeper, due to the importance of recommendations of friends (Peña, 2011).

"When users get involved through social media, every user becomes an advocate for the Olympic Family and someone who spreads certain values and ideals to other members of his or her social network." In order to reach the need of new media the Olympic movement has to leave "valuable items of content open", and on the same time taking care of their relationship with their broadcaster, another main stakeholder (ibid). Trade-offs are unavoidable and it´s the IOCs' task to balance different needs. A combination of traditional media and new media can help to achieve the IOC´s objectives.

Telepresence

VR as a tool can help to positively enhance media experiences. Therefore, the concept of telepresence must be examined. According to Steuer (1992) it is defined as the extent to which a user experiences an environment created by a medium. One key attribute to enhance the feeling is immersion. The higher this immersive experience, the more emotion are included (Wintzen, 2019). And as shown in the subchapter about customer satisfaction, emotions play an essential role in consumers' decision-making processes. The rendering of sensory information towards the user enhances the level of telepresence. There is no better tool at the market, to reproduce senses, as it is possible via VR. Through a creation of emotional connections, consumers' experience will include "a sensorial richer world". But there are still missing senses, like taste and smell, which should be included as soon as the technology is

developed into this direction (Park, Im & Kim, 2018). This inclusion would further enhance the experience, but visual and auditory inputs, two of the five senses, make a combined 91 percent of the human perception (Chrisoph, 2019; Waehlert, 1997). Hence, the focus on the inclusion of other senses can be done at later stages, to further enhance the customer experience. The vividness of VR is providing real life experiences, which is followed by a high level of telepresence. As shown by Park,Im & Kim (2018) literature proved a correlation between emotions and telepresence. Feeling a high level of telepresence creates positive emotions. These positive emotions furthermore enhance customer satisfaction and experience. Thence, telepresence can be critical variable of VR experience, because users' senses are essential for the success of the mediated experienced environment.

Concept of flow experience

Telepresence is influencing users' flow experience. According to Kim et al. (2019) the concept of flow experience predicts and enhances the quality of sport media experiences. Csikszentmihalyi (1975 in Chen, Huang & Chou, 2010) defines the flow state as a "holistic sensation that people feel when they act with total involvement". It is a "mental state" containing total immersion in an environment or task. Just examining this definition and putting it in the context of VR, it seems obvious that VR can help to reach the flow. Another key determinant of the flow state in sport media, is the user´s personal skill and motivation. The more understanding, and knowledge the user has in the mediated sporting environment, the better is his flow experience. As stated by Kim et al. (2018) the skill must be over a certain skill level to reach an appropriate flow state. This means, a higher involvement and understanding of sports helps to enter the flow state. The authors determined that "sport involvement positively influences the flow state" and that the mediated environment is positively influenced by sport involvement. Two other key findings were made. Firstly, VR as a mediated environment enhances the experience of less sport involved customer. Hence, even though their flow state will not be as high as from involved users, their experience can still be enhanced through VR. Secondly, VR can influence both involved and less involved, by offering different information. Noninvolved customer experience can be increased by non-sport information e.g., information about the host city or culture. Involved customer experience can be expanded by sport related information. VR offers the possibility to individually determine the kind of information you want to receive and integrate it in the environment. Since Olympic sports are not always the best-known sports, the IOC could combine the gamification benefits, examined in this thesis,

with media experiences, to reach the highest possible potential. Under consideration of these findings, hypothesis 3 is suggested.

Inclusion of VR in Olympic media

As worked out in the chapter of VR, the created immersion, the feeling of diving into the new world, is unique. This immersive experience is changing the decision-making processes, by altering perception and behavior (Wintzen, 2019). This has direct implication for media experiences. As Boyd & Koles (2019) pointed out, digitalization is a key in order to keep up your relevance as a brand. This in combination with new media and its fast pace and new communication and experience style, can be a real possibility to add value to Olympic marketing. As shown before, social networks can enhance brands equity, which leads to more value inside of the stakeholders' network. Thus, VR should be included in order to create new emotional experiences and strong pictures towards the Olympic brand. Even though the Olympic brand is one of the strongest worldwide (Seguin et al. 2008), stagnation is regression. VR, with all its potential can soon become ubiquitous and adapting it as early as possible can push the Olympic brand even more. The inclusion should be made with a holistic concept, including advertisement, new media, and traditional media (see also figure 9). The examined concepts of flow experience and telepresence can be approached at all levels.

Evoke the aims of Olympic marketing and its stakeholder and value-co creation concept, VR can help to bring an even more realistic Olympic experience to many people all over the world. Reaching the maximum possible audience is one of the main goals. Thus, a combination of broadcasting and social networking will help a lot. According to Wintzen (2019) VR has the possibility to open new markets, since it offers storytelling at a new level, which is needed in the current community. Customer, especially millennials, often define themselves through "shared experiences via social media". These shared experiences broaden the global reach dramatically. Every single user can influence his social community, making exponential growth numbers possible. Media and VR can be used in order to promote Olympic ideals and bring the athletes to their fans. Despite the used channels, Olympic marketing could develop trailer and highlights of the Olympic events and surroundings, transferring the uniqueness (Seguin et al. 2018) to the directly addressed customer base and beyond. According to Billings (2018) Olympic media developed remarkably over the last decades. VR is the next step which offers the opportunity to costumers "to be teleported to a new country and to witness people from nations and cultures across the world bonded over a common Olympic dream".

Due to its opportunities in the field of media, VR is an emerging trend in major sport industries like the NBA and the Olympics (Kim et al., 2019). At the 2018 PyeongChang Games some events were watchable in VR, but the reviews were not the best (Kshetri & Rojas-Torres, 2018). VR as a tech was not delivering the high standard at event broadcasting the Olympics delivered in other areas. But the reviews about the VR opening ceremony were more than satisfying. With a developed technology and the right approaches by the IOC, this positive experience can be transported to the events and an overall experience.

This better enhanced experience can influence the value for stakeholder. Broadcaster as one of the main stakeholders, could profit from this tool. They can generate more revenue by selling VR advertisement possibilities, as well as events. Even though commercialization in connection with the Olympic Movement is criticized, it helped to bring the IOC through crises and helps to promote their fundamental principles and values (Pena, 2009; Real, 1996). Thus, the positive aspects overweigh, the rightly emerging criticism. The NFL and its product American football are a good example how to combine commercialization and the love of the sport. The values brought to the people through sport are supported by their marketing and revenue generating programmes (Real, 1996). The IOC cannot copy this approach, but it could take hints in order to implement some of the structures, without losing the pure sport. Another revenue generating source for broadcaster and partner of the IOC is advertisement. The IOC controls this section quite strictly (IOC 2020b), but for their main partner and stakeholder it offers value. The inclusion of VR in marketing campaigns brings huge benefits regarding to Hackl and Wolfe (2017). According to the authors VR enhances the average dwell time of customers from 2.5 seconds (traditional campaigns) to 75 seconds. And 71 percent of the interviewed would buy products more often if offered in VR. These can be huge contributions to the value of IOC´s partners. Not only, that the decision-making of customers is positively influenced due to VR, the firms, respective the IOC, have way more time to tell their story. This storytelling directly influences the affective domain and enhances customer satisfaction (Wintzen, 2019).

Another point not to be underestimated, is the currently ongoing pandemic. Even though the first attempts of live audiences in sport events start again, Covid-19 changed the way we think. Digitalization started to get normal in our everyday lives and the matter of course of moving freely and deciding where to go, is now more than ever seen as a privilege. This opens the eyes and offers possibilities VR can use in order to replicate live event feelings. Following the literature, hypotheses 4 to 5c are suggested.

As noted, in the subchapter about issues of VR, it needs to be further developed, by addressing these issues. Alcaniz et al. (2019) worked out Cybersickness and technical issues as main problems of VR. On top of that, knowledge about VR has to be gained in order to prepare a holistic VR (media) concept. Media, especially broadcaster, bring the Olympic experience to billions of homes. Enhancing customers immersion with the purpose of providing a more realistic, emotional, and intense experience, could benefit the Olympic brand and all its stakeholder (Ferrand et al. 2012).

Methodology

The aim of this study is to investigate how the Virtual Reality as a tool can positively influence the Olympic movement. This chapter will explain in detail how this was conducted. First the choice of research methodology will be discussed. Subsequently, it will be explained how the data was gathered and lastly how it was analyzed.

There is an ongoing discussion in science, whether qualitative or quantitative methods are more valid. Thus, characteristics of both methods will be mentioned briefly.

Characteristics of qualitative and quantitative studies

Quantitative methods are mostly standardized methods, with the aim of measuring and testing scientific hypotheses by using statistics. According to Silverman (2006) standardized measures of these methods are applicable for rather large samples. The findings can be generalized (Patton 2002). However, quantitative methods have weaknesses. The randomization of defined variables, as well as the missing or less decreased contact to people can lead to wrong implications. Furthermore, some phenomena cannot be measured easily, thus numbers and statistics can be a wrong approach to get the findings you want to get (Silverman 2006)

Qualitative research can be defined as “any kind of research that produces findings not arrived by means of statistical procedures or other means of quantification” (Strauss and Corbin 1998). With qualitative studies, the focus shifts to an individual level, including opinions and experiences (Silverman, 2006). Important findings can be made on this level, which cannot be shown with numbers. But due to the high involvement and interaction, it can be very subjective and error dependent. A less trained researcher can struggle to ask the right question and make the right interpretations. Generalization, like done with quantitative studies, are rather tough to make because of the small sample seizes and individual levels. However, generalizing to a population is not the main goal of qualitative research; rather it aims at understanding and exploring a certain case and context. (Patton, 2002)

Both methods have advantages, as well as disadvantages and authors need to find the suiting method for their research question and objectives.

Chosen method

Examining the mentioned advantages of qualitative and quantitative data, none of the above explained methods fits the best regarding the research question. Therefore, a mixed method, a combination of both approaches was chosen. Since virtual reality is still an emerging tool some

generalized answers about the status quo were needed, as well as an individual view on aspects which cannot be measured and examined via statistics or numbers. Accordingly, an online survey and one expert interview were used.

Method Survey – Sample and characteristics

A simple random sampling was chosen for the online survey with the purpose of not biasing the choice of participants. Since the statistic population of this research could include all people with access to internet and/or social media, this survey was provided online, via social media channels with the remark of the possibility of sharing. Thus, the response rate cannot be defined properly. The only sharable numbers are the views on LinkedIn. 252 possible participants saw this article and 58 participated. Since the survey was also shared on other channels and participants had the chance to share it, it can be said that a maximum of 23 % responded. Realistically the response rate was way under 20 %. The survey consisted of 25 questions and 3 demographic informations. From which 15 were Multiple-Choice questions, 1 ranking question and 9 open answer question. Some Multiple-choice questions contained a simple choice between two options up to 5 answers, one contained a multi choice possibility and the rest used a five-point scale. This was used to see whether, and how strongly, the participants agree or disagree, using one of a number of positions on a five-point scale (Strauss & Corbin, 1998). Thematically the questions can be divided into some main topics. Namely VR experience and expectations (7); sport interest and involvement (6); Olympic Movement (2); Event behavior (6); Media use (4). The questionnaire can be found in the Appendix for further details.

Method Interview Sample and characteristics

Before conducting the interview, existing literature was studied intensively. The gained insights were used in order to understand the concept of VR and the Olympic Movement. With these insights questions were created. Based on these questions, an interview guide was developed. However, due to the development of the interview and the semi-structured character, the guide was not strictly followed. Regarding the interviewed expert it made more sense, to let his answer develop the structure of the interview. The interview guide was, used as a tool to provide orientation during the interview and to make sure that all needed areas were covered (Patton 2002).

For the purpose of this research one expert was interviewed. He was directly approached over

the channels of the IOC. The IOC furthermore suggested the interviewee, Mr. Matt Millington, as the fitting person for this interview. Mr. Millington is the Head of Digital at the Olympic Broadcasting Services and New Media Manager at the OBS Madrid- Olympic Host Broadcaster. The decision to directly contact the IOC was based on the purposive sampling, in which researcher try to find cases which deliver rich information (Patton, 2002). Thus, the expert needed to fulfill some characteristics, such as insights to the IOC plans and ways of working. In addition to that, the expert needed to know VR as a tool. The interview was conducted in English and was recorded. The permission to record, was asked in advance and permitted. The interview took about 30 minutes.

Statistical Methods

For data analysis, several techniques have been used. For the quantitative data analysis, descriptive statistics, like median and standard derivation were used. Thus, the survey data has been cleaned up in order to properly use it. Furthermore, correlations were used in order to describe variables. Excel was the chosen tool, to support the analysis.

Qualitative Data gained through the interview and survey was analysed with the content analysis by Mayring (2007). This approach is building on the strengths of the quantitative analysis such as its guidance by rules and following of the concepts of verification reliability and validity and putting the data into a context. For the purpose of analyzing qualitative data, the research question of this study as well as the theoretical background build the base of understanding. (Mayring 2007). According to Mayring there are three ways of interpretation of qualitative content, namely “summary”, which is a reduction of the data. “Explication”, finding further material and “structuring”, filtering important aspects from the data. For this thesis “structuring” was chosen in order to filter relevant content and analyze it.

This data was coded into categories. Silverman (2006) describes that when coding data, one has to be aware of the risk to miss out data that does not fit into the categories. Thus, it is essential to have in mind the categories and watch for important data left out.

Results

This chapter will present the main data collected from the mixed method approached used in the thesis. Since the research is divided in several topics, the presented results will be divided in these topics, too. There it will be separated between descriptive, inferential and coded data.

Statistics demographic

Table 1. Age of Participants

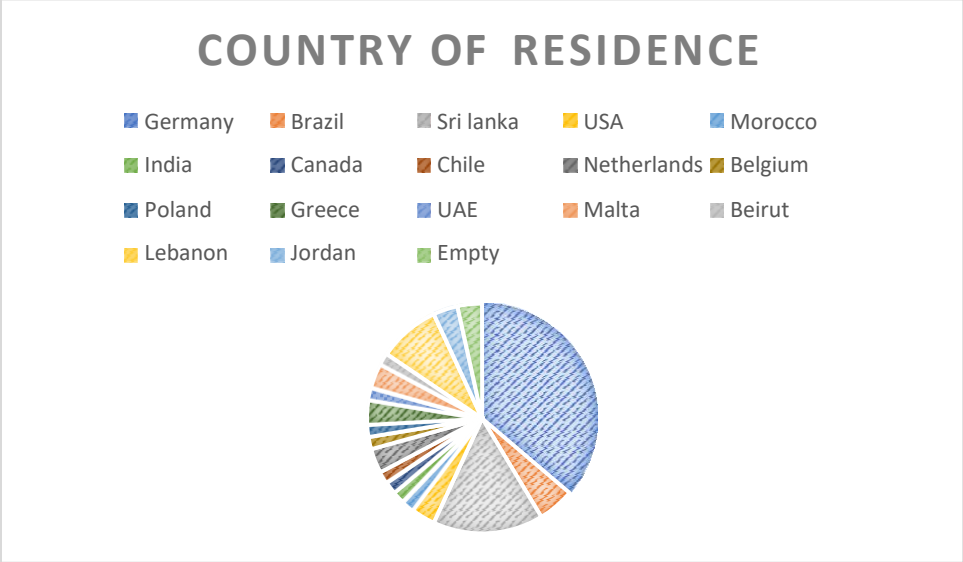
Age	Participants
16	1
17	1
18	3
19	2
20	2
21	2
22	5
23	1
24	2
26	10
27	6
28	2
29	3
30	3
32	6
33	3
34	1
35	1
37	1
45	1
55	1
56	1

(Source: Own data)

Table 1 shows the ages of the respondents of the survey. Grouping these ages in categories, sociology approach of generations is helpful. According to Kuhlmann-Rhinow (2019) there are Generation X (1966-1980), Generation Y (1981- 1995) and Generation Z (after 1995). These generations differ especially in their view to values and their access and knowledge of digital content, which makes this categorization fitting for the topic of VR. Generation X did not grow up with digital content and get to know it at an older age, thus it is not intuitive to them. Generation Y, the "millennials" grew up during the rise of digital content and media, but there was still not a matter of course. Generation Z, the "digital natives" are growing up in our digital world. They get to know if from their first day. This does not directly impact this thesis but is important for further steps.

Generation X: 3 (5%) ; Generation Y: 26 (44%); Generation Z: 27 (46%)

Especially the generations with “more” digital skills participated in this survey. The main reason is the spread of this survey via social media channels.



Graph 1. Country of residence participants

(Source: Own data)

Table 2. Countries of residence of participants

Germany	21	36%
Brazil	3	5%
Sri lanka	9	16%
USA	2	3%
Morocco	1	2%
India	1	2%
Canada	1	2%
Chile	1	2%
Netherlands	2	3%
Belgium	1	2%
Poland	1	2%
Greece	2	3%
UAE	1	2%
Malta	2	3%
Beirut	1	2%
Lebanon	5	9%
Jordan	2	3%
Empty	2	3%

(Source: Own data)

Chart 1 and table 2 present the countries of residence of the respondents.

Statistics VR training

This subchapter presents statistics based on the topic VR training.

From all 58 participant 42 participate in sports. 30 of this at an amateur level and 12 at a professional level. In order to receive this information, the open field question was coded, following the coding agenda and rules (see Appendix).

All respondents participating in sports, where asked to give their opinion towards VR as a tool for sports training ("If you answered yes, do you think that training sessions with Virtual Reality could help you to improve your skills? (Please briefly explain why, why not?"). These open field answers where then coded into the categories following the coding Agenda: undecided, not useful and useful.

Table 3 Results use of VR Training

Category	N
undecided	4
not useful	10
useful	22

(Source: Own data)

The Pearson correlation was applied in order to examine a relation between the level of sport participation and the expectations or experiences with VR training. The result r (42)= 0,59, p = 0,000000067 shows a significant, positive correlation between the variables.

Table 4. Correlation between level of sport participation and the opinion towards VR training

Correlation	
	Experience / Expectations VR as a training tool
Level of sport participation	0,58768398
t	5,6778
p	6,7034E-07
N	42

(Source: Own data)

Statistics VR gamification and Olympics

This subchapter deals with VR as a tool for Gamification and the Olympic Movement itself. Thus, some survey questions, were descriptively analyzed and the expert interview was coded.

The participants were asked to rank some major sport events in order from least likely to watch (1), to most likely (7). The results show that the Olympic Games rank first and third in the interest of the respondents. See Table 5 for the detail of the ranking.

Table 5. Ranking of major sport events in the order of likelihood to watch it

Event	Soccer World Cup	OG Summer	Super Bowl	Wimbledon	NBA Finals	OG Winter	Other
Overall Score	298	302	204	189	200	245	202
AVG Score	5,14	5,21	3,52	3,26	3,45	4,22	3,48
Ranking	**2**	**1**	**4**	**7**	**6**	**3**	**5**

(Source: Own data)

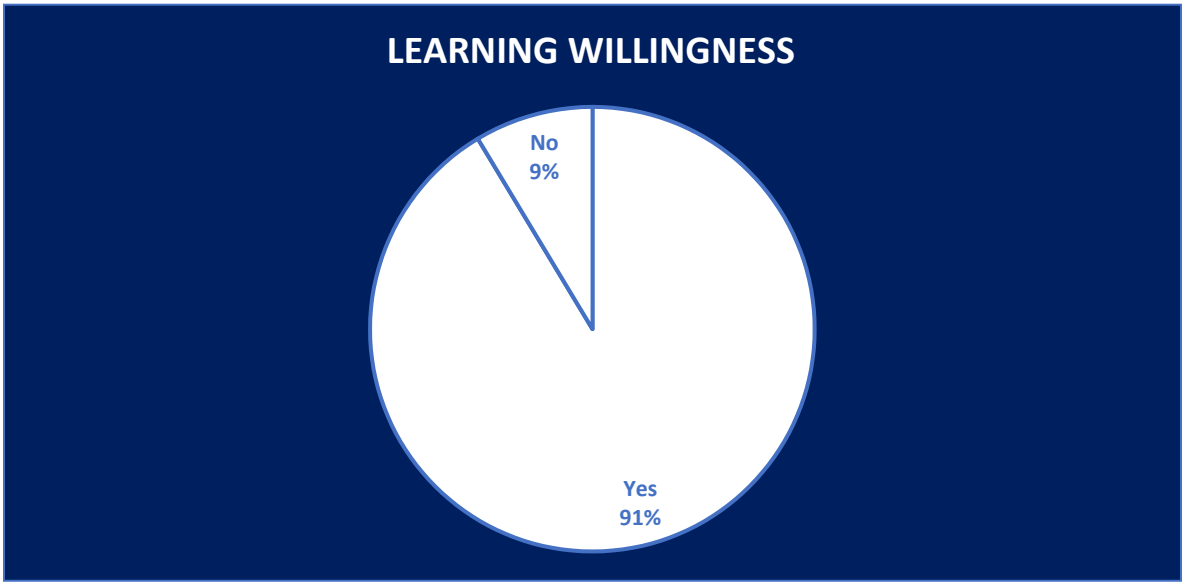
Next participants were asked about what comes in their mind first, thinking about the Olympic movement. They were given choices between elite sports, old fashioned, life principles and values, money and spectacle. These attributions were chosen after an extensive literature research and contain positive connection, as well as criticized attributes connected to the Olympic system. Aim of this question was to see if one of the aims of the IOC, promoting Olympism, is directly connected at first sights. 10% of the respondents connected the Olympic Movement with life principles and values, which is the attribute directly transferred from Olympism and its goals. 38% connect elite sports with the Olympic system and 28 % see spectacle thinking about the Olympic Movement. A combined 24 % connect negative attributes money and being old fashioned with it (each 12%).

Table 6. Connections made with the Olympic movement

Connection Olympics	Elite Sports	Old fashioned	Life Principles and values	Money	Spectacle
absolut	22	7	6	7	16
relative	38%	12%	10%	12%	28%

(Source: Own data)

Lastly the survey asked about the participants willingness to learn more about the Olympic values and the ideas behind Olympism. A significant number of 53 out of 58 answers, stated their will to learn more.



Graph 2. Pie Chart – Participant's willingness to learn about the Olympic Movement (relative)

(Source: Own data)

Coding the expert interview, some points regarding gamification and the promotion of Olympic values could be found. As already stated in the subchapter of VR and gamification:

> *VR is the next step in storytelling, which is essential in order to create an experience beyond the actual product (Keller, 2003). According to Wintzen (2019) a combination of immersion, which is best delivered by VR, and gamification leads to a "cognitive immersion". This kind of immersion leads to the learning environment the IOC needs to create.*

According to Millington, VR offers a point of view change, which can show people new knowledge. "And I remember one guy just flipping lap counting things and these things you don't see on television. Sometimes it's not about the actual live [broadcasting] itself. It's about

the content that surrounds a live sport. And that's what often people enjoy most about it." He spoke about “pictures and highlights” away from sports, like seeing the people behind the Games working. “Offshoot benefit[s]”, which can be created via VR and also add another level besides sport, are shots of the hosting city, or parts of it, showing sample sizes of culture and life.

Another main finding came as an answer to the question if VR can explain the Olympic ideals and teach the Olympic ideals in a better way so to fulfill the Olympic principles. “I think it does. […] this really does offer insight into the athletes themselves in a way that you can't otherwise experience. And certainly, you get to experience the Olympics from the athletes’ point of view in a way that you cannot do in traditional broadcasting.”

Statistics sport involvement and VR

This subchapter deals with statistics regarding the respondents’ involvement in sports, as well as their experience in the use of VR.

In order to create a number for sport involvement, a mean was defined, including all questions regarding the involvement in sports. Namely, interest in sports, sports live watching, sport highlight watching and sport participation (see also Questionnaire in the Appendix). Table 6 presents the descriptive statistic over all participants.

Table 7. Sport Involvement of all respondents

Sport Involvement	
Mean	3,1336
Median	3,2500
Maximum	4,5000
Minimum	1,7500
Standard derivation	0,6974

(Source: Own data)

The 34 participants who already used VR, should rate their positive experience, based on a 5 point likert scale, from strongly disagree (1) to strongly agree (5). In table 7, the results are shown.

Table 8. "Positive" VR experience

positive VR experience	absolut	relative
Strongly disagree	1	3%
Disagree	1	3%
Neither Nor	3	9%
Agree	14	41%
Strongly agree	15	44%
N	34	

(Source: Own data)

Over this results, descriptive statistics were built and presented in table 8.

Table 9. VR experience

VR Experience	
Mean	4,2059
Median	4,0000
Maximum	5,0000
Minimum	1,0000
Standard derivation	0,7007

(Source: Own data)

The Pearson correlation was applied in order to examine a relation between the level of sport involvement and the experiences with VR. The result r (34) = 0,17, p = 0,16 shows a not significant, positive correlation between the variables.

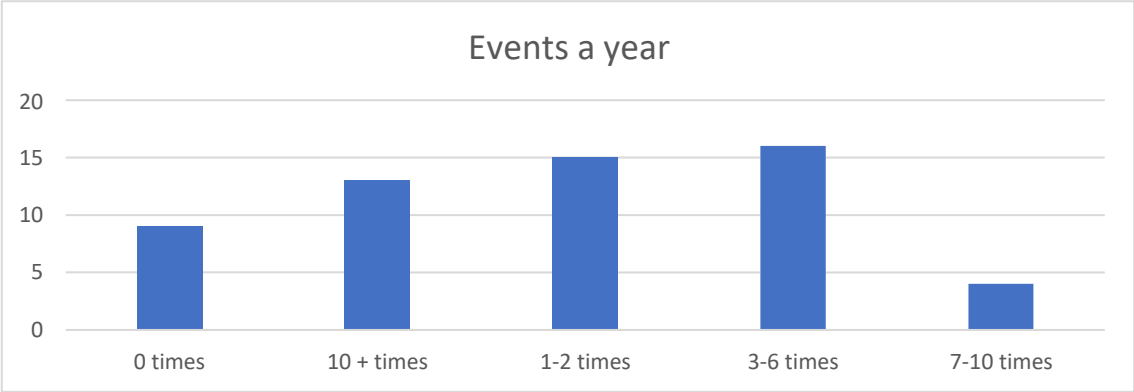
Table 10. Correlation between level of sport involvement and the experience with VR

Correlation	
	VR Experience
Sport Involvment	0,1701
T	0,9907
P	0,164636523
N	34

(Source: Own data)

Statistics VR and media

The following subchapter presents statistics regarding VR and media.

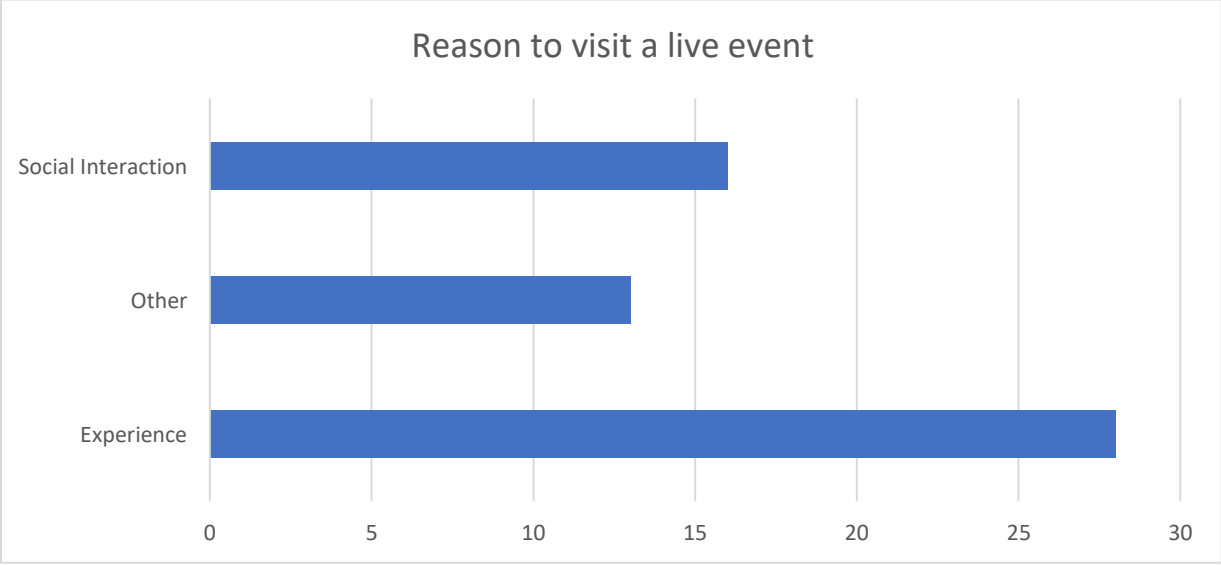


Graph 3. Yearly visited events

(Source: Own data)

As presented in chart 3 16% of the participants never visit live events. 26 % visit 1-2 events a year, 28% which is the majority, visit 3-6 times, 7% 7-10 times and 22% more than 10 times.

The participants were also asked to choose a reason for visiting events. They were given the possibility to choose between social interaction, experience and other. Experience with 48% was the main reason, followed by social interaction 28% and other 22%.



Graph 4. Reasons of visiting live events

(Source: Own data)

Since Covid-19 heavily influenced our society, a question regarding event cancellation and Covid-19 had been asked. *Have you planned to visit a live event this year, which was cancelled due to Covid-19?* 40 times the answer was yes.

Being asked if they would pay rather 400$ to watch an event live or 20$ to watch it via VR, 53% prefer the live events (31) and 47% prefer the VR events (27).

The participating people were also asked how much they would be willing to pay to attend their favorite event of the year live or via VR. The following tables will present the results.

Table 11. Money willing to pay for favorite event (live)

Money Event	
Mean	171,99 €
Median	100,00 €
Maximum	3.000,00 €
Minimum	- €
Standard derivation	169,25 €

(Source: Own data)

Table 12. Money willing to pay for favorite event (VR)

Money VR	
Mean	26,82 €
Median	20,00 €
Maximum	100,00 €
Minimum	- €
Standard derivation	22,51 €

(Source: Own data)

Afterwards, the Pearson correlation was applied in order to examine relations between several variables shown in the following tables.

Table 13. Correlation between yearly visits of live events and money willing to be paid for VR

Correlation	
	Money VR
Visit Live Events	0,0842
t	0,6350
p	0,26401828
N	58

(Source: Own data)

The result r (58) = 0,084, p = 0,26 shows neither a significance, nor a correlation between the variables.

Table 14. Correlation between cancelled events due to Covid-19 and money willing to be paid for VR

Correlation	
	Money VR
Cancelled Event (Covid)	0,1775
t	1,3717
p	0,08781068
N	58

(Source: Own data)

The result r (58) = 0,177, p = 0,08 shows no significance, but a slightly positive correlation between the variables.

Table 15. Correlation between money willing to pay for live events and money willing to be paid for VR

Correlation	
	Money VR
Money Event	0,3826
t	3,3535
p	0,00071811
N	58

(Source: Own data)

The result r (58)= 0,3826, p = 0,0000718 shows a significant, positive correlation between the variables.

Furthermore, the expert was asked if the IOC can enhance their revenue by selling VR events (tickets). “The IOC sells the rights to individual rightsholders, normally broadcasters within a different country, or sometimes broadcast itself to multiple countries. And then it's up to that rightsholder to decide how they distribute content so they can charge for it or they can offer it free”. He also mentioned that it could potentially generate revenue, if digital content were sold separately, but has highlighted that this is not his field of expertise.

Statistics VR customer experience

Lastly, statistics regarding VR customer experience are presented. In order to gain data, qualitative questions and the interview were used. Under regard of the coding agenda (see Appendix) and the existing literature five topics could be worked out.

The customer experience with VR was seen as positive (25), as diverse in terms of fields and use (11), as negative (2), as not accessible (5) or there was no certainty about it (17).

Mr. Millington underscored some of these points with his statements. He mentioned the positive customer experience several times. He called the first time using it “quite amazing” and a “Wow factor”. According to the expert, there is a lot of potential regarding highlights and features. And the IOC “plans to use it even more in future”. On top of that OBS changed the term VR into immersive media, in order to be able to use the full bandwidth of immersive potential.

Regarding the diversity Mr. Millington mentioned virtual studios, transporting the broadcaster into the fields of action within seconds and then switch back again. On top of that, VR allows to create virtual stadia, which then are used to plan and train operations without traveling to the venues.

Accessibility though is a problem, since the cheap VR version using a smartphone, is not offering the experience needed, in order to enhance it towards traditional media. “I would say that VR coverage is not a great experience on mobile. It works very well on a headset”.

It was also said that VR coverage need a greater amount of cameras, which cannot always be guaranteed and that it is very cost intensive. A further negative point is the uncomfortable feeling, potentially triggered by long VR sessions, “people wearing a headset for a long time it can be uncomfortable, certainly at the moment”. It was also indicated that not every sport, for now, is fitting for VR coverage. Ski Alpin for hence, is not a good sport since the cameras would be too close to the athletes, enhancing dangerous situations.

"It hasn't risen as fast as people had predicted and it's been a bit slower than many people had hoped. But it's still rising. There is still interest in it and it's not a product that's gone away, like 3-D viewing, etc. There's still demand for it. We're always interested in bringing new audiences to the Olympic games, especially".

The presented results will be discussed and analyzed in the last chapter of this thesis.

Discussion, Conclusion & Recommendations

Summary of Research

The purpose of this research has been to examine and describe a way to implement Virtual reality as a tool in the Olympic movement, in order to generate value for the movement.

In the first chapter, introduction, the research problem and significance of the study were explained. The second chapter has discussed the Olympic System, the Olympic brand, Olympic marketing, Criticism towards the Olympic Movement, Virtual Reality and the implementation of VR in the Olympic Movement. The third chapter presented the research methodology, the fourth chapter provided the results.

The results confirmed the findings developed through the literature review. VR as a tool has advantages, as well as disadvantages. Advantages can be seen in several fields of use. Using it in data analysis and training situation, VR enhances the output and effectiveness of sessions. Used as a marketing tool, with the purpose of enhancing brand equity and offering a better consumer experience, it is a perfectly fitting tool. The immersion created, leads to a real world feeling, transferring "real-world" behavior into the virtual world. Consumers are more seeking for experiences beyond a simple event visit or product purchase. VR is able to create it and satisfy consumers needs. Disadvantages are accessibility and technical barriers, as well as motion sickness and bandwidth. VR if not perceived with a high quality, for instance because of the use of Smartphone VR devices, will not create an environment as immersive as needed. Due to that, benefits of VR can be nullified. Furthermore, VR deals with issues regarding accessibility. At the moment, costs for VR devices are relatively high, which leads to the fact that it is not a mass media device. Hence the goal of the IOC's media policy, bringing the unique Olympic experience to the widest possible audience, can not be done exclusively with VR. Therefore, VR can just be seen as an additional tool. Regarding a comfortable experience, the issues of motion sickness and bandwidth must be tackled.

Weighing up advantages and disadvantages, benefits occurring using VR justifying further steps in order to generally implement it in the Olympic Movement and other sport areas. By doing so examined disadvantages have to be taken in account and in a best-case scenario solved over time. VR by itself offers a modern tool, still dependent on further developments like bandwidth offered from a country or city. In combination with current tools and media, and with more knowledge and a useful concept, its full potential can be retrieved.

Research hypothesis

This subchapter presents and approves or disapproves the hypotheses made.

H1: The use of Virtual Reality helps to develop athletes (coaches, officials) abilities.

According to Zorowitz (2015) VR as a training tool leads to a dynamic change in the learning curve, due to the immersion and precise creation of a learning environment. It allows to process without having participated in person at all. On top of that the research showed a significant correlation between the level of sport participation and the effect of VR training. The higher the level of sport participation, the higher the effects. Since Olympic athletes are participating at the highest level, the effect of VR training will be positive. This H1 can be approved.

H2: Gamification with VR significantly influence the understanding of Olympism.

"Cognitive immersion" is an ideal learning environment created through the combination of VR and gamification (Wintzen, 2019). To understand Olympism, including its principles and value, cognitive skills are needed. These can be trained or triggered through "cognitive immersion" (ibid). The OBS already uses VR to show Offshot benefits, for instance Tokios famous places or athletes preparing for an event, and "this really does offer insight into the athletes themselves in a way that you can't otherwise experience. And certainly, you get to experience the Olympics from the athletes' point of view in a way that you cannot do in traditional broadcasting." This new level in presenting the Olympics combined with gamification, can teach, and explain Olympic values. Thus, H2 can be approved.

H2a: The Olympic Movement is directly connected to values embedded in Olympism.

As seen in the chapter about criticism and the survey, the Olympic Movement is not directly connected to the values of Olympism. A broader study will help to examine if these critics and findings can be confirmed, until then H2a is disapproved.

H2b: The motivation of learning about Olympism is high.

The results of the survey showed that over 90 % of the people are willing to learn about Olympism. Thus, H2b is approved.

H3: Sport involvement enhances the Virtual Reality experience.

Literature proved that sport involvement enhances the VR experience, if the involved sport is watched. Hence, a professional handball player watching handball has an improved experience, due to her or his telepresence and with it flow state. Generalizing this, results of this study does

not show a significance towards these variables, even though a small positive correlation could be found. Thus, H3 cannot clearly be answered. There are positive effects, but in order to approve the hypothesis, more research has to be done.

H4: Olympic Virtual Reality events enhance the customer's experience.

Customer experience can be explained with the SOR -Model. VR is the stimulus triggering the organism. According to the results, VR offers a "wow effect" and leads to emotions and positive experiences, due to the immersive environment (Wintzen, 2019). There are some negative points, weakening the effects, but H4 can still be approved.

H5a: Broadcaster can generate more revenue due to offered Virtual Reality events.

This hypothesis can neither be approved, nor disapproved. It could be examined, that there is potential to generate more revenue through VR events, but this has to be further examined.

H5b: Customers are willing to pay more for VR if one of their already paid events was cancelled, due to Covid-19.

Results show a positive correlation between these variables, but a significance could not be examined. Though in order to approve this hypothesis, further research has to be done, but the tendency signs in this direction.

H5c: The more people are willing to pay for live events, the less they pay for VR events.

Results showed a significant, positive correlation between both variables. Which means that people are willing to pay more for live events, pay more for VR events. Thus, this hypothesis can be disapproved.

Discussion & Conclusion

This subchapter discusses the findings of the thesis and answers the research question: Can Virtual Reality as a tool implemented in Olympic marketing, strengthens the Olympic movement?

Virtual Reality as a tool has many benefits, which could also be seen in its current usage increase in several major sport areas (Deveny,2020). Implementing a new tool, a knowledge base must be built for the organization. Just with skills and knowledge, right steps towards an implementation can be done.

Especially the Olympic movement can profit from the benefits of VR. The Olympic movement or system is based on a strong brand. This brand was developed and enhanced by an outstanding

marketing programme (Ferrand et al. 2012; Seguin et al, 2008). This approach concentrates on a stakeholder approach, with a value co-creation concept. As shown in the results and literature review, VR can offer value for many stakeholders. This will offer value for the whole stakeholder network and therefore enhance the brand equity of the Olympic brand. Furthermore, Olympic marketing is experiential. According to Schmitt (1999) experiential marketing relates to emotions and feelings. Without triggering them, there will not be a positive experience. Olympic marketing is triggering these emotions (O´Reilly & Seguin, 2009), but VR as a tool will enhance the emotional state and deeper activate the affective domain of customers (Wintzen, 2019).

Talking about emotions and experiential marketing, customer experience is a main marketing approach. Having a significant commitment to the affective domain of consumers, it is an important driver of the whole customer journey (Jozic & Kuehnl, 2017). Especially the digital growth due to Covid-19, changed how we think about experiences and made it even more digital (Boyd & Koles, 2019; LaBerge et al. 2020). Needs and benefits of good experiences could be shown in the thesis survey, as well as in data collected in other surveys. Nearly 50 % of the participants see experience as the main factor of event attendance. Furthermore, Morgan (2019) showed that, "73% of consumers say a good experience is key in influencing their brand loyalties".This shows the importance from the customer side, the organizations side is shown in Morgan's article. "Companies with a customer experience mindset drive revenue 4-8% higher than the rest of their industries." Leading companies in customer experience outplay there competitors in round about 80% of the time. Just looking at this numbers, which are a small part of an overall picture, the importance of a good customer experience becomes clear. VR is able to enhance this experience, through a good telepresence leading to bilateral advantages.

To implement VR, the IOC can rely on their partners, especially from their TOP-Programme, since they are already involved in creation of virtual environments. Using their help, co-creation value can be applied. The Albibaba group for example, already owns VR stores and implement VR as a tech more and more. The IOC can gain more knowledge about VR and offer a huge customer base for their involved partner. Hackl and Wolfe (2017) showed that VR promotion, significantly enhance the dwell time of customers and increase revenue.

Despite not being able to approve all hypotheses, this research presents a starting point in order to implement VR with a holistic approach. With the purpose of following this approach, the challenges of VR have to be reminded. VR deals with the problem of accessibility, which can

be a deal breaker, if this will not be solved in future. If VR reaches its potential and growths forecasts, this issue will be solved soon (Statista, 2020). If not, VR will not enhance the experience of a widespread audience, therefore not significantly strengthens the Olympic movement. Pointed out in the own survey and in literature, e.g. in McCarthy´s (2019) statistical survey, cost barrier is the biggest problem for accessibility. McCarthy did his survey twice, once in 2017 and in 2018. In both results to expensive costs (55%) were the main barrier of costs, comparing this to the survey of this thesis, 25% of the participants not having used VR, mentioned costs as a main barrier. As long as VR is not used as a mass media tool, the benefits provided reach just a partial part of the society. Therefore, ideas must be found to solve this issue and eliminate costs as a hurdle for the use of VR.

Technical issues leading to motion sickness, or a bad video resolution need to be tackled as well (LaViola, 2000). As stated in the expert interview, as long as motion sickness and bad video resolutions occur, not every event can be broadcasted or highlighted with VR. Thus, not the whole experience can be transported into the virtual environment, probably leading to critical voices.

Nevertheless, VR offers a unique experience, a “wow factor”, fitting perfectly to the most unique sporting event of our times. The unique Olympic experience, being supported through VR, is a huge chance. Integrating VR will help to maintain relevance in a digital world, which is developing faster than ever. Furthermore, it helps to achieve the set objectives and promote Olympism if correctly used.

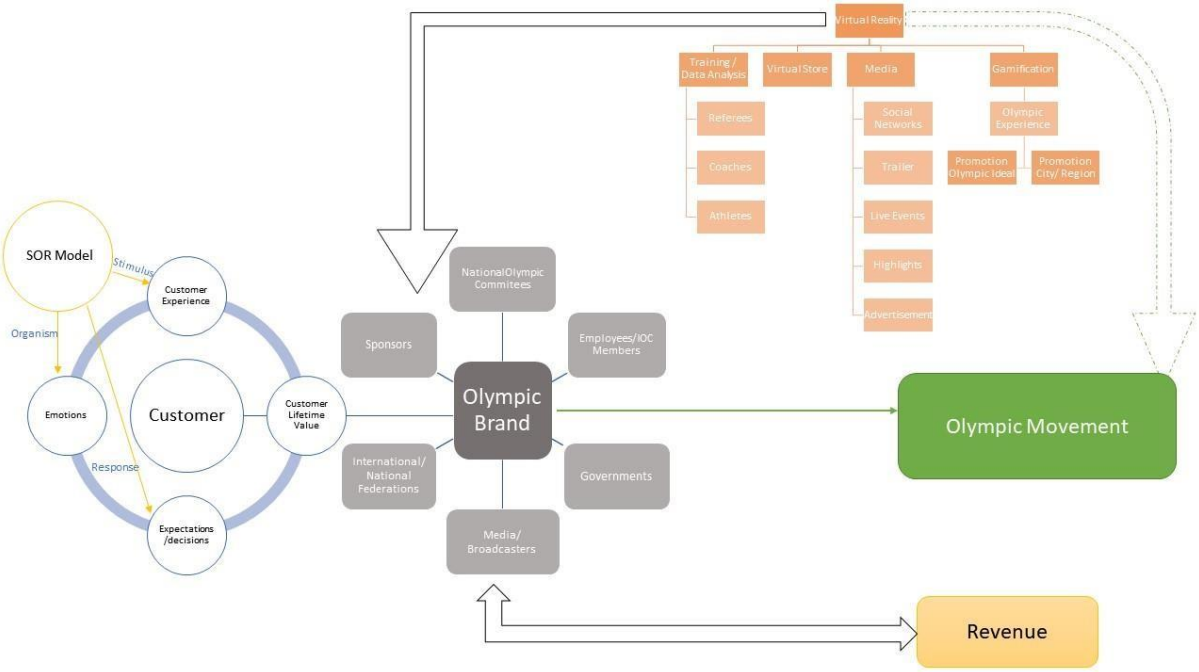
In this thesis several main theories were used in order to develop an answer towards the research question. To understand the Olympic system and brand, the Olympic brand equity model by Ferrand et al. (2012) was used. This model serves as a base for the understanding of the Olympic marketing approaches, containing inter alia the value co-creation concept and stakeholder marketing approach. Furthermore, the SOR model from Woodworth (in Wahlert, 1997) served as the theoretical base towards an approximation of customer decision making and customer experiences. It is an approximation since the human individual can not be fully described in a model. People are not calculatable, but it is a good starting point as an rapprochement to enhance the own customer experience.

The main concepts and theories for understanding VR, were immersion, telepresence and the concept of flow experience. All three describe ways of perceiving a mediated experience and are interconnected. Enhancing each one of them, enhances the whole experience.

This theoretical background, as well as the study results led to a positive answer regarding the research question. VR as a tool, implemented in the Olympic marketing is able to strengthens the Olympic Movement.

Based on this thesis, a starting point for a holistic concept was developed and is presented in figure 10. This figure shows that VR is a supporting tool, not directly influencing the Olympic movement, but indirectly by influencing stakeholder of the system.

Figure 10. Holistic concept Virtual Reality in the Olympic movement



(Source: Own illustration)

Recommendations

Based on this research it is suggested that the holistic concept shown in figure 10 is followed and further developed with the purpose of implementing VR in the Olympic movement. Yet there are some limitations in this study, leading to future research topics. The relatively small sample size of 58 participants should be widened in order to generate a more generalizable result. More experts can be interviewed, with the purpose of minimizing potential problems or difficulties of this concept. In addition to that, a field or laboratory experiment should be created and carried out. These methods will further manifest the findings or bring a new direction into it. An experimental environment and the direct control of the participants will minimize errors regarding the results.

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Appendix

Appendix I - Expert Interview

00:00:00
Interviewer: So thank you again for taking your time. I just take a record in order to use it in my master's thesis. My first question would be, how are you connected to the Olympic movement and to the IOC? What is your exact role in there?

00:00:17
Matt Millington: So my name is Matt Millington. I'm the digital content editor or director of Digital Content. This is my full title for the broadcasting services.

00:00:29
Matt Millington: And as you probably know, broadcasting services are the first broadcast for every Olympic Games and Paralympic Games. Probably look at the broadcast of the IOC.

00:00:45
Matt Millington: We're funded by the IOC where we think of our own independence in wealth, where we were based in Madrid. And the IOC is based in Lausanne. We, the director of the IOC and the points. But we also obviously spent a lot of time with the organizing committees of Olympics and the rightsholders.

00:01:14
Matt Millington: So in my job, I look after all the digital content producer. I joined in 2013 just before Sochi. I was at the BBC for about 20 years and at the time I joined, I didn't really think of additional products.

00:01:37
Matt Millington: It was very much a traditional broadcast company, so that we obviously got up to speak what rightsholders need and want these days, which is digital products.

00:01:51
Matt Millington: So that ranges from streaming video, live video highlights, to white label office. So we have a white label product that encompasses everything that goes on the olympic games for the olympic streams etc..

00:02:09
Matt Millington: This is very important for rightsholders, because during the Olympics we have at its peak for the 45 concurrent livestreams.

00:02:21
Matt Millington: And this is way beyond any other sporting event or any event that broadcast would normally deal with. They may, for instance, stream all the tennis courts from one of the opens, but even that. There is likely to just about maybe touch double figures. But for the majority of rightsholders, they would only have a stream to three events concurrently tables. So to scale up to such an event, Olympics is very expensive for a two to three week period.

00:02:57
Matt Millington: So ability to offer these products for multiple sports is well received in addition to the olympic video player.

00:03:11
Matt Millington: Also work on the virtual reality coverage which is, what I believe, we're here to discuss today.

00:03:18
Interviewer: Thank you very much. So you mentioned the VR services. Actually how was your personal experience with it, before we talk about the IOC experience?

00:03:28
Matt Millington: So what I did, I'll be honest, I didn't have a great deal of experience in VR when I first started.

00:03:38
Matt Millington: But as you can see and probably hear, the majority of people who were engaged in VR are certainly in the past a little bit less.

00:03:48
Matt Millington: So now if you look on the App Store, for instance, the vast majority of content is gaming content.

00:04:00
Matt Millington: However, I do understand that in the last couple of years that has started to change and there are more and more of them offering lifetime experiences, travel experiences. And possibly that the whole covid situation is exacerbated that allows people to get out of the house. And as such, there are more and more offerings.

00:04:24
Matt Millington: The online gaming is still quite small in the VR world, but they're certainly there for many of the major events and a few minor events.

00:04:38
Interviewer: Perfect. Thank you. We talked about the personal experience and you said you haven't had so much before. I think you used it by now because you're promoting it. How did it feel for you? Like, did you really feel immersed or how was the feeling using it the first time?

00:04:56
Matt Millington: I think my experience was similar to many people. There's a real wow factor when you when you try it for the very first time, especially if you're on a really good, video.

00:05:10
Matt Millington: And so the first time that anybody use that is quite amazing. Especially with the point of view experiences. After a while you kind of get more used to it. It seems like a fairly normal thing to be able to do.

00:05:34
Interviewer: Sounds great. So the IOC implemented it the first time 2018 in PyeongChang, if I am right.

00:05:38
Matt Millington: No, the first time we did it was in Lausanne for the Youth Winter Games in early 2016, on a very, very, very small scale.

00:05:53
Matt Millington: And then we, we also did it in Rio, for the 2016 Games.

00:05:59
Interviewer: Okay, then I was wrong with my information. At least in PyeongChang it was a little bit bigger, right? So Intel was involved in a bigger scale, at least from what I can see in the Internet.

00:06:11
Matt Millington: It was similar to what we did in Rio. We have actually, as you may know, OVS is actually quite a small company outside of games time.

00:06:22
Matt Millington: And then we scale up during games time to a huge company with great offices. And we will rely on a lot of suppliers and vendors to supply those products. We've actually changed vendors for various reasons.

00:06:38
Matt Millington: We've been changing our vendor technical supply for the VR several times during that time for those games.

00:06:46
Matt Millington: Which is problematic because you lose the consistency of working with clients. And then you kind of have to start again with people, and explain processes and introduce them to the ways of the Olympics etc. It makes it more difficult. But we had good reasons for needing to change each time. We are trying to be quite different.

00:07:10
Matt Millington: But in terms of scale, it wasn't that different VR. We did a live event every day.

00:07:16
Matt Millington: We did a number of what we call EMG, which means sending out video crews to film content on demand, potential for highlights, features, etc..

00:07:31
Interviewer: The IOC implemented the process with which intention and what is the strategic plan behind it for the future?

00:07:40
Interviewer: I mean, I guess they want to use it even more in future.

00:07:48
Matt Millington: We started in 2016. At that time there were high hopes that VR consumption would rise very, very fast.

00:08:01
Matt Millington: It hasn't risen as fast as people had predicted and it's been a bit slower than many people had hoped. But it's still rising. There is still interest in it and it's not a product that's gone away, like 3-D viewing, etc. There's still demand for it. We're always interested in bringing new audiences to the Olympic games, especially young audiences. And virtual reality was seen as a way of embracing that. Offer different experiences to the traditional broadcaster. So new content that gives people a bit of a Wow factor when they see it.

00:08:42
Interviewer: So we're talking about user experience should be enhanced by using VR. So I guess this is one of the biggest strenghts of VR. Can you name others and possibly opportunities for the future of using virtual reality for the Olympic movement?

00:09:01
Matt Millington: Sorry I missed the first part of your question.

00:09:03
Interviewer: One of the biggest strengths of the virtual reality technology is the user experience. And are there more opportunities for the future, maybe also outside of the broadcasting service, you can imagine.

00:09:19
Matt Millington: If I could just take a step back a bit.

00:09:23
Matt Millington: We often talk about VR since we first started, we've actually changed the way we we kind of tied to this because,

00:09:36
Matt Millington: People will argue about what VR is and what VR isn't. And people have different ideas of what some people would include 360 in that. Other people say it has to be stereoscopic content, etc . And there are arguments about this as a result.

00:09:52
Matt Millington: But we have kind of rebranded it slightly and now call it immersive media. That allows us to encompass all the different forms of VR or immersive content. So we we have stereoscopic 180. We have monoscopic 180. We have panoramic 360. We have a product from Intel called TrueView, which is volumetric content. We kind of now roll into one thing called immersive media.

00:10:27
Matt Millington: If you want to sort of discuss how we may approach that in ways outside of the user experience for the members of public. We've spent quite a bit of time with other partners, like Olympic committees, working on virtual stadiums, stadia. For Beijing, we have partners who work with us to allow us to run within the stadium in a virtual environment. This has huge benefits, especially at the moment when Covid is preventing us from traveling to Beijing, because it means our producers can plan their cameras, camera positions with a virtual stadium that allows them to place their camera in different positions to work out what to do.

00:11:23
Matt Millington: Now, we have a lot of functionality there so we can change the type of camera, we can change the time of day. We can change the weather, but we can emulate a sporting event to a limited amount. Also this allows the producers to play around with where they position their cameras.

00:11:44
Matt Millington: And it also allows all of the planning teams, whether it be security or mic zones or crowd control or whatever it may be. It allows many people to plan ahead for how they would operate within the stadium without actually having to visit it? It also means our rightsholders to do that as well. So traditional rightsholders will go visit the venues every year for at least three years before the games start. This is difficult at the moment or impossible for us. This allows us to give interested parties access to these things to another head. That's an example of how VR were using this kind of technology at the moment.

00:12:29
Interviewer: Thank you very much for this insight. Actually, this is part of my thesis or this was the idea due to Covid and everything how to connect the whole Olympic movement to virtual reality. Because there are some opportunities and there are some parts which are not thought by now. But I mean, at least you can find something about it but you told there are some more plans.

00:12:51
Matt Millington: For Beijing it's actually to big to be clear. This is the role of the organising committee.

00:13:04
Matt Millington: So in terms of Beijing, it's both.The Beijing organizing committee and in for Paris the Paris organizing committee. So it's actually there, you create these virtual stadia.

00:13:21
Interviewer: Following the reviews of the 2018 VR use PyeongChang. They were partly good, partly not so good. So, for example, they said the opening ceremony was great. It was an amazing view. The ceremony was just, a different kind of thing. Like it felt like they were being there. What was the aim at the end of VR? But then there were some reviews with a low resolution. Videos were not working. The idea is great but the resolution was poor. Did the IOC work on that?

00:13:59
Matt Millington: There's two factors here. One it's on the video resolution is super important. The video resolution for support where you need to capture action, which isn't very close to you. Is not as good as people had hoped. It hasn't risen in the same way that that people had anticipated.

00:14:25
Matt Millington: So a number of people can be a little bit disappointed when they watch VR. For this reason, we just choose sports.

00:14:36
Matt Millington: We can't be close to the action. We have chosen sports where you press the action, for instance, alpine skiing. And it's not a very good experience and you can't get close to athletes in skiing because it's too dangerous.

00:14:48
Matt Millington: Also, the cost isnt very low and you need a lot of cameras to cover up alpine skiing properly. And we can do that. But we were limited to the number of cameras that we can use.

00:15:01
Matt Millington: So when you think about the Winter Games, alpine skiing is obviously one of the most important events. But it doesn't lend itself well to virtual reality coverage. There are other sports where you can get close to the action. Those are the ones that work best for us.

00:15:24
Matt Millington: But yes, our video resolution is extremely important. For Beijing we will be using a VR and many people will tell you that you can already tell the difference between 4K and 8K.

00:15:40
Matt Millington: I've seen the tests and as an end user using a headset. And if there is a very, very clear difference, you don't need to be at all video quality merge to see that there's something better. There is. It's clearly better.

00:15:56
Matt Millington: It's still not as great as you would want. It's still not crystal clear. Anything that's more than three or four meters away, you lose focus.

00:16:07
Matt Millington: So it's still a much better close up. But it's a significant improvement to what we have seen in the past. And Beijing will show significant improvement to what we're doing.

00:16:18
Interviewer: It sounds interesting. The plans are to improve it step by step. I mean, you said you improve it for Beijing. Then the next step would be to improve it for the next games like Paris, LA, Milan, right?

00:16:32
Matt Millington: Obviously the technology improves all the time. You've probably heard about some of the Toyotas approach whereby they used all the ball of width is focused on where the video where the user is looking.

00:16:47
Matt Millington: You get a much bigger picture and it blurs out everything to your side where you're not looking. So it focuses is 21all the bandwidth, the area where the viewer is looking.

00:16:57
Matt Millington: We're using that technology, obviously, 180 lends itself better to 360 for that very reason.

00:17:08
Matt Millington: I would say that VR coverage is not a great experience on mobile. It works very well on a headset. You're not really moving around very much.

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Matt Millington: It doesn't seem very immersive and it doesn't seem like you're getting very much extra from it. And for that reason, we still maintain 360 cameras on every live production. Because the 360 cameras

00:17:43
Matt Millington: are give you more immersion on mobile phone.

00:17:49
Matt Millington: And to be brutally honest, the majority, having looked at our analytics and asked the majority of people, will still watch a lot of over a headset.

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Interviewer: That's a good point. This would be another question. So since not everyone has a headset and the headsets, are quite a barrier in terms of prices, especially for countries in the eastern part or countries where people don't have so much money. it's a huge barrier also shown in the literature. Does the IOC plan to generate some revenue from virtual reality when it's getting a bit better or like generating, for example, virtual reality tickets or selling virtual reality tickets for in stadium feeling? And use this revenue to distribute it to countries in need, especially after Covid? I mean there's money needed all over the world, especially in sports.

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Matt Millington: So that's not really the role of the IOC takes. The IOC sell the rights to individual rightsholders, normally broadcasters within a different country, or sometimes broadcast itself to multiple countries. And then it's up to that rightsholder to decide how they distribute content so they can charge for it or they can offer it free.

00:19:14
Matt Millington: That's where we come in, whe're the bridge between rightsholders. Once the IOC has done to deal with the rightsholders that they have the rights for a certain territory. We step in and then offer the products to that particular rightsholder what's not yet done. So it's really up to the rightsholder to do that.

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Interviewer: So stepping back from the IOC, just on your personal feeling, would you think selling VR as a

broadcasting tool for the moment would be a good chance, opportunity to generate revenue and to use it in the Olympic movement to improve the Olympic movement somehow?

00:20:00
Matt Millington: Well, it doesn't quite work out, that's what happens. The IOC sells the rights to rightshold and then the rightsholder decides what outlook, whether they generate money for better or for it for free. It doesn't come back to the IOC once they sell.

00:20:16
Matt Millington: If a rightsholder sell entry or for a match then and it doesn't come back to the IOC would say they decided to do that.

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Interviewer: And so the IOC needed to get a higher amount from the rightholder.

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Matt Millington: They could, that's the potential. I mean, it's not really my territory, this. So I wouldn't sort of quote myself a year or so differently.

00:20:47
Matt Millington: But technically, the rights of the Olympic, the IOC and sell different types of rights, different broadcasters, so they can sell broadcast rights so they can sell digital rights. But normally the cell phone sold rights holder will buy both the broadcast and the digital rights and digital includes to VR. They'll sometimes sell broadcast rights to one company and digital rights to another broadcaster. So, yes, there is a potential revenue for that for the IOC.

00:21:16
Interviewer: I mean, you have the inside. So it's just interesting to see the personal side of it .And the next question, what would be adding to that. You have all the experience, you know, everything about the Olympic virtual reality. Would you buy a ticket for money to have that in stadium feeling, especially now since Tokyo has banned foreign spectators?

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Matt Millington: I'll be brutally honest with you. My favorite VR experience is that we have done in the Olympics all the other features rather than, the live, the life.

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Matt Millington: And this is a common

00:22:01
Matt Millington: Experience. Many people wearing a headset for a long time it can be uncomfortable, certainly at the moment. Maybe it will change in a few years, but watching a two hour sport session on the headset is not really a very comfortable experience currently.

00:22:18
Matt Millington: And it's a little bit unsociable than the ones the content.

00:22:24
Matt Millington: That's done best for us, both in terms of viewership and in terms of my own enjoyment have been the short form features content.

00:22:34
Matt Millington: So, for instance, we did a very nice point of view for the ski jumping and the alpine skiing, which were very, very popular. The ski jumping went really well. They put some sort of dramatic music.

00:22:52
Matt Millington: You have the guy walking to the elevator and then taking the left off. And this is build up tension. I remember very, very well done.

00:23:01
Matt Millington: And that the pieces that really give people joy and we have a showroom at work in an area called

the IBC, the International Broadcast Center, during games time. We have a show where we demonstrate our digital products increasingly are.

00:23:16
Matt Millington: These are the ones that really impressed people these days are PLB. And the ones that get behind the scenes as well. One of the really nice things I like about the VR coverage that you do is that it doesn't just include in the live, but also the pictures and highlights is that you're not just looking at the sport, you can turn around and see a cameraman or a sound guy working on the game.

00:23:46
Matt Millington: You see the officials preparing and exactly what you can see in the crowds.

00:23:55
Matt Millington: And these are things that are generally hidden from you when you're watching the broadcast coverage of the general broadcast coverage, like we try not show the cameras, not show the production or other of VR, you can turn around, see the cameraman or the judges or the guys. There was one of the short track speed skating. And I remember one guy just flipping lap counting things and these things you don't see on television. Sometimes it's not about the actual live itself. It's about the content that surrounds a live sport. And that's what often people enjoy most about it.

00:24:37
Interviewer: Thank you very much for this personal insight. I would add just one last question, especially to your point.

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Interviewer: Would you say that the whole VR coverage, including all this, features the POV, maybe also life attendance at some point? Do you think that this can promote the Olympic ideals in a better way too? I mean, you said that you can show the people, the camera man, you can show the people around the event. You can see the whole experience, and how was it built? Do you think it can explain the Olympic ideals and teach the Olympic ideals in a better way so to fulfill the Olympic principles?

00:25:17
Matt Millington: I think it does. And I can go back to our point of view. We love doing the point of view filming.

00:25:25
Matt Millington: And this really does offer insight into the athletes themselves in a way that you can't otherwise experience.

00:25:30
Matt Millington: So we do try and get behind the scenes, showed it preparing, to show what they're doing to get their equipment ready, show what it's like to be on a cross-country motorbike course.

00:25:44
Matt Millington: And certainly you get to experience the Olympics from the athletes point of view in a way that you cannot do in traditional broadcasting.

00:25:54
Matt Millington: And this is one of my favorite parts of, the virtual reality coverage.

00:26:01
Interviewer: Thank you very much. Thank you for joining and for your time.

00:26:05
Matt Millington: Just before you go, I would add something else that I know that the virtual reality coverage is throwing up recently, which has been a great benefit to us, as you as you may have seen.

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Matt Millington: And certainly I know that it's a popular medium in Germany.

00:26:21
Matt Millington: Many, many broadcasters now are employed virtual studios. So they have that presented in a virtual studio. They may be in a city like Beijing or Tokyo. They may be back in their home country, in Germany

or wherever. But they will often have in these virtual studios a large window of backdrop, which allows you to see the field of play, the football match or what have you. There is great interest for rightsholders in how we can use the VR coverage, especially the panoramic 180 cameras, especially those in high quality. So the 8K for Beijing to transport that studio to a venue of their choice. So they may be discussing the athletics and they can do that from the what looks like a VIP box in the athletic stadium. And then they wish to go to the boxing and we can go to to a venue wideshot from the boxing.

00:27:29
Matt Millington: This is of great interest to the rights holders as more and more employees use these virtual studios, which allow the presenters to be stood in front of different parts of different areas and not just venues, but also from beauty shops we might call beauty shops. So it could be a panoramic shot of Tokyo or a busy street in Tokyo or whatever it may be. These are kind of like a little bit of an offshoot benefit that we've picked up from virtual reality coverage. And I think you'll start to see more and more of this, not so much and take care of it, certainly. But in Beijing, you'll see more of the some virtual backdrop, studio backdrop of being taken from the virtual reality broadcasting coverage.

00:28:20
Interviewer: Thank you very, very much for those insights. I will stop the record now.

00:28:25
Interviewer: Thank you for your time and for the interview and for all the information and also the insides, it is very helpful, so thank you.

Appendix II- Questionnaire

Virtual Realityasa tool for the Olympic Movement

* Erforderlich

1. Do you have experiences or an idea about Virtual Reality? Briefly explain it. *

2. Have you ever used Virtual Reality? *

   Markieren Sie nur ein Oval.

   - 0 times
   - 1 time
   - 2 -3 times
   - 4-6 times
   - 7+ times

3. At a scale from 1 to 5, how good was your experience? (1 worst possible: 5 best possible)

   Markieren Sie nur ein Oval.

	1	2	3	4	5	
bad experince						good experience

4. If you have never used Virtual Reality, are you interested in using it? Please briefly explain why or why not.

5. If you have used Virtual Reality already, do you own a VR supporting system (VR Glass) ?

Markieren Sie nur ein Oval.

- Y
- e
- s
- N
- o

6. Are you interested in sports? *

Markieren Sie nur ein Oval.

	1	2	3	4	5	
not at all	◯	◯	◯	◯	◯	highly interested

7. Name your 5 favorite sports (none if you are not interested at all).

8. Please rank these Major Sport Events below according to how likely you would be watching them. Please choose only one per column, in order from 7= most likely to 1= least likely

Wählen Sie alle zutreffenden Antworten aus.

	1	2	3	4	5	6	7
Soccerr Worrlld Cup Fiinall	☐	☐	☐	☐	☐	☐	☐
Ollympiic Summerr Games – Eventt Fiinalls	☐	☐	☐	☐	☐	☐	☐
Superr Bowll ((Amerriican Foottballll))	☐	☐	☐	☐	☐	☐	☐
Wiimblledon Fiinall ((Tenniis))	☐	☐	☐	☐	☐	☐	☐
NBA Fiinalls	☐	☐	☐	☐	☐	☐	☐

9. If you think about the Olympic Movement, what is your main connection ? *

Markieren Sie nur ein Oval.

- Elite sports
- Money
- Life principles and values Old fashioned
- Spectacle

10. Would you be willing to learn more about the Olmypic ideals and the ideabehind the Movement? *

Markieren Sie nur ein Oval.

- Y
- e
- s
- N
- o

11. How often do you watch live sports in a week?

Markieren Sie nur ein Oval.

- 0 days
- 1 day
- 2-3 days
- 4-6 days
- 7 days

12. How often do you watch sport highlights in a week?

Markieren Sie nur ein Oval.

- 0 days
- 1 day
- 2-3 days
- 4-6 days
- 7 days

13. Do you pay for having more options available? (e.g. Streaming, Pay TV etc.) *

Markieren Sie nur ein Oval.

- Y
- e
- s
- N
- o

14. If you answered yes, how much Dollar do you pay approximately a month ?

15. Which of these media are you using to watch live sports or highlights? (several answers possible) *

Wählen Sie alle zutreffenden Antworten aus.

- Fr
- e
- e
- T
- V
- P
- a
- y
- T
- V
- Social Media (e.g. Twitter, Instagram etc.)
- Gaming Console
- Virtual Reality Glass
- Websites

16. Do you participate in sports - if yes in which sport and at which level (professional or amateur) ? *

17. If you answered yes, do you think that training sessions with Virtual Reality could help you to improve your skills? (Please briefly explain why, why not)

18. How often do you visit live events a year - under regular, non-epidemic conditions? *

Markieren Sie nur ein Oval.

- 0 times
- 1-2 times
- 3-6 times
- 7-10 times
- 10 + times

19. Why do you visit live events *

Markieren Sie nur ein Oval.

- Experience
- Social
- interaction
- Fun

Sonstiges:

20. Have you planned to visit a live event this year, which was cancelled due to Covid-19? *

Markieren Sie nur ein Oval.

Y

e

s

N

o

21. If yes, did this event took place (without audience/ with limited audience)?

Markieren Sie nur ein Oval.

Y

e

s

N

o

22. How much would you be willing to pay to attend your favorite event of the year live? (In Dollar) *

23. How much would you be willing to pay to attend your favorite event of the year via VR? (In Dollar) *

24. Would you rather pay 400 $ to attend your favorite live event or pay 20$ to watch it via VR? *

Markieren Sie nur ein Oval.

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V

R

25. How do you think about personalized Advertisment? (e.g. in TV breaks etc.)

26. Age

27. Nationality

28. Country of residence

Appendix III - Coding Agenda

Statistics VR Training	Category	Definition	Examples	Coding Rule
Level of sport Participation	None	The Participant does not participate in any physical activities fitting the definition of sport	No / none	A clear no, has to be written
	Amateur	The Participant does participate at an amateur level of sport	Soccer at an amateur level	Just "Amateur" need to be in the open text field
	Professional	The Participant does participate at an professional level of sport	Professional in Sailing	At least one present or past sport has to be evaluated as professional
VR as a training tool	not useful	The Respondent sees no use in VR in training	No it's not, there's no physical contact in VR	A clear no or negative statement

	useful	The Respondent clearly sees benefits in the use of VR in training	It will be helpful to create motivation	A clear positive statement
	undecided	The Resondent weighs up benefits and challenges, or has no real idea about it	I've done some training with zoom, it was better than nothing but I missed my coach really checking me out	Any either or statement / for and against statement
Statistics VR customer Experience	**Category**	**Definition**	**Examples**	**Coding Rule**
experience / expectations	positive Experience	A positive connection can be shown	I am. The immersion you can get by using vr is very special in my opinion. Having shown vr to quite a lot of people for the first time, I could tell that each of them had a lot of fun and showed surprise. I'd like to use VR more often than I did, considering the fact, that it gives you the feeling you're diving into a digital world.	A positive statement regarding the use can be clearly seen
	Diverse Tool	VR is not directly connected positively or negatively, it is seen as a tool for sever	...different fields such as games, education, mental illness treatments and medical training. Gaming	There is no rating of VR use, but statements regarding its field(s) of use

		al areas		
	No idea or statement	There is none connection with VR	No I own a ps VR and used it a few times	There is neither a rating of VR, nor any connection to other categories
	Accesseabilty	VR is connected to problems with the accesseability	As far as I know VR is pretty expensive so I never thought of getting me VR Set on my own.	Problems towards the use and access of VR are clearly stated
	negative experience	A negative connection can be shown	No. Just not interested in making the investment, and I prefer to have real life experiences.	A negative statement regarding the use can be clearly seen