Macromedia University of Applied Sciences

Course Title: Strategy and Innovation Processes
Name of Examiner: Prof. Dr. Markus Rometsch

To be completed by students:

M-100803
Student ID number

M-UMf MK MCM 4e 21W
Matriculation

Ederer
Last name

Anastasia Ekaterina Tamar
First name

The student work will be submitted as:
(Please fill in the letter X in the appropriate box)

[X] Individual work

[ ] Group work

Does only apply to group work: (Complete only if it is a group work)

If you are submitting a group work, please list the first and last names of all group members. The names must be entered electronically by the respective group members themselves. By entering the name, it is confirmed that the student agrees to submit the paper in the present form. Furthermore, by entering their names it is declared by the individual groups members to have created the project paper (in case of a group work: the part which the respective student has contributed to the paper and has marked accordingly within the paper) on their own, without the help of others. In the process, the student has not used any aids other than those cited in the listing of sources and literature. All passages taken either verbatim or in adapted form from publications are indicated as such. The work has not been submitted to another examination office in the same or a similar form. With the submission, the group members agree that all evaluations and notes of the examiners are deposited in the uploaded work. The group member who uploaded the work must make the correction notes available to the other group members.

1) _____   5) _____
2) _____   6) _____
3) _____   7) _____
4) _____   8) _____

Assessment of group work:
(Please fill in the letter X in the appropriate box)

[ ] I apply for an <u>individual</u> evaluation (i.e. each member of the group will receive an individual mark)

[ ] I apply for a <u>group</u> evaluation (i.e. each member of the group receives an identical grade)

München, 16.06.2023
Place/Date

Anastasia Ekaterina Tamar Ederer
Complete First Name and Last Name

Evaluation (according to grading scale), result of initial inspection: total points: _____

Date: **Name, first name First Examiner (to be filled in digitally)**

To be completed by the examiner: (Text area for the second examiner)

Strategy and Innovation of Razer and BMW

Date: 16.06.2023

Author: Anastasia Ekaterina Tamar Ederer

Matriculation number: M-100803

Course: Strategy and Innovation Processes

Teacher: Prof. Dr. Markus Rometsch

Abstract

Through the development of technology-driven trends in the automotive industry, car manufacturers have started to collaborate closely with technology companies to implement state-of-the-art technologies into their products (Howells, 2023e). These kinds of collaborations are outstanding for developing unique products, but they also shine a positive light upon the partnering companies allowing them to be acknowledged as innovative digital leaders which positively influences their brand image. This research paper aims to illustrate the products deriving form a potential collaboration between the two brands Razer and BMW. Razer is an American-Singaporean technology company notorious for its gaming hardware. BMW is a renowned German car brand from the premium automotive segment known for its outstanding design and performance. By utilizing Razer's cutting-edge technology and BMW's innovative design, this cooperation could result in the development of a Razer modified BMW vehicle – where the vehicle's interior is furnished with Razer products such as displays, RGB Chroma lighting systems, and modified car seats. These high-performance technological modifications and the newly conceptualized automotive interior design could serve the needs of both gamers and car enthusiasts. A marketing mix and SWOT analysis will be performed on both Razer and BMW to understand the companies' positioning within their respective markets, and to discern the potential strengths, weaknesses, opportunities, and threats that would come with this strategic alliance. From these results it should become possible to explore the aspects of innovation that can emerge from this collaboration, that thus align with current gaming and automotive technology and design trends.

Table of Contents

Introduction

New technology trends have disrupted both the gaming and automotive industries over the past years, thus spurring innovation into a new direction. Technology and gaming companies have increasingly been engaging in alliances between industries to provide partnering companies with state-of-the-art products that allow for new products that are unique, seamlessly efficient, smart, immersive, sustainable, highly user-friendly, and extremely aesthetically pleasing. The implementation of gaming technology in the automotive industry has opened doors for the most advanced automotive interior design, drawing the interest of both gamers and automotive enthusiasts to new products. These kinds of collaborations only service the brand image and reputation of both brands, and thus increase the sales.

This research paper will explore the potential innovative results that could derive from a collaboration between RAZER and BMW where Razer would implement its hardware and other staple Razer products as well as design into BMW vehicles, preferably the BMW M2, M3, or M4 models, all of which are sporty coupe vehicles, most appreciated by the younger and sporty customers. Such a collaboration could pave the way for a new era of innovation and design in both the gaming and automotive industries, providing exceptional, high-tech experiences to their customers.

Company Profile

Razer is a leading global lifestyle brand that produces gaming hardware, software peripherals, and services in the gaming industry. It grew from a "two-man startup to a multinational market leader that was honored on Fortune Magazine's "Unicorn List" in 2015 (private companies valued at US$1 billion or more), before its successful IPO in November 2017" (*About Razer*, n.d.). Razer was initially founded in 1998, starting as a San Diego, California-based subsidiary of kärna LLC. During this time the focus was on developing a high-end gaming-mouse for computer gamers. The current version of Razer was founded in 2005 by Min-Liang Tan, a Singaporean NUS graduate, and Robert "RazerGuy" Krakoff. In July 2017, Razer filed to go public through an IPO in Hong Kong and preceded to be officially listed on Hong Kong stock exchange under the stock code 1337 on the 14th of November (Lee, 2017). In April 2018, Razer declared that it was planning to fully procure the e-payments platform MOL for around $61 million (*Razer to Buy Out E-payments Platform MOL for S$81m*, 2018e). That July, Razer debuted in Malaysia, through launching its e-wallet, Razer Pay (Auto, 2018) (which preceded to be shut down in 2021), to then announce the updated version of their phone, the Razer Phone 2 in October 2021 (*Razer Phone 2 – Flagship // Gaming – Razer Press*, n.d.). Furthermore, Razer announced it would launch its new virtual prepaid debit card in October 2021. A great milestone was the upgrading and relocating of the Singapore Razer headquarters in 2021, which was officiated by Deputy Prime Minister of Singapore Heng Swee Keat at the ceremony. The building entailed a "RazerStore" and a "RazerCafe" (Leo, 2021b). It hired 1,000 positions for the new headquarters which officially opened on 26 October 2021 (Salim, 2021). Razer has two headquarters, one in Singapore and the other in California.

In terms of gaming products and services, Razer offers an extensive product portfolio which is predominantly targeted at gamers. Some of these products include gaming laptops, desktops, keyboards, mice, mouse pads, headphones, and other accessories. The company also provides software such as Razer Synapse and Razer Cortex, which allow users to customize their gaming experience. The technology company's most popular product by sales numbers is the Razer DeathAdder gaming mouse which sold over 10 million units in 2019 (Honorof, 2019). Razer's mission statement is "bringing gamers closer to the games they love". CEO Min-Liang Tan states that their traditional approach remains making "anything that [their] gaming community demands" (Westover, 2014). Additionally, Tan says: "Our credo—"For Gamers, By Gamers"—is more than just a slogan[…]" (Westover, 2014).

Marketing Mix: Razer

Some of Razer's top competitors are Corsair, Logitech, HyperX, ASUS ROG, and MSI who offer similar products and services and compete with Razer in terms of quality, price, and brand recognition. The following marketing-mix will break down the aspects of Razer's products, pricing scheme, promotion strategies, and sales locations.

Product

Razer consists of an impressionable product portfolio of gaming laptops, keyboards, mice, headsets, and other accessories that are designed with the latest technology and features to meet the needs of gamers. Inspecting the product categories on Razer's website, they are divided into the following headings: laptops, components, mice, keyboards, audio, content creation, chairs, console, mobile, and equipment. In the product category laptops, Razer has a selection of laptops ranging in screen size and other characteristics. Under the category components, Razer offers a selection of computer parts. Under mice, Razer offers a vast selection of mice and accessories. Under keyboards, Razer has a total of great line up of keyboards, keypads, and accessories ranging in characteristics and design. Under audio, Razer offers soundbars, speakers, headsets, and in-ear headphones. Under content creation, Razer offers streaming products such as headsets, microphones, ring lights, stream controllers, led strips, audio mixers, carrying cases, capture cards, and cameras. In the product category chairs, Razer offers a selection of gaming chairs, including some that are products of cooperations with other brands such as brands Lamborghini, Koenigsegg, and F1 team, Williams. Under consoles, Razer offers controllers, charging stands and base stations. Under mobile, Razer offers phone coolers, polarized sunglass lenses, grip tape, charging pads, phone adapters, phone protection glass, phone cases and Airpod charging cases. To round off Razer's product portfolio, it has a great list of merchandise products ranging from clothing and backpacks to gadgets and electronics accessories. All Razer products adhere to a specific theme and design, which makes them stand out from other brands. It is notorious for naming all its products after predator animals, as well as for its edgy, sleek, modern, dark, matte design. A lot of these products are garnished with RGB Chroma lights adding to the gamer effect.

Price

Examining Razer's pricing, all products are priced at a premium compared to its competitors. This is because it focuses on delivering high-quality products for the best possible gaming experience[i]. Razer laptops can be priced up to 5.899,99 euros, as seen with the Razer Blade 18[ii], as well as with mice that can sell at 319,99 euros, as seen with the Razer

Viper Mini Signature Edition. The cheapest laptop, the Razer Book - Full HD 60Hz - Intel® Iris® Xe Graphics - Mercury goes for 1.099,99 euros (list price) and the cheapest mouse, the Razer DeathAdder Essential goes for 39,99 euros.

Comparing the pricing of the most expensive and inexpensive products throughout multiple categories of Razer and one of its main competitors, Corsair, the average percentage pricing difference between the two brands is about 49%, where Razer is the more expensive brand. Generally, there is a 15-to-20-euro average difference between Razer and Corsair products. In terms of product lifetime longevity and durability, Razer products can last a over five years if maintained properly, yet it is highly dependent on the manner of use. A gamer who is more prone to use the equipment more aggressively and frequently will most probably have to replace the equipment more frequently than a moderate user[iii].

Promotion

Razer is a globally recognized brand that uses an array of marketing channels to promote itself and its products. More promotion channels include online advertising, social media, such as Instagram (7.3 million followers), influencer marketing with gamers or content creators such as Ninja, Shroud, and Jacksepticeye, sponsorships or being a cooperative partner with big events such as the CES, E3, RazerCon, TwitchCon, and esports events.

Place

Razer products are sold through different marketing channels, including its own Razer online store razer.com, as well as through third-party online retailers and distributors around the world. Razer also has multiple physical flagship stores located globally such as in San Francisco, Las Vegas, Hong Kong, and London - as well as through authorized resellers and retailers through which they sell their products. Finally, Razer sells its products at Esports events where the target market is typically saturated.

SWOT Analysis

A SWOT analysis was conducted on Razer and BMW and were revised alongside each other to determine the opportunities, advantages, disadvantages, and risks that come with a potential collaboration between the two brands.

<u>Strengths</u>

Quality and Practicality

Razer offers premium quality products that are well-built and offer top performance. Recycled materials are used to manufacture the products, promising durability of the products. The seamless functionality of the products allows for an excellent and easy user experience. BMW also shares the same standards of sustainability, craftmanship, quality, and performance with Razer, making a potential collaboration make sense.

Diversified product portfolio

As previously seen in the product section of the Marketing Mix, Razer offers a wide range of gaming products that can be customized. This allows Razer to not only cater to gamers but also to other customers from other market segments with deviating needs. BMW similarly has a wide product portfolio including sedans, coupes, SUVs, and electric vehicles, as well as special edition vehicles developed through cooperations with other brands or tuning companies[iv] that are similarly customizable as Razer products[v]. The vast array of products and customization options is highly advantageous to both companies as this provides the designers of a potential Razer and BMW collaboration more leeway for their ideas and innovations.

Strong brand recognition and Innovation

Just like BMW in the automobile industry, Razer has similarly gained the reputation of a leading brand in the gaming industry as it is best known for producing high-quality, top-performing gaming hardware. Both brands have strong brand recognition, positioning them at the perfect stage for a collaboration project. In most cases it is highly probable that Razer customers will already be aware of BMW, and that a Razer-modified BMW would interest them. BMW customers may know of Razer if they are gaming or technology enthusiasts, and in most cases will not be intimidated by such a collaborative vehicle as they have developed a deep-set trust for the well-established automotive brand beforehand. Since both brands already have strong brand recognition, marketing costs will not be as expensive as for a new brand who would need more promotion to introduce itself. Concerning innovation, Razer, and BMW both invest greatly in research and development, which has allowed both companies to stay ahead of their competitors. In terms of brand and product vison and design, both brands

are sporty and sleek-looking – Razer sponsoring gaming events or Esports, and preserving a modern, quintessential design concept recurrent throughout its product line, just like BMW producing its M series and keeping a sporty theme throughout each of its vehicles and brand image.

Online Presence

It is highly beneficial that Razer and BMW both have a strong online presence, paired with well-designed websites and multiple social media accounts such as Instagram, twitter, and LinkedIn, which helps the companies connect with their customers and business partners, allowing them to maintain their communities. Strong online presence allows for more customers to be reached and enables brand image development, enhanced advertising, and networking[vi].

<u>Weaknesses</u>

Expensive

In terms of pricing, Razer's products are generally priced higher than similar products from its market competitors. The price-quality relationship of Razer products is justifiable, however a potential limitation that could arise from the highly priced products could be that customers who are more price-sensitive would be repelled. Another aspect that should be considered is that collaborations between two well-known brands tend to be more expensive in nature as a unique and exclusive product is developed, which tends to be allocated a higher value.

<u>Opportunities</u>

Growth of the Gaming Industry and Expansion into New Markets

The gamification of digital products is increasingly more common. This presents an opportunity for Razer to bring in its expertise to innovate more state-of-the-art products and thus expand its customer base into new markets from which they can profit from. A collaboration with BMW would present an opportunity to develop more interactive, immersive, gamified car interiors.

E-Sports Trend

Alongside the rise in digitalization and video game popularity, E-sports has increased in popularity. This is another market expansion opportunity for Razer and BMW to take advantage of and make profit from. BMW had an Esports team; if it were brought back, Razer could develop gaming products specifically for this.

High competition

One common threat that should not be overlooked is competition. Razor's greater competitors with established names such as Corsair Logitech, and Microsoft will pose competition. Smaller companies specializing in gaming peripherals should not be underestimated either. Hence, Razer should keep up with innovation and technology trends to maintain its relevance and reputation. Regularly releasing state-of-the-art products to the market will put its rivals at a disadvantage. Razer should stay up to date with the latest industry trends to keep up with the fluctuating consumer preferences. If Razer fails to do so it could lose its market share to competitors.

Fake products

Razer products are easily replicable, making it easy for sellers to reproduce them and sell them at a lower price. In 2015, Razer had to deal with an incident of their products being counterfeited and dealt with them very seriously[vii]. Effects of counterfeit products can be detrimental which is explicitly stressed by Razer's CEO, Min-Liang Tan, "Counterfeit goods put a huge toll on innovation and growth across many industries worldwide. By […] bringing down these operations, Razer hopes to set an example that this […] activity will not be tolerated." These issues can damage the company's reputation and lead to lost sales (Kwan, 2015b).

Technological Trends in the Gaming and Automotive Industries and Market

<u>Gaming Industry</u>

Technological trends are what drive innovation forwards. The $336 billion gaming industry (Statista, 2023) tends to be the first place at which people get to see them. Some of the leading trends of 2023 are artificial intelligence (AI), virtual and augmented reality (VR/AR), blockchain, and Metaverse. It is not unusual to see brands such as BMW collaborating with technology companies to develop new products. An example is the collaboration between BWM and the video game developer Epic Games. The objective was to rethink vehicle development by using technology from the gaming industry to do so. Hence, the BMW iX was developed using gaming technology, specifically a mixed reality system (Brown, 2017).

<u>Automotive Industry</u>

Non-gaming companies are pairing up with gaming and technology companies to create unique products because they can provide expertise and state-of-the-art hardware and software that align with the latest technology trends that the non-gaming or technology companies do not own or invest in. Therefore, they will not produce as good of a product as a technology company would. Some of the technological trends that are shaping the automotive industry today are electric and autonomous vehicles, augmented reality, biometrics, big data analytics, human-machine interfaces (HMI), digital cockpits, 5G connectivity, advanced driver assistance systems (ADAS), predictive maintenance, cloud computing, and in-car health monitoring[viii]. These are just some trends present in the automotive industry and this paper will take a closer look at two trends that are most relevant for a Razer BMW collaboration.

Human-Machine Interfaces (HMI)

According to Janus Yuan, lead UX designer of Driving Control Group and Advanced Driving Autonomy Team at Faraday Future, HMIs are "not only a communication bridge between the driver and the car itself, but […] a principal connector between the driver and outside world" (Yuan, n.d.). The role of HMIs is to allow the driver to interact with the vehicle in the most natural way possible. This has been realized in the form of in-car touch screens and buttons, push rotary controllers, swipe and gesture functions, and speech recognition technology[ix]. Such features allow for a more distraction-free, safe, and enjoyable driving experience (Debkaliuk, 2023). Additionally, multi-information displays and interior customization in vehicles are trends in the automotive industry, as seen with the Mini

Concept Aceman, where drivers can customize and personalize the HMI within their vehicles to match their mood, personality, and style.

The Mini Concept Aceman hosts a customizable and immersive HMI that has a cinematographic audio-visual dashboard, multiple interior and HMI modes, ambient sound and lights, and gesture interaction. This allows for ultimate "me time" for the driver thus enhances their overall experience (MINI, 2022). HMI software can be set to provide customized and personalized vehicle-human interactions, multidimensional graphics, tactile button feedback, and driver augmented reality systems. The goal apart from creating the most user-friendly, efficient, as well as practical HMI, is the that of creating a sense of emotion and connection with the vehicle, which is enabled through the element of customization. Customization and full personalization are the gateway to building an "instant synergy between the driver and the vehicle and increase confidence in the automotive brand (Elektrobit, 2022).

Digital Cockpits

Digital Cockpits go hand in hand with HMIs. The difference between the two is that HMI refers to the system that connects the driver to the car's interior electronic features such as the infotainment system, climate control, ambient lighting, and sound system. The digital cockpit is a type of HMI that focuses on the instrument cluster and driver information display such as the speedometer and the other measuring instruments and functions above the steering wheel. The digital cockpit substitutes for the traditional analog measuring instruments with a fully digital display.

Numbers and Statistics

Having explored some of the technology trends that shape the automotive world, it is essential to observe some cases in which certain of these trends have been realized. Firstly, vehicle interiors become more demanding in quality. According to the results of a research survey performed by McKinsey & Company on the importance of vehicle interiors and the in-car experience, "71 percent of automotive executives expect vehicle interiors to become more important, while only 38 percent held the same views about vehicle exteriors". When inspecting the digital aspects of automotive IVIs and HMIs, a market analysis report on automotive infotainment performed by Research Dive shows that "the global automotive infotainment market is foreseen to grow at a CAGR of 8.32% and garner a revenue of $20,720 million by 2030" (Research Dive, 2022). Apart from interior digitalization, gaming aspects have found their way into the automotive industry. This can be seen through the collaboration between BMW and the video game developer Epic Games starting in 2015,

who utilized "a mixed reality system […] based on Epic Games' Unreal Engine technology, which also powers Fortnite and the racing simulator Assetto Corsa Competizione" to develop the BMW iX, the "first car to have been developed at BMW using gaming technology" (BMW, 2022). BMW has also experimented with AR, thus gamifying the driving experience, as seen in 2022 when the new BMW M2 Coupe was paired with VR glasses for ///M Mixed Reality. This innovation made it possible to drive on a racetrack whilst wearing VR glasses, not being able to see the road, but only a gamified track through the glasses. With mixed reality, any large free area can be turned into a virtual racetrack. BMW has also made its dent in the gaming industry through its involvement in Esports, which "gives BMW completely new touch points with a dynamic, rapidly growing community, making Esports an important future field for BMW marketing activities" and has multiple collaborations and partnerships with the world's best teams from League of Legends, Dota, and BMW sim racing (BMW, 2021). Moreover, BMW has put a lot of effort into making the interior of its vehicles immersive, entertaining, smart, and aesthetically pleasing. This can be seen through three examples: the concept car BMW i Vision Dee, the BMW Group and AirConsole collaboration, and lastly the Mini Concept Aceman. The concept car BMW i Vision Dee, which stands for Digital Emotional Experience, is the vision of the future digital experiences inside and outside of cars[x]. It has an advanced BMW HUD that extends across the full width of the windshield, a BMW mixed reality slider that can take the driver into the virtual world partially of fully by using shy-tech sensors on the instrument panel, this was the driver can gradually fade out reality to his or her liking. Also "the digital experience begins outside the vehicle, with a personalized welcome scenario that combines graphical elements, light and sound effects", which allows for "perfect understanding between humans and their vehicles" (Takahashi, 2023). The i Vision Dee has a very reductive design both inside and out, which has been intentionally "pared down to focus attention on the digital experience and the DNA of the BMW brand" (Takahashi, 2023). According to Frank Weber, member of the board of BMW AG responsible for development, the implementation of high-tech functions, cutting-edge technology, as well as the newest digital trends is highly essential for the success of future car manufacturing. He states "BMW i Vision Dee is about perfect integration of virtual and physical experiences. Whoever excels at integrating the customer's everyday digital worlds into the vehicle at all levels will succeed in mastering the future of car-building" (Takahashi, 2023). The MINI Concept Aceman, also focuses on interior design to be immersive, smart, interactive, and vibrant especially seen by its elaborate IVI system. MINI sponsored gamescom in Cologne, being the official mobility partner of gamescom 2022.

Stefanie Wurst, head of the MINI brand stated "A great feature of MINI is the positive and future-oriented approach to individual mobility and the unmistakable design of the vehicles. In the MINI of the future, gamification will play an increasingly important role and offer a unique experience for our customers. In the collaboration with Pokémon, the shared joy of the franchise brings together two iconic characters who are a perfect match for millions of fans. This is how we are reaching a whole new target group at gamescom 2022, as an event for modern fandom, gaming, and pop culture" (BMW Group, 2022). The IVI of this one-off vehicle hosts an individual mode, "Pokémon Mode" with Pikachu, that takes over the OLED display as the new central instrument when operating the Experience Mode toggle and can be customized[xi]. Lastly the BMW and Air Console collaboration, brought casual gaming into vehicles in 2023. This innovation is thought to make any waiting time within the vehicle more entertaining, for example whilst electric vehicle charging. Air Console is a gaming platform that offers a corpus of different games that can instantly be delivered over-the-air to the vehicle entertainment system within the IVI. The idea is to use one's phone as a controller and the BMW Curved Display to play single- and multiplayer games. All that needs to be done is to scan a QR code in the vehicle and start playing (BMW Group PressClub, 2022)[xii].

In terms of vehicle customization and it is interesting to regard the statistics that highlight how younger generations are more prone to modifying and customizing their vehicles due to social motives[xiii]. According to Hedges & Company, the automotive Specialty Equipment Market (SEMA) is more than $44 billion (Hedges & Company, 2020)[xiv]. According to research conducted by SEMA, "young drivers accessorize at greater rates than the average aftermarket consumer" (Imlay, 2019). Gavin Knapp, SEMA director of market research makes a supporting statement, "When we look at the broad spectrum of people, we find that only a quarter of drivers participate in our industry. With this young group […] even when we factor in the 16- and 17-year-olds, it's still a higher percentage that participates in our industry by accessorizing and modifying their vehicles." The SEMA Young Accessorizers Report states that about 7.9 million young individuals accessorize their vehicles, spending about $7.2 billion on modifications in 2018, and represent a substantial share of the $43 billion industry marketplace. The report additionally points out that teens and young-adult accessorizers say they derive several personal benefits from their purchases, such as a better-looking vehicle (39%), a sense of pride (37%), enhanced vehicle performance (34%), and greater automotive knowledge (33%). Additionally, 36% said they spend their money on interior enhancements, 33% spend on lighting upgrades, and 24% spend on mobile-electronic products[xv].

Automotive Interior Design and Technology Trends

Multiple interior design and technology trends shape the automotive industry today as new technology allows designers to create new concepts and features. Some automotive interior design and technology trends are immersive, smart digital interfaces, biometric sensors, laser technology (LiDar) and high efficiency aggressive LED headlights, lightweight materials such as carbon fiber, minimalism, sustainable materials and vegan leather, matte finishes, retro design, bold colors, panoramic glass roofs, black accents, and further interior customization features. This paper will elaborate on a selection of relevant interior design trends.

Design and Customization

As mentioned above, a variety of different aesthetic accents are implemented into the interiors of cars to create a more interesting aesthetic. BMW is a great match with Razer as they share the same sense of design, that being a sleek, sporty, and aggressive one, including the choice of a similar color palette, that being one of bold colors with a foundation of black and white.

Digitalization

Digital interfaces and dashboards such as the in-vehicle infotainment (IVI), smart surfaces, digital interior and exterior functions, multimodal interfaces (voice, touch, and gesture recognition), voice-activated car OS, elaborate sound systems, heads-up display (HUD), automatic lift gate technology, and intricate ambient lighting are found in most cars today, especially in newer models being released over the last few years. The ultimate automotive technology and design goal is to meet the needs of drivers and passengers for automotive interiors that are highly intuitive, smart, sustainable, and luxurious.

Despite the multitude of interior technology trends, the most relevant in accordance with this paper is the IVI, also known as the in-vehicle infotainment dashboard. With the growing demand for luxurious, as well as smart vehicles, automotive manufacturers are progressively developing cars with integrated infotainment systems. IVI systems offer the driver entertainment, information content, and services for an enhanced in-vehicle experience (Saxena, 2023). Furthermore, IVI systems are built-in high-resolution 12–20-inch touch screen displays, hence car computers, that consist of a wide range of features and functions, an on which the driver can easily interact with. A digital instrument cluster is also present. This cluster consists of digital displays of the traditional analog gauges such as the odometer, speedometer, and RPM (Saxena, 2023). IVI systems feature Bluetooth connectivity for pairing smartphones with the car system, which allows the driver to access and use in-phone

features on the IVI. Platforms such as Android Auto and Apple Carplay tend to be compatible with the vehicle's IVI, which allows for this pairing and cross-operating process to be carried out. While Android Auto supports apps from google (like google maps, google play music, etc.) through any of the android-based smartphone, Apple CarPlay supports iOS-based apps from the App Store (Saxena, 2023). When considering the user-experience process of an IVI it is interesting to consider the control elements. All the functionalities in the latest in-vehicle infotainment systems can be accessed and controlled using touch screen panel of the head unit, button panel, steering wheel controls and voice commands (Saxena, 2023). Another essential entertainment feature is the digital radio and in-vehicle sound system both of which the driver can operate via the IVI. This feature is followed by multimedia support, another essential element which allows for audio-visual content to be transferred to all in-car display screens, the in-vehicle speaker system and headphones via Bluetooth, HDMI cable, USB, as well as streamed from smartphones and tablets via Bluetooth connectivity, enabling hands-free calling, and call log visibility (Saxena, 2023). IVI systems also entail parking assistance, daytime running lights indicators, climate control in the vehicle, voice assistants to control system functionalities (Saxena, 2023). Finally, IVIs also tend to have integrated sensors for different functions, such as gesture recognition sensors, proximity sensors, and camera sensors that amalgamate with the infotainment system to provide safety-related and environmental information to the driver (Saxena, 2023). A prime example of an extraordinary IVI and immersive vibrant interior is that of the Mini Concept Aceman. It is extremely customizable and hosts a variety of IVI modes, such as the MINI Concept Aceman x Pokémon Mode (BMW Group PressClub, 2023). Here IVIs hold a variety of high-tech capabilities and functions that leave room for improvement and further innovation. Due to the digital nature of the interior, there is a great potential for customization of all aspects. These aspects will be explored in the coming sections of this paper.

Ansoff Matrix

The Ansoff Matrix is a strategic planning tool that helps companies analyze their products and optimize their market growth strategy. It is a helpful tool as it provides companies with an efficient and straightforward way to think about the potential risks of growth. The Ansoff Matrix defines four product-oriented growth strategies: market penetration, market development, product development and diversification. The following benefits can be deduced after applying this tool to Razer and BMW.

Market Penetration

If market penetration were used as a growth strategy for increasing sales of existing Razer products into BMW vehicles, Razer could produce gaming peripherals for BMW vehicles, and these could be offered by BMW as part of a luxury car package. Through this strategy, both companies could increase their overall sales in their respective markets. This would help Razer increase its market share in the gaming technology markets, but it could attract more technology-enthusiastic customers for BMW.

Market Development

If market development were used as a growth strategy for selling existing Razer products into new markets Razer could produce custom gaming peripherals and accessories for BMW customers, and BMW could thus sell these products through their dealerships. This way Razer could reach a new market of BMW customers who are gaming enthusiasts, and BMW could offer an additional product line to their customers.

Product Development

If product development were used as a growth strategy for introducing new Razer and BMW collaborated products into the automotive market, Razer could develop gaming peripherals or accessories explicitly designed for BMW vehicles, such as a Razer IVI system, a quintessential Razer chroma RGB lighting system, or even gaming controller that can be mounted onto the steering wheel. This could help Razer expand its product line, and BMW could offer a unique vehicle with a Razer-customized interior. This could potentially attract gaming and technology enthusiastic customers.

Diversification

If diversification were used as a growth strategy for Razer entering the automotive market with completely new Razer products and BMW can use this strategy by diversifying their products into new markets. There is related diversification und unrelated diversification. In this collaboration a related diversification can be realized. For example, Razer could develop Razer gaming chair inspired car seats or BMW racing car seats inspired gaming chairs. BMW

could offer these Razer customized car seats to their customers who are also interested in gaming, and Razer could offer these gaming chairs to BMW enthusiasts who are also gamers. This would help Razer expand into the automotive market, and BMW could offer a unique product line of gaming chairs and car seats to gaming and BMW enthusiasts.

Managing Alliances

Alliances between brands can be very beneficial for the respective collaborative parties. A strategic alliance is an agreement between two or more companies that have decided to share resources to undertake a specific, mutually beneficial project (Kenton, 2022). According to Bain & Company, through such an alliance, companies can improve competitive positioning, gain entry to new markets, supplement critical skills and share the risk or cost of major development projects (Bain & Company, 2018). Other benefits present themselves as well, such as gaining new customer bases, sharing expertise to develop state-of-the-art products, and gaining access to new markets. Nevertheless, managing alliances also includes some challenges such as defining and adhering to the joint mission goals, maintaining transparent communication, and handling potential conflicts of interest. To overcome these challenges, Razer and BMW would need to define clear boundaries and processes for their collaboration. However, a managed alliance between Razer and BMW could grant the following opportunities.

Technology Sharing

First and foremost, a collaboration between Razer and BMW could present the sharing of their technologies to develop and modify their products. For instance, Razer could provide BMW with gaming peripherals that could be integrated into the vehicles control system or IVI. Similarly, BMW could provide Razer with the vehicle and the technology that facilitates in-car gaming experiences or an advanced driver assistance systems (ADAS) that incorporates gaming technologies.

Shared Expertise

Apart from technology sharing, the two brands could share their respective expertise to manufacture new products that appeal to both gamers and car enthusiasts. For example, they could collaborate on developing the Razer car, a BMW M4 whose interior is furnished with Razer hardware, Razer customized IVI system, Razer design and lighting, as well as Razer gaming chair inspired car seats.

Co-Branding

Co-branding their products is a great way for Razer and BMW to positively influence each other's brand recognition. For instance, Razer could produce a limited-edition line of customized gaming peripherals and accessories that feature BMW branding. Hence BMW could offer gaming-themed options for their cars, and feature Razer branding as well as quintessential design traits the vehicle, thus market it as the Razer car.

Joint Marketing

Lastly, through joint marketing, Razer and BMW could collaborate to promote their products to broader audiences. For instance, the two brands could co-sponsor Esports or other gaming events, as well as run joint marketing campaigns that promote the shared features of their products.

Innovation Aspects of RAZER x BMW

As seen in the previous sections of the paper, multiple technological trends are present in the gaming and automobile industries proving that numerous technological innovations are possible through a collaboration such as this one. Three major innovations can be considered when having Razer collaborate with BMW.

Razer x BMW Car Seats

Razer already has an assortment of three gaming chairs that derived from collaborations with the automotive brands Lamborghini, Koenigsegg, and F1 team Williams. For each of the gaming chairs, exact elements from the automobile brands have been added to the chair design. For instance, "Razer Black" and signature "Williams Blue" were used for the coloring of the Williams chair. For all chairs, the logos of the respective automotive brands were implemented on the chairs, as well as the same materials[xvi] used on the actual car seats as well as quintessential brand designs were implemented on the respective gaming chairs. Razer could do two things: collaborate with BMW to make a gaming chair, and secondly cooperate with BMW to design the actual vehicle seats within the collaborative vehicle. These seats would be gaming inspired car seats, holding all the quintessential Razer logo, colors and staple designs found on the gaming chairs and peripheral devices. Of course, the seats would have to be reviewed to fulfill all the legal road requirements.

Razer RGB Chroma Interior Lighting System

The Razer x BMW collaborative vehicle interior would essentially have to be furnished with the notorious Razer RGB Chroma for a lighting system to be revolutionary. This would create one of the most iconic car interiors in the automotive industry and would be celebrated by the gaming industry as well as technology connoisseurs and gaming enthusiasts. The RGB Chroma led lights are found on most Razer peripherals and can perform different light shows. If the interior lighting system were modified this way, it would add to the aesthetic and ambience of the BMW's interior design, making it an archetypical gaming-car. The lighting system would run along, above and below the odometer, dashboard, windshield, car ceiling, along the doors, in the door handles, in and under the glove compartments, in the foot space, along the arm rests, and on the steering wheel. These lights can be manipulated via Razer Synapse, a cloud-based configurator and manager for Razer devices, either from your phone or downloaded from on the vehicles IVI system.

Razer x BMW IVI System

As seen with the Mini Concept Aceman x Pokémon and Air Console, Razer could modify one of its computers such as the Razer Blade 18 and implement it into the Razer x BMW vehicle as the IVI system. Additionally, two further drop-down entertainment screens could be installed in the back of the vehicle for the passengers. The IVI itself could host a Razer Mode with the Razer Sneki Snek opening the hello screen, like the Pikachu in the Aceman Pokémon Mode. The IVI would be immersive, interactive, and manageable via gesture and voice control and have a touch screen. It would have a device syncing system that pairs and interconnects with personal (Razer) -devices such as phones, headsets, mouse, mouse mat, tablets, and laptops. It would be possible to type on a Razer laptop at home, for instance a shopping list, and send it to the Razer car computer, hence IVI. Like Air Console, it would also be possible to play video games from the cars IVI. Steam or a similar platform especially developed by Razer would have to be installed on the IVI, and finally in-car gaming would be made possible. To conclude, the odometer would also be modified by Razer, featuring Chroma RGB lights and digital speed dials in the colors of Razer.

Conclusion

This research paper analyzed and highlighted the technological trends present in today's gaming and automotive industries, as well as which innovations could emerge from a collaboration between Razer and BMW. It has been deduced that it is not uncommon that gaming and technology companies - due to their high level of expertise in their respective fields - are approached and are asked to collaborate with businesses from other industries to develop cutting-edge products for them. As seen through today's automotive interior design trends and the presented case studies, immersive digitalization as well as seamlessly functioning IVIs and HMIs are the essential key aspects that make modern automotive interiors. From the results of the marketing mix and SWOT analysis of Razer and BMW it was found that a collaboration between Razer and BMW could lead to innovative, gamified products for both the gaming and automotive industries.

Moreover, the results of the Ansoff Matrix, provided four growth strategies that Razer and BMW could implement to optimize their market growth. From these strategies product development and the diversification strategy seem to fit best with this collaboration. Product development suggests that Razer implements and modifies its hardware specifically for BMW vehicles, attracting new customers, and diversification strategy allows Razer to develop exclusive products such as gaming-inspired car seats, whilst BMW can offer Razer-enhanced cars to their customers; solidifying their innovative reputation as a company, thus can also attract new customers interested in gaming which can potentially increase BMW's profits. This paper also touches upon the importance of managing alliances and highlights the importance of strategic alliances in today's innovation processes and success rate in the automotive industry.

Lastly, three major potential innovations deriving from the Razer x BMW collaboration were presented, those being the Razer x BMW Car Seats, the Razer RGB Chroma Interior Lighting System, and the Razer x BMW IVI System. Razer collaborating with BMW has the potential to disrupt and shape the future of the automotive industry, especially drive new design trends in automotive interiors. In retrospect Razer could produce its own cars, like Apple plans to do, but in this case the implementation of already existing or modified products into an existing product is less risky and potentially more profitable. On the contrary, the Razer x BMW car wouldn't necessarily need to be mass-produced and could simply remain a concept car. Such an innovation would still positively impact both industries, as new ideas were formed and introduced into the market for further development and

inspiration for car design and interior technology. Moreover, such a collaboration would add to solidifying their reputations as innovative, open-minded brands.

References

Howells, J. (2023e, March 29). Collaboration: key to the auto industry’s future. Orange Business.
https://www.orange-business.com/en/blogs/collaboration-key-auto-industrys-future

Razer to buy out e-payments platform MOL for S$81m. (2018d, April 25). Channel NewsAsia.
https://web.archive.org/web/20180502064102/https://www.channelnewsasia.com/news/singapore/razer
-acquire-mol-global-gaming-virtual-credits-10173018

Lee, Y. (2017, November 13). PC Gear Maker Razer Surges on Hong Kong Debut as Tech IPOs Boom.
Bloomberg.com.
https://web.archive.org/web/20171201033451/https://www.bloomberg.com/news/articles/2017-11-
13/razer-rises-in-debut-after-raising-530-million-in-hong-kong-ipo

Razer Phone 2 – Flagship // Gaming – Razer Press. (n.d.).
https://web.archive.org/web/20190228191853/https://press.razer.com/press-releases/razer-announces-
the-razer-phone-2/

Auto, H. (2018, July 5). Razer Pay launches in Malaysia. The Straits Times.
https://www.straitstimes.com/business/companies-markets/razer-pay-launches-in-malaysia

Leo, L. (2021b, October 26). Gaming firm Razer opens new Southeast Asia headquarters in one-north. CNA.
https://web.archive.org/web/20211027091427/https://www.channelnewsasia.com/singapore/gaming-
firm-razer-opens-new-southeast-asia-headquarters-one-north-cafe-store-2270501

Salim, Z. (2021, February 1). Razer To Hire About 1,000 Roles For New SEA HQ In S'pore. Vulcan Post.
https://web.archive.org/web/20210202073015/https://vulcanpost.com/732417/razer-hiring-about-1000-
roles-sea-hq-singapore/

Honorof, M. (2019, July 13). Razer DeathAdder Passes 10 Million Sales, But Is It Still Worth It? Tom's Guide.
https://www.tomsguide.com/features/razer-deathadder-passes-10-million-sales-but-is-it-still-worth-it

Hollister, S. (2022, April 14). Razer's first Linux laptop is here, but it's not for gamers. The Verge.
https://www.theverge.com/2022/4/14/23025968/razer-first-linux-laptop-lambda-tensorbook-tensorflow

About Razer. (n.d.). Razer. https://www.razer.com/about-razer

Westover, B. (2014, June 11). Razer CEO: "For Gamers, by Gamers" Is More Than Just a Slogan. PCMAG.
https://www.pcmag.com/news/razer-ceo-for-gamers-by-gamers-is-more-than-just-a-slogan

Eklahare, J. (n.d.). Collaborative technology for automotive manufacturing. https://www.industr.com.
https://www.industr.com/en/collaborative-technology-for-automotive-manufacturing-2385103

Kwan, M. (2015). Chinese Counterfeit Ring Busted by Razer. Futurelooks Media Inc.
https://www.futurelooks.com/chinese-counterfeit-ring-busted-by-razer/

Marr, B. (2022, February 28). The Five Biggest Gaming Technology Trends In 2022. Forbes.
https://www.forbes.com/sites/bernardmarr/2022/02/28/the-five-biggest-gaming-technology-trends-in-
2022/?sh=1cca5185fc77

Statista. (2023, April). Video Games - Worldwide | Statista Market Forecast. Retrieved May 2, 2023, from
https://www.statista.com/outlook/dmo/digital-media/video-games/worldwide

®Csm, C. B. P. (n.d.). Top 10 Technology and Innovation Trends in Automotive Industry. www.linkedin.com.
https://www.linkedin.com/pulse/top-10-technology-innovation-trends-automotive-bapat-pmp-csm-

12 Emerging Automotive Industry Technology Trends to Know - Auto - Notarize. (n.d.).
https://www.notarize.com/blog/12-emerging-automotive-industry-technology-trends-to-know

Disruptive trends that will transform the auto industry. (2016, January 1). McKinsey & Company.
https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/disruptive-trends-that-
will-transform-the-auto-industry

How Tech is Driving the Auto Industry Forward. (n.d.). Kyndryl. https://www.kyndryl.com/gb/en/about-
us/news/2023/02/automotive-industry-tech-trends

Motivity Labs Career. (2022, December 21). Top 7 Automotive IT Trends: Technology & Innovations.
Motivitylabs. https://motivitylabs.com/top-7-trends-in-automotive-it-consulting/

StartUs Insights. (2023, January 24). Top 10 Automotive Industry Trends & Innovations 2023 | StartUs Insights.
https://www.startus-insights.com/innovators-guide/automotive-industry-trends-10-innovations-that-
will-impact-automotive-companies-in-2020-beyond/

Taller, H. (2022, December 7). Top 4 Automotive Technology Trends in 2023.
    https://content.intland.com/blog/top-4-automotive-technology-trends-in-2023

Techno. (2023). Top 10 Automotive Industry Trends 2023. TechnoBrains. https://technobrains.io/automotive-industry-trends-to-watch-out-for/

Wadhwani, P. (2023, January 31). Top 10 Automotive Industry Trends to Watch in 2023. IT Blog | Mobile App Development India | Offshore Web Development - Bacancytechnology.com.
    https://www.bacancytechnology.com/blog/automotive-industry-trends

Writer, G. (2022). 11 Recent technological trends in the Automobile sector. Craving Tech.
    https://www.cravingtech.com/11-recent-technological-trends-in-the-automobile-sector.html

Yuan, J. & Faraday Future. (n.d.). The Driver-Focused Human Machine Interface. The Driver-Focused Human Machine Interface. http://www.driverfocusedhmi.com/#introduction

Elektrobit. (2022, August 1). Human Machine Interface (HMI) in automotive – Elektrobit.
    https://www.elektrobit.com/trends/human-machine-interface/

MINI. (2022, July 27). The MINI Concept Aceman - Reveal. [Video]. YouTube.
    https://www.youtube.com/watch?v=m9p8y_mzGQQ

Debkaliuk, A. (2023, March 27). Automotive HMI design challenges | Star Insights. Star.
    https://star.global/posts/automotive-hmi-design/

Payne, S. (2022). Car Design of the Future: 10 Car Trends in Automotive Design. TheCoolist.
    https://www.thecoolist.com/car-of-the-future-automotive-design/

Saxena, A. (2023, April 5). In-Vehicle Infotainment System - Everything You Need to Know About.
    https://www.einfochips.com/blog/everything-you-need-to-know-about-in-vehicle-infotainment-system/

BMW Group PressClub. (n.d.). MINI ist neuer Hauptsponsor der gamescom merch area sowie offizieller Mobilitätspartner der gamescom und präsentiert beim weltweit größten Games-Event in Köln exklusiv das MINI Concept Aceman mit Pokémon Mode. Das begehrteste Einzelstück für MINI Fans und Gaming-Enthusiasten ist das erste Ergebnis der Zusammenarbeit von MINI und Pokémon. BMW Group PressClub.
    https://www.press.bmwgroup.com/deutschland/article/detail/T0403076DE/spielerische-kooperation

BMW Group PressClub. (2023, August 8). Das offizielle Presseportal der BMW Group in 19 Sprachen. Wir stellen Ihnen die neuesten Presseveröffentlichungen der BMW Group aus erster Hand frei zur Verfügung. Das Material umfasst Text, Foto, Audio, Video, TV Footage.
    https://www.press.bmwgroup.com/deutschland/video/detail/PF0009025/mini-concept-aceman-x-pok%C3%A9mon-mode

McKinsey & Company. (2021, November 12). The future of interior in automotive.
    https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-of-interior-in-automotive

Reseach Dive. (2022, July). Automotive Infotainment Market Share & Global Revenue by 2030. Reseach Dive.
    https://www.researchdive.com/8518/automotive-infotainment-market

BMW. (2022, August 3). A New Take on Vehicle Development. www.bmw.com.
    https://www.bmw.com/en/events/nextgen/global-collaboration.html

Parries, M. (2020, November 20). Virtual collaboration -BMW Group is using technology from the gaming sector . - automobilsport.com. NEWLINE. https://www.automobilsport.com/cars-tuning--37,215838,Virtual-collaboration--BMW-Group-is-using-technology-from-the-gaming-sector,news.htm

Brown, M. (2017). BMW Designs a Car Entirely With Video Game Technology. Inverse.
    https://www.inverse.com/article/29417-bmw-vr-kits-gaming-pcs-virtual-cars

BMW. (2021). Live from BMW Welt: The Esports industry assembles virtually at BMW Esports Boost – Premiere for "The Rival Rig" from RIVALWORKS. BMW Corporate Communications.
    https://www.bmwgroupdesignworks.com/wp-content/uploads/2021/06/BMW_Esports_Boost_Press_Release.pdf

Takahashi, D. (2023, January 5). BMW shares its vision of future cars with BMW i Vision Dee. VentureBeat.
    https://venturebeat.com/games/bmw-shares-its-vision-of-future-cars-with-bmw-i-vision-dee/

BMW Group. (2022, August 23). Playful cooperation: MINI is sponsor and mobility partner of gamescom for the first time and presents the MINI Concept Aceman with Pokémon Mode. BMW Group PressClub. https://www.press.bmwgroup.com/deutschland/article/detail/T0403076DE/spielerische-kooperation

BMW Group PressClub. (2023, March 9). BMW Group and AirConsole host joint Developer Competition for In-Car Games. BMW Group. Retrieved May 11, 2023, from https://www.press.bmwgroup.com/global/article/detail/T0410538EN/bmw-group-and-airconsole-host-joint-developer-competition-for-in-car-games?language=en

BMW Group PressClub. (2022, November 11). BMW Group partners with AirConsole to bring casual gaming into vehicles in 2023. BMW Group. Retrieved May 11, 2023, from https://www.press.bmwgroup.com/global/article/detail/T0404246EN/bmw-group-partners-with-airconsole-to-bring-casual-gaming-into-vehicles-in-2023?language=en

Hedges & Company. (2020, July 10). Automotive eCommerce Blogs, Car Enthusiast Market Size and Trends. https://hedgescompany.com/automotive-market-research-statistics/auto-industry-news/#:~:text=The%20specialty%20equipment%20market%20is%20more%20than%20%2444%20billion%20in%202019.&text=This%20data%20comes%20from%20SEMA,do%20it%20yourself%20(DIY).

Imlay, M. (2019, June 3). Do Young People Still Love Cars? Specialty Equipment Market Association (SEMA). https://www.sema.org/news-media/magazine/2019/22/do-young-people-still-love-cars#:~:text=By%20age%2023%2C%20more%20than,them%20stay%20closer%20to%20friends.

Corporate Finance Institute. (2023). Ansoff Matrix. Corporate Finance Institute. https://corporatefinanceinstitute.com/resources/management/ansoff-matrix/

Bain & Company. (2018, August 7). Strategic Alliances. https://www.bain.com/insights/management-tools-strategic-alliances/#:~:text=Evaluate%20and%20select%20potential%20partners,includes%20systems%20to%20monitor%20performance

Kenton, W. (2022). Strategic Alliances: How They Work in Business, With Examples. Investopedia. https://www.investopedia.com/terms/s/strategicalliance.asp

APPENDIX

[i] A good gaming experience with hardware includes ease of use, simplicity, sleek and edgy design, efficiency, durability, precision, and responsivity.

[ii] Razer Blade 18 – QHD + 240 Hz - GeForce RTX 4090

[iii] Additionally, Razer products have a one-year guarantee principle.

[iv] Such as British fashion brand Paul Smith or German tuning company AC Schnitzer.

[v] For which the car manufacturer is notorious for in comparison to other car manufacturers.

[vi] Apart from online networking, BMW has a strong dealership network in many countries, which means that a potential collaborative vehicle would be guaranteed a wider customer reach and exposure increasing the probability to be bought.

[vii] In 2015, a group of counterfeiters were each sentenced with one year in prison and fined around $22,000 (Kwan, 2015).

[viii] Some of the current automotive technological trends that are shaping the automotive industry today are electric and autonomous vehicles (EVs), sustainability, artificial intelligence (AI), augmented reality (AR), virtual reality (VR), blockchain, biometrics, big data analytics, in-car internet, connectivity and connected vehicles, human-machine interfaces, digital cockpits, automatic lift gate, 5G connectivity, internet of things (IOT), advanced driver assistance systems (ADAS), predictive maintenance, cloud computing, vehicle-to-vehicle communication (V2V), vehicle-to-grid (V2G) Technology, vehicle-to-everything (V2X) communication, LiDAR, in-car health monitoring, digital twins, advanced materials, and digital vehicle buying and online retail.

[ix] As explained by Alex Debkaliuk (2023), author of an article on Automotive HMI design challenges, published on product-creation company, Star: HMIs are features and components of car hardware and software applications that allow drivers and passengers to engage with the vehicle, as well as the outside world. These solutions include navigation system touchscreens, voice-enabled vehicle infotainment clusters, the steering wheel, buttons, displays, and driving assistance tools that enable people to understand in-car technology, operate their vehicles safely, and feel comfortable and in-control as self-driving becomes more widely available. In fact, autonomous and electric vehicles cannot achieve mass customer adoption, unless OEMs get HMI development right.

[x] It hosts "digital functions that go far beyond the level of voice control and driver assistance systems we are familiar with today" (Takahashi, 2023).

[xi] Through advanced projection technology, the animation extends over the dashboard, the front doors, and the apron projection. In the animated loop, the Poké Ball appears in the OLED display and moves, to then open in a blue glow which then moves from the OLED display to the dashboard and to the light strip on the doors as well as the front projection through the vehicle interior. In another loop, Pikachu appears on the display at the start and starts a bright yellow lightning attack, which also runs through the vehicle via the inner doors and the front projection (BMW Group, 2022)

[xii] The BMW Group and Air Console are launching a competition to develop games tailored to the in-car experience at the San Francisco Game Developer Conference (GDC) at the end of March 2023 (BMW Group Press Club, 2023). These examples show how important the interiors of vehicles and the implementation of gaming and gaming technologies in the automotive industry are becoming.

[xiii] The automotive industry is highly social in nature and brings people together just like the gaming industry does.

[xiv] in 2019.

[xv] The category most spent on is wheel and tire modifications (49%), and exterior and body modifications (42%). Furthermore, it is vital to acknowledge that today's younger generations see the automobile industry and cars as a community and a main way to connect with friends, have new experiences, and stay busy (Imlay, 2019).

[xvi] The materials used were Premium leatherette (EPU), Alcantara®