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Digital big-bang Metaverse: opportunities and threats

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Abstract

The purpose of this thesis is to analyze the concept of the Metaverse as well as its constituent parts in order to determine the many types of business models available in the Metaverse as well as the motivations behind investments made by various firms. The scope of the case study has been limited to a sample of only two businesses, Ubisoft and Adidas, which are evaluating their most recent investments and initiatives. The research questions for the thesis are as follows: Why do businesses have a tendency to invest in the Metaverse? How will the future population benefit from the Metaverse? What are the potential hazards and opportunities? The research approach that will be used for this thesis work is a qualitative case study. The author intends to explore two organizations that are actively investing in Metaverse in order to acquire a competitive edge over their competitors in the market. The author conducted an analysis of all of the most recent numbers and initiatives carried out by those two firms and compared their respective goals and objectives in the Metaverse.

Key words: Metaverse, VR, Cryptocurrency, Business model, Canvas

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INTRODUCTION

In recent years, virtual reality and augmented reality technologies have been on the increase, which has resulted in a dramatic alteration of the digital world. This transition has led to the establishment of a new type of virtual world known as the metaverse. The metaverse is a shared place in which users may interact with one another and with digital things. The metaverse may be seen of as a new frontier for businesses, since it provides a diverse array of possibilities for establishing connections with clients and generating new sources of income. The metaverse is a virtual world that can be accessed by users over the internet. This virtual world has a substantial influence on the business models that are now in use. It makes it possible for new kinds of business to exist, such as the sale of digital products and services, and it may also make it possible for new kinds of marketing, advertising, and interaction with customers. In addition to this, it paves the way for businesses to develop a presence in virtual places and connect with new audiences, which opens up new business potential. Nevertheless, it also poses difficulties for companies, such as the requirement to adjust to new technology and user behaviors and the necessity to successfully negotiate the legal and regulatory environment of virtual worlds. Among other difficulties, these issues may include:

The purpose of this thesis is to investigate both the potential and the risks that are presented to organizations by the metaverse. The application section of the thesis will center on a case study that examines how two prominent corporations, Ubisoft and Adidas, are tapping into the potential of the metaverse as a new market opportunity. Ubisoft is both a creator and publisher of video games, and the company has been in operation for more than 35 years. Ubisoft made the announcement in 2021 that the company will be investing one billion dollars into the metaverse over the next five years. It is anticipated that this investment will be put toward the creation of new games and experiences for the metaverse, in addition to the expansion of the necessary infrastructure to support it.

On the other hand, Adidas is a worldwide leader in the sportswear industry. In the year 2020, Adidas made the announcement that over the following five years, the company will be investing $1.8 billion into the metaverse. It is anticipated that this investment would go toward the creation of virtual stores for Adidas items as well as the development of virtual experiences that will enable customers to try on Adidas products and interact with them in a virtual environment. The purpose of this case study is to investigate the tactics and strategies that Ubisoft and Adidas

have utilized in their respective investments in the metaverse, as well as the possibilities and challenges that both companies have come across. The influence of the metaverse on their company as well as the opportunities for future expansion in this field will be analyzed as part of the research as well.

This thesis will provide useful insights into the potential and challenges connected with this technology for organizations, which is an important consideration given the rapid development of the metaverse as a sector. The case study of Ubisoft and Adidas will serve as a practical example of how businesses can harness the metaverse to establish new income streams and engage with customers in new ways. This will be demonstrated via the use of a case study. Businesses who are interested in understanding the potential of the metaverse and learning how to handle the possibilities and challenges connected with this technology will find this thesis to be a very helpful resource.

CHAPTER 1. BUSINESS MODELS AND INNOVATIVE TRANSFORMATIONS

1.1 Defining business models and frameworks

The widespread use of personal computers and spreadsheet software coincided with the rise in popularity of the phrase "business model." Before the advent of spreadsheets, business planning often consisted of the production of a single base case prediction. At most, only a limited amount of sensitivity analysis may be carried out in relation to the forecast. On the other hand, the introduction of the spreadsheet ushered in a far more analytical method of planning. As a result, it is possible to do research and examinations on every object, as well as on its constituent parts and subcomponents.

It is now possible to ask any question you want regarding the critical assumptions that your company is dependent on, and it is now possible to see how any change will play a role in every aspect of the whole with just a few keystrokes. Both of these advancements were made possible as a result of the previous ones. To put it another way, it is now possible to simulate the behavior of a company. During that time period, this progression represented something novel for the business world. Prior to the advent of personal computers, the nature of company planning was significantly altered, and as a result, the most successful business models were more often developed by accident than via deliberate design and forethought.

After the invention of personal computers, there was a shift toward a more refined comprehension of the business model. It is now feasible to model enterprises before they are launched into the market since business models have made it possible for corporations to attach their market insights to the ensuing economic spreadsheets in a much more direct and precise manner.[1]

The explosive rise of internet-based firms in such a short period of time has brought to light the necessity to comprehend the processes utilized by successful corporations and to hypothesize the workings of their business models.[2] In 2001, Alt and Zimmermann emphasized that the term

[1] Magretta, J. (2002). Why business models matter, Harvard Business Review

[2] Mahadevan, B. (2000). Business models for Internet-based e-commerce: An anatomy. California management review 42.4, pp. 55-69.

"business model" is used extensively, both academically and in practice, and that a solid business model is generally considered to be of high importance because it affects the revenues and future success of e-Business startups. This is due to the fact that a solid business model is generally considered to be of high importance because it affects the revenues and future success of e-Business startups. However, the authors pointed out in their evaluation from 2001 that there were not many evidence that the business model was understood, nor that aspects of their business model were widely prevalent. They concluded that this was likely due to the fact that the study was written in 2001.[3]

In a related vein, in the book Internet Business Models and Strategies that was published in 2003 by Afuah and Tucci, the authors state that the fact that the phrase "business model" has entered the vocabulary of everyone who is required to work and manage businesses that deal with internet content, ranging from business owners to chief executive officers, is an indication that the significance of the business model has increased with the advent of the internet.[4] Timmers, in his study of the business model for electronic markets in the year 1998, stressed that there were no consistent results in the usage of the phrase "business model." He noted that writers frequently failed to offer a definition for the term, which was one of the reasons for this.[5]

In a similar vein, Morris, Schindehutte, and Allen investigated the business model in the context of entrepreneurial activities and came to the conclusion that there is not yet a unified understanding of its definition, nature, structure, or evolution. The conventional power dynamic between a company's customers and suppliers has been shifted as a result of developments in the global economy. Customers are now able to have more choice, to communicate diverse consumer wants, and to make alternative procurement methods more transparent as a result of advancements in information and communication technology as well as the establishment of relatively open

[3] Alt, R. and Zimmermann, H. D. (2001). Preface: introduction to special section–business models. Electronic markets 11.1.

[4] Afuah, A. and Tucci, C. L. (2003). Internet business models and strategies: Text and cases, Vol. 2. New York: McGraw-Hill.

[5] Timmers, P. (1998). Business models for electronic markets. Electronic markets 8.2.

global trade regimes.[6] Entrepreneurs can develop new chances to combine factor and product markets in a variety of ways by making use of information and communication technology.[7]

For this reason, businesses need to focus more on the needs and wants of their customers so long as technology continues to make it feasible to deliver information and solutions to them at a lower cost. The supply-side shaping strategy that was prevalent throughout the industrial period is no longer applicable in many different fields. Because of these developments, it is now vital for companies to periodically reevaluate the value propositions that they provide to their clientele.[8] A business model is all about data and other evidence that shows how a business creates and values customers. It also outlines the architecture of the revenues, costs, and profits associated with the venture that provides that value.

A good business model is an indispensable tool for any successful organization, whether it's a new venture or an existing player. In addition, successful business models have the potential to reshape industries and drive extraordinary growth.[9] The connection of the Business Model with technology is also remarkable. Technology in and of itself doesn't have much objective value. The potential economic value of a technology remains hidden until it is commercialized. A good business model is what will enable the idea to be transformed into a desired economic value. Using the business model, companies commercialize new ideas and technologies. Potential new technology owned or developed by a startup or business may not have a clear business model. In such situations, technology managers must broaden their perspective to find a suitable business model to derive value from this technology.

If they cannot discover a suitable business model, even if they are the party that develops the technology in question, they will stay behind the 3rd parties or institutions that put that

[6] Teece, D. J. (2010). Business models, business strategy and innovation, Long range planning, 43, pp. 172-194.

[7] Zott, C. and Raphael, A. (2007). Business model design and the performance of entrepreneurial firms. Organization science, 18.2, pp. 181-199.

[8] Teece, D. J. (2010). Business models, business strategy and innovation, Long range planning, 43, pp. 172-194.

[9] Johnson, M. W., Christensen, C. M. and Kagermann, H. (2008). Reinventing your business model. Harvard business review 86.12, pp. 57-68.

technology together with a good business model.[10] It is possible to summarize the areas where business models can contribute to entrepreneurs as follows:[11]

1. Understanding and sharing the way of doing business: Concretely, business models help to capture, visualize, understand, communicate and share the way of doing business.

2. Analyzing the way it does business: Concretely, it can make measuring, observing and comparing the way a company does business more successful.

3. Improving the way of doing business: The concept of business model helps to improve the design, planning, modification and implementation of business models. Also, with a business model approach, entrepreneurs can react more quickly to changes in the business environment. Additionally, the business model concept improves strategy, business organization and technology alignment.

4. Pointing out possible future projections: Business model concept; It can help increase the speed of innovation through business model portfolios and simulation, and help the enterprise or enterprise become more swift and agile in preparation for the future.

At least one of these challenges is faced by each and every business and business idea. If there is already a business, if a new business is going to be opened, or if there is an entrepreneurial spirit present, then questions such as "What is the business model?" and "What is it good for?" can be answered from a new window, which is the Canvas Business Model. What kind of business model do we have? To begin, a Business Model is not the same thing as a Business Plan. A template for how a company generates and disseminates its values, as well as how it maintains its financial viability, is referred to as its "business model." In contrast to the business plan, which details the order in which each activity should be carried out, developing a business model entails creating a road map of the entire enterprise.

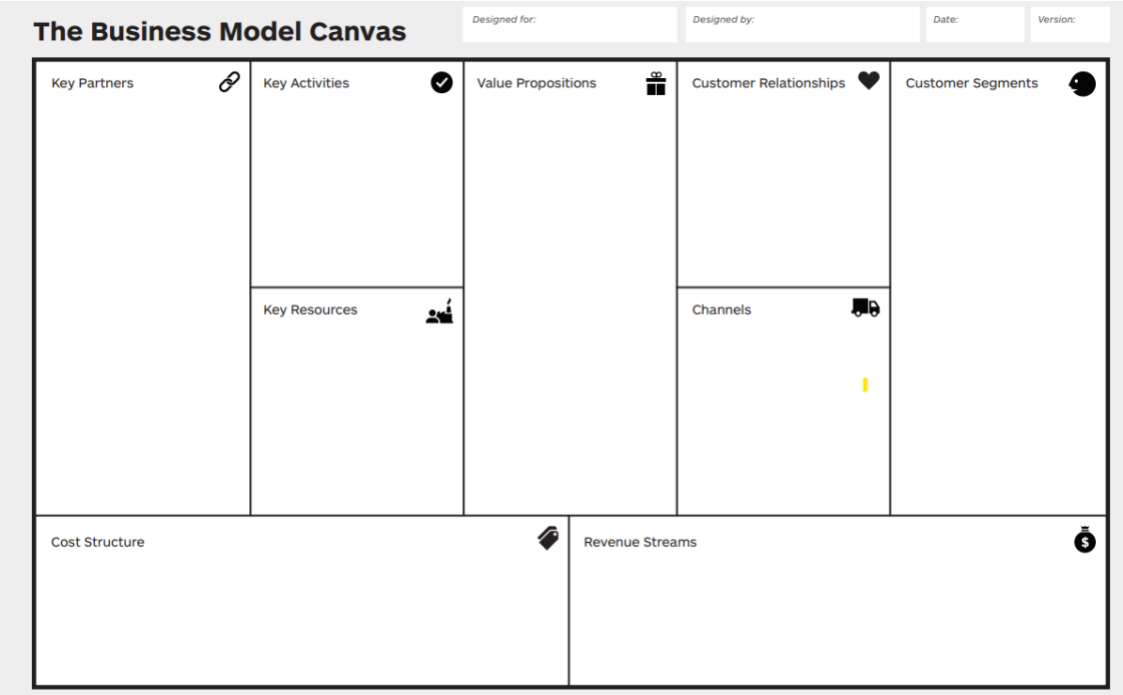
The Business Model Canvas (BMC) was developed and developed during the doctoral thesis of Alex Osterwalder in 2008, led by Eric Ries, and it is now continuing to be used by a large number of large businesses as well as entrepreneurs. The Osterwalder Canvas Business Model

[10] Chesbrough, H. (2010). Business model innovation: opportunities and barriers. Long range planning 43.2-3, pp. 354-363.

[11] Osterwalder, A. (2004). The business model ontology a proposition in a design science approach, PhD Thesis, Université de Lausanne, Faculté des hautes études commerciales

provides entrepreneurs with a template that is simple to comprehend and articulate, allowing them to adapt their business concepts in response to shifting market conditions while maintaining their competitive edge. You will now be able to see everything on one page, which will allow you to avoid wasting time and effort by making connections between the titles, as well as increase your overall performance and motivation. Previously, you would have gotten lost in the pages of lengthy reports that you would prepare for weeks. Osterwalder wants to assist businesses in acquiring the most effective instruments for innovating their value propositions and business models through the use of his Canvas Business Model. Building models and conducting strategic planning are only two aspects of the program. You will also be able to facilitate decisions regarding innovation, mergers, acquisitions, and investments when you use the Canvas business model. If you own a company or are an entrepreneur, you need to have a strong business model in order to persuade investors, attract talented employees, and motivate management and other employees. Obviously, this is not the type of certificate that can be completed in a single sitting and then framed and displayed on the wall. Even if you already have a successful company, if you do not keep your strategy up to date on a consistent basis, you will not be able to keep up with technological advancements or anticipate the challenges you will face.

Figure 1. Canvas Business Model



Source: Carter, M., & Carter, C. (2020)

There are nine building blocks to the Canvas business model. Brainstorming and research should be done about each of the elements in this model. The collected data can be embedded in each relevant part of the canvas business model. The 9 components of the Canvas business model are:

1. Customer Segments

These will be the people or groups of companies trying to target and sell products or services to. Customers may differ by geographic region, gender, age, behavior, areas of interest, etc. sorting by similarities will give them the opportunity to better serve their needs, especially by customizing the solution offered them.

2. Customer Relations

In this section, the type of relationship must be determined you will establish with each customer segment or how will interact with them during their journey with your company. Through the customer journey map, it will be easy to understand the type of relationship customers have with company. It will be able to help identify the different stages customers go through when interacting directly with company. It will also help on how to retain customers and grow business.

3. Channels

This section is there to explain how your company can communicate with and reach your customers. With channels, you can enable your customers to connect with your company. Channels play a role in raising awareness of your products and services among customers.

4. Revenue Streams

Revenue streams have been sources where a company makes money by selling its products or services to customers. In this section, there is a need to explain how company can generate revenue from offers.

5. Key Activities

The activities that must be completed to perform business tool are demonstrated in his section. There are three main categories of activities that make up these activities; production, problem solving, platform/network.

6. Key Resources

This will be where the key resources or key inputs needed to run core activities are listed.

7. Key Partnerships

This section describes the network of suppliers and partners that run the business model. Some activities are outsourced and some resources are obtained from outside the company. Companies form partnerships to optimize their business models, minimize risk, or gain resources.

8. Cost Structure

The cost structure defines all the costs incurred to run a company. Creating and delivering value, maintaining customer relations, and generating income bring costs to every company. Such costs can be easily calculated after determining the main resources, main activities and main partnerships.

9. Value Propositions

This division is the building block at the very heart of the business model. Through the value proposition, it becomes a positioning statement that plays what benefits bring to whom and how to do it. It explains targeted customer base, the problem resolving, and why significantly better than the alternatives.

1.2 Business model innovation, its importance and differences from product, process innovation

A number of academics have emphasized the need of establishing the invention of business models on a more robust theoretical foundation.[12] Although a large number of research do not explicitly base their findings on any particular theory, several studies, such as those that conceptualized business model innovation, did partially employ well-established theories such as the resource-based perspective and transaction cost economics.[13]

In most cases, when people think of innovation, they have their minds set on new product development. There are three distinct ways that product innovation can manifest itself.

[12] Sosna, M., Trevinyo-Rodríguez, R. N., and Velamuri, S. R. (2010). Business model innovation through trial-and-error learning: The Naturhouse case. Long Range Planning, 43, pp. 383-407.

[13] Al-Debei, M. M., and Avison, D. (2010). Developing a unified framework of the business model concept. European Journal of Information Systems, 19, pp. 359-376

1) The creation of a brand-new product, such as the Fitbit or the Kindle produced by Amazon.

2) An enhancement to the functionality of the product that is already on the market, such as an increase in the megapixel count of the digital camera on the iPhone 11.

3) An additional function added to an already existing product, such as power windows for an automobile.

It's possible that technological advances, alterations in customer requirements, or even an outdated product design could be the impetus behind product innovation. The customer is generally aware of any innovations made to a product, which should lead to an increase in the customer's demand for the product.

The innovation of processes is probably the type of innovation that attracts the least attention. The production, distribution, and maintenance of a good or service are all aspects of the process that encompass the facilities, expertise, and technology that go into making them. There are an infinite number of ways that a process can be improved within these broader categories.

Changes in the tools, techniques, and software solutions used to assist in supply chain management and delivery system innovation Changes in the tools used to sell and maintain your good as well as methods used for accounting and customer service innovation Process innovation can include changes in the equipment and technology used in manufacturing (including the software used in product design and development). Process innovation can also include improvements in the tools, techniques, and software solutions used to help in supply chain management and delivery system innovation.

Changes to processes are typically only noticed and valued by employees within an organization, in contrast to product innovations, which are frequently obvious to customers. In general, alterations to a process are more likely to bring about a decrease in total production costs than they are to bring about an increase in total revenue. Process innovation typically entails the least amount of risk compared to the other two types.

Henry Ford's creation of the world's first moving assembly line is widely regarded as both one of the most groundbreaking and well-known examples of process innovation. This

modification to the process not only simplified the assembly of the vehicle but also reduced the amount of time required to produce a single vehicle from twelve hours to ninety minutes.

Differential has just recently finished developing a mobile sales dashboard for Grupo Bimbo. The baking company operates 65 manufacturing plants and 2.5 million sales centers spread out across three continents and 22 countries. As a direct consequence of this, the members of the executive team spend a significant amount of time traveling to meet with their direct reports in various locations around the world. Having a mobile sales dashboard provides the team with easy access to the sales information as well as other key performance indicators (KPIs) for each country, channel, and brand. As a result, they can make more informed decisions regarding sales and spend less time in meetings.

The innovation of a business model is likely the most difficult of the various types of innovation because it will most likely present an organization with significant requirements for change. Frequently, the very capabilities or processes that have been optimized to make a company successful and profitable will become the targets of transformation. This is because transformation seeks to improve something that has already been optimized. These changes may, in some instances, pose a threat to aspects of the company's identity and bring brand expectations and promises into direct conflict with one another.

Business model innovation, on the other hand, is almost always disruptive, high-risk, and game-changing, in contrast to innovation in product and process, both of which can be incremental and moderate. When the topic of business model innovation is broached, it is inevitable that companies such as AirBnB, Uber, and Spotify will be mentioned. These are excellent illustrations of fast-moving companies that were successful in shaking up established markets by modifying or completely flipping the conventional business model of their respective industries.

As a result of these powerhouses, many people could be led to believe that only startups are capable of massively innovative business model. However, there are a number of large, well-established organizations that have leant on their advantages of a larger customer base and greater resources to challenge their existing business model and disrupt themselves. Startups have a significant advantage due to their ability to iterate and adapt their model while they are in the process of creating an initial business model design.

The activity systems view, dynamic capacities theory, and practice theory are just a few of the other ideas that have been utilized to assist in answering the topic of how companies alter their business models. Zott and Amit (2010) illustrated how creative business models may be established via the use of design themes that represent the source of value generation and design components that explain the architecture. They did this by using the activity systems viewpoint to their research. This work, on the other hand, fails to take value capture into account, which restricts the explanation of the (holistic) approach offered for the system.[14]

In addition, Chatterjee (2013) used this viewpoint to demonstrate that companies are able to develop creative business models that convert value capture logic to fundamental objectives, and that these objectives can be achieved through the activity system.[15] The dynamic capability approach views the invention of business models as beginning with an experiment, then proceeding to ongoing modification, adaptation, and fine-tuning based on the lessons learned via trial and error.[16]

From this vantage point, Demil and Lecocq (2010) demonstrate that "dynamic consistency" is a competence that enables businesses to maintain their performance while changing their business models through both voluntary and emergent changes. This is a significant achievement for any company.[17] In addition to this, Mezger (2014) conceived of business model innovation as a separate dynamic skill. He contends that this competency refers to a company's ability to perceive possibilities, capitalize on those opportunities through the creation of valuable and distinctive business models, and then reorganize its competencies and resources in accordance with this new vision.[18] Making use of many parts of practice theory, Mason and Spring (2011) conducted research on the topic of business model innovation in the recorded sound industry. They discovered

[14] Amit, R., and Zott, C. (2012). Creating value through business model innovation. MIT Sloan Management Review, 53, pp. 41-49.
[15] Chatterjee, S. (2013). Simple rules for designing business models. California Management Review, 55, pp. 97-124.
[16] Sosna, M., Trevinyo-Rodríguez, R. N., and Velamuri, S. R. (2010). Business model innovation through trial-and-error learning: The Naturhouse case. Long Range Planning, 43, pp. 383-407.
[17] Demil, B., and Lecocq, X. (2010). Business Model Evolution: In search of dynamic consistency. Long Range Planning, 43, pp. 227-246.
[18] Mezger, F. (2014). Toward a capability-based conceptualization of business model innovation: Insights from an explorative study. R&D Management, 44, pp. 429-449

that this type of innovation may be accomplished through a wide variety of different combinations of managerial techniques.[19]

There have been examples of both static and transformational methodologies used to portray business models.[20] The first way is to see business models as containing fundamental components that impact business performance at a certain point in time. This is known as the core elements viewpoint. This technique provides a summary of the components of a business model as well as an explanation of how those components are put together. This can be helpful in both comprehending and conveying a business model.[21]

The latter, on the other hand, places an emphasis on innovation and the means by which to adapt business models to shifts that occur throughout time.[22] Ex ante analysis has been used by some scholars to determine the fundamental components of business models, whereas a priori analysis has been advocated by others as a potentially limiting approach.[23] It should not come as a surprise that a number of academics discovered a compromise where the elements are only weakly specified, allowing for greater flexibility in the depiction of business models.[24]

In general, a business model is a conceptual tool that identifies and explains the important components of a firm into a distinct and all-inclusive framework, maybe with the use of diagrammatic tools. In addition to its many other benefits, the Business Model is particularly effective at illuminating the strategy that a company employs to profit from technology. It also

[19] Mason, K., and Spring, M. (2011). The sites and practices of business models. Industrial Marketing Management, 40, pp. 1032-1041.

[20] Demil, B., and Lecocq, X. (2010). Business Model Evolution: In search of dynamic consistency. Long Range Planning, 43, pp. 227-246.

[21] Yunus, M., Moingeon, B., and Lehmann-Ortega, L. (2010). Building social business models: Lessons from the grameen experience. Long Range Planning, 43, pp. 308-325

[22] Landau, C., Karna, A., and Sailer, M. (2016). Business model adaptation for emerging markets: a case study of a German automobile manufacturer in India. R&D Management, 46, pp. 480–503.

[23] Dmitriev, V., Simmons, G., Truong, Y., Palmer, M., and Schneckenberg, D. (2014). An exploration of business model development in the commercialization of technology innovations. R&D Management, 44, pp. 306-321

[24] Kiron, D., Kruschwitz, N., Haanaes, K., Reeves, M., and Goh, E. (2013). The innovation bottom line. MIT Sloan Management Review, 54, pp. 1-20.

serves as a model for how a network of companies collaborates to create and seize value from technical innovation, which is another one of its many advantages.[25]

In this sense, the business model is a powerful and strategic model that can explicitly explain, through the use of a combination of narrative and numbers, how an existing business operates, how a new business model is expected to perform, why a certain business is successful or not successful, and how to best exploit from digital. In other words, the business model is a model that explicitly explains how an existing business operates. If businesses want to continue to be successful and competitive over the long term, they need to reimagine their business models and manage them in accordance with how well they operate. The process of innovating a business model can have an effect on an organization's capacity to remain profitable and competitive over the long run.[26] The process of inventing a whole new business model or making significant changes to an existing one is referred to as business model innovation (by changing at least one component).[27] BMI's mission is to meet unsatisfied, unknown, or one-of-a-kind consumer desires by identifying innovative methods to manufacture and derive value.[28]

Business model innovation may be broken down into four different categories: business model acquisition, business model transformation, business model diversification, and business model start-up.[29] The process of creating a new business model for an already established firm is referred to as a startup. Transformation is the process through which a current business model is modified to take on the characteristics of a different business model. Diversification refers to the practice of keeping a current company model in operation while simultaneously developing a new business model. A new business model can be discovered, purchased, and incorporated into an existing one through the acquisition process. It is possible to approach BMI in any way, either as a project or as a process. Although the process view is generally similar, the perspective of the

[25] Wirtz, B.W. (2019), Digital Business Models, Springer Nature Switzerland.

[26] Afuah, A. and Tucci, C.L. (2003), Internet Business Models and Strategies – Text and Cases, 2nd ed., McGraw Hills, New York, NY.

[27] Amit, R. and Zott, C. (2012), "Creating value through business model innovation", MIT Sloan Management Review, Vol. 53 No. 3, pp. 41-49.

[28] Frankenberger, K., Weiblen, T., Csik, M. and Gassmann, O. (2013), "The 4l-framework of business model innovation: a structured view on process phases and challenges", International Journal of Product Development, Vol. 18 Nos 3/4, pp. 249-273.

[29] Geissdoerfer, M., Vladimirova, D. and Evans, S. (2018), "Sustainable business model innovation: a review", Journal of Cleaner Production, Vol. 198, pp. 401-416.

project on BMI does not incorporate any contributions from the relevant literature. Initiation, ideation, integration, and execution are the four steps that make up the process that is referred to as BMI in the 4-I framework.[30]

Finding a need for innovation, which might start with an original event, concept, or decision, is what it's all about when it comes to launching something. Ideation refers to the process of coming up with unique ideas or inventive approaches to a problem. Integration is the process of selecting the most promising choice and then further developing it to create a useful product, technique, or service. Integration may be thought of as a combination of the terms "choose" and "develop." Integration, which ultimately displays the idea in a more comprehensive light, accomplishes this goal by presenting the updated Business Model that is currently being used on the market. BMI is highly relevant to DEs because it fosters and supports the improvement of organizational performance. This makes BMI particularly relevant to DEs.[31]

Academics and industry professionals alike agree that business model innovation (BMI) is critically important to the creation and upkeep of competitive advantages. BMI is especially valuable to owners and managers of businesses since it provides a technique to acquire a competitive advantage over new goods and services. Despite the theoretical basis of BMI performance, it has been largely disregarded in the present literature, and a suitable theory of BMI performance management is still quite a ways off in the future.[32]

1.3 Digital transformations and business model challenges

As a result of the fact that digital transformation is an ongoing and ever-changing process, there is no universally accepted definition of what digital transformation is or what the scope of it entails.[33] The process of creating new possibilities and values through the utilization of digital

[30] Frankenberger, K., Weiblen, T., Csik, M. and Gassmann, O. (2013), "The 4l-framework of business model innovation: a structured view on process phases and challenges", International Journal of Product Development, Vol. 18 Nos 3/4, pp. 249-273.

[31] Spieth, P., Schneckenberg, D. and Ricart, J.E. (2014), "Business model innovation -state of the art and future challenges for the field", R and D Management, Vol. 44 No. 3, pp. 237-247

[32] Nielsen, C., Lund, M., Thomsen, P.P., Kristiansen, K.B., Sort, J.C., Byrge, C., Roslender, R., Schaper, S., Montemari, M., Delmar, A.C.P. and Simoni, L. (2018), "Depicting a performative research agenda: the 4th stage of business model research", Journal of Business Models, Vol. 6 No. 2, pp. 59-64.

[33] Schallmo, D. R., & Williams, C. A. (2018). History of digital transformation. In Digital Transformation Now! (pp. 3-8). Springer. h

technologies, as well as the process of strengthening social structures via the utilization of digital technologies and making them more efficient, is characterized as digital transformation. For the purpose of defining digital transformation as a process, it is necessary to construct the process so that it takes into account not only the future but also the past and the present.

Consequently, the adaptation of people, processes, and technologies are going to be the foundational pillars of this change. Due to the fact that this process consists of a variety of different components, it is necessary to examine digital transformation using an approach that is system-based and to incorporate all levels of the structure that is converting into this process. Transformation is not a method for fully discarding the previous system; rather, it is a strategy for modifying the previous system so that it can keep up with the change process, or even so that it can survive the change process, and for upgrading the current system. From this vantage point, the human, which is one of the fundamental aspects of the digital transformation process, is the primary subject in the process of adapting technology, while the technology itself, the object, and the process are the predicates. According to this methodology, in which the process serves as a predicate, transformation is required in order to gather and analyze data, to arrive at a better future by deriving information from knowledge, and by deriving wisdom from knowledge.

The term "digital transformation" refers to a process that can be broken down into a number of different paths and stages. This process is concerned with the business models, strategic orientations, and values of institutions. In addition to the technical dimensions, there are also social dimensions.[34] According to this point of view, studies on digital transformation show that the concept of innovation is at the center of digital transformation, and that the concept of digital transformation and innovation are often used interchangeably. This is supported by the fact that the term "digital transformation" was coined in the 1980s.[35]

Notable global initiatives that support the process of digital transformation are also worth mentioning. For instance, the 9th goal of the Sustainable Development Goals, which was announced by the United Nations in 2015, emphasizes the future importance of digital

[34] Osmundsen, K., Iden, J., & Bygstad, B. (2018, September). Digital Transformation: Drivers, Success Factors, and Implications. In MCIS (p. 37).

[35] Reis, J., Amorim, M., Melão, N., & Matos, P. (2018, March). Digital transformation: a literature review and guidelines for future research. In World Conference On Information Systems And Technologies (pp. 411-421). Springer.

transformation and points out the importance of digital transformation being inclusive. In a similar vein, UNESCO (2019), via its program titled "Future of Education," emphasizes that information and learning are humanity's greatest renewable or sustainable resources that may be used to adapt to difficulties and innovate alternatives. Education, in the same vein, places a strong emphasis on the necessity of generating and having access to information, with the goal of realizing the vision that education changes the world by doing more than simply reacting to the changing reality.[36]

Along the same lines as these views, EDUCAUSE (2021) calls attention to the transformational influence that technology has by highlighting the significance of the fast adoption of educational technologies in the teaching and learning edition of his study called Horizon Report. In higher education institutions that are working to adapt themselves to the process of digital transformation, digital transformation is a necessity both to catch the change and to gain the power to compete in the global race. This is because digital transformation allows higher education institutions to gain the ability to compete on a global scale. There are opinions that support digital transformation as well as those that are skeptical of digital transformation and strongly opposed to digital transformation. Despite the fact that digital transformation is seen as a necessary action to gain competitiveness and innovate, there are opinions that support digital transformation.[37]

It is believed that the need for two important skills in the field of education has emerged as a result of the Covid-19 pandemic, the first of which is self-adaptation, and the second of which is change. Although there are different opinions on digital transformation, it is thought that the need for these skills has emerged.[38] It is anticipated that students who are better able to adapt themselves to the one-of-a-kind circumstances presented by Covid-19 will demonstrate their capacity to think creatively and shift their mindset toward the idea that their skills ought to be applied to the field that is pertinent to the situation. It is of the utmost significance to link the idea of digital

[36] Brooks, D. C., & McCormack, M. (2020). Driving Digital Transformation in Higher Education. EDUCAUSE. https://e-learning-teleformacion.blogspot.com/2020/06/driving-digitaltransformation-in.html

[37] Bigum, C., & Kenway, J. (2005). New information technologies and the ambiguous future of schooling-Some possible scenarios. In A. Hargreaves (Ed.), Extending educational change (p. 95–115). Cham, NL: Springer.

[38] Ferrel, M. N., & Ryan, J. J. (2020). The impact of COVID-19 on medical education. Cureus, 12(3).

transformation with activities pertaining to learning and instruction in a manner that is premeditated and is founded on an approach that is systemic.[39]

Because the system approach is based on the fundamental principle that the parts that are related to each other work interactively in a whole, the problem that is experienced in any of the parts that make up the system should be removed from the system by interfering with the problem, without significantly affecting the operation of the system, and/or the interaction with the other parts in the flow of the system should be made efficient. This is because the system approach is based on the basic principle that the parts that are related to each other work interactively in For instance, the human body is an example of anything that may be taken into account within the framework of the systems approach.

The modern era has brought about significant shifts in the commercial sector. Activities have become dematerialized, moving away from traditional working ways and toward the use of working methods that are supported by information technology and digital tools. Some businesses may have reacted negatively to the shift by showing opposition and lacking faith in it. When confronted with an uncomfortable circumstance, one frequently encounters managers who are daunted by the magnitude of the task at hand, work teams who are unwilling to give up their traditional methods of operation, or individuals who are just terrified of change. There are a great deal of psychological roadblocks, each of which has the potential to occasionally hold down the adoption of novel and efficient solutions. Nevertheless, with effective management of change, all of these challenges may be surmounted, and one can make the most of the benefits that the next transformation may provide. In point of fact, the majority of decision-makers have a good understanding of the obstacles posed by technical advancements; but, the challenges posed by the discipline of economics, or even management and the social sciences, should not be ignored. In the following, we will discuss some of the issues that Lemoine and his colleagues (2014) regard to be important concerns:[40]

[39] Ackoff, R. L. (1994). Systems thinking and thinking systems. System Dynamics Review, 10(2- 3), 175-188

[40] Lemoine, C. (2014). Se former au bilan de compétences-4e édition : Comprendre et pratiquer la démarche. Dunod.

- Concerns of a technical nature: It is abundantly clear that the success of the process of digital transformation is inextricably tied to the company's capacity to master technology and their applications and to match these elements with the overarching strategy and the goals that are the end result. In a similar manner, in addition to these skills, additional success factors are added, such as professionalism in the collection and processing of data from internal and external flows, or even access to the skills required for this change, or even the establishment of loyalty and retention programs for them. All of these factors are essential to the achievement of success. A significant obstacle lies at the root of all of these difficulties, and that obstacle is the governance of change, or more specifically, digital transformation. Unquestionably, the primary goal is to master risk management and performance strategies while simultaneously enhancing value creation processes via the utilization of emerging technology.[41]

- Aspects Relating to the Economy The advent of digital technology ushered in a new era in management science. Old beliefs that have been passed down from earlier eras are either no longer relevant or, at the very least, need to be reconsidered and brought up to date. In a similar vein, working processes within firms as well as mechanisms of governance are always being updated at a breakneck pace day after day. Big Data, Blockchain, and the Internet of Things are now assets of an intangible and intangible nature that must be treated all like the company's previous assets. This is because these types of assets cannot be physically possessed. The academic community has an immediate need to discover the suitable tools and procedures for managing these assets. These are unquestionably significant assets that the markets have not yet adequately evaluated to their full potential.

- Human Issues: The disruptions caused by digitalization give rise to a number of issues for human resources, many of which are notoriously difficult to overcome because of the rapidity with which change occurs and the volatility of plans, objectives, and benchmarks. More than ever, digital transformation underscores the need to change the work environment, which should be centered on individuality, motivation, innovation, and above all recognition and merit. This should be the case because of the following reasons: 1.

[41] Bounfour, A., Fernandez, V., & Waller, E. (2015). Cloud computing and organisational design: towards a comprehensive research agenda. Systèmes d'information management, 20(4), 3-10

In addition to the technology challenges described earlier, the human element is unquestionably one of the most important factors in determining whether or not the digital transformation will be successful. In a related matter, a study conducted by McKinsey came to the conclusion that approximately 45 percent of the company's tasks are amenable to automation. This would free up employees' time from mundane and repetitive tasks, allowing them to concentrate more on really challenging tasks and creative endeavors. The fact that digital processes are working correctly is not, in and of itself, sufficient evidence to guarantee that the shift will be successful from a purely technological standpoint. Indeed, employees, managers, and executives all need to accept and adapt to these unpleasant changes in order to go forward.

There have been many transformation efforts that have been unsuccessful because the participants did not want to be a part of this movement, they were hesitant to adopt a new system, they did not have the skills necessary to integrate, or they did not have the backing of their hierarchical superiors. When it comes to the digitization process, the human element is still believed to be the weakest link.

Therefore, employees need to be persuaded by the change and the goals it aims to achieve. They are obligated to participate in this program in any way possible. In a similar vein, upper management has a responsibility to ensure that the workplace is conducive to innovation and change. Developing a new culture for the company is the only thing that has to be done.

- Morality and the obligation to care for others Issues: It is vital to highlight ethical concerns, those relating to the social responsibility of the organization, as well as environmental issues, in addition to the challenges pertaining to digital transformation that were described before in this paragraph. Without this consideration, the success of the digital transformation process would, without a doubt, be jeopardized, and its efficiency will suffer as a result. In this regard, let us not forget that the notion of CSR presupposes that a corporation is a social agent that is a component of a global framework where the decisions and actions of management personnel have impacts and build interactions with stakeholders, society, and the economic environment.

The final stage of digital transformation in the contemporary period is referred to as the Metaverse. This topic will be covered in further detail in the chapter that follows. The Metaverse is a domain of virtual reality that exists in three dimensions and allows users, who are represented

by avatars, to interact with one another, with the environment, and with the things that are located there. Users are also able to engage with the things that are currently there.

The term "avatar" refers to a digital depiction of a person that may be used within the Metaverse. The Metaverse is an environment that is made up of a potentially unlimited number of worlds in which users can communicate, network, play, participate in sports, work, use services, buy, sell, create new assets, attend events, express artistic talent, start businesses, and carry out any other activity that can also be carried out in the real world, but without the limitations associated with their position in space or language barriers. In other words, the Metaverse allows users to do all of the things that they can do in the real world, but without To put it simply, an avatar is the digital representation of a person.

Because it is built on technologies that currently enable users to access the full capacity of their connections, users who have connections that are extremely fast will be able to make full use of the potential of the Metaverse. It is, in point of fact, a cloud-based region that is managed in a significant degree by artificial intelligence and may be explored through the use of virtual and augmented reality. Transactions that take place inside this area may be codified with the use of smart contracts that are kept on the Blockchain. Non-fiat tokens, also known as NFTs, are used to verify the ownership of assets and the originality of works of art. Fiat currency and cryptocurrencies may both be used to pay for products and services.

CHAPTER 2. THE METAVERSE

2.1 The concept and ecosystem of Metaverse

The World Wide Web is continually gaining new dimensions as an incomplete project and provoking many disputes in the modern world, which is marked by the constant development and transformation of new communication technologies. The environment was primarily characterized by a one-sided transmission mechanism, and users participated primarily in the role of reader or consumer. Initially, the project was categorized as Web 1.0. In other words, the user of the website was in a position to consume content that had already been prepared. Later advances made possible the establishment of a new field that is now known as Web 2.0. This was made possible by putting an extremely fundamental idea like interactivity at the core of the Web. It is the manifestation of second generation internet services, and it has served to define the digital system that internet users create by becoming content producers, collaborating and sharing, and basing their actions on interactions with tools.[42]

The concept first began to be used in the early 2000s. As a result, the fundamental concept behind Web 2.0 is to provide users of the internet with as much engagement as is humanly possible, to make it possible for users to produce their own content, and to make sure that this content can be shared with other users. Users have taken their place not just as consumers who consume content that is already made, but also as producers who are able to produce in this system. Users consume content that is already made. The decline in the costs of storing information on the internet and connecting to it has also been a contributing factor in the development of social media platforms like YouTube, Facebook, Twitter, and Wikipedia, as well as virtual public spaces online where users can share content, particularly text, video, and photo-sharing websites. While Web 2.0 has a relatively recent chronological past and has not been able to fully expand in the majority of the peripheral nations, conversations about Web 3.0 have begun in earnest in the countries that are considered to be the heart of the internet.[43]

[42] Aghaei, S., Nematbakhsh, M. A., & Farsani, H. K. (2012). Evolution of the world wide web: From WEB 1.0 TO WEB 4.0. International Journal of Web & Semantic Technology, 3(1), 1-10.

[43] Nath, K., Dhar, S., & Basishtha, S. (2014, February). Web 1.0 to Web 3.0-Evolution of the Web and its various challenges. In 2014 International Conference on Reliability Optimization and Information Technology (ICROIT) (pp. 86-89). IEEE.

The procedure, which is now in the stage of the project, is based on texts that are both imaginative and scientific in nature as its primary sources. In this context, the term "Web 3.0" is sometimes connected with dystopia, and other times with utopia, but most commonly with robotics or artificial intelligence. In the end, the fundamental concept behind Web 3.0 is the concept of merging the virtual experience with the experience of the real world to the greatest extent feasible, and even constructing the Internet to function as a new living environment if at all possible. This line of thinking leads us to the concept of the Metaverse, which was first introduced by Neal Stephenson in his fictitious novel Snow Crash, which was published in 1991. The scientific community, which frequently constructs the future through intimate collaboration with the world of fiction, has recently placed a greater emphasis on the word "Metaverse." The problem took on new dimensions when the concepts and projects of establishing a Metaverse, which gained weight in decentralized structures such as Blockchain, started to attract the interest of global central businesses such as Google, Amazon, and Facebook.[44]

The prefix "meta" and the suffix "verse" are the two components that come together to form the word "metaverse." Therefore, the word's literal definition refers to a cosmos that exists outside of the physical world. However, what lies beyond the material world in this context does not relate to a philosophical or spiritual realm; rather, it is a world that has been constructed by the Internet. In addition, the term "Metaverse" refers to a digital environment that is completely immersive in all three dimensions. This is in contrast to the more all-encompassing idea of "cyberspace," which describes the entirety of the shared online space in all of its various representational dimensions.[45]

The widespread application of the notion in this manner is intimately connected to the widespread COVID-19 pandemic. As a matter of fact, as is well known, the pandemic process has established a clear path towards digitalization all over the world. People, in other words, tried to open up as much as they could in online virtual environments as a strategy for dealing with the repercussions of closure, which was the opposite of what they did in the real world, which was to close down. This method of using technology to fight the pandemic, which disrupts one's normal

[44] Mystakidis, S. (2022). Metaverse. Encyclopedia, 2(1), 486-497.

[45] Dionisio, J. D. N., III, W. G. B., & Gilbert, R. (2013). 3D virtual worlds and the metaverse: Current status and future possibilities. ACM Computing Surveys (CSUR), 45(3), 1-38.

routine in order to protect themselves, provided hints that pointed in a new direction. To such an extent that, despite the fact that the pandemic has had a significant negative impact on the global economy, there has been a significant increase in the demand for technical products in addition to the need for fundamental consumption. The efforts of the service industry and many communities to continue their operations online, particularly educational institutions and a wide variety of business lines, are what explains the reasons for the need in the field of technology. In the end, COVID-19 has been a huge impetus in making the Metaverse a reality. The Metaverse is an initiative that claims to provide accessibility in order to serve social needs, and COVID-19 has provided an opportunity to open oneself up to these changes.[46]

Since the 1990s, when the Internet first gained widespread use, cyberspace has undergone consistent development. There have been many different types of computer-mediated virtual environments developed, such as social networks, video conferencing, virtual 3D worlds (for example, VR Chat), augmented reality applications (for example, Pokemon Go), and fungible token games (eg Upland). Even if they are persistent and disconnected, these virtual worlds have, to varying degrees, led to our participation in the digital transition. In order to further allow digital change in every element of our physical existence, a new word known as "metaverse" has evolved in recent years. An immersive picture of the Internet as a large, unified, persistent, and shared world is the driving force behind the concept of the Metaverse. The Metaverse, which is defined by upcoming technologies such as Augmented Reality, 5G, and artificial intelligence, may seem futuristic; nonetheless, it is a signal that the digital great bang of our cyberspace is not far away. At the beginning of this digital explosion, we are witnessing the rapid expansion of the virtual limits of the cyberspace that we are accustomed to, and this appears to be achievable with the offline/online interface of a series of virtual worlds that are collectively referred to as the Metaverse.[47]

The term "Metaverse" was given its current connotation for the very first time in Neal Stephenson's speculative fiction novel Snow Crash, which was published in 1992. In this book, Neal Stephenson describes the Metaverse as an enormous virtual environment that exists in parallel

[46] Kim, J. (2021). Advertising in the Metaverse: Research agenda. Journal of Interactive Advertising, 21(3), 141-144.

[47] Park, S. M., & Kim, Y. G. (2022). A Metaverse: Taxonomy, components, applications, and open challenges. Ieee Access, 10, 4209-4251.

with the real world and allows users to interact with one another through the use of digital avatars. Since its debut, the Metaverse has been characterized in a variety of ways, including as a computer-generated cosmos, a living space, a virtual collective space, an embodied internet or spatial internet, and a world of reflection. Although the term "Metaverse" has traditionally been used to refer to an immersive, three-dimensional digital realm, over time, several conceptions of the Metaverse's one-of-a-kind nature and organization have emerged.[48]

As a whole, we have progressed from perceiving the Metaverse to be one huge network of interconnected virtual worlds. Previously, we understood the Metaverse to be an enhanced version of individual virtual worlds. Neal Stephenson, in the novel Snow Crash, vividly conveyed the Metaverse as a virtual world perspective, in which people interact with smart agents and each other in an immersive world that resembles a developed metropolis along a neon-lit, one hundred meter-wide large boulevard called the street. describe how they interact with one another. Users have access to the Metaverse through computer terminals in the novel as well. These terminals project a first-person vision of virtual reality onto glasses and pump stereo digital sound into miniature earphones that hang from the bows of the glasses and are worn in the wearer's ears. Within this region, users are able to navigate with their avatars by walking or driving their virtual cars, construct buildings on the pieces of virtual real estate that they have owned, and take part in any and all social and instrumental activities.

It is possible to say that the studies on the concept of metaverse, which has a 30-year history in terms of etymology, have gained momentum recently. The fact that this concept did not attract attention at the beginning can be expressed as the fact that new communication media and technologies have made groundbreaking innovations in the recent period. The emergence of technological innovations such as the Internet of Things (IoT), three-dimensional (3D) software, blockchain-based technological infrastructures in recent years makes this concept more popular today. When we look at the studies on the Metaverse, it is possible to say that the studies are mainly from America and South Korea. When we look at some of these studies, it is seen that metaverse gives more information about its working principles, scope and usage areas.

[48] Ning, H., Wang, H., Lin, Y., Wang, W., Dhelim, S., Farha, F., ... & Daneshmand, M. (2021). A Survey on Metaverse: the State-of-the-art, Technologies, Applications, and Challenges. arXiv preprint arXiv:2111.09673.

The work in which the concept of metaverse is explained in all aspects and which is the most comprehensive example on this subject is Lee et al.'s (2021) article All One Needs to Know about Metaverse: A Complete Survey on Technological Singularity, Virtual Ecosystem, and Research Agenda. Lee et al. deal with many topics from computer-mediated virtual environments to augmented reality applications and under these headings, they emphasize that the most important tool that provides digital transformation is the metaverse. In the study, it is stated that in the context of new generation technologies such as 5G, systems such as human-computer interaction, artificial intelligence, blockchain, computer vision, internet of things and cloud computing create a metaverse ecosystem.[49]

Regarding the usage areas of metaverse, Kim Jooyoung (2021) focuses on how the metaverse is used in the field of advertising.[50] Jee Young Lee (2021) focuses on how the metaverse can integrate the virtual and the real on three-dimensional software, emphasizing that the phenomenon can develop in the context of hyper-reality.[51] Again, it is possible to say that there are studies in which metaverse is explained through three-dimensional software in current studies. At the same time, Yue Han et al. (2021), in their study called A Dynamic Resource Allocation Framework for Synchronizing Metaverse with IoT Service and Data, have made certain models about how the metaverse can be synchronized with the Internet of Things (IoT) and data in order to be more effective.[52]

Yesha Sivan (2008) states that the three-dimensional world (3D) creates in itself three-dimensional communities, creativity and trade in the metaverse universe.[53] Hendaoui et al. (2008) also focus on three-dimensional social virtual worlds and draw attention to the fact that the continuation of the money flow in this environment is commercially important, through examples

[49] Lee, L. H., Braud, T., Zhou, P., Wang, L., Xu, D., Lin, Z., ... & Hui, P. (2021). All one needs to know about metaverse: A complete survey on technological singularity, virtual ecosystem, and research agenda. arXiv preprint arXiv:2110.05352.

[50] Kim, J. (2021). Advertising in the Metaverse: Research agenda. Journal of Interactive Advertising, 21(3), 141-144.

[51] Lee, J. Y. (2021). A study on metaverse hype for sustainable growth. International journal of advanced smart convergence, 10(3), 72-80.

[52] Han, Y., Niyato, D., Leung, C., Miao, C., & Kim, D. I. (2021). A dynamic resource allocation framework for synchronizing metaverse with iot service and data. arXiv preprint arXiv:2111.00431.

[53] Sivan, Y. (2008). The 3D3C metaverse: A new medium is born. New media and innovative technology, 133, 159.

related to virtual commercial environments.[54] Alanah Davis et al., in their article Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses (2009), examine how people interact with three-dimensional avatars or software through sample applications.[55] In spite of the fact that the metaverse appears to be a phenomenon that is conceptually derived from the merger of real and virtual, it would be more accurate to approach this notion in depth in terms of its extent. When a conversation is opened up about what exactly the superuniverse is, the first thing that comes to mind is probably unreal or intangible. However, while at first glance this interpretation appears to make sense, it is actually insufficient in terms of the scope of the topic being discussed. Because the metaverse, which places itself between the real and the virtual, demonstrates a propensity that is supported by both universes, we can say that the metaverse is supported by both.

The experience of being in the actual world also brings with it the sensation of being in a virtual setting and of becoming embodied in that world. The clearest illustration of this sense of existence is supplied by VR (virtual reality) glasses, which are becoming increasingly popular in today's society and are worn by a lot of people. You might also express things like "I am in this location" by building customized virtual representations for oneself in the metaverse environment. This would allow you to leave your "virtual fingerprint" in the virtual cosmos. You are able to interact within the digital environment using the avatar that you have designed for yourself, and you are able to locate a space for yourself inside a cosmos that is always open and has no limits. The Metaverse can be broken down into three primary parts. These characteristics include presence, interoperability, and standardization. The sensation of sharing a digital place with other people, often known as "being embodied," is what we mean when we talk about presence. The ability to effortlessly move across sandboxes while bringing along the same virtual assets, such as avatars and digital assets, is what we mean when we talk about interoperability.

In order to guarantee the interoperability of platforms and services within the metaverse, standardization is required. According to Dionisio et al. (2013), the shift to a three-dimensional virtual network or metaverse of the metaverse is feasible in the following four areas: Immersive reality, ubiquitous access and identification, interoperability, and scalability become achievable as

[54] Hendaoui, A., Limayem, M., & Thompson, C. W. (2008). 3D social virtual worlds: research issues and challenges. IEEE internet computing, 12(1), 88-92.

[55] Davis, A., Murphy, J., Owens, D., Khazanchi, D., & Zigurs, I. (2009). Avatars, people, and virtual worlds: Foundations for research in metaverses. Journal of the Association for Information Systems, 10(2), 1.

a result of these four areas of development.[56] When dealing with realism, it is essential to ascertain whether or not the user will be able to feel psychologically and emotionally immersed in the alternative place if the virtual space is sufficiently realistic. It is possible to access the virtual spaces that make up the metaverse using any digital device that is now available as well as the user's virtual identity, which is one way to illustrate the ubiquity of the metaverse. The term "interoperability" refers to the efficient functioning of virtual environments as well as the seamless combination of different computer systems. When discussing scalability, the primary concern is whether or not the internet server possesses sufficient power to support higher size servers.[57] It is feasible to observe that the metaverse universe has developed over a wide range of topics when we examine the figure that is provided below for the scope, economy, and ecology of the metaverse. When we examine the domains in which Metaverse was initially formed, we find that it is founded on a point of view that is primarily concerned with entertainment, games, branding, and sales. One of the most crucial factors that will determine the outcome of this process is whether or not companies want their brands to take advantage of the virtual world as the most effective medium through which they can express themselves. When it comes to the economy, Metaverse is becoming a platform that is fast growing, especially in terms of enhancing the visibility of companies, broadening the audience that they are targeting, and opening new doors that lead to income. According to the Newzoo 2021 report, it is stated that the first industries to implement metaverse-based technologies are the music industry, the television and film industry, the fashion and cosmetics industry, sports, education and training, the art industry, the fast-moving consumer goods industry, the automotive industry, tourism, retail, and factories and offices. In the same research that was published in 2021, it is indicated that technologies based on the metaverse would soon be utilized in the areas of public transit, defense, smart cities, and medical care.[58]

American entrepreneur, writer and game designer Jon Radoff evaluates the metaverse ecology through 7 layers (value chain) in his article titled “The Metaverse Value Chain” (2021).[59]

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[56] Dionisio J., David N., William G. Burns III, and Richard G. (2013). 3D Virtual worlds and the metaverse: Current status and future possibilities. ACM Comput. Surv. 45, 3, Article 34 (June 2013)

[57] Ibid

[58] Newzoo Report. (2021). Newzoo: Introduction to the Metaverse Report, https://newzoo.com /insights/trend-reports/newzoo-intro-to-the-metaverse-report-2021-free -version/

[59] Radoff, J. (2021). The Metaverse Value-Chain. Trillions of dollars are pouring into…| by Jon Radoff| Building the Metaverse. Medium, 12.

1st Layer: Experience (Games, Social Apps, E-sports, Shopping);

2nd Layer: Discovery (Ad networks, Stores, Agencies etc.);

3rd Layer: Creative Economy (Design Tools, Asset Markets, Workflow, Trade);

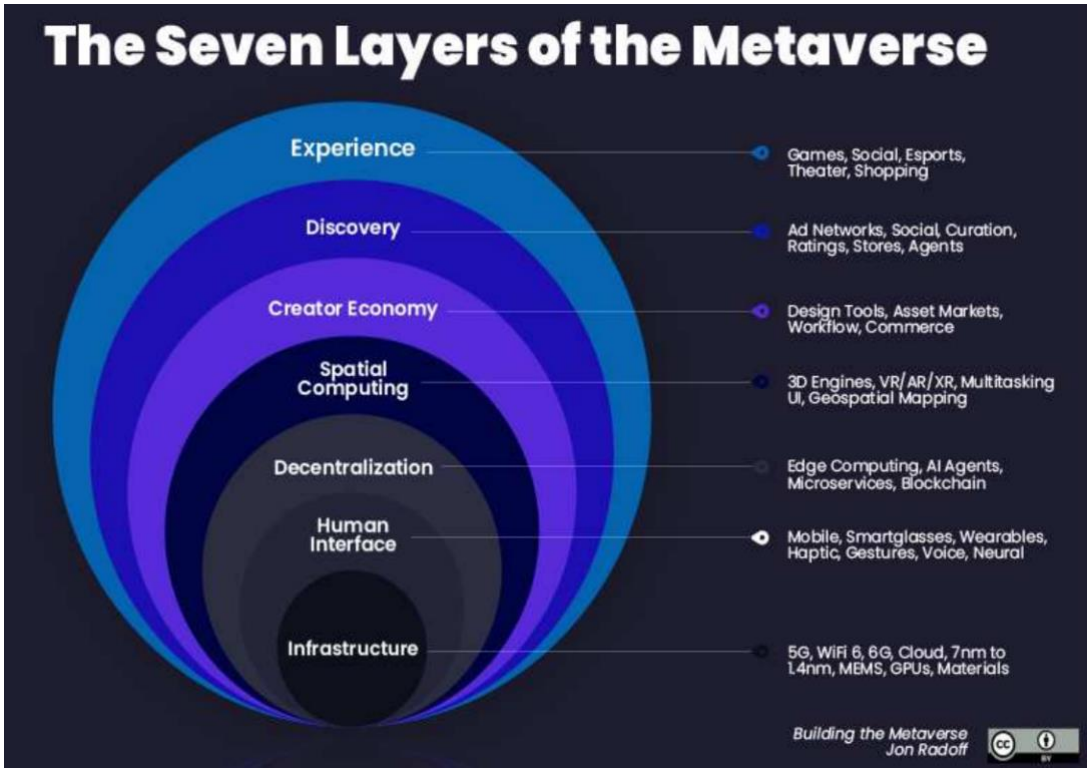
4th Layer: Spatial, 3D Programming (3D, Augmented Reality, Virtual Reality, Multitasking User Interfaces, Geospatial Mapping);

5th layer: Decentralization (Computing at the Edge, Artificial Intelligence, Intelligent Agents, Microservices, Blockchain);

6th layer: Human Interface (Wearable Technologies, Smart Glasses, Mobile Technologies, Touch, Mimics, Voice, Nerves);

7th layer: Infrastructure (5G, WiFi 6, 6G, Cloud Computing, Micro Electro-Mechanical Systems, Graphics Processing Unit).

Image 1. Jon Radoff Building The Metaverse (2021)



Considering the situations that are or may occur in the 7-layer metaverse value chain designed by Radoff, respectively; It should be understood that we experience the virtual world in terms of the possibilities offered to us by web 2.0 in the first layer. In the first layer, the 2 or 3

dimensional state of everything should not be understood, on the contrary, it should be perceived as the recording of the physical space in the virtual world. For example, a physical venue might sell just a few seats in the front row, but a virtual concert can create a personalized plane of existence around each individual, where they can always enjoy the best seat in the house.

The idea of creating community-oriented content in the social networks-oriented layer 2, the discovery layer, can result in a much more cost-effective result than many marketing methods. For this reason, the idea of creating cost-effectiveness with NFT, for example, is one of the most used innovations in the metaverse universe. Because with NFTs, it becomes possible to transact with virtual tokens that cannot be traded in a decentralized market. In the context of the creative economy, tier 3 metaverse experiences are not only becoming increasingly immersive, social, and real-time, but the number of creators creating them is growing exponentially. This tier includes all the technologies that creators use daily to create experiences that people enjoy. The best example of the creative economy layer is the virtual currency cryptocurrencies, which appeared for the first time in 2008 under the name Bitcoin.

Cryptocurrencies are virtual currencies that do not have any physical existence and are also secured by encryption. With this system, where it becomes almost impossible to perform more than one transaction with encryption, forgery can be prevented. In the 4th layer, which also includes three-dimensional spatial computing and virtual reality-based programming, it is seen that hybrid real/virtual computing, which erodes the barriers between spatial computing and physical and ideal worlds, is proposed. The important thing here is to create a value obtained from the combination of the real and the virtual and to put it into use. For example, the fact that blockchain technology removes financial assets from central control and surveillance is the most obvious example of the hybrid order between real and virtual.

The 5th layer, which emphasizes decentralization, can actually be handled with the 4th layer. Because it is seen that end-to-end computing encryption, artificial intelligence systems and blockchain technology are used in this layer, and these technologies can work without being connected to any center or system. For example, NFTs and cryptocurrencies can be traded decentralized using end-to-end encryption, artificial intelligence systems and blockchain technology without being tied to any market center. The 6th layer, referred to as the human interface, can also be expressed as an area where an effort is made to create a sense of reality for

the devices used by humans, especially wearable technologies. For example, the integration of VR (Virtual Reality) glasses and computers with our bodies is a good example of a human interface. In the 7th layer, where the technological infrastructure is expressed, it is aimed to further enable the systems and devices we use with new generation systems. For example, network contention with 5G technology, which is delayed due to the pandemic and still cannot be used, increasing the bandwidth significantly while reducing the delay, or increasing the bandwidth by another order of magnitude with 6G are examples for the infrastructure layer.

2.2 Cryptocurrencies and Metaverse

In the universe of the metaverse, multiple forms of currencies are utilized in each civilization and market, and shopping takes place in the same market (locally) with each society's own cryptocurrency. As of the end of December 2021, the market has seen the exchange of more than forty different meta currencies.

To begin, if the ideas of money and tokens in cryptocurrency are defined more precisely, then the topic of cryptocurrencies will be much simpler to grasp. Coins and tokens are the two forms that cryptocurrencies can take. Coins are the name given to cryptocurrencies that have their very own blockchain. Tokens, on the other hand, are the name given to cryptocurrencies that are exchanged on an existing blockchain that has already been built. Nevertheless, despite the distinction between the two, the term "coin" can also be used in place of "tokens," which is a practice that was carried over from Bitcoin. Tokens can also be classified as fungible or non-fungible, depending on whether or not they can be exchanged for other tokens.

Since cryptocurrencies and the metaverse are both based on the same underlying technology (blockchain, to be specific), it is expected that cryptocurrencies will become the predominant form of payment in the metaverse. In a global metaverse, the use of cryptocurrencies would be the means of exchange that is easiest, most convenient, and most cost-effective.[60] A great number of the coins that are used in the metaverse are traded back and forth. There are coins that are used to buy and sell a variety of goods, including games and land-workplace, despite the fact

[60] Laeeq, K. (2022). Metaverse: Why, How and What. https://www.researchgate.net/publication/358505001_Metaverse_Why_How_and_What/link/62053bb0afa8884cabd70210/download

that some of these currencies are much more recent and are not in demand. The following gives an overview of the three metaverse coins that have the biggest market capitalization.

Decentraland is a virtual reality platform that uses the cryptocurrency known as MANA. Decentraland is a digital real estate that is supported by the Ethereum blockchain. Users or digital property owners can create applications, buy and sell goods and services, and engage in other activities within Decentraland. These activities require a token known as MANA. On the Decentraland platform, there are two types of digital assets: LAND, which consists of non-fungible digital parcels, and MANA, which is a fungible ERC-201 token that must be burned in order to stake a claim on LAND and make purchases of in-world goods and services.[61] On this platform for virtual reality, digital lands can be bought and sold in either the primary market or the secondary market. Both markets are open to buyers and sellers.

Sandbox Virtual Reality Platform Cryptocurrency: SAND - The Sandbox metaverse is a play-to-earn (P2E) game built on the Ethereum blockchain. SAND is the native money of the Sandbox virtual reality platform. The Sandbox is a decentralized platform that gives players and content creators the opportunity to own a piece of the gaming virtual universe, take part in the government and economy of the world, as well as build and enjoy a straightforward method of monetizing their gaming time. In the Sandbox metaverse, digital parcels are referred to as LAND, and in-world coins are referred to as SAND. Both of these terms are capitalized. Transactions on the Sandbox digital platform are conducted using an ERC-20 token that was generated on the Ethereum blockchain. SAND is a vital component of the Sandbox platform and serves as the basis for these transactions.[62]

AXS and SLP are the two cryptocurrencies that are supported by the Axie nfinity Virtual Reality Platform. A pay-to-play (P2P) game based on the Ethereum blockchain, Axie Infinity metaverse is conceptually comparable to the Sandbox metaverse that was discussed earlier. Axie Infinity is an online role-playing game that takes place in a planet teeming with intriguing animals known as Axies, which players can acquire and keep as pets. The objectives of the players are to defend, cultivate, gather, expand, and establish kingdoms for the Axies. The Axie Infinity virtual

[61] Ordano, E., Meilich, A., Jardi, Y. & Araoz, M. (2017). Decentraland: A Blockchain-Based Virtual World. https://decentraland.org/whitepaper.pdf

[62] The Sandbox Whitepaper (2020). https://installers. sandbox.game/The_Sandbox_ Whitepaper_2020.pdf

reality platform has a player-owned economy in which users have the ability to truly own the resources they acquire in-game through good gaming and contributions to the ecosystem, as well as the ability to buy, sell, and trade those resources. The platform consists of ERC-20 tokens known as Axie Infinity Shard (AXS) and Smooth Love Potion (SLP).[63] Both of these cryptocurrencies are referred to as Axie Infinity Shard.

2.3 Meta-estate industry as a new trend

In its most general sense, the term "virtual land" refers to the ephemeral terrain that can be found in online games and other virtual environments. It is also sold in the same capacity as land, just like actual land. The transaction will take place using the native cryptocurrency of the land being purchased. In June of 2021, the sale of virtual land in Decentraland brought in more than $900,000 in revenue. And this is merely a straightforward illustration. For crypto aficionados and market speculators, the prospective return on investment in virtual land appears to be attractive in light of the growing interest in information.[64]

Two reasons: bragging rights and return on investment The metadatabase is now hosting a number of different initiatives that are related to virtual real estate. The idea is the same as when you buy an NFT; you become the owner of this digital asset, and due to the fact that it is stored on the blockchain, anyone can confirm that it is genuine. You have the option of renting out your virtual land for parties and other special events (yeah, it is a strange thing to do), or selling it in the future after it has increased in value.

You might even construct a digital home on it so that you no longer have to pay rent, or you could establish a digital art gallery on it so that aspiring artists may exhibit their work. Snoop Dogg, who is an American rapper, provided an unusual example of a source of revenue. He hosted an exclusive gathering in the replica of his own mansion that he had constructed on The Sandbox NFT platform. The attendees were required to have an NFT that granted them entrance to the party in order to participate.[65]

Investors in the Metaverse have the opportunity to generate a consistent income from the virtual land they own. For instance, you could use NFTs to construct a virtual house on your virtual

[63] www.whitepaper.axieinfinity.com/axs

[64] Virtual real estate plot sells for close to $1 mln | Reuters

[65] Snoop Dogg is rebuilding his real-life mansion in The Sandbox NFT metaverse (cryptoslate.com)

land and then rent it out in order to generate a monthly income. Or, you could establish an NFT art gallery and rent out space in it to burgeoning crypto artists so that they can exhibit their work on the metaverse.

The Sandbox, Decentraland, and CryptoVoxels are now the most well-known websites among a broad variety of others that allow users to buy, sell, and trade digital real estate. In these virtual worlds, users are permitted to move freely about the environment and interact with one another. They are at liberty to monetize the land in any manner that they deem appropriate for their preferences. On the other hand, in contrast to the conventional procedures used in the actual world, the production of and the administration of real estate assets in digital spaces are fundamentally distinct (IRL). There will be a large amount of variation in a number of elements, including the level of risk involved and the amount of capital that will be committed. The same cannot be said for the manner in which we make use of these qualities. The early use cases, such as building art galleries and holding concerts on virtual property, have already been transferred directly from the real world into the virtual reality.

The establishment of a virtual embassy in the metaverse by the Caribbean island nation of Barbados attracted the attention of people all over the world. The process of developing virtual experiences within the metaverse has already been initiated by a number of well-known companies in the consumer electronics and fashion industries. The creative applications of this technology are not limited in any way by the rules of physics because of the nature of the technology. Users are free to use and design the property according to their own preferences. So How to Buy Virtual Land on Metaverse?

Today, there are several virtual worlds that allow you to buy virtual real estate. Decentraland is arguably the most popular you can buy virtual lands. Now, if you are interested in purchasing virtual land in the metadata, here is how to do it.

1. Opening a Digital Crypto Wallet

The first step is to get a digital crypto wallet. You cannot buy virtual land using fiat money, so in order to purchase and store your cryptocurrency, it is necessary to first obtain a wallet. Ideally, the wallet you choose should integrate with your browser.

There are several options such as MetaMask or Trust Wallet. You can also use the Binance Chain Wallet if you wish. However, it is best to first check if the wallet supports the cryptocurrency that will be used to purchase virtual land.

2. Selecting the Real Estate Platform

There are several virtual metadata storage platforms from which property can be purchased. The two most popular options are Decentraland and Sandbox. OpenSea is also an option if purchasing through a third party is required. OpenSea is a great idea for first-time buyers as it allows shopping without constantly switching between platforms. Prices can be compared and the value can be evaluated according to the virtual neighborhood where the land is located.

3. Browsing a Plot of Land

Now it's enough to browse through the different pieces of land available and choose the one you want to buy. It can be seen how far his property is from the more famous places. Prices tend to increase for properties close to popular destinations. Once a piece of land to purchase has been selected, simply click on it to see the available information. Virtual real estate can be purchased in Decentraland using the cryptocurrency ETH or MANA.

4. Linking the Wallet

To confirm the purchase, it is necessary to link the wallet to the account. When registered and the purchase is confirmed, the virtual real estate will be sent to the wallet.

5. Confirm Your Purchase

As long as there is enough money in the wallet and the price is agreed upon, the purchase will take place.

2.4 Sectors potentially impacted by the metaverse

Knowing exactly which brands Radoff found in the virtual world or metaverse market correlate to each of the seven layers is necessary in order to achieve a deeper level of comprehension regarding the metaverse universe. Because of this particular facet, it is now feasible to have an understanding of the components that make up the virtual universe. In the following Metaverse Market Map, which Radoff last updated in November 2021, it is possible to see how brands are categorized in terms of experience, discovery, creative economy, spatial three-

dimensional programming, decentralization, human interface, and infrastructure. These categories include, respectively, experience, discovery, creative economy, spatial three-dimensional programming, and infrastructure.

Image 2. Market Map of The Metaverse (2021)

Source: [Market Map of the Metaverse. In my article on the value-chain of the… | by Jon Radoff | Building the Metaverse | Medium]

It is seen that there are digital platforms such as Meta, MineCraft, Netflix, Youtube, Tencent in the 1st layer, which takes place as experience and includes areas such as games, social applications, e-sports, shopping. There are platforms such as Facebook, Unity Ads, Google, Google Play, Discord, IronSource in the second layer, which is located as a discovery and mostly contains advertising networks, stores and agencies. In the 3rd layer, which takes place as the creative economy and concerns design tools, asset markets, workflow and trade, there are decentralized platforms such as Sandbox, Decentraland, SomniumSpace, as well as centralized platforms such as Unity, Roblox, EpicGames, Horizon, Microsoft. is seen.

It is seen that there are software such as Unity, AutoDesk, Unreal Engine, Omniverse and Mozilla in the 4th layer, which is also involved in spatial, three-dimensional programming and

concerns 3D software, augmented reality, virtual reality, multitasking user interfaces, geospatial mapping.

There are companies, decentralized open source blockchains and platforms such as Ethereum, Gemini, IBM, Microsoft, Immutable, OpenSea in Layer 5, which is decentralized and includes computing, artificial intelligence, smart agents, microservices and blockchain at the edge.

Companies such as Apple, Oculus, Xbox, PlaySation, Samsung, Huawei, Microsoft HoloLens take place in the 6th layer, which is the human interface and includes wearable technologies, smart glasses and mobile technologies.

In the 7th layer, which is the last layer and includes areas such as 5G, WiFi 6, 6G, Cloud Micro Electro-Mechanical Systems, GPU, Nvidia, Azure, GoogleCloud, Marvell, Intel, Sony, Apple, Panasonic, IBM brands and platforms. It is possible to see other brands and platforms in detail on the metaverse market map above.

According to Rehm, Goel, and Crespi (2015), the Metaverse presents considerable opportunity for adopting human-centered techniques to produce high value-added applications in next-generation virtual physical systems. These opportunities can be found in the virtual world. When seen in this light, it is easy to make the observation that Metaverse has the potential to establish an ecosystem that prioritizes humans and is user-friendly, all while producing economic outputs. On the other hand, the Metaverse has the ability to open up new doors for professional development and to reveal new specialized fields that have not yet been explored. As can be seen from the examples given above, the utilization of blockchain technologies is an essential component of the process that results in the creation of the economic ecosystem that exists in the Metaverse. It should not go unmentioned that the NFT technology is an essential part of the economic operations that take place in the Metaverse.[66]

It is possible to say that NFT technologies have the potential to be used in terms of preserving the one-of-a-kind quality of the added value that can be produced in the Metaverse universe, ensuring its transfer, and determining the rarity of the produced items or artifacts. This

[66] Rehm, S. V., Goel, L., & Crespi, M. (2015). The metaverse as mediator between technology, trends, and the digital transformation of society and business. Journal For Virtual Worlds Research, 8(2).

is something that can be said because it is possible to say that NFT technologies have the potential to be used. This is the social class reasoning that applies in real life.

It should also be called into question at the point when it is being transferred to the universe of the metaverse. To give just a few examples, the rarity of works owned by virtual artifact collectors, the width of land owned in the Metaverse universe, and access to necessary resources in the Metaverse universe are all examples of factors that can bring the social class phenomenon that exists in the real world into the Metaverse.[67]

At this point, it is important to keep in mind that the price of the virtual bag offered by Gucci in partnership with Roblox is higher than the price of the bag in the real world. Additionally, it is important to keep in mind that people care about what their avatars are wearing in the virtual world.[68]

The NFT technology opens up brand new doors of possibility for the commercial endeavors of artists. According to Kugler (2021), artists frequently give art galleries close to 50 percent of the income they earn from their works. However, NFT is an alternative to this situation, as it allows any artist to create NFT works on platforms such as OpenSea or Foundation, control the promotion process, and NFT with the exception of basic transaction fees.[69] He claims that he may be entitled to the entirety of the profits from the sale of From this vantage point, we will discuss that NFT has produced a new art economy, and that the Metaverse, one of the most important components of which is NFT technology, will bring a new dimension to the economic relationship between artists and galleries, which are inseparable components of the art ecosystem, with digital galleries, art events, or marketplaces. In other words, we will argue that the NFT has produced a new art economy. possible. On the other hand, the NFT technology is not without the possibility of encountering difficulties. It is feasible to categorize these difficulties as difficulties with usability, problems with security and privacy, problems with administration, and difficulties with adaptability. There is a possibility that these issues will be transferred to the universe of the

[67] Ma, V. (2021). 5 Futuristic Jobs of The Metaverse.https://hackernoon.com/5-futuristic-jobs-of-the-metaverse.

[68] Howcroft, E. (2021). Crypto fashion: why people pay real money for virtual clothes. https://www.reuters.com/business/finance/crypto-fashion-why-people-pay-real-money-virtual-clothes-2021- 08-12/

[69] Kugler, L. (2021). Non-fungible tokens and the future of art. Communications of the ACM, 64(9), 19-20

Metaverse by means of NFTs, or that they may influence the procedures involved in the economic growth of the Metaverse. It is feasible that these issues will be resolved with the development of new professions in the Metaverse.[70]

It is feasible to arrive at the conclusion that the economy that exists in the Metaverse will not be entirely separate from the economy that exists in the physical world, but rather will be an essential component of the economy that exists in the future. In this context, it is essential for employees to have new competencies on a scale ranging from the use of blockchain technologies to the daily use of virtual reality technologies. In other words, employees need to be able to do everything from use blockchain technologies to use virtual reality technologies. It is also feasible to talk about the professions that will be modified to work in the Metaverse, as well as the professions that will be created specifically for use in the Metaverse. Ma (2021) People in the Metaverse will be reflected in their avatars, which will be styled by Metaverse stylists; Tour guides who are able to tell the history of the locations in the Metaverse; He mentions that professions such as Metaverse lawyers who will follow the legal processes in this field and Metaverse marketing specialists who will blur the boundaries between the real world and the digital world may emerge. Advisors who will be positioned like investment experts due to the fact that an excessive number of NFTs can be produced in the Metaverse.

A study was carried out by Goldberg, Kugler, and Schar (2021) to determine the pricing of virtual plots and NFT in the Decentraland sample. The study measured the pricing in terms of pricing. According to the researchers, the data they collected coincide with the findings of the city economy in the real world. This is the context in which their statement is made. In addition to this, he claims that investors place a higher value on properties that have addresses that are easy to recall.[71]

Researchers have compared virtual lands to places like search engine embeds and trade shows, both of which are environments in which businesses fight for the attention of potential customers. It is feasible to suggest, in light of these findings, that Metaverse provides a significant

[70] Wang, Q., Li, R., Wang, Q., & Chen, S. (2021). Non-fungible token (NFT): Overview, evaluation, opportunities and challenges. arXiv preprint arXiv:2105.07447.

[71] Goldberg, M., Kugler, P., & Schär, F. (2021). The Economics of Blockchain-Based Virtual Worlds: A Hedonic Regression Model for Virtual Land. Available at SSRN 3932189.

base for the promotion of goods and services, although this would require further investigation. For instance, it is feasible in some activity areas of Decentraland to come across billboards. Even if this is considered to be the precursor to the Metaverse world, the fact that it enables a successful branding activity to be carried out regardless of the location of the improvements that are to be covered is a significant advantage. The Museum District in Decentraland may also play host to a presentation or event pertaining to the digital currency known as DogeCoin at some point. It is conceivable to interpret that an effective communication channel exists between a crypto currency and its users, who are the people most likely to make up the currency's target audience in a structure that was pioneered by Metaverse.

In this context, it is possible to state that Metaverse can serve as a basis for strategic communication activities such as boosting brand value or sales-oriented activities, social responsibility campaigns, fairs and events. This is something that can be said because Metaverse can serve as a basis for these activities. It is common knowledge that arranging particular events and installing billboards in the areas surrounding those events can contribute to the local economy in a meaningful way. In light of the research that has been conducted, one may make the case that Metaverse has the potential to become a significant platform, particularly for companies that deal in digital goods. Because it has been recognized that Metaverse has the potential to give many different opportunities to businesses in terms of providing digital items to customers, allowing customers to experience such things in cyberspace, or cultivating relationships with customers.

Although the economic opportunities that the Metaverse has the potential to create are centered on creative products such as artworks, virtual lands, and even some texts that already use NFT technology on platforms that can be considered to be the forerunners of the Metaverse, it is unlikely that the Metaverse will offer new opportunities in the long run due to the involvement of large technology startups, well-known institutions, and developing technology. carries along with it. According to Dan (2021), NFT technology can create a novel user experience and can help develop brand awareness. He also notes that brands such as Taco Bell, Coca-Cola, Campbell's, Microsoft, and Nike are currently in the process of releasing NFTs to the market.[72] These

[72] Dan, A. (2021). NFTs Reshape Brand Marketing In The Creator Economy, https://www.forbes.com/sites/avidan/2021/09/13/nfts-reshape-brand-marketing-in-the-creatoreconomy/?sh=272e6f06da2d

suggestions made by Dan also highlight the fact that Metaverse, which has already internalized NFT technology, has the potential to create new communication opportunities for businesses in the long run. These opportunities will allow businesses to create brand awareness as well as new, realistic, and multidimensional consumer experiences with the audiences they are trying to reach.

2.5 Future of XR industry and Global investment in key technologies

Establishing a virtual environment for human-machine interaction is what "extended reality" (XR) refers to. This is done by combining the real and the virtual with the help of a computer. "XR" is an abbreviation that refers to a group of several technologies, including virtual reality, augmented reality, mixed reality, and others. The key components of the XR idea are virtual reality (VR) and augmented reality (AR), both of which offer experiences in virtual worlds. On the other hand, the technologies that they employ to produce a virtual experience are rather dissimilar to one another: AR is able to produce virtual items that do not exist in the actual world by making use of computer graphics technology and visualization technology. AR is also able to accurately place virtual objects in the real world, which places users in a real-virtual environment that is linked. VR creates a closed-loop, immersive experience in a virtual world by simulating a virtual world through the use of various pieces of hardware and by having computers build a simulated environment. The primary focus of VR is on the users' ability to interact in real time with the simulated world. In general, augmented reality technology is behind virtual reality technology.[73]

In a manner analogous to virtual reality (VR), the development of augmented reality (AR) faces obstacles such as the display of virtual settings, the performance of sensor and interface device combinations, and others. In addition, augmented reality calls for display systems that can combine virtual and real-world settings without any noticeable break in continuity, as well as the capacity to accurately place virtual items in the real world. Consumers have started to take note of the several virtual reality head-mounted displays (HMDs) and eyewear gadgets that are currently on the market.[74]

There are still a lot of technological hurdles to get through with augmented reality glasses. At this time, virtual reality (VR) hardware accounts for close to half of the market, augmented

[73] Pitt, B. (2019). The study of how XR technologies impact the retail industry, now and in the future.
[74] Hillmann, C. (2021). The History and Future of XR. In UX for XR (pp. 17-72). Apress, Berkeley, CA.

reality (AR) hardware accounts for roughly a third of the market, and mixed reality (MR) hardware accounts for the remaining percentage. The development of 5G technology and the network will enable more application scenarios, which, when combined with the integration of AI technology with computational vision and the innovative functions of hardware, will lead to an increase in the degree to which virtual reality and augmented reality (VR and AR) technologies and applications are integrated with one another and can communicate with one another. This is the first time that the concepts of MR and XR have been mentioned.

The final consumers view both virtual reality and augmented reality as contributing to and enriching their virtual experiences. This report investigates the investment opportunities and prospects available in the XR market in light of the growth and demand in that sector. XR is an umbrella word that applies to virtual reality, augmented reality, and mixed reality technology. XR will allow for the creation of a world in which the real and the virtual are completely intertwined with one another. You won't have to choose between the real world and the digital world; rather, you'll be able to seamlessly shift between the two in an environment that is totally centered on the human experience. You will experience significant improvements to your perception, memory, and intellect. In addition, you will have the ability to transcend space and call upon things at will. It will radically upend the way that we think about how people and machines engage with one another by enabling interactions that are completely realistic and scenario-based at any time and everywhere.

A vision of computers was presented by a psychologist named Licklider more than half a century ago. According to this vision, individuals would be able to interact directly with computers to increase their capabilities. During the past 60 years, we have been able to realize an unrestricted, two-dimensional link with the virtual world as a result of the benefits of Ethernet, the Internet, personal computers, and cellphones. XR will usher in a world where the real and the virtual are perfectly blended together, where human-centered interaction will push the limits of what is possible for people to do and produce novel experiences.[75] Looking to the future, XR will usher in a world where the real and the virtual are perfectly blended together. Mark Zuckerberg has placed an emphasis on extended reality (XR) as the primary component of Facebook's long-term strategy since he views it as the next generation of computing platforms. XR is considered to be the next

[75] Hillmann, C. (2021). The History and Future of XR. In UX for XR (pp. 17-72). Apress, Berkeley, CA.

generation of computing platforms not only due to the fact that it possesses the capability to build a new universe but also due to the fact that it combines several significant technologies that pertain to the age of computing. In addition to leveraging cutting-edge technology like as artificial intelligence (AI), blockchain, and big data, it also has requirements that are more demanding for processing power, algorithms, and data. Additionally, it needs higher precision and experience requirements for operating systems, optical, chip, sensing, perception, and interface technologies, as well as other pieces of hardware and software. This is because of the increased complexity of these technologies. In order to be considered standard hardware, XR devices need to fulfill stringent requirements regarding durability, precision, usability, real-time performance, and cost reduction for each technical aspect.[76]

Through the use of XR technology, new worlds will be created:[77]

Conditions of employment:

Because work may now be carried out in a purely digital environment, an HMD does away with the requirement for a physical workplace. In the virtual world, we have workplaces that have the appearance of being high-end and realistic. These offices feature a range of display equipment and a highly customized work environment. It is possible to hold every meeting virtually, which would eliminate the need for time-consuming commutes. You merely need to send out a meeting invitation, and after that, you will have the opportunity to meet face to face with both customers and coworkers.

Education-related hypothetical situations: We'll be exposed to new ways of learning. Because of the proliferation of online educational tools, every student will have access to the most cutting-edge materials, and the online environment will support a wide range of instructional pedagogies. Students, for instance, are able to precisely examine the chemical reactions that are taking place in the course of chemical experiments when using AR glasses. Additionally, students are able to engage in face-to-face conversation with native speakers of a new language and

[76] Damar, M. (2021). Metaverse Shape of Your Life for Future: A bibliometric snapshot. Journal of Metaverse, 1(1), 1-8.

[77] Ratcliffe, J., Soave, F., Bryan-Kinns, N., Tokarchuk, L., & Farkhatdinov, I. (2021, May). Extended Reality (XR) remote research: a survey of drawbacks and opportunities. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-13).

experience through digital reconstruction what is being described in writing. The effectiveness, interactivity, and personalisation of education are all areas that have room for improvement.

Real-World Examples: Virtual reality (VR) Will Change How We Spend Our Free Time. People will be able to hold get-togethers with their friends whenever and wherever they like thanks to the social atmosphere that will be generated in the virtual world. In addition, they will be able to conduct private conversations, play games, and watch movies with distant relatives. The scenario of the future that was presented in the box office smash film Ready Player One in 2018 is becoming a reality. In the future, thanks to the integration of all information, social, news, and entertainment resources that XR provides, there will be no need for devices such as televisions, game consoles, desktop computers, electronic books, and other similar products. Because the XR-created environment provides us with easy access to whatever we might require, the costs of purchasing new equipment and replacing old ones are greatly reduced. For instance, as opposed to purchasing an expensive piece of hardware that needs to be installed in the living room, all we need to do is pay for the program in order to have access to a virtual television with a large screen.

Instances in which health care is involved: The field of medicine will make greater use of XR, and future surgical procedures will place a greater emphasis on the instruments and technologies of AR. Combining virtual images with actual surgical situations will provide the optimal solution and operational support for real-time diagnosis and treatment. This will result in a significant reduction in the amount of time spent diagnosing patients and an improvement in the quality of care they receive. It is possible that augmented reality (AR) holograms may take the lead in medical education in the near future. This would significantly improve the effectiveness of doctor-to-doctor communication and efficiently duplicate medical resources.

ByteDance made their debut in the virtual reality (VR) industry in August of 2021 when they purchased the fledgling company Pico. Prior to it, ByteDance has been making large investments in virtual reality and augmented reality research, developing a plethora of technologically advanced interaction technologies, and increasing its level of awareness of the outside world.[78] The agreement attracted a lot of attention, putting the spotlight on ByteDance's dedication to expanding its XR-related businesses and motivating additional digital firms to enter the market strategically. Apple, Facebook (Meta), Microsoft, Google, Huawei, Tencent, and

[78] TikTok owner ByteDance acquires Pico and takes first step into VR (cnbc.com)

ByteDance are all working diligently to build their very own augmented reality (AR) ecosystems with the intention of becoming key players in the platform for the next generation of computing.[79] When it comes to the market for extended reality (XR), numerous IT behemoths have entered through unique development trajectories and pathways depending on their respective competitive advantages, thereby creating distinct XR ecosystems. Apple is known for being an innovator in the personal computer and smartphone markets over the course of its history. Therefore, if Apple publishes its AR glasses in 2023 as expected, they will likely cause a disruption in the XR market as well as contribute to its growth. In point of fact, Apple has already set up an XR ecosystem and is gradually promoting AR offerings to clients through the iPhones it manufactures.[80]

In 2010, Apple made investments in a variety of related technologies, such as motion capture, facial recognition, indoor location, MicroLED displays, and others.[81] Since 2015, Apple has significantly accelerated technological development in the XR sector and acquired numerous hardware and software firms that specialize in augmented reality and artificial intelligence. Apple has also launched a number of its own augmented reality and artificial intelligence products. It has only just recently started purchasing content companies as well. By doing its own research and making strategic acquisitions, Apple has established a moat of critical technology patents, which is a crucial security for the company as it prepares to enter the XR market. In January of 2020, Apple made a purchase that included 59 patents for augmented reality and 3D reconstruction technologies. Apple now owns approximately 330 important patents related to XR technology.

Additionally, Apple is expanding the number of companies that are a part of its augmented reality ecosystem. It works actively in collaboration with a number of partners to develop new tools and technologies that will improve user experience with applications. At the same time, it works to deepen links with developers in order to create a closed-loop ecosystem.

Apple presently possesses an operating system that has more than one billion users, the most popular AR Kit software platform in the business, as well as a diverse ecosystem that includes a wide variety of devices and applications. Because of this, Apple is now in a perfect position to launch another creative product that helps advance the business of consumer AR and VR. To begin,

[79] TechCrunch is part of the Yahoo family of brands

[80] Apple headset to be delayed further - unveiling not until 2023 (mixed-news.com)

[81] Apple Buys Company That Makes Animated Characters Look Human | Time

Facebook is a key evangelist for XR inside the realm of social media. Facebook believes that XR is the computing platform of the future generation and the second big wave of computing that is centered on humans. Since it purchased Oculus in 2014, Facebook has been working to expand its augmented reality (AR) ecosystem to incorporate a wider variety of components, such as hardware, software, content, and application software.[82] Oculus VR headsets are currently the most widely used headsets on the market, making them an excellent foundation for Facebook's upcoming extended reality projects. In addition, five years after purchasing Oculus, Facebook made a significant step toward the metaverse space by unveiling their virtual reality (VR) social platform Facebook Horizon at the Oculus Connect 6 conference in 2019 and launching it officially in 2020. This occurred in the same year that the conference took place.

Users have the ability to create their own characters, play games with their friends, and develop original material within the Horizon, which increases Facebook's potential as a social network of the next generation. Technology companies based in China: Make use of the strengths that each individual possesses in order to establish unique XR application ecosystems. As a cross-domain and highly integrated technical application scenario, augmented reality (XR) is a crucial technology in Huawei's strategic plans.

2017 saw the release of the HUAWEI VR2, a virtual reality headset that was compatible with computers, smartphones, and cloud VR.[83] The HUAWEI VR1, the world's first pair of virtual reality glasses, was launched in 2016. Huawei presented the VR Glass 6DOF Game Set in 2020. In addition, HiSilicon introduced the Rokid Vision AR glasses along with the XR chip. This chip is capable of decoding content in 8K resolution and possesses robust GPU and NPU components. During the 2018 Huawei Developer Conference, Huawei introduced the comprehensive Huawei AR Engine as well as the brand-new Reality Studio, both of which are used for the creation of augmented reality content. Huawei held a global 5G+AR conference both online and offline in order to collaborate on the further development of 5G+AR by working with international operators and partners and exploiting application ecosystems provided by third parties. This was done in order to advance the development of 5G+AR.

[82] Facebook Buys Oculus, Virtual Reality Gaming Startup, For $2 Billion (forbes.com)
[83] [News] Huawei Launches Virtual Reality Headset in China - HUAWEI Community

In 2018, the worldwide XR finance market hit a low point, however it has since recovered significantly. The global XR finance and M&A deal size climbed by a compound annual rate of 31 percent from 2018 to 2020, rising from a low point of RMB 14.2 billion in 2018 to a high point of RMB 24.4 billion in 2020, according to figures that aren't completely comprehensive. This was achieved by rising from the industry's low point of RMB 14.2 billion in 2018. Additionally, from 109 in 2018 to 166 in 2020, there were more transactions involving financing and mergers & acquisitions. Global financing and M&A activity surged by 108 percent in the first half of 2021 compared to the same period in 2020, totaling RMB 22.9 billion. In comparison to the first half of the previous year, this statistic shows an increase of 108%. Regarding the various regional markets, foreign markets outside of China saw the first inflow of capital, setting the stage for a global recovery. From 2018 to 2020, domestic capital continued to exhibit a very slight decrease trend. HiAR, Sandbox, Digital Domain, and iQIYI Smart carried out the majority of the financing agreements with a total value of over 100 million RMB in 2019, which helped the market. However, domestic finance and M&A transactions were only worth RMB 2.1 billion in 2020, a decline of 58% from the previous year.

In 2021, Chinese XR finance made a comeback, which was motivated by improving sentiment toward international capital markets. Whether it was the substantial funding of hundreds of millions of RMB from iQIYI VR or the A funding of hundreds of millions of RMB from Raypai Tech, both indicate that the industry is on the verge of recovery. Strategic investments and mergers & acquisitions were the most frequent sorts of capital market transactions in terms of the global financing rounds of XR in the year 2020, in addition to seed rounds, A rounds, and other kinds of investments led by financial investors. There will be 220 finance transactions, 54 strategic investment transactions, and 38 merger and acquisition agreements in 2020. A total of 41.8 percent of all financing occurrences were represented by this. Using Google as an example, the company has made a number of mergers and acquisitions (M&A) investments in the extended reality (XR) sector during the past few years. These investments include the following: the purchase of North, a Canadian maker of augmented reality glasses, for $180 million in 2020; the investment of 5% of Hello TeamSolar, an augmented reality startup, to develop augmented reality technology in 2019; and the strategic investment of $15 million to purchase Glo, a manufacturer of Micro LEDs, for 13% of its equity at the end of the year. The likelihood that startups will receive strategic investments from or be acquired by larger organizations will rise in a market environment where

the industrial chain is maturing and the giants are moving more and more. In addition, a prime example of an exit strategy is the successful public offering of Roblox in 2021. The whole value chain of a sector, including its hardware, software, content, and applications, can be searched for emerging investment prospects.

Hardware, software, content, and applications make up the four main industrial chains that make up the extended reality (XR) market. There are numerous sub-industries inside each of these industry chains. There are numerous links that make up the complete supply chain, each of which is interconnected. All industrial chain connections and ecosystems must collaborate and grow in order to guarantee the ongoing success of the XR sector as a whole. As a result of the growth of industrial ecosystems, there are a variety of opportunities for strategic positioning and investment. A piece of hardware's basic parts may include things like optical parts, screens, processors, storage, cameras, batteries, and so on. The screens and optical devices, which together represent 40% of the hardware's overall cost, are the main devices when the price of the Oculus VR headset is broken down into its component elements.

Additionally, the chip is crucial because the CPU and memory represent for 30% and 15% of the cost, respectively, and Qualcomm dominates this market. The market is become more cutthroat, though, as global giants like Apple, Google, Microsoft, Facebook, and Sony separately research comparable CPUs. In addition, indigenous producers, led by Huawei, are spending money on chip development. These companies want to obtain a competitive edge from using virtual reality (XR) while releasing it from outside influence. The operating system and the development engine are two more crucial factors in software. The industry is also concerned about its ability to support the development of a successful developer ecosystem. The ability to create an active content ecosystem and the capacity to lower the creation threshold in order to increase the effectiveness of content production are important areas of concentration in terms of content.

CHAPTER 3. DOING BUSINESS IN METAVERSE

3.1 Business models transformation with emergence of Metaverse

In recent years, the concept of the Metaverse has begun to spread throughout the web. The conventional forms of media as well as other Web 2.0 platforms cannot be compared to the Metaverse. In point of fact, due to the fact that Metaverses embed a one-of-a-kind combination of features, such as network openness, user-generated content, socialization, persistency, playfulness, and interactivity, not only do new ways to engage potential customers emerge, but also original services and innovative forms of collaboration are feasible. The increasing number of users who participate in graphical, digital, and three-dimensional settings has convinced businesses that the Metaverse may be a market in the making. As a result, businesses began to contemplate business possibilities that could be seized rather than problems that might be avoided. While some writers focused their attention on the aspects of digital environments that may be relevant to commercial activities, others researched the characteristics of the economic systems that are incorporated in the Metaverse. Both sets of authors contributed to the overall body of knowledge.[84] Our primary interest is the manner in which companies may use Metaverse into their operations in order to identify new avenues leading to increased competitive value. The analysis of the management literature revealed two primary lines of inquiry: the connection between the Metaverse and marketing, and the influences that online platforms have on the business models of various companies. It is important to approach the development of a set of guidelines and accomplishments for users from a marketing perspective: Artists and idea designers are in charge of the creation of virtual commodities, while the marketing department, which in principle is equipped with the analytical tools and consumer in-sight required to optimize customer value, is rarely involved in the process.

We can also differentiate between products that are only accessible within the Metaverse and are designed primarily for entertainment purposes, and products that can be utilized outside of the context of a game and include things like digital lessons, courses, and electronic articles such as e-books. Therefore, the second category suggests that the Metaverse may function as an expanded market, in which v-commerce extends beyond the sale of products connected to the

[84] Kim, T., & Kim, S. (2021). Digital Transformation, Business Model and Metaverse. Journal of Digital Convergence, 19(11), 215-224.

environment. Because it simulates a face-to-face setting for communication, the Metaverse is the perfect medium for business-to-consumer and business-to-consumer transactions. A tremendous amount of focus has also been placed on the second problem, which is the research into the shopping and consumption habits of people living all over the world.[85]

The player's behavior regarding the purchase of virtual items can be broken down into three distinct sub-behaviors: the formation of motivations for the pursuit of virtual items, the formation of behavioral intentions regarding the purchase of virtual items, and the player's actual purchasing behavior. The research also demonstrates that the purchase of virtual things is influenced by both individual psychological variables and external contextual elements, which suggests that certain problems associated with the Metaverse may emerge.[86]

The link between trust product diagnosticity, informativeness, and product descriptions on the one hand, and avatarization on the other, is something else that may be taken into consideration. Being an avatar, therefore, has the potential to alter the views that customers in the actual world have. Users' incentives are directly related to the symbolic and monetary worth of the virtual products they possess. Values such as profitability and affordability, social belonging, status, ostentatious consumerism, identity and selfhood, individualism, and social lubrication are all connected to avatars. Other values include profitability and affordability.

The ongoing dynamic between business and the web has entered a new stage, which can be represented as Metaverse. The vast majority of people perceive business management as the method through which companies integrate innovation, commercial operations, and value-creating processes in order to increase their profitability, social capital, and knowledge. In light of this, the objective is to get an understanding of the circumstances under which the Metaverse may influence the evolution of business models. The congruence between the actions of users, the structure of the platform, and BM motivated developers to investigate other avenues for integrating the Metaverse and business. In order to conduct an analysis of the current situation of the Chinese MMOG sector, we may make use of a BM framework. The business experience may be broken

[85] Kim, T., & Kim, S. (2021). Digital Transformation, Business Model and Metaverse. Journal of Digital Convergence, 19(11), 215-224.

[86] Kraus, S., Kanbach, D. K., Krysta, P. M., Steinhoff, M. M., & Tomini, N. (2022). Facebook and the creation of the metaverse: radical business model innovation or incremental transformation?. International Journal of Entrepreneurial Behavior & Research.

down into four stages, which are identified by the framework as "sustaining," "technical aspects," "environmental factors," and "revenue model concerns." The dynamic processing of BM development is also depicted by the impacts of feedback loops. This kind of development is very necessary given that the elements that influence the success of a company's business model when it is in its formative phases are distinct from those that influence the success of the firm when it has reached a more mature level. The method by which income is collected will also be altered.[87]

V-commerce and other embedded transaction systems have been effectively designed to reach consumers and to pay out revenues, despite the fact that some writers argue that microtransaction models may drive participants to embrace opportunistic conduct. The fact that Metaverse dynamics require software companies to consider the BM as a whole and not just its revenue system is one of its strongest selling points.

The Real Money Trade, sometimes known as RMT, demonstrates how network externalities have an effect on the success of Metaverse. Drawing on the notion of value net, we may show the BM of developers in terms of value creation dynamics, stressing the additional value that can be supplied to clients via a value creation system. The flows of value that connect each of the many subjects involved in the value creation system are given a significant amount of importance. The value network facilitates the trading of a variety of assets, including virtual goods and information, as well as real money and in-game currency. The description of these flows provides some invaluable insights since it makes it easy to pinpoint the locations of various network effects when they are triggered. Because it is so close to being a direct translation of a social activity system into a business model, the approach that was suggested looked to be more suited to take into consideration the social components of the business.[88]

At this point, the focus turned from the creators of the Metaverse to the process by which actual businesses join the Metaverse and combine their real and virtual operations. It is feasible to relate viable business models (BMs) in Metaverse to the anticipated advantages of long-term enterprises. New Brand Channel, Consumer Feedback, and Brand Engagement are the three distinct categories into which business endeavors have been sorted. Nevertheless, it is quite evident

[87] Poian, M., & Cagnina, M. R. (2010). Business Models and Virtual Worlds: The Second Life Lesson. Available at SSRN 1847893.

[88] Huhh, J. S. (2009). An economic analysis on online game service. Available at SSRN 1335120.

that a marketing-focused criterion was chosen for this application. Scholars whose research focused on innovation have produced some very remarkable new discoveries. Platforms based on Web 2.0 are putting pressure on businesses to include customers in practices of co-creation. Because of its combination of a digital, immersive, and interactive environment, as well as its editing capabilities, Metaverse is a perfect platform for capitalizing on the expertise of its users. An interaction model that is built on an avatar, for instance, may be utilized to propel innovation processes. In point of fact, the purpose of developing goods and services through the use of avatars is to meet the requirements of actual customers while taking into account the actual circumstances in which they would be used. It is possible to leverage on both the explicit and implicit information held by users by combining the technology of Metaverse with the customer-centric approach of open innovation.

The ability of any user to sell what they have developed is essential to the functioning of Metaverse as a business platform. As a direct result of this, a successful enterprise may be built from the ground up. Paradoxically, this indicates that in the Metaverse, individual users may end up being the competitors of actual firms in the real world. The term "v-business" has been given to describe this type of situation. A "v-business," sometimes known as a "virtual business," is a company that operates in an online environment. This is something that may be characterized as an operation whose goal is to supply goods or services with the intention of turning a profit from the sale of those goods or services. V-business refers to for-profit and not-for-profit business endeavors that take place in a virtual world that is highly analogous to the actual world. V-business can also be referred to as online business. Both of these studies take a theoretical approach to defining the many components of BM, as well as their linkages and the ways in which value may be added to businesses.

The idea of a product is experiencing significant change as a result of the rise of digital technology. The addition of services to the core product is moving more and more toward a digital format, which results in a rise in the value of the product as a whole due to the addition of value obtained from digital advancements. Automobiles, for instance, that are equipped with GPS systems, sensor-based self-driving technologies, and self-monitoring and automatic ordering refrigerators, are basic examples of traditional products that have been infused with digital services to make them more than product – they morph into servicitized products with increased value proposition for customers. Other examples include self-monitoring and automatic ordering

refrigerators. The digitalization of the items also makes it possible for them to be connected to networks and have connection. This has significant repercussions for the development of new business models. To begin, the networking of items via the use of internet and mobile technologies is giving birth to a rental economy. This rental economy is characterized by the fact that the latent value of privately held objects is being unlocked through the use of digital networking for rental alternatives (e.g., Airbnb for houses and Uber for automobiles). These types of goods make it possible to implement the platform models that we covered in the prior section. Second, the products themselves turn become the point of entry for the provision of value-adding services. For instance, advances in the Internet of Things (IoT), in which items are imbued with intelligent technologies that enable communication with one other and the users, as well as the ability to give services to consumers on an ongoing basis, have made these things possible. Another recent case in point is that of Peloton, which makes use of the product and connection in order to supply consumers with work-out services that can be performed in the convenience of their own homes. Third, products and services themselves are beginning to morph into services. This is especially true in the realm of information products such as software and content such as music, video, and text. Online and mobile technologies are playing an important role in the delivery and fulfillment of these services. This has made it possible to construct product lines consisting of a variety of digital and traditional formats that do not use digital technology, which has fascinating ramifications for the different bundling strategies.

Direct-to-consumer (DTC) business models have become increasingly popular as a result of the proliferation of digital environments. Blue Apron, Hello Fresh, and Dollar Shave Club are three excellent examples of non-digital DTC business models. In the realm of digital media, the proliferation of content in the form of entertainment content, software, and various other kinds of information products has resulted in the development of ad-supported content models (particularly for news and other forms of content). These models are one of the most common types of digital business models. All of these innovations also create chances for customizing and personalizing content as well as product and service offerings. These opportunities may be achieved by modifying not just the primary product or service but also the augmented digital services. This entire process becomes a continual and dynamic one as new technologies come into play. For example, augmented reality and virtual reality are revolutionizing the way shops and home-gym services are offered.

For businesses that sell to consumers as well as those that sell to other businesses, technological success in the metaverse will depend on three factors. The following are 10 actions that businesses may take to get their metaverse strategy and capabilities development off the ground and running. Why Having ownership over, or alternatively assuring easy access to and management of, data and information, as well as the surrounding "geography," on the application layer of the metaverse is of the utmost importance.

• Providing robust links between digital layers and the physical and virtual worlds (human-machine interface), incorporating Internet of Things sensors to enable human-to-metaverse interaction and blockchain technology to generate genuine and unalterable ledgers for the sake of trust.

• Providing the tools that are necessary for both consumers and businesses to spend more time in the metaverse. These tools include computing power, low latency to ensure timely access to information, artificial intelligence to provide continuous learning, fault tolerance, and enhanced contextualization, as well as privacy and permissions to ensure the proper controls are in place, and enhanced contextualization.

3.2 Current company examples using Metaverse and their products/services

The most cutting-edge technology, such as 5G, cloud computing, computer vision, blockchain, and artificial intelligence, are all included into Metaverse, which has applications in a wide variety of areas, including video games, the visual arts, and commerce. Because different countries in the Metaverse have distinct policies, the representative corporations, as well as the typical goods they produce and the growth goals they have, are likewise diverse from one another depending on the country. For instance, the United States of America, which is known as the pioneer of Metaverse, has a Metaverse pattern that is rather comprehensive. This layout is utilized in many different industries, including commerce, gaming, the arts, and social affairs. China is home to a sizable consumer base as well as several successful Internet businesses and services. The economic sector, artistic expression, and video gaming have all been gradually incorporated into the Metaverse by domestic Internet enterprises. While Japan is concentrating on its application areas in the animation and video game industries, South Korea is government-led and is driven by the idol business. Japan's accumulated advantages in the ACG sector and its vast intellectual

property resources allow it to do so. Luxury goods manufacturers in Germany and Italy are experimenting with virtual goods and other methods in an effort to broaden their consumer base. The following is a listing of other representative firms from various nations along with the usual items that they provide.

Amazon - Amazon has been working on a brand-new virtual reality (VR) shopping experience since 2018 and has been attempting to leverage Metaverse in order to establish a virtual store where customers can interact with digital goods in order to demonstrate its dominant position in the market. This is being done in order for Amazon to further its position as the dominant online retailer. Amazon will make shopping online an all new and improved experience for you. View a virtual area that is enhanced in three dimensions and illustrates the fundamental layout of your house. As a result of the addition of this new capability, users may now swipe in the appropriate direction to appropriately interact with the virtual items included within the room.

In 2022, Amazon began hiring people based on their level of knowledge of the metaverse, which is one of the most significant clues that occurred at this time. The gaming technology segment of the corporation required the services of an experienced senior product manager. Beyond that, however, not much is known, which may be due to the fact that the company has just released the metaverse game Cloud Quest.

Cloud Quest may be thought of as its own miniature Amazon metaverse from a technical standpoint. The game takes use of a variety of innovative technologies, one of which being the cloud computing infrastructure provided by Amazon known as AWS. The scope of Cloud Quest, on the other hand, is not nearly as expansive as what the vast majority of people see in their heads when they think of the metaverse. People compete against one another in a miniature city by solving technological challenges utilizing Amazon's cloud computing platform. Cloud Quest is an engaging active learning experiment that is interesting. However, when viewed in the context of Amazon's initial journey into the metaverse, it takes on a far more fascinating quality.

Facebook - Facebook made the announcement that the corporation would be rebranding itself as Meta in October of 2021. Despite the fact that the parent business has changed its name,

the corporate structure has not changed. However, Meta has indicated that it intends to separate the financial reporting of the operational segments into Family of Apps and Reality Labs.[89]

Facebook explained the move by stating that it was important to rename in order to accommodate the company's increased offering of products and technology. This was the reasoning for the change. The new name alludes to Meta's long-term goal of constructing a metaverse, which is essentially a novel kind of social network situated inside an interactive virtual environment and designed to bring together a variety of people for the purposes of gaming, working, and leisure.[90]

In terms of procedures, it is possible that Meta currently has the majority of the pertinent internal procedures in place; hence, the firm will need to place a greater emphasis on further boosting its efficiency as opposed to entirely revamping it.[91]

One piece of evidence that lends credence to this assertion is the news that the corporation has no plans to alter the structure of its corporate governance.[92] Processes that will require additional honing may include customer-facing procedures that are necessary for new monetization mechanisms or data security issues that are not relevant in the current environment of social networks but are likely to gain traction in the future. Both of these categories of processes may require additional honing in the future. It is necessary to distinguish between partnerships with customers in the advertising space and partnerships that are responsible for shaping the ecosystems of the metaverse. Meta has already established relevant partnerships with some of the most successful corporations in this industry, which positions it as one of the most successful advertisement outlets in the world. In 2020, revenue from advertisements is expected to total over $84 billion, accounting for 97% of the company's total revenue. Despite the fact that some of

[89] Meta (2021). "The Facebook company is now Meta", Meta Press Release, available at: https://about.fb.com/news/2021/10/facebook-company-is-now-meta/

[90] Forman, L. (2021), "For Meta, the metaverse isn't so extra", The Wall Street Journal, available at: https://www.wsj.com/articles/for-meta-the-metaverse-isnt-so-extra-11636045785

[91] Thompson, A. (2018), Facebook Inc. Operations Management: 10 Decision Areas, Productivity, Panmore Institute, available at: http://panmore.com/facebook-inc-operations-management-10-decisions-productivity

[92] Canales, K. (2021), "Facebook changing corporate name to Meta", Business Insider, available at: https://www.businessinsider.com/facebook-new-name-meta-rebrand-metaverse-zuckerbergapps-2021-10

Meta's partners, like Patagonia, have brought attention to the inadequacies of the firm's methods, the company still has a good positioning.[93]

In order for Meta to realize its goal for the metaverse, the company will need to build new alliances to expand the scope of the ecosystem and bring other businesses onto the platform.[94] One such relationship is with the eyewear maker Ray-Ban, which focuses on the production of hardware, while another partnership with Microsoft, which focuses on the development of software, has been demonstrated through online meetings. In conclusion, notwithstanding Meta's strategy for developing new technologies, the announcement made by the firm reflects more of an evolutionary progression in the process by which it creates value than it does a revolutionary breakthrough. Building on what it currently possesses, the organization already possesses the majority of the key skills it needs to develop the technology. These capabilities include internal procedures and collaborations. Meta has marketed itself to consumers as a new platform that enables them to do practically everything imaginable, including socialize with friends and family, work, study, play, shop, and create.[95]

This self-description, however, amounts to nothing more than a visionary statement at the current time, taking into consideration the fact that many relevant components necessary for an experience that is actually functional are still in the research stage. The initial prototype of Horizon Home demonstrates that the imaginative offering of Meta may affect the how of users in terms of the methods in which they will engage, but will not dramatically impact the what, which is interaction.[96]

In addition, it is still unclear how exactly users will be able to construct their own virtual avatars in a high quality depiction, despite the fact that this function represents an essential

[93] Egan, M. (2021), "Patagonia CEO: companies should join us in boycotting Facebook", CNN, available at: https://edition.cnn.com/2021/10/28/business/patagonia-ceo-facebook-boycott/index.html
[94] O'Flaherty, K. (2021), "Why Facebook's metaverse is a privacy nightmare", Forbes, available at: https://www.forbes.com/sites/kateoflahertyuk/2021/11/13/why-facebooks-metaverse-is-aprivacy-nightmare/?sh5cebcb0e6db85
[95] Meta (2021), "Connect 2021: our vision for the metaverse", Tech@Facebook, available at: https://tech.fb.com/connect-2021-our-vision-for-the-metaverse/
[96] Dwoskin, E. (2021), "Facebook is changing its name to Meta as it focuses on the virtual world", The Washington Post, available at: https://www.washingtonpost.com/technology/2021/10/28/facebook-meta-name-change/

component of both the virtual experience and interaction. In any case, Meta will continue to function as a platform that facilitates connections between users and the sharing of content among those individuals. The only thing the corporation is willing to guarantee is that in the not-too-distant future it will provide a new user experience that is made possible by technology.

This future capacity does, however, involve the added supply of new hardware components like Oculus virtual reality headsets and remotes, which will enable users to access the metaverse and experience it in a manner that is distinct from their typical engagement in the medium. These pieces of hardware may be thought of as the entrance to the metaverse, and having them is essential to having a successful experience within it.[97]

Roblox - Roblox is a platform for online multiplayer gaming that was introduced in 2006 and allows users to both build their own games and play those that were made by other users. Roblox now hosts more than 50 million distinct games. Robux are Roblox's site-wide money, and while the game itself is free to play, there are a number of aesthetic and in-game enhancements that can be purchased with Robux. Players have the option of purchasing Robux with a one-time purchase or by subscribing to Roblox Premium on a recurring monthly basis. In addition, in order to get additional Robux, users have the ability to resell objects, engage in trades, or monetize their games. The users of Roblox, both amateur and professional, are responsible for developing the games that may be played on the platform. Roblox is looking to its users to provide user-generated content in order to develop a metaverse. To put it another way, Roblox's goal is to establish itself as the platform upon which users may construct the metaverse. Players have the ability to design their own virtual worlds or compose their own games; the only restriction is their creativity. Roblox supports virtual reality (VR) devices to further enhance the user experience. Roblox has grown to become the user-generated content (UGC) gaming platform that supports the most operating systems, including iOS, Android, PC, and Mac. Roblox is currently one of the worlds that have the potential to be one of the worlds that is most similar to the Metaverse.[98]

[97] Oculus (2021), "Oculus for developers", Oculus Homepage, available at: https://developer.oculus.com/

[98] Han, J., Heo, J., & You, E. (2021, October). Analysis of metaverse platform as a new play culture: Focusing on roblox and zepeto. In Proceedings of the 2nd International Conference on Human-centered Artificial Intelligence (Computing4Human 2021). CEUR Workshop Proceedings, Da Nang, Vietnam (Oct 2021).

Epic Games - Towards April of 2021, Epic Games made the announcement that they will be investing one billion dollars in the construction of a metaverse. And completed the acquisition of Skethfab, the most popular platform for 3D models, with the intention of absorbing user traffic coming from the Skethfab platform and increasing its market share in the metaverse. Epic Games is a leading proponent of the metaverse and a forerunner in the development of its central subject. It has demonstrated that such events might draw millions of players who are looking for entertainment in new formats by successfully organizing virtual music concerts and movie showings within Fortnite. These kinds of live events also provide a way for celebrities and sponsors to interact with their own audiences of followers and consumers. Even while many of these events are marketing campaigns designed to highlight Epic's technological power, they also illustrate customer interest in making use of virtual worlds for activities that take place in the real world. Epic's huge user base gives the company the ability to try out new things and work toward creating a compelling metaverse service in the near future. In light of the fact that children have been a driving force behind Roblox's expansion over the past few years, Epic intends to incorporate them into its ecosystem. In April of 2022, Epic entered into a partnership with Lego to develop a children's metaverse. Given how important the issue of protection within the metaverse is, this is a significant step. Because it is difficult to confirm that children are participating in activities that are suitable for their ages, many parents are doubtful.

Snapchat - The well-known social media application known as Snapchat (SNAP) is forming strategic alliances with businesses in an effort to revolutionize the manner in which users make purchases on the internet by employing augmented reality (AR). AR try-on is something that Snapchat hopes will become a regular purchasing tool in the near future, allowing users to wave their phones and virtually try on the newest Puma sweatshirt.

As social media platforms transition into metaverse enterprises, the technology company is broadening its offering of augmented reality (AR) try-ons and increasing accessibility to its AR technology in an effort to strengthen its partnership with brands and shops.

Brands will have an easier time creating three-dimensional, photorealistic copies of their products with the help of new technologies, and customers will have an easier time trying out these things. Brands now have the ability, for the first time ever, to incorporate these augmented reality try-on tools into their own applications, which means that they do not need to separately create or

buy this technology. Puma and Ralph Lauren are among the first to test the product. Users of Snapchat will also have an easier time discovering things that they can virtually try on, according to Snap's new Dress Up area. This is the first time that the company has developed a dedicated location for the aforementioned variety of content. Snap has high expectations that augmented reality would become more widely used if it grants other app developers and developers permission to utilize Snapchat's technologies outside of the Snapchat app for free.[99]

Decentraland - You may purchase and trade lands and plots on the Ethereum-based virtual platform known as Decentraland, which is a three-dimensional representation of the Metaverse. After that, you may utilize the land to develop your own settings and applications or a market, depending on what your needs are. It thrives as the first-ever totally decentralized virtual arena that enables individuals to immerse themselves in a one-of-a-kind experience of technology's power and allows them to interact with others in a manner that was not previously possible. Decentralized and land are the two components that make up DECENTRALAND, as suggested by the name. This indicates that the platform is completely decentralized, making it an excellent choice for everyone who possesses a solid understanding of augmented reality and cryptocurrency and who is eager to explore the digital world of Metaverse. January 2020 marked the beginning of the project's availability to the general public. Ari Meilich and Esteban Ordano were the ones in charge of it. It is a user-only platform that gives users the ability to generate, exchange, and sell their own digital content as well as their assets in virtual real estate. On Decentraland, it is possible to own anything and everything, from an art gallery to hangout areas, from conference facilities to opulent residences. The cryptocurrency known as MANA may be used to purchase these virtual assets, which are referred to as Non-Fungible Tokens. MANA, Estate, and LAND are the three primary tokens that may be utilized inside Decentraland. Within the context of the Decentraland ecosystem, each of these coins has its own unique function. It all started as a proof of concept for transferring ownership of digital real estate to users on a blockchain, and that's exactly how Decentraland got its start. This digital real estate was first implemented as a pixel on an endless 2D grid. Within each pixel was information that described the pixel's color and identified the owner of the pixel. This particular experiment was given the name "Decentraland's Stone Age." The creation of the Bronze Age, a 3D virtual environment that is segmented into land parcels, was

[99] Bushell, C. (2022). Metaverse brand extension. Available at SSRN.

begun by the team before the end of 2016. Using a customized version of the Bitcoin blockchain, the owner of each parcel was able to link their parcel with a hash reference to a file. Users exploring the virtual world might use a Distributed Hash Table (DHT) and BitTorrent to download the file holding the parcel's content, which determines the models and textures that are to be shown at that point. This reference could be found here.[100]

SAMSUNG - Through the development of an immersive experience that they call 837X, Samsung, which is a worldwide leader in innovation and interconnection, has increased its engagement with its consumers. Customers may play, dance, discover, create, and interact with others in the metaverse when they visit that location, notwithstanding where in the globe they may be physically located.

Built on the Decentraland platform and modeled after a flagship showroom and educational space in New York City, 837X will be continuously updated with new worlds to discover, tasks to accomplish, and material to unlock. But for the time being, 837X is focused on implementing improvements that are both sustainable and routine in order to have a real impact. Enter the code 837X to begin a voyage filled with one-of-a-kind artifacts, incredible vistas, unusual visitors, and environmentally conscious behaviors.

Gucci - Gucci, an Italian luxury company, has introduced a line of virtual athletic shoes. After making the purchase, customers may utilize the footwear on the Gucci app as well as the virtual reality social network VR CHAT, or they can test out the footwear on the Roblox gaming platform.

MetaDubai - In order to create the most comprehensive virtual world image, economic system, and application set possible, MetaDubai is currently working on the construction of a Metaverse city in Dubai that will be based on blockchain technology, non-fungible tokens, artificial intelligence, and decentralized data storage.

3.3 Future implications for business world

The Metaverse will, at some point in the future, construct a world that features a fully operational economy that spans both the physical and digital realms. The present digital assets,

[100] Jeon, H. J., Youn, H. C., Ko, S. M., & Kim, T. H. (2022). Blockchain and AI Meet in the Metaverse. Advances in the Convergence of Blockchain and Artificial Intelligence, 73.

virtual content, intellectual property, and digital currencies may all be transferred inside the Metaverse, and this world will also have the capability to be completely self directed and iterative.

In the same way that the internet has already connected 63 percent of the world's population in just half a century, technology is advancing at a rapid pace. With the upcoming iterations of 5G, AR, VR, MR, and other technologies and terminal devices, the Metaverse may change in ways that are far beyond people's expectations in terms of the construction of a new internet form that features multi-interface, full-sensory immersive human-computer interaction. This is something that hopefully will become a It is not only the technological and content issues that still need to be conquered; the regulatory elements also need to be handled. There are still a lot of obstacles to be overcome. The Metaverse is a virtual world that exists independently from the real world. However, events that take place in the Metaverse can have an effect on the real world. At the same time, the Metaverse has its own independent economic system to support the rules of the virtual world. However, this raises a number of questions, including who will make the rules, who will design the code, whether there will be sufficient regulation of the transmission of information, whether there will be instances of money laundering and fraud, and so on.

The expansion of the Metaverse will result in a rise in investment across a broader range of industries. In the first place, it will cause the market for virtual products to see even more growth. The market for virtual products is currently valued at around US$50 billion, but analysts anticipate that this figure will more than double by 2025, reaching US$190 billion. Second, it has the potential to speed up the development of AR and VR. The total number of AR/VR devices that were shipped reached 5.12 million units in 2020 and is expected to reach 43.2 million units in 2025. The global AR/VR market will have associated expenditures of US$12 billion in 2020 and is expected to grow at a CAGR of 54% over the five years of 2020-2024. Thirdly, it will further stimulate the rapid growth of cloud computing, as the implementation of the Metaverse would demand more huge data storage and computational needs. This means that cloud computing will be further promoted. Fourthly, for the content or platform builders themselves, they have the ability to construct an immersive virtual world that combines social, entertainment, advertising, online shopping, and other functions, and their commercial value speaks of a geometric increase when the user value chain is extended.

The year 2021 is often regarded as the beginning of the Metaverse. During this historical period, which is known as the era of spacious navigation, human beings are working toward the goal of entering the digital world. The Metaverse is made up of a number of different technologies, and it is currently in the early stage of the Metaverse. However, the Metaverse is not yet accessible to humans, and the implementation of the Metaverse requires a number of different techniques, such as 5G, VR/AR, cloud computing, and so on. In addition, the core technology of AR/VR does not yet have a well-defined business model. These technologies have just opened the door and begun to navigate the first channel of the Metaverse; to experience the full potential of the Metaverse, further components are necessary. If the current iteration of the Internet is capable of completing offline activities such as going to the office, doing one's shopping, and teaching, then the next iteration of the Internet, which will usher in the age of the Metaverse, should be capable of fully penetrating and integrating the physical world, achieving true interoperability among technologies, and even fully realizing the potential of the virtual world in the physical world of three dimensions. Connecting the real world with the virtual world while participating in an immersion event involves using the internet. A short while ago, China's most prominent mobile application development service provider. Aurora Mobile successfully integrated the push feature in the self-developed game demo on the Roblox platform. Not only does this function make it possible for people in the real world and in the virtual world to communicate with one another, but it also paves the way for further development of the Metaverse, which offers a novel method of operation.

The length of time necessary for the learning of new skills and training may be drastically cut down thanks to the possibilities presented by the metaverse. There is a possibility that digital coaches powered by AI will become available to provide career guidance and assistance with staff training. It's possible that any thing in the metaverse may be turned into an interactive experience, complete with 3D representations and step-by-step guides. Thanks to the widespread use of virtual reality role-play exercises and simulations, worker avatars will soon be able to learn in very realistic game play settings, such as the high-pressure sales presentation, the difficult customer, or a problematic employee interaction. Examples of this include the high-pressure sales presentation, the tough customer, and a problematic employee interaction.

Virtual reality technology is already being used to speed up the process of skill acquisition in a variety of sectors, including the following: Embodied Labs has used 360-degree video to help

medical professionals experience the effects of Alzheimer's Disease and age-related audiovisual impairments, in order to assist in making diagnoses. Manufacturing giant Bosch and the Ford Motor Company have pioneered a virtual reality (VR) training tool, using the Oculus Quest headset, in order to train technicians on complex machinery. Medivis, a business that specializes in surgical technology, is employing the HoloLens technology developed by Microsoft in order to educate medical students by having them interact with three-dimensional anatomical models. The business Metaverse Learning, which is situated in the United Kingdom, worked along with the UK Skills Partnership to develop a set of nine augmented reality training models for front-line nurses in the United Kingdom. The models made use of three-dimensional animation and augmented reality in order to evaluate the learners' capabilities in a variety of scenarios and to emphasize the most effective nursing care procedures.

Research indicates that traditional classroom- or instructor-based training may not compare favorably to virtual world training because the latter provides more opportunities for learning by doing, more room for visually demonstrating concepts and work practices, and overall higher engagement through game immersion and quest-based problem-solving. Learning in virtual worlds may also make use of virtual agents, which are AI-powered bots that can support learners when they are stuck, offer nudges, and generate projects with varying degrees of difficulty. Because autistic people are more likely to respond positively to visual cues than they are to verbal ones, the visual and interactive features of metaverse-based learning are likely to appeal to them. One strategy for addressing social anxiety on the job is to make use of technology such as virtual reality to simulate safe and lifelike settings in which the individual may practice social situations such as giving speeches and participating in meetings.

CHAPTER 4. RESEARCH DESIGN

4.1 Research methodology

The method of case studies is going to be used for the research approach. This methodology was selected because it makes it possible to conduct in-depth research on individual organizations and the ways in which they interact with the metaverse. The case study technique is especially helpful for investigating complicated and ever-changing phenomena like the metaverse, as it enables the integration of data from a variety of different sources and is therefore very practical.

Ubisoft and Adidas will be analyzed separately as separate entities in this case study that will be conducted. These businesses were selected because they are both currently engaged in active work with the metaverse and have indicated intentions to incorporate it into their operations in the near future. We will be able to acquire insight into the opportunities and risks that the metaverse holds for businesses operating in a variety of industries if we study these enterprises and learn from them.

In order to carry out the case study, we will first collect data from a wide range of different sources. This will consist of already conducted interviews with important players from Ubisoft and Adidas that have been put online, as well as sources like as reports from companies, press announcements, and stories from the news. In addition to this, we are going to investigate the firms' existing strategies, activities, and future intentions in relation to the metaverse.

When all of the data has been gathered, it will be subjected to a number of analyses, such as content analysis and theme analysis, to determine what can be learned from the information. The findings will be used to uncover patterns and themes linked to the possibilities and risks that the metaverse poses for organizations. These patterns and themes will be utilized to inform future research.

The case study technique will, in general, make it possible for us to get a profound comprehension of the manner in which Ubisoft and Adidas are addressing the metaverse and the potential ramifications that their activities may have for other types of companies. The findings of this study will be of great assistance to businesses that are considering expanding their operations into the metaverse, as well as to policymakers who are interested in gaining a better understanding of the possible effects that the metaverse might have on the economy.

4.2 Research questions

1. What opportunities does the metaverse present for Ubisoft and Adidas, and how are they currently leveraging them?

2. What has been their strategy for Ubisoft and Adidas entering Metaverse space?

3. How do Ubisoft and Adidas's future plans regarding metaverse compare and what are the opportunities and challenges they see in the future?

4.3 Research context

The metaverse has the potential to revolutionize various industries, such as gaming, entertainment, education, and e-commerce, by providing new opportunities for engagement, collaboration, and revenue generation. However, the metaverse also presents a number of challenges, including issues related to privacy, security, and regulation.

In order to understand the opportunities and threats that the metaverse presents, this thesis will utilize the case study method to examine the works of Ubisoft and Adidas with the metaverse. These companies were chosen because they are both actively working with the metaverse and have announced plans to integrate it into their operations. By studying these companies, we will be able to gain insight into the ways in which the metaverse is being used in practice, as well as the potential implications of these uses for businesses and society as a whole.

The case study method is particularly useful for exploring complex and dynamic phenomena such as the metaverse, and it allows for the integration of multiple sources of data. To conduct the case study, we will gather data from a variety of sources such as interviews with key stakeholders from Ubisoft and Adidas, as well as secondary sources such as company reports, press releases, and news articles.

The findings of this research will have important implications for companies looking to enter the metaverse and for policymakers looking to understand the potential impact of the metaverse on the economy. Additionally, the research will contribute to the existing literature on the metaverse by providing a detailed examination of the ways in which real-world organizations are approaching this emerging technology.

CHAPTER 5. FINDINGS

5.1 Sandbox metaverse and briefly about Ubisoft and Adidas

5.1.1 Sandbox

Sandbox is a blockchain-based virtual world where users can buy, sell, and create virtual experiences and assets. These experiences and assets can include anything from virtual real estate, to in-game items, to unique digital collectibles. The Sandbox's metaverse is a decentralized, community-driven platform that allows users to create, share, and monetize their own gaming experiences.[101]

The Sandbox uses a cryptocurrency called SAND, which is an ERC-20 token built on the Ethereum blockchain. SAND is used as the primary currency for buying and selling virtual assets within the Sandbox metaverse. Users can purchase SAND through cryptocurrency exchanges, and then use it to buy virtual land, or "LAND," in the metaverse. Each LAND represents a unique, non-fungible, digital asset, which can be owned by a single user and used to create and monetize their own virtual experiences.[102]

The Sandbox's business model is based on the sale of LAND, as well as the sale of in-game items and experiences, and the collection of transaction fees for buying and selling virtual assets within the metaverse. Users can also monetize their own experiences by charging SAND for access to their virtual worlds or by selling in-game items. The Sandbox also plans to generate revenue through advertising and partnerships with game developers, brands, and other entities interested in reaching a highly engaged gaming audience.[103]

The Sandbox has a unique governance system that allows the community to vote on the direction of the platform. The SAND token holders are able to vote on key decisions such as the addition of new virtual assets and experiences, changes to the platform's rules, and the distribution

[101] Christodoulou, K., Katelaris, L., Themistocleous, M., Christodoulou, P., & Iosif, E. (2022). NFTs and the metaverse revolution: research perspectives and open challenges. Blockchains and the Token Economy: Theory and Practice, 139-178.

[102] Nakavachara, V., & Saengchote, K. (2022). Does unit of account affect willingness to pay? Evidence from metaverse LAND transactions. Finance Research Letters, 49, 103089.

[103] Kiong, L. V. (2022). Metaverse Made Easy: A Beginner's Guide to the Metaverse: Everything you need to know about Metaverse, NFT and GameFi. Liew Voon Kiong.

of revenue. This allows for a decentralized, community-driven approach to the development and growth of the Sandbox metaverse.

Users may search for and purchase creator's ASSETS using SAND via Sandbox's NFT Marketplace in order to include them into a range of their LAND holdings. Similarly, VoxEdit users and producers may upload, publish, and sell their NFT-based ASSETs. As a kind of evidence of ownership, verification, and authentication, these ASSETs are uploaded to an InterPlanetary File System input on the Ethereum blockchain. In addition, this assures that ASSET-related information is irreversible and unmodifiable without the consent of respective/specific ASSET owners.[104]

Many of Sandbox's themed NFTs were created in conjunction with significant non-crypto business partners as well as some of the top blockchain/cryptocurrency organizations, including Binance, Atari, Smurfs, Care Bears, CoinMarketCap, Avenged Sevenfold, Gemini, Deadmau5, and FTX, among others. The NFT collection of Sandbox is further categorized by form/type with regard to LAND, ENTITY, EQUIPMENT, and ART, as well as by additional qualities including: behavior, slot, tier, attribute, biome, tag, and coordinate, as well as any related sales.

Sandbox's marketplace facilitates a fast and effective shopping environment for users seeking to deal in NFTs with a range of features. LAND is an oken in the Sandbox metaverse that represents a piece of digital real estate on the Sandbox map. After purchasing LAND, players may populate it with various games and ASSETS. Similar to previous metaverse implementations, LAND may be merged to build ESTATE, which enables creative teams to produce bigger and more immersive online experiences. Within the Sandbox metaverse, there are only 166,464 pieces of LAND accessible. Each basic unit of LAND on the Sandbox map consists of 96x96 meters within the Sandbox universe, allowing for a wide range of blockchain-based in-game experiences without being unmanageable. ASSETs are ERC-1155-compliant tokens that are produced by gamers that create/assemble user-generated content. These ASSETs are thereafter sold on the Sandbox marketplace as NFTs and are mostly utilized as creative elements within The Sandbox Game Maker.

[104] Bhujel, S., & Rahulamathavan, Y. (2022). A Survey: Security, Transparency, and Scalability Issues of NFT's and Its Marketplaces. Sensors, 22(22), 8833.

As previously alluded to, Sandbox users may monetise their interactions and involvement with the site in three key ways:

Building Games: Using Sandbox's Game Maker, users may create and monetize a variety of games using land assets that players control. Sandbox users are able to build and sell ASSETs in the Sandbox marketplace.

Land Ownership: After acquiring LAND in one of Sandbox's LAND sales, players may rent out their holdings or fill them with content to earn fees and improve the value of their LAND. Sandbox enables users to perform transactions on the Ethereum blockchain network with platform-paid transaction costs, hence enhancing the overall user experience.

As part of the platform's business strategy, Sandbox collects 5% of the total value of all transactions through marketplace transaction-related fees. The remaining 95% of transaction value is derived by premium NFT/ASSET, LAND, and subscription services. In addition, 26.50 percent of all SAND transactions are returned to the Sandbox Foundation. In return, the Sandbox Foundation supports the ecosystem by providing several incentives, like as grants, to encourage the production of high-quality content and video games. To date, the Foundation has funded over 17 gaming projects, distributed grants to 100+ artists to produce NFTs, supported local community managers to expand The Sandbox's global awareness, sponsored numerous prizes for various contests organized directly by The Sandbox team, and supported play-to-earn tournaments and cross-gaming with activities that promote the adoption of SAND.

5.1.2 Ubisoft

Ubisoft is a French video game company founded in 1986. It is one of the largest video game publishers in the world, with franchises including Assassin's Creed, Far Cry, Tom Clancy's Rainbow Six, and Just Dance. The company also operates several game development studios around the world, including Ubisoft Montreal, Ubisoft Quebec, and Ubisoft Toronto. In terms of technological strategy, Ubisoft has been investing heavily in artificial intelligence and machine learning. The company has formed partnerships with several research institutions and universities to develop new AI technologies for use in its games. Additionally, Ubisoft has been using AI to

improve player experience by creating more dynamic and realistic non-player characters and environments in its games.[105]

Ubisoft has also been focusing on expanding its presence in the mobile gaming market. In 2020, Ubisoft acquired the mobile game developer, Ketchapp, to expand its portfolio of mobile games. The company also announced plans to release several of its popular franchises, such as Assassin's Creed and Tom Clancy's Rainbow Six, on mobile devices. In recent action, Ubisoft has been focusing on expanding its live service offerings. With the success of games as a service model, the company has been investing in games that have a long-term player engagement. This includes games such as Tom Clancy's The Division 2 and Rainbow Six Siege. Additionally, the company has also been releasing new content and updates for its older games like Assassin's Creed Odyssey and For Honor.

Ubisoft also announced that it would be working on more games for the next-generation of consoles and PC including the new Assassin's Creed game and Far Cry 6. In terms of collaboration, Ubisoft has announced a partnership with Google to bring some of its games to the cloud gaming platform, Stadia. This partnership allows players to stream Ubisoft games on any device with a stable internet connection, making them more accessible to a wider audience.

In the October 2021, Ubisoft announced that it will be opening a new studio in Dallas, Texas. This new studio will be focused on developing multiplayer games and expanding the company's live service offerings. Overall, Ubisoft's current technological strategies include investing in AI and machine learning, expanding its presence in the mobile gaming market, and expanding its live service offerings. The company continues to focus on developing new games and content for its popular franchises, as well as exploring new partnerships and opportunities in the gaming industry.

5.1.3 Adidas

Adidas is a German multinational corporation that designs and manufactures footwear, apparel, and accessories. The company was founded in 1948 by Adolf Dassler, and it has since grown to become one of the world's largest sportswear manufacturers. Adidas is known for its

[105] Santos, N. (2022). Assassins and the Creed: A look at the Assassin’s Creed series, Ubisoft, and women in the video games industry. Women in Historical and Archaeological Video Games, 9, 25.

iconic three-stripe logo and its commitment to innovation and technology in the sportswear industry. In terms of technological strategies, Adidas has been investing in digital technologies and e-commerce to enhance the customer experience and increase efficiency in its operations. The company has implemented a digital-first strategy, which includes the use of data analytics, artificial intelligence, and machine learning to better understand customer behavior and preferences.

Adidas has also been focused on sustainability, using new technologies to develop more environmentally friendly products. The company has set a goal to use only recycled polyester in all of its products by 2024, and has been using digital technologies such as 3D printing to reduce waste in its manufacturing process. Adidas has been working on various collaborations with technology companies, one of the most notable being its partnership with Carbon, a California-based digital manufacturing company. The partnership allows Adidas to produce performance products such as running shoes in a faster and more sustainable way, by using Carbon's Digital Light Synthesis technology. This technology uses digital light projection, oxygen-permeable optics, and programmable liquid resins to produce high-performance and customizable parts. The partnership has allowed Adidas to produce new product lines, such as the "Futurecraft 4D" shoe, which is made using 3D-printed midsole.

Adidas has also announced a partnership with OpenAI, a research company that focuses on artificial intelligence. The partnership aims to create more personalized shopping experiences for consumers by using AI to analyze customer data and recommend products that align with their preferences. Adidas also has a partnership with MyFlexFit, a technology company that uses 3D scanning to provide customers with customized insoles and shoe inserts. The partnership allows customers to scan their feet using a mobile app, which then generates a 3D model of their feet. This data is used to create customized insoles that are tailored to the customer's specific needs.

Adidas has also been focused on expanding its presence in the e-commerce market, with the company announcing plans to open a new e-commerce platform in 2021. The platform is expected to provide customers with a more personalized shopping experience by using data analytics and AI to recommend products based on their preferences. In summary, Adidas is a company that is committed to using technology and innovation to enhance the customer experience, improve sustainability, and increase efficiency in its operations. The company has

been collaborating with technology companies such as Carbon, OpenAI, and MyFlexFit to develop new products, create more personalized shopping experiences, and reduce waste in its manufacturing process.

5.2 Latest actions of companies and future plans

5.2.1 Adidas “Into the metaverse”

In 2021, Adidas made their debut in the metaverse by releasing a series of NFTs in collaboration with a number of noteworthy projects.[106] These projects included Bored Ape Yacht Club, Mutant Ape Yacht Club, Pixel Vault NFT, and others. The whole collection was snapped up in a matter of minutes and brought in a total of $23.5 million in a single day's sales.[107]

Holders of the company's tokens will have access to both physical goods and open Metaverse virtual land experiences. The company specializes in sporting gear. The significance of these connections lies in the fact that they put both the magnitude of the Metaverse and the significance of NFTs into proper perspective. Previous notable Adidas partnerships has resulted in the production of iconic and one-of-a-kind collections with prominent singers. Two recent examples of such partnerships are the 2019 collaboration between Beyoncé and Ivy Park and the 2016 relationship between Kanye West and Yeezy. The expected collaboration between Adidas and an NFT community of apes will take place in 2021.[108]

It is crucial to connect with communities to enable a meaningful transition while bridging the gap into the metaverse. This will ensure a smooth transfer. Fans of Adidas who are merely interested in new items and experiences, rather than cryptography or the metaverse, have a chance to benefit from this as well. Because at least 9,620 NFTs were set aside for public sale, it is theoretically possible for anybody, regardless of whether they are crypto enthusiasts or not, to acquire a "Into the Metaverse" NFT. Adidas gives its consumers the impression that they are members of a prestigious organization by promising them access to a variety of real and virtual

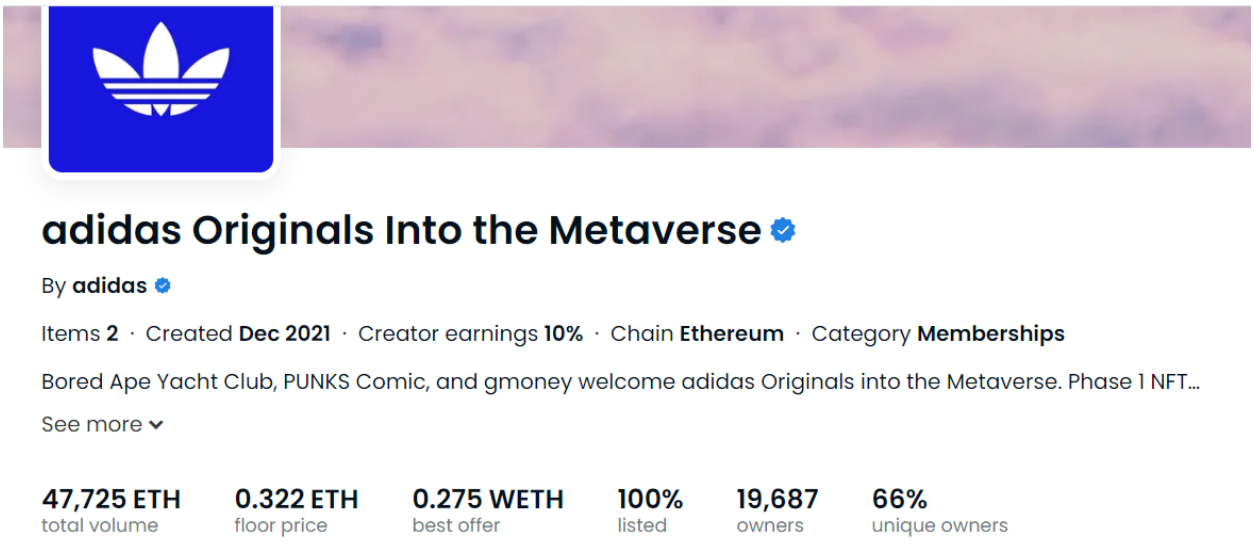
[106] Weking, J., Desouza, K. C., Fielt, E., & Kowalkiewicz, M. (2023). Metaverse-enabled entrepreneurship. Journal of Business Venturing Insights, 19, e00375.
[107] Gonzalez, P. (2022). Digital fashion in the Metaverse.
[108] Noris, A., & Cantoni, L. (2022). Digital Fashion Communication: An (Inter) cultural Perspective. In Digital Fashion Communication (pp. 1-147). Brill.

goods and activities. This may be a limited edition hoodie or beanie to wear to the gym, or it could be a ticket to an Adidas event in the metaverse, where NFT will function as the actual ticket.[109]

Image 3. Into the metaverse by Adidas

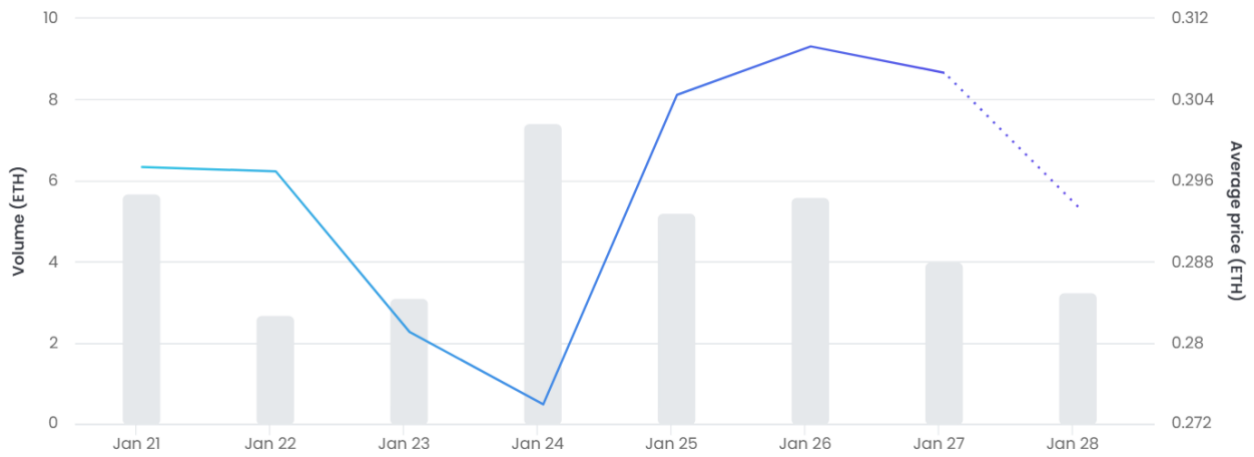
The image of adidas Originals Into the Metaverse Opensea account and recent indicators is given below.

Image 4. Opensea account of adidas



[109] Gli NFT adidas sono arrivati: benvenuti nel Metaverse | adidas Italia

Figure 2. Sales figures



During the period beginning on the 21st and ending on the 28th of January 2023, a total of 127 Adidas Originals Into the Metaverse NFTs were purchased. There were a total of $60,14k worth of sales for the adidas Originals Into the Metaverse product. One adidas Originals Into the Metaverse NFT cost an average of $473.5 when it was first released. There are 19,690 people who hold adidas Originals Into the Metaverse, and each of them has control over 2 tokens out of a total quantity of 2.

Another initiative of Adidas was in collaboration with Prada. The 20th of January, 2022 The third iteration of the metaverse collaboration between adidas Originals and Prada, two global companies recognized for their persistently progressive drive to innovation and uniqueness, is now available. Both Adidas and Prada will be reaching out to their respective audiences in an effort to solicit one-of-a-kind and anonymous contributions of images for the NFT project in the Open Metaverse. Zach Lieberman, a well-known creative encoder and digital artist, is going to take 3,000 pieces of artwork from the community and turn them into NFTs. These NFTs will then be used as tiles in a massive NFT mosaic that will be created all at once.

The collaboration with the NFT collection of Bored Ape, one of which has taken the name Indigo Herz and become the brand's new face, but more importantly with the crypto-visionary gmoney, one of the pioneers of the NFT explosion, and the PUNKS Comic crew, who are instead playing another interesting role within the new crypto-art market by creating a series of comics

that insert the character into the metaverse, appears to be the brand's entry point into the metaverse for those who are interested

A non-secondary consideration that plays on the dynamic between the concept of the metaverse and that of personal identity, the latter of which has only recently begun to assume a growing significance within the development of fashion brands that have tried to both develop collective identities through the social engineering of their online communities and to change the narrative surrounding fashion itself by transforming its products not into status signifiers but rather into cultural artifacts. A non-secondary consideration that plays on the dynamic between the concept of the metaverse and that of personal identity. adidas' new initiative, its collaboration with the comic book industry, and the significance placed by the brand on the idea of a place where anyone can choose and redefine their identity represent perhaps the clearest points of connection with the psychology of Gen Z, the generation that will carry adidas' legacy forward into the coming decades. Beyond its enormous marketing potential, which BoF estimates to be around $50 billion, adidas' new initiative, its collaboration with the comic book industry, and the significance placed by the brand on the idea of a place where anyone can choose and redefine

A pledge coming from a totally cost-free cooperation, participants in the adidas for Prada re-source NFT project will keep full ownership of their non-fungible tokens (NFTs) they create as part of their participation in the project. On the Digital Marketplace, Adidas and Prada Will Hold an Auction for Lieberman's Final NFT Extremely Rare and Accounting for the Majority of the Sale Proceeds Going to Slow Factory, which is a non-profit organization and institute devoted to the creation of education in order to develop meaningful solutions and inclusive societies. Prada and adidas Originals will use NFTs and Web3 technology to create a new sort of collectivity that is based on ownership, authenticity, and community as a way to pay homage to Open Innovation. Participants will be rewarded for their involvement in this new type of collectivity. The delivery of the project on the Polygon network was made possible by a partnership between adidas and Prada and Polygon Studios. The adidas for Prada re-source initiative is the deciding factor in this newest cooperation that has moved both brands into the metaverse. It is unceasingly inventive and unmistakably community driven.

5.2.2 Ubisoft and metaverse

Ubisoft and The Sandbox, a blockchain game, are working together to introduce Rabbids, which are mischievous critters resembling rabbits, to the metaverse. Ubisoft is now managing a digital zone in The Sandbox alongside more than 200 other partners, some of which include Snoop Dogg and The Walking Dead. In the beginning, Rabbids were only supporting cast members in another video game series. The characters quickly garnered popularity, which motivated Ubisoft to launch a solo video game franchise. In addition, a television show, a feature film, and a forthcoming original series produced by Netflix will all be based on the characters. Ubisoft had already included digital riches for the Rabbid series by the time the mania for non-fungible tokens (NFTs) began to spread in the year 2020. The first effort was made in the form of a fundraising drive for the United Nations Children's Fund.

Image 5. UbisoftxSandbox collab

Since they were initially conceived in the year 2020, the virtual creatures who would eventually be integrated into Sandbox's metaverse have experienced a process of artistic evolution. They are more engaging and engaged than the initial NFTs, which were already quite interactive. In addition, using the development tools provided by The Sandbox's Game Maker, gamers will be able to create their very own games that make use of the Rabbid IP license.

Ubisoft has, for a considerable amount of time, exercised extreme caution with regard to the implementation of play-to-earn efforts for a well-known gaming company that is active in blockchain technology. The company recently became a member of the Hedera Governing Council and operates an Entrepreneur Lab, which for the past three years has provided assistance to blockchain start-ups. However, the Sandbox is the first metaverse collaboration that it has participated in.

The fact that Ubisoft has been around for a while and seen the ebbs and flows of trends in online gaming may be a contributing factor to the company's circumspection. Both NFTs and play-to-earn games satisfy almost every criterion associated with hype. Ubisoft, on the other hand, has demonstrated far more daring than other well-established video game companies. On December 7, 2021, development at Ubisoft began on what would become the most ground-breaking NFT-related project in the history of AAA video games. Quartz is the name of the NFT platform, while Digits is the name of the NFTs that it supports. Quartz was named after the mineral quartz. A few of the guys were caught off guard when it made its entrance. despite the fact that it had been waiting for such a very long period, as you have most likely deduced from what has been shown thus far.

A beta version of the Quartz program is currently being tested. Ubisoft developed three new free-to-play skins for Ghost Recon: Breakout in an initial batch. This was only the beginning. In order to avoid the Ghost Recon NFT market from turning into a speculative one, players were required to have finished a sizeable section of the game before they were eligible to make a purchase of one of these items. The company put in a lot of effort, but in the end, they were unable to predict the reaction of players who were concerned about the environment when Quartz was first released. In its current, Bitcoin-driven form, blockchain is extremely detrimental to the health of the natural world. The introduction of new income streams made possible by virtual products and experiences is one of the potential effects that the metaverse might have on the business model utilized by Ubisoft. Within the metaverse, for instance, Ubisoft may sell virtual real estate or in-game objects, as well as provide unique experiences that are only accessible from within the metaverse. Additionally, the metaverse may provide Ubisoft additional chances for participation and income in the form of advertising and brand collaborations. These opportunities may be presented to Ubisoft.

The capacity for Ubisoft to offer more immersive and participatory experiences for users is yet another advantage that may result from the metaverse. If this advantage is taken advantage of, Ubisoft may see a rise in the amount of customers who remain loyal to the brand. Both Ubisoft and Adidas are large corporations that have made significant financial investments in the metaverse. The metaverse is a shared virtual reality in which users may communicate with one another and digital things. Despite the fact that both corporations have made investments in the metaverse, their strategies and initiatives couldn't be more unlike. Ubisoft is both a creator and publisher of video games, and the company has been in operation for more than 35 years. Ubisoft made the announcement in 2021 that the company will be investing one billion dollars into the metaverse over the next five years. It is anticipated that this investment will be put toward the creation of new games and experiences for the metaverse, in addition to the expansion of the necessary infrastructure to support it.

On the other hand, Adidas is a worldwide leader in the sportswear industry. In the year 2020, Adidas made the announcement that over the following five years, the company will be investing $1.8 billion into the metaverse. It is anticipated that this investment would go toward the creation of virtual stores for Adidas items as well as the development of virtual experiences that will enable customers to try on Adidas products and interact with them in a virtual environment. One of the primary distinctions between the metaverse investments of Ubisoft and Adidas is the primary focus of each company's respective initiatives. The investment made by Ubisoft is largely geared toward the creation of new games and experiences for the metaverse, whereas the investment made by Adidas is mostly geared toward the creation of virtual shops and experiences for the company's products.

Another point of differentiation is the amount of money being put in; Ubisoft has declared that they would invest one billion dollars, while Adidas has announced that they will contribute over two billion dollars. Ubisoft's video game business brought in $2.14 billion in revenue for the company in the year 2020, whereas Adidas's apparel business brought in $26.9 billion in revenue for the company. This shows that while Ubisoft's investment in the metaverse may constitute a considerable amount of the company's entire business, for Adidas, the metaverse only accounts for a lesser portion of the company's total income. Although Ubisoft and Adidas are both making investments in the metaverse, the two companies' strategies and initiatives couldn't be more different from one another. While Ubisoft is concentrating on the creation of new games and

experiences, Adidas is working on constructing virtual shops and experiences for its products. The quantity of money invested as well as the primary emphasis of each company's operations are two more factors that differentiate the metaverse investments of the two businesses.

5.3 Business canvas model for Ubisoft and Adidas

5.3.1 Adidas

The metaverse, or virtual world, is poised to have a significant impact on the business canvas model of Adidas. By incorporating metaverse into its business strategy, Adidas can take advantage of the numerous opportunities that virtual reality offers to enhance its customer experience, increase revenue streams, and streamline its cost structure. Adidas Business Canvas Model with Metaverse Integration:

1. Customer Segments: The metaverse provides Adidas with the opportunity to expand its customer base by targeting new customer segments who are interested in virtual reality shopping experiences. By offering virtual product trials, customization options, and immersive brand experiences, Adidas can attract a wider range of customers who might not have been interested in traditional physical shopping. This can help Adidas to reach a broader audience and increase its customer base, as well as potentially open up new markets that were previously untapped.

2. Value Proposition: Adidas offers a range of products, from footwear to apparel, designed for high performance and style. The metaverse provides an opportunity for Adidas to enhance its value proposition by creating a virtual shopping experience that allows customers to try on products in a virtual environment, and even customize their own products.

3. Channels: Adidas uses a variety of channels to reach its customers, including physical stores, online shopping, and wholesale distributors. The metaverse provides an opportunity for Adidas to expand its reach and improve customer engagement by offering a virtual store and interactive customer experience.

4. Customer Relationships: Adidas places a high importance on cultivating lasting relationships with its clientele and offers a diverse range of customer assistance options, such as a customer loyalty program and a robust presence on the internet. The metaverse presents an opportunity for Adidas to further improve its client ties by providing a personalized and immersive virtual

purchasing experience for each individual customer. This presents a potential for Adidas to capitalize on the metaverse.

5. Revenue Streams: Adidas generates revenue through the sale of athletic wear, footwear, and accessories. The metaverse provides an opportunity for Adidas to expand its revenue streams by offering virtual products, such as virtual experiences, virtual merchandise, and virtual events.

6. Key Resources: Adidas relies on its brand, products, and distribution channels as its key resources. The metaverse provides an opportunity for Adidas to leverage its key resources by using virtual experiences and virtual merchandise to promote its brand and increase customer engagement.

7. Key Activities: Adidas focuses on product design, marketing, and distribution of its products. The metaverse provides an opportunity for Adidas to expand its key activities by offering virtual experiences and virtual merchandise, and leveraging virtual events and virtual customer interactions to promote its products and brand.

8. Key Partnerships: Adidas has business relationships with many different types of companies, including retailers, distributors, and suppliers. The metaverse presents a potential for Adidas to extend its collaborations. Specifically, the company might build alliances with developers of virtual worlds and other virtual commerce platforms in order to provide its customers with a holistic experience when purchasing virtually.

9. Cost Structure: The expenditures associated with product design, marketing, and distribution might be a burden for Adidas. Through the utilization of virtual experiences and virtual items, as well as the reduction of costs associated to physical stores and inventory management, Adidas has the opportunity to lower its overall cost structure through the utilization of the metaverse.

5.3.2 Ubisoft

The effect that the metaverse has had on the video game industry has been considerable, and it presents a big opportunity for businesses such as Ubisoft. Players now have access to a fresh and original method for interacting with video games thanks to the introduction of the metaverse, which delivers an experience that is more dynamic and immersive than anything that has come before it. It is anticipated that this new reality would significantly alter the processes through which video games are created, distributed, and played. In this light, it is essential to take into account

the potential effects that the metaverse can have on the commercial canvas model utilized by Ubisoft.

1. Customer Segments: Ubisoft has the opportunity to increase the size of its customer base by targeting new customer segments through the use of the metaverse. These new customer segments are people who are interested in having gaming experiences that take place in virtual reality. Ubisoft is able to appeal to a larger variety of clients, including those who previously may not have been interested in traditional gaming experiences, by providing virtual reality games. This can assist Ubisoft in reaching a wider audience and growing its consumer base, in addition to possibly opening up new markets that were not previously exploited.

2. Value Proposition: Thanks to the metaverse, Ubisoft is able to improve its value proposition by developing virtual reality gaming experiences that put customers in the middle of the action and let them feel as though they are a part of the game. This presents a chance for Ubisoft to separate itself from other gaming firms by providing players with an entirely new degree of involvement and interaction with the games they play.

3. Channels: The metaverse provides Ubisoft with the potential to reach its customers through new channels, such as virtual reality gaming platforms and virtual reality retail stores. These new channels will allow Ubisoft to better serve its customers. Ubisoft is able to broaden its market presence and boost the level of connection it has with its consumer base by using these new distribution channels in its distribution plan.

4. Customer Relationships: The metaverse presents Ubisoft with the chance to improve its customer relationships by providing a virtual reality gaming experience that is both individualized and immersive for each individual customer. This will allow Ubisoft to better serve its customers. This might ultimately lead to improved customer loyalty and involvement, which would be beneficial for Ubisoft's long-term growth and success.

5. Key Resources: Ubisoft has the opportunity to broaden its revenue streams thanks to the metaverse, which enables the company to sell virtual reality games, virtual reality experiences, and virtual reality products. Ubisoft gains access to a new revenue stream as well as an additional method to further monetize its already established games and franchises as a result of this development.

6. Key Activities: Ubisoft's games, its technology, and its intellectual property are its primary resources, and the company relies on all three of these. Ubisoft now has the opportunity to make the most of its core resources by taking advantage of the metaverse and promoting its games and brands through the use of virtual reality experiences as well as virtual reality products.

7. Key Activities: Ubisoft's primary activities include the creation of video games, as well as the marketing and distribution of those games. The metaverse presents an opportunity for Ubisoft to expand its core business operations by, among other things, providing virtual reality gaming experiences and virtual reality merchandise, as well as capitalizing on virtual events and virtual customer interactions to promote its games and franchises.

8. Key Partnerships: Ubisoft collaborates with a wide range of businesses, including gaming platforms, merchants, and technological companies, to name a few of its most important partnerships. Ubisoft now has the chance to broaden its partnership scope by forming alliances with virtual reality platforms and virtual reality shops through the use of the metaverse. This will allow the company to give its customers with a comprehensive virtual reality gaming experience.

9. Cost Structure: Ubisoft must bear the costs associated with game creation, marketing, and distribution in order to remain profitable. Through the utilization of virtual reality experiences as well as virtual reality items, as well as the reduction of costs associated to physical retail outlets and inventory management, Ubisoft has the chance to lower its overall cost structure through the utilization of the metaverse.

Companies like Ubisoft have the potential to improve their business models and achieve greater levels of success by taking use of the many opportunities presented by the metaverse. Ubisoft is in a position to broaden its market presence, boost customer engagement, and propel long-term growth and profitability by capitalizing on the one-of-a-kind capabilities offered by virtual reality.

CONCLUSION

The metaverse is a huge and ever-changing world that gives enterprises with a variety of opportunities as well as obstacles. The metaverse is a shared virtual reality that provides businesses with a broad variety of opportunities to engage with their consumers and develop new sources of revenue. However, this also creates a number of obstacles that companies will need to overcome in order to be successful in this new digital frontier. One of the most significant advantages that the metaverse offers to companies is the opportunity to provide their clients with novel and interesting experiences. Businesses now have the ability to build virtual storefronts, events, and other experiences that may draw people and drive sales thanks to something called the metaverse. In addition, companies may utilize the metaverse to collect data and insights that might help them better understand the requirements and preferences of their customers through the usage of this platform.

However, companies are going to face a variety of difficulties as a result of the metaverse. One of the most significant obstacles is the requirement that companies make investments in the infrastructure and resources essential to the success of their metaverse operations. For organizations, and especially for small and medium-sized businesses, this may be a considerable financial strain. In addition to this, companies have the burdensome responsibility of navigating the intricate legal and regulatory framework that the metaverse entails, which may be difficult.

In general, the metaverse is a new frontier for businesses, giving a broad variety of options to engage with consumers and establish new revenue streams. This makes the metaverse an attractive place for companies to expand into. When making an investment in the metaverse, however, it is imperative for companies to carefully analyze their goals and objectives, as the potential and problems connected with this technology might vary dramatically from situation to situation. Those companies who are able to successfully handle the opportunities and difficulties that the metaverse presents will be in a strong position to capitalize on the numerous advantages that may be gained by utilizing this technology. In addition, companies need to be aware that the metaverse will very certainly bring about changes in the way business is conducted, as well as new business models and methods of doing business. Businesses need to start considering how they may tweak their strategy in order to remain competitive in the face of these developments.

The application section of the thesis has been structured around a case study that examines how two prominent corporations, Ubisoft and Adidas, are capitalizing on the opportunities presented by the metaverse from a commercial standpoint. The case study has shed light on the primary distinctions between the tactics and efforts implemented by these organizations, as well as the potential and dangers posed by their respective metaverse investments. Business canvas model fore both companies is given after conclusion.

The metaverse is a new frontier for businesses, offering a diverse variety of possibilities for connecting with clients and developing new sources of revenue. When making investments in the metaverse, however, it is imperative for companies to carefully analyze their goals and projects, as the potential and risks connected with this technology might vary dramatically from one instance to the next. The case study of Ubisoft and Adidas demonstrates how businesses may exploit the metaverse to establish new income streams and engage with customers in new ways. The case study also provides as a practical illustration of how businesses can leverage the metaverse. Businesses who are interested in understanding the potential of the metaverse and how to handle the possibilities and challenges connected with this technology may find the insights presented in this thesis to be a beneficial resource.

Business Model Canvas - Adidas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
- alliances with developers of virtual worlds and other virtual commerce platforms in order to provide its customers with a holistic experience when purchasing virtually.	- an opportunity for Adidas to expand its key activities by offering virtual experiences and virtual merchandise, and leveraging virtual events and virtual customer interactions to promote its products and brand.	- to enhance its value proposition by creating a virtual shopping experience that allows customers to try on products in a virtual environment, and even customize their own products.	- a personalized and immersive virtual purchasing experience for each individual customer.	- expand its customer base - virtual product offers - customers interestedn in virtual shopping
	Key Resources - to leverage its key resources by using virtual experiences and virtual merchandise to promote its brand and increase customer engagement.		**Channels** - a virtual store and interactive customer experience.	

Cost Structure	Revenue Streams
- Through the utilization of virtual experiences and virtual items, as well as the reduction of costs associated to physical stores and inventory management, Adidas has the opportunity to lower its overall cost structure through the utilization of the metaverse.	- revenue streams by offering virtual products, such as virtual experiences, virtual merchandise, and virtual events.

Business Model Canvas - Ubisoft

<table>
<tr>
<td rowspan="2">Key Partners
- partnership scope by forming alliances with virtual reality platforms;
- virtual reality shops through the use of the metaverse.</td>
<td>Key Activities
- taking advantage of the metaverse and promoting its games and brands through the use of virtual reality experiences as well as virtual reality products.</td>
<td rowspan="2">Value Propositions
- developing virtual reality gaming experiences that put customers in the middle of the action and let them feel as though they are a part of the game.</td>
<td>Customer Relationships
- improve its customer relationships by providing a virtual reality gaming experience that is both individualized and immersive for each individual customer.</td>
<td rowspan="2">Customer Segments
- customer segments who are interested in virtual reality gaming</td>
</tr>
<tr>
<td>Key Resources
- selling virtual reality games, virtual reality experiences, and virtual reality products. Ubisoft gains access to a new revenue stream as well as an additional method to further monetize its already established games and franchises as a result of this development.</td>
<td>Channels
- Metaverse Platform: Utilize the metaverse platform as the main channel to reach and engage with players.
- Online Marketplace: Offer virtual goods and real estate through an online marketplace accessible within the metaverse.
- Virtual Reality Headsets: Offer the metaverse through virtual reality headsets for an immersive experience.</td>
</tr>
<tr>
<td colspan="3">Cost Structure
- Through the utilization of virtual reality experiences as well as virtual reality items, as well as the reduction of costs associated to physical retail outlets and inventory management, Ubisoft has the chance to lower its overall cost structure through the utilization of the metaverse.</td>
<td colspan="2">Revenue Streams
- Virtual Goods and Lands Sales;
- Subscriptions: Offer monthly or yearly subscription services to players for access to exclusive content and premium features in the metaverse.
- Access Fees: Charge fees for access to premium areas or events in the metaverse.
- Partnerships and Licensing: Partner with brands and organizations to offer their products and services in the metaverse, or license the metaverse technology to other companies.</td>
</tr>
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