

# A kriptovaluták szerepe a fenntartható gazdaságban

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**Szerkesztők:**

Széles Zsuzsanna – Resperger Richárd – Szőke Tünde Mónika



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**Felelős kiadó: Prof. Dr. Fábián Attila**  
**a Soproni Egyetem rektora**

**Szerkesztők:**  
Széles Zsuzsanna  
Resperger Richárd  
Szőke Tünde Mónika

**Lektorok:**

Bazsóné Bertalan Laura	Obádovics Csilla
Baranyi Aranka	Paár Dávid
Bartók István	Pappné Vancsó Judit
Jankó Ferenc	Papp-Váry Árpád
Keresztes Gábor	Széles Zsuzsanna
Kópházi Andrea	Szóka Károly
Kovács Tamás	Tóth Balázs István
Mészáros Katalin	Varga József
Németh Nikoletta	

**Technikai szerkesztő:**  
Takács Eszter

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# Fashion Industry Projects Realized with the Use of Web3

*PAULOVICS, Ágnes<sup>1</sup>*

**Abstract:** Web3 is all about decentralization and giving users more control over their personal data. The fashion industry is known for being innovative, so it is no surprise that companies in this area have already been experimenting with concepts based on Web3 technologies. In current research, the focus is on exploratory studies used to collect and describe the actions and activities of textile companies in the Web3 era. The aim of this article is to present various projects from the fashion companies that are innovative in the fields of Metaverse, non-fungible tokens (NFTs), digital fashion, traceability, authenticity, and crypto payments.

**Keywords:** fashion industry, blockchain, NFT, Web3, Metaverse

**JEL Codes:** O33, M31

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## Web3 használatával megvalósított divatipari projektek

**Absztrakt:** A Web3 a decentralizációra és a felhasználóknak a személyes adataik feletti nagyobb kontrollra való kiterjesztésére irányul. A divatipar híres az innovációról, így természetes, hogy az ezen a területen működő vállalatok már kísérleteznek a Web3 technológián alapuló koncepciókkal.

Ebben a kutatásban feltáró tanulmányokra összpontosítok, hogy összegyűjtsem és leírjam a textilipari vállalatok tevékenységeit és akcióit a Web3 területén. Célom, hogy bemutassam a divatcégek különböző projektjeit, amelyek a metaverse, az NFT-k, a digitális divat, a nyomon követhetőség és hitelesség, valamint a kriptofizetések területén mutatnak be újításokat.

**Kulcsszavak:** ruhaipar, blokklánc, NFT, Web3, metaverse

**JEL-kódok:** O33, M31

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<sup>1</sup> Paulovics Ágnes PhD-hallgató (*PhD Student*)  
Soproni Egyetem Lámfalussy Sándor Közgazdaságtudományi Kar Széchenyi István Gazdálkodás- és Szervezéstudományok Doktori Iskola  
(*University of Sopron Alexandre Lámfalussy Faculty of Economics István Széchenyi Economics and Management Doctoral School*)  
(paulovics.agnes@phd.uni-sopron.hu)

## Introduction

Fibres and textiles have been in use for several thousand years. Their most important and widespread application is for clothing (Gries et al., 2015). Clothing is one of the basic needs of humans. It protects them from the elements and serves as means of expressing personality and lifestyle (Gries et al., 2015). Although the textile industry may appear to be creative from an outside observer's viewpoint, and it seems to be a shiny world, often, designers cannot unfold their creativity. Creatives usually receive defined costs and target prices for the products before they start designing. During the development of apparel products, particularly high priority must be on ensuring that the products are marketable, the target group can afford them, and they appeal to the consumers. All sub-decisions on determining the design and ultimately the price must be carefully considered. Thus, the quality of the fabrics, the processing methods, and the applied accessories are carefully chosen (Blackburn, 2009).

As designers must look so heavily at cost of components and materials, they can't always unleash their creativity in physical products. However, they have completely new possibilities when it comes to designing digital products and experiences. Web3 technologies offer a wide range of opportunities for them. As the fashion industry is an innovative and forward-thinking sector, it is crucial for fashion brands to evaluate the possibilities of these technologies. Since Web3 is a new technology, there is a lack of knowledge on how to integrate it into business to provide the greatest benefits for both companies and customers. The goal of current study is to examine existing projects in the area of Web3 and to provide an overview of potential use cases to help fashion companies develop their own projects in this area, which might result in increased values for customers and in an improved customer experience. To examine fashion industry projects realized with the use of Web3, the following hypothesis is defined:

**H1:** In the textile industry, there are existing Web3 projects, which are used in various areas and for different purposes in the companies.

**Q1:** Which Web3 based projects have already been realized in the textile industry?

The publication first provides insight into the existing literature and explains the terms Web3, Web 3.0 and the technologies enabled by Web3. Then the methodology of the research is described. The main part of the work is the presentation of the solutions realized by textile companies in the field of Web3. The work is closed with the conclusion.

## **Literature review**

### ***Web 3.0 and Web3***

Over the past decade, there has been a dramatic shift in the way how the Internet is used. The World Wide Web evolved from a static, one-way medium to a dynamic, two-way medium. This shift is driven by the rise of social media and the proliferation of mobile devices.

Web 3.0 and Web3 are terms often used interchangeably, but there is a big difference between the two. The term Web 3.0 refers to the next stage of the Internet, where the web becomes more intelligent and aware of the users. Web 3.0 is a semantic web, where information is organized and presented in a way easy for machines to understand. This will allow a more personalized experience for the users, as well as new applications and services, which are unimaginable today, will be developed (Van Elegem, 2022).

On the other hand, Web3 is a term used to describe the decentralization of the web and means a set of protocols and technologies allowing the creation of decentralized applications. With Web3, there is no single point of control or failure. Instead, the web is powered by a network of decentralized computers, a.k.a. the peer-to-peer web. This new model of the web has the potential to transform the Internet to a form never seen before.

While Web3 is a necessary component of Web 3.0, it is not the same thing (Takyar, n.d.).

### ***The definition of Web 3.0***

Web 1.0, the first stage of the World Wide Web, was released in 1995. Web 1.0 is characterised by static HTML pages and limited user interaction. Web 1.0 focuses primarily on desktop users and not generally on the Internet. The technology is not as interactive as Web 2.0. Although early Web 1.0 sites are developed by using simple HTML codes, the move to Web 2.0 brings a more sophisticated use of coding languages, such as CSS, XML, and JavaScript, with it.

Web 2.0, the second stage of the World Wide Web, was released in 1997. In case of Web 2.0, increased user interactivity and collaboration are found. Web 2.0 sites allow users to contribute and make contents, such as comments, ratings, and reviews. Social networking sites, like Facebook and Twitter, are examples of Web 2.0.

Web 3.0, the third stage of the World Wide Web and is characterised by increased Semantic Web technologies and personalization. Additionally, it is the most current iteration of the web. Web 3.0 is more interactive and has more features than Web 2.0. Furthermore, in case of Web 3.0, new technologies, such as facial recognition and virtual reality, are introduced, as well. With Web 3.0, the users' data are used to create more personalised experience. For example,



the results of search engines may be tailored according to the users' locations and interests (Terra, 2022).

Web 3.0 is based on the idea of Semantic Web, which is a web of data that can be read and understood by machines. The goal of Web 3.0 is to make it easier for machines to find and use information on the web. Therefore, standards for how data are structured and linked are created. The Semantic Web is sometimes referred to as Web 3.0, but this is not an accurate description. The Semantic Web is solely one part of what make up Web 3.0. The Semantic Web has the potential to revolutionise the way the World Wide Web is used. By making information more accessible and easier to understand, the Semantic Web makes it possible to use the World Wide Web in ways never had thought to be possible before. The Semantic Web is an extension of the current web, and it is developed by the World Wide Web Consortium (W3C). The W3C works on standards that make it easier for computers to understand the meanings of web pages and data (ScienceDaily, 2008).

### ***The characteristics and the technologies of Web3***

Web3 is based on the blockchain technology. The blockchain technology idea has been around since 2008, when the creator of Bitcoin, Satoshi Nakamoto, posted his famous paper titled “Bitcoin: A Peer-to-Peer Electronic Cash System” to the Cryptography Mailing List (Nakamoto, 2013). In his paper, Nakamoto describes how Bitcoin could be used to create a currency that does not require a trusted third party (e.g., a bank or government) to verify the transactions. Instead, people rely on other users of the currency in verifying the transactions correctly, and in turn, they receive rewards. This is known as the proof of work (Kapilkov, 2020).

The idea behind Web3 is to decentralise and tokenise the Internet; thus, users have more control over their personal data as well as over their interactions with centralised companies, such as Google and Amazon. This new version of the Internet allows users to experience true freedom and independence in their online lives (Luong, 2022).

The characteristics of Web3:

- Web3 is decentralized. It means that instead of having large parts of the Internet under the control and ownership of centralized entities, it distributes ownership among its creators and users.
- In addition, Web3 is permissionless thus giving all people the same right to join Web3, and nobody is excluded.
- Web3 offers native payments and utilizes cryptocurrencies for money transactions, rather than depending on the obsolete banking and payment service providers' infrastructure.

- Furthermore, Web3 is trustless and works with incentivized and commercial mechanisms, rather than reliance on trustworthy third parties (Ethereum, 2022).

There are several technologies under development to make the use of Web3 possible including the followings:

1. **Blockchain:** Blockchain is a distributed database allowing secure and transparent transactions. This technology could be used to create more secure and private applications (Dubey, 2022).
2. **NFT:** The NFT technology allows the creation of digital assets that are unique and cannot be duplicated. This technology might be used to create more secure and private applications (Sharma, 2022).
3. **Metaverse:** Metaverse is a virtual world developed to allow the creation of virtual assets and experiences. Metaverse is a collective, virtual, shared space created by the convergence of virtually enhanced physical reality and physically persistent virtual space including the sum of all virtual worlds, augmented reality, and the Internet. Metaverse is the next generation of the Internet, where digital assets are linked to physical assets, and the identity is persistent. Additionally, metaverse enables a new generation of applications and services that provide more immersive and user-centric experience than what is possible today (Sinha, 2022).

## **Methodologies**

In accordance with the research question, it was investigated which Web3 based projects have already been realised in the textile industry. As outlined in the literature review, Web3 technologies are new and offer a wide range of possibilities. Nevertheless, at the beginning, it is challenging to identify potential use cases and discover promising projects.

Observation was chosen as the research method because it is particularly suitable to gather first insights and information in a new research area (Greve–Wentura, 1997). Through the conducted third-party observation, the behaviour of textile companies was monitored. The context is natural, as the behaviour of companies is based on real life experience, the environment is not artificially created. The form of observation is unsystematic and takes place without a standardised scheme; more emphasis was placed on spontaneity. The observation is non-participatory and hidden.

The inductive approach was applied to investigate the research object. This has provided the opportunity to discover connections between the projects and finally to group them. This has not only resulted in a list of potential projects, but the projects have been categorised and can be explained in relation to each other.

Current research work focuses on exploratory studies; therefore, the actions and activities of textile companies are collected and described. Furthermore, the research aims to collect possible solutions for the integration of Web3 technologies. However, since the study does not include quantitative data, it is not possible to draw conclusions about the extent of these activities.

## Findings

Secondary research has discovered and structured a wide range of projects. These projects can be assigned to five different categories: metaverse, NFTs, digital fashion, traceability, authenticity, and crypto payments. The following part of the paper presents projects from each of the mentioned areas, providing an opportunity for fashion companies to get inspired and understand the possibilities offered by Web3 technologies.

### *Metaverse presence*

#### *H&M Metaverse*

The H&M Virtual Showroom, shown in *Figure 1*, is a new and immersive way to experience some selected H&M collections. The Virtual Showroom is possible by the use of 3D assets, which extend the experience by providing innovative materials. Furthermore, the Virtual Showroom enables the meeting with media relations virtually giving the customers the freedom to engage and interact whenever and with whomever they choose (H&Mbeyond, n.d.; Journee, n.d.).

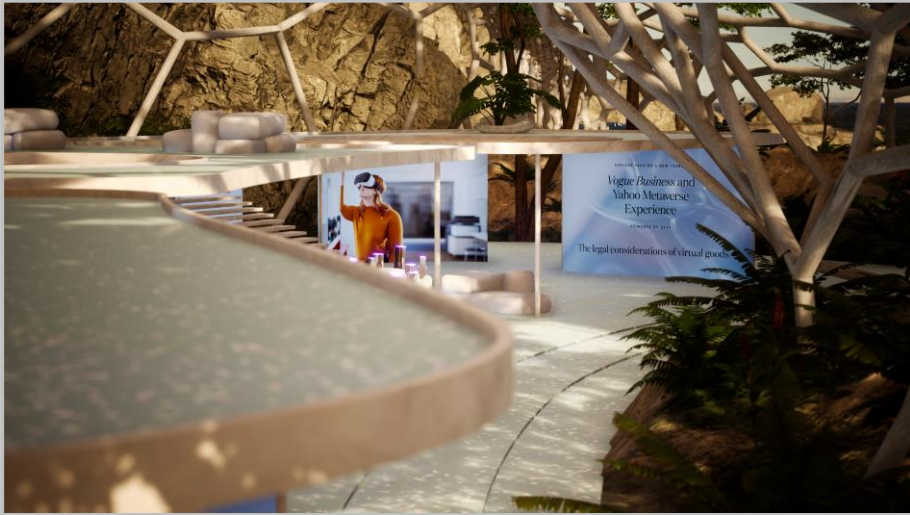


**Figure 1: H&M Metaverse**

Source: H&Mbeyond (n.d.)

### *Vogue Business Metaverse*

The Vogue Business Metaverse was a two-hour event hosted by Vogue Business in partnership with Yahoo and Dept in 2022. The event was open exclusively to Vogue Business Members and included informative panels and keynotes on making sense of the new landscape of fashion within the Metaverse as well as exploring the immersive, sensory world created by Journee to highlight the new Metaverse technology (Journee, 2022). An impression of the Vogue Business Metaverse is visible in *Figure 2*.



**Figure 2: Vogue Business Metaverse**

Source: Journee (2022)

### *Nikeland*

In 2021 Nike created a Metaverse store on Roblox called Nikeland, see *Figure 3*, where customers are offered to try on virtual products. So far, the shop has been visited by nearly 7 million people from around the world. The main generator of traffic to the store is the organization of events. One of the most successful events was when LeBron James visited Nikeland during the NBA All-Star Week. He engaged with the participants, which was welcomed by the players (Sutcliffe, 2022).



**Figure 3: Nikeland: The Metaverse of Nike**

Source: Sutcliffe (2022)

#### *PUMA X 10KTF*

PUMA has already entered New Tokyo, the virtual city that is home to 10KTF, which was founded in September 2021. 10KTF is known in Metaverse as a leading manufacturer and of its digital accessories on demand (Business Wire, 2022). The new partnership might spawn digital sneaker and NFT collections and is expected to give fans the ability to personalize their experience. More details have not been announced yet (Leonhardt, 2022). A published picture of the collaboration is shown in *Figure 4*.



**Figure 4: PUMA & 10KTF Collaboration**

Source: Leonhardt (2022)

## ***NFTs and digital goods***

### *NFTs Without Additional Functions*

NFT sales are gradually becoming a part of the revenue stream for fashion brands. Some of the biggest brands, such as Adidas, Nike, and Gucci, could reach \$137.5 million in NFT sales alone. Italian high-end clothing brand Dolce & Gabbana concluded nine NFT auctions on September 29, 2021 thus generating a history-making total of 1,885 ETH (approximately \$5.7 million) and establishing a new benchmark for apparel NFTs (Langston, 2021). Furthermore, the record for the highest-priced suit ever sold is set, as well. The digital Glass Suit earned the clothing house \$1 million (Jagati, 2022). It is visible in *Figure 5*.

NFTs can be added to social media profiles via crypto wallets, and they can be presented as an avatar. This feature has been available on Twitter for some time (Das, 2022). Meta made this function available on Instagram and Facebook on August 30, 2022 (Draht, 2022).



**Figure 5: Glass Suit by Dolce&Gabbana**  
Source: Langston (2021)

*NFTs With Additional Functions*

There are NFT projects that not solely provide a unique NFT design but add features and permissions to it, as well.

One example is the video game launched by Louis Vuitton, where the brand takes the opportunity to teach the players the 200-year history of the fashion house. In the game, the players could unlock stories and collect 16 pages from a Louis Vuitton manuscript. Those players who reach a certain score might enter a raffle for 10 NFTs. The NFTs are transferable across the platforms, not solely a digital asset is embedded in the game, and they act as avatars on social networks, too. In addition, these NFTs grant their owners access to various exclusive events and private parties (Jagati, 2022). The game, which is available on Android and Apple, has already been downloaded two million times contributing to sharing the story of the brand successfully with a broad audience (Hooi, 2022). An impression of the app's visual language is shown in *Figure 6*.



**Figure 6: App developed by Louis Vuitton**

Source: Hooi (2022)

Other NFTs working as keys were provided during the New York Fashion Week in 2022 by five designers to unlock the invitations and products of the show. This case goes beyond the traditional usage of NFTs merely as collectibles and adds additional value to them (Schulz, 2022). Through this approach, not solely the press, buyers, and influencers can join the shows but the holders

of these NFTs, as well (Leclere, 2022). The technology that allows access only if one is in possession of the correct fungible or non-fungible token is called token gating. The permission to read content is granted if the correct token is in the wallet, but denied if it is not available (Stelzner, 2022). Token gating can be used to limit the access to product drops and to provide unique experience to drive the demand (Martins, 2022).

#### *In-game Skins and Accessories*

Another way of fashion companies to bring their products into Metaverse is their collaboration with video game companies.

Queen Bee Dionysus virtual handbag of Gucci, shown in *Figure 7*, has been purchased lately for the in-game currency of 350,000 Robux equivalent to the value of \$4,115 (Jagati, 2022), which is more than the price of its physical version sold for \$3,400 (LUXUS+, 2021). This bag is not an NFT, but it is merely a digital good without any real value, use, and transferability outside the Roblox world (@alexisohanian, 2021).



**Figure 7: Virtual handbag of Gucci**

Source: @alexisohanian (2021)



A similar project was a collaboration between Balenciaga, the brand of women and men’s fashion, leather goods, and perfume based in Paris since 1937, and part of the Kering Group (snkraddicted, n.d.) and Fortnite, one of the most popular video games in the world, with over 350 million registered user (Schönbächler, 2022). A collection of 4 characters dressed in Balenciaga clothes are created, shown in *Figure 8*. Additionally, the outfits have transformational properties, as during the game, they change in color. On the one hand, the collaboration created digital Balenciaga outfits for Fortnite; on the other hand, a Fortnite collection for the physical stores is introduced, as well. The collection is not based on the expensive NFTs, but this cooperation brings the Balenciaga brand to millions of dedicated gamers with a relatively low barrier to entry (Yotka, 2021).



**Figure 8: Fortnite & Balenciaga Collaboration**

Source: Yotka (2021)

Besides Balenciaga, Ralph Lauren sets on virtual clothing, as well. In collaboration with Zepeto, a social network from South Korea, digital clothing of 12 looks with 50 unique items is offered. The price for these products is set in an affordable range; each item costs between 14 and 40 ZEMs, which is equivalent to \$0.57 to \$2.86 (Swant, 2021). An impression of the collaboration is visible in *Figure 9*.



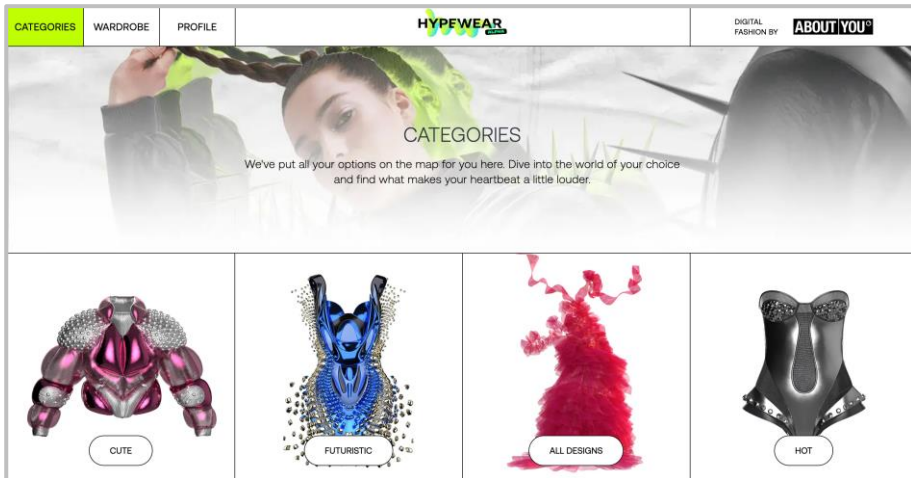
**Figure 9: Ralph Lauren & Zepeto Collaboration**

Source: Swant (2021)

### ***Digital fashion***

Digital fashion is a growing trend in Metaverse. It is a way to show personality and style through clothing. An own look can be created, or the trends set by other users might be followed. Digital fashion can be used to make a statement. Since clothing is available as digital collectibles or NFTs, it can be widely traded on NFT marketplaces thus increasing its value over the time, which is not the case for many physical or pre-owned garments (Jagati, 2022).

About You developed the first online store for digital fashion called Hypewear, shown in *Figure 10*. As one of the fastest growing e-commerce companies, About You focuses on launching innovative projects in the field of digital fashion. The goal is to provide the general public access to digital fashion items. For this purpose, a web store is developed and built on Algomart, an NFT marketplace running on Algorand, which is the most sustainable blockchain in the world. Different collections are available in the webshop: some of them are more affordable, others are limited editions with special drops. In addition to their own collection, other brands are offered the opportunity to sell their 3D fashion through the Hypewear platform (About You, n.d.).



**Figure 10: Digital Fashion from Hypewear**

Source: About You (n.d.)

### ***Traceability and authenticity***

Ensuring the authenticity of luxury products has always been a challenge. To combat counterfeiting, a system proving the origin of the products is needed. To develop this system, in 2019, LVMH, Prada Group, and Richemont founded the Aura Blockchain Consortium.

The non-profit organization develops solutions for its members to take the customer experience to a new level and to increase the trust and transparency for the customers. Two membership solutions are offered, which enables fashion brands to choose the model most suitable for them (AURA – The Aura Blockchain Consortium, n.d.).

Not solely collaborations, but private companies set on the blockchain technology for traceability, as well. 3D AG, the Swiss company, specializes in the field of micro and nano technology, especially in holography to fight counterfeiting and to protect intellectual property. The products of the company support brands; thus, their customers can ensure the authenticity of the products. Moreover, 3D AG recognized the opportunity to offer their customers an even better solution with blockchain: the traceability of their products. Thus, their own platform is built, where brands can log actions on their products to inform their customers about the bigger events related to the product, such as the production, delivery, and the date of selling the item (3D AG, n.d.).

### ***Accepting crypto payments***

The fashion industry is one of the most volatile and ever-changing industries in the world. With new trends and styles constantly emerging, the industry always looks for new ways to stay ahead of the curve. One of the latest trends emerging

in the fashion industry is the acceptance of crypto payments. Cryptocurrency is a digital or virtual currency that uses cryptography for security. The cryptocurrencies are decentralized meaning they are not subject to the control of governments or any financial institution. Bitcoin, the first and most well-known cryptocurrency, was created in 2009 (Frankenfield, 2022). Since then, over 10,000 different cryptocurrencies have been created with more are to be created every day (Statista, 2022). The acceptance of cryptocurrency payments in the fashion industry is a trend that is gaining traction. More and more fashion brands are beginning to accept crypto payments to stay ahead of the curve and keep up with the latest trends.

The luxury fashion brand Off-White accepts crypto payments in their flagship stores in Paris, Milan, and London (Sinclair, 2022). The company relies on an arbitrage system provided by Lunu, a German-based payment solution provider that integrates the use of cryptocurrencies into the real economy (Lunu, n.d.).

Besides Off-White, Balenciaga, Gucci (James, 2022), and Philipp Plein (Torcasso, 2021) offer in-store crypto payments, too. Crypto payments in web stores are on the rise, as well. Nike, H&M, Etsy, Overstock.com, and Macy's offer this solution in their webshops (Vinerix, 2022).

## Conclusion

### *The evaluation of the hypothesis*

At the beginning of the research, I defined the H1 hypothesis, and I claimed that there are existing Web3 projects in the textile industry, which are used in various areas and for different purposes in the companies. During in-depth secondary research, I have found that there are several existing Web3-based projects in the textile industry. These projects can be categorized into the following sections: metaverse, NFTs, digital fashion, traceability, authenticity, and crypto payments. These projects include both short-, medium-, and long-term actions and offer a mix of solutions for fashion companies. In addition, it can be recognized that there is a trend toward a more collaborative way of working through partnerships. Based on these facts, I can conclude that H1 can be accepted, and I formulate the following thesis:

**T1:** In the textile industry, there are existing Web3 projects, which are used in various areas and for different purposes in the companies.

### *The limitations of the research*

One limitation of the work is the lack of current, scientific literature. Since the subject area of Web3 technologies in the fashion industry has not yet been taken up in scientific research, the sources of research are mostly non-scientific and have educational rather than scientific character.

Further research needs arise from the nature of the research method. The research is limited to the analysis of already realized projects. As a result, only projects that exist are presented; and potential and more creative projects are not shown. In order to cover a broader spectrum of projects, qualitative interviews with fashion and/or crypto clients could take place, generating novel ideas for the use of Web3 technologies through brainstorming.

### ***Recommendations for the continuation of the research***

The next step of this research might be to analyze customers' acceptance and satisfaction in relation to these projects as well as customers' interest in the new offerings. Afterwards, based on the collected information, an action plan could be created to recommend the fashion companies on which projects they should focus and how to introduce them into their business in the easiest way to increase both the demand and the sales of their products.

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