

Digital fashion in the metaverse

An undefined space with many opportunities

White paper by

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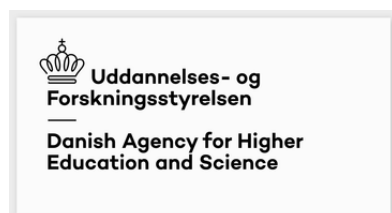
Welcome

White paper

IT UNIVERSITY OF CPH



AARHUS UNIVERSITET



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Introduction

A lot has happened in the digital space in the past couple of years. Yet, there is still so much that is unknown, especially regarding digital fashion. There are endless opportunities and plenty of room for play, but many things are to be investigated, experienced and discussed.

In this whitepaper, we aim to kickstart this investigation by considering concrete cases of digital fashion in and around Denmark. Most importantly, we wish to start an inclusive, open conversation around digital fashion and the metaverse.

As two (non-conventional)

academics writing this paper, our first thought was to look for definitions, perhaps leading us to our first finding. The digital space we were about to enter with our investigation has not yet been defined. It is being shaped as we write these lines. Therefore, we had to adjust and instead immerse ourselves in conversations and the space itself, finding the right questions to ask and observing how the collective shaping exercise in the digital realm is going.

Have you ever felt like

An outsider when entering the world of fashion? Have you been shamed or felt left out when the topic of sustainability or digitalisation came up? Have you ever felt like you had no place in discussions around these topics? Don't worry; you are not alone. We felt all of the above, during our investigation. First, the fashion environment often functions as an exclusive little bubble, and when topics such as sustainability and more often digitalisation come up, it can become an even more unfriendly space.

We see many parallels between sustainability and digitalisation in the fashion industry, not just in the sense that we hope one encourages the other and vice versa but also in the way these topics are being discussed, often from a very high horse, in a greatly exclusive manner, talking down to those who want to enter the space and immediately making them feel inadequate. Abbreviations and big words are easily thrown into sentences, leading to one-sided discussions and people abandoning these unwelcoming spaces.





Introduction

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By now, it is clear that it is not only important to talk about the abovementioned topics mentioned above, but also how we talk about them. If we learnt anything from all the bad teachers we had to endure in math class, shaming never results in successful learning. The same applies to learning about sustainability and digitalisation.

The environment you are about to enter

with this paper is rapidly changing and evolving, and you may feel that you are already left behind, but we hope that will not stop you from wanting to learn more. It is hard to get around the big words and abbreviations when discussing digital fashion; you will see some on the following pages. Still, we surrounded them with kinder ones that will hopefully make you feel less alienated. We acknowledge that it is difficult to grasp something that is not physical; therefore we encourage you not just to read but to listen, try and interact with all the cases and other materials we enlisted for you. There is no better way to get to know the digital than to enter it.

With this paper, we want to help fashion brands

and others interested in digital fashion start their journey, but that is not all. Our not-so-hidden agenda in sharing our findings is to stress that the digital is not a replacement but a complement to the physical. It is crucial that while shaping the digital space, we do not just copy-paste the physical but try to make it more inclusive and open, collaborative, playful, traceable, sociable and sustainable, and try to avoid making the same mistakes again. We encourage the builders and users of digital fashion and the metaverse to be critical of the space they will enter with us.



But what is the Metaverse?



In June 2022, we went to study the metaverse in Seoul, South Korea, as part of the Digital Fashion Roundtables project and by the invitation of Innovation Centre Denmark Seoul and the facilitation of Lifestyle & Design Cluster. The packed agenda included meetings with a wide range of stakeholders from virtual production, communication, fashion tech companies, knowledge institutions, representatives of metaverse platforms, and more. Although the meetings varied in content and conversation, there was a common denominator. Each of them started by conveniently skipping the definition of why we were all there for, the metaverse, always for the same reason - we all know what the metaverse is. But do we? Do we really? We, of course, have some experiences and ideas of what it is and even more wishes for what it could be, but the fact is that “the metaverse” is not something done and defined yet. There are a variety of fragmented digital experiences, technologies and platforms, but as of now, the metaverse is more of “just that”, a fragmented collection of “metaworlds”. There are endless opportunities but many limitations too. In this paper, we will take the easy way out and not define this space either, but rather play with “what it could be”. However, we would like to provide you with some prompts from some of the experts we talked to just to get the ideas flowing while you read.

A few attempts to define the not yet defined metaverse



“I would define the metaverse as the exploration of Web3 and the virtual world. I feel it's all-encompassing of any virtual means, whether that be augmented reality, 3D clothing, avatars etc., to create an environment which can be explored outside of the IRL.” – Holly Vennell, Director of Marketing, Birger Christensen Collective

“A virtual platform where people can interact with each other in different types of universes. This will be an animated and living platform, not a plain normal website, but an environment where you can move around with your avatar, somewhat similar to what we know from gaming today.” – Heidi Svane Pedersen, Head of Digital, Lifestyle & Design Cluster

“The metaverse is an integrated network of 3D virtual worlds. The true metaverse – the one that becomes the central platform of our lives – will be an augmented world.” – Peter Vangsbo, Former Director, Innovation Centre Denmark in Korea



A few attempts to define the not yet defined metaverse



“The “metaverse” defines the cultural and technological transition towards commonplace interoperability across digital platforms, services, and experiences.” – Jonathan Jeffery, Director of Growth, Rokoko

“The connection of various digital platforms where a user interacts with a digital representation of themselves.” – Alexandra Ilg, Head of Web3 Commerce and P

“I would describe the current metaverse as the absolute beginning. I think at this point, we can't call it metaverse, but instead virtual spaces where you hang out with friends, group chat, and attend classes and business meetings. I believe this will change when the providers and users start to consider the metaverse as new ways of thinking about social behaviour and not just trying to establish the real world i

We also asked metaverse users to define the metaverse:



“A parallel digital universe where algorithms create the limits.”

“I define the metaverse as a significant evolution event of how we will use blockchain-driven technology in the near future.”

“Metaverse is, in my opinion, an immersive experience and can come in many ways. Some examples can be try-ons in digital fashion, online meetings using avatars, interactive metaverse games in VR, and shopping online using an avatar in a store. It is to feel you are in another place than where you are for real.”

“A decentralised virtual 3D environment wherein users can experience, work and socialise with the freedom of being who they want to be. From a more commercial standpoint, I would say that it is the next iteration of the internet by increasing the sense of immersion, compared to staring at a screen. This means that it is an opportunity to gain even more data on consumer behaviour and attitudes to create products with better market fit without expensive prototyping costs (for companies). For private in

“Many people understand the metaverse as some sort of VR extension of the internet, but for me, the internet (and the metaverse) have been a part of our reality for some time. The metaverse stands for the ability to connect and potentially make money with things on the web. This doesn't necessarily have to





X-Ray Fashion by MANNND

- Learning from the mistakes of the past and the physical

#sustainability

Before we step foot in the digital world, it is crucial to examine the mistakes of the past and the physical. It is no longer a secret that the fashion industry is a troublesome machine that urgently needs improvements. Although digital fashion is not the sole solution to the problem, it can help in many ways. An important step towards bettering the industry is understanding it, which is often not easy, as brands are not always forthcoming regarding their supply chain and overall sustainability and responsibility agenda. A lot stays hidden, and often only half-truths or false information reach the public, resulting in greenwashing and techno-washing with the introduction of digital solutions. Even if the information is openly shared, it is often hard to navigate and digest for the ordinary customer.

What is techno-washing?

Greenwashing is a well-known term for organisations and brands claiming to be environmentally conscious and sustainable based on false information or no actual action at all. Techno-washing can be categorised as a sub-genre of greenwashing, claiming that because something is digital (was built or only exists digitally) it is automatically sustainable. This is only sometimes the case; we must be just as critical in the digital world as we are in the physical world. Bringing the greenwashing rhetoric to the digital space is just as harmful as overlooking it in the physical.

There are many ways we can approach and try to better the fashion industry, but perhaps one of the most important ones is changing consumer behaviour. Digital storytelling can serve as a great tool to help make that change happen.

As consumers,

we have a strong connection with clothes. We need them to cover up and to keep us warm, there is no way around it. Often, we go a step forward and use them as a way of self-expression. They are an essential part of our everyday life, yet we know surprisingly little about them. What are they made of? Where were they made? Who made them? How did they get to us? How should we use and take care of them? What should we do when we are done using them? These are all relevant questions to ask and will remain relevant when entering the digital.

X-Ray Fashion by MANND

As a first stop,

before we venture into the digital, we invite you to take a walk through a phygital experience with one of Denmark's most innovative XR storytellers, MANND and their award-winning VR documentary, X-Ray Fashion, that tells the dark story of garment production in the physical world of the fast-fashion industry.

As the audience,

you are invited on this eye-opening journey to see and feel different stages of garment production that you usually never have access to: the glamorous catwalk shows in New York, the inside of a sweatshop in India and the water supply polluted by fabric dye from the factories. You come face to face with the sweatshop workers, who sew your jeans, and the environmental impacts caused by the fashion industry. This piece is an eye-opener, a conversation starter and the beginning of a changed consumer mindset worldwide.

X-Ray Fashion is a pioneering VR

An experience that combines interactive CGI environments, functioning as transitions, and various live-action 360 scenes. The visuals are combined with a physical installation, where audiences walk barefoot through the different stages of the fast-fashion supply chain. Changing surfaces, wind, heat, water and smell complement the scenes in the movie.

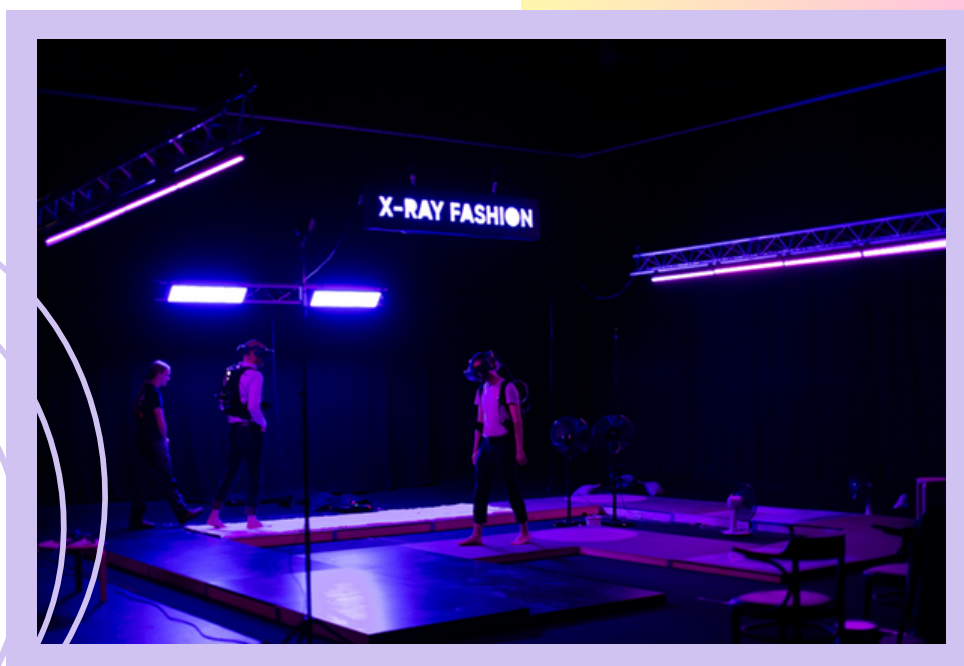


Photo by MANND

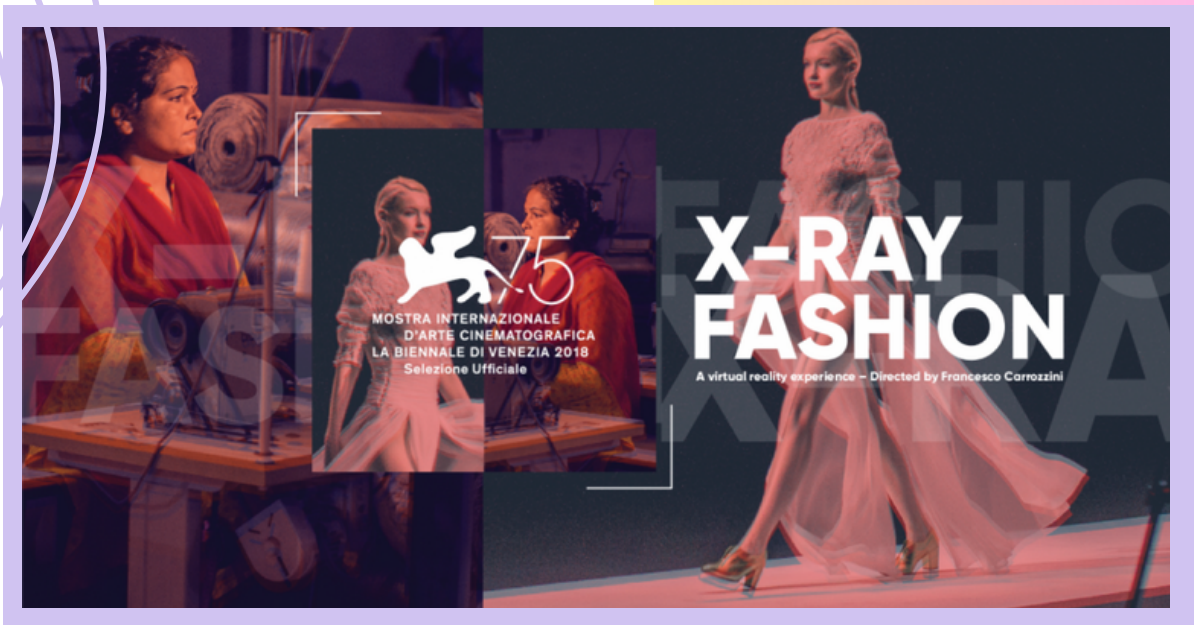


Photo by MANND



For more information on X-Ray Fashion and MANND's work, listen to the [“Digital fashion in the metaverse” webinar](#)



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NFTs as the digital

native format for the metaverse

Before we completely go down the metaverse rabbit hole, we must take a short detour to familiarise ourselves with a phenomenon called Non-Fungible Tokens or NFTs. An NFT is mainly used to verify the ownership and authenticity of a digital file. Before NFTs, it was easy to share digital files such as JPEGs, 3D files and MP4s on the internet, and since shared files are identical, it was almost impossible to prove the origin and ownership of a file. NFTs are stored on a blockchain with a unique quality that can not easily be altered once created. This gives NFTs interesting use cases, such as being a tool for securing the ownership of a piece of digital fashion.

Simply put, NFTs can be used to prove that there is only one of a kind of a specific physical or digital object and who owns this object.

For example, an NFT can store intellectual property rights and the ownership of a given digital file and thus be used to sell and share digital fashion. NFTs can also represent land ownership in metaverses and be used as certificates for digital art. Furthermore, NFTs can secure the provenance of physical objects, and if ownership of a digital and physical object is stored in an NFT, it is called a phygital item.

NFTs already have a thriving ecosystem of collectors and issuers, and many metaverses and digital fashion initiatives revolve around this technology.

To begin to create NFTs for digital or physical fashion,

you have to get a wallet that connects to a blockchain. The NFT can be accessed through the wallet, and only the owner of the wallet can prove ownership of the NFT. There are lots of platforms where it is possible to create NFTs. On some of the platforms, you can create NFTs directly without anything but a wallet. Some platforms are curated, and you have to go in partnership with them to be able to use the platform. If you want to test out how NFTs are made yourself, the easiest way to get started is by installing the browser extension Metamask (find their @MetaMask account on Twitter and follow the link in bio to their homepage) and then go to Opensea and connect your Metamask wallet and create a free NFT from there

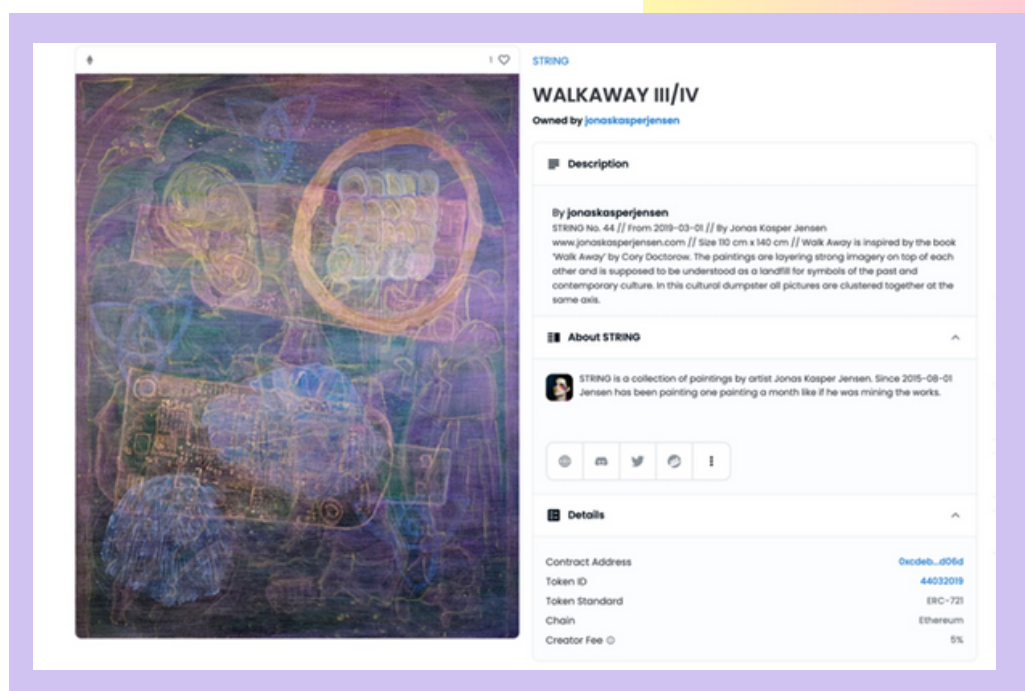
If you find this interesting and want to explore NFTs further, we recommend contacting some of the platforms mentioned in this paper or do your own research. NFT platforms and what they offer change rapidly, and by the time you read this paper, there might be platforms that fit your needs better than now when we write these lines. To get your imagination going, we have included an example below of how to use NFTs.

NFTs as provenance

for physical artworks

#traceability

An example of a project that utilises NFTs is STRING by Jonas Kasper Jensen. STRING is a series of paintings that all have the same size. Every month, a new painting is created. To document this, Jensen is using NFTs. Beneath, you can see an example of what a STRING NFT looks like:



Example of an NFT on the Ethereum network as shown on OpenSea

NFTs as provenance for physical artworks

The NFT carries information about the painting, such as the title, when it was made, materials and description of the work. You can also see a photograph of the painting and technical data like the blockchain the NFT was created on. Note that in this case, the NFT has a creator fee of 5% so that every time the painting/NFT is sold on the secondary market, Jensen will automatically receive 5% of the sale.



Example of the physical work exhibited at Arden Asbæk Gallery

As seen in this picture, STRING can be shown in galleries like traditional art. In this case, the paintings are exhibited at Arden Asbæk Gallery. The gallery still handles everything from shipping, sales, promotion, etc. If a painting is sold, Jensen sends new collectors the NFT that has the function of provenance for the painting. In this way, collectors will be able to prove that they own the painting by showing that they own the NFT. The NFT works not only as provenance for the painting, but also as proof of ownership.

NFTs as provenance for physical artworks



Example of the digital work exhibited at Voxles metaverse

In this example, STRING is exhibited in the blockchain-based metaverse, Voxels. This exhibition has the potential to attract an international audience, and visitors can see the NFT and their provenance by simply clicking on the images while walking around the exhibition with their avatars. Also, if they desire to purchase a painting, they can buy the NFT in the digital environment. NFTs thus enable the work to be consumed by a larger audience than were the paintings only physical and they make it simple and efficient to create installations in a metaverse.

Useful links:



To see the NFTs



Documentation of the physical exhibition



Go to the digital exhibition

Welcome to the phygital

Where the in-between is not always a bad place to be: NFTs as digital fashion

Getting into the digital, especially without a solid strategy to follow or use cases to lead the way, may seem impossible. However, as our introductory definitions show, there is no better space than the not yet defined “metaverse” to experiment.

Before bigger financial and time investments, many brands do smaller pilot projects to explore the digital scene, just like Copenhagen-based fashion brands, Soulland and Birger Christensen Collective did. As a first foray into their digital journey, both opted for an NFT drop at Copenhagen Fashion Week with strong ties to the physical.

The drop from Soulland

#inclusivity #openness

As a part of the SS22 collection showcased at Copenhagen Fashion Week in 2021, Soulland dropped three different NFT packages. Each package is connected to the physical Penelope suit and provides different levels of engagement.

- Soulland Penelope Collectible
 - A collectable NFT of the Penelope 3D suit that can be viewed in AR or worn on Snapchat.
- Soulland Penelope Digital
 - An NFT including the Penelope 3D suit, and its 3D design files, offering the possibility to experiment with Soulland's designs non-commercially.
- Soulland Penelope Phygital
 - An NFT including the Penelope 3D suit, its 3D design files and the Gerber files together with a physical made-to-order suit.

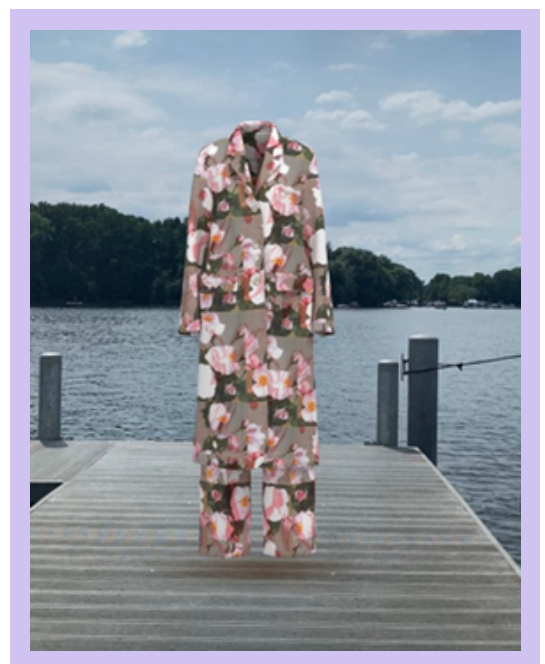
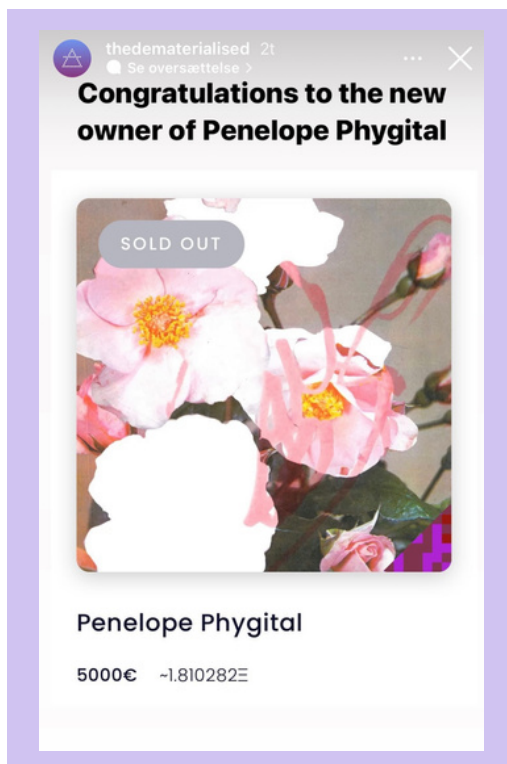


Photo by SOULLAND

What to consider

- Find the right collaborator. The drop was facilitated by and launched on [THE DEMATERIALIZED](#) (5), a Web3 authenticated virtual goods marketplace, creating new ways into the world of fashion.
- Explore how the digital can offer an alternative to the shortcomings of the physical world: Soulland's drop is a great example of connecting the digital world to the physical, and it showcases how digital fashion can foster creativity and freedom both on the designer and the user side.
- Test the digital customer environment and how they are different from your regular customers. It is important to understand that by entering the digital space, you will be interacting with new customers or old customers in new ways. The core of communication might still be the same – the emotional attachment we have for clothes – but the digital might require the adoption of a different language.
- Understand your limits and resources: This pilot was a good opportunity to test the waters for a small brand with limited resources. Soulland generated revenue after the first hour the digital asset dropped and sold out later on.
- Follow-up: A successful drop does not stop with the sale. It is crucial to analyse the process and the outcomes to continue your digital journey.



[THE DEMATERIALIZED](#), a Web3 authenticated virtual goods marketplace, creating new ways into the world of fashion. Contact THE DEMATERIALIZED: Alexandra Ilg, alexandra@thedematerialised.com



You can listen to Soulland Co-founder and Creative Director Silas Adler talk about the collaboration here: <https://www.youtube.com/watch?v=4anvLwQZtps>

The drop from

Birger Christensen Collective

#inclusivity #openness

The Birger Christensen Collective drop is similar to Soulland's, releasing an NFT as part of a fashion show at Copenhagen Fashion Week in 2022, collaborating with THE DEMATERIALISED.

ROTAT3 MORPH PHYGITAL

A 1/1 NFT with augmented reality virtual try-on and a limited edition made-to-order physical THERESA dress together with access to digital collectibles, and a ROTAT3 membership which unlocks a bonus NFT for a digital wardrobe refresh for the next season.

ROTAT3 MORPH

Limited edition NFT collectibles with augmented reality try-on, digital animations and 2D collectibles together with ROTAT3 WORLD membership benefits including early access to new collection drops and a bonus NFT update airdropped in March 2023.



Photos by the Birger Christensen Collective



Why partnership is key

– Birger Christensen Collective x
MOJOMOTO x ifland

#collaboration #playfulness

Most of us are well aware of the major issues in the fashion industry, including unethical and irresponsible environmental and human practices. A less talked about problem influencing the aforementioned issues is the fashion industry's excessively competitive nature and complete lack of collaboration. This is something that should and could be improved entering the digital.

As many of the brands are only about to start their digital journey or are in their testing phase, there is no concrete strategy built yet, and initiatives are driven by either lonely digital fashion enthusiasts or employees who have been tasked with exploring the digital, but might be missing sufficient knowledge, resources and competencies.

At this point, it is crucial to identify the right people to work with, and these people often can't be found in-house just yet. This is when collaboration becomes more important than ever.

After the successful NFT drop, selling out within minutes, driven by curiosity, Birger Christensen Collective continued its digital journey, taking a step forward to conquering the digital realm and quickly becoming one of the leading examples of how to conduct digital collaborations and build a digital strategy. In January 2023, the brand launched an exclusive partnership with SK Telecom's metaverse platform 'ifland'.

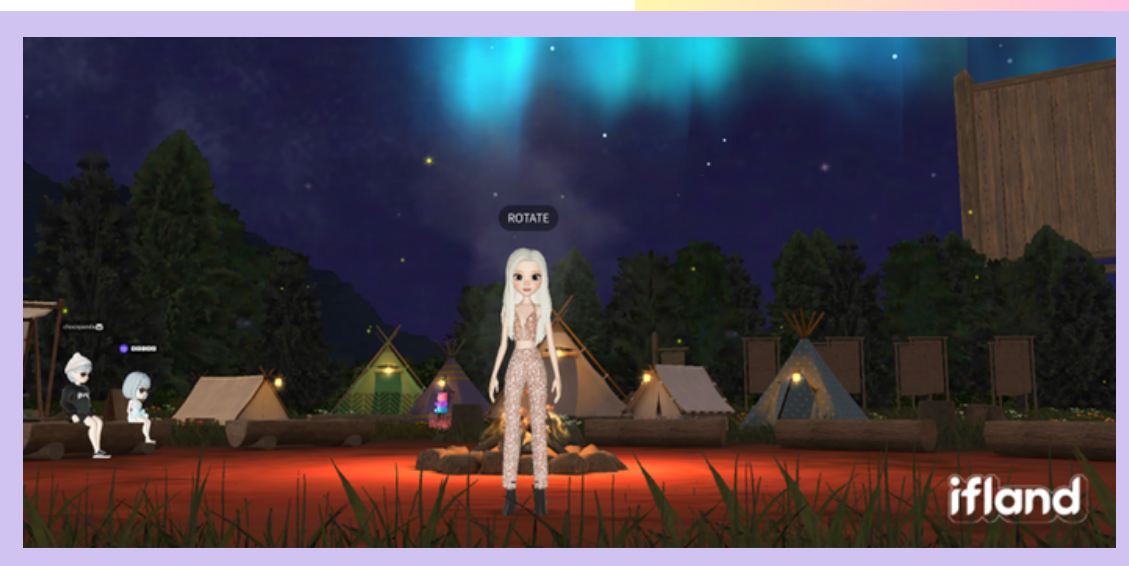
Ifland is a virtual world, offering features such as voice chatting and texting with friends globally, using various movements and gestures, sharing slides and communicating in real time, and gathering with more than 100 people at a time in lands with 3D graphics. In November 2022, the South-Korean-based metaverse launched in 48 markets across the globe, including Europe, the U.S. and Asia. Users can now download the app from Google Play (Android) and Apple App Store (iOS).

Why partnership is key – Birger Christensen Collective x MOJOMOTO x ifland


The ifland lands, many of which are regularly visited by K-pop artists, are a great new territory for brands to conquer that are open and eager to play. The slogan “make your if’s come true in this metaverse world” is one that can be easily applied not just by the users but the brands entering the space too, as seen by Birger Christensen Collective example.



Images by the Birger Christensen Collective



Although bringing their brands ROTATE and REMAIN into such a space was a challenge, it is important to highlight the gains that came with the obstacles.



Both brands can be spotted from miles away thanks to their distinctive details and silhouettes. Translating these elemental aesthetics into a digital space with limitations is not only a challenge from a technical point of view, but also from a design perspective. These difficulties, however, allow for space for creativity, playfulness and interactions with a whole new customer segment. The digital world created on ifland is not a carbon copy of the brands' physical existence, but actually a clever extension of it.

By downloading the app, users can create their own avatars and dress them up in a selection of shoppable ROTATE and REMAIN items and will get access to skins that are exclusive to the digital space.

The Birger Christensen Collective designed and launched the first ifland collection with its long-term partner, MOJOMOTO. MOJOMOTO is a great partner in crime when it comes to creating digital-only fashion and lifestyle products that can be used and traded in the Web3 environment.

What to consider:

- Find your perfect partners in crime. The Birger Christensen Collective successfully identified the collaborators they needed for a Web3 launch, including a metaverse platform that fit their needs and a digital fashion designer that could navigate the challenges of the metaverse.
- Don't be afraid to venture "outside": You can learn a lot outside of the walls of your company. There are many platforms and people out there that you can choose to work with. Spending time finding them will benefit you in the long run.

Contact Birger Christensen Collective Holly Vennell, hve@birger-christensen.com

Contact THE DEMATERIALIZED Alexandra Ilg, alexandra@thedematerialised.com

Contact Mojomoto Lars Rahbæk, lr@mojomoto.eu

Contact ifland Genya Smagin, genya@sk.com



Where are the users?



The metaverse as seen by digital and blockchain natives

Since the use of digital fashion in the metaverse is a relatively new phenomenon, and only a few brands have undertaken the journey of implementing metaverse strategies in their business model, it is hard to know the needs and habits of users. Luckily, since NFTs are stored on a public ledger, it is often possible to find their owners. For our investigation, we have located two digital fashion collectors and asked them about their use of digital fashion and the metaverse. These two very different users of the metaverse give insights into how users might interact with digital fashion and other creative industries in the future.

User perspective I

Interview with artist and NFT collector Twinrafters

#playfulness

In the following interview, NFT collector and metaverse user Ceargio Bagenda, who goes by the online alias Twinrafters, talks about how he experiences and uses the metaverse. The images accompanying the interview are taken in the metaverses where Twinrafters has his NFT collection on display.

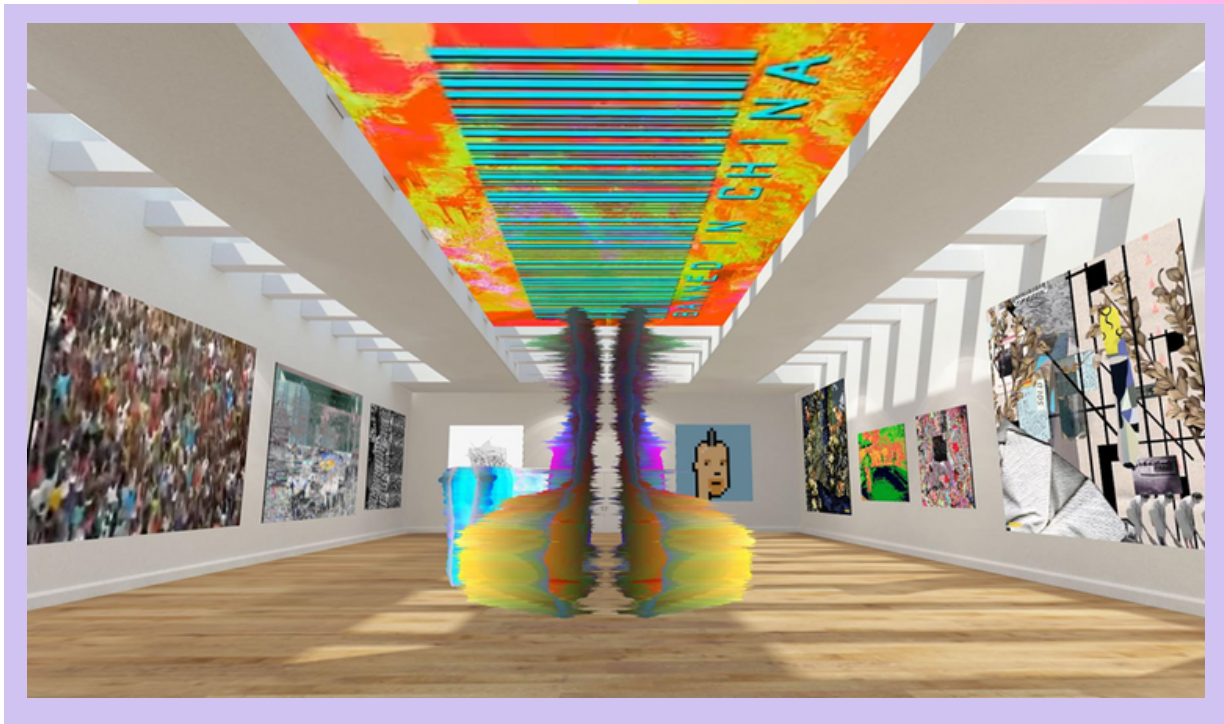
What is the metaverse to you?



Twinrafters (TR): The metaverse is an expansion on how digital content is consumed as well as the evolution of how we as people interact with each other online through online avatars and 3D digital realms. To add, the metaverse is an infinite space. I am curious to see how people will occupy it as it progresses.

What metaverses have you been using?

TR: Cryptovoxels (CV) mainly and on a few occasions, Decentraland (DL).



Twinrafters NFT collection installed in OnCyber metaverse

What do you do in the metaverse?

TR: Most of the time I visit the metaverse to view digital art and digital art galleries. I think the metaverse is a great tool and platform to showcase and build digital art communities true to the media it incorporates. I also enjoy attending events I can't attend physically, due to either the event solely taking place in the metaverse or the event taking place both physically and digitally, but I can't attend physically due to either time or travel restrictions.

What is the visual and audible experience you get in the Metaverse?

TR: Although the visual and audible capacity of the metaverse is ultimately limited to our best hardware and software at the time, something that isn't limited is the sense of scale the metaverse provides. The visual idea of scale and proportion is what usually lack the most when we browse the internet with our phones, tablets, and computers. While in the metaverse, especially using a VR headset, the scale of a digital object can finally be understood, a digital painting can be scaled up to the size of a 30-metre mural and the viewer can get the sense of something massive. Going back to what I said earlier, the metaverse is infinite, how will we occupy this space?

Why did you decide to use a metaverse?

TR: I believe the metaverse is the next iteration of the internet and how communities will interact online. There will be many metaverses just like there are many web browsers (Firefox, Chrome, Safari, etc.). I personally decided to use the metaverse because I see its boundless potential and by being an early participant, I hope I can influence its direction towards something good and meaningful.



Twinrafters NFT collection installed in OnCyber metaverse

What is attracting you to a specific metaverse?

TR: I am mostly attracted to the CV metaverse because it seems to be the most independently run community metaverse. Likewise, I would like to think that CV is kind of the birthplace for more of the indie-run NFT art galleries online today.

Do you own digital garments in the metaverse?

TR: Yes and no. I've been given digital garments for attending certain metaverse-held events but I've never bought any garments myself. Do I see myself buying digital garments for my metaverse avatar in the future? Totally! Just like how people buy skins for their video game characters or even physical clothes for themselves, it's a way to define yourself and be separate from the crowd.

Do you have any experience customising your avatar and clothing in the metaverse?

TR: For both CV and DL I have customised my avatar's clothing. It helped me achieve a sense of personal identity for my avatar



Twinrafters NFT collection installed in OnCyber metaverse

Are there any current trends for fashion that you have noticed in the metaverse?

TR: Most trends I've noticed usually involve some sort of cyborg/technology-laced human hybrid, further embracing the Sci-Fi tradition of the internet; something that you wouldn't often see in the physical world. Moreover, I do believe fashion will develop further in the metaverse, humans always find new and interesting ways to adorn their bodies either in the physical world or the digital.

Is it important to you that the metaverse you are using is built on a blockchain?

TR: I personally prefer to use a metaverse built on blockchain due to the belief that blockchain technology will provide decentralisation, transparency, and immutability and if we can carry those strengths over to the metaverse platform it would make it a more enjoyable and secure experience.

If yes, what blockchain are you most interested in, and do you bring NFT assets like digital fashion into the metaverse from other blockchain platforms?

TR: Ethereum and its potential Layer 2s is my preferred blockchain network. I mention Ethereum's Layer 2s because I believe that to properly scale Ethereum for global mass adoption, we need transactions to be cheap and fast, and Layer 2s addresses that problem. Furthermore, I would bring my NFTs and digital assets into the metaverse, I think those two will go hand in hand. The adoption of blockchain technology has introduced a whole new world of digital asset ownership.

Who are your peers in the metaverse?

TR: Mostly artists and NFT gallery operators.

Why would you choose one metaverse over another?

TR: My ideal metaverse would be one that is mainly community-driven, blockchain interoperable, and has good graphics and coding.



Twinrafters NFT collection installed in OnCyber metaverse

Do you have an economic incentive to be in the metaverse?

TR: I do, practicing digital art, I have every incentive to showcase my artwork in order to promote and sell my work.

Do you think the metaverse will be adopted en masse and how long do you think it will take for it to be normalized?

TR: With any new technology, there will be initial pushback, more so with the older crowds; some people simply refuse to understand new technology out of ignorance and or arrogance. However, younger people, especially people we can classify being Gen Z, are already so immersed in social media and the internet that switching to the metaverse will be like switching to any new platform that becomes hip. By 2025 I think several metaverse platforms will develop enough to where users can have a somewhat smooth experience interacting with others online. By 2030 I think it will be the normal way to browse the internet and consume digital content.

User perspective II

Interview with digital fashion collector Brandon Kang

#sociability

What is the metaverse to you?

Brandon Kang (BK): The metaverse, to me, is a digital place where anyone around the world can interact with each other. In this day and age, with technology and VR capabilities, I see the potential of the metaverse to be multiple decentralized and 3D open worlds interconnected with each other, having the ability to bring your own assets in and out, as well as a sustainable economy.

What metaverses have you been using?

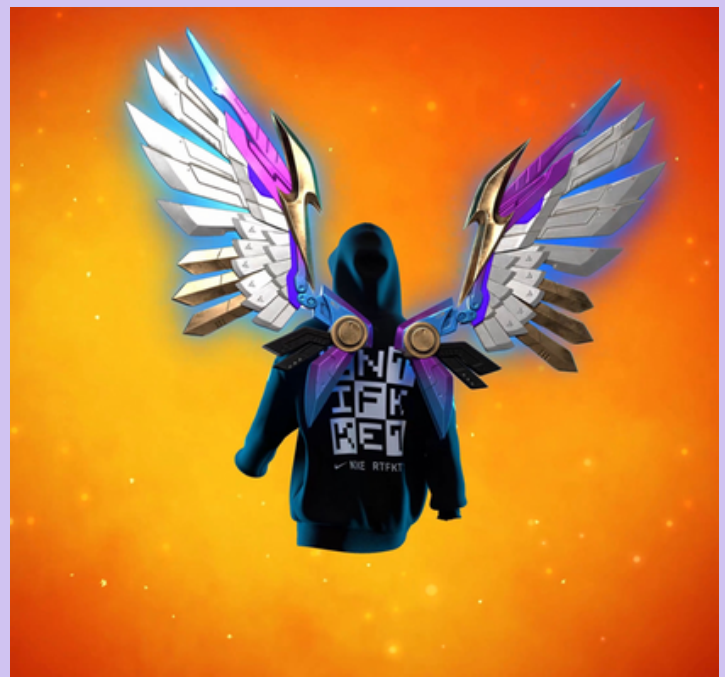
BK: Not many that I use on a regular basis, as none have been very appealing and still in the early stages of figuring things out in this whole interconnected metaverse. I have used DCL, Sandbox, voxels, and a few more with limited use. More recently, The Otherside has been an amazing experience, utilizing new technology and building foundational tools for creators and users of all skill levels to be involved in the economy.

What do you do in the metaverse?



BK: So far, it has been mainly a walking simulator, but I hope more and more will be built and developed into where there are millions of things to do.

Digital Fashion “RTFKT x NIKE AR HOODIE”
from Kang’s NFT collection



What is the visual and audible experience you get in the Metaverse?

BK: It is up to the platform to deliver on this, and so far in my experience, it has been very underwhelming. I am, however, excited about Otherside’s spatial audio integration and how seamless it is to communicate with a voice around others.

Is it important to you that the metaverse you are using is built on a blockchain?

BK: One hundred per cent. The security and provenance of digital items, in my opinion, are the backbone of how a decentralised and self-sovereign economy can function in the metaverse.

What blockchain are you most interested in, and do you bring NFT assets like digital fashion into the metaverse from other blockchain platforms?

BK: Ethereum – due to the number of developers and dapps (decentralised applications) being built. Currently, many metaverse platforms do not support bridging over and supporting cross-chain NFT assets until there are demand/use cases and a 100% secure way of doing so.

Why would you choose one metaverse over another?

BK: The development and user base would be a couple of the main factors that would attract one platform over another. I have played MMORPGs (massively multiplayer online role-playing game) where I rarely see anyone in these massive worlds, and it really hinders the experience when a lot of the gameplay and mechanics are based around team efforts. It is also a lot more fun, in my opinion, when you are constantly around real, active players.

Do you have an economic incentive to be in the metaverse?

BK: Sure, so long as the platform provides a sustainable economy where the playing field is levelled for everyone and has a creator economy



Digital fashion “FEWO SHOE LEGENDARY”
from Kang’s NFT collection

User perspective III

The metaverse Zepeto from a user perspective

#sociability

As we have already discussed in this paper, it can be hard to grasp what the metaverse is without experiencing it. In the following text, Sophie, a South Korean student and a user of Zepeto explains how and why she uses the metaverse. Zepeto is an app where users can meet and chat in different themed worlds. Zepeto lets its users customise their avatars and buy digital clothing. Zepeto is developed by the South Korean company Naver Z corp. and has more than 10 million registered users. The images are smartphone screenshots from the Zepeto metaworld.

Sophie does not consider herself a specialist. She thinks that Zepeto is a perfect game app for Generation Z. She downloaded Zepeto because of her extracurricular activities at her college. She had to use the application for college activities during the COVID-19 lockdown. She says that most Korean universities used this app to organise and operate university activities during the COVID-19 lockdown. The university would tell the students to download the application, dress up an avatar and meet there to have classes.

The first thing a new user has to do upon downloading Zepeto is to dress up the avatar. There are a lot of options. You can choose clothes, boots and accessories for your cartoon-like animated avatar. Sophie thinks that the avatar looks childish, but at some point, she finds herself trying to dress up perfectly and buy fancy clothes. To purchase clothes in Zepeto, one needs in-game coins or diamonds. It is possible to earn coins by doing quests or watching advertisements. Diamonds can only be bought for real money. Some marvellous things are expensive; the player must pay with diamonds to get those, but some basic clothes can be purchased for free coins. Sophie says that she tries to make her avatar look like her authentic self and that her friends who use Zepeto do the same.



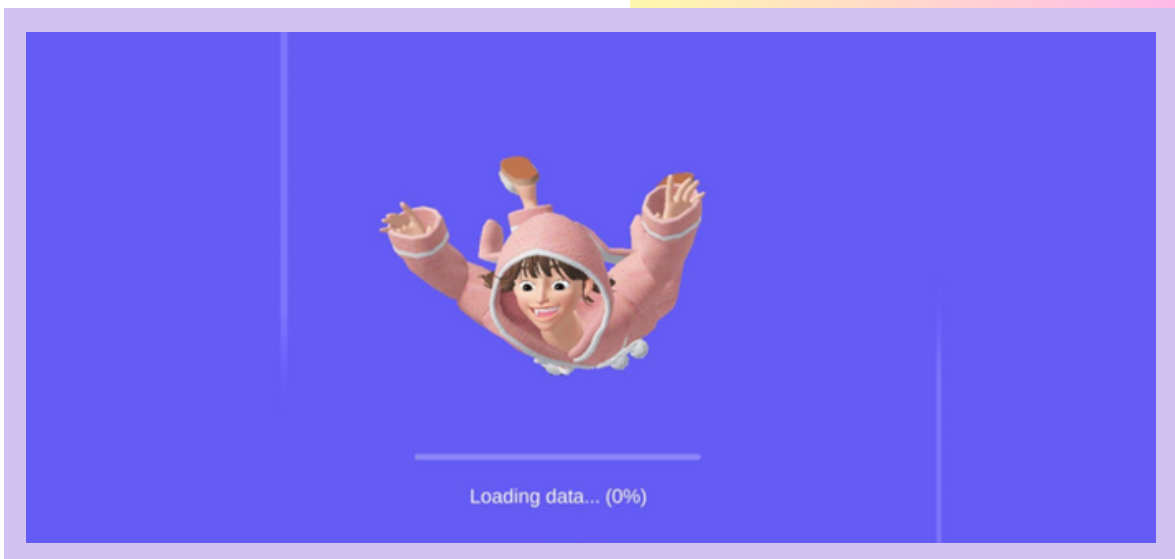
Screenshot from Zepeto on mobile

She meets with her friends in different themed environments in the app. This could be a United Nations theme or an amusement park theme.

Chanel is one of the examples Sophie mentions, as the luxury fashion brand created its map and clothing in Zepeto. Sophie says that many young people like to meet on that particular map and show their collection of Chanel clothing to each other. Visiting a map is like being in an actual city; the feel is similar to a game.

“Let's meet at Zepeto and go to some amusement park and hang out there.”

During the COVID-19 pandemic, everything in South Korea was under lockdown, Sophie says. So she would meet with her friends in Zepeto and hang out online. Before meeting in the virtual environment, they would dress their avatars perfectly. They would, for example, take on crowns and make their avatar have some funny posture, and they would be messaging each other through the application.



Screenshot from Zepeto on mobile

Sophie is not using the app that much anymore since she began to meet her friends in the physical world after the lockdown ended.

She says there are no real competitors in the market. Kakao, Facebook, TikTok and FaceTime can be used but they provide an entirely different experience. Sophie is sure that Zepeto has a growing user group, but she is still determining if it will be relevant to her because the pandemic has ended. There are so many opportunities to meet friends offline. Of course, Zepeto is exciting and fun. There may be some that will still use it, she concludes.

Learnings and guidance

When we undertook the journey of investigating digital fashion and the metaverse, we were not entirely sure what to expect and what would emerge from this research. One thing that we now know is that it is a space that is fast-evolving and is said to have huge potential. There is no one-size-fits-all approach to it, and everyone we talked to is following a tailor-made one to enter the space. There are, however, some learnings and takeaways that everyone can benefit from.

We took a walk in the virtual world while intentionally having our feet on the physical ground. If you took the time to walk with us, then you have already learnt a lot. If you did not have the time, make sure to just read this part with the most important learnings, prompts and some guidance you may require before jumping into the digital:

- We all have a strong connection with and an irreplaceable need for physical clothing. Digital fashion is not here to replace this connection and need, but to complement it.
- The metaverse is still in its infancy. As of now, it is an undefined and unfinished space with a lot of room for influencing and shaping. This is the time to enter and experiment with it. It is not for everyone but we are at a point where by entering it, you have the unique opportunity to shape and make it fit you, not the other way around.
- This freedom comes with a lot of power that must be used cleverly. Let's consider X-Ray Fashion and the many things that are not well-built in the physical world and let's not repeat but learn from them when we build the digital. Let's build it in an ethical, responsible, sustainable, inclusive, and co-creative way.
- Do not underestimate the power of storytelling. It is one thing to be present and a whole other one to be welcome and understood.

Learnings and guidance

- Collaboration is key! Do it with metaverse and NFT professionals who already know about the scene and community customs. If you find the right partners, you have already come far in understanding and establishing a connection with the users of the metaverse.
- This space is already populated with many that are not from the regular fashion crowd but are digital and metaverse natives, representatives of the gaming and or blockchain community. A lot of them are part of Generation Z and Alpha. These are your potential new customers who require different interactions from your regular customers. Take the time to get to know them, to play with them, to learn from them, to teach them. Let them show you new ways of thinking about fashion. Metaverse users are often driven by ideology or interest in technology, and their interest in digital fashion can be driven by interests beyond the fashion itself, such as economic, ecological and sociopolitical.
- This is the time to experiment! An easy way to test the ground, as shown in the paper is to create an NFT drop together with a new clothing line. While doing this, create awareness on social media before the drop and follow up on the drop investigating and showcasing how new owners have used digital fashion.
- Establish a presence in an already existing metaverse. This can help you create brand awareness and understand the users so that you cater directly to them instead of trying to sell them something that does not meet their needs or reasons to be in the metaverse in the first place. Metaverses mentioned in this paper are:

Links to Metaverse platforms:



Decentraland



Ifland



Otherside



Sandbox



Voxels



Zepeto

Learnings and guidance

- Interoperability might be a challenge not only on the technical side but on the human side too. The digital space is fragmented, technology is constantly changing and improving and it takes time to learn how to integrate things but don't let this hold you back. A great way to compensate for the lack of technical interoperability is focusing on the interoperability of humans, of the people you work with inside and outside of your company. Seek collaborations and scout for both specialists and generalists. You will need people who can dig into particular technologies but also people who can navigate all the worlds (design, communication and marketing, tech) coming together and translating between the different languages they operate with.
- Keep an eye on new, emerging talent.
- Give space to creativity and interact with your users/customers. Digital allows for closer communication and more ways to co-create. Your users/customers might be the new talent you have been looking for.
- Don't think in silos, rather, make your digital agenda company-wide. Take time to educate all your employees. Make your digital agenda an essential building block of your overall sustainability agenda.
- Keep the long perspective in mind. Focus on figuring out how to decouple growth from using more resources and generating more revenue streams without producing more in the physical. If one strategy does not work, then try another. What worked today may not work tomorrow since the space is developing fast, and new trends emerge constantly. Think of your efforts in establishing a metaverse business as an ongoing long investment that might not immediately result in earnings on the baseline, but might end in a prospering and thriving business in the future.

It should be clear now that the metaverse is a vast field of opportunities and that it is being shaped at this very moment. How it will end up looking and being used is still uncertain. One thing that is certain though is that the metaverse will only be as inclusive, collaborative, playful, traceable, sociable and sustainable as we make it. We, early contributors, have the opportunity to shape it and create a space that we will want to inhabit. It is definitely time to take action and get involved in the creation of this powerful new place, not only for profit but also because we can make it into an alternative world that might help us reflect on our actions in the physical world too and change both for the better.

Appendix

Overview: Digital Fashion Roundtables (2021-2022)



[Brands, creativity, new possibilities](#)



[Education, industry, transition](#)



[Experience, immersion, responsibility](#)



[An NFT primer, how to mint, what to mint and where to mint](#)



[Digital fashion in the metaverse](#)



[New digital fashion competencies – education, motivation, and implementation](#)



[Digital fashion in the metaverse: A conquered yet uncharted territory \(Let's Get Started\)](#)

[2023 recording links here](#)

Appendix

Overview: Digital Fashion Exhibition – A Conversation Starter (2022)

From 9 to 12 August 2022, during Copenhagen Fashion Week, Lifestyle Lab, in collaboration with Aarhus University, Kolding Design School and the IT University of Copenhagen, hosted a small digital fashion exhibition and a collection of conversations exploring the digital and physical and what lies in between, the so-called phygital. The exhibition included cases covering 3D design, play, digital-only clothing, virtual reality and more, tapping into different areas of digital fashion, such as design, production, sales, new customers and platforms.

List of exhibitors



[Bandicoot Imaging Sciences](#)



[Design School Kolding](#), (Jannie Sloth Hansen, Thomas Bendtsen, Felix Hammerich Clausen, Lan Krebs)



[Hero By Ahlgreen](#)



[Virtual Aps](#)



[Jonas Kasper Jensen](#)



[Kapsules](#)



[MANND](#)



[Vonoa](#)

Some of the cases of the exhibition, together with a few additions, then became the subject of this paper.

References



[Bain, M. \(2022\). The Secrets to a Successful NFT Drop.](#)

Ball, M (2022). The Metaverse: And How It Will Revolutionize Everything. Liveright.

Castronova, E. (2008). Exodus to the Virtual World: How Online Fun Is Changing Reality. St. Martin's Griffin.

Copenhagen Institute for Futures Studies. (2022). Whitepaper: The Future of the Metaverse Version 1.1.

Hackl, C., Leuth, D., Di Bartolo, T. (2022). Navigating the Metaverse: A Guide to Limitless Possibilities in a Web 3.0 World. Wiley.



[Juulsen, T. \(2021\). NFT and blockchain explained – what you need to know as a newcomer.](#)

Narula, H. (2022). Virtual Society. Penguin Books Ltd.



[Fashion Knowledge – A podcast series by Beata Wilczek, Unfolding Strategies.](#)

Thank you

Gratitude fills our closing words. Thank you for exploring digital fashion and the metaverse with us. A special thanks to all the curious minds who supported our work. Your engagement has added depth to our journey. Together, we shape the narrative of digital fashion. Thank you for being part of this exciting exploration.

