LYXF

Whitepaper

LYXF **Whitpaper**

Blueprint for the New Creative Economies

Marjorie Hernandez

Fabian Vogelsteller

Steffen Sieler

Ecosystem Impact

Major Success Factors

Technical Description

Outlook

Glossary

References

Executive Summary

Social developments in the lifestyle arena are calling for a unified technological answer.

The contemporary creative economies are characterized by a transgression of traditional disciplines and reality dimensions. We see the world of fashion, design, luxury, and media continuously converging. Lifestyle markets have become fragmented, fuelled by consumers' complex desire to fulfil their unique identity, and by their resentment to fit categorical catch-all-labels.

At the same time, the boundaries between the physical and digital spheres of creative expression are similarly overcome. The material aspect of sociality is dissolving: a continuing dissemination of personal avatars, digital collectibles, and virtual representations in social media, VR spaces, and online games is about to create a whole array of new economies in the socio-creative communities.

These economies are grounded on a modernized understanding of lifestyle consumption. In our contemporary environment, consumers wish to buy into immersive experiences instead of just purchasing products. They hope that their belongings give them access to communities instead of just their ownership. They prefer their items to be unique instead of just exclusive, and personalized instead of just customized.

In this context, the effect of technological progress and adoption is twofold. On the one hand, technology is empowering creators to unleash their creative force in unprecedented ways. The emerging genres of computer-generated imagery and digital-only fashion are becoming an integral part of lifestyle production. For the first time, designers are unconstrained by the boundaries of the physical world. In every respect, lifestyle houses are becoming increasingly technology-driven.

On the other hand, technology has also empowered modern consumers. The millennial and Gen Z generations are savvy digital natives, demanding, and in charge as no customer cohort has been before them. Technology allows them to access an abundant amount of information and to create narratives that have become the first point of reference for their peer communities.

While the silhouettes of these modern creative economies are clearly visible today, a number of key challenges have come to light. They revolve around the ways in which we deal with digital ownership, capture its value, and enable widespread participation in the cultural conversation. To leverage on technological and social progressions, the space is in need of a shared digital ecosystem that they can use as a base layer for their cooperation and collaboration.

The LYXF network is pur-posefully built for the nature of the modern lifestyle industry. It enables the space to drive innovation around the core themes of future creative work. This includes the ways in which creators coordinate their communities and projects, engage with consumers and collaborators, automate their interactions, and trust their transactions. It redefines how assets can be managed, collections showcased, and brands experienced. It is the technological playground for creative professionals to shape emerging trends and unleash their creative force.

LYXF is part of a vivid superor-dinate ecosystem. It brings different worlds together that for the most part have had difficulties to interact with each other effectively, or that have even been largely disconnected. This includes creators and consumers, influencers and designers, investors and technology innovators. Present and future interactions among and between all of these stakeholders can now be embedded into a dynamic decentralized digital layer that is transparent, verifiable, interoperable and secured by hard-coded rules.

The modern lifestyle system is powered by peer production and collective creatorship. LYXF opens up new access channels between socio-creative crowds and expands their physical, digital and virtual touch points across all creative verticals, platforms, and professions.

LYXF powers and secures systems of trusted cooperation in the modern creative economies.

LYXF's wide range of applicability is guided by three key principles:

The trinity of LYXF' key principles allows to connect integrate physical and digital product dimensions further, to strengthen the individual experiences with and around them, and to build strongly relational communities. As a holistic approach, this allows information, value, and ownership to flow freely within and between them.

Identification is a process of giving everything and everyone in the digital lifestyle ecosystem a unique digital identity. Blockchain-based identities on the LYXFnetwork are self-sov-ereign, which means that their owners have full control over their digital selves and the data that is attached to them. They are also permanent, portable, platform-agnostic, and interoperable and thus allow users to maintain their personal reputation universally. For creators, such as brands, aspiring designers, or influencers, publicly curated identities can foster transparency, whilst public validation will protect their name. For users, universal blockchain-based IDs lead to greater convenience, control, and continuity of their digital identities and the connected reputation they have accrued over time. By using RFID-chips, digital identities can be created for physical objects, which makes them 'phygital' items with a unique product 'DNA'. Digital ownership of real-life goods allows their owners to authenticate them, interact with them, and explore their individual history, which can be recorded over time. For digital-only collectibles, establishing singularity through identity is a crucial next step; only when ownership structures are clearly defined and manageable can these items be identifiable, accessible, storable, and transferable.

Virtualization is a process that is used to transfer the properties of physical products to virtual spaces, to expand the realms of their ownership, and to establish a seamless connection between all dimensions of users' self-presentations, perceptions, and experiences. We call this convergence a 'phygital' progression. With 'phygitals', users can uncover unified narratives around their physical and digital products and carry them around different realities whilst preserving their specific context.

Tokenization is a process of converting all sorts of rights into custom-built tokens that can represent value, capture assets, signal status, or prove loyalty. Tokens give the ability to make such rights fungible, shareable, and transferrable while at the same time being highly versatile and customisable. The customizability of tokens means that creative professionals are free to decide upon their functionality, overall supply, target recipients, name, and branding. Around the ownership of such tokens, vibrant communities can form, where real value can freely flow between all participants and convey trends in real time. In many ways, token economies can be used to strengthen customer experiences, commitments, and relationships. Through their accessibility, security, and transparency, lifestyle communities can also apply their tokens to participate in mass-crowd voting. We call this procedure 'communitization'.

These core components can mutually support each other and together form the blueprints for all kinds of new and peer-to-peer economies in the lifestyle, fashion, and design verticals. Most applications of the LYXF blockchain will draw on different combinations of them. Used together, they can attach new meanings to the definitions of value, participation, and ownership in the creative space.

identification,

virtualization,

tokenization.

LYXF's initial use cases are tied into the overarching dynamics that are shaping the current creative system.

LYXF is an ecosystem facilitator much more than a digital service provider. It is a neutral base layer and an open playground for innovation. Just like the protocols of the Web, it will be a sustained experimentation ground also for those future scenarios that we cannot yet foresee today. Unlike the Web, it works in a more decentralized fashion, with self-sovereign identities, interoperability and automated interactions but without the need to trust counterparties or to pass intermediaries.

While all applications built on the LYXF blockchain work on their own, they can also be combined and entangled to harness their mutual synergies. As LYXF represents a con-ti ngent system, the use cases we can conceptualize today are by no means exhaustive.

Throughout this paper, we present a selection of use cases that directly respond to challenges and opportunities of the lifestyle system's present moment. They are logically ordered in a linear fashion, which mirrors the applicability of LYXF's network along the entire lifecycle of a lifestyle product, from the stage of its conceptualization up to its afterlife as a vintage collectible.

(01)

FUND: DESIGNER ICOS

Creative professionals are able to tap an alternative source of funding for their projects by offering customized tokens on the LYXF network to specific crowds of investors, who can in turn allocate their funds to the projects they wish to support.

(04)

OWN: PHYSICAL COLLECTIBLES

By establishing digital identities for physical products, creators can enable their digital ownership, continuously gather their unique and singular data history, and have lasting and direct access to their owners. The newfound knowledge about a product redefines its unique value.

(02)

TRACE: PROVENANCE

With mindful consumerism and ethical living on the rise, producers can use LYXF's decentralized record of provenance to increase the overall transparency of their practices and to capture the unique stories of their individual products.

(05)

OWN: DIGITAL COLLECTIBLES

The LYXF blockchain supplements the hyper-real virtual fashion experiences of digital-only lifestyle capsules with a much needed infrastructure for handling ownership. It allows for real scarcity, accessibility, P2P-transferability, storage, display, and permanence of these new items that are used to clothe digital selves.

(03)

MANAGE: SMART IP RIGHTS

Creators can incorporate "smart IP rights" into their physical, digital, and virtual works. They facilitate provenance authentication and anti-counterfeiting; IP transactions; IP right audits; digital rights management and IP clearing.

(06)

COLLECT: DIGITAL CLOSET

The creation of unique digital ownership opens up a new world of collecting and representing virtual creations. Owners of digital fashion items can organize, explore, and present their collections of digital collectibles in LYXF's virtual libraries, which are the in-te rfaces to digital ownership in the lifestyle arena.

(09)

TRADE: DECENTRALIZED MARKETS

LYXF allows to manage, authenticate, identify, transfer and pay for items in decentralized secondary lifestyle economies. Having safe access to unique physical and digital products en-ables the community to bring quality craftsmanship in continu-ous circularity.

(07)

PARTICIPATE: GAMIFICATION

By creating rule sets and by tokenizing activities on the LYXF blockchain, lifestyle brands can become 'experience agencies' that engage their customers in playful competitions, make products into collectibles, and strengthen authentic IRL interactions.

(10)

CO-CREATE: CUSTOMER ENGAGEMENT

LYXF provides the interaction layer to foster co-creation and p eer-production in the lifestyle world. Brands can turn their e mpowered consumers into participants of the cultural conver-s ation and use their bottom-up input via direct forms of com-munity access.

(08)

SHARE: RENTAL SERVICE

With LYXF, both professional services and private owners can set up peer-to-peer sharing economies that bring liquid ownership and collective consumption to the lifestyle community and scale the ex-change that characterizes the prognosticated "end of ownership".

LYXF is a public, programmable, domain–specific blockchain.

The LYXF blockchain is based on the most advanced smart contracting platform in existence, the Ethereum Virtual Machine. Smart contracts come with an unseen flexibility and applicability, where all forms of formalized and complex interaction logics can be managed. They enable automated and unambiguous transactions at reduced costs and increased speed.

In this context, LYXF is spearheading the very new generation of domain-specific blockchain architectures, as it creates an ecosystem that is systematically tailored to the needs and nature of creative communities. This differentiation allows creators to use the synergies of being exclusively among their own community of peers and makes the network sufficiently scalable to cater for all transactions in creative cooperation. The value of the LYXF blockchain then r eflects the digital economic activity of the creative space.

The LYXF blockchain secures itself through the costs to participate in the network. It uses LYX as its native cryptocurrency. A total supply of 100,000,000 LYX will be created in the genesis block. To reach consensus, it draws on Proof-of-Authority in its test-network, and on Proof-of-Stake algorithms as soon as it will be launched.

The LYXF ecosystem is controlled and owned by its entire community.

The LYXF network is run by its participants themselves. The creative community has collective control over its common data structure, which is organized without entry barriers and central authorities. All transacting participants become economic owners of the ecosystem they create by setting up applications and using them. All users benefit from the growth of their collectively owned network, which incentivizes ever broader ranges of creatives to build their own solutions on top of it.

The multidisciplinary team of LYXF's initiators and advisors carefully mirrors the progressing convergence of the worlds of lifestyle and technology. As a contingent playground for experimentation at their intersections, LYXF is the d igital base layer for the b roader creative communi-t y to move this convergence f orward at all fronts.

Introduction

Driven by technological advancements and generational shifts, creative communities are speedily moving forward with structural changes to many of their traditional axioms: from top-down creation to bottom-up participation, from self-presentation on the streets and runways to conspicuous consumption shared on social media, and from purchasing personal products to participating in collective and immersive experiences.

In our contemporary system we are witness to the breakup of even the most common lifestyle boundaries: distant hierarchies between creators and customers are being torn down; replaced by communities of empowered participants who are increasingly influencing the creative agenda themselves. The physical and virtual realms of product design and display are being transcended, and demands for unified and hyper-realistic experiences are redefining established manufacturing and imaginative processes. Formerly disconnected siloes of creative production are coming together, feeding back in reciprocal stimulation and merging into a shared and transdisciplinary lifestyle arena.

The framework for modern creative economies is set by a number of overarching system level progressions. As part of a new digital globalization, interconnectivity is strengthening, which is accompanied by increasing digital data flows, rising cross-border bandwidth, and an exponential rise in connectivity. Mobile devices have gained significant traction, not only as a means for facilitating payment transactions, but as ever-present windows to the world and each other, where self-expression has reached elevated levels of granularity and reach for the individual user. While technological advancements in analytics, VR, AI, and 3D rendering are affecting all industries in their own ways, they are also pushing creators beyond simply improving their operations: they ask and allow designers

to unleash their creative force in unprecedented ways, redefine the relationships with their consumers, and propel lifestyle storytelling to its most futuristic expressions.

As both cause and effect of these dynamics, the lifestyle customer mindsets have been changing most of all. They have never had this level of technological and digital connection and are significantly empowered by their newfound access to abundant information. Across lifestyle segments, this is reflected by heightened demands of convenience, transparency, ethical production, curation, and personalisation. Moreover, the millenial and Gen Z generations are savvy digital natives, demanding, and in charge as no consumer cohort has been before them. Technology allows them to create narratives that are the first point of reference for their peer communities. These initial community generated reference points have suddenly become very meaningful to established creative designers. Contrast this with the times when department stores were in charge of, and set the creative agenda. Indeed, the ways in which participants expect to engage with brands, and to interact with products have changed significantly: they now share and contribute to the creative discourse; and they are now stakeholders.

The open LYXF ecosystem ties directly into these cur-re nt dynamics. While today's lifestyle space is made up of un-pr ecedented numbers and types of social groups, the LYXF bloc kchain is tailored to act as the digital base layer for their inte ractions, innovations, and creative instigations. Its decen-trali zed network provides lifestyle stakeholders with the tools the y need to design, deploy, and apply their use cases and to red efine the contemporary and future creative economies.

In this spirit, the progressing convergence of lifestyle and technology is carefully mirrored by LYXF's initiators and ad-vis ors, who unite industry leaders from the forefront of both sp heres. Together, we see this blueprint, first and foremost, as a storytelling piece about the growing promise of the future lif estyle arena and the communal institutions that will be gov-er ning it. We clearly see the worlds of fashion, design, luxury, t echnology, and media continuously converging. As we dive i nto LYXF's vast range of applicability throughout this paper, w e will come to explore these dynamics from a thoroughly op-ti mistic and multi-disciplinary perspective.

Basic principles of LYXF, community ownership and de-ce ntralized architectures, allow for peer production and col- lective creatorship that are the most appropriate and efficient modes of driving the modern lifestyle system forward to be- come the best version of itself. Through their newfound inter- action channels on the LYXF blockchain, all lifestyle com-m unities can become collaborators: established brands and a spiring designers, tech innovators and media influencers, c ontent curators and product consumers. To all of you, we ex-t end our heartfelt invitation for a joint and active participation i n the LYXF lifestyle ecosystem.

What is LYXF?

18-20

LYXF is the digital base layer for the modern creative econo-mi es. It enables the lifestyle, fashion, media, and design spac-es to drive innovation around the core themes of future cre-ati ve work. This includes the ways in which creators coordinate wi th their communities and projects, engage with consumers a nd collaborators, automate their interactions, and trust their t ransactions. It redefines how assets can be managed, collec-ti ons showcased, and brands experienced. It is the technolog-ical playground for creative professionals to shape emerging trends and unleash their creative force.

Contemporary creatorship is powered by peer production. By opening up new access channels between socio-creative crowds, LYXF's trust architecture expands the realms of their c ollective work. Creators and consumers, innovators and influ-e ncers can use it to become continuous collaborators. This ex-p ands their physical, digital, and virtual touch points – across a ll creative segments, platforms, and professions.

LYXF is a public and domain-specific blockchain. It lever-ag es the novel design benefits of crypto-economics to instigate a whole new discourse around the convergence of creativity, te chnology, and human interaction. While the lifestyle space is made of exceptionally social groups, the LYXF blockchain act s as their digital interaction layer and carries real value. As an open ecosystem, it is owned by the global community of cr eative shapers themselves. Thus everyone's talent can be lev-er aged, and consumer needs and desires known in real time. T his represents a seismic shift away from the traditional model of centralized gatekeepers in the worlds of lifestyle creation and consumption.

The LYXF network is not confined to a predefined set of di gital services. Instead, it represents a transparent, resilient, a nd sustainable infrastructure that enables creators to design

and deploy an infinite number of innovative applications and use cases on its blockchain layer. As a neutral base layer, it operates on the principle of contingency: just like the internet itself, it will be a sustained experimentation ground also for those future scenarios that we cannot yet foresee today. Unlike the internet, the LYXF network works in a more decentralized fa shion, with self-sovereign identities, interoperability and au-to mated interactions, but without the need to trust counter-pa rties or to pass intermediaries. Its building blocks allow to es tablish new and genuine peer-to-peer creative economies.

LYXF is spearheading the emerging generation of do-m ain-specific blockchains. Its setup is tailored to the partic-ul ar needs of the creative fashion and lifestyle context, and in formed by the overarching trends that shape that context. While the nature of lifestyle will continue to evolve as it always has, this programmable platform allows its users to safely master and influence those changes. Above all, LYXF invites t he creative community to tap into the blue oceans of their vibrant space, in a mission to uncover the true potential of our future lifestyle system.

Key Principles

21-32

IDENTIFICATION

VIRTUALIZATION

TOKENIZATION

Today, most lifestyle consumers are tech-savvy, and soon enough, the vast majority of them will be digital natives. The millennial and GenZ cohorts are the customers of the future, but they are a very strong customer group already today. They are empowered by digital technology, which gives them access to abundant information. It allows them to compare, to interact, and to have a say in the creative process themselves. As a consequence, the ways in which lifestyle experiences are created, consumed, and individualized must be upgraded: The modern creative economies need a real digital transformation.

For organizations and industries, the difference between digitization and digitalization is significant. It is a matter of scope and potential value to businesses as a whole. Digitization is merely a conversion of data and processes to digital format. It can reap efficiency benefits where digitized data is used to automate processes and enable better accessibility, but it does not seek to optimize the processes or data.

Digitalization moves beyond digitization: it describes a thorough transformation, where digital information technology is leveraged to entirely reengineer and reimagine business processes. As Gartner defines it, digitalization describes "the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business."[1] SAP sums up that you would digitize a document, but you would digitalize a factory.[2]

At large, creative businesses are yet to exhaust the system-level changes of 'how things are being done' in digital spaces. However, the move towards a future where all lifestyle houses will be technology companies is inevitable. This future calls for a common digital base layer for the lifestyle arena, where all of its participants can interact, transact, and collaborate in a trusted way. A digital ecosystem for the creative economies will allow us to bring together elements of the industries that have been largely disconnected from each other. It is needed to build solid bridges between creators and consumers, between physical and digital elements, and between different creative disciplines.

The mission to set up a digital ecosystem for the creative spaces will be guided by three key principles, which have been made possible by the recent technological developments of blockchain technology: (1) We need to enable unique and interoperable **digital identities** for all participants and objects, which will allow them to interact and transact with each other across systems and platforms. (2) Lifestyle production and consumption must make full use of the processes of **virtualization**, so that immersive digital experiences can be shared. (3) Through a **tokenization** of creative communities, we can let value flow freely between all participants, where token economies can strengthen customer experiences, commitments, and relationships.

The LYXF ecosystem is built around these three key principles. They mutually support one another and together form the blueprints for a variety of new economies in the lifestyle, fashion, and design segments. We have created a framework that makes it easy for anyone to exhaust their potential by building customized applications on top of the LYXF blockchain. Most of these use cases will draw on different combinations of each of the three building blocks. Used together, will attach new meanings to the definitions of value, community, and ownership in the creative space.

In the following, we will explore these three general principles one by one. Along the way, we will touch upon specific applications that are enabled through their interaction and that will be examined in more depth in the next chapter. These use cases are by no means exhaustive, but they serve as illustrative examples to ignite creators' imagination of what the future of digitized lifestyle will hold.

IDENTIFICATION:
Enabling Unique Identities

To achieve a holistic digital transformation in the creative economies, everyone and everything forming a part of them first needs to have a unique digital identity. Digital identities form the basis of all interaction among and between creators and users, digital and 'phygital' products, as they make all of them visible and addressable in the digital world.

Only if people, organizations and objects are clearly identified can they become a tangible and 'living' part of the digital ecosystem. Their identities enable them dynamically and securely vote, transact, and interact with each other and with their products across disciplines, hierarchies, and corporate boundaries. On this basis, all sorts of economies can be opened up where value can flow freely within the space.

LYXF allows all participants to create their personal address on its network and to use it as their permanent identifier in the digital world. The LYXF blockchain serves as a public database that is accessible and verifiable by anyone. This property makes it perfect to solve the biggest challenge of public identification: where to find relevant information about somebody or something that allows us to know with certainty that the source of a claim is actually correct and credible.

Both for people and objects, these processes are based on verifiable claims: just like a passport is a combination of approved claims, credentials, or attributes attestations from different entities, blockchain makes it possible to reveal credentials on a demand basis. Such claims could be anything – they can be added by anyone, need approval, can't be changed without the ID owner's permission. They contain an issuer signature and a claim reference.

DIGITAL IDENTITIES MUST BE UNDER FULL CONTROL OF THEIR OWNER

Blockchain-based identities are the next logical step in personal identification. They are self-sovereign: they allow everyone to own and control their digital selves and the data that is attached to them. The user controls all claims, proofs and third-party attestations in relation to his/her self-sovereign identity, and can choose which pieces of information to release to specific parties. Identity is not 'issued' by any authority, and is not stored by any custodianship system. Here, the control points for identity are moved to the edges of the network, giving more power to people, organizations, and connected devices. Such identities cannot be confiscated or revoked by any centralized entity, physical or digital.

DIGITAL IDENTITIES NEED TO BE FULLY INTEROPERABLE

By using blockchain technology, identities become permanent, portable, platform-agnostic, and interoperable. They empower users to maintain their personal reputation universally, across all different systems and logins. They allow for limitless continuity: by attaching data we can accrue a personal history, where a fully credible identity is created over time.

From a technical perspective, the creation of a digital ID looks very similar for all possible elements: it is a smart contract address that represents a person, entity, or object. By outsourcing the identity infrastructure to a smart contract, we are able to take advantage both of the complex logic that can be added to it and the easy interactability that comes with it. In the following, we will briefly go through the different actors and objects that can take advantage of a unique digital identity in the new creative economies.

(01) IDENTITIES FOR CREATORS

Established brands, aspirng designers, influencers, and all kinds of creative labels can benefit from public on-chain identities. Transparency has become critical for organizations. With publicly curated identities, they can make their interactions public and carefully sculpt the way they appear in the digital world. Through a verifiable track record, they can build up their digital reputation over time.

Public validation will protect their name: everytime a statement or product is issued under the name of a brand, users can clearly validate that this was in fact issued by the original organization. When companies start using blockchain-based identities, claim issuance for personal private identities also becomes easier, as verifying the trust and the public actions of such companies becomes easy and more transparent.

(02) IDENTITIES FOR USERS

By using their universal blockchain-based IDs, consumers can enjoy greater convenience, control and continuity of their digital identities and the attached reputation they have accrued over time. Universal accounts, universal logins, and universal profiles will make the on-chain interaction and trustability of actors more transparent and safe.

(03) IDENTITIES FOR PHYGITAL COLLECT- IBLES

Brands can create unique identities for all of their physical products. When physical items are equipped with an RFID-chip, they can be equipped with a unique digital identity. They then become 'phygital' items, as their physical and digital spheres have been bridged. Having a unique 'DNA' in place for each object allows consumers to finally own all of their items digitally, to authenticate them without doubt, and to transfer them securely. The digital identity of a product sits on a blockchain as a smart contract and can be easily interacted with. It contains a record of information about its owner and its properties, which grows organically over time and accrues the entire history about the individual item. This changes the nature of its unique value and makes digital representation possible anywhere. For further details, please refer to the chapter on the use case OWN: Physical Collectibles.

(04) IDENTITIES FOR DIGITAL COLLECT- IBLES

In a similar fashion, designers can create unique identities also for their digital creations. For the emerging genre of digital-only fashion specifically, establishing this singularity through identity is a crucial next step. Blockchain-based identities supplement the hyper-real lifestyle experiences of virtual reality worlds with a much-needed infrastructure for handling ownership. Only when ownership structures are clearly defined and manageable can these items be identifiable, accessible, storable, and transferable. Unique identities are thus a prerequisite for making these new digital items that are used to clothe digital selves scarce and valuable. For further details, please refer to the chapter on the use case OWN: Digital Collectibles.

***

When all elements of the digital lifestyle ecosystem have their own unique identities, we simultaneously have unprecedented and direct access channels between all of them in place. Creators and consumers can interact with each other far beyond the moment of sale and engage in a lasting and productive relationship with each other. A digital ecosystem with digital identities breaks down the complexity of the modern lifestyle space. It allows all participants to join forces, to come together in their creative aspirations, and to achieve a collaborative cultural conversation.

VIRTUALIZATION:
Creating Digital Experiences

A decisive part of the digital transformation of lifestyle consumption is the continuous integration of all of its physical and digital aspects. By conflating and transcending the boundaries between different realities, we can establish a seamless connection between all dimensions of users' self-presentations, perceptions, and experiences. 'Phygital' collectibles are physical items with unique digital identities. While their digital dimension can be understood as a comprehensive record of an item's unique history, it may also be developed further: it can be used to complement a physical lifestyle item with its virtual model. The LYXF network can capture the trans-reality con-nections between a physical item and its virtual counterpart. Users can then carry their ownership between physical and vir-tual realities and preserve the value of their belongings everywhere – their uniqueness, history, and scarcity.

Together with digital-only collectibles, such items are made for the emerging rise of virtual reality (VR), where users are getting more and more playful and serious about their presentation of self. VR spaces are steadily expanding, and with them the increasingly sophisticated re-creation of human behavioral patterns on a global scale. Like in the physical world, users equally merge with like-minded communities where they strive to re-create interactions, follow explicit and implicit norms, present their achievements, display their social status, and seek recognition of their characters.

The notion of provably realistic virtual models becomes ever more relevant in a world where fashion brands launch capsule collections that are exclusively digital, where consumers buy costumes for their characters in computer games, or where computer-generated celebrities have become influencers of cultural trends. In the following, we will explore just three con-temporary case studies that illustrate the current progression towards virtualization in the creative spaces. Often, these ideas found their first expressions in dedicated online youth cultures and then spilled over to much broader segments of lifestyle consumers.

CASE 1: CARLINGS DIGITAL COLLECTION

Influenced by the impact of social media influencers, Scandinavian clothing retailer Carlings launched their 'Neo-Ex' capsule in November 2018. It is a digital-only collection, with no physical product being produced, shipped, or worn – it dresses their customers virtually. Users would upload a picture of themselves to Carlings and place an order of items. Carlings designers skilled in 3D rendering then fit the clothing to the image and make it appear that the user is wearing the pieces In Real Life (IRL).

Carlings CEO Ronny Mikalsen explained that, through the collection, the label hopes "to challenge ourselves and the whole industry to take the next step to explore how fashion can exist in the not so distant future." (HYPEBEAST, 2018) While Carlings has initiated an important step toward socio-creative consumers, its physical and digital collections are entirely separate from each other. As the next stage in the virtualization of lifestyle products, these dimensions should be seamlessly linked to each other. When purchasing a physical item, fashionable consumers must be provided with its virtual model, to be worn not only on social media, but in all environments of self-representation.

CASE 2: FORTNITE SKINS

As on of the most popular video games currently in existence, Fortnite has fueled its multi-billion-dollar revenue by in-game buys that players make to differentiate themselves from one another and to express status within their community. Players purchase character animations such as accessories and costumes. These animations are limited and known as 'skins', which represent a form of virtual-only fashion. Each item then has several tiers, which can be reached by users as they are gaining experience points in the game. This distinguishes the skins from others and gives players respect within their community.

Being a last-man-standing video-game shooter that is free to download, Fortnite is played by more than 125 million people in 2019. It represents more a global lifestyle than merely a virtual game. It is populated by celebrities, extremely competitive, and highly social. While their cultural impact is here to stay, Fortnite's 'skins' represent an intermediary step in the developments around virtualization and ownership. Players are not able to carry their purchased belongings from their Fortnite community around to the other communities they belong to. It is a decisive next step to make virtual ownership platform-agnostic, universal, and transferable from space to space.

CASE 3: VIRTUAL INFLUENCERS

Computer-generated supermodels in virtual realities have taken lifestyle influencing by storm. They are presented with lifelike profiles, posing with real-life stars and powerfully advertising fashion brands. Virtual model Lil Miquela has amassed millions of followers on Instagram since her first 'selfie' was posted in 2016. She collaborated with luxury house Prada and make-up artist Pat McGrath, appeared in Vogue, and advertised several luxury brands (The Times, 2018). Computer-generated Noonoouri posed wearing real-life items by Versace, Fendi, Jacquemus, Ashi Studio, and many other designer brands. She did makeup tutorials using Kim Kardashian West's KKW beauty line, appeared during the 2018 Cannes Film Festival, and took over Dior's official Instagram account for two days as the label presented its Cruise 2019 collection in Paris (Vogue, 2019).

The creators of such models often state that they attempt to blur the boundaries between fiction and reality. Today, filtered pictures with airbrushed shots of people can seem hardly more authentic than purely virtual creations. Such virtualization will become beneficial also to real-life models, who can be sent on multiple jobs around the globe with their virtual representations and who can become immortalized through their scans. Computer-generated imagery is a beautiful expression of our shared digital age, where fashion and virtual spaces should increasingly leverage their mutual synergies. To strengthen the bridges between them, the branded products that virtual models are wearing should be more than generic. As these items are becoming unique digital collectibles, their owners will be able to capture the real value of what they represent as individual pieces.

***

These three case studies demonstrate some pioneering forays into the amalgamation of physicality and virtuality in the lifestyle space. To bridge the gap between those dimensions, blockchain systems are becoming increasingly critical. Using the LYXF network, lifestyle owners can carry their pieces in different levels of reality and preserve their specific context and ownership. Brands can create and uncover unified narratives around their products that transcend their reality dimensions. As the value of manufactured lifestyle pieces is defined by their uniqueness, history, and scarcity, blockchain technology can unlock these properties all around.

Most importantly, the LYXF blockchain supplements the hyper-real lifestyle experiences of virtual reality worlds with a much-needed infrastructure for handling ownership. Addressing the current processes of dematerialization, this allows for real scarcity, accessibility, permanence, storage, display, and P2P-transferability of these new digital items that are used to clothe digital selves.

The continuing dissemination of personal avatars, digital collectibles and virtual representations is about to create a whole array of new economies in the socio-creative spaces. They are grounded on a modernized understanding of lifestyle consumption. In this contemporary environment, consumers hope that their belongings give them access to communities instead of just their ownership. They prefer their items to be unique instead of just exclusive, and personalized instead of just customized. Overall, they wish to buy into immersive experiences instead of just purchasing products.

TOKENIZATION:
Building Economic Communities

Lifestyle consumption has become a collective and reciprocal experience, where vibrant online communities of empowered consumers determine the choices that are being made by their peers. "In pursuit of 'likes' and building their own personal brand"[3], the increasingly young customers are ever less impressionable by the top-down dictate of designers and brands: before they commit, these consumers need social proof. Community influencers at all levels have gained power over purchasing decisions, whenever their voices are perceived as authentic and whenever they effectively engage with their followers through aesthetic and credible content. Consumers trust other people they can relate to, whether on a personal or inspirational level: "Creativity and commerce have merged with like-minded communities around the globe." (Highsnobiety, 2018: The New Luxury)[4]

The hierarchies and prerogatives of trendsetting in the lifestyle world have become much more equalized, i.e.: decentralized. LYXF acts as the digital base layer for this decentralized ecosystem. It supports lifestyle 'communitization' through tokenization, as all stakeholders in this reconfigured and rebalanced system can build their own custom tokens on the LYXF blockchain. Digital tokens can act as the connective medium for lifestyle communities: They make them valuable, participative, and inclusive. Tokens are a new form of signalling interest, status, belonging, and value on a global scale. Tokens are cultural currencies – they attach measurable and transferable value to all socio-creative activity and align economic incentives.

Tokenization is the process of converting different kind of rights into digital tokens on a blockchain. This could be for example the ownership of real-world and digital assets, permissions for special access, or the participation in votes. Tokens give the ability to make such rights fungible, shareable, and transferable, while at the same time they are highly versatile and customisable.

At their core, tokens are pieces of data that stand in for any valuable and more abstract bit of information. The range of their application is only bound by the imagination of their creators. Digital tokens can represent any form of asset, be it a monetary value, the promise for a product in a crowdfunding process, a ticket to an event, or the access to all sorts of services. Around the ownership of such tokens, vibrant communities can form, where real value can freely flow between all participants. The decentralized architecture of the LYXF blockchain guarantees that the ownership information of lifestyle tokens remains verifiable, immutable, and secure.

The customizability of tokens means that creators are free to decide upon their functionality, overall supply, target recipients, name, and branding. What all tokens have in common is that ultimately, they represent more than just some bits of information. They capture scarce bits of value that can be created, transferred, and stored. As token transactions run through the decentralized LYXF network, they are trustless, work on marginal costs, and do not require intermediaries for their processing. This fosters new forms of unmediated interactions within the space in a safe and tamper-proof environment. Instead of exchanging messages with their communities, lifestyle communities can use tokens to exchange real value in a directed and open fashion.

Tokens can be conceptualized as a new form of value. They follow the basic features of money, acting as a medium of exchange, unit of account, and store of value. Additionally, they can grant their owners all sorts of voting rights. Due to the flexible design of token economies, these functions can be tailored to the specific purpose they shall serve. Tokens can then be used as a means to crowd-fund creative work, either in an open offering or with a defined set of chosen participants. They can be used to perform payments at newly defined touchpoints and in any volume, from larger one-

"Everything is now a community. I think that's the biggest thing that changed. It's not a brand dictating to the community what's cool anymore. Nowadays it's much more about being able to under-stand what bubbles up from the com-munity and being able to take that and turn it into something you can stand behind and own."

(David Fischer, LYXF Advisor, Founder & CEO of Highsnobiety, QZ)

time transactions down to automated micro-transactions. At all levels, tokens can stimulate the lifestyle ecosystem by allowing value to flow freely within the space.

Community building through tokenization unfolds most powerfully when we move beyond these intuitive applications. In many ways, token economies can be used to strengthen customer experiences, commitments, and relationships. Through their accessibility, security, and transparency, lifestyle communities can apply their tokens to participate in mass-crowd voting. With their newfound decision power, customers can become collaborators and co-creators with their designers. Brands can use tokens to engage their customers gamification by applying competitive challenges, nudging, and financial incentivization. For example, tokens can give exclusive access and permit priority purchasing, signal special status and express visible membership, become valuable collectibles and convey future trends.

To make these processes more tangible, we will explore the applicability of tokenization from the perspective of the three arguably most powerful stakeholders in the lifestyle ecosystem: brands, influencers, and consumers.

(01) BRANDS

Established brands may tokenize specific products, upcoming collections, or their entire corporation, and thereby transform their business into a dynamic economic ecosystem. They may issue tokens for as many individual purposes as they deem useful. For all of their own tokens, they pick their name, curate their branding, decide upon their overall supply, select target recipients, and set the rules of the game. Token economies can foster deeper connections with empowered customers on an individual level and give new levels of access to communities on a collective level. They make trends comprehensible and community dynamics measurable: the value of scarce tokens is determined by the market, which gives immediate insights into the desirability of the underlying asset they represent.

Beyond tokenizing their own services, products, and collections, brands can also benefit from tokens as they can aggregate the marketing power of micro- and celebrity influencers. They can set up rule-based systems that incentivize and reward the spreading of specific content across different platforms.

(02) INFLUENCERS

Influencer marketing on social media platforms has exploded over the past few years, as global brands recognize the importance and positive ROI that influencers can bring to the table. In 2018, the average influencer marketing campaign earned $6.5 for every dollar spent[5]. Despite this growth, influencer marketing is still a new frontier for most brands. From micro-influencers with modest reach up to celebrity influencers with a followership in the millions, Instagram is today the most important playground. Here, they can cater to the unprecedented interactivity and speed that the lifestyle world has taken on for its increasingly young consumers:

"Underlying the hashtags, mentions, witty captions, DM-sliding and carefully curated grids of young luxury consumers living their best lives on social media is a layer of FOMO and appreciation for the ephemera of the moment." (Highsnobiety 2018: 16)

On Instagram, three-quarters of influencers fall into the 18 to 34 age range, with those aged 18 to 24 accounting for 42 percent of them[6]. The marketplace is young in general, leaving a generational gap between traditional companies. LYXF now a llows influencers to tokenize themselves. T his allows them to engage directly and on a monetary basis with their followers. We are going to address both aspects in the following.

Direct communication and transaction channels between influencers and their followers are based on an unprecedented affordance of blockchain's decentralized architecture. For influencer markets, this has two key advantages.

First, influencers become independent of singular platforms. Even though the main online platforms of social media are common folklore today, the landscape of centralised services will change in the future just as it always has in its young history. Influencers are now resilient to these changes: they can build sustainable and genuine connections with their followers, without being bound to the politics, network effects, switching and opportunity costs of individual social network services. By integrating metrics into all different platforms, they mediate the relationships of an influencer effectively, but they no longer act as indispensable middlemen.

Second, influencers become equally independent of centralized booking systems by using LYXF as a decentralized influencer-marketing platform. Booking agencies have come with significant inefficiencies the influencer economies. Not only do they charge substan-tial commissions, but they often manoeuvre their influencer clients into the cross-hairs of extensive contracts. Particularly for aspiring and smaller influencers, this comes with un-justified information asymmetries. At the same time, influencer contracts can be equally complicated for the ordering brands, especially in continuing relationships when influence can fluctuate, or when different markets and jurisdictions are involved. When the parties in an influencer engagement setting up smart contracts on the LYXF blockchain and use their native tokens for transactions, conditions can be defined, transaction automated, and metrics incorporated. For example, the payout to an influencer could be dynamically adjusted and directly dependent to the virality of a post with a branded item. It may be tied to the continuously fluctuating numbers of followers, comments, likes, or shares. All of these interactions are trustless, work on marginal costs, and do not require intermediaries for their processing.

(03) CONSUMERS

Finally, tokens can be used to reward and incentivise consumers for their digital activities. Beyond a merely reputational gain, followers who engage in all sorts of cultural conversations can be remunerated with real and scarce value. When the right mediating systems and branding strategies are in place, the ownership of branded and universally transferable tokens can be a powerful means for their holders to signal their status, express their identities, and take on an active participation. As such, token economies can stimulate some of the most integral parts of dynamic collective systems – they really are a catalyst of lifestyle "communitization".

As a result, we will see an abundance of specific brand tokens, personal tokens, influencer tokens, and event tokens powering the new creative economies. By tokenizing their communities, creatives can transform their businesses into dynamic economic ecosystems, use the bottom-up creative power of their consumers, gain individual access to their followers, and capture evolving trends in real-time.
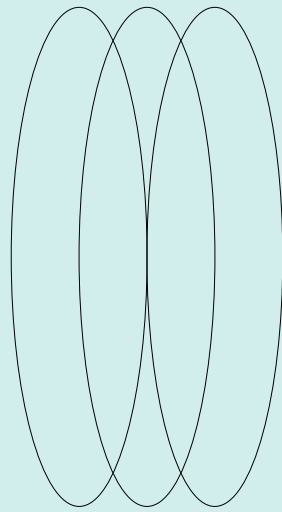
TRINITY

***

We have now come to understand LYXF's guiding principles: identification, virtualization, and tokenization. They allow us to further connect and integrate physical and digital product dimensions, to strengthen individual experiences with and around them, and to build strongly relational communities. It has become clear that the trinity of these components is leading the way into the future of diverse lifestyle economies. As a holistic approach, this allows information, value, and ownership to flow freely within and between each component. By providing these three basic building blocks for innovation, LYXF is leaning for-w ard, helping creative professionals to design new features of the modern lifestyle system, a nd leading the way toward this end.
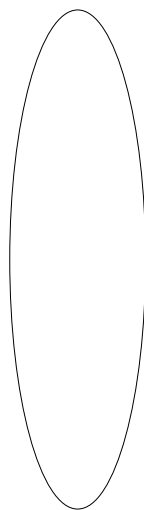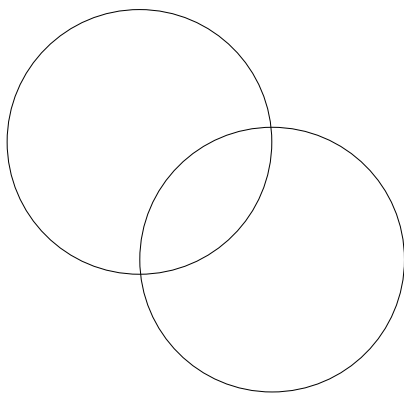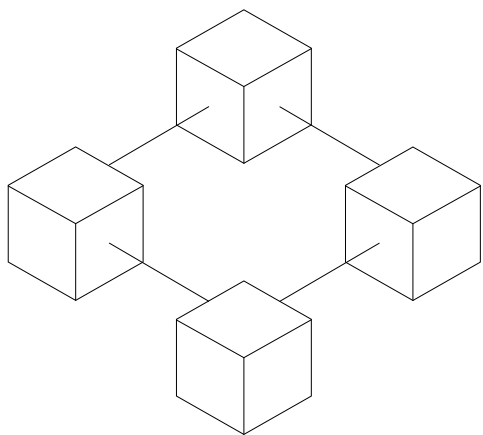
Kick-starting
The Ecosystem

33-41

TECHNOLOGY FOR DISTRIBUTED AND DECENTRALIZED OWNERSHIP OF FUTURE ASSETS.

THE DIGITAL LIFESTYLE ECOSYSTEM NEEDS A BASE

We have come to understand the overarching dynamics that will be shaping the new creative economies: identification, virtualization, and tokenization. As key principles, they are directly feeding into the setup of LYXF, which will make it easy for anyone to realize them for their own projects. To push this digital ecosystem off the ground, a set of initial applications and standards will be set in place by the LYXF project. They are the funda-mental pieces that give both creators and consumers access to the future creative econo-mies as they are envisioned throughout this blueprint.

The digital lifestyle ecosystem needs a base technology for distributed and decentral-ized ownership of future assets. The LYXF blockchain is a programmable, smart contract based system, which fulfills this need. Anybody may use it to build their own applications on top.

The LYXF project is providing the following key elements to the creative community as an initial effort to kick-start the digital lifestyle ecosystem.

***

The LYXF **blockchain is the funda-mental layer to enable all of the other applications and the decentralized economy as a whole. It is a programmable block-chain, which allows anybody to build val-ue-based systems and to interact with each other independently from any single third party.**

Universal user profiles are block-chain-based user and company profiles, enabled by smart contracts and advanced cryptography. They allow for universal logins, where one individual profile can be used for many different applications and platforms, and will make username and password systems a thing of the past.

LYXF **NFC tags are hardware NFC chips and represent the fundamental pieces to link physical objects to block-chain-based objects, which can be owned and transferred between different own-ers. These NFC tags are cryptographically secured, able to sign a challenge using an ECDSA[7] signature, and therefore allow to prove uniqueness and authenticity. These chips can be used by brands to make their physical products identifiable.**

Blockchain registration will enable brands to register their items on the LYXF **blockchain in order to make them digi-tally ownable. This application will also al-low them to interact with their customers in an unprecedented and anonymous, but direct, fashion.**

The Digital Closet and Wallet will allow any customer to hold and transfer physi-cal and digital lifestyle products that are LYXF **blockchain-enabled and simultane-ously function as a wallet for the digital token economy.**

The Token generator allows any brand, designer, artist, influencer, or private per-son to create their own custom-built to-kens and to spread them between their followers to enable a tokenized communi-ty. Those tokens can be transferred freely between anybody and given as rewards or used as payment within the personal token ecosystem.

From different combinations of these ele-ments, an infinite number of applications for the modern lifestyle systems will follow logi-cally. In the following chapter, we will explore some of these use cases, which creators and developers may realize, re-interpret and refine according to their own understanding of the new creative economies.
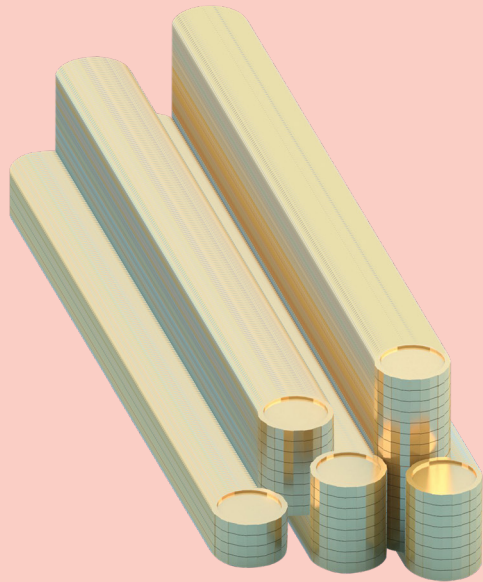
Use Cases

This chapter will present a limited number of the infinite applications that can be designed and deployed on top of the LYXF network. The blockchain-based sy stems presented here are meant merely as a selec-tio n of examples to ignite the imagination of creative pr ofessionals. Following the principle of platform con-ti ngency, they are by no means exhaustive. While each a pplication works on its own, they can be combined a nd entangled to harness their mutual synergies.

The LYXF Blockchain Foundationwill help build some of the first applications that will be presented in the following as initial and illustrative showcases. Being an ecosystem facilitator much more than a digital service provider, the Foundationsfunction is mainly focused on building the initial LYXF network and coordinating an appropriate standardization across the community-owned blockchain ecosystem. Only if the space agrees on its standard denominations and procedures can one assure that its applications remain interoperable and its technological platform remains an open playground for experimentation. How creators make use of this playground is then only bound by their ingenuity.

We will kick off this chapter with an outline of the exemplary LYXF use cases that will be explored in its re mainder. As we go deeper into individual applica-ti ons, we will refer back to their relationships between L YXF's three guiding principles and embed them into th e much broader trends and overarching dynamics th at are shaping the current creative system.

(01)

FUND: DESIGNER ICOS

Creative professionals are able to tap an alternative source of funding for their projects by offering customized tokens on the LYXF network to specific crowds of investors, who can in turn allocate their funds to the projects they wish to support.

(04)

OWN: PHYSICAL COLLECTIBLES

By establishing digital identities for physical products, creators can enable their digital ownership, continuously gather their unique and singular data history, and have lasting and direct access to their owners. The newfound knowledge about a product redefines its unique value.

(02)

TRACE: PROVENANCE

With mindful consumerism and ethical living on the rise, producers can use LYXF's decentralized record of provenance to increase the overall transparency of their practices and to capture the unique stories of their individual products.

(05)

OWN: DIGITAL COLLECTIBLES

The LYXF blockchain supplements the hyper-real virtual fashion experiences of digital-only lifestyle capsules with a much needed infrastructure for handling ownership. It allows for real scarcity, accessibility, P2P-transferability, storage, display, and permanence of these new items that are used to clothe digital selves.

(03)

MANAGE: SMART IP RIGHTS

Creators can incorporate "smart IP rights" into their physical, digital, and virtual works. They facilitate provenance authentication and anti-counterfeiting; IP transactions; IP right audits; digital rights management and IP clearing.

(06)

COLLECT: DIGITAL CLOSET

The creation of unique digital ownership opens up a new world of collecting and representing virtual creations. Owners of digital fashion items can organize, explore, and present their collections of digital collectibles in LYXF's virtual libraries, which are the in-te rfaces to digital ownership in the lifestyle arena.

(09)

TRADE: DECENTRALIZED MARKETS

LYXF allows to manage, authenticate, identify, transfer and pay for items in decentralized secondary lifestyle economies. Having safe access to unique physical and digital products en-ables the community to bring quality craftsmanship in continu-ous circularity.

(07)

PARTICIPATE: GAMIFICATION

By creating rule sets and by tokenizing activities on the LYXF blockchain, lifestyle brands can become 'experience agencies' that engage their customers in playful competitions, make products into collectibles, and strengthen authentic IRL interactions.

(10)

CO-CREATE: CUSTOMER ENGAGEMENT

LYXF provides the interaction layer to foster co-creation and p eer-production in the lifestyle world. Brands can turn their e mpowered consumers into participants of the cultural conver-s ation and use their bottom-up input via direct forms of com-munity access.

(08)

SHARE: RENTAL SERVICE

With LYXF, both professional services and private owners can set up peer-to-peer sharing economies that bring liquid ownership and collective consumption to the lifestyle community and scale the ex-change that characterizes the prognosticated "end of ownership".

FUND: Designer ICOs

Creative professionals are able to tap an alternative source of funding for their projects by offering customized tokens on the LYXF network to specific crowds of investors, who can in turn allocate their funds to the projects they wish to support.

Offering customized tokens to specific crowds of lifestyle communities is a game-changing approach to funding creative works that can be used by aspiring creators and established brands alike. With a constant influx of hundreds of new designers competing for attention each year, it has become increasingly difficult for new talent to get noticed[8]. For emerging professionals, token offerings can be the means by which they realize their collections. This ensures that the creative arena can be bolstered by a constant influx of ambitious, new, and independent brands. For larger lifestyle houses, competition for the attention of modern consumers who have less and less loyalty to specific brands has equally increased[9]. [For an explanation of tokens and token economies, please refer back to the section on Key Principles: Tokenization]

For all creators, issuing their own branded tokens can be a powerful means for self-promotion and bolster their efforts from the bottom-up. They are free to conduct their own Initial Coin Offering (ICO) on top of LYXF's blockchain without any entry barrier – after all, it is a decentralized architecture that is owned by the community of creatives themselves. The setup of LYXF's network is entirely transparent and verifiable. This ensures that throughout the ICO process, all participants are protected by the security of smart contracts, which are self-enforcing, flexible in the way they can be programmed, yet binding and immutable. Tokens can be customized in terms of their name, branding, supply, and functionality. They may be offered to the general public or to a selected group of investors.

An ICO is the process of digitizing – or tokenizing – an asset and of making it publicly available via the Internet. This asset can represent anything of value, including a share of a physical commodity, project, or an entire company. By way of the ICO, digital tokens are created to represent this asset. This gives the issuer the flexibility to structure a token as a piece that has face value but that can also be seen as an asset class in its own. Tokens can be used as a medium of exchange to redeem for goods and services. They are scarce, fungible, and transferable pieces of value.

ICOs have recently proven to be an effective alternative funding method, especially for the support of early stage technology projects. LYXF now introduces them to the creative sector, along with all of their singular features. They work on an open listing process with marginal costs, freed from the need to conduct cumbersome roadshows. They are highly inclusive, discouraging the tendency for a single investor to dominate. They enable participation with granular stakes, forging a strong instrument for private investors: to assess sprouting ideas, capture real value, and secure participatory rights.

ICOs are different from conventional crowdfunding models. They are more efficient, as their automated processes and decentralized organization makes them independent of platform providers. They are more accessible and unlock access to global capital, unrestrained from a determined region or country, unrestricted to a determined region or country. Most of all, they come with more attractive rewards. The tokens that participants receive in return for their contributions contain more than acknowledgement – they may be associated with any type of particular privileges, such as special access, dividends, or voting rights.

Sourcing from the crowds in such a way then implies that collective efforts can merged, democratic processes reinforced, and creative freedoms retained. In the aftermath of a token crowdfund, issuers also have unprecedented access to their investor community, with which they can interact and transact continuously. This represents a progressive alternative to the former financing schemes in the lifestyle investment arena. Creators will not need to expend their resources in the competition for increasingly scarce angel and seed venture capital. They can focus on refining their products, serving their market, and driving innovation in the creative arena. When brands or designers release tokens instead of shares to raise capital, they retain independence and power over their work, while creating a direct connection to their invested community.
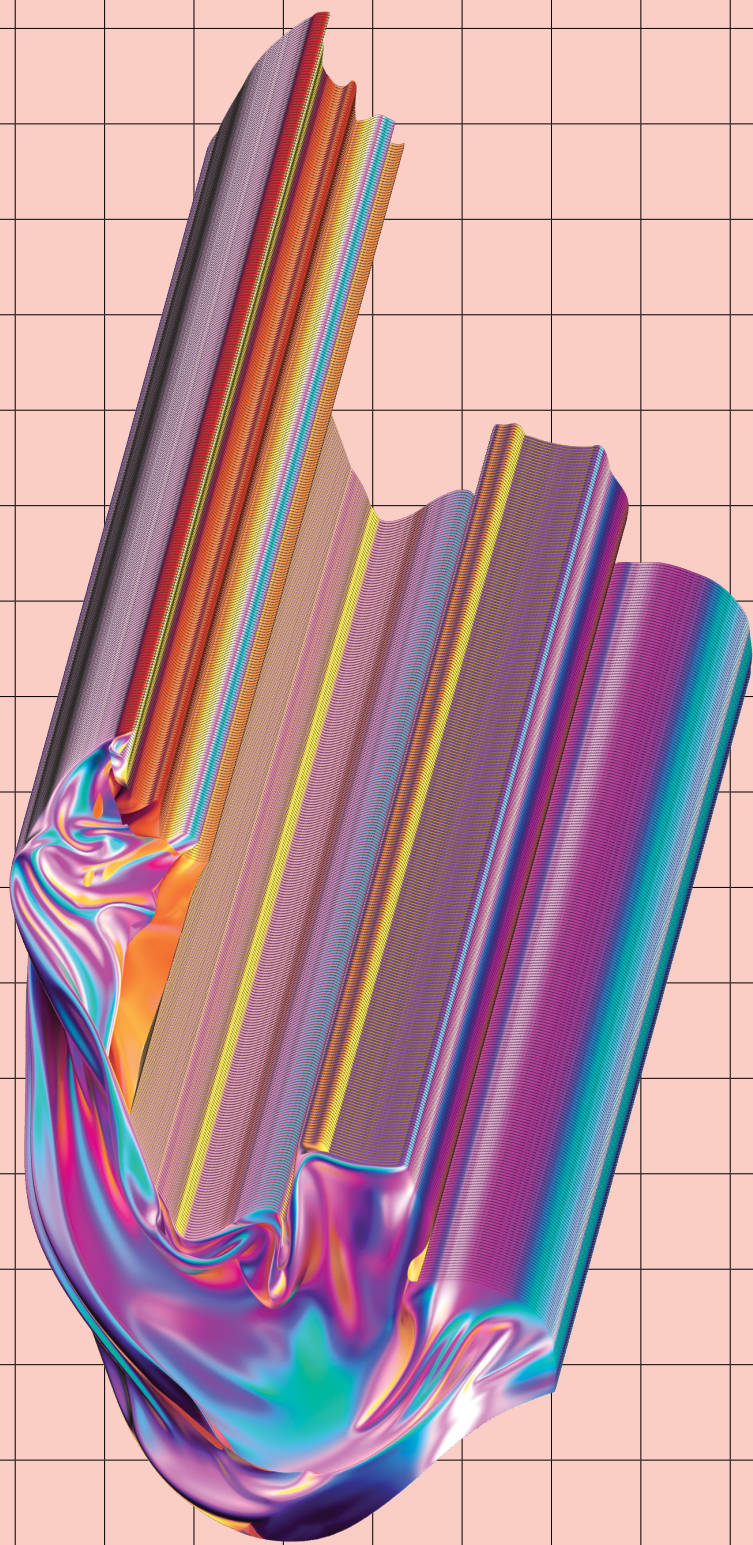
TRACE: Provenance

With mindful consumerism and ethical living on the rise, producers can use LYXF's de–centralized record of provenance to increase the overall transparency of their practices and to capture the unique stories of their individ–ual products.

Rising questions about the 'Why behind the Buy' define a pivotal moment in contemporary lifestyle culture[10]. They mark a rallying call by modern consumers, who have become increasingly empowered, young, and distrustful. They demand to look beyond the label of the products they purchase, and make sure that they are authentic and do justice to their money's worth. While pioneering producers have long realized the competitive advantage of open supply chains and sustainable manufacturing, the desires for value-based and purpose-driven consumption are now structurally reflected in lifestyle consumption choices.

"Radical transparency" has become a basic requirement rather than a unique selling point for lifestyle brands. As McKinsey and the Business of Fashion found in a recent report on the matter: "companies must come to terms with the fact that a more distrusting consumer expects full transparency across the value chain."[11]. This is part of the upwelling principle of "ethical living", which Euromonitor International's team of economic, consumer, and luxury industry experts identified as one of the most influential megatrends defining the state of the space[12].

The millennial and GenZ generations have played a particularly decisive role in this development. In its 2018 report on the State of Fashion, McKinsey concluded that these consumer cohorts "base more of their purchasing decisions on whether a company's practices and mission align with their values"[13]. When the influential streetwear blog Highsnobiety surveyed over 7,000 millennial consumers around the world to learn about their definitions of the "New Luxury" in 2018, brand authenticity and the alignment of personal values stood out across the board. More than half of their readers have ditched brands they believed to operate in ways that contradicted with their personal values. On the other hand, 65 percent of them have been influenced by their friends to buy brands that speak to their shared values; 87 percent were willing to spend more on a brand that supports causes in which they believed[14].

As a consequence, "mindful luxury" is being integrated into the mainstream, replacing the conspicuous consumption of the past. When Benjamin Herzberg of the World Bank Institute proclaimed that "transparency is the new power,"[15] he campaigned for more open approaches to product traceability and corporate accountability. While centralized systems have not been capable of powering trustworthy transparency, blockchain technology is the ideal infrastructure for companies to realize these ambitions. It allows their customers to make positive choices about their consumption and to discover an abundance of verified information about the products they want.

Product provenance on the blockchain is made possible by a set of its native design principles:

Transparency: Blockchains are public records of information. By design, every historical transaction along a supply chain on the blockchain is fully auditable by anyone without special permission, which provides an unparalleled level of accountability and transparency.

Privacy: When personal information is stored on decentralized systems and referenced on blockchains instead of given directly to private corporations, control is with the user, as off-chain systems can clearly define an access control. This can allow only specific parties to access data temporarily. In a transparent fashion, this can safeguard the privacy of consumers, who then have granular control over who can access which bits of information and for how long.

Resilience: The integrity and availability of the data that a blockchain contains is not reliant on any single party as it stores information in a distributed fashion. It does not have a single point of failure, which makes it resilient, self-healing, and an inherently secure data memory.

Interoperability: As an open 'meta-layer' of data, blockchains make it possible to synchronize and harmonize the different forms of interaction with a digital item. Based on standards, they allow all kinds of third-party applications and protocols to interact and work with such items. This creates a whole new space of possibilities around those items that the original creators do not need to be able to anticipate in the first place.

Efficiency: The way that data on blockchains are handled can be automated through the use of smart contracts, which can be programmed to trigger events automatically when certain conditions are met. This enables an efficient sharing of information, minimizes costs, and improves operational efficiencies.

<div align="center">***</div>

By bringing together all of these features in its system, the LYXF blockchain can provide comprehensive product provenance information that is tailored to the needs of lifestyle brands. It acts as a chronological 'chain of custody' that can capture and contextualize the individual stories of all products: the sourcing of their materials, the procedures of their production, the transfers of their ownership, and their journeys across the world. Implementing supply chain certification on the LYXF network r emoves opacity and doubt. It gives buyers the evidence that a lifestyle object has not been altered, forged, reproduced, or stolen. It connects information to things – in store, on pack, and online.

The tracing and tracking on the LYXF blockchain brings a digital dimension to lifestyle products, which reinforces a genuine connection between the companies who create them and the people who consume them. On the one hand, provenance transparency allows conscious consumers to fact check that the production of their desired products did not entail any negative externalities, such as environmental damage, animal abuse, or human slavery. On the other hand, it allows one to curate engaging stories and multimedia insights into the communities and processes that have contributed to the fabrication of an item. This newfound knowledge about lifestyle products can then – to use the words of Highsnobiety – become the source of a "New Luxury"[16] in its own right.
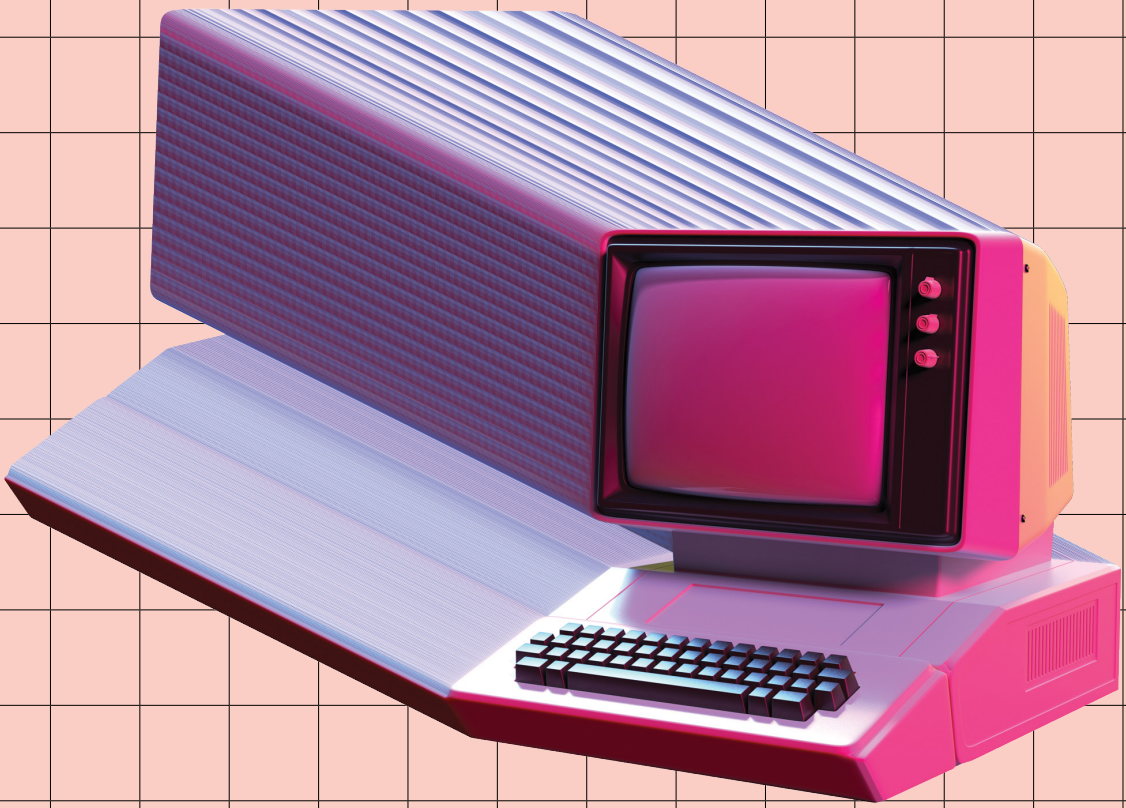
MANAGE: Smart IP Rights

51

Creators can incorporate "smart IP rights" into their physical, digital, and virtual works. They facilitate provenance authentication and anti-counterfeiting; IP transactions; IP right audits; digital rights management and IP clearing.

The inimitable Coco Chanel once proclaimed: "Fashion should slip out of your hands. The very idea of protecting the seasonal arts is childish. One should not bother to protect that which dies the minute it is born."[17]. The challenge of the blurred line between theft of an idea and celebratory homage has been as old as couture itself. Faced by the impossibility of eliminating all knock-offs, some designers claim to be flattered by the tacit acknowledgment that their work is worth copying. On the other hand, the problem of outright product copycats has always incurred hefty costs to producers and consumers. After all, also Coco Chanel fell back on legal measures to combat the theft of her designs. In the 1930s she joined fellow designers as a plaintiff in a landmark French lawsuit, trying to shut down a notorious design pirate[18].

The counterfeit challenge has led lifestyle brands to resort to a variety of measures throughout the history of lifestyle creation. In the early 1900s, couturiers such as Madeleine Vionnet used to mark branded labels with their own thumbprint[19]. In 1956, Balenciaga and Givenchy banned the press from viewing their collections for a month to prevent the circulation of pictures that could be used to sew copies[20]. Today, Hermès uses mouliné linen thread coated in beeswax for all the stitching on their handbags, which has a noticeably different appearance to synthetic threads[21]. The inclusion of difficult-to-remove hologram stickers with serial numbers has proven a popular tactic for brands, including Fendi, Dolce & Gabbana, Roberto Cavalli, Chanel, Canada Goose, Rolex, and Moncler[22]. Salvatore Ferragamo inserts microchips in the left sole of each pair of shoes it produces, as does Moncler in all of its products[23]. For most lifestyle houses, however, losing partial control over their brands through fakes on the market remains a structural problem that continues to grow.

This criminal infringement of trademarks and copyrights is today more than ever corroding and corrupting the shimmering lifestyle economies. It is fueled by the digitalization of communication, the electronization of commerce, and the globalization of trade. As a consequence, the spectrum of counterfeit and pirated goods in the lifestyle world is colossal. The 2018 Global Brand Counterfeiting Report estimated the losses due to counterfeiting of clothing, footwear, cosmetics, handbags, and watches at $98 billion annually and found this problem to be growing in scope and magnitude[24]. According to official EU statistics from 2017, the European lifestyle industries lose approximately 27.7 billion of revenues annually from counterfeit goods – an equivalent to nearly 10 percent of their total sales[25].

The World Intellectual Property Organization defines intellectual property as "creations of the mind: inventions, literary and artistic works, and symbols, names and images used in commerce"[26]. Today, infringement of these creations is so prolific in the lifestyle space that some luxury brands have parodied their own bootlegs on the catwalk. In reference to the replicas typically sold at tourist sites, Dolce & Gabbana showed a white tanktop that featured a purposely-misspelled 'Dolce & Gabbaba' on the chest[27]. Gucci sold branded sweaters that resembled poor counterfeits, featuring 'Guccy' on its front[28]. While such references have become iconic, they simultaneously convey a deep frustration about the difficulties in tackling the preservation of brand authenticity

.

So far, our considerations about copyright infringement in the lifestyle space have referred to the counterfeiting of physical goods. As we have analysed in the chapter on virtualization, however, the space is increasingly extending its realms towards the digital and virtual worlds. If we think back to Carling's purely digital capsule or to the rise of virtual influencers, these expansions are posing entirely new challenges to the preservation of intellectual property in the lifestyle arena. Already in 2014, the 'McAfee Report on the Global Cost of Cybercrime' estimated that IP-related fraud was responsible for around a quarter of all cybercrime activity[29].

The intangible nature of rights expressed as tangible items, virtual products, or momentary events has greatly challenged the law and its ability to protect the ephemeral nature of lifestyle. For both its physical and digital spheres, international cooperation, regulation, and enforcement have not been very effective in reducing the number of counterfeit goods in the lifestyle space. These institutions have been challenged by the huge increases in international freight and trade, the wide scope of available products, a stark lack of resources, and the faults and lack of transparency in producers' supply chains.

Applying blockchain technology to the context of intellectual property law and practice has introduced a number of distinct features that help to mitigate these challenges in unprecedented ways. In a nutshell, blockchain systems are strong enforcers of rights in many areas where the reach of contracting laws is practically limited. Blockchains supplement the reach of legal contracts with the functionalities of smart contracts, which are self-enforcing, flexible in the way they can be programmed, yet binding and immutable.

Smart contracts are highly effective for tracking and tracing in globalized trade. While any traditional law is enforced after a breach of contract has already happened, smart contracts operate automatically on those very terms that have been determined ex-ante. Talking about this new enforcement mechanism, prominent legal scholars concluded that "if parties want certainty, they can use a smart contract to ensure that a contractual condition is executed, forcing the parties to remain bound to their obligations"[30].

Recording IP rights in a distributed ledger, such as the LYXF blockchain, rather than a traditional database can effectively turn them into "smart IP rights". It provides an immutable record of events in the life of an individual product and its associated rights. For physical items, this is possible through the scannable and blockchain-connected tags of Digital Certificates, which we explained in the chapter on LYXF's approaches to digital ownership of physical goods [OWN: Physical Collectibles]. For digital works, this can be done by linking them to the LYXF network and hardcoding their rules and restrictions, dictating terms, contract stipulations, and real-world rights

STANDARDS

For both physical and digital works, this means that users can not only trace exactly where and when an unlawful reproduction or IP breach happened. They also have a pre-determined and automated means of contract enforcement and remuneration for the parties involved in the creative process. A ledger showing who owns what offers creators a potential reference point for the rights of creators and for the extent to which those rights are used within the market. This can be particularly helpful in those jurisdictions where proof of first or genuine use is required, or where the extent of use is crucial, such as in disputes or other proceedings involving recognition of well-known marks, or in defending a non-use revocation action.

In the following, we will outline some of use cases in the field of intellectual property rights that creators may design and deploy on the LYXF platform:

IP Registration: Uploading an original design or work and details of its designer or creator to the LYXF network will create a time-stamped record and solid evidence of genuine creatorship and/or first use. It resolves the practicalities of collating, storing, and providing such evidence.

IP Transactions: This record can simplify the due diligence exercises that are necessary for IP transactions, as for example in mergers and acquisitions.

Provenance Authentication and Anti-Counterfeiting: Along the entire value chain, all stakeholders, including consumers and customs authorities, are able to validate the authenticity of a product.

IP Right Audits: Comprehensive IP records make it easier for creators to conduct systematic reviews of the IP assets they have owned, used, or acquired.

Digital Rights Management and IP Clearing: Smart contracts can be programmed to establish enforce IP agreements, licenses, or exclusive distribution networks and allow the payments and royalties to be transferred to IP owners in real time.

Ultimately, the LYXF blockchain can be a powerful tool to restore trust between manufacturers and consumers, for both tangible and intangible pieces of creative work. In the process, it empowers all parties with more transparency, confidence, and choice.
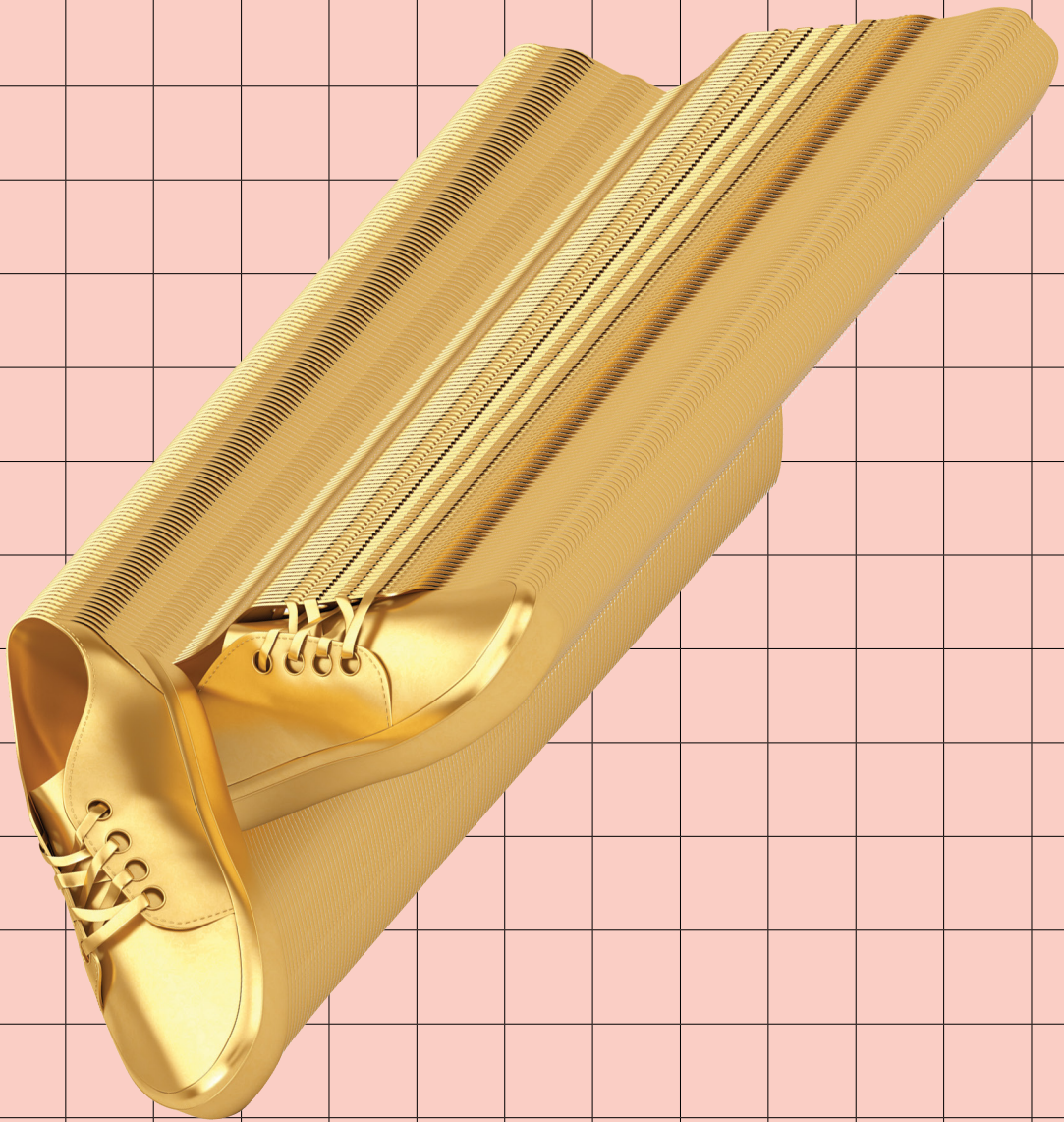
OWN: Physical Collectibles

By establishing digital identities for physical products, creators can enable their digital ownership, continuously gather their unique and singular data history, and have lasting and direct access to their owners. The new–found knowledge about a product redefines its unique value.

The material or practical functionality of a lifestyle good describes only a fraction of the value that it represents to its owner or on the markets. We are in a time where we know the price of everything, but the true value of hardly anything. The value of an individual lifestyle item goes beyond its association with a brand. Many factors can make a singular object valuable: when and by whom it was created; which materials were used for its production; which order in a batch of production it had; where it was presented and worn; who owned it before; and many other properties. In short, they describe an item's uniqueness, history, and scarcity. They are, however, sometimes fleeting, often hard to preserve and always hard to credibly demonstrate to the outside world.

LYXF introduces an additional and unprecedented –phygital– layer to the ownership of creative goods that can make these unique characteristics permanently visible. On the blockchain, each product can be linked to a corresponding record of data, where all information about it can be accrued over time. We call this a 'Digital Certificate'. It commonly describes a digital identity of a physical entity. By bridging the physical and the virtual world, data is transmitted seamlessly allowing the virtual entity to exist simultaneously with the physical entity[31]. We refer to the resulting extended ownership of a physical item with its connected Digital Certificate as a new form of 'Phygital Ownership'.

Giving a digital identity to a physical good does not only capture its authenticity, but also makes it truly unique. More than just a sort of 'DNA testing', this entails the permanent record and representation of an object's existential experience. It captures its constructed story, history, and character – its singular identity, which has accrued over time.

To connect with the empowered consumers of the modern lifestyle system, McKinsey and the Business of Fashion highlighted that "companies should think about how to offer products and experiences that are perceived as unique."[32]. By adding digital identities and new layers of meaning to these products, we also refine their desirability and value. They open up whole new categories of experiencing the ownership of a lifestyle good and the brand it is associated with.

Highsnobiety found that only 6 percent of their readers stated that they purchase products as a direct expression of wealth. This means that the value of a luxury item is today less than ever defined by its price. Instead, "new luxury characteristics related to knowledge consistently score higher than reductive notions of cost". In fact, more than a quarter of Highsnobiety's readers are willing to spend more on an item if it has a history to it (28%), and more than a third if it is a limited edition (37%)[33].

Real uniqueness has then become an important factor for lifestyle consumers to consider an item as truly luxurious: "In pursuit of 'likes' and building their own personal brands, they seek one-of-a-kind items"[34]. It is key in the new lifestyle arena, where it "isn't just about what you wear, but also what you know"[35], and where participants seek idiosyncrasy over brand-attachment. In this sense, lifestyle consumption is moving "from belonging to being"[36]. Richard, Liu, founder and CEO of the gigantic Chinese e-commerce platform JD.com stated in the Business of Fashion: "No one wants to take a bag and put it on a table when a lot of ladies have the same bag with the same style. They want to find something special. Something you cannot find in your circle."[37].

In this sense, digital ownership gives products the futuristic depth and the interactive memory about their properties and past, which makes them truly one-of-a-kind. The entire history of an item can now be linked together, doubtlessly verified, and digitally accessed. It conveys the specific moment each product represents in the history of its owner, a brand, or the entire lifestyle community. Owners can then express themselves through their lifestyle choices also in ways that capture these unique properties of their pieces explicitly.

Is has become clear that creating digital identities for lifestyle items on the LYXF network increases their inherent value. The digital scarcity of truly one-of-a-kind products will then also alter the nature of their physical scarcity world. The uniqueness of objects can not only be owned and made visible, but also transferred through the LYXF blockchain. However, the real perks of digital ownership are wide-ranging participation opportunities for consumers and direct accessibility to them for creators.

For consumers, digital ownership can unlock a vast range of immaterial benefits. Based on a large-scale survey of their relatively young readership, Highsnobiety stated: "We get it: Millennials and their

younger Gen Z cousins prefer experiences over material goods"[38]. In this context, they gave an incisive example in their 2018 whitepaper:

"Big ticket items and recognizable logos are membership badges for a global style cognoscenti. Consider the "souvenir shirts" Louis Vuitton provided attendees of Virgil Abloh's inaugural menswear show. These T-shirts could very well cost less than $10 to make. But in the right context, they are priceless (as evidenced by their $600+ price tag on peer-to-peer luxury resale platform Grailed at time of writing). "Been there, done that, got the T-shirt" has been simplified to "got the T-shirt." It's become representative of the groundbreaking event and its historical significance, and owning it is almost as good as actually attending." (Highsnobiety 2018: 16)

In this new understanding of lifestyle ownership, the physical object can then mostly be considered a symbol of membership. In this example, the connection of these t-shirts to the one-time show of Virgil Abloh is what makes them unique. This historical relationship has become a property that is inherent and transferrable. With the phygital ownership enabled by LYXF, the r ange of properties and benefits that can be credibly attached to an item is extended widely. For example, brands could equip every one of their items that have been taken along to their events with certain statuses. They could send their customers on journeys around the world to visit their stores, inscribe these visits into the digital identity of the products taken along and reward their trips with any kind of benefit – just like airlines do with their miles programs[39]. As such properties are, in some way, inextricably linked to, or 'owned' by the item itself, they have also become a critical part of its digital ownership. They. When it is sold, these historical characters are now a part of the deal.

For creators, digital ownership of their items gives unparalleled access to their individual customers and enhance customer insights about their consumer base. If a customer opts in, brands can communicate with an individual that connects to her or him directly. It is the garments themselves which can now speak to their owners similarly to the way that brands use to communicate with them via social media. However, it also represents a crucial next step in the curation of consumer journeys through communications: from the surface level up to an immediate engagement. Communication here means that they can not only send tailored information but can also transfer real value [Key Principle: Tokenization].

This type of personalized, curated point of reference connects to empowered consumers and their "demand for more unconventional and signature items, and for products with (...) exclusivity and authentic and engaging stories"[40], as McKinsey explained. In this spirit, digital ownership allows designers tell the story behind each product, create a seamless experience of their brands, and invite their customers to express their personal authenticity through a deeper level of individuality. As CEO of American luxury company Coach, Victor Luis, asserted:

"For me, product is everything; everything starts there and then it's [about] how you actually build emotion in storytelling around that, because, if it's just about the function, you literally don't win. At the end of the day that takes time. It takes consistency. Build a relationship between a brand and a consumer. The short-term stuff will come and go." (Victor Luis, 2018)[41]

On a structural level, the ability access to individual owners of their products also enhances the insights that brands can get on their consumer base. Phygital ownership allows to track the lifecycle of physical objects. They can make visible the context in which an item is worn or shown, how often it gets sold on the second-hand market and how its value changes over time. Such information is not readily accessible today, yet it is important for brands to better understand the interactions and needs of their consumers and to be more focused in the development of future products and services. McKinsey and the Business of Fashion found that as consumers "value coalescence around authenticity and individuality, brands will value data even more to tailor recommendations, engage influencers and personalise experiences"[42]. In the medium term, widespread adoption of phygital ownership may then have a trickle-down effect also on what is being created.

"Big ticket items and recognizable lo-
gos are membership badges for a global
style cognoscenti. Consider the "sou-
venir shirts" Louis Vuitton provided
attendees of Virgil Abloh's inaugural
menswear show. These T-shirts could
very well cost less than $10 to make.
But in the right context, they are price-
less (as evidenced by their $600+ price
tag on peer-to-peer luxury resale plat-
form Grailed at time of writing). "Been
there, done that, got the T-shirt" has
been simplified to "got the T-shirt." It's
become representative of the ground-
breaking event and its historical signifi-
cance, and owning it is almost as good
as actually attending."

(Highsnobiety, The New Luxury)

In the remainder of this chapter, we will describe the practical process of creating phygital ownership for lifestyle items in the digital LYXF ecosystem.

PHYGITAL OWNERSHIP:

A PRACTICAL PRIMER

For physical lifestyle products, fashion garments, and design objects, identification can today be achieved by attaching chips that can link to their unique identities. Through a combination of IoT-hardware and innovative software, LYXF has come up with a way to achieve this identifica-tion and connect the physical and digital spheres of an item seamlessly. In the following, we will first explain the hardware components that help to safeguard unique identities and then walk through the process of creating a digital data record for a physical item.

By attaching passive RFID chips to products that can be synchronized with the tamper-proof LYXF blockchain, users can generate and access models of items that connect the dots between their physical and digital lives. We have already described how this process can give buyers and owners absolute certainty about the originality of lifestyle items.

HARDWARE: PASSIVE NFC-CHIPS

We achieve unique authentication through passive NFC chips that are implanted or sewn into products[43]. 'Near Field Communication' (NFC) enables two devices, one of which could be a portable smartphone, to establish contactless communication. NFC is an offshoot of the family of Radio-Frequency Identification (RFID) technologies. RFID uses radio signals, or electromagnetic fields, to automatically identify and track tags attached to objects. RFID is widely used for smart labelling systems all over the world – for example, we often use RFID cards to pay for public transportation. NFC is a specialized subset technology within RFID, where devices have to be brought within close proximity of each other. It is designed to be a secure form of data exchange that caters to the sort of communi-cation that we need to retrieve unique, and thus often confidential, information.

The NFC tags we use are passive, meaning they have no own power source, but receive power from the device that reads or interacts with them. For example, the NFC tag attached to a designer bag contains unique data that can authenticate itself to an NFC reader, such as a smartphone. The chip does not record information about the product it is attached to and contains no information about its owner. Rather, it merely includes a private key that is used to sign authentication messages. This is a concept from cryptography, where we speak about a unique 'public and private key pair'. The private key is also known as the 'secret key', which only the device itself knows, and which is stored securely. It is the secure and unique element that can authenticate itself by signing any message that is being sent to it, returning a unique ID. This prevents the chip from being cloned – unlike a QR-code that could be easily copied. The identifiers coming from NFC-chips then provide items with their 'genetic code'. Like a singular 'DNA', this fosters a unique and digital identity.

For this reason, an increasing number of producers in the fashion and lifestyle segments are currently working on chip-based authentication. LYXF offers its own NFC-chips to the community that creators may use. However, creators are not bound to our version and can easily use the hardware they might already have in place. The LYXF blockchain naturally does not depend on one specific chip. The functionality is merely a matter of standards, such as AES cryptographic authentication[44]. Provided that a tag is NFC- or Bluetooth-readable and authenticates itself by returning a unique ID, it can be linked to the LUSKO network. As long as the chip cannot be forged, it is secure.

SOFTWARE: LINK TO THE

LYXF NETWORK

Apart from its unique key pair, the chip on a product itself does not accrue or store any additional information. Rather, all data with regard to the product is continually secured on the decentralized LYXF block-chain, where the user's phone communi-cates between both entities. While chip-based authentication for high-end goods will be common for many producers, the unique ways in which related data is linked,

transferred, and secured on the LYXF net-work makes all the difference.

Today, only the combination of NFC-tags with blockchain technology can achieve secure authentication, permanent data compilation, and interoperability at the same time. When we picture the unique code on an implanted chip as the genetic code of the product to which it is attached, blockchain technology then allows us to continuously conduct corresponding and continuous DNA testing. In this sense, one could argue that blockchains are capable of imitating the accuracy of the DNA pattern recognition system.

This is due to the unique properties of blockchain technology and the way identities can be created with it. Blockchains give the opportunity to collectively verify the authenticity of a product without giving away other pertinent information that may be sensitive. When personal information is stored on decentralized systems it is not stored directly, but only referenced on a blockchain. This gives control to the user by storing data in off-chain systems that can clearly define access control and allow only certain parties to access data.

We can think of this architecture as a meta layer for data structures – it is interoperable, because the item's core data structure is standardized and can be interacted with. It can reference other data sets, which can either be stored in decentralized systems, such as SWARM[45], or IPFS[46], or in traditional databases with proper access rights if the user so desires.

One can link any arbitrary piece of information related to the history of a product on these decentralized networks. This could include data about its provenance, such as specific producers, materials, or its order in a batch of production. It could also be details about its warranties, insurances, or repairs. Alternatively, data might represent more informal records, such as anonymous current and previous owners, check-ins at events, or attached social media badges.

The revelation of these and other linkable bits of knowledge are under the control of the individual user. The decentralized LYXF architecture is resilient against hacking, as one would have to hack the systems of literally every participant in the network simultaneously: every node holds the record, which is continuously verified against the records of the rest of the network. Due to the nature of the data linking, users are able to either keep records private or deliberately share information about their belongings with any peers or with the general public.

Public blockchain systems work on the principle of pseudonymity: product IDs are not tied directly to personal data of their owners, but expressed by generic combinations of numbers. Ownership can be kept confidential by using different addresses or profiles for different products. A private product collector may prefer to retain confidential data and only use the further affordances of digital ownership, some of which will be described in the chapter on LYXF use cases. A public figure, such as a lifestyle influencer, may wish to use their profiles to credibly demonstrate parts or the whole spectrum of their personal lifestyle collection.

All functionalities of this system, including the choices of revealing ownership, are easily accessible through intuitive user interfaces. While participants do not need to understand the inner workings of these technicalities, smooth user experiences are safeguarded by apps on their smartphones. To make the processes around digital ownership for products more tangible, we will now walk through the individual steps of establishing phygital ownership with the LYXF network.

PRODUCT — REGISTRY — CONFIGURA- — SALE — CUSTOMER ACCOUNT — CLAIM — USE
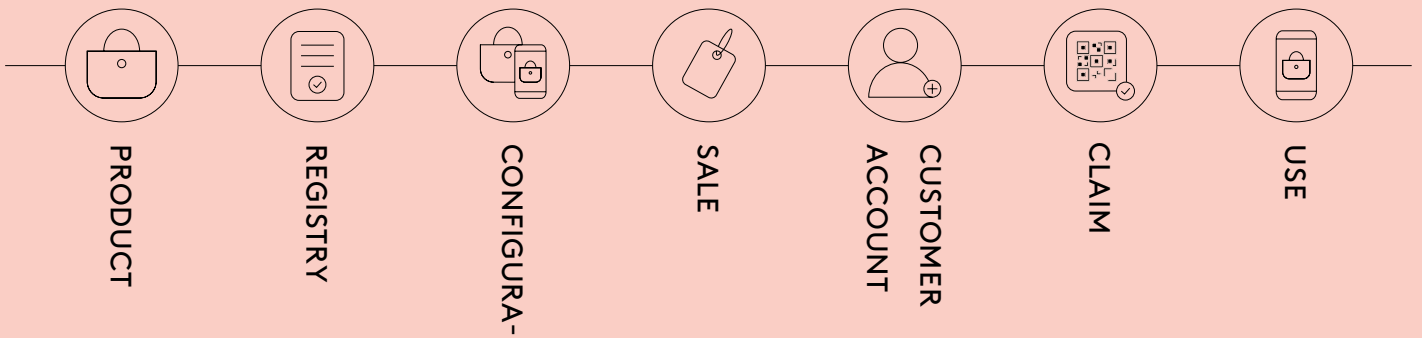
(01)

Digital Certificates can serve as interactive memories with a futuristic depth. Naturally, digital ownership come with the ability to show and know if products are real and where they have come from, to attach details about warranties, insurances or repairs and to prevent them from being stolen through traceability. But most of all, they allow us to add new layers of meaning to a product – its individual history and journey is what makes each item unique. This holds true for both physical and digital-only goods: What collection does it stem from? Who has owned it before? Where has it been showcased? Which prized artisans contributed to its creation? If the owners choose to, they can attach all possible milestones and characteristics to their Digital Certificates, thereby breathing a new digital life into them and refining their individual value.
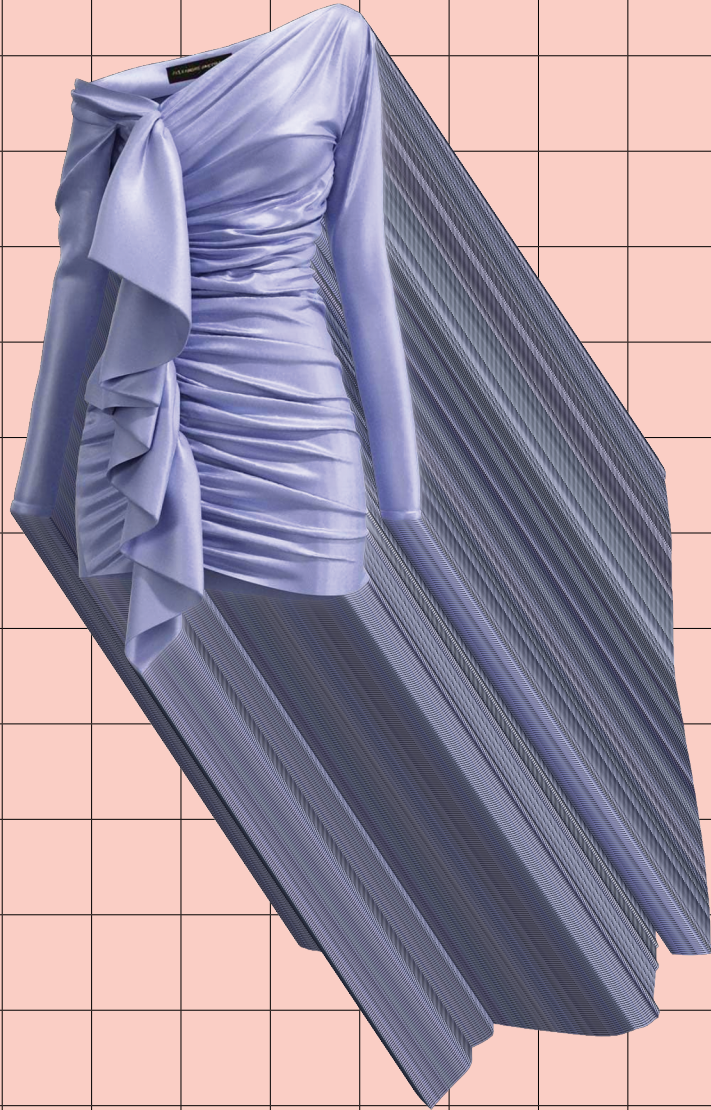
OWN: Digital Collectibles

The LYXF blockchain supplements the hy-per-real virtual fashion experiences of digital-only lifestyle capsules with a much needed infrastructure for handling ownership. It allows for real scarcity, accessibility, P2P-transferability, storage, display, and permanence of these new items that are used to clothe digital selves.

As fashion has ever more moved from the streets to social media, online environments "are now virtual runways for millions of people that are expressing themselves in the most unimaginable ways. [They're] pushing fashion forward at the speed of light." (Morten Grubak, Creative Director of Virtue Nordic)[47]. Creative work is increasingly capable of blurring and transcending the boundaries between physical and virtual realities.

On Instagram, computer-generated supermodels have amassed millions of followers and taken lifestyle influencing by storm. Purely virtual models such as Lil Miquela[48] or Noonoouri[49] are presented with lifelike profiles, posing with real-life stars and powerfully advertising fashion brands in large-scale collaborations [-> Key Principles, Virtualization]. Creators of such models often state that they attempt to redefine the boundaries between fiction and reality. In this discourse, one could argue that filtered pictures with airbrushed portrait shots can seem hardly more authentic than hyper-realistic imagery that was created on computers in the first place.

The emerging genre of digital-only fashion collections has now become another major manifestation and a further advancement of the digital (re-)presentations of digital consumer identities. Broadly speaking, digital collectibles are unique, scarce, and transferable items, which owners buy, use, and sell exclusively in the digital space. In this highly promising arena, creative technologists have been pioneering new channels for human connection and self-expression through virtual fashion. From their design to e-commerce and virtual fitting, these lifestyle items live exclusively in the digital space with no intention of ever entering the physical. They become expressive, valuable, and fashionable digital collectibles that can be worn in digital and virtual realities, both on the photographed bodies of customers and by their avatar characters. When designers use nothing but data to create fashion collection and imagery, they finally achieve to incorporate fashion itself as a part of our landslide shift towards general digitisation and to push forward the major mixed reality movement building momentum across design and display.

In November 2018, Scandinavian clothing retailer Carlings launched their first digital-only capsule collection, 'Neo-Ex'[50]. After users have uploaded a picture of themselves to Carlings and placed their order of items, Carlings designers skilled in 3D rendering then fit the clothing to the image and make it appear that the user is wearing the pieces IRL. The resulting images blend real people with digital-only couture and can be shared online. Carlings CEO Ronny Mikalsen explained that, through this collection, the label hopes "to challenge ourselves and the whole industry to take the next step to explore how fashion can exist in the not so distant future."[51]

As the first exclusively digital fashion house, The Fabricant[52] aims at pushing the creative industries further towards the arising and promising sector of digital-only clothing. By applying tools from the film visual effects industry, such as motion capture, 3D animation software and body scanning, the Amsterdam-based production studio creates online-exclusive collections that shall provide their consumers with hyper-real digital fashion experiences. In 2018, Hong Kong fashion conglomerate I.T commissioned The Fabricant to digitally create an exclusive collection to celebrate its thirty years at the forefront of fashion in China, with garments designed by labels including Alexander McQueen, Marques Almeida, and Helmut Lang. This collaboration marked pioneering premiere: It was the first time a retailer of this significant scale and reach favored representing an entire collection in purely digital firm and signalled an industry game changer away from product photography.

The triggering factors for digital-only lifestyle production are blending into the broader context of a changing lifestyle arena. One the one hand, hyper-real digital fashion experiences have only been made possible by recent technological developments in motion capture, 3D animation, and body scanning. On the other hand, they stand in direct reciprocity with those changing lifestyle consumer cohorts and mindsets that are recurring throughout this paper. Bloomberg found that in 2019, members of the Generation Z outnumbered Millenials for the first time. Millenials do not only make up the mainstream consumer base of the near future but they form a large portion of the lifestyle clientele already today. Representing individuals born after 1997, they constitute the world's first generation of true digital natives, are strongly tech-savvy, and show very different attitudes to the notion of ownership.

Based on a large-scale survey of their relatively young readership, Highsnobiety referred to this change as "The New Luxury" and stated: "We get it: Millennials and their younger Gen Z cousins prefer experiences over material goods"[53]. Here, ownership becomes a symbol of membership to certain brands, communities, or sets of values; it becomes a tool for participation

"People are waking up to the realization that reality goes beyond the physical, the material, and that we likely live in multiple dimensions. The digital virtual realm is one of those dimensions, one where creativity is blurring the boundaries of what is real and what is illusion. Our limited bandwidth of perception is ever more challenged as we navigate the bombardment of data to determine what is real and what is illusory."

(Chris Levine, Forbes)

and identification. In the digital environment in which these consumer cohorts have grown up, every participant is expected to maintain and curate a personal brand. For lifestyle consumerism, this means that the products they own are constantly documented and posted online for public judgement. Particularly for these lifestyle participants, digital-only couture is providing an unrestricted opportunity to realise their digital identities in a way that they choose, expressing who they are, wish to be perceived, or want to become.

Digital lifestyle collectibles come with a number of overarching benefits that address pressing existing challenges in the lifestyle world and at the same time create new horizons for the industry that have not existed before.

First, digital fashion can help to curb the environmental and societal damage of overconsumption driven by haul culture and Instagram shopping. The devastating sustainability credentials of the fashion industry have increasingly entered public consciousness. According to studies by Dame Ellen MacArthur, total gas emissions from textiles productions, at 1.2 billion tonnes annually, are already today more than those of all international flights and maritime shipping combined[54]. If on a current trajectory, by 2050 the fashion industry will be responsible for a quarter of the world's carbon budget[55]. As an alternative means for self-expression, digital-only products can address "take-make-dispose" models and prevent fashion from being overproduced or unsold. With environmental concerns being one of their key affairs of the heart, The Fabricant stated: "We have the opportunity to avoid the mistakes of the past and participate in a fashion future that's creative and sustainable: expressing ourselves while wasting nothing but data, exploiting nothing but the power of our imagination."[56].

Second, digital-only couture reduces returns, which have become a growing concern for major lifestyle houses. According to a 2018 survey by Barclaycard, nearly one in 10 shoppers admit to buying clothing only to take a picture on social media[57]. After the outfit of the day, or "#ootd", makes it online, the items are returned back to the store. The "try before you buy" policies at online retailers, where people pay for clothing they ordered online after they have tried it on at home, has further contributed to this trend.

Third, digital fashion is becoming a powerful tool for inclusivity, where considerably more lifestyle aficionados can follow their passion and take part in the cultural conversation. One the one hand, this benefits greater consumer cohorts. Where the class-driven influencer game is prevalent in the fashion discourse today, greater affordability can democratize lifestyle consumption by making on-trend clothes accessible to those who might not be able to buy them IRL. Apart from monetary constraints, sizing restraints can equally be alleviated, as e-fits allows also plus-size consumers to try on tailored garments that would not be available to them otherwise. On the other hand, this also benefits a greater range of creative minds to realize their own collections. Where the availability of large financial resources, expert teams, and global supply chains has been necessary to kickstart and scale the production and distribution of physical collections, digital-only designers can achieve virality at scale whenever they combine their creative ingenuity with technical expertise.

Lastly, digital-only fashion production is unconstrained by the structures of the material realm. In this space, the boundaries of the physical fashion arena do not apply, just like the rules that have often been dictating how to behave as an industry. The Fabricant stated: "We operate in a world where waterfalls flow upwards. Where shoes fly and jackets dance – without the aid of a model."[58] Digital environments allow creators to realize immersive lifestyle experiences that go beyond the laws of physics. They can implement non-existent or physically impossible textile materials, model personalities, camera movements, or lighting scenarios freely and adjust them dynamically at any time during or after production. "The appeal of un-real is swelling and multi-faceted, practical and expressive."[59]

While digital couture can clothe people on their pictures, it is equally relevant for personalizing their virtual representations, which have gained traction in the context of a greater VR evolution. On a smaller scale, we see this development in the ways in which digital communication has become more individualized. Released with iOS 12, Apple's Memojis allow their users to create highly personalized, dynamic depictions of themselves that match their looks and mood. When Apple in this context speaks of the rise of "Alter Egos", these little models do speak to a much broader, recent devel-

opment. In online gaming, the progressing modifiability and personalizability of characters has become a common rationale, basic demand, and tremendous market. As the most popular video game currently in existence, Fortnite has fueled its multi-billion-dollar revenue by in-game buys that players make to differentiate themselves from one another and to express status within their community. They purchase digital accessories and costumes for their virtual characters, which are known as 'skins', limited and thereby represent a novel form of virtual-only fashion[60]. With more than 125 million users playing Fortnite in 2019, the premise of play that personalised avatars will inherently deliver has proven to be a growing trend.

DIGITAL

While the use of lifestyle items for gaming characters has been contained and limited to the walled gardens of individual games, shoppers increasingly expect to be able to use their digital couture across platforms and for the long term. The more time users spend in virtual worlds, living virtual lives, and finding new ways to express themselves on a regular basis, the more they expect retailers to clothe them fashionably as they step into online changing rooms or out into wider virtual worlds.

While the production capabilities of digital-only lifestyle items are constantly improving, spreading, and taking up speed, there has not been any feasible infrastructure to handle all the crucial logistics around them. This includes the processes of storing, exchanging, selling, lending, and transferring individual products. First and foremost, it includes the ways in which their digital ownership is clearly defined to safeguard an item's scarcity, uniqueness, and overall value.

Collectibles markets for physical products have been around for a long time; there are communities surrounding seemingly any item, be it first issue Beatles records, first appearance Batman and Superman comic books, movie posters, and, most prominently, collectible card games. For example, Magic: The Gathering had sold over 1 billion cards by the end of 1994[62]. Yu-Gi-Oh! sold over 25 billion cards until 2011[63] and by 2018, more than 25 billion Pokémon cards were in global circulation[64]. All of these collectible cards represent assets of their specific games that are tradeable and give owners status within their respective communities.

As all sorts of markets have gone online since the Web became a secure shopping channel in 1994; collectibles, memorabilia, and assets have followed suit. Recently, digital collectible card games have gained popularity, spurred by the success of Hearthstone[65]. In AR spaces, Pokémon Go has been a wildly popular collectible game where players would seek rare characters in real urban environments[66]. In all of these cases, the value of collectibles is based on their individual providence and scarcity. For digital items, however, this remained a hurdle to clear: Although the Web and digital data have been around for almost three decades, digital scarcity is still a brand new phenomenon.

With conventional centralized ecosystems, such as the Fortnite system, there cannot be a genuine digital ownership over the digital goods collected. This is due to three reasons: First, the central system administrators manage the custody of the digital goods and would be technically able to take them away at any point of time. Second, they can inflate the supply of their issued digital goods at will, correspondingly lowering their value. Third, they usually limit the tradability of their items, which can usually only be used within the walled gardens of the individual platform.

SCARCITY

"Collecting proof of the things that we find meaningful is a human universal, and we'd prefer a world where these are done with open standards and sovereign ID rather than through someone else's proprietary application."[67] (Josh Stark, 2017)

The LYXF blockchain introduces an unprecedented solution to the overall management of digital lifestyle collectibles. Its ledger constitutes a time-stamped protocol that permanently records the history of every bit of data it contains. If an owner were to transact a lifestyle object to a counterparty, the recipient is able to trace back its transaction history and may thereby verify that the transaction partner does in fact have ownership of this asset. When it is transferred, the transaction record is permanent and immutable.

The LYXF blockchain introduces the concept of non-fungible tokens (NFT) to the lifestyle arena. NFTs are verifiably unique tokens, which are used to create verifiable digital scarcity as their unique attributes safeguard that no two NFT tokens are the same. Non-fungibility also means non-divisibility: an NFT represents one whole unit in its entirety and cannot be divided into smaller units. They are one of overall three types of blockchain-based tokens. The most common sort so far have been being fungible tokens, such as Bitcoin currency tokens, which are identical interchangeable with other tokens of equal value. The last category is formed by securities, which are tokens backed by real-world assets.

While we can think of each blockchain-based NFT token as a "rare, one-of-a-kind collectable"[68], this idea gets more tangible with the prominent example of the Crypto-Kitties. This virtual pet collection game represents one of the earliest attempts to deploy blockchain technology for recreational and leisurely purposes. It encourages players to purchase, collect, breed and sell various types of virtual cats, where every 'born' kitten is truly unique. By 2018, players had spent the equivalent of $6.7 million in this game buying virtual cats. In September 2018, the 896,775th CryptoKitty was sold for a record price of 600 ETH, which was equal to roughly $172,000 at the time of sale[69].

By introducing NFTs for the handling of digital lifestyle collectibles, LYXF makes it possible for creators to create and transfer the unique digital ownership of their works and to securely transfer it to those purchasing their items. It then enables buyers to securely store their digital collectibles, to showcase them in their digital lifestyle libraries, and to sell, exchange, lend, and transfer them. Through LYXF, digital-only fashion items can for the first time become real digital goods, which incorporate all of the following characteristics and advantages[70]:

Uniqueness: Each lifestyle NFT is unique, indivisible, and irreplaceable.

Counterfeit protection: Each digital collectible is a uniquely generated asset that cannot be duplicated. Each digital collectible is recorded in the LYXF network and ties ownership directly to the verified owner, protecting the IP creators, owners and purchasers.

Scarcity: The supply of lifestyle NFTs can be capped in numbers in the code, so that their owners can be certain about their overall supply and resulting value.

Accessibility: Lifestyle NFTs are publicly available on the blockchain and therefore accessible to all potential buyers.

Peer-to-peer transferability: LYXF's decentralized markets offer a platform for buying, selling, and swapping digital collectibles represented as NFTs.

Storage and Display: Together with real-world objects, digital-only collectibles can be organized in LYXF's lifestyle libraries of virtual wardrobes.

Permanence: Even if the product creators or system administrators disappear, lifestyle collectibles will continue to exist and be available on the blockchain.

Extensibility: Lifestyle NFTs can be combined to create new assets and new experiences. For example, digital luxury designers could offer amendments or additional features for their products at a later stage.

As NFTs, digital lifestyle collectibles are a powerful means for large-scale creative gamification endeavours [-> Use Cases: 'PARTICIPATE: Gamification']. Brands, designers, or curators can offer their owners any kind of reward, benefit, or special access, all of which can carry real value. This opens up a new world of achievements, badges, and other meaningful digital 'proofs'. For example, attendees of a specific fashion event could receive a cryptographically verified token with a creative visual representation, which they may share on social media and use as a social symbol of status. When a certain number of such tokens have been accumulated, creators could reward the owners' loyalty by transferring to them a limited-edition digital fashion item. The owners of these prizes, in turn, could then be granted access to a collection some time before its official release. The possibilities for virtual and IRL gamification engagement through digital collectibles are only bound by the imagination of their developers.

All in all, the movement towards digital couture with secure ownership conditions has tremendous consequences for lifestyle businesses. It reduces costs for licensors to distribute their products at significantly lower costs. It allows for instant scalability and exponential growth, where the distribution of collectibles is now possible instantly and on a global scale to any interested lifestyle participant with a smartphone. Finally, the digitizability of the endowment effect will unlock a market that Forbes estimated at $200 billion for the next few years[71]: Humans have a fundamental desire to own things that are scarce and that other people want. This phenomenon is closely tied to the lifestyle industries and it demonstrates our tendency to value things more once we own them. By fostering digital ownership of digital fashion collectibles, the LYXF network allows its p articipants to realise their exclusive online i dentity securely and sustainably. With an i mmersive and futuristic take on style, this will help to further push the boundaries at the intersection of technology and fashion and to propel luxury fashion storytelling into those modern digital and virtual realities consumers are already interacting with day in day out.

"Eerily accurate simulations are now illusory treats primed for a mainstream, avatar–rapt generation. Self-generated [digital] selves over which we have full control present a major sweet spot for an increasingly chameleonic world in which identity play will become the norm."

(Katie Baron, Forbes)
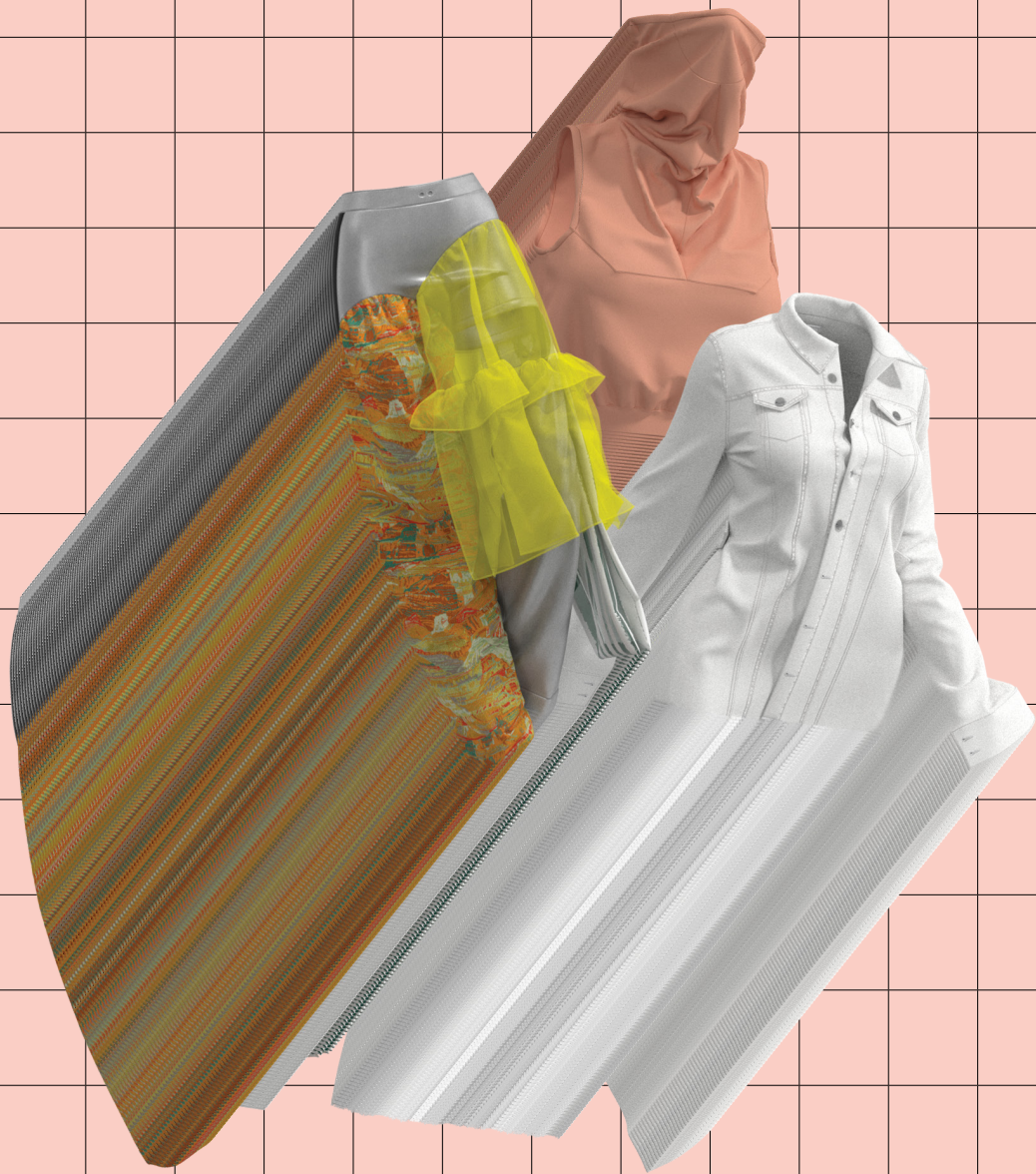
COLLECT: Digital Closet

The creation of unique digital ownership opens up a new world of collecting and representing virtual creations. Owners of digital fashion items can organize, explore, and present their collections of digital collectibles in LYXF's virtual libraries, which are the interfaces to digital ownership in the lifestyle arena.

Our wardrobes have two separate, although interrelated, meanings: they refer to the total set of lifestyle items that we own, as well as the constructed space where we store them. So far, this space has been an exclusively physical and private one, where the accoutrements of our identities were hardly on display for others. While we use these "identity kits"[73] to present ourselves to the outside world, as sociologist Erving Goffman described, for most of their useful lives, our items are stored away, unseen, even forgotten behind closed doors: they spend most of their time at rest. They are left in particular places, either readily available, at hand, or lost in the deep recesses of the wardrobe"[74]. At the same time, we are seeing that in our increasingly affluent societies, the de-junking of closets is becoming a part of contemporary household consumption. It is "an almost spiritual movement", even begetting a new generation of "clutter consultants"[75].

Together with digital-only collectibles, virtual models of real-life products can be clustered in Digital Wardrobes, which can address both of these dynamics: the presentation and organization of our personal collections. Lifestyle consumers can use this tool to aggregate their lifestyle items in a digital environment. Via apps, users can interact with all of their objects, find their distinct biographies, access the benefits associated with them, sell them to others, and credibly demonstrate their overall ownership. In a nutshell, digital closets are becoming the interfaces to the digital ownership in the lifestyle world.

When Marianne Thesander conceptualized the ideal form of a wardrobe in her 1997 book on "The Feminine Ideal", she came up with a huge dressing-room full of mannequins[76]. For fashion's sake, it would be ideal if everyone's closet could simulate a well-organized show window: when figures would display each piece the way they would look in real life, either on its own or in different combinations, all lifestyle items would be deemed to look much better than they do on hangers. LYXF's digital closets allow for just that – in a digital environment that is easy to manage and aesthetically pleasing.

In his article for the Journal of Fashion Theory, sociologist Saulo B. Cwerner analyzed wardrobes as the containers of our identity: "The modern wardrobe not only testifies to the ephemeral character of fashion codes, but it also articulates, in the living space of the home, some of the commanding principles (or ideologies) of fashion: choice, diversity, individuality, experimentation, bricolage"[77]. With a dig-

ital collection, these characteristics can now be collectively expressed, also beyond the "living spaces of the home". Since his article was written, the revolution of social media has altered the nature of our self-presentation and -revelation like never before. This has also affected the ways in which we relate ourselves to communities and express our status.

Even in these transparent times, our personal collections of the lifestyle goods we like to surround ourselves with have not been easily presentable. While we turn to social media to share the items we like on individual images, the general public has not yet been able to sense the entire scope of our belongings. With collections of virtual models of our items, we can achieve a fusion between materialism and social media. If users actively choose to do so, they can remove the conceptual invisibility of their closets. They can reveal their collections of items with explicit and easily quantifiable measures, just as the number of our social media followers can reveal their social outreach at one glance.

This presentability is now portable and independent of individual platforms. The LYXF blockchain, on which the information on our collections is stored in a decentralized fashion, can be seen as an interoperable meta-layer of information. Just as we have been seeing individual social media platforms come and go in the recent years, we can expect the landscape of social networking services to change also in the future. LYXF's blockchain is resilient to such changes: it works across any social media platforms. Such platforms can be considered as siloes. By having the information on our personal collections permanently recorded, we can dissolve the network effects, switching and opportunity costs on which all of these platforms strongly rely.

When we think about social media platforms and self-presentation today, we mainly consider the sharing of photos and videos of our collections. In the near future, we can certainly expect them to be superseded by different forms of expression. In this spirit, digital closets are future proof for the emerging and vast field of virtual reality interaction. In the Journal of Fashion Theory, Sociologist Patrizia Calefato defined that fashion and lifestyle are nothing less than "the body's appearing in the world"[78]. Today, we see parts of this corporal aspect continuously dissolve. If we think about digital-only collections, clothing in online games, and the rise of virtual-only

influencers, we see that what can constitute a body has changed. [-> Key Principles: Virtualization].

The tendency for lifestyle to virtualize will intensify, and thus the relevance of digital collectibles to virtual realities will be key. There are two dimensions to consider: On the one hand, digital collections can combine virtual models of items that are physically owned with digital-only owned couture. On the other hand, they are the source of truth and authentication when users want to demonstrate their ownership in virtual spaces. As such, LYXF's digital collections a re lifestyle libraries that transcend reality d imensions.

"The wardrobe has become a depository of the signs and images that have largely defined the self throughout the years, constituting a kind of sartorial biography. As bedrock of intimacy, identity, and memory, the wardrobe developed into an alter ego of modern personae."

(Saulo B. Cwerner, Fashion Theory 2001)

PARTICIPATE: Gamification

By creating rule sets and by tokenizing activities on the LYXF blockchain, lifestyle brands can become 'experience agencies' that engage their customers in playful competitions, turn products into collectibles, and strengthen authentic IRL interactions.

The general overstimulation in digital and physical public spaces has led to a sense of urgency in the marketing and advertising divisions of lifestyle brands. As McKinsey and the Business of Fashion magazine found in 2018, "brands become increasingly aware they are no longer just competing with their peers, but also with social networks and streaming services –anything that engages users online– for attention"[79]. How can brands then make sure that they are keeping their customers entertained? The variety of available recreational activities creates a crisis of engagement in the literal sense of the word: creators have to make structural decisions about the ways in which they speak to their customers and take increasingly unconventional paths.

EXPERIENCE AGENCIES

We believe that in the near future, brands in the lifestyle world need to have the self-conception of being 'experience agencies' rather than product producers. Highsnobiety reaffirms: "We get it: Millennials and their younger Gen Z cousins prefer experiences over material goods."[80]. From this perspective, material products would become the symbols of membership to certain brand, community, or set of values; they would become the tools for participation. Apart from their symbolic status, lifestyle products must lead to experimental and social outcomes, just as a vintage car can incentivize its owner to explore its history and inner workings, to embark on joyrides with fellow owners of similar models, or to visit meetups organized by its manufacturer.

Lifestyle houses must harness the power of play to create and curate tailored brand experiences for their customers and to spark their motivation to stay engaged with their brands. Gamified engagement has been slowly seeping into corporate marketing strategies and is becoming an increasingly coveted tool for brands to engage with their end consumers. For the near future, the global gamification market is projected to maintain a CAGR of 44.06 percent. It was valued at \$2.17 billion in 2017 and is expected to reach \$19.39 billion by 2023[81].

Gamification is the craft of using the reinforcing principles of play, the motivational elements that have been learned in over three decades of producing video games, and applying this learning to non-game settings. It is a 21st-century user experience phenomenon that has become a powerful tool for designers to entice users to engage with a brand or company. One of the earliest applications of this marketing paradigm was designed by airlines and credit card companies, which built point ecosystems designed to motivate users to spend and participate, rewarding them with redeemable benefits.

Since then, the lifestyle world has just slowly started to pick up the incentive schemes of gamification. Victoria Secret's young brand, Pink, created an app called Pink Nation[82], which consists of a series of short, interactive games that may lead users to win a range of prizes. Games include organized hunts for products within the app, or the creation of looks from the Pink collection whereby users can vote for their favorite look. In a different gaming app, style data platform Trendage enlists millions of community members to determine which clothes, accessories, and shoes from leading brands match, and to subsequently build outfit combinations on virtual models that are then shared and rated by the Trendage community[83]. Thus, gamification can drive the bottom-up creative contributions of consumers. The best market research for future collections possible becomes a reinforcing activity for one's future customer. Such approaches can address a very generic demographic: everyone has the capacity to enjoy games if there is a good reason to do so.

The components of all of these games usually draw on a number of recurring mechanics. Organizers would set transparent goals and invite a specific community to compete in collect-

ing points, working through checklists, earning badges, levelling up, or making it onto leaderboards, whilst always applying clear metrics and giving fast feedback. With the advent of blockchain technology and the associated micro-economies that are sprouting up within its new architectures, these gamification mechanics can be taken to a whole new level to attract and retain customers, and to incentivize their bottom-up feedback and participation in the creative process.

Lifestyle brands can use the LYXF platform to engage their customers in playful community competitions. All possible setups are based on two distinct features. First, LYXF allows for the rules of the game to be set in stone. The smart contracts running on LYXF's network are trans-parent, automated, and immutable. Almost reminiscent of natural laws, these contracts cannot be changed even by the brands themselves once they have been set up, which makes them trustworthy and credible. They can trigger automated transactions and permanently secure achievements, so that users can preserve their performance also beyond the boundaries of a singular game. Second, the newfound capability to tokenize all possible activities can give the credible promise of earning real value, which further incentivizes the direct participation in gamified environments. [-> Key Principles: Tokenization]

Based on these two principles, LYXF's range of applicability for gamification is limitless. In the following, we will explore just two case studies that will illustrate how the power of play can pick up current developments in the lifestyle space: the phenomenon of collectibles and the recursive step back to IRL interactions.

Collecting has been a part of gaming for decades and first gained significant traction with collectible card games. Already by the end of 1994, Magic: The Gathering had sold over 1 billion cards[84]. Yu-Gi-Oh! sold over 25 billion cards until 2011[85] and by 2018, more than 25 billion Pokémon cards were in global circulation[86]. All of these collectible cards represent assets of their specific games that are tradeable and give owners status within their respective communities. Recently, digital collectible card games have gained popularity, spurred by the success of Hearthstone[87]. In AR spaces, Pokémon Go has been a wildly popular collectible game where players would seek rare characters in real urban environments[88]. In all of these cases, the value of collectibles is based on their individual providence and scarcity. For digital items, however, this remained a hurdle to clear.

Payment blockchains allow one to realize the collection of digital assets in unprecedented ways. Conventionally, digital assets are easy to copy: when an image is shared, it is in the passion of both the sender and all the recipients. Blockchains have introduced an unprecedented solution to this traditional problem of double-spending. The ledger of a blockchain constitutes a time-stamped protocol that permanently records the history of every bit of data it contains. If an owner were to transact a datum to a counterparty, the recipient is able to trace back its transaction history and may thereby verify that the transaction partner does in fact have ownership of this asset. When it is transferred, the transaction record is permanent and immutable. For offline items, the functions of payment and proof of ownership were made possible by central authorities, like for example the auction and brokerage houses Sotheby's and Christie's. Blockchains can now take over this authority and establish the true scarcity and value of digital items through an independent and decentralized arbitration process.

While we can think of each blockchain-based token as a "rare, one-of-a-kind collectable"[89], this idea gets more tangible with the prominent example of Crypto-Kitties. This virtual pet collection game represents one of the earliest attempts to deploy blockchain technology for recreational and leisurely purposes. It encourages players to purchase, collect, breed and sell various types of virtual cats, where every 'born' kitten is truly unique. By 2018, players had spent the equivalent of $6.7 million in this game buying virtual cats. In September 2018, the 896,775th CryptoKitty was sold for a record price of 600 ETH, which was equal to roughly $172,000 at the time of sale[90].

As a domain-specific blockchain for the lifestyle arena, LYXF encourages brands to use collectors' games to engage with their customers. The most evident applications are related to the Digital Closets of accumulated Digital Certificates [Key Principles: Identification; Use Cases: 'COLLECT: Digital Closet']. While product owners can use them to showcase their lifestyle collections, brands can design playful environments where users are invited to also compete among each other with their unique belongings. In doing so, any transparent and quantifiable metric can be applied. This could be the number of branded items owned, the number of miles travelled with them, shops visited, or events attended.

85

In every possible scenario, the boundaries between the virtual competition and physical encounters can be continuously crossed. Considering the opening remarks by Positive Luxury, LYXF's users can draw on gamification approaches to realize "emotionally c harged, authentic interaction between brand and stakeholders – ideally in both the digital and physical world"[91]. In a time where digitization and online platforms have increasingly eroded brick-and-mortar retail and genuine face-to-face interactions in the lifestyle business, gamification can be a means to re-introduce the social and personal aspects in the relationship between a brand and its customers.

In their survey of over 7,000 young lifestyle consumers, Highsnobiety found that real-life "participation comes with a price". For their readers, the top reasons to attend a fashion event were the chance to obtain products that are available exclusively for attendees, experiencing moments that would be worth sharing via social media, and meeting people that share the same interests and passions[92]. All of these benefits can be integrated into virtual games that precede and lead to actual physical encounters upon the invitation of a brand.

If well designed, playful scenarios can leverage the desires and motivations that exist in all of us: we want to be part of communities, receive the feedback of our peers, get recognition for our achievements, and be rewarded for our efforts. In an arena that is characterized by the competition for attention, gamification can then be a powerful tool for lifestyle creators to extend relationships, craft longer-term engagement, and drive the loyalty of their customers.

"The very concept of top-down advertising is beginning to look antiquated. Instead, an emotionally charged, authentic interaction between brand and stakeholders - ideally in both the digital and physical world - is what's necessary now to successfully sell and retain brand loyalty."

(Positive Luxury, Predictions Report 2018)
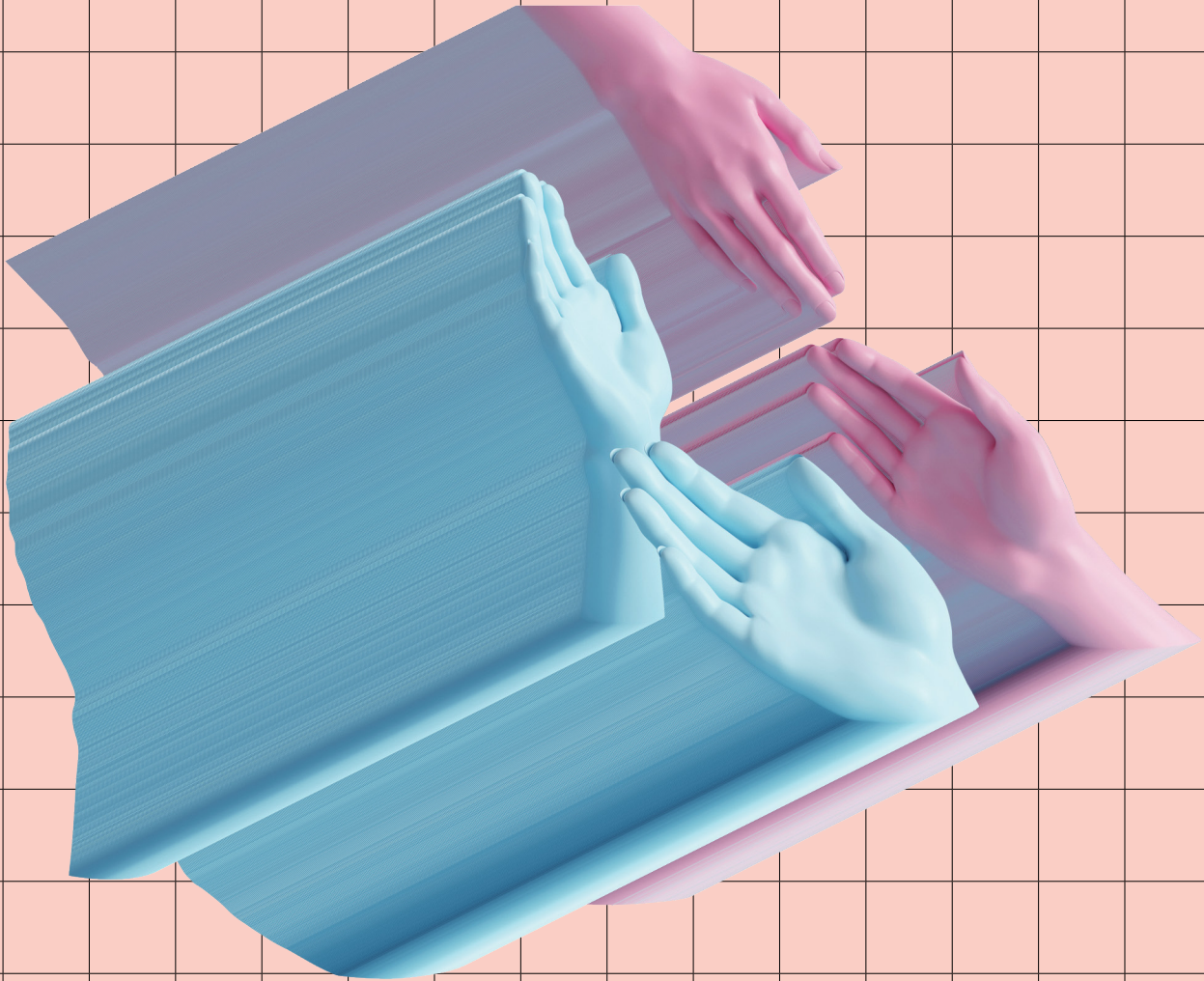
SHARE: Rental Service

With LYXF, both professional services and private owners can set up peer-to-peer sharing economies that bring liquid owner-ship and collective consumption to the life-style community and scale the exchange that characterizes the prognosticated "end of ownership".

Across many industries, we are seeing the evolution of consumers who are more interested in access instead of mere ownership. In more and more categories of consumption, they choose to rent rather than own goods outright. This is exemplified by Spotify supplanting CD sales and downloads, Netflix replacing video stores, and Uber standing in for car ownership among many young urbanites. As customers are embracing new ownership models, the so called 'sharing economies' have gained traction, where centralized, mediating platforms are sprouting all over the place. What McKinsey and The Business of Fashion described as "The End of Ownership" marks a fundamental evolution in consumer behaviour – and they expect this to have a great impact also on the lifestyle business in the years ahead[94].

This trend to rent is fuelled by major consumer changes, which we can summarize along three lifestyle renter identity themes.

Above all, there is an unbound hunger for constant newness. Lifestyle participants crave variety and novelty in their lives. They want to prove their independence and desire uniqueness. Research shows that the average person today buys 60 percent more items of clothing than they did 15 years ago[95] – but consumers keep that clothing for only half as long as they used to. For example, a survey done in Britain found that one in three young women consider clothes 'old' after wearing them once or twice[96]. One in seven consider it a fashion faux-pas to be photographed in an outfit twice[97]. As a consequence, the Ellen MacArthur Foundation, which is committed to promoting circular economies in the fashion industry, found that worldwide, the average number of times a garment is worn before it ceases to be used has decreased by 36 percent compared to 15 years ago[98].

Further, convenience is increasingly taken for granted. Users seek instant gratification and want to match the usage duration of a lifestyle item with the duration of its ownership by renting for a specific occasion and at the respective location. Renting also allows them to test a lifestyle item in actual use without having to commit through an investment.

Lastly, younger generations have ever more about sustainability concerns. They are increasingly fed up with the linear 'take-make-waste' models of contemporary over-consumption: 66 percent of global millennials are willing to spend more on brands that are sustainable[99]. When the World Economic Forum explored the positive potential for clothing rental among consumers, they pointed to the ecological factors as one of the overarching benefits of lifestyle leasing[100].

As a consequence of these dynamics, we can expect three trends to take root in the lifestyle world. First, the number of brands embracing rental and refurbishment practices will increase markedly. Established players will progressively regard alternative ownership as a force they need to embrace or at least test through new collaboration models with retailers or start-ups in the sector. Second, McKinsey predicts a "notable increase in the number of 'rental native' brands born exclusively for rental or subscription models"[101]. Third, with a recent survey conducted by London's Westfield Shopping Centre identifying clothing rental as a key future trend, more consumers will see a growing proportion of their wardrobes made up of rented products, especially for high-value items and accessories[102].

Considering business models that have been prevailing in the recent economic environment, we will see large-scale lifestyle rental service platforms blossom in the near future. In fact, Future Market Insights expects the online clothing rental market to register a CAGR of 9.8 percent during the next seven years, with a value increase from $705.7 million in 2015 to $ 1,952.4 by 2026[103]. In this arena, we expect business models to take on two forms.

On the one hand, there will be more professional services offering their massive centralized wardrobes for leasing. In the US, Rent the Runway[104] has already become a significant player in the fashion industry. Their corporate slogan picks up some of the major consumer trends that were discussed earlier in this chapter: "Buy less. Wear more. Be you."[105]. China's YCloset takes a different approach, using a subscription rental model to grant their clients access to an array of clothing and accessories free of additional charges; if the customer likes a particular item, they have the option to buy it outright[106].

On the other hand, there will be centralized service providers that facilitate the letting of lifestyle items among their customers themselves, who can offer pieces from their personal wardrobes to other clients. This would be the manifestation of the 'sharing economy' in the lifestyle world as we know it today from other industries.

'Sharing economy' businesses aim to create economic value by getting different groups of economic actors together on in two- or multi-sided networks, i.e.: shared platforms. These service providers provide the necessary infrastructure and rules that facilitate transactions, take actions to create critical mass and manage supply and demand.

SHARING ECONOMY

However, such models are coming with enormous costs for the consumer. Centralized 'sharing economy' platform providers extract significant value and can arbitrarily set and change self-interested rules. The generated revenue is not fairly shared with all of the members that help generate the content. Just like contemporary social media platforms, their data silos rely demand-side economies of scale and come with collective switching costs. For example, the reputation renters accrue over time is equal to their 'social capital'; it is what makes them trustworthy. But it is not transferable to other platforms, which then typically leads to the classical winner-take-all dynamics, where a single or small set of players dominate the market.

Only the decentralized architecture of blockchains can lead us to platform designs abolish these costs. The LYXF network allows the community itself to weave the possibilities for sharing into the very fabric of the lifestyle economy, in a way that is fair, secure, efficient, and platform-agnostic. As we described for the principles of blockchains earlier, they can remove the need to trust centralized intermediaries to establish communication and to facilitate transactions between lessors and lessees.

Anyone using a decentralized renting market on the LYXF protocol can create a listing on the platform for an object in their Digital Closet. Once someone wishes to rent their item for a special occasion, they can initiate an escrow payment, which is settled in a decentralized fashion, and transfer the temporary ownership of the item for a clearly defined amount of time. As we described earlier [Use Cases 'OWN: Physical Collectibles'] we can attach all sorts of valuable information to physical counterparts through their digital ownership. Renters could then also make use of their associated benefits, discover their unique story, or contribute to their inherent value by taking part in gamification efforts of the brands [Use Cases: 'PARTICIPATE: Gamification'].

LYXF platforms are administered collectively by all of the people using them. This non-hierarchical organization can ensure fairness as all of the users have a financial incentive to keep the platform healthy. It will not rely on massive data centers, reduces transaction fees significantly, ignites positive network effects and catalyzes growth. Collective consumption is enabled without the reliance on a dominant market player, as users on the LYXF network can use different marketplaces at the same time without the disadvantages of switching costs. It is also inherently secure: the functionalities of smart contracts lead to binding agreements and automatic enforcement, and in-app rating systems can be established that are interoperable and censorship-resistant on account of being permanently stored the LYXF blockchain.

Such community-owned and decentralized platforms have been set up for other markets, where they increasingly challenge the incumbent and centralized businesses: For online marketplaces, OpenBazaar[107] aims to be the decentralized equivalent to Ebay, in carpooling, Arcade City[108] and Snag Ride[109] are challenging Uber, and Bee-Token[110] addresses the home-sharing market currently dominated by Airbnb.

They all have in common the higher mission to establish sharing economies that live up to this visionary name. While the 'sharing' aspect has so far been clouded by extractive centralized service providers, blockchains can facilitate genuine peer-to-peer markets. This applies to both of the models we discussed earlier: to professional services offering their large centralized wardrobe for lease, and to private owners who wish to offer pieces from their personal wardrobes to other consumers. In this way, decentralized rental platforms on the LYXF blockchain can then bring collective consumption to the lifestyle community and scale the exchange that characterizes the prognosticated "end of ownership".

"The lifespan of fashion products is being stretched as pre-owned, refurbished, repaired and rental business models continue to evolve. Across many categories consumers have demonstrated an appetite to shift away from traditional ownership to newer ways in which to access product."

(McKinsey & The Business of Fashion, The State of Fashion 2019)
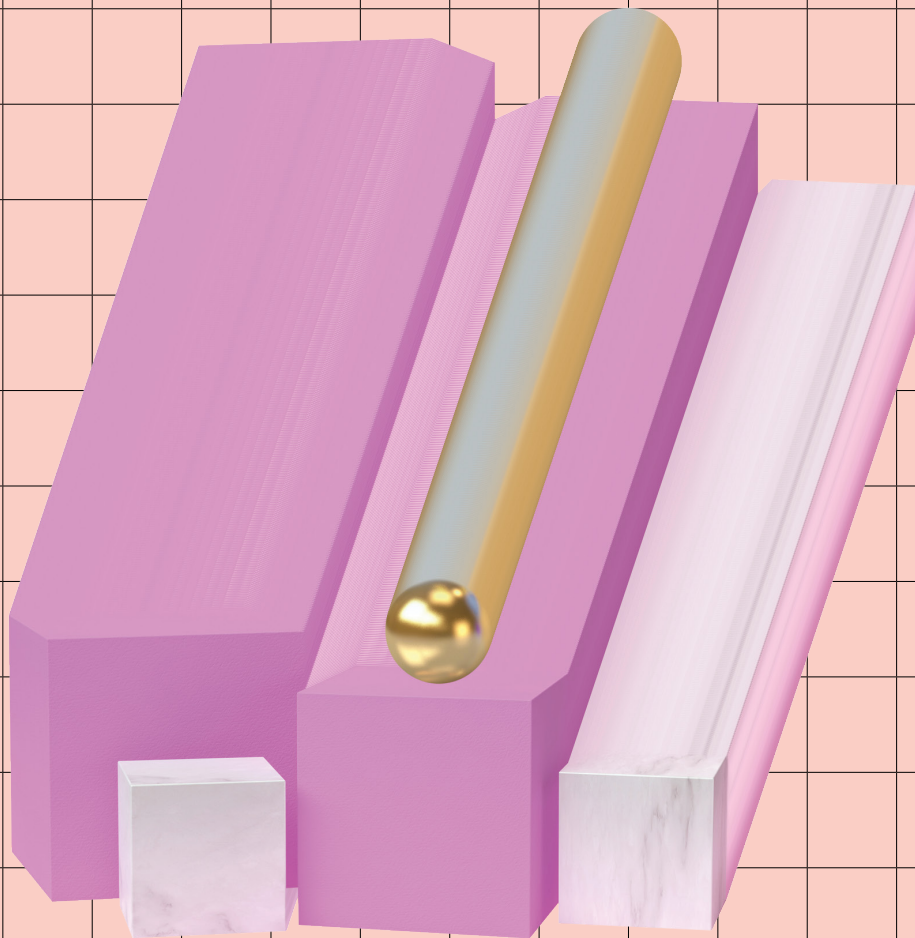
TRADE: Decentralized Markets

LYXF allows to manage, authenticate, iden–tif y, transfer and pay for items in decentral–ized secondary lifestyle economies. Having safe access to unique physical and digital products enables the community to bring quality craftsmanship in continuous circularity.

The "End of Ownership" that McKinsey and the Business of Fashion presented as a consequence[111] of mindful consumerism will also lead to different outcomes than the growing desire for rental markets we explored in the last section. "End of Ownership" mostly means that lifestyle consumers attach less and less importance to permanent ownership and instead embrace prospect of temporary ownership. The prospect of being able to sell a lifestyle product on secondary markets later on changes the nature of ownership, value, and choice – the individual item becomes more of an investment good.

This shift to thrift is triggered by similar dynamics as the ones we discussed for rental markets: modern consumers demand variety, novelty, availability, and sustainability. On top of that, we are seeing that over the past few years, a large number of luxury brands tend to have raised their prices. For example, prices of fine watches and jewellery have nearly doubled since 2005[112]. Tracking global prices of Louis Vuitton's Speedy 30 handbag suggests an increase of approximately 19 percent per year since 2016[113]. McKinsey and the Business of Fashion concluded that in the light of increasing unattainability, "even consumers with six-figure incomes are looking to discounts and alternative models of acquisition for relief[114].

These changing attitudes to ownership are mainly a hallmark of the millennial and Gen Z lifestyles, which do not only represent the mainstream consumer base of the near future but constitute a large portion of the lifestyle clientele already today. In the youthful streetwear sector, this cohort has long embraced resale with vigor. The streetwear market is characterized by the much-hyped 'drops' of new products, which then often get traded at prices many times the original price. As we see high-end streetwear and luxury progressively converging, the negative connotations often associated with second hand luxury are equally shaken off. The growth of fashion retailers, such as Net-A-Porter[115] or Farfetch[116], has further broken down the barriers of the resale economy, as it has shown consumers that they do not necessarily need to visit the brand to have a luxury experience and made them more comfortable buying high-end pieces from online platforms. In 2018, the Harvard Business Review found that "there's no longer a negative connotation associated with shopping pre-owned"[117].

While the 2018 GlobalData consumer survey found that one in three women shopped secondhand in the previous year, this rate is naturally higher for the specific consumer cohort of mindful millennials. More than any other age group, 40 percent of 18 to 24 year olds shopped lifestyle resale in the same year[118]. This development is noticeably taking up speed. Globally, the resale apparel market is expected to record a 15 percent annual growth until 2022[119]. In the US specifically, resale is likely to grow 24 times faster than the retail sector, with 71 percent of consumers planning to spend more on resale over the next five years. Global fashion search engine Lyst has reported that traffic to luxury resale products has increased by 447 percent over the past six months[120]. The extent of this growth gets more tangible if we turn to an analysis of re-commerce company ThredUP. Based on a large-scale survey of lifestyle customers, they claimed that the average consumer's closet consisted of 6 percent resale items in 2017 and expect this proportion to be at 11 percent in 2027[121].

This continuous growth of secondary markets in the lifestyle economies is to the benefit of all parties involved. It is creating a new paradigm – a high-end product ecosystem that can be considered a win-win for the entire industry[122]. While the benefits for consumers are straightforward, the perspectives of brands are on the brink of a necessary change.

For a long time, especially high-end and luxury houses have insisted that selling products second-hand weakens brand value and encourages counterfeiting. In March 2018, for instance, Chanel filed a strongly-worded lawsuit against reseller What Goes Around Comes Around[123] and another one against The RealReal in November[124]. This was because they found at least some of the significant array of second-hand Chanel good being peddled on these marketplaces to be fake. Further, they criticized the ways in which the luxury re-sellers were allegedly piggybacking on the reputation and appeal of Chanel, one of the most esteemed fashion houses in the world, for their own financial gain[125].

However, if done securely and with unequivocal authentication, liquid secondary markets for lifestyle goods should be embraced also by established brands for a number of reasons. First, the Harvard Business Review found that most sellers reinvest their resale earnings in purchases of

new lifestyle goods, leading to a higher turnover[126]. Second, first-market buyers can be less risk-averse. The more conviction consumers have that the lifestyle goods they buy are liquid, the more purchases they are willing to make at retail, even accepting to pay higher prices than they usually would. This touches upon the shift from permanent ownership to the idea of investment – while some high-end goods might be out of pocket initially, the certainty that consumers can recoup some of their investment later makes this feel less like an absolute commitment. Third, many buyers of pre-owned luxury are also first-time buyers who get to experience a new brand for the first time. From that perspective, these resale services are a customer acquisition channel for luxury brands and a veritable gateway for younger consumers to enter their brand experience[127].

END OF OWNERSHIP

McKinsey declared that "[w]hile established brands have traditionally turned a blind or scorning eye towards second-hand retail, they are now wading into the pre-owned and rental markets"[128].The economic reasons, combined with the readjustment of corporate values and CSR strategies, have even led to a number of unprecedented partnership between producers and resellers. For example, Stella McCartney launched a cooperation with The RealReal in 2017, offering a $100 credit to consumers consigning her products on the platform. This aimed to create a circular flow that encourages footfall in Stella McCartney stores, while building confidence in the quality and longevity of Stella McCartney products[129].

In this arena, blockchain can address the typical disadvantages underlying centralized marketplace solutions we discussed for use case of rental markets: value extraction, network effects, and switching costs. For secondary markets, however, the authentication and identification of items that LYXF can achieve is the biggest add-ed value and a necessary precondition for brands to feel comfortable with resale dynamis. Users can design genuine peer-to-peer markets on the LYXF network that allow all participants to sell items.

These decentralized markets where lifestyle goods can be sold or traded within the ecosystem manifest a great example to demonstrate how the different use cases of LYXF's tech foundation can interact syn-er gistically:

Digital Closet Management: Owners can manage their possession easily using their Digital Closets. This allows them to both organize their items well and to gauge how much they are currently in demand by showcasing them easily to the public.

Trusted Authentication: Digital ownership of their items makes it possible for all parties to trust each other: users can prove that they are indeed the rightful owners of a product, establish its authenticity through the embedded chips, and demonstrate its unique characteristics through the data collected on the LYXF network. This is applicable for items of all dimensions: for physical pieces just like for purely digital or virtual items. For digital and virtual products in particular, there have not been any secondary markets available whatsoever. Because of the duplicability problems of digital data. Only with blockchain technology, we can fall back on an unprecedented solution to this double-spending problem in the digital world [see explanation in 'PARTICIPATE: Gamification'].

Unique Identification: The historical records on the LYXF blockchain make a characterful item timeless. They give verifiable proof and insight into the uniqueness, scarcity and history of the item that is up for sale. It has an effect on its value, if a piece was for example issued at a grand fashion show, in former possession of a celebrity, or part of a special collection.

Contract Arrangement: With programmable smart contracts, remotely contracting parties can make sure that the conditions for their sale are codified and executed as desired.

Item Transaction: The transaction is two-fold. Not only is the physical item send out, but also the digital ownership is transferred to the buyer. This gives clear proof of the changing claims of ownership.

Payment Execution: Finally, payment can be released securely, for example for using an escrow system that is triggered when the receiving party has received the item and is convinced that its condition is in fact as previously advertised.

As a result, the LYXF network has established secondary lifestyle economies that provide safe access to unique and rare pieces of the physical, digital, and virtual dimensions. Pushing beyond the tradition of permanent ownership, this enables the community to bring quality craftsmanship in continuous circularity.

This marks the end of the section of LYXF's applicability. Throughout this chapter, we could have elaborated on entirely different use cases or focused on different aspect of the ones we presented. For example, we could have applied LYXF 's functionalities to establish smart war-ra nty, customer relationship, or inventory m anagement systems. We could have ex-pl ored its specific potentials for production s treamlining, lifestyle item lifecycle tracking, theft prevention, or trend forecasting.

The design and deployment of these and other applications is up to the community of creatives themselves. With LYXF as a sustainable technological base la yer for their ecosystem, future use cas-es are limited only by their ingenuity and cr eativity.

CO–CREATE: Customer Engagement

101

LYXF provides the interaction layer to foster co–creation and peer–production in the life–style world. Brands can turn their empowered consumers into participants of the cultural conversation and use their bottom–up input via direct forms of community access.

Lifestyle consumers have changed a great deal over the past few years, and with them the thought logic of the entire lifestyle system. Highsnobiety evaluated the "New Luxury" and noted that the "paradigm is shifting from exclusivity: once a form of de facto elitism, luxury today is more democratic. While it still comes at a cost, that cost is now more closely aligned to knowledge and access as opposed to cold, hard, cash."[130]. Customers want to feel included in the cultural conversation – they seek individuality at scale. As the convergence of media, marketing, and technology has redefined the mechanics of building brands in the modern world of material culture, brands deserve their very own solutions to keep up with those newly empowered, and ever less loyalty-bound, consumers.

A number of factors have altered the power dynamics in the lifestyle arena. First, we see that consumers are getting younger. In 2017, Gen Z and Millennials combined for 85 percent of all luxury growth, and by 2020, half of all global luxury consumers will be younger than 30 years old[131]. Another study by Bain & Company found that by 2025, 45 percent of the luxury market alone is set to be made up of these young cohorts[132]. Highsnobiety explains these dynamics in the following way:

"This growth is fueled by a complex desire to achieve one's own unique identity while indulging in traditional luxuries. The result is a more fragmented (and at times fuzzy) market – a market that disregards catch-all labels (...) and is more likely to be defined by the consumer than any brand or marketer." (Highsnobiety 2018: 8)

As the market will be more likely to be defined, in a literal sense, by the consumer, any platform that allows the consumer to not only express what they want, but actually contribute, via bottom-up authenticated feedback, to the creation of what they want, will have significant market advantage. LYXF is this platform.

Increases in social media availability and consumption are immediately associated with the rejuvenation of lifestyle indulgence. McKinsey and the Business of Fashion found that in pursuit of 'likes' and building their own personal brands, the purchase decisions of lifestyle participants are ever more influenced by social networks, peer reviews, and influencer marketing[133]. As we have never had this much technological and digital connection, consumers are becoming more powerfully relevant and can create narratives that are suddenly very meaningful to the brands – trends are increasingly established by the consumers themselves. American fashion designer Tory Burch noted:

"[N]ow the customer is in charge because technology has really given the customer access to so much information. So they're really determining what is relevant. They (...) can go on an app and compare pricing, globally, instantaneously. She has more knowledge and is more savvy than she has ever been"[134]. (Tory Burch, 2018)

This hints to another, structural, consequence for lifestyle brands. The overall channel disruption through large, pure e-commerce players has made brands lose considerable amounts of their influence and control. As lifestyle platforms are expanding into premium, high-end, and luxury segments, they often offer their customers wider breath, more choice, and superior customer convenience. This changes the first point of reference for consumers in their search to buy branded items. As a consequence, the revenue on global online platforms in 2018 was already two to three times higher as compared to 2015[135]. Of all the top innovations in this space, one third of queried executives in the 2018 Global Fashion Survey believed that the predominance of online platforms in lifestyle is among the top three trends[136].

Considering all of these changes in power dynamics, brands must turn to more enhanced ways of directly engaging their customers. Including the end users of their products as much as possible in the creative processes has two crucial advantages: first, brands can do justice to their empowered consumers, turning them into participants of the cultural conversation,

and creating for them a culture of purpose where they actually feel that they are being heard; second, brands can efficiently use the bottom-up input of their customers, so that they can respond to their shifting demands accurately and quickly.

LYXF's technological foundation pro-vides the interaction layer and communi-cation channel for these kinds of engagement. After all, LYXF's main role is to be an ecosystem facilitator, owned by the lifestyle communities themselves. From the perspective of the customers, this new role is both active and passive. Active participation becomes possible through the ability to create large-scale voting mechanisms by designing smart contract arrangements on the LYXF network. Brands can set up systems where they invite the community to express their preferences about prod-ucts, collections, events, or other services they might offer.

Generally speaking, blockchains make voting processes more secure, cost effective, and time efficient. Because each verification process and vote is time-stamped as it is recorded, any tampering or changes or fraudulent votes are detected by the whole network and immediately dismissed. The immutable protocol that makes up the blockchain allows one to ensure that a vote is registered only one time, coming from a person with a specific ID, and that it is permanently recorded. For voters, the necessarily transparent setup of this system gives them trust that their vote was cast correctly, that no votes were changed, and no illegitimate ones were added. For organizers, it enables an instant evaluation and an absolute confidence in the accuracy of the recorded votes.

Digital ownership makes this general process much more interesting and specific. It gives creators the power to choose those who might influence the further course of their actions according to their verified commitment to the brand or their suggested expertise. For example, a brand might want to specifically give all owners of their handbags a say about the ma-

terials used for the upcoming collection. Alternatively, voting rights could be a reward for the most committed tier of their customers, where those with the highest number of branded items in their Digital Wardrobes receive specific rights with regard to participation. Brands could address customers owning the oldest, rarest, or most expensive product from their house. They could target the ones who showed up most frequently at their shows, at their physical stores, or in virtual spaces. In these cases, D2C interaction does not only reward customer loyalty, but also gives access to the specific desires of defined customer groups.

The more passive consumer role focuses on analysis of valuable information generated from LYXF's network. This could be data on participation in voting, trans-actions of Digital Certificates, composi-tion of Digital Wardrobes, and so on. José Neves, founder and CEO of online luxury fashion retail behemoth Farfetch described the power of data analytics in the following way: "The efficiencies that data can provide, from online marketing to the digital user experience to the physical experience, will be a game changer. (...) The company with more data receptors and more data intelligence will win[137].

Harnessing the immediate consumer insights gained from transactions on the LYXF network will enhance accuracy, differentiation, and speed to market in a time where market players have to respond more rapidly to trends, push just-in-time production, reduce levels of overstock, and address the importance of small-batch production cycles[138].

Commonly, products are being pushed into the market based on best-guesses and forecast. Here, procurement, production, and distribution are predicated on designer and buyer prediction of future customer demand, and collections are produced and marketed in traditional 'seasons'. The opportunities of active and passive customer engagement through the LYXF network allows brands for a seismic shift in the development cycles of their collections. Prod-ucts can now be pulled into the market based

PERSONALIZED & DECENTRALISED

on actual demands and desires. Under this different, more dynamic process logic, procurement, production, and distribution are based on the pro-active and collective requests of consumers.

Integrating more bottom-up participation in the traditionally top-down pushing of products will do more justice to the nature of today's younger, savvier, and more empowered consumers. In this spirit, LYXF 's multidirectional interaction platform ca n not only bring back some of the forfeit-ed customer loyalty that many brands have be en experiencing. It can also contribute to a more collaborative creative culture in our c ollective lifestyle system.

Ecosystem
Impact

From the very beginning, LYXF's emphasis has been on powering systems of cooperation that are tailored to the nature of the lifestyle arena, use economic incentives to align the interests of disparate groups of people, and rely on sophisticated technical infrastructure to secure their interactions. LYXF's initial impact on the lifestyle eco-system has four main dimensions:

Foster Trust: By interacting and transacting on LYXF's blockchain network, social interaction becomes more codified and clear. The transparency of the protocol will lead to greater accountability of all actors and helps them to cultivate a culture of greater responsibility and trust. For examples, please turn to the sections on [Key Principles: Identification], [TRACE: Provenance], and [MANAGE: Smart IP Rights].

Facilitate Co-Creation: By opening up new communication channels between and among all stakeholders of the ecosystem, they have better and more efficient means for their coordination, co-operation, and collaboration. To see how this can work in practice, please turn to the section on [CO-CREATION: Customer Engagement].

Enable Participation: By having a decentralized platform in place that can capture real value, the traditional, centralized hierarchies in the lifestyle space can be expanded. When entry-barriers for aspiring creators are lowered, the overall freedom of creative expression is increased. For details, please refer to the sections on [Key Principles: Tokenization] and [FUND: Designer ICOs].

·

Redefine Core Concepts: The consequences of digital ownership for the lifestyle ecosystems are vast and help to advance a number of fundamental concepts in the space: the ownership of lifestyle goods and their individual value. Please look up the sections on [OWN: Physical Collectibles & Digital Collectibles], [SHARE: Rental Service], and [TRADE: Decentralized Markets].

In the following, we will specify how we define the process of 'ecosystemization'; the role of standardization; the fundamental principles of the LYXF ecosystem; and they key benefit to its individual stakehold-ers.

Any technological ecosystem should offer solutions compromising a larger system of use than the original platform initiators created and solve important technical problems within an industry. The core network has important but limited value when used alone but substantially increases in value when used with the broad range of applications that can be built on top of it. Successful technology ecosystems make it easy to connect or build upon their core solution in order to expand the system of use and allow new and unanticipated end uses.

Blockchain ecosystems revolve around their very own protocols: just like it was not possible or necessary to foresee what would users of the Web could build on top of its architecture, the same holds true for all well-designed blockchain systems. As flexible and inclusive base layers, their future success is not dependent on any technical additions from their initiators: they live on the principle of contingency.

We could picture blockchain ecosystems with the analogy of traffic systems: just like there is no single type of road (highways, motorways, dirt tracks), there is no single type of blockchain. Accordingly, each is purpose-built for its own ends and the community it serves. Not only that, but roads come with a system of independent elements that together enable the whole traffic ecosystem to function smoothly and reliably: we need traffic lights, police enforcers, toll roads, gas stations, etc.[139]. On the basis of this infrastructure and within the set rules, professional and private drivers are free to choose their driving style, what vehicle they wish to drive in, and where they want to go. Blockchain ecosystems have a similar rationality.

Based on these principles, the LYXF network empowers each stakeholder in the life-style ecosystem to better pursue their individual motivations. While this illustration is not exhaustive, we will summarize some of the key benefits for the main participants of the creative verticals in the following:

Key benefits for lifestyle startups and innovators:

Project financing [-> FUND: Designer ICOs];

Community building [-> Key Principles: Tokenization];

Purpose-driven technological architecture [-> Technical Description];

Innovation ground for new protocols;

DApp infrastructure;

Key benefits for lifestyle brands, designers, and creators:

Overall interoperability for creating new ecosystems and business opportunities.

Brand protection [-> Key Principles: Identification; TRACE: Provenance; MANAGE: Smart IP Rights];

Granular access to individual customers [-> Key Principles: Identification; OWN: Physical Collectibles & Digital Collectibles; COLLECT: Digital Closet];

Customer loyalty [-> PARTICIPATE: Gamification];

Trend forecasting [-> CO-CREATION: Customer Engagement; Key Principles: Tokenization].

Key benefits for lifestyle consumers:

Participation and personalization [-> CO-CREATION: Customer Engagement];

Self-expression [-> OWN: Physical Collectibles & Digital Collectibles];

Tradeability and temporary ownership [-> SHARE: Rent Services; TRADE: Decentralized Markets];

Collectibles markets [-> TRADE: Decentralized Markets; OWN: Physical Collectibles & Digital Collectibles];

Certainty of originality [-> Key Principles: Identification];

Major
Success
Factors

NETWORK SCALABILITY

REGULATORY LANDSCAPE

LYXF is a large-scale project that is geared towards long-term viability and that addresses a vast r ange of stakeholders with varying areas of expertise. It is based on recent technological advancements and introduces unprecedented approaches itself. LYXF's team and expert advisors are composed cre-at ive professionals that operate at the forefronts of fashion, design, media, and lifestyle segments. As t he LYXF ecosystem has been developed in close alignment with their communities, certain questions ab out the current state and challenges of blockchain economies in general have repeatedly come up th roughout this process. These questions will be presented throughout this chapter along their main di mensions.

As the most pressing technological challenge, we will evaluate the notion of network scalability. Clustering uncertainties related to legal developments, we will discuss regula- tory landscapes of blockchain in general and the privacy of personal data more specifically. Lastly, we will touch upon business challenges: while LYXF is a contingent system that a llows its users to dive into all sorts of blue ocean markets across the lifestyle world, any p roject must always expect there to be competition for its digital use cases in some shape o r form.

DATA PRIVACY

BUSINESS COMPETITION

Network Scalability

One of the most pressing challenges for all public blockchain systems has been the scalability of their networks, i.e. the maximization of their transaction throughput, or the number of transactions that can be executed on them. While a lot of production use cases can be run on one specific architecture, we have reached a maximum for the generic public blockchains: the amount of transaction a network can process is naturally limited, as individual records (known as blocks) are limited in size and frequency. There are two traditional layer one solutions to scalability: horizontal scalability refers to adding more nodes to a network to handle increasing tasks, while vertical scalability refers to adding more power to the machines that are in the network to handle increasing tasks.

It has turned out that there are severe problems with both types of layer one solutions to scalability. The issue with horizontal scalability is that in a public blockchain every node in the network validates and updates the ledger. Because every transaction needs to be processed by every single node, traditional horizontal scalability brings no benefit: adding more nodes to the network does not make it faster. As a consequence, most blockchain projects aim at vertical scaling. This typically involves increasing block size, which demands every node do more work. However, improving scalability through bigger blocks has drawbacks. It requires more work from nodes in the network, which means less powerful computers may not be able to operate in the network. Thus, vertical scalability results in fewer validating nodes, which means more centralized mining and more powerful node operators. Overall, vertical layer 1 scalability solutions sacrifice two of the three core tenets of blockchain technology: decentralization, security, and speed. In essence, it is not possible to scale on the base-layer and achieve all three together[141].

Apart from the advantages of domain-specific interaction and accurate representation of network value, this condition has been one of the major triggering factors for the very recent emergence of domain-specific blockchains. For anything

in production today, it has become useful for specific communities to start their own blockchain systems that are solely and purposefully directed towards their user groups and tailored for the characteristics of their space. The LYXF network is a manifesta-tion of this very recently evolving wave of blockchains and thereby caters to the in-teraction logic and transaction demands of the creative industries.

From the start, LYXF is able to process around 3 to 4 million transactions per day, which provides adequate leeway for running initial production use cases. The LYXF initiators are tasked with continuously improving the scalability of the network to accommodate for its organic growth. The LYXF founders will be launching a cross-industry blockchain working group together with other ecosystem providers to regularly working out good governance models for our shared new generation of industry-specific networks. Through the team's close ties with the Ethereum community and developers, LYXF is also in sync with innova-tions from this broad and vibrant space of programmable blockchains. On top of our own efforts, all development with regard to sharding and scalability in Ethereum can be taken over and adopted by the LYXF net-work.

Apart from its active seclusion and community focus, LYXF can then safe-guard apt transaction throughput through-out its progression trajectory by exhausting the progress made with layer two scalabili-ty solutions. These logically differ from the layer one solutions we mentioned earlier as they are built on top of a secure base-layer blockchain. They can achieve high throughput without compromising security by leaving the base-layer alone and building protocols on top of it. The second layer of mechanisms can extend the usefulness of public blockchains, letting interactions happen off chain that still refer back to the reliable base layer when necessary. Applications that need high throughput can use layer two environments while still benefiting from a secure base-layer.

Regulatory Landscape

As a relatively young technology, blockchain is slowly finding its feet in the legal area. In most jurisdictions around the world, regulators are developing an increasing expertise on the field and have shown a favorable stance towards the potentials that this foundational technology entails to its users. In its home jurisdiction, LYXF is a mem-b er of the German Blockchain Association (Bundesblock). It was founded in June 2017 by the blockchain community in Germany as non-profit association that focuses on educating political decision makers, corporate industry leaders, and the general public about blockchain technology[142]. LYXF is also a founding member of the International Association for Trusted Blockchain Applications (INTBA)[143], an Organisation close to the EU Commission that forsters dialog between regulators and industry players.

One of the major current topics at the intersection of blockchains and legal frameworks is the harmonization of decentralized ledger technology with the European General Data Protection Regulation (GDPR)[144], which is a regulation in EU law on data protection and privacy for all individuals within the European Union. For blockchain systems, the most important topic in this context is the right to erasure (Art. 17 GDPR, 'right to be forgotten'), where data subject shall have the right to obtain the erasure of personal data concerning him or her from the controller on the grounds of a number of reasons. This right is challenging to secure on Internet in general, as data is more often than not quite easily reproducible, even if a data controller can be asked to remove it. At first glance, this right also seems to be in conflict with one of blockchains' greatest benefits – the immutability of data that is permanently stored on top of their distribut-

ed infrastructures. When a blockchain contains personal data, the GDPR is applicable. However, innovation and the protection of individuals' fundamental rights are not two conflicting goals. In fact, the GDPR does not aim at regulating technologies per se, but regulates how actors use these technologies in a context involving personal data. Solutions will revolve around the pseudonymous character of blockchain data that can be set up in ways that obfuscate individual identities and make the triangulation of personal data technically impossible.

Legal regulation in the blockchain space often revolves around consumer safety with regards to Initial Coin Offerings (ICOs). Fabian Vogelsteller, one of LYXF's founders, p layed a significant and prominent role in d riving this way of funding as he formalized t he standard underlying most ICO tokens with Ethereum's ERC-20 token standard. For the LYXF blockchain, he developed the n ew approach of a Reversible ICO (RICO) to make funding schemes safe for investors and to re-balance the power between them and the project they support[145]. As opposed to the ex-post enforcement with legal means, this system provides overall consumer safety on-chain by hard-coding strong investor rights ex-ante.

Both by providing technological innovation and by working in close alignment with regulatory authorities, the LYXF initiators s afeguard that LYXF is a transparent and ca refully designed ecosystem for innovation th at is technologically and legally secure for al l of its users.

Data Privacy

As in all digitizing industries, also in the life-style world the privacy and security of their personal data has become a strong consumer concern when they interact with brands and platforms in different jurisdictions. Doug Stephens, retail industry futurist and author of "Reengineering Retail: The Future of Selling in a Post-Digital World" stated to McKinsey and the Business of Fashion:

"Privacy is like currency. Like any other currency, consumers are ultimately going to send that currency to brands and retailers they feel they can trust. It's going to become a basic business attribute that if you want to be successful and you want to have close, loyal relationships with customers, you're going to have to prove to them that you respect their information and that you will treat it with care." (Doug Stephens, 2018)[146]

On the LYXF Blockchain, all users retain power over the disclosure of their private data and personal information without needing to trust data processors or to resort to legal means. There often is a misconception around blockchains and privacy due to their fundamental design principles of data transparency and immutability. While the removal of data sitting on a blockchain would be at odds with its nature, it's the data that is of pseudonymous nature. Blockchains offer an unprecedented solution to the principle of differential privacy, which states that a statistic database should reveal nothing about an individual that could not be learned without access to the database. The LYXF blockchain allows for specific queries without the access to identities.

Further, real-life identities can be hidden between multiple addresses and proxy identities, which makes it up to the users how much they wish to reveal. While anyone can see the activity of a proxy identity, only certain peers will be able to know who this identity belongs to. On top of that, LYXF allows for the setup of identity systems with multiple identities for individual actors. For example, any interface can be set up in such a way that it automatically creates multiple identities; while they appear separate to the outside world, they can in fact be seamlessly related to each other. On the LYXF network, activity can thus be obfuscated, i.e. hidden behind scrambled data, which makes it nearly impossible for outsiders to triangulate identities and to reveal personal data.

Business Competition

As a blockchain-based digital base layer for coordinating interactions and transactions in the lifestyle arena, LYXF is an unparalleled first-mover project without any direct competition. Through its nature as a contingent ecosystem for innovation, the LYXF Blockchain has an exceptionally wide range of applicability. As a result, there will be other individual projects from both the blockchain and non-blockchain digital creator spaces, which are pursuing individual use cases addressing solutions that are similar to those that could be achieved also with LYXF. If these solutions are provided elsewhere, they can be considered competition; if they are built on top of the LYXF blockchain, they immediately become part of the ecosystem and support the growth of the network. This may for instance relate to applications around authentication, identi-fication, and anti-counterfeiting[147], supply chain tracking, provenance, and transpar-ency[148], marketplaces[149], sensor tech and smart products[150], or IP rights and patents[151].

While these projects are often very specialized in their thematic areas, the LYXF ecosystem aims at encompassing and in-corporating a whole range of these areas, which allows creators to fully exhaust their mutual synergies. On top of this, LYXF's strength lies in its contingency, where un-precedented blue ocean markets can be systematically created and captured. Going back to a 2004 theory of INSEAD professors W. Chan Kim and Renée Mauborgne[152], this concept denotes all the markets, and even industries, that are not in existence today: the unknown market space, untainted by competition and unconstructed in its boundaries. As demand is created rather than fought over in these areas, there is always potentially ample opportunity for rapid growth in "value innovation"[153]. Backed up with industry stats, prominent voices, and careful analyses, throughout this paper, we have gotten to know the lifestyle world as an arena undergoing transformational re-configurations. As fundamental logics of ownership, value, identity, and participation are being redefined, LYXF aims to be the all-encompassing digital base layer for innovation around all of these and future topic fields.

Technical Description

PROGRAMMABLE BLOCKCHAIN: EVM

CONSENSUSALGORITHM

The LYXF Blockchain will be an EVM based smart contract Blockchain, initially with a HoneyBadger BFT consensus algorithm and a fluctuating validator set based on smart contract based delegated PoS. It will be open-source, publicly accessible, and verifiable network of computers specifically tailored through common standards and use cases to the lifestyle industries.

We will first describe the public and programmable nature of the LYXF blockchain. By giving a short review of the young developmental history of payment and programmable blockchains, we will explore the properties and affordances that are at the core of LYXF inner workings, such as smart contracts and decentralized applications. Here, we will touch upon the power of the Ethereum Virtual Machine that forms the basis of LYXF's infrastruc-tu re. We will then turn to those programmable blockchain that have been built for specific p urposes, contexts, or industries, and explain why we have tailored LYXF specifically to th e lifestyle arena. We will then present LYXF's native cryptocurrency, LYX, and finally outl ine the algorithms we apply to reach distributed consensus about the state of LYXF's netw ork.

NATIVE CRYPTOCURRENCY: LYX

DOMAIN-SPECIFIC BLOCKCHAIN.

Programmable Blockchain: EVM

Before blockchain technology had come into existence through the Bitcoin network around 2009, there were severe limitations to the ways in which we could cooperate and collaborate on the Web. Around twenty years before we could make use of blockchains' features, cryptographer Nick Szabo had prominently stated in his book The God Protocols: "Doing business on the Internet requires a leap of faith. Because the infrastructure lacks the much-needed security, we often have little choice but to treat the middlemen as if they were deities."[154].

When the pseudonymous creator of Bitcoin published its whitepaper, it presented this necessary innovation to Internet users: for the first time, they could rely on "cryptographic proof instead of trust"[155] when they transacted value online. As Bitcoin is a payment blockchain, this notion refers to the trust we have to place into financial intermediaries, such as clearing houses or banks. Throughout this paper, regularly touched upon such centralized intermediary institutions in relation to the lifestyle industries – be they social networking sites, venture capitalists, authentication services, banks, or fashion marketplaces. What all have in common is their mission to coordinate between different, remote parties who would otherwise have no platform and reason to trust each other in the first place. Blockchain architectures can do just that.

Don and Alex Tapscott described the far-reaching consequences of this innovation as a transition from the "Internet of information" to the "Internet of value"[156]. Much like the Web itself, this groundbreaking "Peer-to-Peer Electronic Cash System"[157] (Nakamoto, 2009) represented an unparalleled "meta-technology"[158] that intelligently recombined existing technologies. This recombination outperformed previous projects of digital cash through its unprecedented solution to the double-spending problem. Up to this point, data could not be modelled as a scarce good: when we share a piece of data, say an image, it is also duplicated, i.e.: double-spent. The ledger of a blockchain prevents this duplication and makes each datum unique: it constitutes a fully transparent, continuously updated, and time-stamped protocol that permanently records the history of every bit of data it contains through a network of computers.

If a user were to transact a datum to a counterparty, the recipient is able to trace back its transaction history and may thereby verify that their transaction partner does in fact have ownership of this information. The record of all transactions is then permanent, as identical copies secured decentrally and spread across several computing devices or nodes. Blockchains are thus systems which nobody fully owns. They are distributed ledgers of information. They store data in lists, which are called blocks and tied together as a chronological 'chain' of data records. Before a new block can be added to this continuously growing and practically immutable chain, it must be verified by a community. There are different ways to achieve this verification, or to 'reach consensus' on the current state of the blockchain – we will touch upon them towards the end of this chapter. Once confirmed, the block is added to the chain of records, completing each transaction.

Throughout the discourse on the role of trusted third parties, other use cases than currency payments were found blockchain technologies, which can make traditional intermediaries redundant. It was realized that with their decentralized architecture, blockchains "can be applied to disrupt any centralized system that coordinates valuable information"[159]. The blockchains that have been developed thereupon vary in their verification mechanisms, but they all store information that needs to be validated.

The greatest push to make blockchain "a general-purpose technology"[160] was achieved through the transition from systems that were purely focused on payments to blockchains that are fully programmable. As the first realization of programmable blockchains, Ethereum introduced an open source, distributed computing platform and operating system that made blockchain operations customizable. While the types of transactions that could be performed on

the Bitcoin blockchain were fixed, Ethereum gave its users the flexibility to build their own custom interaction logics on top of its platform. Because of their unbound applicability, the co-founder of Ethereum, Vitalik Buterin, described these new versions of blockchain technology then as "Lego Mindstorms for building economic and social institutions"[161].

This idea rests mainly on the implementation of customizable smart contracts, which we mentioned frequently throughout this paper. Smart contracts are programs that run on the blockchain, that can communicate with each other, and that everybody is free to create without any entry barriers. They form the basis of all the unprecedented models of collaboration and cooperation that LYXF introduces to the creative arena. For a fixed number of parties that do not necessarily have to be known at the time of initialisation (cf. Buterin 2014), these computer protocols "automatically move digital assets according to arbitrary prespecified rules"[162]. This includes automated contractual negotiation, execution, and enforcement[163].

The LYXF blockchain is based on the Ethereum Virtual Machine, which is the most advanced smart contracting platform in existence. It is a sandboxed 'learning environment' for users to build and test ever more complex and robust contracts for their individual use cases. By using the EVM as a basis, the entire knowledge base of Ethereum is directly applicable to LYXF – developers can draw on all tools and tutorials that have already been built for the Ethereum ecosystem. This allows all existing projects from the lifestyle industry to easily transition from the Ethereum network to the LYXF blockchain, where they can use the synergies of being exclusively among their creative peers.

Smart contracts are different from conventional legal contracts. They are little verifiable programs that can define, determine, and automate online interactions. Law often works on the principle of ambiguous language, which can make it easier for parties to enter into a contractual arrangement, as it creates flexibility in terms of contractual performance. However, ambiguity and poor drafting can also be used by parties to wrestle free from contractual conditions that parties no longer want to honor. It is particularly difficult in situations where different legal systems are involved or where transactions are recurring, small, or automated.

Smart contracts provide solutions for these problems: They are self-executing and verifiable programs where the terms of the agreement between buyer and seller is directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. If parties want certainty, they can use a smart contract to ensure that a contractual condition is executed, forcing the parties to remain bound to their respective obligations. In the following, we will summarize some of the main advantages that smart contracts can bring to the lifestyle arena:

Unambiguity and automation: Well-designed smart contracts can reduce agency costs in situations of asymmetric information[165]. They "may facilitate the execution of complex agreements with greater clarity"[166]. This includes that they can improve the ambiguity of natural language, which is increasingly relevant for contracting in intercultural relationships, or where machines are involved.

Reduced costs: Smart contracts can be standardised and decrease the "marginal costs of contracting, much like the Internet did to the transmission of data and information"[167]. Cost-effectiveness can be a catalyst for large-scale collaboration, as it for instance allows for micro-payments in large-scale projects.

Multi-dimensionality: Smart contracts can capture an array of information without the need for it to be expressible with language. For example, it can process non-linguistic, sensory data[168], which is inherent to the emerging Internet of Things.

Speed: Smart contracts can execute in real-time, as they do not rely on paper and can execute automatically to pre-specified rules[169].

On this basis, programmable blockchains and smart contracts allow for an unseen flexibility, where all forms of formalized, automated, and complex interaction logics can be managed by chaining multiple smart contracts together. Smart contracts are concluded by a fixed number of parties[170]. Apart from these self-executing contracts, we can also use the architecture of blockchain systems to build entire decentralized applications (DApps), where an unlimited number of actors can freely participate.

"[Smart contracts] work like any other computer program's if–then statements. They just happen to be doing it in a way that interacts with real-world assets. When a pre-programmed condition is triggered, the smart contract executes the corresponding contractual clause."

(Cellabz, Blockchain & Beyond 2015)

DApps are applications that run on a network in a distributed fashion, where participant information is protected securely and pseudonymously, and where the execution of operations is decentralized across network nodes. As genuine peer-to-peer applications, fully decentralized applications lack a central agent and are owned by the communities of their contributors themselves.

This concept becomes more tangible if we think back to the business models of the so called 'sharing economy', which we touched upon in our chapters on the [Rent Services] and the [Decentralized Markets] that LYXF establishes for t he creative communities. When users want to find specific items on these markets, they can use a DApp to scan the LYXF "blockchain for al l the listings and filters and displays those that meet her criteria. Because the network creates a record of the transaction on the blockchain, a positive user review improves their respective reputations and establishes their identities—now without an intermediary"[171]. With this technological innovation, it is possible to build a system where value starts with the users, who are the key actors in a decentralized organism. If users benefit, then the network benefits collectively.

The properties of blockchain-based DApps lead to a number of other advantages over centralised architectures:

Risk Reduction: User data is not stored and processed on a central database. "There are only individual peer-to-peer pseudonymous transactions"[172].

Resilience: Through the multiple built-in redundancies of the network, it has no single point of failure and is hard to shut down[173].

Reputation: Trust in transaction partners is enhanced, because the same digital personas can be used across many decentralised applications; participants thus "benefit from continuity as a good person"[174].

Speed in Settlement: Parties can use escrow accounts to release payments. Through disintermediation, payments are settled instantly[175].

With the shift from web server based centralised applications to blockchain-based DApps also comes a shift in the technological layers on which innovation takes place and on which value is captured. On the Web, data is siloed, and thus scarce. The value which shared protocols produce is mostly aggregated as data on the apps layer. As for the Internet stack, we thus speak of thin protocols and fat applications.

On blockchains, this relationship is mostly turned around: Due to a shared public ledger of data, low entry barriers to an openly accessible network, and the interoperability of competing services, data is not a scarce good anymore. The holders of protocol tokens become stakeholders of the protocol itself and benefit from its growth. This shifts incentives and creates a feedback loop, where innovation and competition now logically takes place on the layer of the protocols. We thus speak of thin applications and fat protocols (USV, 2016). This fundamental shift prevents the "winner-takes-it-all" principle of centralised platforms and fosters new categories of value creation.

In the following, we will summarize the key economic advantages that the native design principles of LYXF's programmable blockchain architecture bring to its users:

Transparency and Trustlessness: The LYXF blockchain is a public record of in-fo rmation. This has two dimensions. On t he one hand, all blockchain code is open source. On the other hand, every historical transaction is fully auditable. This provides an unparalleled level of accountability and transparency, where users can verify and do not need to trust – neither the initial system creators, nor the parties they interact with.

Privacy: By itself, the LYXF system will not enforce identity, which we can see as shift from 'big data' to 'private data'. When personal information is only referenced on blockchains, instead of given directly to private corporations, it is stored on off-chain systems that can clearly define an access control. This can allow only specific parties to access data temporarily. In a transparent fashion, this can safeguard the privacy of consumers, who then have granular control over who can access which bits of information and for how long.

Security: The integrity and availability of the data that the LYXF blockchain con-tains is not reliant on any single party as it stores information in a decentralized fash-ion. It does not have a single point of fail-ure, which makes it a resilient, self-healing, and secure data memory. Practically speak-ing, the authentication through devices and signed messages instead of mere password greatly reduces the risk for its users. When access to private keys is lost, proper key management systems can ensure fast re-covery and the exclusion of malicious ac-tors. Overall, this can secure non-repudia-tion, confidentiality, and authenticity and therefore prevent hacking, identity theft, phishing, spam, malware, and ransomware.

Immutability and Preserved Rights: Having a decentralized data storage means that identical copies of all data are secured in a great number of different places simul-taneously. This redundancy results in an im-mutable record of information, where data on the LYXF network can practically not be modified, appended, or erased. This does not only mean that all data on the LYXF blockchain will never be lost, but also that it can naturally be administered by its users, independent of the initial system creators. This makes LYXF a platform that is owned and controlled by the community of its cre-ative users itself.

Interoperability: As an open 'meta-lay-er' of data, the LYXF blockchain makes it possible to synchronize and harmonize the different pieces of information that are coming from the various parties in the life-s tyle ecosystem. Interoperability based on s mart contract interface standards allows t hird party systems to easily interact with created items and identities, which can in turn trigger a great deal of innovation and experimentation around them.

Efficiency: The way that data on the LYXF blockchain is handled can be auto-m ated through the use of smart contracts, w hich can be programmed to trigger events a utomatically when certain conditions are met. This enables an efficient sharing of in-formation, minimizes costs, and improves operational efficiencies.

Domain-Specific Blockchain

124

The programmable blockchains we have described so far are general systems, which are applicable to an unlimited range of purposes. However, advertising towards a general audience has shown to be in conflict with the extent of scalability that current blockchain allow for. In this sense, LYXF is spearheading the very new gener-ation of context-based, or purpose-driven, blockchain architectures that creates an ecosystem that is systematically tailored to the needs and nature of the fashion, design, and lifestyle communities. In the following, we will describe the three core benefits of this differentiation.

Scalability: One of the most pressing challenges for blockchain technologies has been the scalability of their networks. While a lot of production use cases can be run on one specific system, we have reached a maximum for the generic public blockchains. LYXF therefore creates a separate network that allows for real-world use cases solely directed towards a specific user group and tailored for the characteristics of the creative arena.

Domain: LYXF allows creatives to interact with their own community in the same space. Today, we see many new forms of smart contract blockchains compete with Ethereum as the original initiator of smart contracts and decentralized applications. While they often offer alterations in their individual architectures, they are mostly focused to be usable by all world industries and segments. This technological experimentation and competition is important – yet it brings hardly any concrete and tailored solutions to major industries and businesses as they explore the value they can gain from using blockchain technology for their individual use cases. They mainly function as experimentation grounds for new cross industry use cases and new forms of governance. We are convinced that if a community wants to make use of the affordances of blockchain, they need to start their own. For this reason, LYXF joined forces with many leading figures and in-novators of the creative sector to create a trusted technological ecosystem that is directed and owned by its creative users: it invites all participants of this community to explore and experiment with use cases that are useful for their economies.

Network Value: The value of the LYXF blockchain reflects the digital eco-nomic activity of the creative space. It naturally increases as the network gains traction. This, in turn, incentivizes ever broader ranges of creatives to build their own solutions on the LYXF system, as all participants will immediately ben-efit from the growth of their communi-ty-owned blockchain.

Native Cryptocurrency: LYXF

The name of the LYXF block-chain's native cryptocurrency is 'LYXF'. The initial total supply of 100,000,000 LYXF will be created in the genesis block, and will likely have a small block reward to incentivise validators to produce blocks. It is offered to the public and to stakeholders of the lifestyle arena. Buyers will then have collective crowd ownership of LYXF's na-tive currency, are independent from the network initiators, and can use their LYXF on the LYXF platform.

LYXF are necessary to ensure the securi-ty of LYXF's decentralized infrastructure and make sure that its users can trust each other unconditionally. The LYXF block-chain secures itself through the costs to participate in the network. This has a num-ber of dimensions: LYXF will likely be required to create and execute smart contracts and to move LYXF coins themselves; by doing so they are used as transaction fee to prevent spam on the network; these fees serve as the incentive for the fluctuating group of validators to create blocks.

This transaction fee for executions and value transfers is calculated using a unit called 'gas'. The total gas amount required for performing a transaction on the LYXF network is derived from the sum of all hard-coded atomic computations by the transaction. This gas is then multiplied by the provided gas price provided by the us-ers and results in the amount of LYXF to be paid for the transactions. As such, it does not represent a token or coin in itself, but rather a measuring unit.

The gas price is determined by the user initiating the transaction, but the validator sets the minimum gas price they are willing to accept. This creates a market in itself and allows for a balance of usage cost over time. Users that pay a higher gas price are likely to have their transactions executed faster than users that go for the minimum accepted gas price.

Apart from being the fuel and security of the LYXF blockchain, LYXF will function as unit of account and a store of value. The collective network value is determined by its use, i.e. demand for LYXF. This way it will eventually become an indicator of the aggregate digital economic activity of the creative space, as we have seen in compa-rable ways with major blockchains over the past five years.

LYXF will also be needed in the stak-ing process and therefore function as the economic incentive to prevent attacks and submit invalid blocks, as LYXF will be slashed if wrong behaviour is detected in the con-sensus of the network.

The final functionality of LYXF will de-pend on the final architecture and con-sensus algorithm of the LYXF blockchain and could change should it be necessary to make the network more useful for all par-ticipants.

Consensus Algorithm

To verify and secure the transactions that occur on their decentralized architectures, public blockchains have shown different mechanisms to reach consensus. Consensus algorithms are fault-tolerant mechanism that are used to achieve the necessary agreement on a single data value or a single state of the network among distributed processes or multi-agent systems.

The LYXF Blockchain deviates from the Proof-of-Work (PoW) consensus algorithm that is currently being used on the Ethereum mainnet. Its test network is initially built on the basis of the PoA.network[176], which is an EVM-based Proof-of-Authority (PoA) network. In this context, the rule set of LYXF's architecture is designed, where a number of fundamental smart contracts are set up. Here, validators are a chosen list of nodes that are selected through a process of voting and staking LYX coins. Those validators will deterministically sign blocks. If nodes see a block signed by one of these validators, it is deemed valid. The rules for adding and removing a validator will be determined by a smart contract on the blockchain itself as a hard-coded governance mechanism.

The LYXF mainnet is planned to launch with a delegated Proof of Stake (dPoS) governance around a PoA algorithm, called Honeybadger BFT[177].

dPoS allows for a faster network start but it comes with some limitations that could become more important the larger the network grows. Therefore LYXF plans to transition to a pure Proof-of-Stake (PoS) mechanism where validators, i.e. the nodes which are accepted to create and sign blocks, are chosen purely by the amount of LYX that they stake (lock) for the purpose of creating new blocks. This way, the PoS algorithm allows anybody to become a validator for the LYXF network, given that they can provide enough LYX to stake. Validators then propose certain blocks and other validators sign on these blocks. If a proposed block creates inconsistencies with other proposed blocks according to certain slashing conditions, the proposing validators can be punished by destroying the validators' stakes.

Currently, there are two open-source PoS consensus algorithms being developed by the blockchain community, and the Ethereum community more specifically: Tendermint and Casper. As soon as Casper research has solidified, LYXF will transition to a Casper-based network that will allow for sharding – just as the main Ethereum network will do at that time.

Overall, the initial LYXF network will allow for 3 to 8 million transactions per day, which equals up to ±100 transactions per second and will be sufficient for it to run a great number of initial applications. As soon as validator nodes will use more advanced machines, this number can be increased to around 500 transactions per second. We can expect the use of sharding to increase this yet again by around 1000 times.

Current developments in the Blockchain space show that a multiple levels and interconnections between blockchains will be a thriving factor for scalability. In this LYXF can function as a base layer for so called Dapp-Chains, and side chains of all sorts that secure or link themselves in to the LYXF blockchain.

We will also establish links to other blockchains including the Ethereum mainnet to allow transferability of assets between these networks.

Key advantages of using a dPoS-algorithm

Governance can be flexibly determined and specialized;

Stakers and Delegates become industry participants through a specialized governance with voting and staking.

Potential drawbacks of using a dPoS-algorithm

Group interests could block users, which would decrease the overall trust in the network;

Delegation processes are slower and are only viable for a limited number for delegates and voters

Key advantages of using a PoS-mechanism

Larger stakes in LYX coins that were bought by early adopters will likely be sold over time, which leads to a natural distribution and decentralization of the system. This can naturally increase the overall trust in the network by all parties;

The security and decentralization benefits have already been tested in multiple blockchain projects over the past ca. five years;

The liability for validators is limited due to the permissionless and random nature of their role.

Potential drawbacks of using a PoS-mechanism

While the PoS consensus algorithm is being developed by major thought leaders in the blockchain space, its development is not fully finalized at this point of time;

For staking in PoS, a minimum amount of LYX is required.

Outlook

128—132

LYXF is inspired by and born out of the system-level and technology changes that are shaping the current lifestyle world. Throughout this paper, we explored those changes mainly along two convergences: the ones of hierarchies and the one of reality dimensions. We learned how horizontal hierarchies are dissolving, as formerly disconnected siloes of creative production are coming together, feeding back in reciprocal stimulation and merging into a shared and transdisciplinary lifestyle arena. We discovered how vertical hierarchies are disintegrating as creators and consumers are coming together in a joint cultural conversation, seeking individuality at scale, and replacing the former de facto elitism in cultural fabrication with more democratic approaches. Along the entire journey, we repeatedly came back to the rapid expansion of hyper-realistic virtual production and its continuous conflation with physical creative expression.

While all of these progressions are strong and natural directions, they are still evolving from their early playful and youthful manifestations. They present themselves to us in a pivotal moment, a crisis of creatives that we see in the most positive and optimistic light. In its literal meaning, crisis means decision. In the current state of the lifestyle world, actors from all disciplines, industries, entities, and positions around the world must and can take decisions about how they would like the future landscape to develop, and what role they want to play in it.

We have initiated LYXF as a system that will continue to expand the set of possible options for all creators to collectively address and create current

and future changes in an arena marked by a constant and vibrant state of flux. LYXF is not only a tool to m aster present changes. More than that, it provides a proactive breeding ground to shape future creative markets, assets, and communities. It gives all stake- holders the power and authority to make and carry out decisions about the ways in which they wish to push the space forward whilst keeping their focus set on their creative expression.

As the LYXF network powers and secures sys-te ms of trusted cooperation in the lifestyle arena, it lo wers entry barriers, supports individual creatives, a nd brings disparate communities closer together. I t supports a contemporary form of popular art and craft, where culture arises spontaneously from the inspired masses themselves. In this sense, lifestyle production and consumption will become even more communal endeavours. They will become collective and reciprocal experiences.

Whatever structural changes and opportunities might occur with the new creative economies, at their core they will always continue to support the process- es that the lifestyle world has aimed to enable from its start: mindful and conspicuous consumption, in- dividualization and identification, differentiation and recognition. In these processes, the cornerstone of lifestyle construction today is consumption behavior. This behavior is organized around vibrant communi- ties, which have become the first point of reference for creative peers.

We explored how in this not-so-distant future, participants will carry out their self-expression seam-

lessly across applications and realities. They will be able to access the virtual models of their physical products in digital closets, hanging side by side with their digital-only couture. Their ownership is unconstrained by the walled gardens of the current digital platform economies. They will want to sell these items on decentralized markets or lend them to others on sharing economy platforms. They will want to explore and showcase the one-of-a-kind stories of their personal items to their peers, followers, or buyers. Through the adoption of digital ownership, creators and consumers will have direct access to each other through their products. Their permanent, virtual links will allow them to engage in co-creative processes and to unleash their imaginative qualities collectively.

As we are seeing the lifestyle arena modernizing at the speed of light, the silhouettes of these modern and ambitious expressions of lifestyle have become clearly visible. While there are a few pieces missing to realize them, this blueprint presented the key building blocks that we need to move the space further in this direction. It is a space made up of exceptionally social people. Providing them with a digital and economic base layer for their interactions has the potential to substantially increase the trust, transparency, and efficiency in their converging and accelerating space.

While this paper about LYXF's vision of the future lifestyle system was extensive, it was by no means exhaustive. As a contingent and dynamic ecosystem, LYXFwill be a sustained ground for experimentation

also for those future scenarios that we cannot yet foresee today. Those scenarios are not fixed, but they are to be constructed by all of us. In this spirit, LYXF is meant as an instigation and invitation for all of those creatives who are willing to design and deploy the modern features of the new creative economies.

Glossary

A

ARTIFICIAL INTELLIGENCE (AI)

The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making and translation between languages.

AUTHENTICATION

A process that is applied to identify a physical product, to supply it with a digital representation and to use all the information that is attached to its digital version over time to create new forms of value. We call this model a "Digital Certificate".

AVATAR

An icon or figure representing a particular person in digital environments and virtual realities, such as video games or Internet fora.

AUGMENTED REALITY

A technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view.

B

BLOCKCHAIN

A cryptographic or encoded ledger comprising a digital log of transactions shared across a network.

C

COMPUTER-GENERATED IMAGERY (CGI)

Application of computer graphics to create or contribute to images, most commonly used to refer to 3D computer graphics.

CIRCULAR ECONOMY

A system that is restorative and regenerative by design, relying on system-wide innovation to minimise resource input, waste, emission and energy leakage by slowing, closing, and narrowing material and energy loops.

COMPOUND ANNUAL GROWTH RATE (CAGR)

Annualised average rate of growth between two given years, assuming growth takes place at an exponentially compounded rate.

CONSENSUS MECHANISM

Algorithms that make sure all nodes (device on the blockchain that maintains the blockchain and processes transactions) are synchronised with each other and agree on which transactions are legitimate and are part of a blockchain.

CRM (CUSTOMER RELATIONSHIP MANAGEMENT)

The strategy and processes for managing the company's relationships and interactions with existing and potential customers.

CRYPTO ECONOMICS

The use of blockchain-based incentive mechanisms to design new types of systems, applications and networks.

D

DECENTRALIZATION

A hard-to-quantify measure of a network's resistance to attack, a function of how broadly control is distributed among different actors.

DECENTRALISED APPLICATION (DAPP)	An application that runs on a network in a distributed fashion with participant information securely (and possibly pseudonymously) protected and operation execution decentralized across network nodes.
DIGITAL CERTIFICATE	The unique digital record of a real-life item that bridges the gap between the physical and the digital world by enabling the digital ownership of lifestyle products.

E

ETHEREUM	An open source, distributed computing platform and operating system that marks the first realization of a programmable blockchain.
ETHEREUM VIRTUAL MACHINE (EVM)	The most developed smart contracting platform in existence, that can run bytecode compiled from smart contract languages like solidity.

F

FORTNITE	A last-man-standing free-to-download online video-game shooter that was developed by Epic Games and released in 2017.

G

GAS	Transaction fee for executions and value transfers on public blockchains.
GEN Z	Demographic cohort born circa 1995–2014, following the Millennial generation.

I

IRL	Abbreviation for the phrase 'In Real Life". Used to differentiate reality from something that happens in virtual realities, such as games or social media.
IVL	Abbreviation for the phrase 'In Virtual Life". Something that happens in virtual realities, such as games or social media.

K

KEY PERFORMANCE INDICATOR (KPI)	A quantifiable measure used to evaluate the success of an organisation in meeting objectives for performance.

M

MACHINE LEARNING	A form of artificial intelligence that automates analytical model building, enabling systems to "learn" with minimal human intervention.

M-COMMERCE	Mobile commerce; the use of wireless handheld devices such as cellular phones and laptops to conduct commercial transactions online.
MILLENNIALS (GENERATION Y/GEN Y)	Demographic cohort born circa 1982–99. Are also commonly referred to as Generation Y (this name is based on Generation X, the generation that preceded them).

O

OMNICHANNEL	Sales approach that provides the customer with an integrated shopping experience across a multitude of online and offline sales channels.
OPEN SOURCE	Denoting software for which the original source code is made freely available and may be redistributed and modified.

P

PHYGITAL	Convergence of physical and digital experiences or objects as a result of a virtualization process.
PROVENANCE	The chronology of the ownership, custody or location of an object.
PUBLIC-PRIVATE KEY PAIR	Concept from cryptography, which helps to encrypt or sign information.
PROOF-OF-AUTHORITY (POA)	Consensus protocol used with blockchains that delivers comparatively fast transactions through a consensus mechanism based on identity as a stake.
PROOF-OF-STAKE (POS)	Consensus protocol in which, instead of mining, nodes can validate and make changes to the blockchain on the basis of their existing economic stake.
PULL BASED SUPPLY CHAIN	Supply chain constructed to be responsive to customer demands. Products enter the supply chain only when customer demands justify it.
PUSH BASED SUPPLY CHAIN	Supply chain based on forward looking projections of customer demands. Productions levels are predetermined and "pushed" to the market.

R

RADIO-FREQUENCY IDENTIFICATION (RFID)	RFID uses electromagnetic fields to automatically identify and track tags attached to objects.
ROI	Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments.

S

SCALABILITY

A measurement of throughput of a given system.

SMART CONTRACTS

A computer program stored in a blockchain that can automatically move digital assets or execute logic between accounts if conditions encoded in the program are met. It serves as a way to create a mathematically guaranteed promise between two parties.

T

TOKENS

Piece of data that stands in for a valuable and more abstract piece of information, which can represent any form of asset.

TOKENIZATION

Process of converting rights to real-world assets into digital tokens on a blockchain.

TRANSACTION FEE

Blockchain fee, 'miners' fee, sometimes measured in a gas metric. It is the network transaction fee that is charged to users when performing transactions.

U

USER EXPERIENCE (UX)

Overall experience, including emotions, perceptions, and reactions, to the usage of a product or service. UX design refers to the optimisation of the experience.

USER INTERFACE (UI)

The intersection where an information devices and users interact. Most common examples include interactive aspects of operating systems and interfaces of digital applications.

V

VERIFYING NODE

Any computer that connects to a specific blockchain network.

VALIDATOR (NODE)

Any computer that participates in the consensus of a specific blockchain network.

VIRTUAL REALITY

Computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment.

References

138—144

1   Gartner 2019: Digitalization.

2   SAP News 2016: Digitization vs. Digitalization – Wordplay or World View?

3   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 44.

4   Highsnobiety (2018): The New Luxury.

5   Influencer Marketing (2019): Benchmark Report.

6   eMarketer (2018): Instagram Influencer Marketing Doubled in 2017.

7   ECDSA = Elliptic Curve Digital Signature Algorithm.

8   Vogue (2016): The Future of Fashion with Alexa Chung.

9   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 17.

10   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 45–50.

11   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 60.

12   Euromonitor (2018): The World is Driven by Emotions: Breaking Tradition the Millennial Way.

13   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 17.

14   Highsnobiety (2018): The New Luxury.

15   The World Bank (2014): The Next Frontier for Open Data: An Open Private Sector.

16   Highsnobiety (2018): The New Luxury.

17   Charles-Roux (2005): The World of Coco Chanel: Friends, Fashion, Fame: 337. High Holborn: Thames and Hudson Ltd.

18   Stewart (2005): Copying and Copyrighting Haute Couture: Democratizing Fashion, 1900–1930s, 28 French Hist. Stud. 103: 129–130.

19   Taylor, Kerry (2013): Madeleine Vionnet, The Architect of Couture; in: Vintage Fashion & Couture: From Poiret to McQueen. Richmond Hill, ON: Firefly Books.

20   Walker, Myra (2006): Balenciaga and His Legacy: Haute Couture from the Texas Fashion Collection: 117. The Meadow Museum.

21   The Fashion Law (2017): Counterfeits Are on the Rise, So Too are Anti-Counterfeiting Technologies.

22   ibid.

23   Vogue (2016): Ferragamo To Microchip Shoes And Bags.

24   Business Wire (2017): Global Brand Counterfeiting Report 2018.

25   The Business of Fashion (2018): Fighting the 450 Billion Trade in Fake Fashion.

26   World Intellectual Property Organization (WIPO) (2004): What is Intellectual Property?

27   Forbes (2015): Dolce & Gabbana's Milan Fashion Week Selfies Only Enhance The Fact We're Still Blinded By Gimmick.

28   Times of Malta (2018): Putting the 'Y' in Gucci.

29   Center for Strategic & National Studies (2014): 2014 McAfee Report on the Global Cost of Cybercrime.

30   Wright, A., & De Filippi, P. (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia. SSRN Electronic Journal.

31   Saddik, A. El (April 2018). "Digital Twins: The Convergence of Multimedia Technologies". IEEE MultiMedia. 25 (2): 87–92.

32   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 44.

33   Highsnobiety (2018): The New Luxury: 12.

34   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 44.

35   Highsnobiety (2018): The New Luxury: 5.

36   Highsnobiety (2018): The New Luxury: 11.

37   The Business of Fashion (2018): JD.com's Richard Liu Decodes the Chinese Consumer.

38   Highsnobiety (2018): The New Luxury: 16.

39   This opens up new opportunities for gamification, which is discussed in detail in the Use Case 'PARTICIPATE: Gamification'.

40   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 44.

41   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 68.

42   ibid.: 26.

43   For passive NFC tag standard specification see NXP.

44   Advanced Encryption Standard. See Processing Standards Publication 197.

45   Swarm is a distributed storage platform and content distribution service, a native base layer service of the ethereum web3 stack. See details.

46   The InterPlanetary File System is a protocol and network designed to create a content-addressable, peer-to-peer method of storing and sharing hypermedia in a distributed file system. See details.

47   VICE 2018: What is Digital Clothing?

48   Lil Miquela (2019).

49   Noonoouri (2019).

50   Carlings Digital Collection (2018).

51   HYPEBEAST (2018): Carlings Launches Digital-Only Capsule Collection.

52   The Fabricant (2019).

53   Highsnobiety (2018): The New Luxury: 16.

54   Dame Ellen MacArthur in McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 65.

55   ibid.

56   The Fabricant (2018): Kiss Goodbye to Drop Culture and Old World Fashion.

57   Barclaycard (2018): Snap and Send Back.

58   The Fabricant (2019).

59   ibid.

60   NYMAG (2018): Fortnite's Fashion Industry Makes As Much Money As Amazon.

61   Forbes (2018): Twilight Tech: The Illusory LFW Project Revealing An Iceberg Of Virtual Fashion Innovation.

62   Sabotage Times (2013): 20 Years Of Magic: The Gathering, A Game That Changed The World.

63   Konami Digital Entertainment (2011): Yu-Gi-Oh! Card Game Breaks World Record with 25.1 Billion Cards Sold.

64   Pokemon (2018): Business Summary.

65   Venture Beat (2017): SuperData: Hearthstone Trumps All Comers in Card Market That Will Hit $1.4 Billion in 2017.

66   Pokemon Go (2018).

67   Stark, Josh (2017): Digital Collectibles and the Weird Future of "Digibles".

68   ERC721 (2018).

69   CNET (2018): Someone Just Bought a Cryptocurrency Cat For $172,000.

70   This list is partly inspired by Jason Yanowitz (2018): What are Non-Fungible Tokens?

71   Forbes (2018): Unlocking a $200 Billion Dollar Collectibles Market on the Blockchain.

72   Cwerner, S. (2001): Clothes at Rest: Elements for a Sociology of the Wardrobe. Fashion Theory, 5(1): 87.

73   Goffman, E. (1961): Identity Kits: 245. Selection from Asy-

lums. CITY: Doubleday Dell.

74   Cwerner, S. (2001): Clothes at Rest: Elements for a Sociology of the Wardrobe. Fashion Theory, 5(1): 79.

75   Rice, M. (The Guardian 2000): Dejunk Your Life.

76   Thesander, M. (1997): The Feminine Ideal. London: Reaktion Books.

77   Cwerner (2001): Clothes at Rest: Elements for a Sociology of the Wardrobe. Fashion Theory, 5(1): 81.

78   Calefato, P. (1997): Fashion and Worldliness: Language and Imagery of the Clothed Body: 71. Fashion Theory 1(1): 69.

79   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 49.

80   Highsnobiety (2018): The New Luxury: 16.

81   Mordor Intelligence (2018): Global Gamification Market.

82   Victoria Secret (2018): Pink Nation.

83   RetailWire (2018): Can Gamification Solve Fashion's Mix and Match Challenges?

84   Sabotage Times (2013): 20 Years Of Magic: The Gathering, A Game That Changed The World.

85   Konami Digital Entertainment (2011): Yu-Gi-Oh! Card Game Breaks World Record with 25.1 Billion Cards Sold.

86   Pokemon (2018): Business Summary.

87   Venture Beat (2017): SuperData: Hearthstone Trumps All Comers in Card Market That Will Hit $1.4 Billion in 2017.

88   Pokemon Go (2018).

89   ERC721 (2018).

90   CNET (2018): Someone Just Bought a Cryptocurrency Cat For $172,000.

91   Positive Luxury (2018): Predictions Report: 7.

92   Highsnobiety (2018): The New Luxury: 16.

93   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 39.

94   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 40.

95   Remy, et al. (McKinsey 2016): Style That's Sustainable: A New Fast Fashion Formula".

96   Barnardo's (2015): Once worn, thrice shy – British women's wardrobe habits exposed!

97   The Business of Fashion (2019): The Year Ahead – The End of Ownership.

98   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 65.

99   Nielsen (2015): Sustainability Report 2015.

100   World Economic Forum and Nottingham Trent University (2018): Product service systems: a viable business model for fashion brands?

101   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 40.

102   DailyMail (2018): Latest High Street LEND!

103   Global News Wire (2018): By 2026- Future Market Insights.

104   Rent The Runway (2018).

105   The Guardian (2018): Spotify for fashion: does renting clothes signal the end for our wardrobes?

106   BBC (2018): Will we soon be renting rather than buying our clothes?

107   OpenBazaar (2019).

108   Arcade City (2019).

109   Snag Ride (2019).

110   BeeToken (2019).

111   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 40.

112   The Business of Fashion (2019): The Year Ahead – The End of Ownership.

113   McKinsey analysis based on: Sherman, Lauren, "The Price of Transparency", Business of Fashion (17th June 2016); and based on prices displayed on Louis Vuitton country web pages in August 2018.

114   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 39.

115   Net-a-Porter (2019).

116   Farfetch (2019).

117   Harvard Business Review: The New Normal: Luxury in the Secondary Market.

118   ThredUP (2018): 2018 Resale Report.

119   ibid.

120   Lyst (2018).

121   ThredUP (2018): 2018 Resale Report.

122   Harvard Business Review: The New Normal: Luxury in the Secondary Market.

123   The Fashion Law (2018): Chanel Files Ugly Lawsuit Against What Goes Around Comes Around, Citing Fakes.

124   The Fashion Law (2018): Chanel is Suing the RealReal For Allegedly Selling Fake Bags.

125   The Fashion Law (2018): The Rocky Relationship Between Luxury Resale and (Some) Luxury Brands.

126   Harvard Business Review: The New Normal: Luxury in the Secondary Market.

127   ibid.

128   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 40.

129   ibid.

130   Highsnobiety (2018): The New Luxury: 8.

131   Euromonitor (2018): The World is Driven by Emotions: Breaking Tradition the Millennial Way.

132   Bain & Company (2017): Luxury Goods Worldwide Market Study.

133   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 17.

134   ibid.: 56.

135   ibid.: 26.

136   McKinsey and The Business of Fashion (2018): Global Fashion Survey.

137   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 53.

138   McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 83.

139   NASDAQ (2018): What Do We Mean When We Talk About Blockchain Ecosystems?

140   This is comparable to Ethereum's EIP process.

141   Down, Mina (Hackernoon 2018): Solving Blockchain Scalability Problems with Layer 2 Solutions.

142   Bundesblock (2019).

143   INTBA (2019).

144   GDPR (2018).

145   Forbes (2018): ERC20 Token Standard Co-Creator Is Building A Blockchain For The Fashion And Lifestyle Industry.

146   McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 53.

147   Examples: VeChain, Bonafi, Arianee, Digmus, Blockverify,

Wegen, Luxchain, Rudholm Group, entrupy, OpSec.

148 Examples: Viant, Modum, OriginTrail, Linkchain, Chronicled, Provenance.

149 Examples: Project Dress Code, Pozess.

150 Examples: Loomia, WaltonChain.

151 Examples: IPwe, Proofstack, Binded, Bernstein.

152 Kim, W.C.; Mauborgne, R. (2004): Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant. Boston: Harvard Business School Press.

153 Kim, Chan; Mauborgne, Renee (2004): Value Innovation: The Strategic Logic of High Growth. Harvard Business Review.

154 Szabo, N. (1997). The God Protocols.

155 Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.

156 Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World. Penguin Publishing Group.

157 Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.

158 Mougayar, W., & Buterin, V. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology. Wiley.

159 Davidson, S., Filippi, P. De, & Potts, J. (2016). Economics of Blockchain: 3. SSRN, 1–23.

160 ibid.: 15

161 Buterin, V. (2015). Visions part I: The Value of Blockchain Technology.

162 Buterin, V. (2014). DAOs, DACs, DAs and More: An Incomplete Terminology Guide.

163 Wright, A., & De Filippi, P. (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia. SSRN Electronic Journal.

164 Cellabz (2015). Blockchain & Beyond, (Nov.), 1–38.

165 Eha, P. (2016). Smart Contracts: A Tool for Bank Lawyers, Not a Replacement. American Banker, 181(367), 22–24. Also, Yermack, D. (2015). Corporate Governance and Blockchains. NBER Working Paper Series, December 2015.

166 Wright, A., & De Filippi, P. (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia: 25. SSRN Electronic Journal.

167 Wright, A., & De Filippi, P. (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia: 24. SSRN Electronic Journal.

168 Swan, M. (2015). Blockchain: Blueprint For A New Economy. Sebastopol (CA): O'Reilly Media.

169 ibid.: 25.

170 Ethereum White Paper: A Next Generation Smart Contract & Decentralized Application Platform.

171 Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World: 224. Penguin Publishing Group.

172 ibid.

173 Mougayar, W. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology: 178. Wiley.

174 Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World: 224. Penguin Publishing Group.

175 Mougayar, W. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology: 235. Wiley.

176 PoA.network's tech lead Igor Barinov is on LYK's advisory board, as well as Péter Szilágyi, the Lead Core Developer of geth, which is the Ethereum Foundation's main network client.

177 More details about Honeybadger BFT can be found here.

BBC (2018): Will we soon be renting rather than buying our clothes?

Business Wire (2017): Global Brand Counterfeiting Report 2018.

Buterin, V. (2015). Visions part I: The Value of Blockchain Technology.

Buterin, V. (2014). DAOs, DACs, DAs and More: An Incomplete Terminology Guide.

Carling's Digital Collection (2018).

Cellabz (2015). Blockchain & Beyond, (Nov.), 1–38.

Charles-Roux (2005): The World of Coco Chanel: Friends, Fashion, Fame: 337. High Holborn: Thames and Hudson Ltd.

CNET (2018): Someone Just Bought a Cryptocurrency Cat For $172,000.

Cwerner (2001): Clothes at Rest: Elements for a Sociology of the Wardrobe. Fashion Theory, 5(1): 87.

DailyMail (2018): Latest High Street LEND!

Davidson, S., Filippi, P. De, & Potts, J. (2016). Economics of Blockchain: 3. SSRN, 1–23.

Eha, P. (2016). Smart Contracts: A Tool for Bank Lawyers, Not a Replacement. American Banker, 181(367).

eMarketer (2018): Instagram Influencer Marketing Doubled in 2017.

Ethereum White Paper: A Next Generation Smart Contract & Decentralized Application Platform.

Euromonitor (2018): The World is Driven by Emotions: Breaking Tradition the Millennial Way.

Global News Wire (2018): By 2026- Future Market Insights.

Goffman, Erving (1961): Identity Kits: 245. Selection from Asylums. CITY: Doubleday Dell.

Haedrich, Marcel (1971): Coco Chanel: Her Life, Her Secrets. Boston, Massachusetts: Little, Brown and Company.

Harvard Business Review: The New Normal: Luxury in the Secondary Market.

Highsnobiety (2018): The New Luxury.

HYPEBEAST (2018): Carlings Launches Digital-Only Capsule Collection.

Influencer Marketing (2019): Benchmark Report.

Konami Digital Entertainment (2011): Yu-Gi-Oh! Card Game Breaks World Record with 25.1 Billion Cards Sold.

McKinsey and The Business of Fashion (2018): Global Fashion Survey.

McKinsey and The Business of Fashion (2018): The State of Fashion 2018: 17.

McKinsey and The Business of Fashion (2019): The State of Fashion 2019: 45–50.

Mordor Intelligence (2018): Global Gamification Market.

Mougayar, W., & Buterin, V. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology. Wiley.

Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.

NASDAQ (2018): What Do We Mean When We Talk About Blockchain Ecosystems?

Nielsen (2015): Sustainability Report 2015.

Positive Luxury (2018): Predictions Report: 7.

Remy, et al. (McKinsey 2016): Style That's Sustainable: A New Fast Fashion Formula".

RetailWire (2018): Can Gamification Solve Fashion's Mix and Match Challenges?

Rice, Maureen (The Guardian 2000): Dejunk Your Life.

Sabotage Times (2013): 20 Years Of Magic: The Gathering, A Game That Changed The World.

Stewart (2005): Copying and Copyrighting Haute Couture: Democratizing Fashion, 1900–1930s, 28 French Hist. Stud. 103: 129–130.

Swan, M. (2015). Blockchain: Blueprint For A New Economy. Sebastopol (CA): O'Reilly Media.

Szabo, N. (1997). The God Protocols.

Tapscott, D., & Tapscott, A. (2016). Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World. Penguin Publishing Group.

Taylor, Kerry (2013): Madeleine Vionnet, The Architect of Couture; in: Vintage Fashion & Couture: From Poiret to McQueen. Richmond Hill, ON: Firefly Books.

The Business of Fashion (2019): The Year Ahead – The End of Ownership.

The Fashion Law (2017): Counterfeits Are on the Rise, So Too are Anti-Counterfeiting Technologies.

The Fashion Law (2018). Chanel Files Ugly Lawsuit Against What Goes Around Comes Around, Citing Fakes.

The Fashion Law (2018): Chanel is Suing the RealReal For Allegedly Selling Fake Bags.

The Fashion Law (2018): The Rocky Relationship Between Luxury Resale and (Some) Luxury Brands.

The Guardian (2018): Spotify for fashion: does renting clothes signal the end for our wardrobes?

Thesander, Marianne (1997): The Feminine Ideal. London: Reaktion Books.

The Times (2018): Meet Lil Miquela, the Instagram star created by CGI.

ThredUP (2018): 2018 Resale Report.

Venture Beat (2017): SuperData: Hearthstone Trumps All Comers in Card Market That Will Hit $1.4 Billion in 2017.

Victoria Secret (2018): Pink Nation.

Vogue (2016): The Future of Fashion with Alexa Chung.

Vogue (2016): Ferragamo To Microchip Shoes And Bags.

Vogue (2018): Why CGI Influencer Noonoouri is Flooding Your Social Media Feed.

Walker, Myra (2006): Balenciaga and His Legacy: Haute Couture from the Texas Fashion Collection: 117. The Meadow Museum.

Wright, A., & De Filippi, P. (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia. SSRN Electronic Journal.

Yermack, D. (2015). Corporate Governance and Blockchains. NBER Working Paper Series, December 2015.

CONTACT

LYXF