

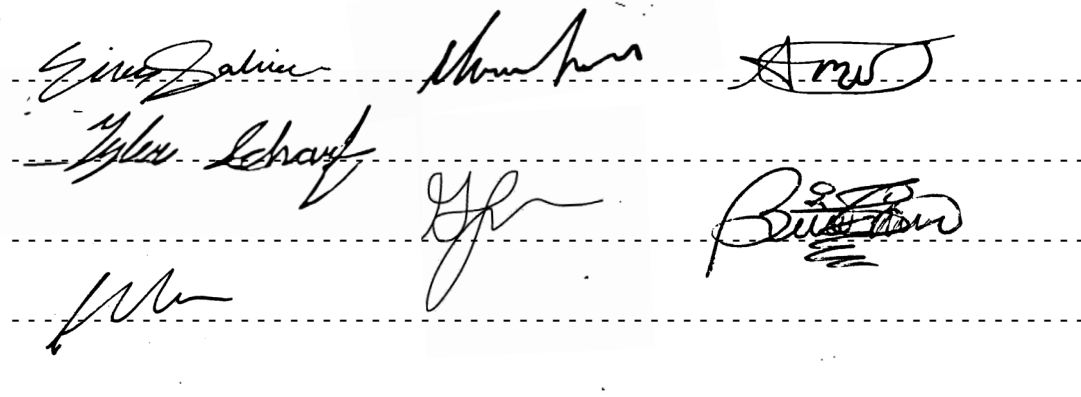


A CO-CREATION NETWORK
FOR MULTIPLAYER PRODUCTS

Crowdmuse Whitepaper v1.0
(28.06.23)

Eiman Soliman
Maryam Mazraei
Tyler Scharf
Amir J.

Contributors sign here:

The image shows four handwritten signatures on a background of horizontal dashed lines. The signatures are arranged in two rows. The first row contains three signatures: 'Eiman Soliman', 'Maryam Mazraei', and 'Amir J.'. The second row contains two signatures: 'Tyler Scharf' and another signature that appears to be 'Amir J.' or a variation of it. The signatures are written in black ink.

1. Abstract
2. Overview
3. The problems
 - 3.1. Lack of resources, access to supply and upfront costs
 - 3.2. Supply chain transparency, gated footprint data and fragmented digital assets
 - 3.3. IP appropriation and constrained monetization models
4. The solutions
 - 4.1. Co-creation, creator networks and preorder drops
 - 4.2. Multi-sided marketplace (supply and demand)
 - 4.3. Creator ownership and licensing models
5. Onchain networked goods use cases
 - 5.1. Digi-physical fashion
 - 5.2. Other use cases
6. Platform features
 - 6.1. Multiplayer product NFTs
 - 6.2. Co-creation marketplace
 - 6.3. Creator profiles
7. Protocol architecture
 - 7.1. Product Contract
 - 7.2. Profile Contract
8. Roadmap and integrations
9. Organization
 - 9.1. Core team
 - 9.2. Crowdmuse creator network

O. Glossary

"MULTIPLAYER PRODUCTS"

Products that involve more than one individual in the creative process, from conceptualization to creation, production, and distribution.

"CREATIVE ASSETS"

Tangible products of creative work, such as images, videos, music, and text.

"INTELLECTUAL PROPERTY"

Legal protection that a creator uses to secure rights over their creative assets.

"ARTIFACT"

Pattern files, tech packs, 3D files, or other digital assets that a contributor along the value chain submits to a multiplayer product.

"CREATOR NETWORKS"

Communities of creators who collaborate with each other, share resources, and promote each other's work.

"HEADLESS BRAND"

A brand with no centralized entity driving the narrative, culture, and concepts behind it.

"CO-CREATION"

The process in which a brand or multiple creators co-design a product with input from their fans.

"ONCHAIN"

Actions or assets that take place on the blockchain.

"NETWORKED GOODS"

Assets that exist on the blockchain and are tied together by the collaborative effort of creators.

"SMART CONTRACT"

Code on the blockchain that automatically executes, controls or documents events and actions according to the terms written in the code.

Abstract

Crowdmuse is a protocol for creators to collaborate on **multiplayer products** with brands, makers, and communities while maintaining ownership over their **creative assets**.

We are building onchain coordination rails that lower the barrier for creators to build digi-physical products across fashion, consumer goods, print, media, and other multiplayer products.

Crowdmuse Whitepaper v1 is intended to provide an initial glimpse into the world we collectively envision and how we think it could work.

A world where creators come together to co-create unique cultural **artifacts** and collectibles.

A future in which the way we create, consume and interact with products will be reimaged by onchain tooling that brings transparency, ownership and collective incentive design to creators, makers and collectors.

Overview

For too long, creators have been isolated in their pursuits, and their creativity has been stifled by the limitation of upfront capital, network, and distribution.

Consumer products like fashion are expensive to design and produce. The market is dominated by centralized supply chains and brand conglomerates with deep pockets, existing distribution channels, and vertically integrated value chains.

Creators working for traditional brands are paid only a fraction of the value they help create, and they are unable to retain ownership rights over their creative assets and Intellectual Property.

Independent creators often struggle to gain recognition because they lack the upfront capital and resources required, distribution networks to grow their audience, and are limited in how they can monetize their **Intellectual Property**.

Until now, the creator economy has been limited to the single-player sandbox with consumer social apps like YouTube, Instagram, and TikTok; marketplaces like Kickstarter, Etsy, and Shopify; and gig platforms like Fiverr.

With NFTs, creators can tap into (decentralized) distribution channels to monetize their creations using marketplaces like Zora, Metalabel, and Sound.

Crowdmuse enables creators to scale their skills by tapping into a network of value-aligned creators, brands and makers to collaborate on digi-physical products.

Much like the days of the Renaissance, we envision a world where creators will hold an esteemed role in society as technology frees them from the busywork of coordination between brands and communities to sustain themselves. Creators will be able to focus on what they do best: create.

3. The problems

Despite the growth of the creator economy, being a creator is hard work.

When creating any form of art, Creators have to use their talents to create a product, transform that product into something their fans would consume, and then manage distribution in hopes of sufficiently monetizing that product-only to sustain themselves until the next creation.

While NFTs may provide better revenue capture tools than traditional web2 creator platforms, they do not provide creators with adequate scaling solutions for the real world. Creators struggle to find sufficient financing to cover upfront costs for end-to-end manufacturing of the product they wish to sell. Although crowdfunding is an option, it is difficult to raise money as an individual creator without a reputation, which also takes time to build.

Without a reputable brand behind them, creators have limited access to the resources they need to launch and distribute a product. With a reputable brand, creators often give away ownership of their Intellectual Property and have no choice as to how it is used.

In this section, we will tackle the existing problems in fashion design and manufacturing alongside challenges concerning creator Intellectual Property and monetization.

3.1 Lack of resources, access to supply and upfront costs

Fashion, like many other consumer goods verticals, has been going through a digital transformation as adoption from a digitally native audience of creators and consumers soars. This is impacting not only the design and production processes but the entire supply chain and those involved within it.

For designers and brands, difficulty in obtaining access to supply and resources has hindered many from being able to explore the true potential of their products. Those that are able to form strong and reliable supplier relations are often protective of their supply network due to the sheer difficulty in sourcing reliable suppliers and the enormous amount of effort required in supplier operation management for successful production and fulfillment of orders.

The business model in the traditional fashion industry is a negative working capital model, which means money has to be invested upfront to meet high minimum order quantities for stock inventory before products are pushed to market.

The industry however is experiencing a growth in demand for access to micro-factories to achieve desirable production minimums, opening a huge opportunity to move away from the traditional 'push system' (stock model) and transforming this into a 'pull system' (stockless model) of presell, preorder, made-to-order and minimum-order-quantity manufacturing.

This helps to create a more sustainable manufacturing approach and a positive working capital model, whereby the designer or

brand can get money in first from orders to then dispatch into fulfilling physical production. In this scenario, the core cost accrued onto the brand or designer is the upfront physical sample cost, which is usually a one-off cost to ensure digital files like tech packs and 3D renders translate well into the desired physical product outcome. Once that is secured, the pull system model ensures desired order volumes are met without any upfront coverage of stock.

3.2 Supply chain transparency, gated footprint data and fragmented digital assets

The challenge of implementing sustainable business models that are economically viable has grappled consumer markets, particularly fashion for a decade or more. Existing solutions are yet to scale sufficiently to meet customer needs across the demand curve.

Customers are increasingly feeling responsible about their purchases, and brands want access to sustainably sourced materials from suppliers they can trust. However, securing access to reliable supply chains (see section 3.1) requires collaborative supplier and producer networks to scale sustainable production.

Web2 software solutions such as [Supply Compass](#) and [Compare Ethics](#) have tried to bring visibility to a product's provenance and footprint. However, such offerings have failed to track the value generated by each contributor at each stage of the product life cycle and lack verifiable footprint data due to unstandardized and incomplete data sets from third party sources.

Without adequate source of truth data to verify the exact footprint of a garment, such as the quantity of energy, water and chemicals used in production, it is impossible to prove sustainability claims.

Providing clear transparency and visibility in the supply chain, although a mission for many small to medium sized brands, remains to be a major challenge.

Leading fast fashion companies continue to grow in market share by vertically integrating their supply chains to control all stages of the product value flow, from design and manufacturing through to delivery to the end-consumer. Multiple instances of greenwashing have occurred as companies such as [H&M](#) are 'misleadingly, illegally, and deceptively seeking to capitalize on consumer green trends'—a consequence of existing incentive mechanisms for companies to protect their profit margins and control information flows within the value chain.

Due to a lack of shared incentives and software-to-software interoperability, pre-sale and post-sale data sources and tooling remain fragmented across the supply and value chain. This results in knowledge, techniques, sourcing and digital assets becoming gated or controlled by incentivized parties.

3.3 IP appropriation and constrained monetization models

Creators often struggle to protect their Intellectual Property (IP) from appropriation by larger brands and cannot sufficiently monetize their creations without centralized distribution channels.

In traditional fashion, creators receive only a small portion of the value their creations generate, and they have limited control over their own creative assets and IP.

Large brands often leverage the IP from their employees for multiple revenue streams without providing any additional compensation.

While the creator economy has enabled independent creators to monetize their designs on platforms like [Gumroad](#) and [CLO-SET Connect](#), trackability and usage of creator IP is limited by the lack of provenance in creator assets.

The emergence of non-fungible tokens (NFTs) has opened up new opportunities for creators to tap into decentralized distribution channels and monetize their work.

NFTs have provided creators with the tooling to monetize their audiences directly while minimizing platform fees. This gives creators artistic freedom and enables them to capture revenue all across the demand curve as they are better able to sell products and memberships according to audience needs.

However, many creators still struggle to build audiences to create that demand. While NFTs may provide better revenue capture tools, they do not provide creators with scaling solutions.

Creators without an existing community can tap into audiences through open ([Zora](#)) and curated marketplaces ([Metatlabel](#)), brand collaborations (Nike [Swoosh](#)), or **headless brands** ([Songcamp](#)), but most creators still struggle to sufficiently monetize their IP while building audiences to scale their brands.

4. The solutions

Crowdmuse seeks to lower the barrier for creators to unlock personalized experiences for their communities—essentially moving creator mode from single to multiplayer.

Art is collaborative by nature, particularly fashion and music. For decades, creators have been open-sourcing parts of their works to allow others to remix and reuse.

Recently, demand has been emerging among creators for increased accessibility and ownership of techniques, playbooks, and other Intellectual Property. These creators have been joining forces to share collective upside and costs as [“headless” brands](#) co-create products that reflect their shared values.

We propose experiments with collective incentive mechanisms across memberships, ownership, and loyalty through use of preorder drops, multi-sided marketplaces, and creator licensing models.

Headless brands can help creators co-create more value together than they ever could alone.

4.1 Co-creation, creator networks and preorder drops

Co-creation refers to the process in which a brand or multiple creators co-design a product with input from their fans. Drop culture has been influencing brand retail strategy since its birth in the 90s by Japanese streetwear brand GOODENOUGH (GDEH). Lifestyle brands like Supreme and Luxury brands like Louis Vuitton are collaborating with reputable artists on limited edition physical drops, making product drops and brand collaborations a significant [retail trend](#).

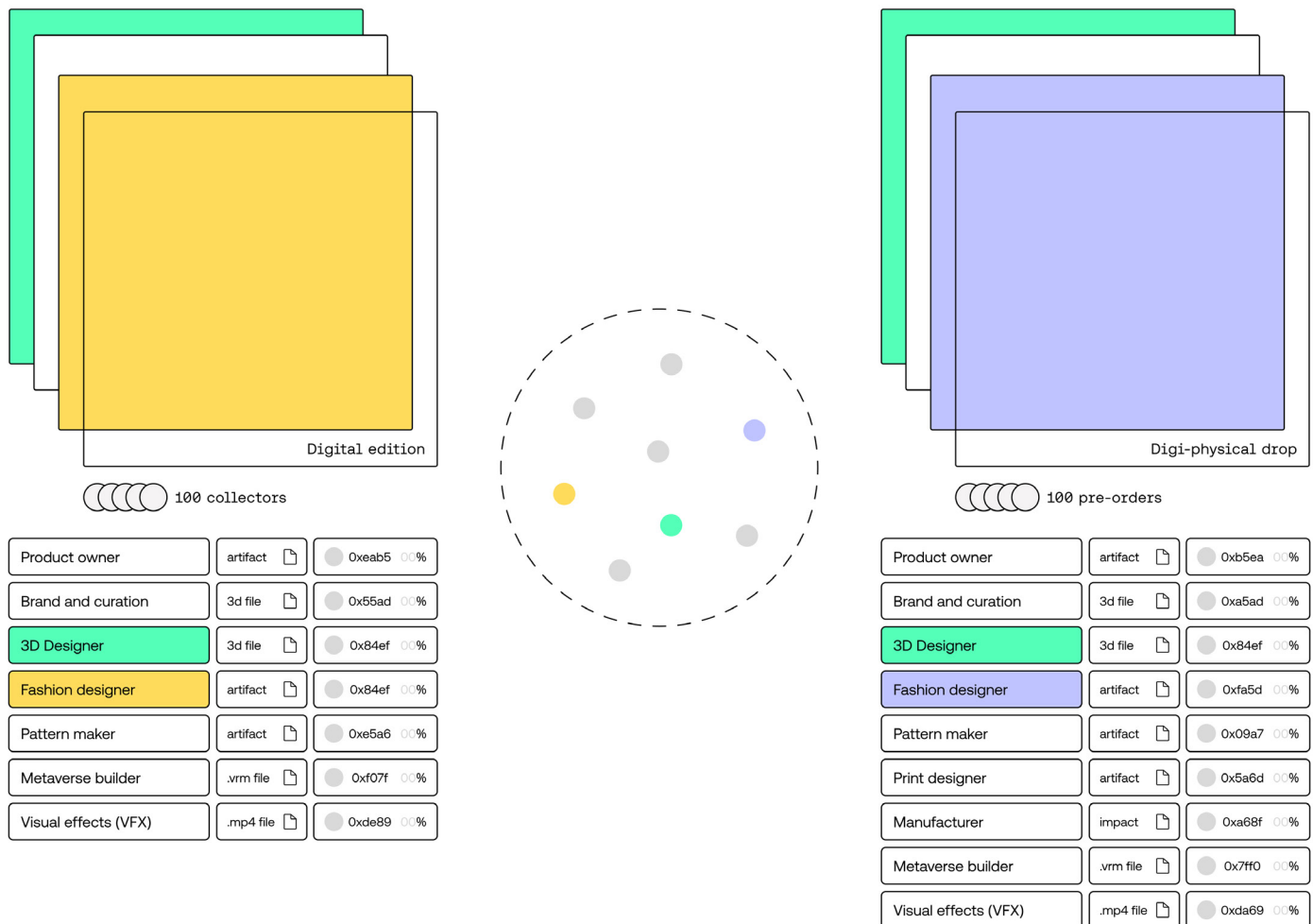
Co-creation is emerging as a result of a more proactive consumer base and the democratization of product creation. Market trends in consumer culture are driven by technological developments, an increasing desire for sharing the creative process, and new methods of value creation.

At Crowdmuse, we started looking at how bringing creator roles, assets and collaboration onchain could streamline the process of co-created and co-owned products within a given product creation flow.

Blockchain is a distributed order book for skills and products that unlock **creator networks**. The diagram shows how a creator has their own profiles and given DIDs (Decentralized IDs, similar to a login). These profiles or roles can be any creator type like a 3D designer or pattern maker. Each creator can submit a digital asset, or **artifact**, like the 3D file of a garment, into the Crowdmuse product creation flow.

As part of the Creator Splits feature, each creator profile can earn a percentage of revenue from the sales and secondary royalties of a product drop, based on their proof of creation.

Creator artifacts and skills can be plugged into multiple product creation flows, meaning that a 3D designer can plug their digital assets into another creator network to create an entirely new product.



The artifacts submitted by creators as part of the product creation flow can be open source or gated, depending on the creator's product drop strategy. Once an artifact has been submitted into the CrowdmuseProduct NFT **smart contract** (see section 7), it will forever be authenticated to that profile.

This results in the development of onchain co-ownership models that distribute risk amongst the collective to provide asymmetric risk reward ratio: the chance of exponential return is slightly higher than dealing with financial risk individually.

As these creator networks scale and become more open, new players entering can tap into their favorite creator libraries to compose new experiences.

Creator networks unlock opportunities for meaningful collaboration through co-ownership models. Where this differs from creator collective compensation models is that contributors can own and monetize their IP along the value chain. As such, contributors are exposed to greater potential upside relevant to their immediate contributions.

The nature of limited edition product drops positively impacts the rate of manufacturing. On the Crowdmuse marketplace, brands and creators can presell and preorder product drops to buyers. This helps to mitigate upfront stock costs and meet the desired number of orders first before fulfilling production and delivery.

Creators and brands building digi-physical products with their communities can use the CrowdmuseProduct contract and marketplace for multiplayer drops.

4.2 Multi-sided marketplace (supply and demand)

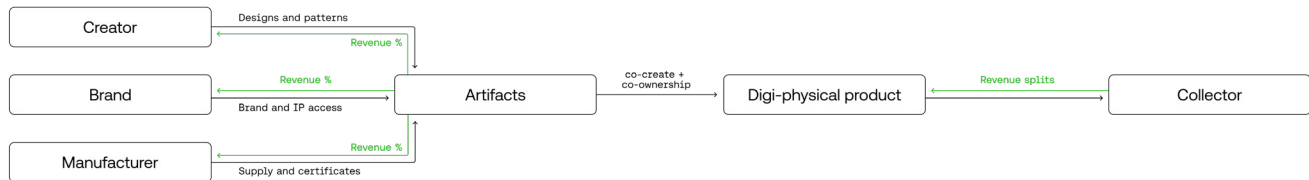
In order for the multiplayer creator economy to thrive, a multi-sided platform is needed to enable the various market participants to easily transact with each other.

Efficiently matching supply with demand is one of the greatest challenges that the creator economy faces. Many talented creators go undiscovered because of the inability to distribute their work far enough to obtain adequate demand.

The blockchain brings a financial layer to the internet which can be leveraged to bring increased efficiency and liquidity to the creator economy. We believe that better matching of creators and brands with suppliers will accelerate growth of the creator economy and bring more value directly back into the hands of creators. They will be better able to co-create products that consumers resonate with, and revenue will be shared more equally amongst all contributors.

See revenue sharing diagram below.

Multiplayer products



*revenue % = primary sales and secondary royalties

When a creator puts their Intellectual Property on the Crowdmuse Marketplace, a brand can license the creator's artifact to co-create a digi-physical product. They can tap into a supplier and producer in our network to produce that product and then distribute it to collectors. With every purchase of a product, the revenue is automatically split between all contributors.

This leads to a circular economy as creative IP can be remixed or reused, and supply can be more easily repurposed to the network of creators. Instead of a single creator having to meet minimum order quantities to produce a good, a network of creators can be matched with a network of suppliers to better fulfill demand. Once growth of the network reaches an inflection point, this becomes a supply web.

In this multi-sided marketplace, suppliers and producers can bring their made-to-order capacity onchain with verifiable footprint standards like energy credits and water consumption. This is the natural evolution of web2 footprint standards like ByBorre's [Textile Passports](#).

By providing infrastructure to facilitate more efficient transactions between creators, brands, suppliers, and consumers, our goal is to scale the creator economy in a sustainable manner.

4.3 Creator ownership and licensing models

With onchain creativity, creators can mark the originality of their creations on the public ledger, and can receive perpetual royalties as brands and other creators remix their creations.

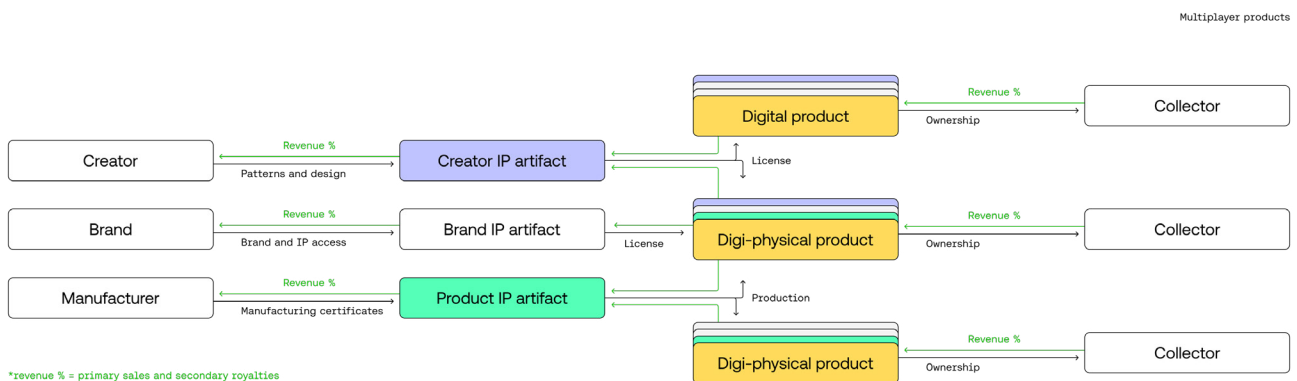
NFTs and onchain legal primitives provide a way for creators to protect their IP, monetize their work, and build direct relationships with their fans.

Intellectual Property has become a topic of diverse conversations in web3 (and AI), from the adoption of the [Creative Commons CCO](#) implemented by Nouns, Chain Runners, and Moonbirds, [Grimes' public pledge](#) to open source her language models for 50% royalties of any AI generated collaborations, [VitaDAO's implementation of IP-NFTs](#) for biopharmaceutical research, and [Ocean Protocol's data IP](#) access and ownership with sublicensing.

Given market developments with web3-enabled composable co-creation (Nike [.Swoosh](#), [Joyn](#), [1OKTF](#)), NFT community IP ([Nouns](#), and [broad landscaping by 1kx](#)), and creator IP licensing ([CLO-SET Connect](#), [Artstation](#), [Titles](#), [Arpeggi Kits](#), [Legato](#)), there is a huge opportunity for growth in the coordination of multiplayer creation and IP collaboration.

On the Crowdmuse Protocol, creators can collaborate on drops by contributing to the CrowdmuseProduct NFT with their sketches, 3D designs, music, art, animations, best practices, material data, and product specs, while preserving ownership over their creative IP through on-chain decentralized identities (DID).

Creator DID's will be linked forever to the products they create or contribute to—meaning that brands, designers and manufacturers receive a proportional split of direct product sales for their contributions, as well as licensing royalties every time their creative assets are remixed in product collaborations.



When a creator provides a 3D digital design or animation, their Intellectual Property (IP) rights are programmed as on-chain artifacts with licensing terms for how this IP can be accessed, reused, remade, or remixed. This work can be licensed to others and royalties are automatically distributed back to the owner.

A creator can also opt out of royalties and make this contribution truly open source if they wish, signifying their desire towards enabling a more regenerative world.

As more positive-sum incentive models are introduced in society, our thesis is that more creators will opt to open source their creative IP as other creators can freely remix and optionally stream back revenue share of derivative products as a creative homage.

5. Onchain networked goods use cases

Once network effects begin to grow through collective incentive mechanisms, marketplaces and licensing models (see section 4), creators will be able to scale their products more easily by collaborating with a network of value-aligned creators, brands and makers.

We see the greatest opportunity for onchain networked goods to be implemented in the fashion industry, but are not limited to one single use case. Other verticals across the creator economy and multimedia can also benefit from the same infrastructure.

5.1 Digi-physical fashion

Fashion design and production methods are especially suitable for onchain adoption. The industry is undergoing technological advancements with increasing interest from fashion designers and manufacturers to open source or license pattern libraries and manufacturing techniques.

For example, [\[a\]lindustri](#), a factory for physical and digital garment production based in Sweden, received over 100,000 downloads in the first few days of launching its [OSPP](#) (Open source Production Pattern) CLO-SET Connect profile, a public research project concerned with distribution of pattern making information and theory. Other efforts such as [Atacac](#) showcase the same approach of selling pre-constructed patterns to speed up the pattern design process.

Licensing best practice playbooks for textiles and sustainable manufacturing has seen fashion organizations such as [The Sustainable Angle](#) utilizing Gumroad to make sustainable material sourcing and production methods techniques more accessible.

Regarding community co-creation, [several companies](#) have crafted models for community members to submit designs and collaborate on the final design of products, such as Fluevog's "[Open Source Footwear](#)" project or Threadless' [Design Challenge](#).

However, outside of cash, prizes, or being recognized as a talented designer, incentives remain somewhat thin; oftentimes such competitions provide only a fixed upfront payment, with no future buy-in and unfriendly legal terms.

The launch of Nike's Swoosh campaign promises immersive community experiences designed to give fans and creators an opportunity to co-create the future of Nike. While this experiment signals mainstream adoption of web3 co-creation principles, "[Nike's ultimate ownership and oversight of activities . . . doesn't exactly chime with the decentralized Web3 ethos](#)," as the exact details around ownership and royalties remain unclear.

Blockchain technology presents a new opportunity for bringing patterns and manufacturing certifications onchain. By giving verifiable ownership to assets onchain and a mechanism to monetize creator and manufacturer assets, each player across the value chain is incentivized to allow their IP to be used for product design and production to receive immediate and future revenue streams. This in turn scales the creative process and attracts more contributors.

As part of the Crowdmuse go-to-market Signature Capsules, we have been curating digi-physical multiplayer fashion drops with a focused group of fashion designers, 3D designers and sustainable micro-factories in collaboration with online communities. This approach allows us to have direct access to multiple creators across the product creation flow and facilitate sales directly to collectors on the Crowdmuse Marketplace. Online communities or brands can pick patterns and styles from our creator and supplier library that they wish to collaborate with.

USER PROFILES

- Brands and online communities:
To co-create with others on the network for brand access and resources.
- Fashion designers and pattern makers:
To submit pattern files and tech packs for a physical garment creation for a physical sample and production.
- 3D designers:
To help boost visualization of a digital and physical product. Fashion designers and pattern makers can also hold 3d design talents.
- Digital print designers:
To work with pattern makers to ensure prints are captured correctly on the item and formatted correctly for the physical production.
- Manufacturers:
To submit certifications to prove sustainable manufacturing best practices.
- Multimedia creator:
To create animations, AR or digital interpretations of physical items for their buyers.

We are working with partners who are building storefronts and creator marketplaces on top of the Crowdmuse Protocol, including a web3 storefront with MetaFactory.

5.2 Other use cases

Multiplayer digi-physical drops can go across a multitude of use cases and market verticals. Depending on the brand or creators drop strategy these can be a digital edition drop or a digi-physical edition drop. Creators have the ability to give their community unique experiences.

Other use cases we are experimenting with include:

| Fashion | Accessories | Media and print | Ticketing and events |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Brand/community Fashion designer 3D designer Pattern maker Print designer Manufacturer Fulfilment partner + | Brand/community 3D designer AR filter designer 3D Printing studio Jewellery maker Fulfilment partner + | Publication Writer and editor Illustrator Animator Graphic designer Photographer Print house Fulfilment partner + | Event curators Collaborators Venue partner DJs and performers Photographer Videographer |

6. Platform features

Crowdmuse empowers creators to own their creative IP and scale their talents through multiplayer co-creation.

Creators can bring their digital assets onchain as artifacts with built-in licensing contracts tied to their profiles, enabling collaboration on multiplayer products between creators, brands, and communities.

As the blockchain provides a distributed order books for digital assets, the Crowdmuse platform enables a multi-sided marketplace for skills and services between creators and brands:

- Creators are able to co-create multiplayer products with a network of brands and communities to monetize their creativity while retaining IP rights;
- Brands and communities are able to tap into a composable library of designs and products to cater to the dynamic needs of their members;
- Collectors are able to support their favorite artists directly and gain access to exclusive member experiences through tokenized community networks;

Crowdmuse whitepaper v1 outlines three features enabled by the Crowdmuse back-end and marketplace.

At the time of whitepaper v1 release, only the Multiplayer Product NFT described in section 6.1 is available for use in a closed beta. The Co-creation Marketplace and Creator Profiles are under development, and sections 6.2 and 6.3 share our plans for platform features to be released in the next 12 months.

6.1 Multiplayer product NFTs

With Multiplayer NFTs, brands and creators can launch no-code, digi-physical products with built in revenue splits, creator attribution, and redemption features.

Each multiplayer collectible is a dynamic NFT built on the Polygon Blockchain using a modified ERC-721 contract.

Three roles can interact with the smart contract of a Multiplayer NFT:

- The **Product Owner** is typically a brand representative or lead creator who deploys the Multiplayer NFT contract and chooses the creators to collaborate with.
- **Creators** can be artists, designers, makers, or animators who bring their creative IP on chain through their Creator Profile. Creators can contribute or license their creative assets as artifacts through the Product Contract deployed by the Product Owner.
- **Collectors** are the buyers of the Multiplayer NFT and gain access to token gated perks within the Product Bundle. Collectors are also curators, showcasing their favorite Creators and earning rewards for early support and distribution.

Product NFTs are collaboration agreements between brands and creators with built-in creator splits, artifact licensing, and redemption. Features include:

- **Creator splits** are programmed revenue sharing agreements that enable creators to receive a % of primary NFT sales as well as a royalty % of secondary sales.
- **Product bundles** include the perks granted to collectors of the NFT, including physical collectible redemption, digital assets like 3D assets, animations and metaverse models, and token-gated experiences.
- **Product artifacts** are the creative assets brought onchain by creators as part of the product creation process. Creators can license their creative assets by adding an artifact to the product NFT contract. These artifacts will also be added to the creator profile, available to be remixed or licensed in future products.

6.2 Co-creation marketplace

The Crowdmuse marketplace features digi-physical products co-created with a network of curated brands, creators, and makers.

After the first 10 curated drops, the Crowdmuse marketplace will open the product creation feature for our early network for creators and brands.

Creators and brands will be able to launch multiplayer products in collaboration with verified creators and makers on the Crowdmuse Marketplace.

Suppliers and Producers can offer their supply and production capacity with revenue sharing terms, lowering the barrier for independent creators to co-create made-to-order, high-quality, and sustainable garments.

Collectors can discover unique fashion collectibles and support their favorite creators and communities to make history onchain, curating the next creative renaissance.

6.3 Creator profiles

Creator Profiles serve as onchain records of a creator's journey, documenting all artifacts and products they have created on the blockchain.

Forever linked to their decentralized identities (DIDs), Creator Profiles empower creators to showcase their creative Intellectual Property (IP) as Artifact NFTs, marking the originality and impact of their creations.

These artifacts can encompass a wide range of creative outputs, including sketches, 3D designs, music, art, animation, best practices, material data, or product specifications.

Furthermore, licensing agreements brought onchain with **Artifact NFTs** enable creators to define the terms of access, usage, and remixing for their creations.

Currently there are two types of licenses available on Crowdmuse:

- Open source license - artifact can be used or remixed freely with optional royalties
- Creator license - artifact can be used or remixed with a mandatory royalty

Under the Creator License, other creators and brands can license a creator's artifact NFT with mandatory royalties set by the original creator. Creators receive perpetual royalties every time their artifacts are used or remixed.

Suppliers and producers have the option to augment their Creator Profiles with **Verifiable Credentials** by signing their Proof of Impact across material quality, material waste, carbon footprint, water consumption, and working conditions. These credentials aggregate and rank onchain quality and footprint standards to incentivize healthier value chains.

Verifiable credentials are a natural evolution of web2 footprint standards like ByBorre's Textile Passports, and provide consumer-driven demand for certificates with onchain reputation ([Otterspace](#)), energy credits ([Younergy Crypto](#), [Jasmine Energy](#)), and impact certificates ([Hypercerts](#)).

7. Protocol architecture

The Crowdmuse Protocol is built on Polygon and will consist of two smart contract primitives: the CrowdmuseProduct and CrowdmuseProfile contract.

The CrowdmuseProduct contract is a modified ERC-721 that enables creator splits, creator artifacts, and redemption.

The CrowdmuseProfile contract (still in development) will enable creator DIDs, creator artifact licensing, and verifiable credentials.

The combination of the product contract and creator profile contract enables:

- creative IP ownership and licensing rights for creators
- co-creation incentives for creators, makers, and collectors

In the following sections, we will detail the design decisions and technical specifications of our core contracts.

The CrowdmuseProduct is open source, available to be forked and built on independently. Because the CrowdmuseProfile contract is under development and testing, section 7.2 simply describes the planned contract architecture, which may change based on user testing.

7.1 Product Contract

Each multiplayer collectible is a dynamic NFT built on the Polygon Blockchain using a modified ERC-721 contract with built in creator splits, creator attribution, and redemption.

This is a standard NFT smart contract (ERC-721) that contains additional features:

- The ability to distribute value transparently back to the creators behind each garment, based on their proportional contribution
- A function to protect creative assets with token gated access control and store contribution data (contributor address, files, split %)

ADDING A CREATOR ROLE AND PERCENT REVENUE SPLIT

When creating and deploying the Product Contract, the Product Owner (typically the brand representative or lead creator) can add creators to collaborate with and set the creator split percentage of revenue from the product sale and secondary royalties. These onchain revenue sharing agreements enable creators to receive a percentage of primary NFT sales as well as a percentage of royalties from secondary sales.

ADDING A CREATOR ARTIFACT AND TOKEN GATING CREATOR IP

Creators can submit artifacts as part of the product creation flow that can be open source or license gated, depending on the creator's product drop strategy. Once an artifact has been added into the CrowdmuseProduct NFT smart contract, it will forever be tied to the product and the creator's profile.

CrowdmuseProduct contract uses Lit Protocol to encrypt access to Intellectual Property (IP), data, and legal agreements.

By employing token gating features, only collectors of NFTs and licensors of artifacts who meet the specified access control requirements can retrieve the decrypted encryption key, granting them access to the artifact assets.

PRE-ORDER PRODUCT NFTS

Collectors can buy or pre-order the final product as an NFT to enjoy a digi-physical experience in which they are able to own both physical and digital versions of their product. By purchasing the product NFT, Collectors receive an ERC-721 token and can redeem any physical artifacts on the Redeem Page by inputting a postal address.

DISTRIBUTING FUNDS FROM PRODUCT CONTRACT

Upon purchase and resale of a Product NFT, all funds will be first distributed to the Product Contract. The funds from the product contract can be distributed permissionlessly to all Creators at the defined creator splits. Each creator receives a percentage of direct sales and secondary sales.

7.2 Profile Contract

The Profile Contract is a decentralized identity (DID) linking a creator's wallet to all the artifacts and products they create on Crowdmuse.

This contract, currently in development at the time of whitepaper v1 release, will enable creators to set up their profile, contribute to products, add artifacts with licensing agreements, and verify credentials for Proof of Creativity and Proof of Impact.

CREATING PROFILE

Any creator interested in joining the platform can mint a Profile NFT, which represents their Creator Profile. This Profile NFT gives creators control and ownership over their creations, and enables them to create Artifacts and showcase the products they have co-created.

CONTRIBUTING TO A PRODUCT

Creators can collaborate on drops by contributing their artifacts to the CrowdmuseProduct NFT. This involves adding their artifacts in the Product Contract and setting their licensing terms. Creators receive a proportional split of all direct product sales and secondary royalties for their contributions.

CREATING AN ARTIFACT

Creators can create individual artifacts as NFTs, representing their unique creations. These artifacts can be linked to the creator's profile and serve as a testament to their originality and impact. The artifacts can include various forms of creative outputs, including sketches, 3D designs, music, art, animation, best practices, material data, or product specifications.

LICENSING AN ARTIFACT

Creators can choose to license their Artifact NFTs, offering two types of licenses. Under the open source license, the artifact can be used or remixed freely with optional royalties. Alternatively, the creator license encrypts the Artifact with Lit Protocol, such that other creators and brands have to license the Artifact with enforced creator splits when using or remixing the artifact. The original creator defines the terms of access, usage, and remixing, and they receive perpetual royalties whenever their artifacts are utilized or remixed.

8. Roadmap and integrations

We believe onchain co-creation and IP marketplaces will incentivize healthier value chains for the digi-physical products we create, consume and interact with.

The same way Shopify and Amazon empowered merchants to sell their products in a few clicks, we believe Crowdmuse can scale the creator economy through multiplayer co-creation, permissionless IP marketplaces, and decentralized supply chains.

SHORT TERM ROADMAP AND EXPERIMENTATION

| OBJECTIVE AND EXPERIMENTATION | DESCRIPTION | ESTIMATION |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Curated creator and community multiplayer digi-physical drops | Onboarding focused group of early adopters as part of drop collaborations with immediate community sales pipeline. 'Create' flow closed for vetting and learning from the first 5 to 10 curated drops. This also helps to ensure data standardization across creator IP artifacts submitted as user flows are iterated and improved. | Q2 - 4 23 cont. |
| Open-source aspects of the contract and documentation | Publish dev docs and open-source in demand CrowdmuseProduct contract features to enable other products to build on i.e. MetaFactory web3 storefront. | Q2 - 3 23 |
| Creator community drop memberships, experiences and integration | Drop strategy per customer request can differ, therefore curated drops allow us to experiment with post-sale consumer utility and membership models to increase engagement and loyalty of creators, brands, and end customers. Current partner integrations being considered include claiming and memberships via Otterspace , NFT bundling via Future Primitive ERC-6551 , AR integrations (Memento, 8th Wall), access-gating (Tokenproof). | Q3 - 4 23 cont. |
| Creator profiles and integration | Each creator artifact (IP) that is submitted as part of the creation flow gets associated with the owner and added to the Creator Profile. Naturally creator profiles will showcase their co-created drops and artifacts. Current integrations for Crowdmuse profiles include Lens Protocol. | Q4 23 - Q1 24 |

LONG TERM SUGGESTED EXPERIMENTS

| OBJECTIVE AND EXPERIMENTATION | DESCRIPTION |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Open marketplace | Open Create page and user flow for a wider user base of creators and brands to deploy digital-physical product NFTs. |
| Co-creation proposals | Experimenting with methods to increase co-creation and access between collaborators. Brands and Communities can launch product proposals open for collaboration by verified creators and makers on the Crowd Muse Marketplace. |
| User checkout and revenue management with integration partners | Utilize solutions including checkout and subscription payment solutions via Superfluid . Creators and brands manage treasury via Safe for revenue management. |
| Collective growth experiments | Support collectives or brands by enabling dynamic ownership between creators, producers and brands. Potential integrations with fundraising treasury tools include Juicebox , Nouns Builder , and Hypercerts . |
| Onchain certification and verified supply chain footprint | <p>Opportunity is to collect standardized and verified product metadata per garment to show transparency in its supply chain and remove greenwashing.</p> <p>Partners helping with this include MetaFactory MFOS ERP solution on extended data points per apparel item, as well as Younergy Crypto and Jasmine Energy for verifiable certificates and footprint data.</p> |

9. Organization

Crowdmuse is made up of a team of core contributors and a growing network of creators and makers, operated as a contribution-based DAO, and incorporated as a standard Delaware C-corp.

We believe purpose-driven, regenerative organizational values can be established socially and incentivized with technology. Smart contracts provide the base economic layer while [Decentralized Autonomous Organizations](#) (DAOs) provide the coordination layer for meaningful collaboration through co-ownership models.

This powerful combination of intrinsically and extrinsically motivating factors unlocks greater incentives for collaboration to solve the complex, interdependent problems we face as a species today.

The Crowdmuse core team is a collective of creatives, entrepreneurs, engineers, and researchers, with over 10 years of experience across creative direction, startups and scale-ups, venture, and blockchain development.

We have come together to build the best version of a web3-enabled future.

10. Core team

Eiman Soliman, CO-STEWARD AND SYSTEM DESIGN LEAD

10+ years of experience in systems engineering across energy project development, collaborative R&D commercialization, and early-stage, climate tech VC. Eiman has led several early stage product development teams for supply chain tools, AI-enabled knowledge management, and a B2B energy marketplace. Since 2019, Eiman has been contributing to and building projects in the web3 space, while also investing across creator tooling, DAO infrastructure, real-world P2P networks, and digi-physical infrastructure as an angel investor and member of Seed Club Ventures.

Maryam Mazraei (Maz), CO-STEWARD AND NETWORK EFFECTS

9+ years of experience across sustainable fashion supply chain and brand creation, having started her first company in this space in 2011, startup-scale-up operations, product, growth and VC investing in D2C, SaaS, Impact and Creator Economy verticals. Maz has spent the past 2.5 years in web3, contributing and co-creating DAOs, working on bringing new use cases and access onchain.

Tyler Scharf, CONTENT AND COMMS

15+ years entrepreneur across sustainable tourism, hospitality, education, coaching and web3. Early stage investor and active participant in DAOs. Translating culture and values of crypto for more sustainable global adoption.

Amir Jabari (AJ), TECH LEAD AND FULL-STACK ENGINEER

Technologist with 6+ years of experiences ranging from data science, mobile, web and defi. Previously also worked in government policy and the social impact sector.

FOOA, BRANDING, GRAPHIC DESIGN, UI/UX

Graphic design is my passion, graphic design is my prison.

Gabe Hyun, FRONT-END ENGINEER

Active in front-end web development working across multiple web3 and AI projects.

Bertil Tandayamo, FULL-STACK ENGINEER

Full-stack engineer with 3+ YOE, collaborating within the web3 environment. Built a successful B2B NFT marketplace, with a significant user adoption during its initial release. Also showcases a deep passion for music and entrepreneurial pursuits, particularly within the web3 landscape. Engaging in a NFT marketplace designed specifically for independent artists.

9.2 Crowdmuse creator network

Over the past year, we have been growing our network of creators and building alongside a group of early adopters that share in mission and vision. Crowdmuse creator network is composed of brands, designers, creators and garment design and manufacturing studios.

CREATOR COLLECTIVE INCENTIVE DESIGN EXPERIMENTATION

[Signature Capsules](#) is the first community-led fashion collective to be launched on the Crowdmuse protocol. This is where a group of creators collaborate on drops to leverage onchain co-ownership and revenue generated from drops to be redistributed back to the collective for funding of future projects. We will be continuing experimentation of this approach on the Crowdmuse protocol and marketplace.

CREATOR NETWORK SPOTLIGHT

[MetaFactory](#)

[Weseeclarly](#)

[Metadreamer](#)

[Hugh Clarke](#)

[KALAU](#)

[Rickard Lindquist](#) and [Johanna Wirel](#) at [\[a\]industri](#)

[Daniel Mohr](#)

[Lara Vivara](#)

[Paula Kühn](#)

Gabriel Maria Platt at [Phoebe Heess](#)

[Tropical Futures Institute](#)

[OxZed](#)

[algoriddims](#)

[CU3D](#)

[Ooliverse](#)

[Peacenode](#)

[Erica Miller](#)

[Damara Ingles](#)

Danielle Elsener and Clayton Haun at [DECODE](#)

[Mochi Gabriel](#)

[Salief Lewis](#)

[Max Bochman](#)

[Alice Stew](#) +

10. References

[Digiphysical Goods: Bringing Programmable Utility to Physical Products](#)

[Multiplayer Creation: Unlocking Participatory Media](#)

[Augmenting Culture: The Emerging Field of Digital Fashion](#)

[How I chose among the 649 projects in Bitcoin's Beta Round](#)

[Seed Club SC05 Demo Day](#)

[Bitcoin ImpactDAO book pg 88 April 2022 Edition](#)

