Web 3 | Blockchain and the Metaverse

The Metaverse is the EXPERIENCE and Web 3 is the TECHNOLOGY that enables the Metaverse experience.

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Introduction

“An already booming gaming and online ecosystem has been thrust years further into the future... The convergence of a number of new technologies including Mixed Reality, Blockchains, Cryptography and Self Sovereign Identity make possible much of what sci-fi authors and gamers alike have dreamed of for decades, and the global pandemic has forced us to take giant leaps forward in a hurry. Now billions of people are living, working and playing online, and spending billions of dollars per month on digital property and services. But we’re still in the early days of discovering what connectivity and interoperability can do at this scale, and how the emergent properties of these new worlds can affect our communities and our lives.” (Crucible) I like this short piece because it highlights the speed at which everything is happening in tech right now, but more importantly because of the word choice of “convergence of new technologies”. It is very difficult to take in all of the innovation happening in the tech world right now so unless you are in the “tech community”, that article piece may have been more confusing than it was exciting.

Web 3 Technology

"The Metaverse is the EXPERIENCE & Web3 is the TECHNOLOGY that enables the Metaverse experience"

Blockchain *The building blocks for physical tech and cryptography.*	
Decentralized Finance (DeFi) Cryptocurrency Decentralized Autonomous Organizations (DAO’s) NFT’s	**Metaverse (Digital & Physical Connection)** Gaming Mixed Reality

https://www.metaverseai.org/

Web 3.0, Virtual Humans & the Open Metaverse

- For the first time in human history, advanced 3D Virtual Reality tech & Web3.0 collectively enable the true Open Metaverse, a persistent, high-fidelity virtual realm where people can play, build, and monetize their experiences with virtual humans on the blockchain.

Decentralized Identity & 3D High-Fidelity Avatars

- Avatars form our digital representation in the Metaverse. Create your high-fidelity 3D with the most advanced AI engine.
- Blockchain-based DiD avatars empower users to own and keep their valuable virtual identity & avatars across the Metaverse. Privacy & ZKP feature safeguards users' privacy in the virtual realm.

NFT & Virtual Human enables Metaverse-native Phygital Assets

- NFT merges the digital realm with reality. The Future is Phygital (Physical + Digital).
- Securely own your AI Avatar, Virtual Lands, Digital Items in fashion, gaming, VR/AR as intelligent NFTs.

Evolution of the Web

Web 1.0	**Web 2.0**	**Web 3.0**
Web 1.0 refers to the first stage of the World Wide Web evolution.	Refers to websites which highlight user-generated content, usability, and interoperability.	Refers to the evolution of web utilization and interaction which includes altering it into a database.
• Mostly Read-Only • Company Focus • Home Pages • Owning Content • WebForms • Directories • Page Views • Banner Advertising • Britannica Online • HTML / Portals	• Wildly Read-Write • Community Focus • Blogs / Wikis • Sharing Content • Web Applications • Tagging • Cost Per Click • Interactive Advertising • Wikipedia • XML / RSS	• Portable and Personal • Individual Focus • Live-streams / Waves • Consolidating Content • Smart Applications • User Behavior • User Engagement • Behavioral Advertising • The Semantic Web • RDF / RDFS / OWL

Timeline

2008

- Satoshi Nakamoto, a pseudonym for a person or group, publishes "Bitcoin: A Peer to Peer Electronic Cash System."

2009

- The first successful Bitcoin (BTC) transaction occurs between computer scientist Hal Finney and the mysterious Satoshi Nakamoto.

2010

- Florida-based programmer Laszlo Hanycez completes the first ever purchase using Bitcoin — two Papa John's pizzas. Hanycez transferred 10,000 BTC's, worth about $60 at the time. Today it's worth $80 million.
- The market cap of Bitcoin officially exceeds $1 million.

2011

- 1 BTC = $1USD, giving the cryptocurrency parity with the US dollar.
- Electronic Frontier Foundation, Wikileaks and other organizations start accepting Bitcoin as donations.

2012

- Blockchain and cryptocurrency are mentioned in popular television shows like The Good Wife, injecting blockchain into pop culture.
- Bitcoin Magazine launched by early Bitcoin developer Vitalik Buterin.

2013

- BTC market cap surpassed $1 billion.
- Bitcoin reached $100/BTC for the first time.
- Buterin publishes "Ethereum Project" paper suggesting that blockchain has other possibilities besides Bitcoin (e.g., smart contracts).

2014

- Gaming company Zynga, The D Las Vegas Hotel and Overstock.com all start accepting Bitcoin as payment.

- Buterin's Ethereum Project is crowdfunded via an Initial Coin Offering (ICO) raising over $18 million in BTC and opening up new avenues for blockchain.
- R3, a group of over 200 blockchain firms, is formed to discover new ways blockchain can be implemented in technology.
- PayPal announces Bitcoin integration.

2015

- Number of merchants accepting BTC exceeds 100,000.
- NASDAQ and San-Francisco blockchain company Chain team up to test the technology for trading shares in private companies.

2016

- Tech giant IBM announces a blockchain strategy for cloud-based business solutions.
- The government of Japan recognizes the legitimacy of blockchain and cryptocurrencies.

2017

- Bitcoin reaches $1,000/BTC for the first time.
- Cryptocurrency market cap reaches $150 billion.
- JP Morgan CEO Jamie Dimon says he believes in blockchain as a future technology, giving the ledger system a vote-of-confidence from Wall Street.
- Bitcoin reaches its all-time high at $19,783.21/BTC.
- Dubai announces its government will be blockchain-powered by 2020.

2018

- Facebook commits to starting a blockchain group and also hints at the possibility of creating its own cryptocurrency.
- IBM develops a blockchain-based banking platform with large banks like Citi and Barclays signing on.

2019

- China's President Ji Xinping publicly embraces blockchain as China's central bank announces it is working on its own cryptocurrency
- Twitter & Square CEO Jack Dorsey announces that Square will be hiring blockchain engineers to work on the company's future crypto plans
- The New York Stock Exchange (NYSE) announces the creation of Bakkt - a digital wallet company that includes crypto trading

2020

- Bitcoin almost reaches $30,000 by the end of 2020
- PayPal announces it will allow users to buy, sell and hold cryptocurrencies
- The Bahamas becomes the world's first country to launch its central bank digital currency, fittingly known as the "Sand Dollar"
- Blockchain becomes a key player in the fight against COVID-19, mainly for securely storing medical research data and patient information.

Blockchain

Overview

Blockchain, sometimes referred to as Distributed Ledger Technology (DLT), makes the history of any digital asset unalterable and transparent through the use of decentralization and cryptographic hashing. A simple analogy for understanding blockchain technology is a Google Doc. When we create a document and share it with a group of people, the document is distributed instead of copied or transferred. This creates a decentralized distribution chain that gives everyone access to the document at the same time. No one is locked out awaiting changes from another party, while all modifications to the doc are being recorded in real-time, making changes completely transparent. (BuiltIn)

A blockchain is a decentralized ledger of all transactions across a peer-to-peer network. Using this technology, participants can confirm transactions without a need for a central clearing authority. Potential applications can include fund transfers, settling trades, voting, and many other issues. (PwC)

The blockchain is a ledger, or lis The decentralized network, which provides network security and transaction verification. The incentives embedded in the network protocol, which encourage participants to contribute computing resources for network support. The publicly available knowledge that a transaction has been posted to a global public transaction ledger. The personal data security enabled by public-private key cryptography. The dedicated core team of developers and miners who continually support and improve the code, help secure the network, and validate transactions. ? t, of all of a cryptocurrency ' s transactions, and is the technology underlying Bitcoin and other cryptocurrencies. This decentralized public ledger keeps a record of all transactions that take place across the peer peer network. Users can contribute to the network by providing computational power to assist with the verification of transactions in " mining "). (PwC)

Characteristics:

- Decentralization. The Peer-to-peer (P2P) network is formed by all blockchain users. All users are equivalent in P2P network and jointly maintain the data in blockchain without the central manager. The data is stored and updated in a decentralized manner.
- Anonymity. In blockchain, transactions are completed without using the real identify ID of users. Blockchain adopts address-based transactions based on cryptographic algorithms, rather than personal identification. Every user can use one or multiple anonymous addresses to access the blockchain network. Therefore, users' personal information, e.g., assets and transaction information are well protected.
- Immutability. Once the transaction is completed, it will be packaged into blocks and synchronized to all nodes in the network. The hash value of the current block is stored in the next block, which means you need to regenerate all following blocks and get recognised by all users if you modify the data in the block. The cost of data tampering is significantly increased.
- Auditability. Each transaction on the blockchain is recorded with a timestamp. Any blockchain user can trace the transaction record through any node of the blockchain network, and can verify the data through the hash value of the block. A complete traceability information chain could be formed with timestamp, which could be used for auditing.
- Autonomy. Data can be shared in a more safe and convenient manner on blockchain through consensus algorithms and protocols without the participation of authoritative third parties.

Terms

dApps

Smart Contracts

Tokens

Consensus Mechanism

- This is how nodes communicate together to arrive at an identical conclusion. Bitcoin uses Proof of Work or PoW. Binance Smart Chain, also known as BSC, uses a Proof of Staked Authority or PoSA. And Ethereum is migrating to Proof of Stake aka PoS. As you can tell, consensus is by no means a solved game at this point in time. Solana uses a consensus called Proof of History. Proof of History works through a time-stamping solution; each transaction has a time stamp allocated to it that allows it to be verified as a legitimate transaction by the rest of the network in mere fractions of a second. Solana has a breakdown of the eight technologies that they believe position themselves as the fastest, most scalable, and most secure blockchain in the game. (QuickNode)

Decentralized Finance (DeFi)

On Lex Friedmans podcast, Micheal Saylor brings up the concept that money can be described as all of the energy in civilization and currency is the asset we use to move energy around. Decentralized finance is the proof of concept. As long as someone has been making, supplying and distributing goods or services, there has been some sort of economy; economies grew larger as societies grew and became more complex. Sumer developed a large-scale economy based on commodity money, while the Babylonians and their neighboring city states later developed the earliest system of economics as we think of, in terms of rules/laws on debt, legal contracts and law codes relating to business practices, and private property.[15] When you think about the economics of the metaverse—or metanomics—there are opportunities in almost every market area. Imagine you have an online avatar and you want to change what it/you are wearing, you will be able to buy limited-edition, digitally branded clothing that you pick after browsing a virtual showroom. Or you may start your own small business, such as an art gallery where you display your latest and greatest collections, or a virtual private club. Decentralized finance (DeFi) refers to the infrastructure, processes, and technologies used to democratize financial transactions.

Decentralized Finance (DeFi) refers to the infrastructure, processes, and technologies used to democratize financial transactions. In addition to monetization, and as a means to exchange value, token-holders can also participate in the platform's governance (e.g. vote on decisions). A decentralized autonomous organization (DAO) or decentralized autonomous corporation (DAC),[a] is an organization represented by rules encoded as a computer program that is transparent, controlled by the organization members and not influenced by a central government, in other words they are member-owned communities without centralized leadership.[1][2] A DAO's financial transaction record and program rules are maintained on a blockchain.

- Blockchain = Digital Currency (Currency is the asset used to move energy)
- Cryptocurrency
- Non-fungible Tokens (NFT's) = Dematerialized Assets (Assets allowing transactions without taxable obligation)
- Decentralized Autonomous Organizations = Community

Cryptocurrency

A cryptocurrency is an encrypted data string that signifies a unit of currency. The cryptography makes it nearly impossible to counterfeit and the medium of exchange through a computer network makes it not reliant on any central authority, such as a government or bank, to uphold or maintain it. Bitcoin is Hope - "Bitcoin is a bank in cyberspace, run by incorruptible software, offering a global, affordable, simple, & secure savings account to billions of people that don't have the option or desire to run their own hedge fund."

- Crypto-Property (Bitcoin Cash, litecoin)
- Crypto-Platform (Smart Contracts - Ethereum, Solana)
- "Standard Currency" (Tether, Circle)

Non-fungible Tokens (NFT's)

NFTs are unique digital assets created on the blockchain. They can be everything from gaming items and digital art, to sports collectibles and real-world assets. Today, NFTs are fueling the rise of new economic models and interconnected digital realities.

A non-fungible token (NFT) is a unique, non-interchangeable digital asset stored on a blockchain. NFTs allow content creators to limit the number of owners of an asset to as few as one, thereby creating an element of scarcity that has never existed in the digital world. Along with many other forms of digital content ownership (including cryptocurrency), NFTs are expected to underpin value exchange in Web3, a more decentralized version of the internet under development that's featuring interoperable platforms. Web3, in turn, may provide the structure for a metaverse or a series of metaverses — landscapes of virtual spaces where users can transition seamlessly across multiple experiences. Digital Asset or Contract encrypted on the blockchain:

- Art
- Avatars
- Products
- Buildings
- Wearables

Tokens

ERC-20 token

ERC stands for Ethereum Request for Comment, and 20 is the proposal identifier number. ERC-20 was designed to improve the ETH network. ERC-20 defines tokens as blockchain-based assets that can be sent/received and have value. ERC-20 tokens are similar to Bitcoin and Litecoin in many aspects. However, the most significant difference is that instead of running on their own blockchain network, ERC-20 coins run on Ethereum's blockchain network and use gas as the transaction fee. (QuickNode)

ERC-20 is a standard or guideline for creating new tokens. The standard defines six mandatory functions that a smart contract should implement and three optional ones. To start you can give your token a name, a symbol, and mention how dividable your token is, by specifying the decimals. ERC specifies a set of mandatory functions, which are a bit more complex and listed below:

- totalSupply: A method that defines the total supply of your tokens, When this limit is reached the smart contract will refuse to create new tokens.
- balanceOf: A method that returns the number of tokens a wallet address has.
- transfer: A method that takes a certain amount of tokens from the total supply and gives it to a user.
- transferFrom: Another type of transfer method which is used to transfer tokens between users.
- approve: This method verifies whether a smart contract is allowed to allocate a certain amount of tokens to a user, considering the total supply.
- allowance: This method is exactly the same as the approved method except that it checks if one user has enough balance to send a certain amount of tokens to another.

Decentralized Organizations

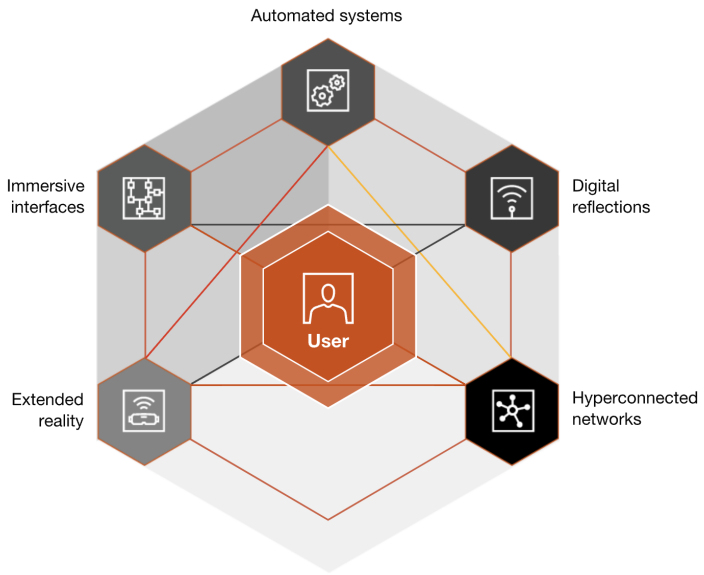
In addition to monetization, and as a means to exchange value, token-holders can also participate in the platform's governance (e.g. vote on decisions). A decentralized autonomous organization (DAO) or decentralized autonomous corporation (DAC),[a] is an organization represented by rules encoded as a computer program that is transparent, controlled by the organization members and not influenced by a central government, in other words they are member-owned communities without centralized leadership.[1][2] A DAO's financial transaction record and program rules are maintained on a blockchain.

Metaverse

The term 'metaverse' has been coined to further facilitate the digital transformation in every aspect of our physical lives. At the core of the metaverse stands the vision of an immersive Internet as a gigantic, unified, persistent, and shared realm. While the metaverse may seem futuristic, catalyzed by emerging technologies such as Extended Reality, 5G, and Artificial Intelligence, the digital 'big bang' of our cyberspace is not far away. (All One Needs To Know About The Metaverse)

3D Space & Time	**Decentralized Money**	**Form of Government**
Just as the physical universe is a collection of worlds that are connected in space, the metaverse can be thought of as a bunch of worlds connected by web 3 technology.	If **money** is described as all of the energy in civilization and **currency** is described as the **asset** we use to move energy around, then DeFi and DAO's are the proof of concept.	A government is the system or group of people governing an organized community, generally a state.

Future: Landscape of virtual spaces with transferable identities and assets enabled by blockchains that are interoperable or interchangeable.



The metaverse is a seamless convergence of our physical and digital lives, creating a unified, virtual community where we can work, play, relax, transact and socialize.. A key point is that there is no one virtual world but many worlds, which are taking shape to enable people to deepen and extend social interactions digitally. This is done by adding an immersive, three-dimensional layer to the web (Web 3), creating more authentic and natural experiences. The metaverse even has the promise of facilitating accessibility from the comfort of the home, breaking down boundaries and democratizing access to key goods, services and experiences. (JP Morgan)

- Today, cloud technology is addressing the processing power and storage to support extended reality and immersive interfaces. Hyperconnected networks that leverage 5G are nearing maturity. AI is helping to create digital reflections

that combine computer vision, speech and deep learning to offer users experiences that feel real. The decentralization of finance and the economy, as supported by blockchain, is making partly automated financial systems possible. Finally, digital-native consumers and the pandemic's impact on consumption habits are igniting demand for the virtual products and experiences that the metaverse offers.

Already, companies are looking to the metaverse to:

- Enrich the consumer experience
- Introduce virtual products, only available in the metaverse
- Collect new data on customers
- Market physical and digital products and services
- Support metaverse payments and finance
- Offer hardware and applications that support metaverse activities

AR | MR | VR | XR

Augmented Reality (AR)

Augmented reality (AR) is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory.[1][2]

Mixed Reality (MR)

Mixed reality (MR) is the merging of real and virtual worlds to produce new environments and visualizations, where physical and digital objects co-exist and interact in real time. Mixed reality does not exclusively take place in either the physical world or virtual world, but is a hybrid of augmented reality and virtual reality.[1]

Virtual Reality (VR)

Virtual reality (VR) is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality include entertainment (particularly video games), education (such as medical or military training) and business (such as virtual meetings).

Extended Reality (XR)

Extended reality (XR) is a term referring to all real-and-virtual combined environments and human-machine interactions generated by computer technology and wearables.[1] E.g. It includes representative forms such as augmented reality (AR), mixed reality (MR) and virtual reality (VR)[2] and the areas interpolated among them.

Industries & Services

Before we can begin to tackle the details of the Metaverse and what Web 3 technology offers the world, it is important to break down the fundamental parts of the digital ecosystem. Since every person using the technology is a user and as you will see later most of the technology is interoperable, it is important to separate the concept of a Web 3 Consumer vs. a Developer. I like to compare the consumer to someone who is operating a business or a customer of a business. Where as a developer is someone working for a business or creating something for a specific sector within a business or industry. When you get into the micro details of the different uses in the Developer Section, you will see each industry has tons of overlap so if you are someone looking to specialize in something within a specific tool or software it may be best to look at the Tech Sector.

Consumer Industries An industry is a classification that refers to a group of companies that are related in terms of their primary business activities.	**Developer Sectors** A sector is an area of the economy in which businesses share the same or a related product or service. Read how to use sectors to increase investing gains.
Industries • Fashion • Gaming • Music • Real Estate • VR Spaces	**Sectors** • Architecture, Engineering & Construction (AEC) • Art, Media & Entertainment • Game Development
Market Leaders • Meta • Roblox • Microsoft • Discord • OpenSea	**Market Leaders** • Adobe • Autodesk • Blender • Epic Games (Unreal Engine)

Developers

When you actually begin working within the programs you immediately learn as a developer you should have a general understanding of different programs. For example, If you want to create a forest you create trees in Blender, then in Unreal you create the forest out of the trees you created in Blender. It is for this reason that it is important to have a broad knowledge of the technology innovations happening around the web 3 space.

3 Major Sectors for Developers

Architecture, Engineering & Const. (AEC)	Art, Media & Entertainment	Game Development

Industry Roles	Market Leaders
Programmers	Adobe
3D Artists	Autodesk
Animators	Blender
2D Artists	Discord
UI (User Interface) / UX (User Experience)	Epic Games (Unreal Engine)
VFX (Animator)	Github
Tech Art	Google / Microsoft Operating Systems (Docs, excels, ect.)
Sound Design	Steam
Producers	Unity
Game Design	
World Design	
Localisation	
IT	
Community Management	

Programmers
- Unreal Engine - C++ or BluPrint (C++ = Native)
- Visual Studio or Rider (Debugging)
- Beyond Compare (Diff and Merging for no conflicts)
- Notepad - Text Editor

3D Artists
- Blender - UV (how to flatten)
- Substance Designer (Texture Creation)
- Substance Painter (Apply Textures to models)
- Adobe Photoshop (2D images but can enhance textures)
- Marmoset Toolbag 3 (RealTime Rendering) (“Baking into texture models)
- ZBrush (Organic Textures)
- Pure Ref - Reference Models and boards

Animation
- Autodesk Maya
- Animbot (Plug in for maya)

2D Artists
- Adobe Photoshop (
- ProCreate (Ipad drawing software)
- Unreal Engine (Scale and concept)

UI (User Interface) / UX (User Experience)
- Adobe Illustrator (vector art is scalable)
- Photoshop
- Unreal Engine (blueprints to script)
- Microsoft Visio - yED (flowchart and diagram tools)

VFX (Animation)
- Houdini (simulations) (Connect Nodes)

- Blender (Prototype quickly)
    - Unreal Engine
    - Substance Designer (Textures)
    - Adobe Photoshop

Tech Art

Technical Artists are hybrid creative and technical operators who liaise between the artist and the programmer teams. They require both visual skills as well as programming knowledge to understand both disciplines and problem solve between departments.

- Visual Studio Code / Rider (Programming)
- Houdini (uses for scripts)
- Python (Scripting Language) - Profiling tools
- Blender (checks mesh work to save data)
- Adobe Photoshop
- Substance Designer
- Substance Painter

Sound Design

- Wise (Audio Engine)
- Unreal (has audio engine)
- Reaper (DAW - Digital Audio Workstation)
- Vital (wavetable synthesizer)
- Hardware

Producers

- All office (Google and Microsoft)
- Slack
- Monday

Game Design

- Unreal Engine - Glue everyone's work together for design
- Microsoft Excel Spreadsheet
- Powerpoint
- Photoshop to overlay changes
- Microsoft Visio - diagrams

World Design

- Unreal Engine
- Word - Powerpoint - Excel (asset lists and progress) (Show process and expectations
- Google Earth
- Adobe Photoshop for Pigment Map

Localisation

- Unreal Engine (Localisation)
- Crowdin (Computer assistance translation tool) - meet translators
- Python for small scripts (text gathering or other things without editor)
- Excel / Sheets
- Discord (community localisation)
- Google Translate

IT

- PowerShell (text to speech and other tools)
- Python (crash simulation)
- Jenkins
- Incredibuild (Compiles a lot of computer work around the office)

Community Management

- Discord, twitter, twitch, ect.
- Adobe Premiere
- Adobe After Effects (Special Effects) (Logos)
- Adobe Photoshop
- Audacity / Sonar Recording Audio
- Adobe Audition (proces audio)_
- ShadowPlay (Screen capture)
- OBS Studio (live streams)
- Stream Elements (bot commands)
- Restream (Stream to multiple Platforms)
- Google Slides for (in game) presentations
- Stream Assistant (comments, countdown, random)

3D Mapping & Models

3D Mesh Model	3D Point Cloud Model	Orthomosaics

Photogrammetry

- Photogrammetry uses aerial photos to create highly accurate 3D terrain maps.
- Areas & Volume (Geodetic: Large Scale, Land (Mountains, Rivers) - Cadastral: Boundaries, Land Ownership)
- Lidar gives you a point cloud, but because photogrammetry stitches photos together to create your model, you get the visual details of every feature on your site, taking abstraction out of the conversation. Think of it like this: lidar produces an elevation set, while photogrammetry gets you elevation plus visuals.

Lidar

- Laser Scanning (Light Detection & Ranging) - Lidar is a method for determining ranges by targeting an object or a surface with a laser and measuring the time for the reflected light to return to the receiver. It can also be used to make digital 3-D representations of areas on the earth's surface and ocean bottom by varying the wavelength of light. It has terrestrial, airborne, and mobile applications.[1][2]
- Lidar is commonly used to make high-resolution maps, with applications in surveying, geodesy, geomatics, archaeology, geography, geology, geomorphology, seismology, forestry, atmospheric physics,[6] laser guidance, airborne laser swath mapping (ALSM), and laser altimetry. It is also used in control and navigation for some autonomous cars[7] and for the helicopter Ingenuity on its record-setting flights over the terrain of Mars.[8]

Aerial Mapping

Aerial Mapping, also known as Aerial Photogrammetric Survey (APS) consists of using drones to collect telemetry data, images and data from large, risky or hardly accessible industrial facilities. Generate aerial insights and upload imagery to create accurate, high-resolution maps and 3D models for detailed analysis. Easily export data in the format you need, or use open APIs to sync your data with everyday tools. (DXF, LAS, OBJ, SHP, TIF, JPG. All this data is collected with high level of precision by drone instruments and then are treated by powerful softwares which transform this data into high resolution 3D photogrammetric models. 3D photogrammetric models and orthomosaics not only unveil a much richer universe of constructive details compared to traditional 3D CAD/CAE models but also render their update much easier when necessary.

Interior Mapping

Captures 2D photography and 3D data from job sites, and automatically stitches them into a complete, immersive 3D model of a real-world job site. Consumers will have the ability to watch, enjoy, and share by simply sending an embedded link. Annotate, share, measure: Export assets (point cloud, reflected ceiling and floor plan images, 3D mesh file, 2D photos, and more) and continue working in other software that you already use.

- Generate Industry Standard Floor Plans
- Take a free-moving interactive tour of the entire entity anytime/anywhere you have internet.
- The measurements are not only accurate, but can be made visually appealing for presentations.

Product Mapping

AEC

Architecture, Engineering & Construction (AEC) - Also include manufacturing because of the industry standard. This is a massive, almost endless industry in regards to web 3. For years engineers have been using “web 3 like” technology, but for the first time we are seeing a major acceleration in how the technology is being used. Rather than just for models and testing, the AEC industry is using web 3 for advertising, project management, communication and more.

Tools & Equipment

- Autodesk
- Matterport

Development Process

1) Project Goal	**2) Project Area *Size**	**2) Project Software**	**3) Render Engine**
Architecture	under 100 m2	3Ds Max	V-Ray
Interiors	100 m2 - 500 m2	Archicad	Maxwell Render
Landscape	500 m2 - 1000 m2	AutoCAD	Artlantis
	1000 m2 - 5000 m2	Cinema 4D	Corona Render
	5000 m2 - 10000 m2	Rhinoceros	Lumion
	above 10000 m2	SketchUp	KeyShot
		SolidWorks	Thea Render
		Revit	Blender

Fashion

Digital fashion is going to change the entire industry in just a few short years. Today, interactive 3D can depict any garment, texture, or accessory exactly as it appears in real life, and then place it within a photoreal environment, opening up a new world of virtual fashion shows, collaborative design, immersive retail experiences, and the metaverse. Soon customers will shop for clothes online by clicking on a fashion item and uploading a picture of themselves in order to receive a picture back with you actually wearing the item. Other technology using Augmented Reality will allow you to see in real time what items look like on you using AI / 3D Technology. This will ultimately lead to digitalization of fashion industry stores where consumers will be able to walk through virtual stores via their VR headset and other devices. It is important to have a virtual fashion library because it is becoming industry standard and can save brands time and money, while also being innovative.

Tech Pack

All professional virtual fashion designers understand that a tech pack is needed by manufacturers.

- Garment sketch
- Spec sheet with garment measurements
- Technical sketch
- Grading
- Other design details such as types of fabrics.

Mannequin

- Once we have all the fabric information we next need to make the mannequin. This is necessary even if you will showcase your virtual clothes without an avatar. It is critical to have the exact size measurements to create the right digital avatar for your digital clothing. The desired body can be fully replicated on a 3D avatar and adjusted within a few edits. This makes it perfect commercial usage.

3D Model the base shape of the garment

- To create a base shape of the garment in 3D you can use softwares; CLO 3D, Zbrush or Marvelous Designer. This all depends on how complex the digital clothing is. The important aspect is to get the folds right and how fabrics look when it expands and overlays an object. Rotary patterns, fringes, and anything related to jewelery are created in a different software. Therefore, both will be handled separately to achieve the best results.

Bringing everything together

- Next is to pose your avatar (mannequin) so that your garment can float and look realistic. This requires bringing both the element embroidery patterns and also the base shape onto your avatar to fit everything perfectly. Then you will simulate the whole thing in from a t-pose into your final pose.

Export the Digital Clothing for Rendering

- The final step is to export everything created into your rendering engine. Here you have a number of options, depending on your computer. Here you can find a list of your options and requirements.

Gaming

Game Development

- In-Game Product Development
- Streamers
- Competitive Gaming

Industry Leaders

- Blizzard - Battle.net
- Steam
- Rockstar Games
    - Grand Theft Auto, Manhunt, Max Payne, Midnight Club, Red Dead, Bully

Equipment

- Fanatec - https://fanatec.com/us-en/
- Razer - https://www.razer.com/

Media & Entertainment

Roles

Equipment

Real Estate

- If you want to personalize a virtual home, you can purchase an original piece of art, tokenized as a digital asset. You can even own the land the house is built on. Ethereum-based platforms like Decentraland, for example, are already selling virtual plots that people can develop.
- In time, the virtual real estate market could start seeing services much like in the physical world, including credit, mortgages and rental agreements. However, with the emergence of decentralized finance (DeFi), collateralized lending primitives and the composability of blockchain token-based digital assets, a next-generation financing company could potentially leverage digital clothing as collateral to underwrite virtual land and property mortgages. In fact, the financing company may not be a company at all, but instead, a selforganizing, mission-based community of people (who may not have met at all in person), also known as a decentralized autonomous organization (DAO). The DAO may have seeded its original balance sheet into a multi-signature wallet to create the mortgages. An additional layer of tokenomics to incentivize certain participant or community behaviors creates another level of gamification and commercialization.

The Metaverse Group is a leading virtual real estate company offering exposure to this burgeoning industry via the Metaverses. We facilitate the acquisition of virtual property along with a suite of virtual real estate centric services that are provided by pioneers of the crypto, blockchain and non-fungible token (NFT) industries. (https://metaverse.properties/)

Opportunity	**Services**
• Property Management • Property Development • Consulting • Marketing	• Buying and selling of virtual real estate across the Metaverses • Development of virtual land (we help bring your dream to life) • Expert level consulting for all major metaverses • Finding a rental within the metaverses to fit any need • Property management of existing real estate • Marketing and advertising your business in the metaverse
Property Development	**Property Management**
• Architecting your build • Designing your build • Developing your build • Establishing development on the map	• Renting of your property to clients • Technical and visual maintenance of your property • Collecting of rents from clients • Point of contact for all client-related issues and inquiries

Industry Leaders

Full Universe & Ecosystem

- Meta - https://about.facebook.com/
- Roblox - https://www.roblox.com/home
- The Sandbox - https://www.sandbox.game/en/
- Decentraland - https://decentraland.org/

VR Spaces

Whether its for business or just hanging out, these are interactive sites that allow you use spaces within their platform.

Resources

- File Format Docs
- Web 1.0, Web 2.0 and Web 3.0 with their difference - GeeksforGeeks
- Archlogbook - https://www.archlogbook.co/
- Techugo - https://www.techugo.com/

Metaverse

- Everything you need to know about the Metaverse
- 12 Examples of Brands in the Metaverse - Practical Ecommerce

NFT's

- https://opensea.io/blog/guides/non-fungible-tokens/#On-chain_vs_off-chain
- https://www.quicknode.com/guides/solidity/how-to-create-and-deploy-an-erc20-token
- The beginner's guide to creating & selling digital art NFTs
- The Non-Fungible Token Bible: Everything you need to know about NFTs
- Quick Overview of the NFT Ecosystem

Blockchain

- https://www.technologyreview.com/2018/04/25/143246/how-secure-is-blockchain-really/
- https://builtin.com/blockchain/blockchain-companies-roundup
- https://www.pwc.com/us/en/industries/financial-services/fintech/bitcoin-blockchain-cryptocurrency.html
- (QuickNode) https://www.quicknode.com/guides/web3-sdks/how-to-mint-an-nft-on-solana

Cryptocurrency

- 276 – Michael Saylor: Bitcoin, Inflation, and the Future of Money - Lex Fridman Podcast