Blockchain and NFTs for Web3.0 and Metaverse

Vincenzo Croce

Head of Media and Immersive contents Lab

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"Metaverse: beyond the hype, use cases and key technologies"

Web 3.0

What is it ?

The next generation of Web…

- A vision of a **decentralized web** that could implement an anternative, or complementary dimension, to the Web2.0 where a few big players control the rules.
- Bringhing new business models **to valorize users data and contents**, offering a **decentralize, open and permissionless economy** offering applications that are designed to be users-centric

Genealogy

Web1.0 : WWW (World Wide Web), usind HTML, l'URL o URI (Uniform Resource Identiíer) and HTTP protocol. 1991, Tim Berners-Lee published online the first web page

Decentralized / Users having passive role

Web2.0: Social Network era, centraliazation in an ***oligarchy of a few big players*** such as Google, Amazon, Facebook. 15 January 2001, Jimmy Wales and Larry Sanger published first Wikipedia, free collaborative encyclopaedia collecting **users generated contents**, Internet started to be interactive collecting, bottom up, collective intelligence and knowledge. **-> Web2.0 Revamped** : Implementing **semantic web** that was actually part of the Web3.0 vision.

Controlled by an Oligarchy / Users having active role

Web3.0 : conceived by Tim Berners-Lee (again), a vision of an immense source **of data governed by intelligent applications** able to understand the cognitive context (semantic web) with the goal to analize those data and take decisions. **->Addendum: decentrailzed** to guarantee that data and control remain on the users hands to avoid dangerous oligachies

Decentralized/ Users having active role in their data and contents valuechain

Web 3.0

What is it ?

Genealogy

Web1.0 : Decentralized / Users having passive role

Web2.0: Controlled by an Oligarchy / Users having active role

Web3.0 : Decentralized/ Users having active role in their data and contents valuechain

Web 3.0

Applciations and Key elements

Kind of Applications

- **dApp**, decentralized applications not controlled by a unique provider. Main part of them require an infrastructure like blockchain-smartcontract networks. Off-chain is theoreticall possible but not easy to be implemented in a decentralized way.
- **deFi** is a specif kind of dApp for finance. Can implement applications for Assurance, Deposti account, Loans leveraging on crowdsourcing
- **DAO** – Distributed Autonomous organization in which community members hold authority over a leadership central. DAOs can perform a wide range of functions, including philanthropy, investment, fundraising, project management and many more. Government exploits governance tokens and access tokens leveraging on the blockchain mechanisms .

Key elements

- Decentralized
- Inspired to Intellectual property and privacy protection
- Data and community centric

Web 3.0

Scenario

At this moment Web 3.0 is an amazing promise not easy to be implemented

- Web3.0 applications will increase but int the short terms scenario it is **difficult it will replace the Web2.0**
- Probably it will coesist with the Web2.0 for a while **dending on technologies improvements and users behaviour and business models.**
- For privacy Web2.0 demonstrated many fragilities, Web 3.0 was also born to put a stop to situations
    - **blockchain in theory it would be the perfect technology to encrypt data**
    - it is currently **too expensive** to think of being able to extend it to the mass of personal data that is exchanged on the web every day.
    - **Web2.0** offers centralized mechanisms that **are very easy to use for the users** without wallets or similar mechanisms requested by the decentralized approach

The battle between Web 2.0 and Web 3.0 depend a lot from the responsibility of individual users. Convenience tips the proverbial needle of the balance by Web 2.0, while responsibility would tend to favor the innovations of Web 3.0.

Metaverse

What it is?

In essence, the Metaverse is an immersive environment where people interact and engage through avatars, serving as an extension of the digital ecosystems and transforming the way we live and work

- A single entity cannot own the Metaverse
- It is meant to be an ecosystem for interaperable mutiple virtual worlds
- Aimed at create an immersive experience for users
- Goal: transforming the way we live and work

Metaverse

Different perspectives

- As this evolution progresses, we expect that all industries will be impacted, with a proliferation of use cases and projects for digitally immersive experiences
- Its diffusion depends on the adoption of apps that are part of an ecosystem
- It should be conceived as an interoperable ecosystem of ecosystems
- The rate of its evolution is linked to the evolution of technology and the global digital awareness and consciousness, which is becoming more informed and opinionated about how these technologies
- Technology trigger and availability are not enough for evolution to happen: maturity in adoption will follow tech maturity and human cultural awareness.

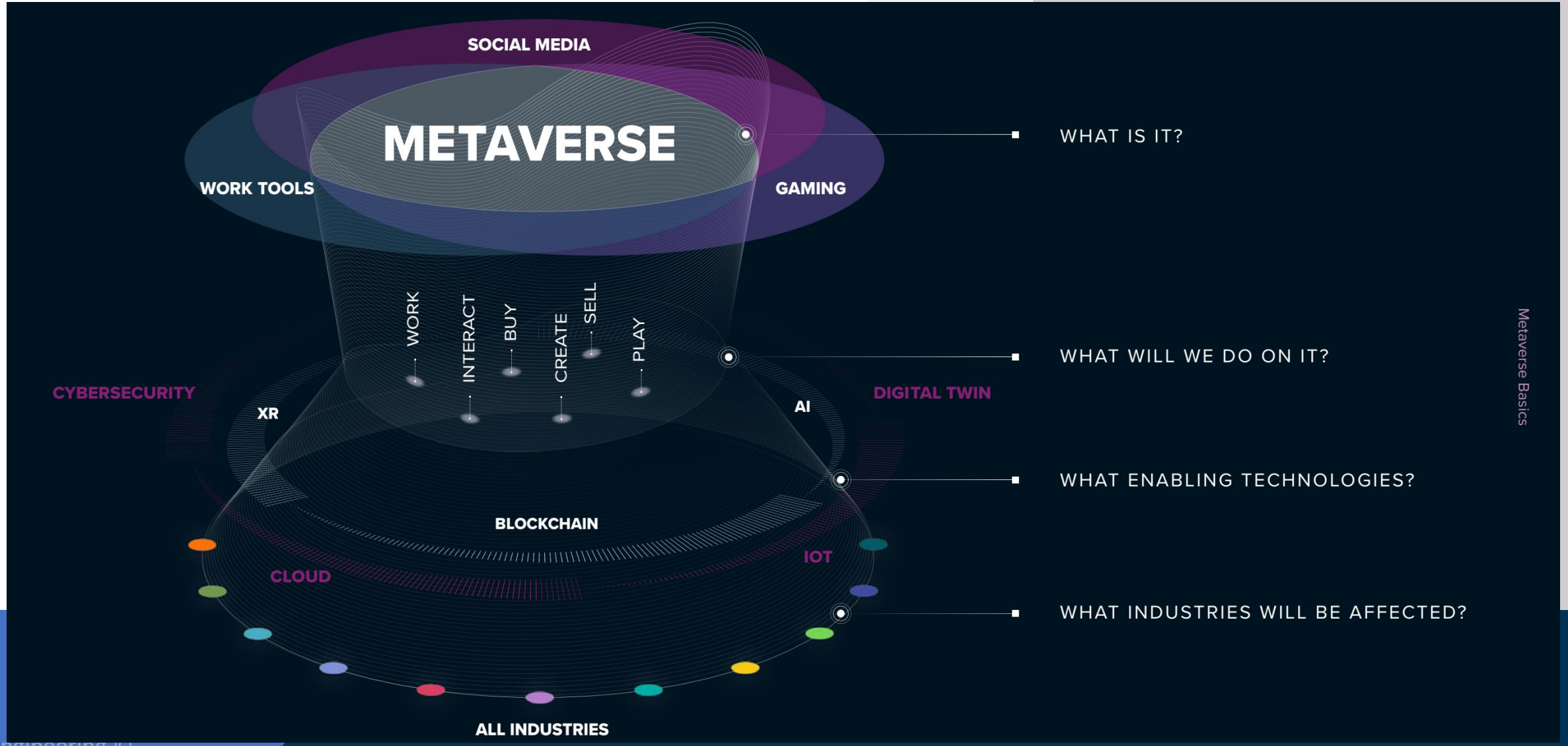
Metaverse

Enhabling Technologies

- **XR : VR + Ar + Aptic interfaces** for immersive environment
- **Blockchain** as basic infrastructure for NFT and smart contracts
- **Gaming** as environment for digital assets trading – play to earn
- **Social Media** for communities engagement
- **Cloud** as conputational and data handling infrastructure

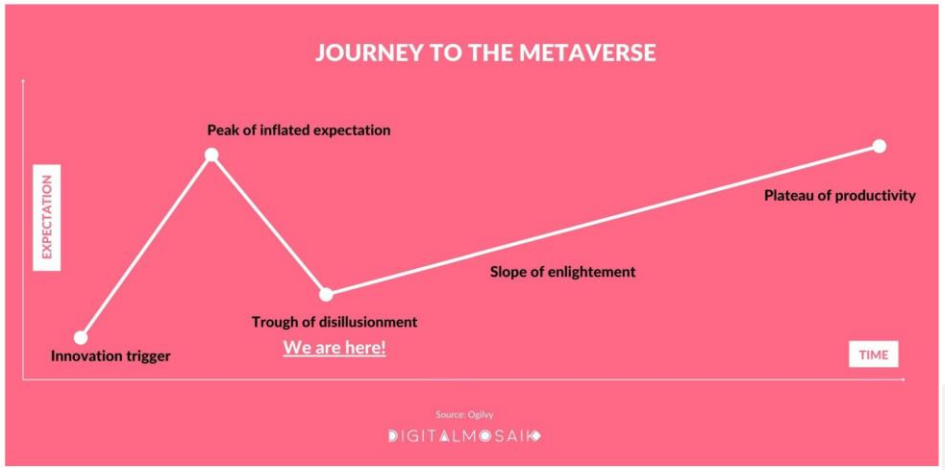
Metaverse

The Basics

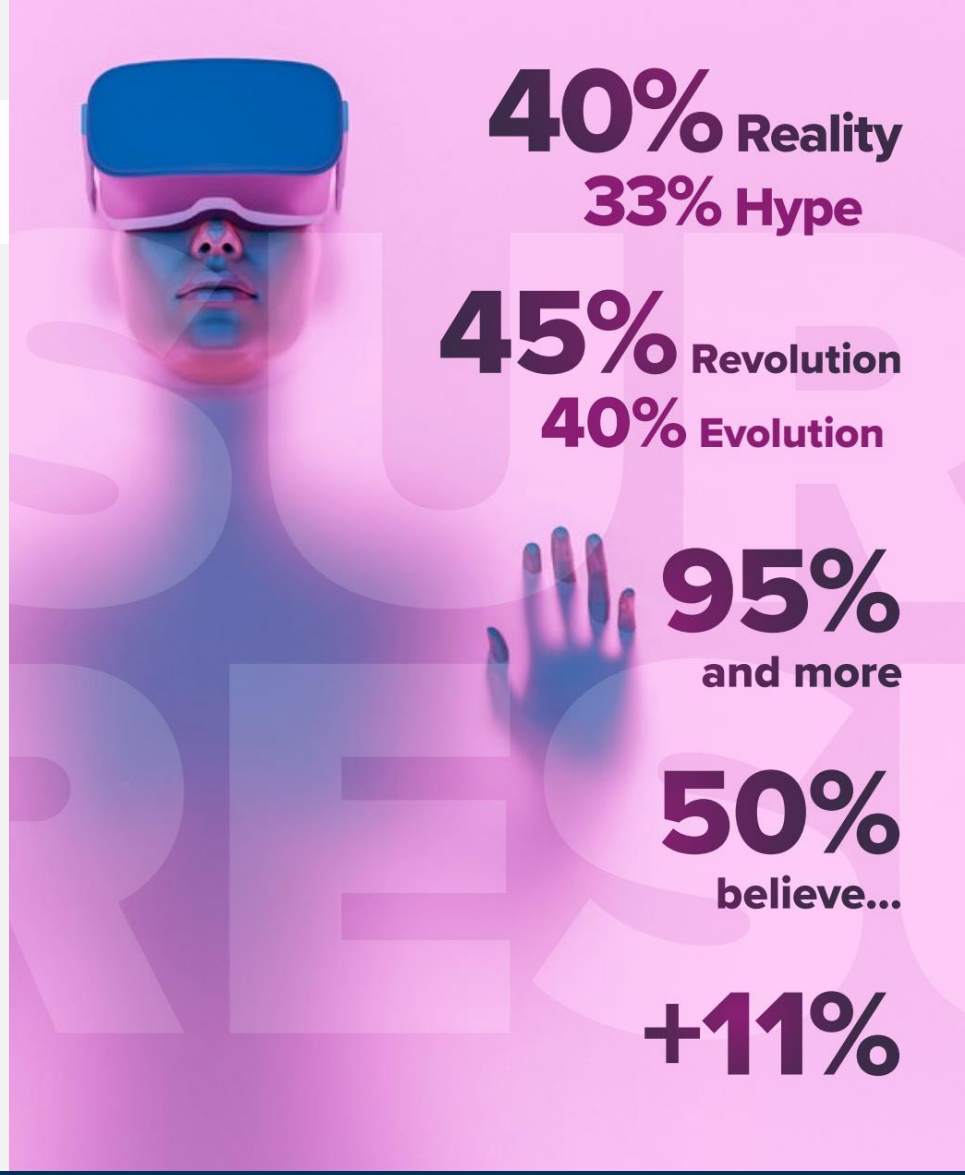


Metaverse

Hipe Vs Reality



- The balance between hype and reality witnessed in 2022 is changing as there is a clear increase in people feeling this will be Reality.
- Revolution still seems to be slightly ahead of Evolution.
- There is a wide consensus that the Metaverse will reach maturity by 2033
- ... that the impact of Metaverse will be relevant in the next 24 months.



Metaverse

Some Use cases

Gaming

Healthcare

Industrial Manifacturing

Creative Industry

Power Grid

Real Estate

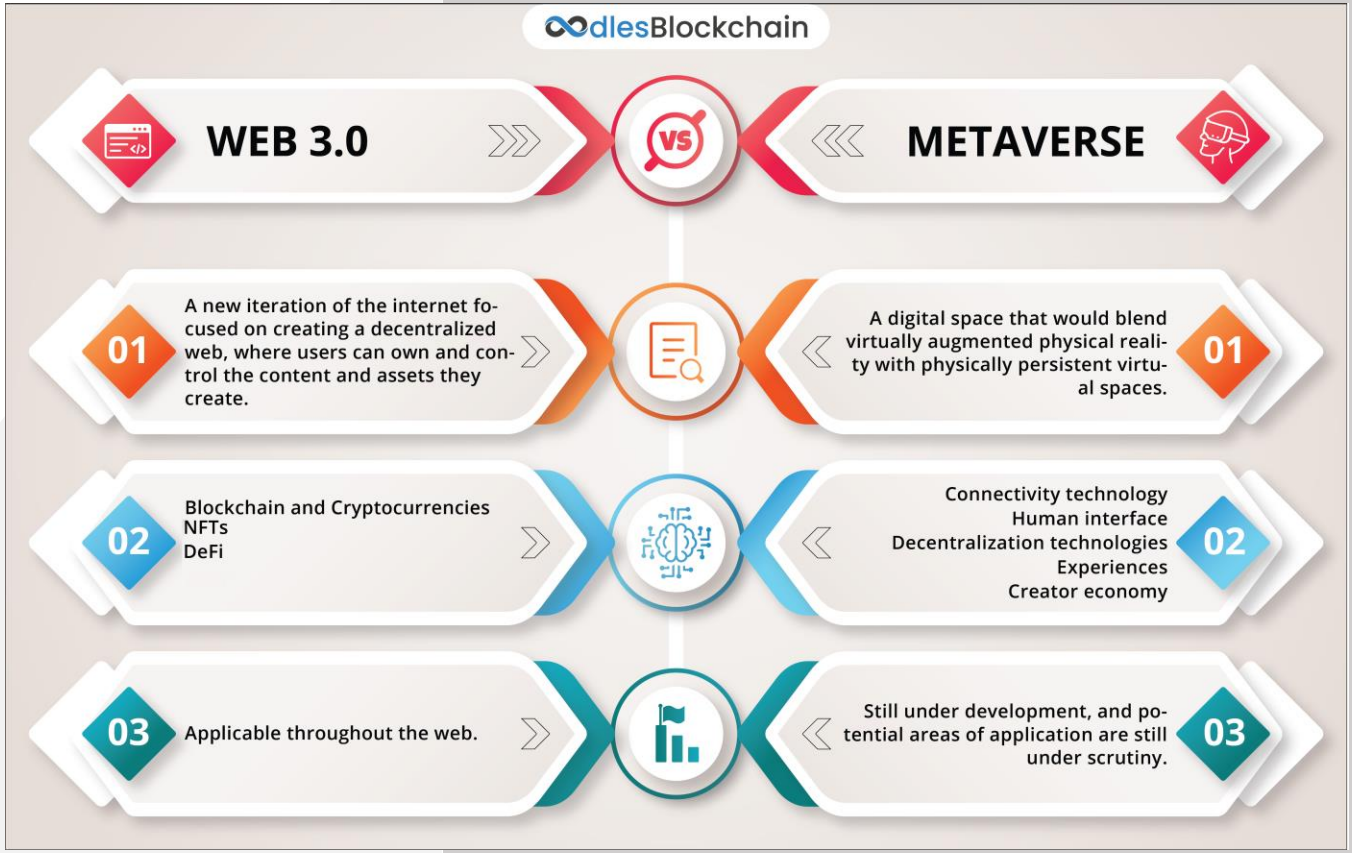
Education

Web 3.0 and Metaverse

Complementary roles

- **Web 3.0** concerns about **the rules to govern** of the new Internet
  - Open
  - Decentralized dApp & DeFi
  - Intellectual property and privacy protective – Digital Identity
  - Data Centric
  - User and Community Centric – DAO
  - Universal assets transferability
  - Digital currency / crypto currency

- **Metaverse** will pave the way of **how the users will interact** within Internet
  - Using **VR, AR and haptic sensors**
  - Handling **objects** – via NFT
  - Using crypto and CBDC (central bank digital currency) - **Money**
  - Exploiting **Defi – Banking**
  - Handling **communities – DAO**
  - Using social tokens for loyalty programs - **Rewarding**



NFT and Blockchain

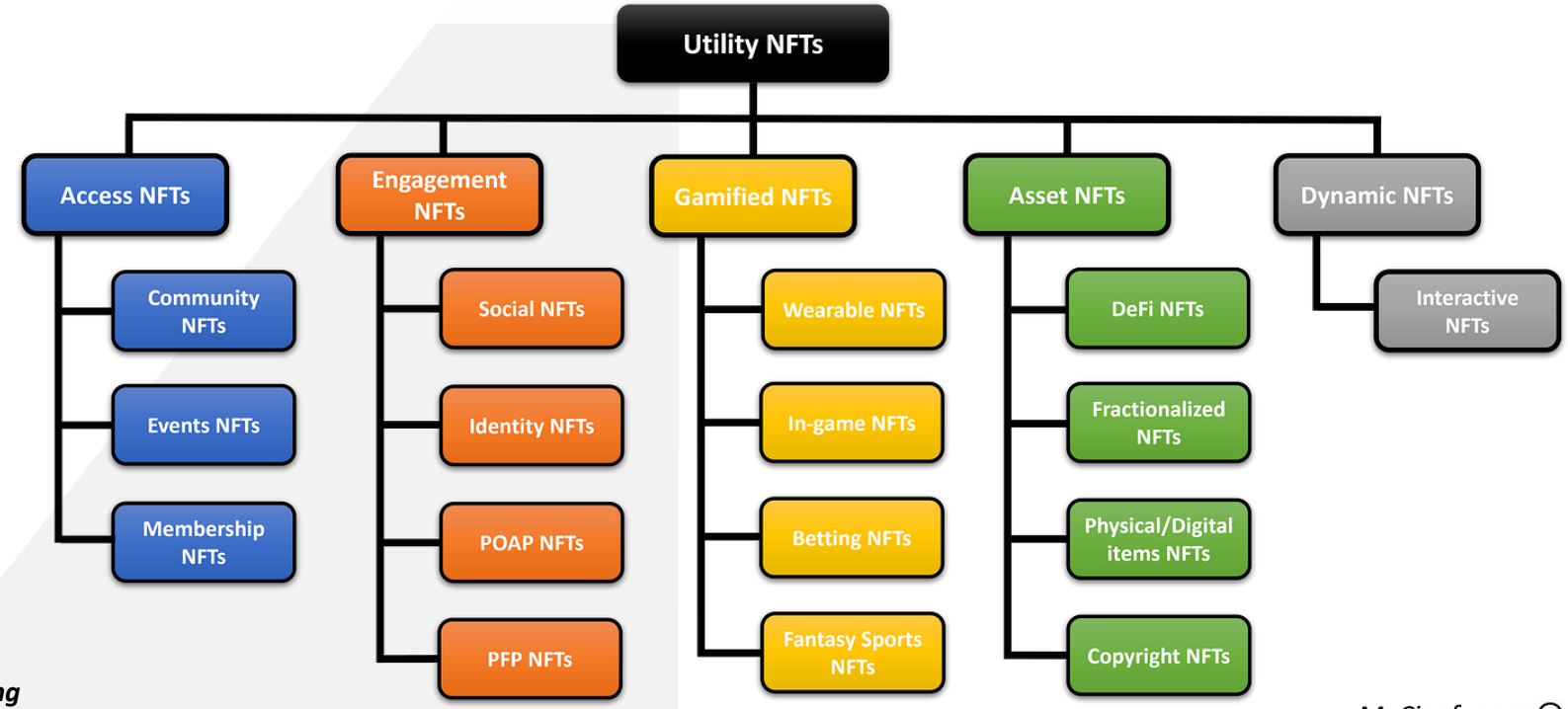
A Key enhabling technology

Blockchain offers different kind of tokens:

- **fungible**, to represent a value or fragment of it
- **Non fungible tokens (NFTs),** assets that have been tokenized via a blockchain. They are assigned unique identification codes and metadata that distinguish them from other tokens.

NFTs are considered the **technologica base for the Metaverse economy** allowing the creation of a digital assets marketplace in a Virtual Worlds where it is not easy to define rules for ownership, distribution , revenue sharing etc.

However, the utility of NFTs can be quickly **extended** in both the **digital and physical realm** by linking the NFTs to use-cases like ***memberships, discounts, ticketing, intellectual property, and copyrighting or connecting them to DeFi projects as an asset.***



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SUN project: where the physical and virtual worlds meet

Extended reality (XR) solutions that integrate the physical and the virtual world, towards the concept of Web3.0 and Metaverse.

SOLUTION

SUN will develop the SUN XR Platfrom for representing digital twins, wearable sensors and haptic interfaces, artificial intelligence-based solutions to address limitations of wearable devices, Hyper-realistic avatars - physically convincing - digital 3D twins of real people, blockchain-based solutions for the digital assement management.

SUN XR Platform will exploit a **Tokenized Platform**, based on **blockchain technology** and **NFTs**, for the fair, trasparent and secure management of the **XR digital assets**. Engineering also provides its deep expertise and knowledge in the context of the Data Space for the definition of the first *European Media Data Space.*

Scenarios

1) XR for rehabilitation after accidents or diseases

2) XR in the industry sector to increase safety and improve social interaction among workers

3) XR to remove interaction barriers for persons with disabilities.

RESULTS

- Physically convincing digital 3D models
- AI-based XR solutions for mixing physical and virtual worlds
- Novel human-machine interaction for XR
- Non Fungible Tokens (NFT) for XR digital assets exchange
- Definition of European Media Data Space.

Research Project

PROJECT VALUE

- Innovation

PROJECT TEAM

- Research & Innovation

ENABLING TECHNOLOGIES

- Blockchain
- AI & Advanced Analytics
- Digital Twin
- XR

DAFNE+: a decentralized platform for fair creative content distribution

The use of blockchain and Non-Fungible Tokens (NFTs) as key enabling technologies for Digital Asset Management and the Metaverse in the creative content industry.

APPROACH

Blockchain technology, the implementation of **NFTs transactions** and **the Web 3.0 paradigm** have increased the possibility for ***artists***, users and ***creators*** to take part in a cultural and artistic distributed community with an eye on its evolution towards the Metaverse.

DAFNE+ uses those novel technologies and offers **new business** models to the cultural and creative industries, improving their global reach and opening up **new distribution channels without the rules imposed by intermediaries**.

The project develops a blockchain based platform supporting: the creation of **Decentralized Autonomous Organizations (DAOs)** and the emerging co-creation model in Web 3.0, for fair creative content distribution through new digital models based on NFTs.

SOLUTION

DAFNE+ provides **innovative services and tools for digital asset creation and management** by developing new applications and enabling users to produce and ingest new content, directly valued and distributed.

The project simplifies the framework for the artists allowing them to use a set of tools, which can help them to easily participate and to offer their creative content over blockchains, without necessarily having a technical background.

RESULTS

- DAO platforms based on blockchain for creative industries
- NFTs and blockchain based tools for digital asset management
- Novel technologies (AI, 3D Avatars, etc...) for innovative digital asset production
- New business models based on DAOs and fair revenue algorithms
- Decentralised NFT Marketplace integrated with virtual spaces and metaverse.

Research Project

Engineering ©

PROJECT VALUE

- Innovation

PROJECT TEAM

- Research & Innovation

ENABLING TECHNOLOGIES

- Cloud
- Blockchain
- AI & Advanced Analytics
- XR

STORE ENG: Corporate Multimedia and Shop

We aim to improve knowledge of our company through interaction with multimedia content.

APPROACH

Here at Engineering, our ambition is to support companies in the exploration of Metaverse-related technologies, partly through the identification of solutions to be presented at in-person events.

The aim is to show the contents related to our business reality through a new, engaging and immersive experience.

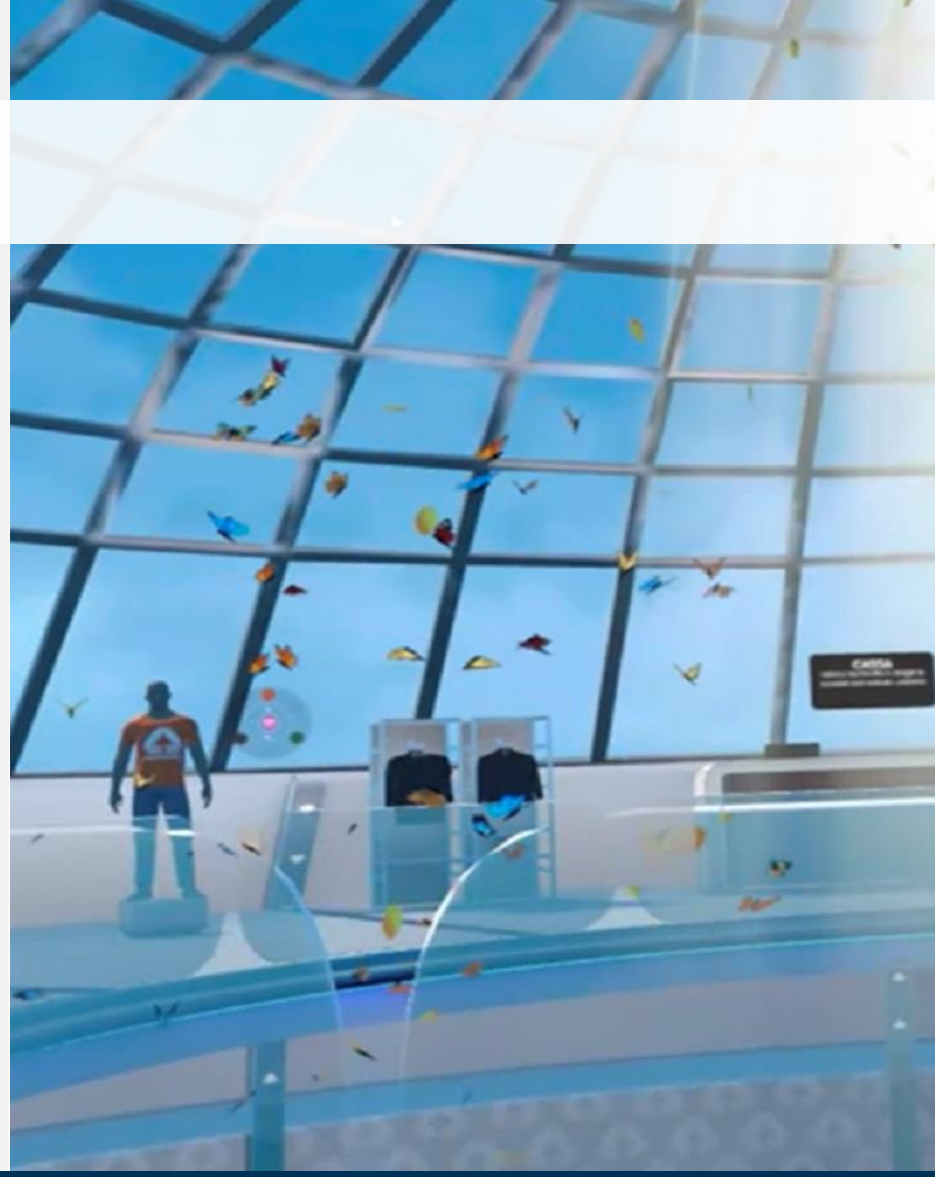
SOLUTION

We created an Oculus App, where users can learn about the Engineering world and interact with virtual spaces:

- Multimedia content
- Gamification
- Shop with interactive display and selection of gadgets, clothing, etc.

RESULTS

- Improved employer branding
- Immersive interaction with corporate identity
- Acquisition of new clients and partners.



PROJECT VALUE

- Innovation
- Visibility

PROJECT TEAM

- Digital Solutions

ENABLING TECHNOLOGIES

- XR

Ferentino Metaverse Academy

Engineering's training school presents itself in the Metaverse.

APPROACH

Our client is one of the leading corporate schools on IT in Italy, an Academy that last year alone delivered 32,000 training days, with 30,000 participants, 240 certified teachers and more than 600 courses available.

The "Enrico Della Valle" IT & Management Academy ensures the digital and managerial training of people and also deals with inclusion initiatives. Above all, however, it looks to the future: to the opportunities, provided by the Metaverse, to enter into dialogue with the new generations and to open new communication channels.

SOLUTION

Metaverse Academy is a virtual experience through which it is possible to acquire skills on Company procedures within the training school, including navigation and access to Company locations.

The experience is accessible through an immersive, multi-user app available on both PC and Oculus platforms that allows users to:

- test their knowledge and skills with games and quizzes

- broaden their knowledge of company information and procedures.

RESULTS

- Improved onboarding for new recruits

- Engagement & employer branding

- Corporate image

PROJECT VALUE

- Innovation
- Visibility

PROJECT TEAM

- Digital Solutions
- IT & Management Academy "Enrico Della Valle"

ENABLING TECHNOLOGIES

- XR