



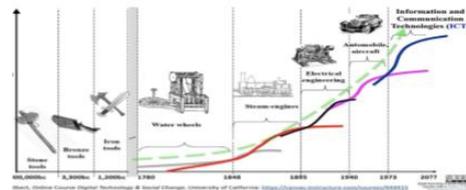
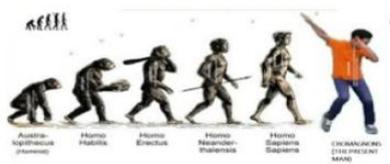
Immersive AI: Transforming Reality with Intelligence and Interaction



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Highlights



- Understanding the Immersive AI
- Making Artificial Sense of The World
- Working with the Artificial Sense
- Considerations, and way forward!



CHAPTER 2 Metaverse: Various Forms and Interpretations

Introduction

The chapter covers the diverse manifestations and interpretations of the metaverse. From its portrayal as a game, virtual world, and eXtended Real (XR) world to its role as a new social media platform and collaboration hub, the chapter delves into the different facets of the metaverse. It examines expert perspectives and the loosely defined nature of the concept, while also discussing the metaverse's potential as the next evolution of the internet. The chapter explores metadata and people networks, characteristics of the metaverse, immersive experiences, and their impact across various sectors. It also addresses misconceptions and trends, guiding navigating the evolving metaverse landscape.

Structure

In this chapter, we will discuss the following topics:

- Metaverse: a game
- Metaverse: a virtual world
- Metaverse: an extended real world
- Metaverse: a social collaboration platform
- Metaverse: as defined by the experts

Exploring the Metaverse

- Defining the metaverse
- Metaverse: the next internet
- Metaverse: myths vs reality
- Navigating the evolving metaverse landscape

Objectives

The objective of the chapter is to provide readers with a comprehensive understanding of the diverse interpretations of the metaverse concept and the reasons behind its loose definition. By exploring different perspectives and examining myths and realities surrounding the metaverse, readers will gain insights into the evolving nature of this concept. Additionally, this chapter aims to establish a common definition and outline the key characteristics associated with the metaverse. Upon completing this chapter, readers will have a solid foundation for comprehending the metaverse and its implications in future discussions.

Metaverse: a game

Digital gaming has played a significant role in driving the adoption of technology. From pre-installed card games to social titles like Super Mario on personal computers and the Snake game on Nokia mobile phones, gaming has been instrumental in shaping entertainment and technology adoption. The influence of gaming on technological advancements can be traced back to science fiction games and entertainment, making it natural to view the metaverse as a game, while the term itself originated from a science fiction novel.

Metaverse: a virtual world

Facebook's dominant position in the realm of social media and its significant influence on the digital world have positioned it as a key player in the metaverse.

Metaverse: an extended real world

Scientists have been exploring Augmented Reality (AR) through games like Pokémon Go, which defines the metaverse as an extended version of the existing universe, allowing it to be used and accessed. Intel's objective is to build 3D maps and connect the entire world with its gaming devices, which it aims to do through its research and creation. Google CEO Sundar Pichai views the metaverse as immersive computing in the form of AR. Intel's goal is to create a metaverse that is an extended world with varying degrees of immersion.

Metaverse: a social collaboration platform

Facebook, now known as Meta, has emerged as a major force in the development of social collaboration. Through various acquisitions and investments in platforms like Instagram and WhatsApp, Meta has established a strong presence in the digital communication space. The company's focus is on creating a metaverse that is a social collaboration platform, where users can interact and collaborate in a virtual environment.

Metaverse: myths vs reality

In this section, we delve into the prevalent myths and misconceptions surrounding the metaverse and contrast them with the reality of this emerging digital phenomenon. The metaverse has captured the imagination of many, but it is essential to separate fact from fiction to gain a clearer understanding of its true nature and potential. Table 2.1 outlines the myths and misconceptions and the reality of the metaverse.

Myth / Misconception	In reality
The metaverse is a single, unified virtual world.	The metaverse is a collection of interconnected virtual worlds.
The metaverse is a fully immersive, 3D environment.	The metaverse can be accessed through various devices and platforms.
The metaverse is a new form of social media.	The metaverse is a new form of digital collaboration and communication.

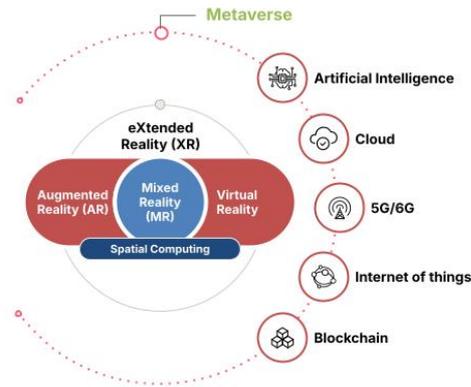
Metaverse: the next internet

When we think of the internet and its impact on the world, we often think of the way it has changed the way we communicate and the way we work. The metaverse is being seen as the next evolution of the internet, a place where we can interact and collaborate in a virtual environment. The metaverse is not just a collection of virtual worlds; it is a new way of thinking about the internet and the way we use it.

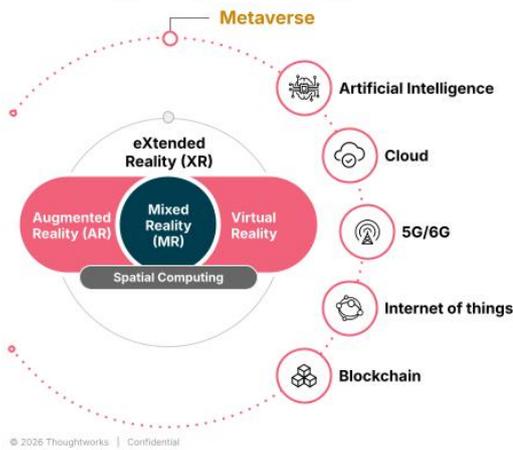
Metaverse: as defined by the experts

The best several definitions of the metaverse, based on different understandings and perspectives, and the consensus of people and industry. Early ideas tend to focus on virtual worlds and the creation of a new digital space. More recent definitions focus on the metaverse as a collection of interconnected virtual worlds, where users can interact and collaborate in a virtual environment. The metaverse is not just a collection of virtual worlds; it is a new way of thinking about the internet and the way we use it.

Realities are going through a paradigm shift



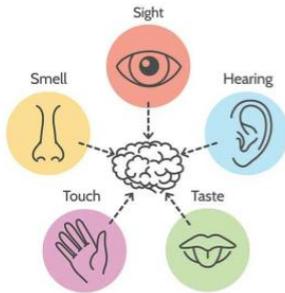
Realities are going through a paradigm shift



XR beyond head mounted devices - web XR / mobile XR

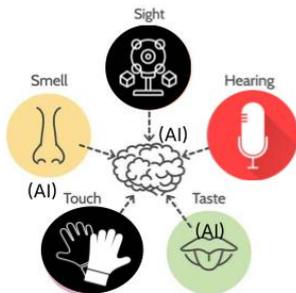
- Immersive experience re-ignited by Apple Vision Pro/Android XR
- Ecosystem shaping up with Meta Horizon OS/ Google Android XR / Qualcomm Spaces
- XR investment growth over 100% in next 5 years for optimization of Enterprise operations
- Driving XR based use cases
 - Simulation & Training
 - Operational Efficiency
- Enhancing XR experiences using AI
- Rise of spatial intelligence systems
Physital AI / Immersive AI

How do we make senses of the world?



🌐	Depth Sensing
🚩	Object detection, Voice recognition
🌐	Motion tracking - Physics, Gravity
🚩	Physical and psychological safety perception

How do we make senses of the world?



🌐	Depth Sensing, (Lidar, Image to 3D, NeRF...)
🚩	Object detection, Voice Recognition
🌐	Motion tracking (SLAM, Physics Engine)
🚩	Physical and psychological safety perception (Sensors, Actuators, BCI - AI)

The Shift We Are Living Through

From Digital Experiences to Intelligent Realities

We used to step into digital worlds –



Now intelligence steps into ours –



Physical and virtual realities are converging –



The Shift We Are Living Through

From Digital Experiences to Intelligent Realities



Immersion traditionally

Audio visual
Screens, headsets, and visuals
Immersion was visual and device-bound
AR, VR, MR → XR
Experience, XRgonomics



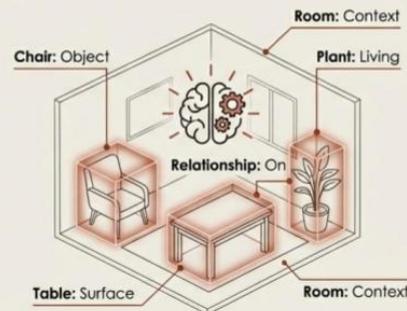
Immersion moving towards

Spatial Interaction
Schematic understanding
Headless interfaces
AI glasses
XR → Intelligent XR
Emotion is new interface
Immersive Intelligent World!

Immersive Intelligent World

Spatial Computing as the Foundation with Reality,
When Reality Becomes Semantically Aware

- Spatial computing enables machines to understand space
- Objects, places, and relationships become machine-readable
- Reality becomes searchable and interactive
- AI understands environments semantically, not just geometrically
- Different parts of a scene are indexed and contextualized
- Humans and machines can reason and act within physical spaces



Use cases

Use Case 1: Spatial Retail Intelligence

IoT, Smart Tags, and Operational Efficiency

Retail stores become living digital environments

- Spatially aware IoT tags enable:
- Accurate placement tracking
- Faster maintenance and repair
- Better planogram compliance



/thoughtworks

From Insights to Action

AI Agents, Robots, and Indoor Navigation

Indoor navigation improves both customer and staff experience

- AI agents and robots can:
- Locate problems
- Navigate to physical locations
- Perform or trigger actions
- Planogram

Intelligence moves from dashboards to execution



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Use Case 2: Customer Engagement & Museums

Spatial AI + LLMs for Living Experiences

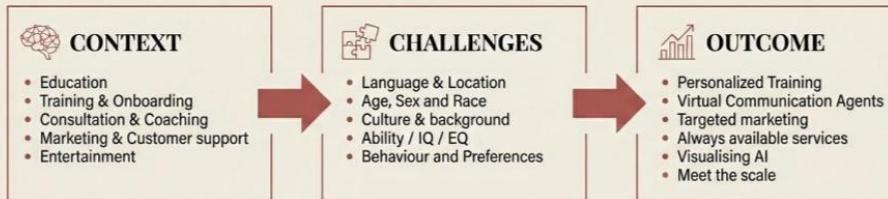
Cultural spaces become adaptive environments

- Visitors are guided contextually, not statically
- LLMs personalize storytelling in real time
- Experiences become emotional and memorable



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Communication with Artificial Sense



Use Cases & Examples



Retail & Marketing

- In-store AR based engagement
- 360-degree VR tours
- Virtual Artist
- Virtual shopping experience, fitting rooms etc.
- AR based product catalog
- Virtual marketing
- Try before you buy
- Virtual customization



Enterprise & Training

- VR based design and engineering reviews
- 3D visualizations
- VR events
- Interactive 3D Simulation
- Training & Employee engagement
- Field service

Working with Artificial Sense



Use Cases & Examples



Safety and Compliance

- Innovative Marketing
- Increased user/staff engagement



Operational Efficiency

- Improved service and repair

Challenges

The next leap in immersion goes beyond sight and sound

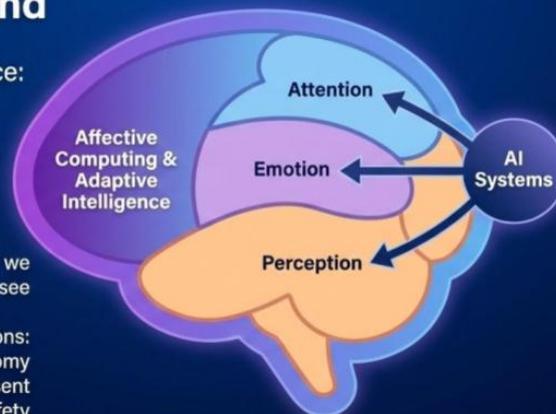
AI systems are beginning to influence:

- Attention
- Emotion
- Perception

Experiences can shape how we feel, not just what we see

This raises new questions:

- Cognitive autonomy
- Emotional consent
- Psychological safety

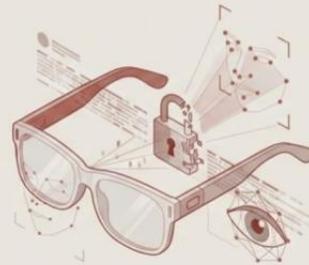


Survival begins at the level of the human mind

Survival Challenges

Privacy, Identity, and Ubiquitous AI Glasses

- Always-on intelligence changes the privacy equation
- Questions of:
 - Who sees what
 - Who owns spatial data
 - Who controls identity
- Poor design leads to surveillance, not empowerment

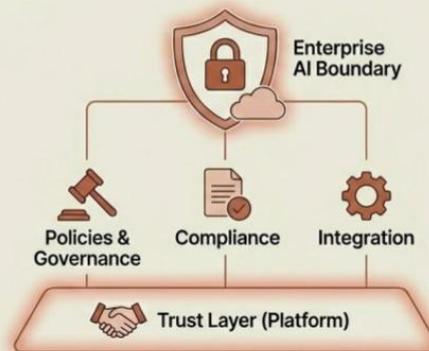


Platforms and Enterprise AI

Trust, Policies, and Responsible Systems

Immersive intelligence must operate within enterprise boundaries

- Integration with policies, governance, and compliance is essential
- Trust becomes the platform layer



The Way Forward!

Innovation without responsibility leads to fragility

SURVIVING VS THRIVING

Designing for Resilience, Not Just Innovation

Designing for Resilience, Not Just Innovation

SURVIVING

FRAGILITY

THRIVING REQUIRES:

RESILIENCE

SUSTAINABLE GROWTH & TRUST

ETHICAL AI

TRANSPARENT SYSTEMS

HUMAN-CENTERED DESIGN

The image is a comparison between 'Surviving' and 'Thriving'. On the left, 'Surviving' is depicted as a precarious tower of blocks (some with gears and lightbulbs) on a cracked, crumbling base labeled 'FRAGILITY'. On the right, 'Thriving' is depicted as a sturdy classical building with three columns on a solid, rocky base labeled 'RESILIENCE'. The columns are labeled 'ETHICAL AI' (with a scales icon), 'TRANSPARENT SYSTEMS' (with a magnifying glass icon), and 'HUMAN-CENTERED DESIGN' (with a heart icon). The building's pediment is labeled 'SUSTAINABLE GROWTH & TRUST'. The overall theme is that responsible innovation leads to resilience and trust, while irresponsible innovation leads to fragility.

Standards Matter the most

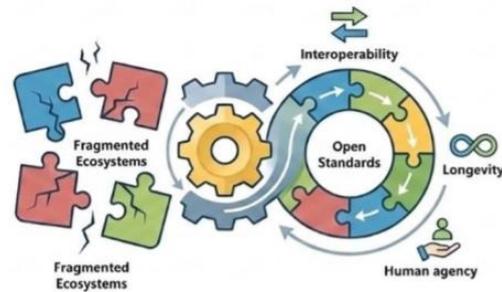
Open, Interoperability, and User Control

Fragmented ecosystems erode trust

Open standards enable:

- Interoperability
- Longevity
- Human agency

Standards are survival tools, not technical details



Call to Action: Building the Future Together

The immersive intelligent world is a shared responsibility



Way Forwards: Navigating the Metaverse & AI Glasses Era



THANK YOU

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