CONCURRENT EVENTS

IPOS 2024

Refineries • Petrochemicals • Process Industries

4th Edition of Downstream Process Optimization Technology & Safety Conference

DATS 2024

4th Edition of "Digitalization & Automation Tech Summit"

17-18 December 2024; Hotel Holiday Inn, Mayur Vihar, New Delhi

Reimagining Downstream Efficiency and Safety with Immersive AI Technologies

Kuldeep Singh

Principal Consultant, Author,
Global Emerging Technology Leader
Thoughtworks Technologies India Pvt Ltd

/thoughtworks

Speakers Profile

Kuldeep Singh

Thoughtworks Technologies India Pvt Ltd

Years of Experience: 20

Educational Background:
B.Tech, Computer Engineering, NIT Kurukshetra

Brief Job Profile:
Principal Consultant and Global Emerging Technologies Leader at Thoughtworks, driving innovation by shaping engineering standards, best practices, and delivering cutting edge technology solutions.

Professional Expertise:
Established Centers of Excellence for technologies like IoT, AR/VR, and Web3. Led transformative data projects and designed scalable enterprise solutions. As a writer and speaker, I actively contribute to the tech community and society, and I'm the proud author of *Exploring the Metaverse: Redefining reality in the digital age", and holds two patents in XR.*

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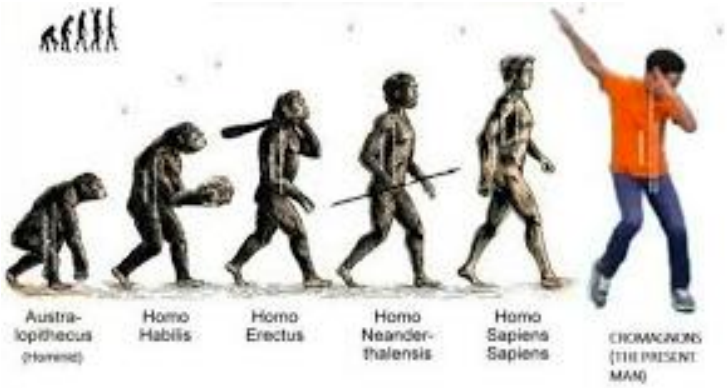
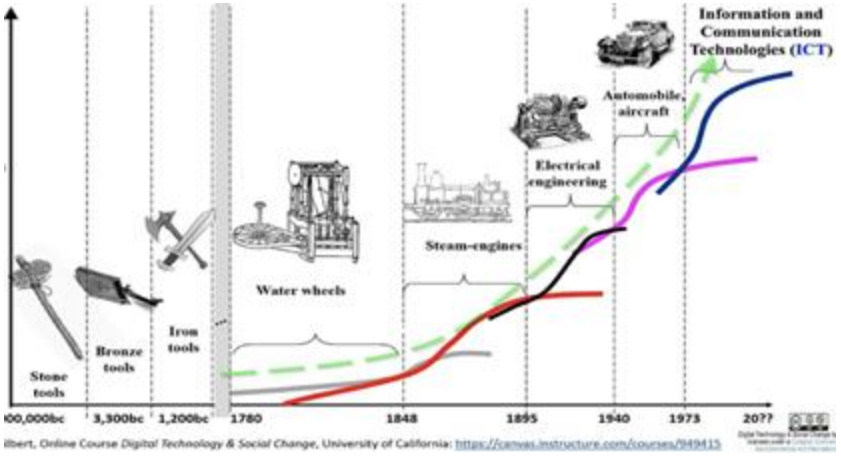
Highlights





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

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Understanding the Immersive AI

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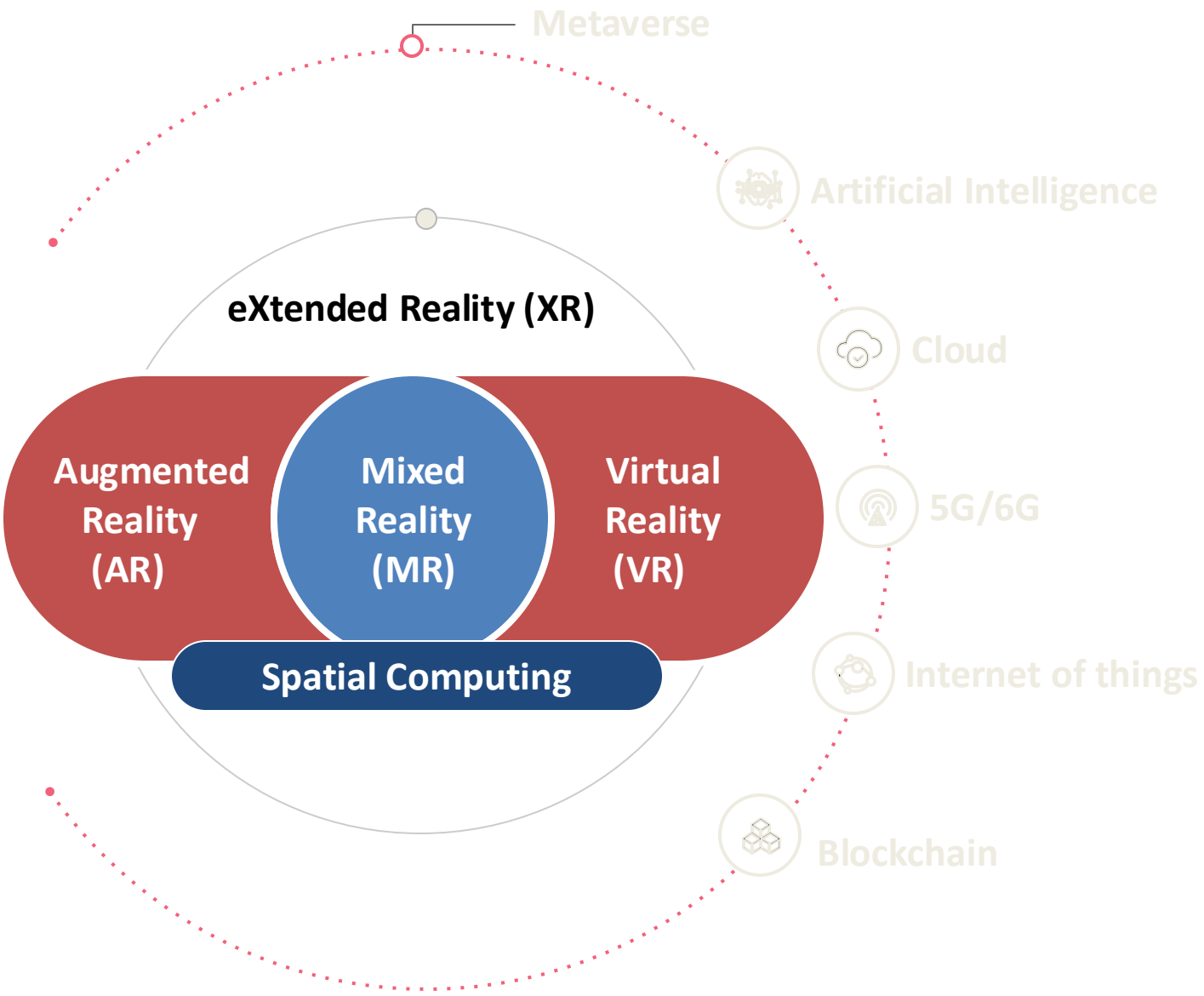
Understanding Immersive AI



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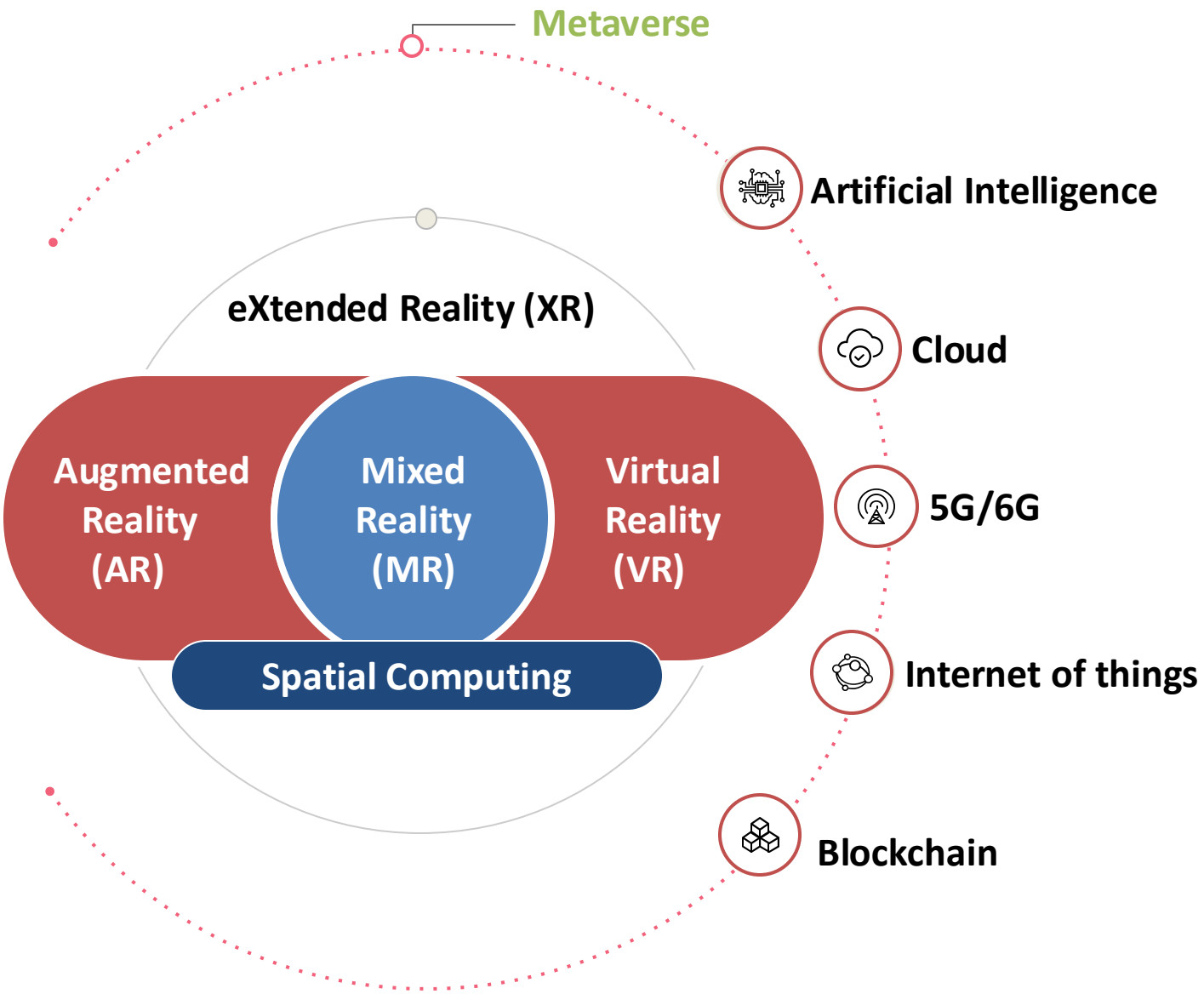
Understanding Immersive AI



Understanding Immersive AI

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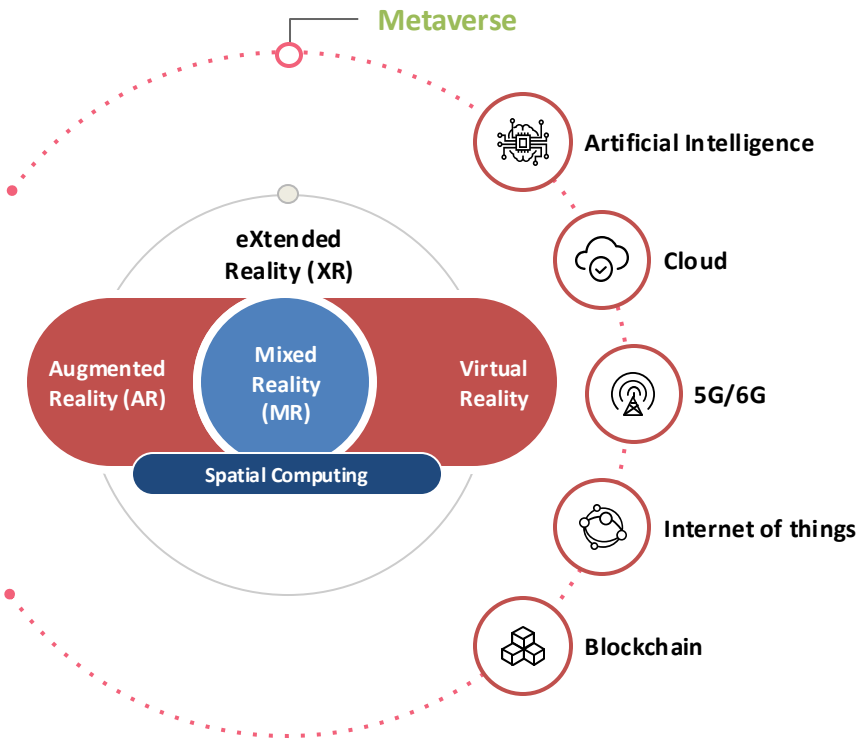


XR beyond head mounted devices - web XR /mobile XR

Immersive experience re-ignited by Apple Vision Pro

Ecosystem shaping up with Meta Horizon OS/ Google Android XR / Qualcomm Spaces

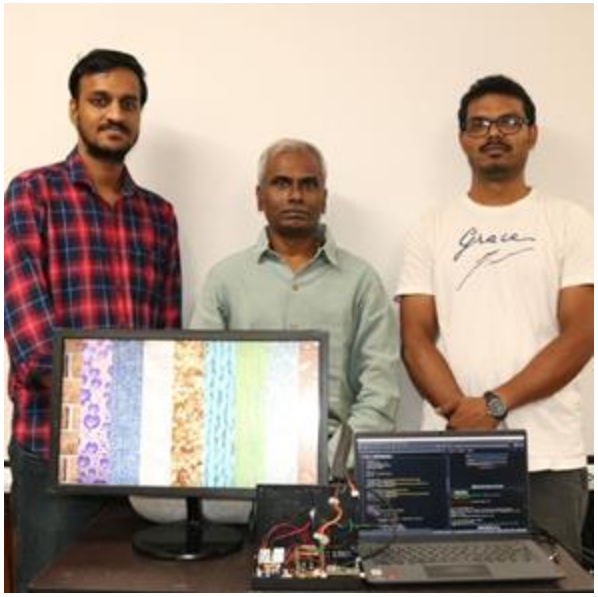
100% Investment growth over next 5 years in enterprise operations

XR Use cases

- Simulation & Training
- Operational Efficiency

Enhancing XR experiences using AI

Rise of spatial intelligence systems

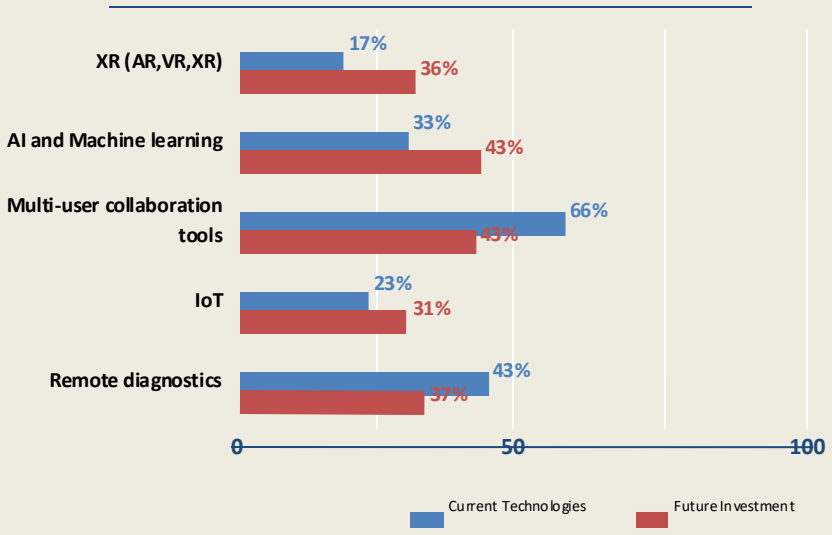


Exploring
the
Metaverse

Key observations and trends

Enterprises are adapting their strategies to incorporate transformative XR technologies for a competitive edge

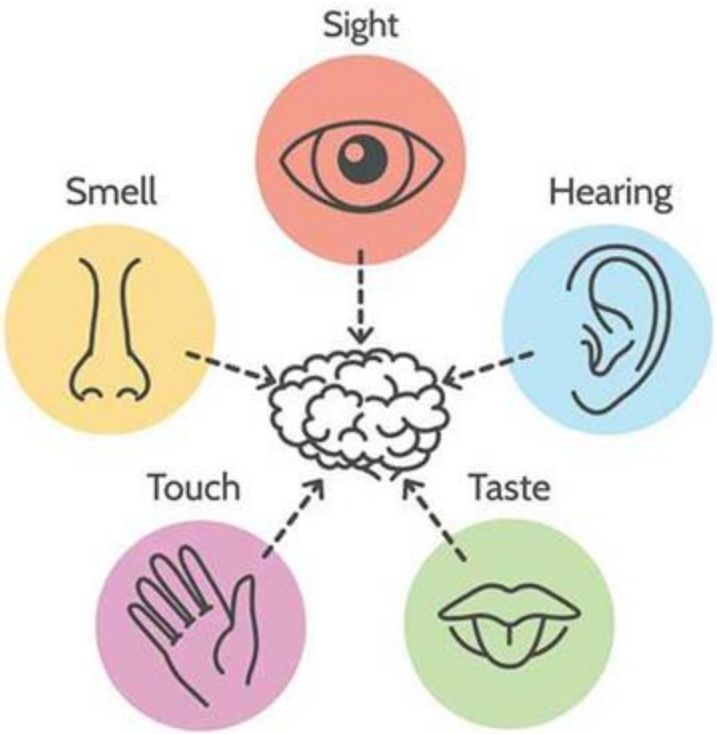
Technologies companies are investing in to optimize operations today, and what is planned for the future



Survey from ABI Research. Survey respondent roles included sales and marketing, operations, Information Technology (IT), frontline workers, and executive-level employees.

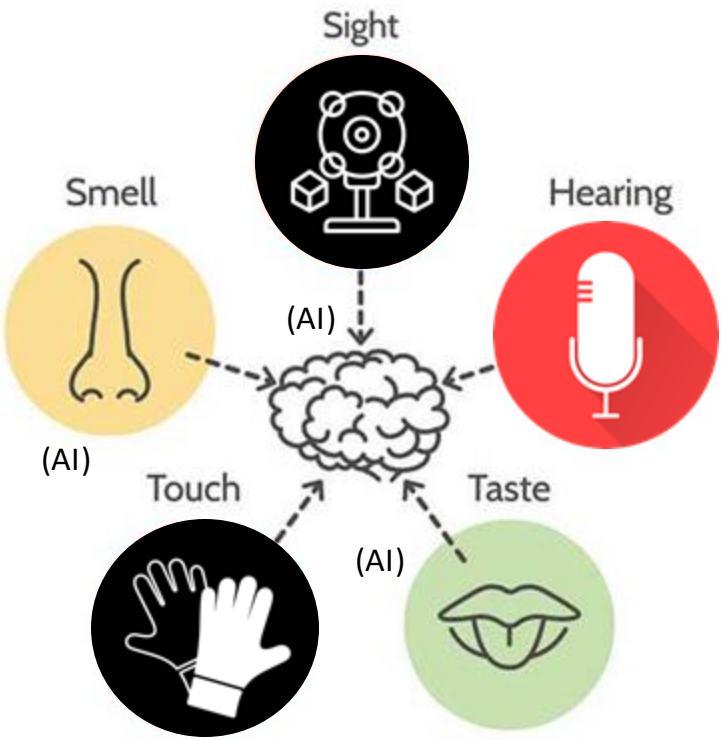
Immersive AI - Making artificial sense of the World

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?



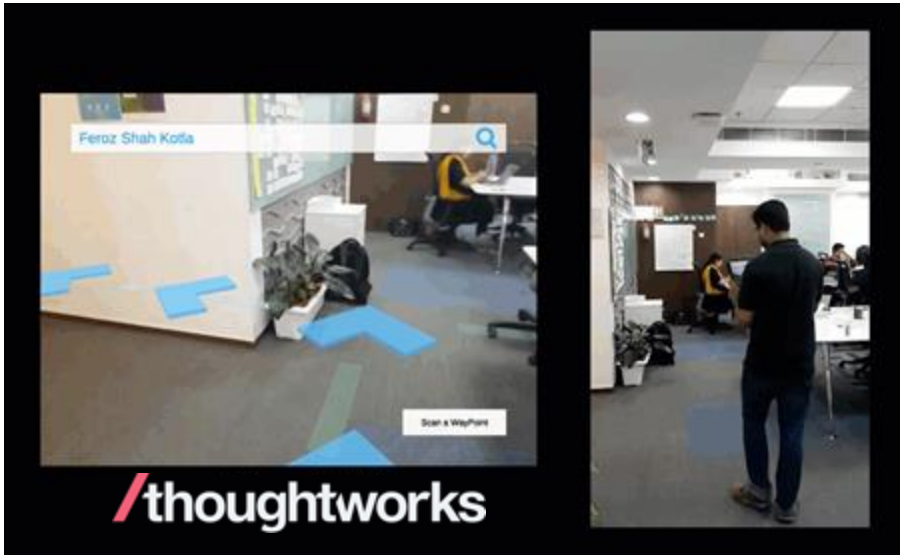
- Depth Sensing, (Lidar, Image to 3D, NeRF…)
- Object detection, Voice Recognition
- Motion tracking (SLAM, Physics Engine)
- Physical and psychological safety perception (Sensors, Actuators, BCI - AI)

Space Aware Apps

Spatial Computing

Volumetric Apps

Spatial Anchor, World Coordinates



Map and navigation, optimal routing

Indoor, Outdoor, City Scale, beyond experiences. Social hotspot, targeted marketing and more.

Measure, Tracking Area, Volume Estimation, Progress.

Building Equity with Technology

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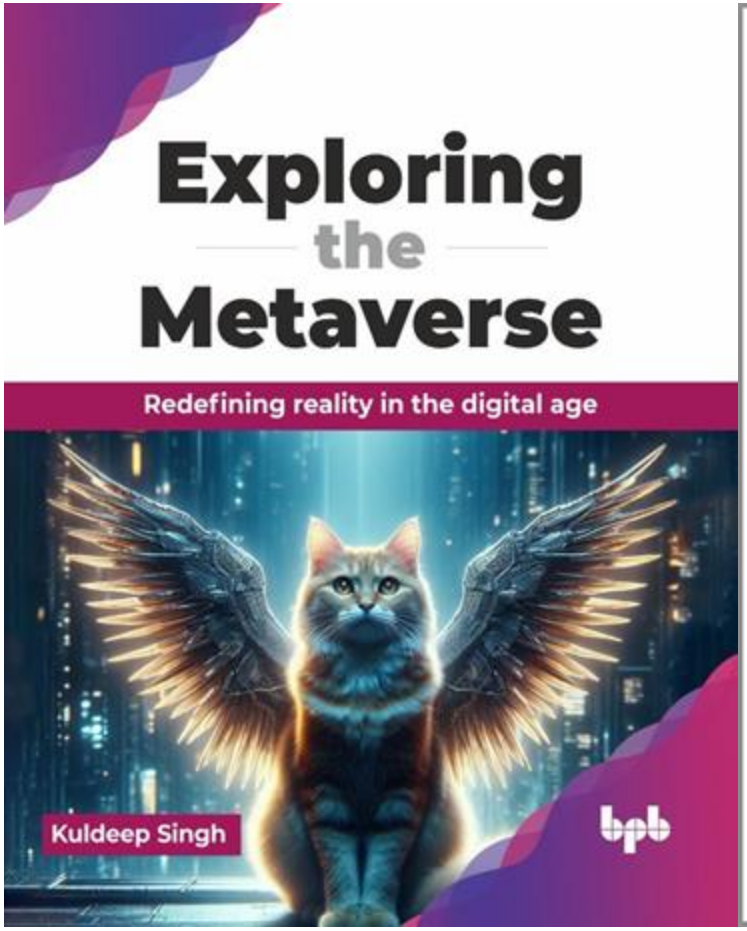

CHAPTER 4

AI Empowering the Metaverse

Introduction

This chapter explores the crucial role of **Artificial Intelligence (AI)** in the metaverse, enabling intelligent and seamless interactions within virtual environments. It covers how AI capabilities contribute to immersive and interactive experiences in the metaverse, encompassing user identification, natural language interactions, visual perception, physical interactions, spatial awareness, audio experiences, and advanced data processing. It also touches up on the research that connects the brain to computers and manipulates dreams and thoughts to bring magic of technology.

> **Any sufficiently advanced technology is indistinguishable from magic**
>
> *-- Arthur C. Clarke*

Structure

In this chapter, we will discuss the following topics:

- Artificial Intelligence
- Importance of AI
- Evolution in AI
- AI enabling metaverse

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Generative XR

Space aware AI bringing new era of immersion

XR is becoming an interface for AI

https://thinkuldeep.com/post/generative-xr-space-aware-ai-bringing-new-era-of-immersion/

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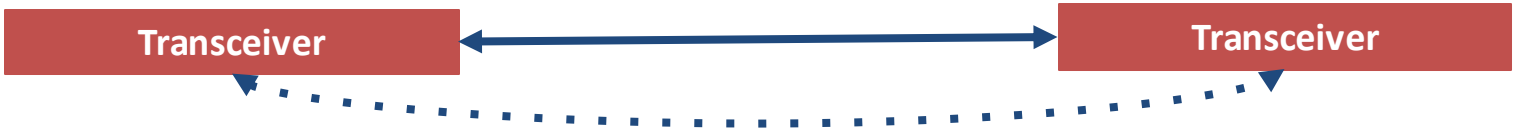
Immersive AI - Working with the Artificial Sense

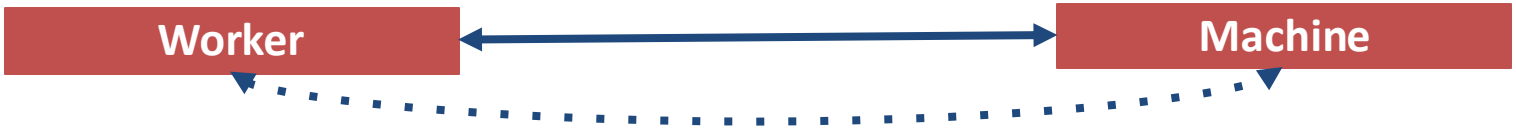
Communication with Artificial Sense



Context	Challenges	Outcome
• Education • Training & Onboarding • Consultation & Coaching • Marketing & Customer support • Entertainment	• Language & Location • Age, Sex and Race • Culture & background • Ability / IQ / EQ • Behaviour and Preferences	• Personalized Training • Virtual Communication Agents • Targeted marketing • Always available services • Visualising AI • Meet the scale

In-store AR based engagement	360-degree VR tours	Virtual Artist	VR based design and engineering reviews	3D visualizations	VR events	Virtual shopping experience, fitting rooms etc.
AR based product catalog	Virtual marketing	Interactive 3D Simulation	Training & Employee engagement	Field service	Try before you buy	Virtual customization

Working with Artificial Sense



Context	Challenges	Outcome
• Operational Efficiency • Safety • Audit and Compliance • Hybrid working • Remote working	• Aging labour, shortage • Outdated knowledge, • Traditional trainings • Working with machines • Mental health • Increasing Complexity and cost	• Enhanced capability with AI assistant • Human machine Integrated working • Targeted upskilling • Safety compliance • Practice with simulation

Benefits			
	Enhanced Customer Experience	Safety and Compliance	Innovative Marketing
	Increased user/staff engagement	Operational Efficiency	Improved service and repair

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Considerations, and the way forward!

Considerations, the way forward

Challenges

- Privacy and Identity Protection
- Dependence
- Social Isolation, Mental issues
- Awareness
- Sustainability - Viability, Bearability, Equitability

The Way Forward

- Collective effort - Academia, Industry, Businesses, Governing body, and people.
- Create awareness, use it wisely.
- Contribute in developing standards and and practices, open ecosystem.

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Thanks and keep in touch

Kuldeep Singh

Principal Consultant, Global Emerging Technology Leader

/thoughtworks

- kuldeeps@thoughtworks.com
- thinkuldeep.com
- medium.com/xrpractices
- linkedin.com/in/kuldeep-reck/
- x.com/thinkuldeep

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