

**EHTEL**

*AIOTI – 22 Nov 2022*

# VERSES

Imagine a Smarter World.™



**Philippe Sayegh**, Chief Adoption Officer, VERSES  
*philippes@verses.io*



- VERSES is a **cognitive computing company** specializing in next generation AI
- Founded in 2018. EU HQ in **Eindhoven**.
- VERSES is the developer of KOSM™, the world's **first network operating system for enabling distributed intelligence**.
- VERSES technology is based on the **Spatial Web standards**
- **Public** company, Clients include **Fortune 500**
- **Horizon Europe – Flying Forward 2020** – autonomous drone governance in urban areas : Eindhoven, Zaragoza, Milan, Olu, Tartu.



# V VERSES



**1. PROTOCOLS**



**2. COGNITIVE COMPUTING PLATFORM**

**3. SPATIAL APPLICATIONS**

A night view of Earth from space, showing city lights and the Milky Way galaxy in the background. The Earth's horizon is visible, with a bright blue and white glow from the atmosphere. The city lights are concentrated in the central and eastern parts of the continent shown. The Milky Way galaxy is visible in the dark sky above the horizon.

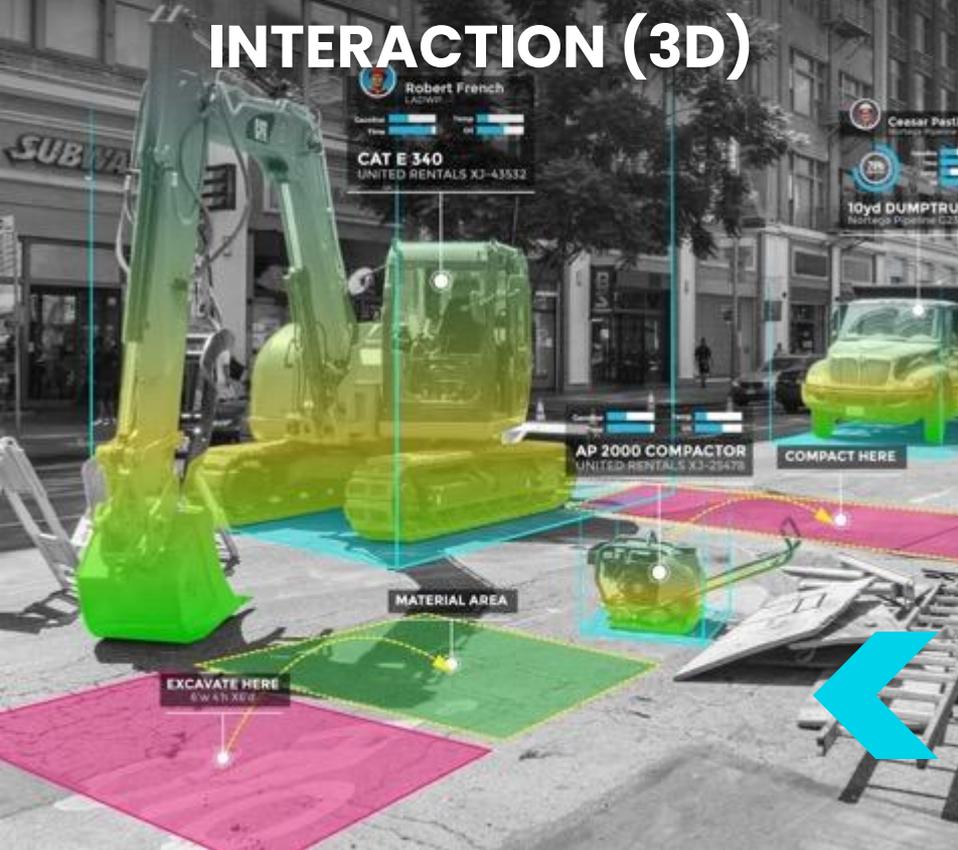
**WHAT'S NEW?**

**VERSES**

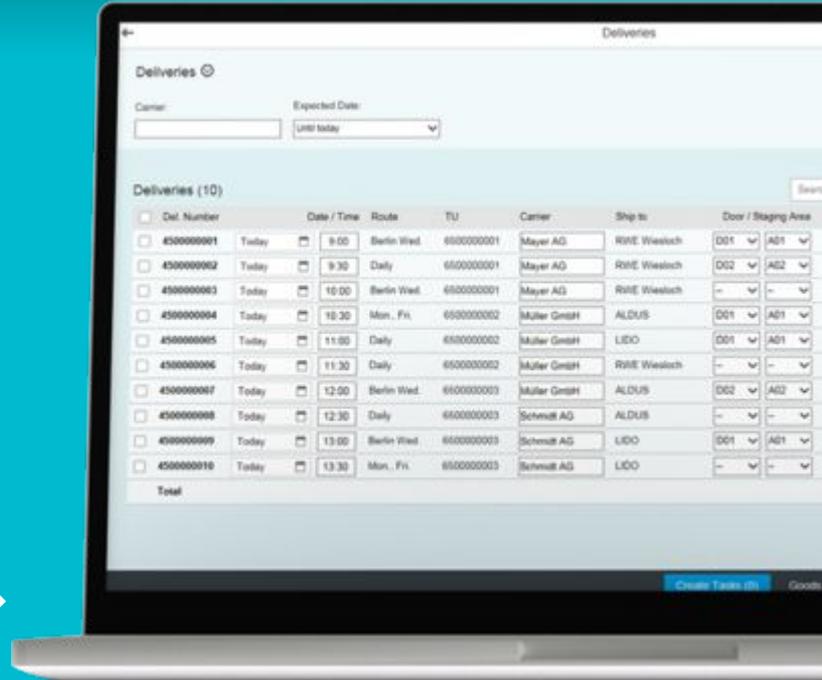
# PROGRAMMABLE SPACE

Today's Enterprise Systems are "Dimensionally-Challenged"

## INTERACTION (3D)



## INFORMATION (2D)





## The Spatial Web and Web 3.0

What business leaders should know about the next era of computing

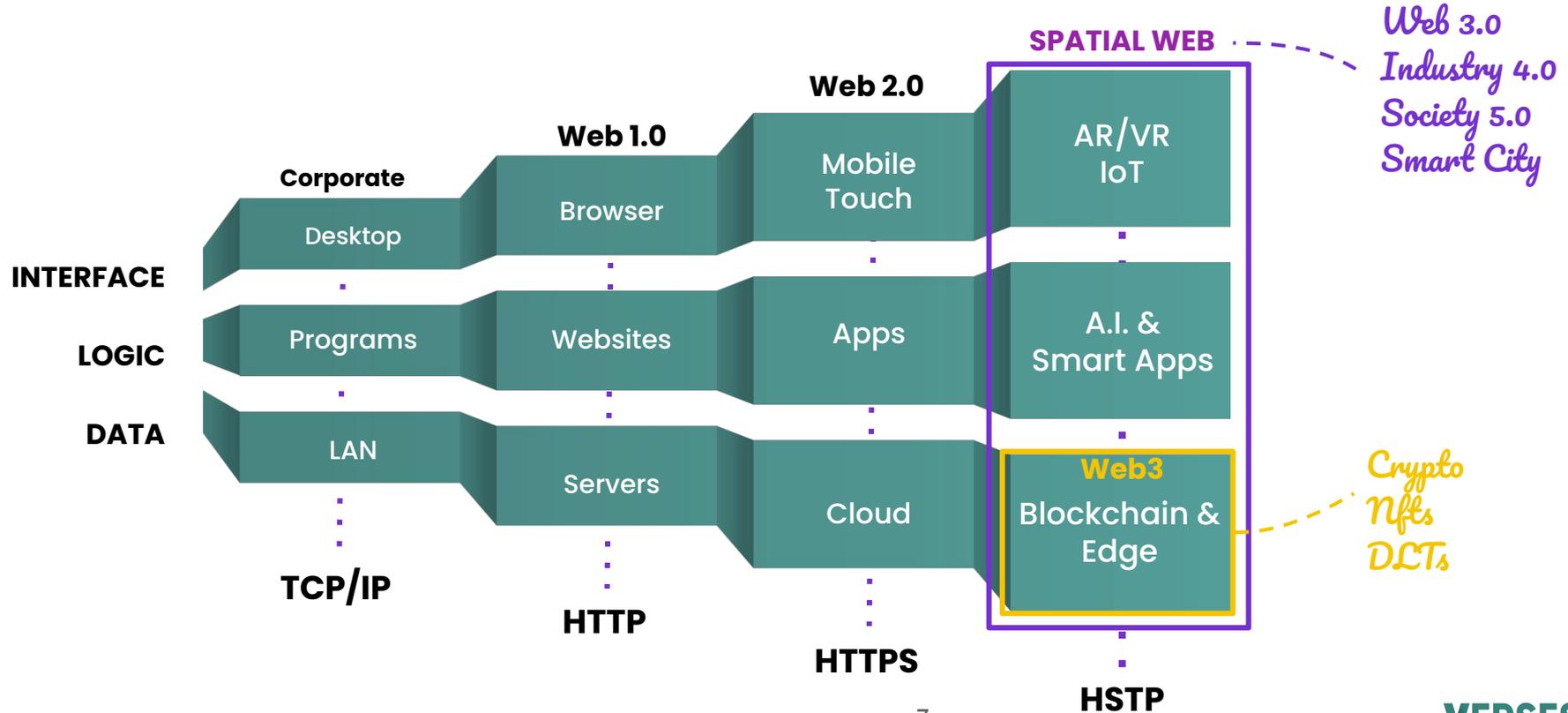
*"The Spatial Web eliminates the boundary between digital content and physical objects..."*

# From a web of pages to a web of spaces

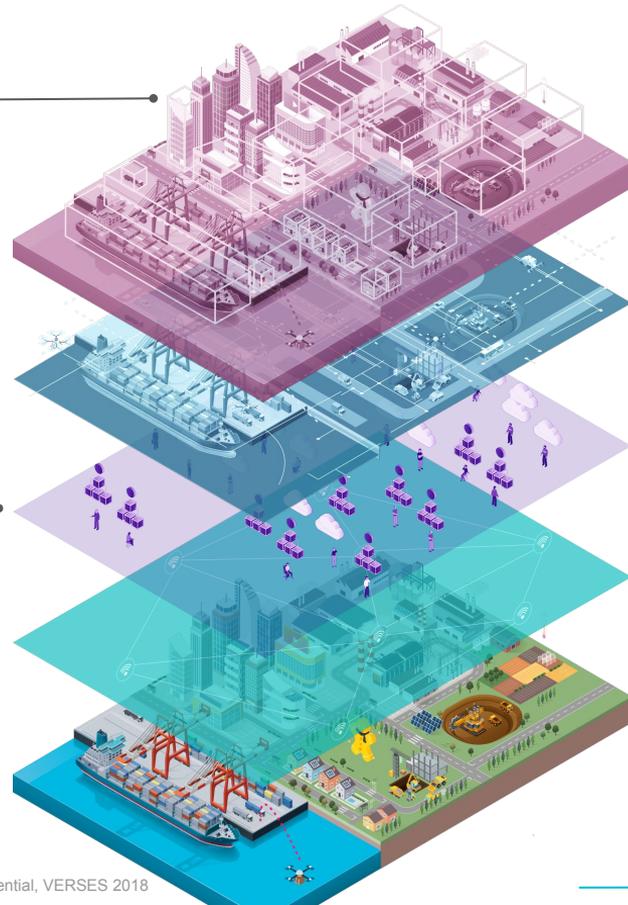
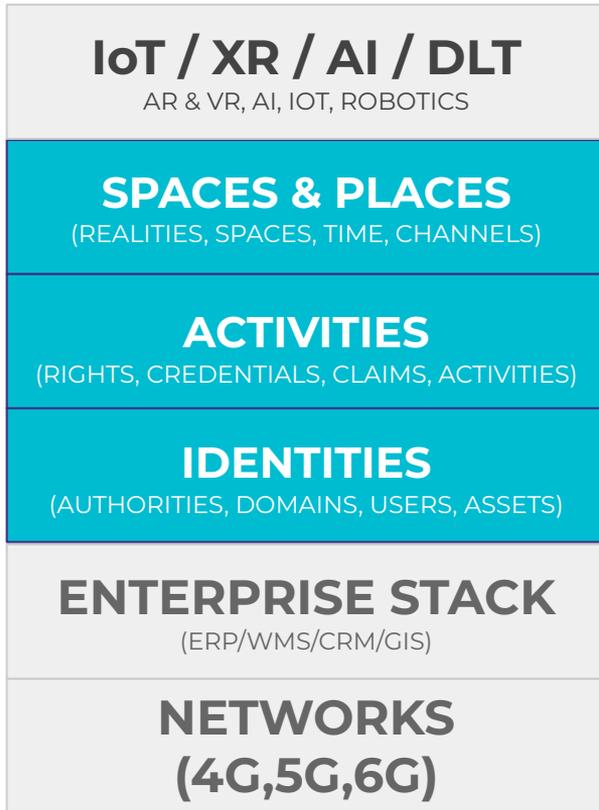
[Read the Deloitte Insights Article](#)

# THE SPATIAL WEB

The next generation internet that enables a hyper-integrated, contextually-aware, ethically-aligned network of humans, machines, and AI.



# A NEW CYBER-PHYSICAL INFRASTRUCTURE



INTEROPERABILITY

SECURITY

PRIVACY

POLICY

A night view of Earth from space, showing city lights and the Milky Way galaxy in the background. The Earth's horizon is visible, with a bright blue and white glow from the sun or moon just below it. The city lights are concentrated in the central part of the image, showing a dense network of lights. The Milky Way galaxy is visible in the upper part of the image, stretching across the sky.

# THE SPATIAL WEB STANDARDS

# 100 + GLOBAL MEMBERS

(Academia, government, business leaders)



INTERNATIONAL STANDARDS  
ASSOCIATION

Hyperspatial Transaction Protocol (HSTP) &  
Hyperspatial Modeling Language (HSML)

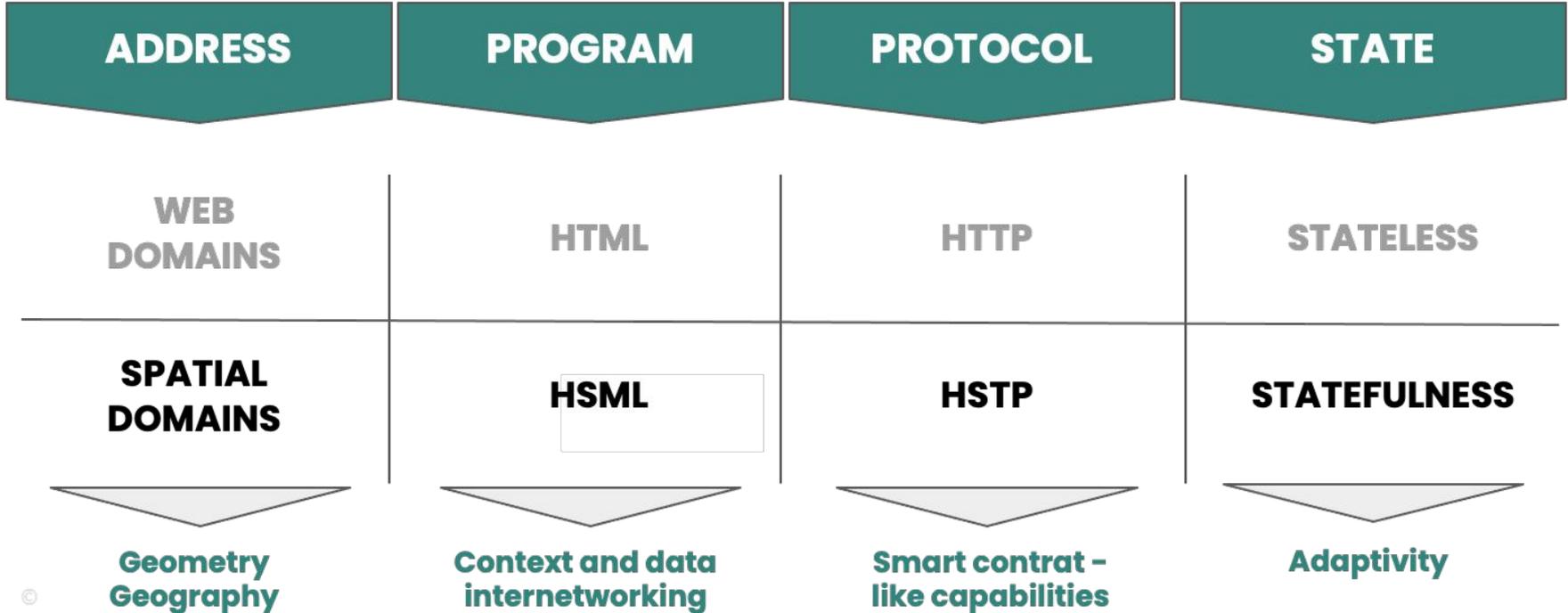
## SPATIAL WEB WG P2874

Also informed by IEEE's Ethically-Aligned  
Design P7000 Series of standards that  
provide guidance for the support of human  
rights, well-being, accountability, and  
transparency for AI and Autonomous  
Intelligent Systems

**"Public Imperative Standard"**

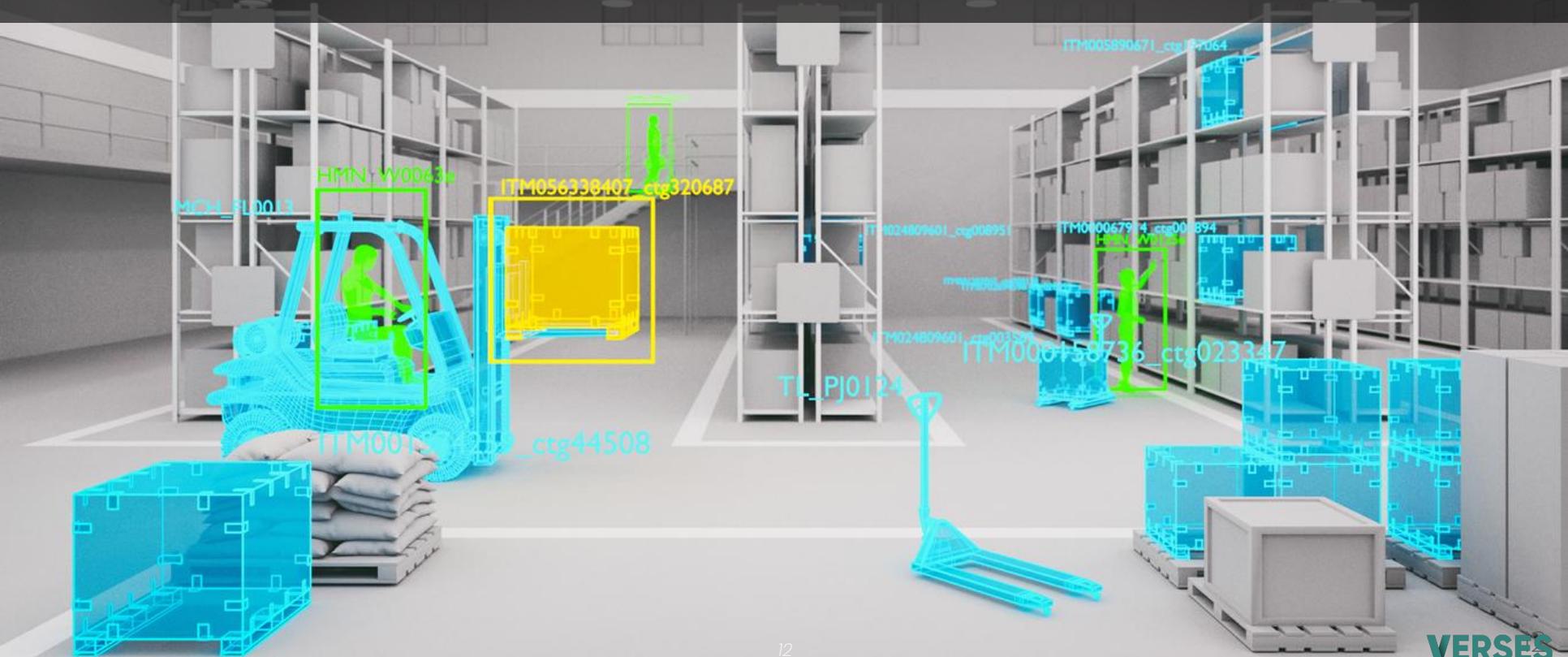
# MULTI-DIMENSIONAL STANDARDS ARE KEY

## - SPATIAL WEB STANDARDS AND PROTOCOLS -



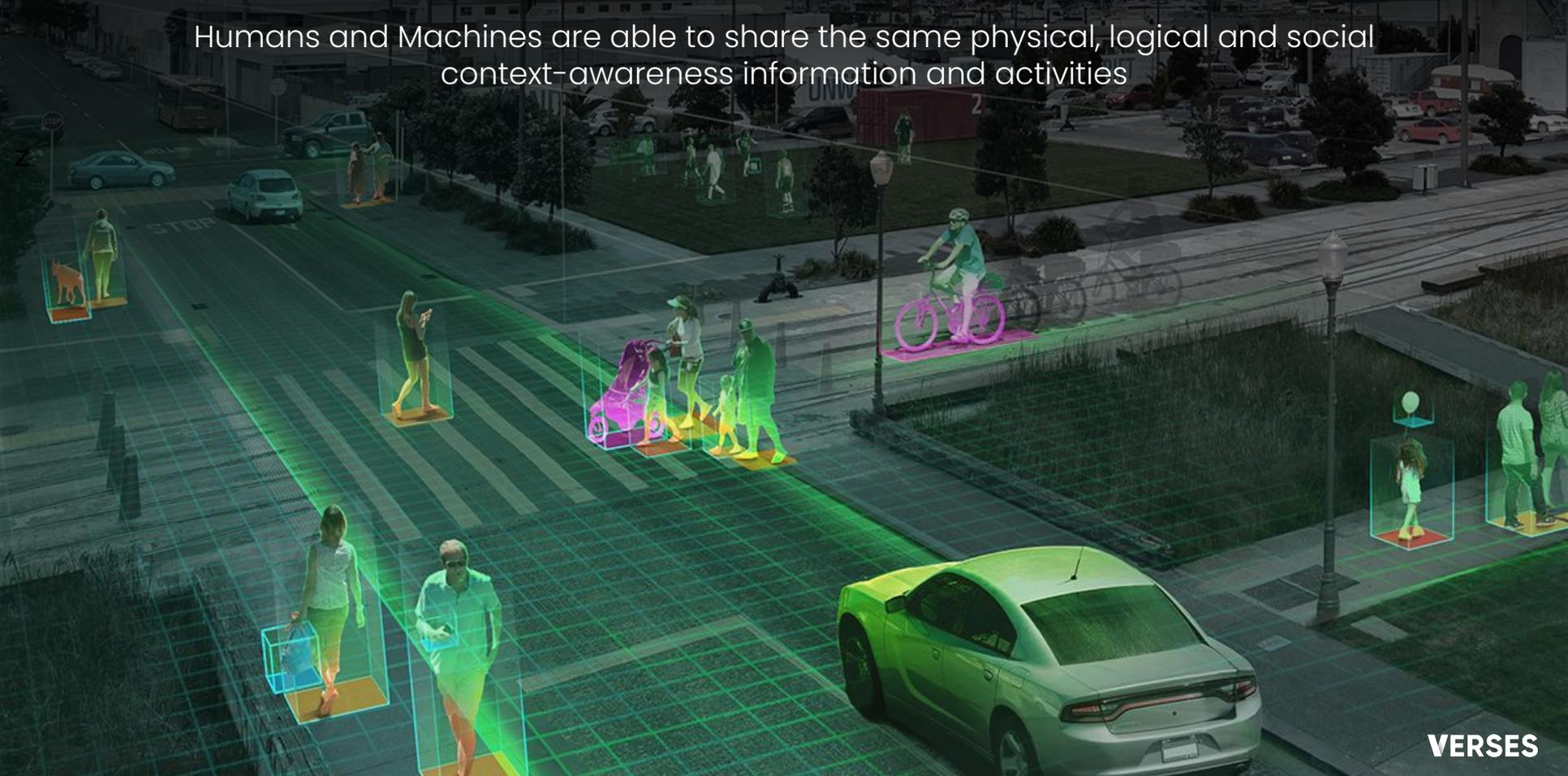
# INDOOR SPATIAL DOMAINS

Combining **Digital Twin** (3D + ID's) + **Digital Thread** (Data Integrity) + **Spatial Contracts** (Rules) results in a spatial network that **links** people, places, things and their activities.



# OUTDOOR SPATIAL DOMAINS

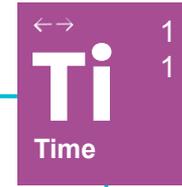
Humans and Machines are able to share the same physical, logical and social context-awareness information and activities



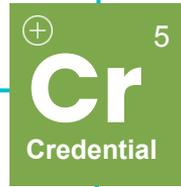
# HSML MODELS CONTEXT (META-DATA)

**HSML** - Hyperspace Modeling Elements form a canonical data model that can be used to digitally describe any class of user, object, policy and activity in physical, digital and virtual space.

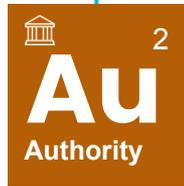
*WHERE/WHEN*  
**SPACES  
& PLACES**



*WHAT/HOW*  
**ACTIVITIES**



*WHO/WHAT*  
**IDENTITIES**





# EXAMPLE: A HOSPITAL ROBOT

**Us**<sup>1</sup>  
User

An Identified  
**Robot**

**Cr**<sup>5</sup>  
Credential

as represented by  
**Medical Procedure  
Certificate**

**Sp**<sup>9</sup>  
Space

in **Patient's Room**

**Au**<sup>2</sup>  
Authority

by virtue of **Health and  
Human Services**

**Cl**<sup>6</sup>  
Claim

is **Certified to perform  
various procedures and  
is able**

**Re**<sup>10</sup>  
Reality

in **Physical Reality**

**Do**<sup>3</sup>  
Domain

within **USC Medical  
Center**

**Ac**<sup>7</sup>  
Action

to **Take Blood  
Pressure**

**Ti**<sup>11</sup>  
Time

in **Present Time**

**Ri**<sup>4</sup>  
Right

shall have the Right to  
**Take Blood Pressure**

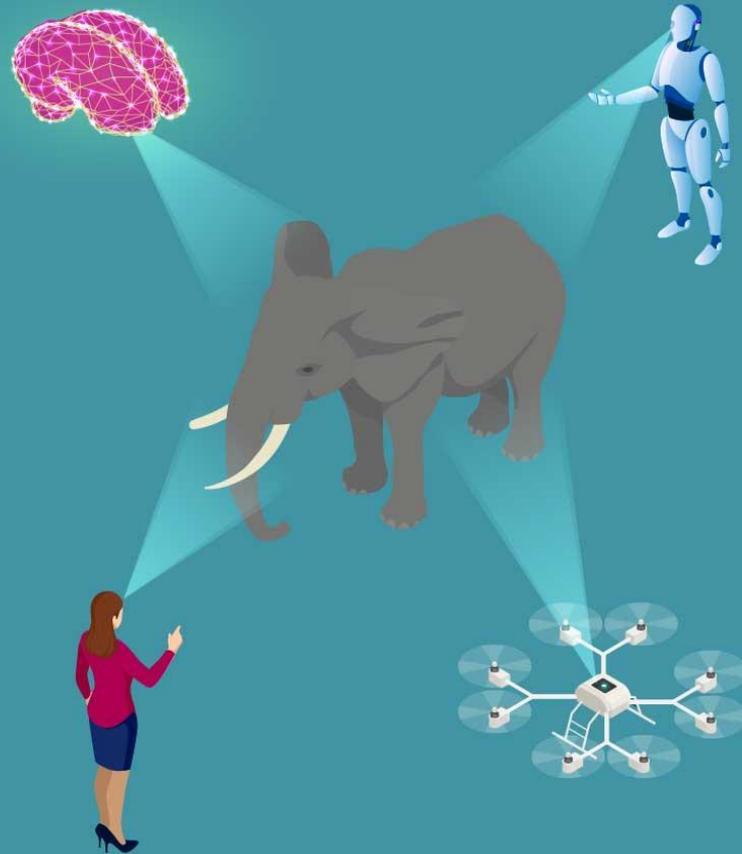
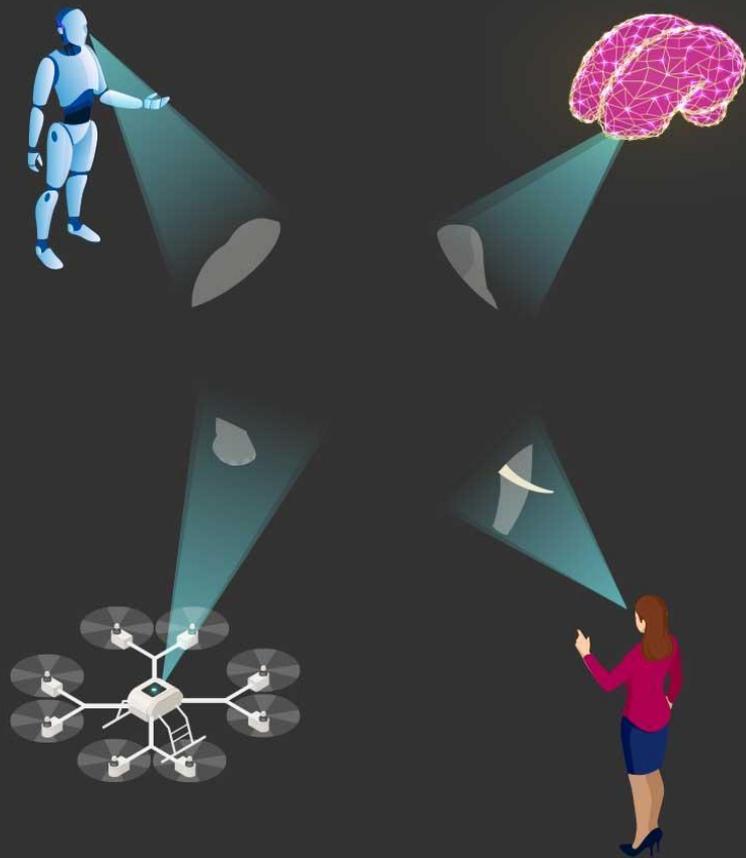
**As**<sup>8</sup>  
Asset

On an Identified  
**Human Patient**

**Ch**<sup>12</sup>  
Channel

On the **Hospital  
Private Patient  
Channel**

# POLICIES & REALITY SHARED ACROSS EDGES



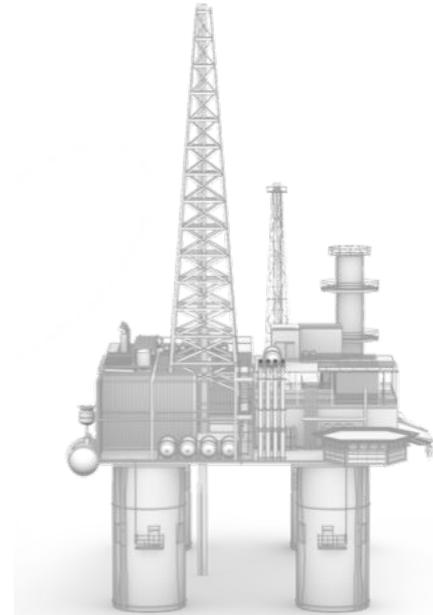
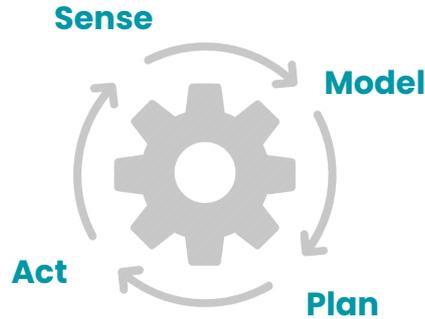
# DIGITAL WORLD MODELS

Real World Objects and Data Models Synced and Linked



**WORLD**

Living. Real-time. Dynamic



**WORLD**

3D Physics-based model

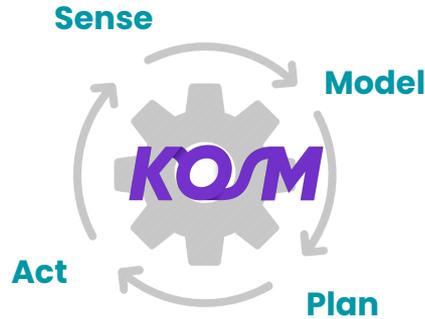
# ADAPTIVE SPATIAL TWIN



**WORLD**

Living. Real-time. Dynamic

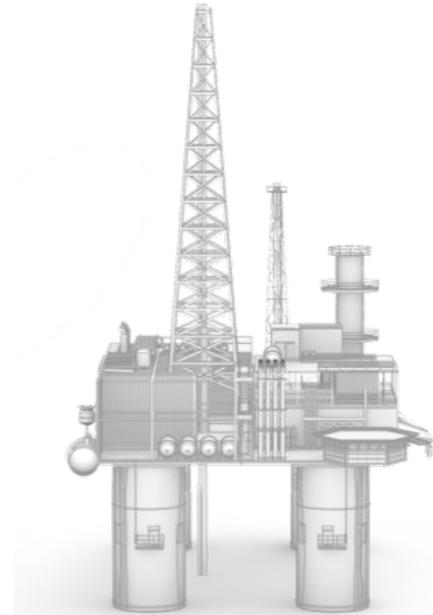
## The Intelligence loop



Understand and  
search the world

AI based simulation  
& recommendation

Multi-party execution  
& operations



**WORLD**

3D Physics-based model



Hospitals are extremely dynamic environments with complicated workflows where challenges with communication and coordination result in **massive inefficiencies.**

**\$2T+**

**Annual Waste** in  
Global Healthcare

**10-20%**

**Lost inventory**

**30%**

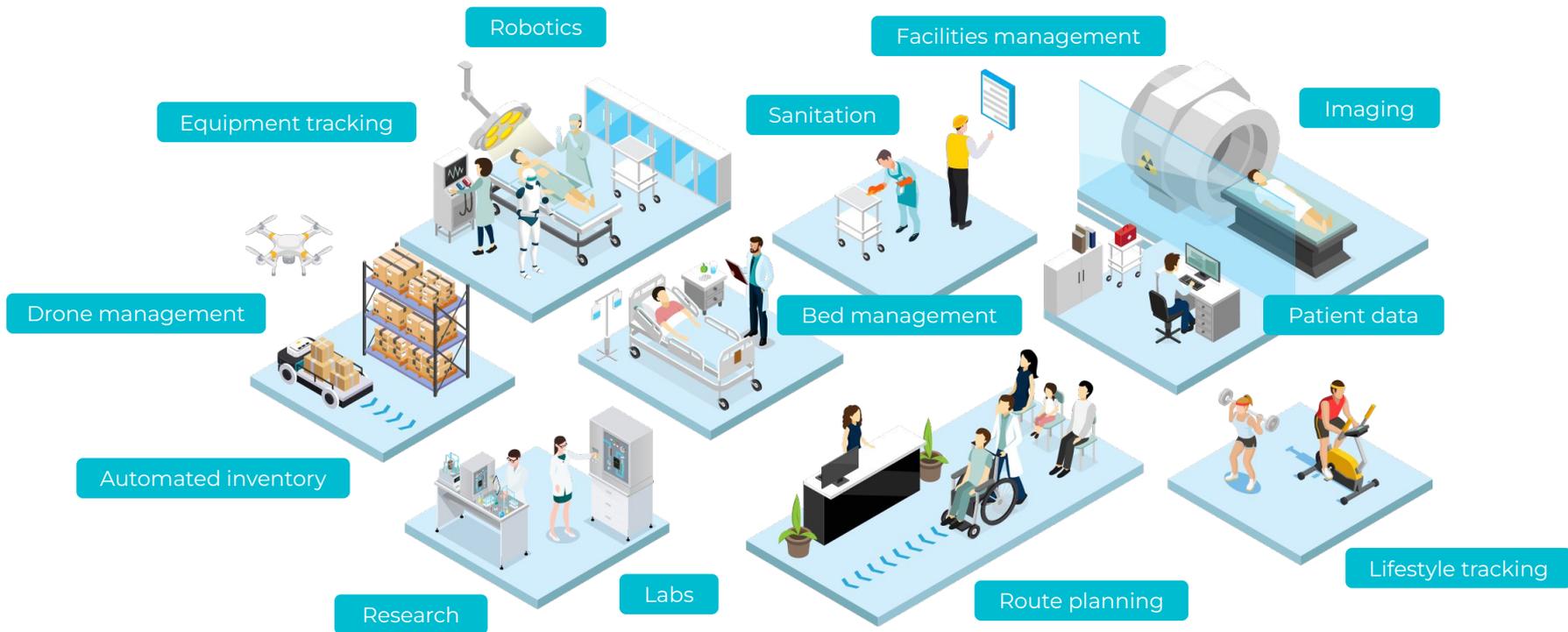
**Time spent searching  
for equipment**

**15%**

Supply chain **savings** from greater  
**Planning, Analysis & Control**

# SMART HOSPITAL OPERATIONS

**KOSM** provides a **single integration service for hospital operations** and enables location-based spatial rights management, access control, asset tracking, dynamic routing, and adaptive task optimization.



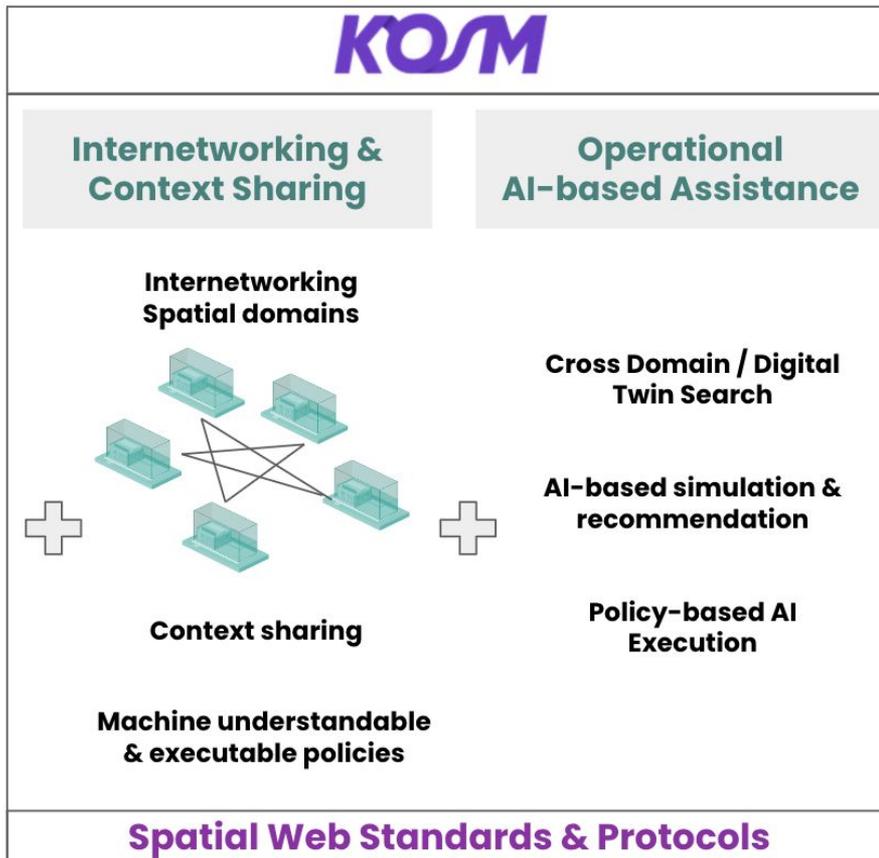
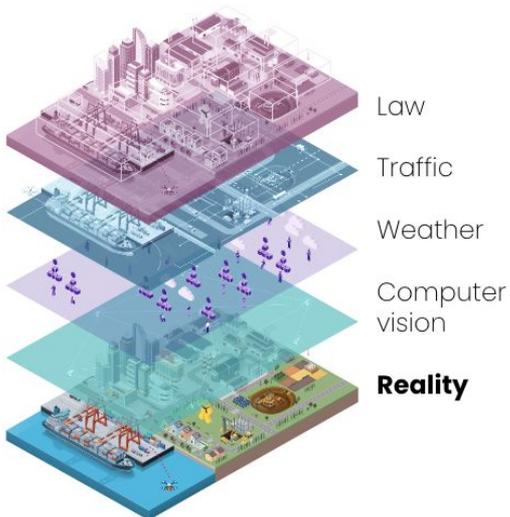
# USE CASES DISCUSSED WITH US

## KOSM applied to the health sector

- Asset tracking : **Real-time inventory management**, visibility and accuracy.
- Bed Management : **AI-powered** bed management for helping hospitals **optimize patient flow**.
- Route optimization : Solving **travelling salesman** and other **optimization models** in the context of a hospital.
- Spatial Tasking : **Ward planning** and team coordination or certified robot cleaning / in-room delivery

# YOU CAN START NOW

## Digital Twins / Data Spaces & systems



- Autonomous
- Efficient
- Compliant
- Secure

Flows of people and things



**Contact us !**  
**Join the IEEE WG P2874**  
**Check out our website :**  
**[www.verses.io](http://www.verses.io)**



**Philippe Sayegh**  
*Chief Adoption Officer, VERSES*  
[philippes@verses.io](mailto:philippes@verses.io)