

**OMEGA FASE**  
**FRAMEWORK**

**Designing Human-Centric, Decentralized  
Digital Infrastructure for the AGI Era**

**Arnaud Taddei - Frederick Tschernutter**

**WELCOME**

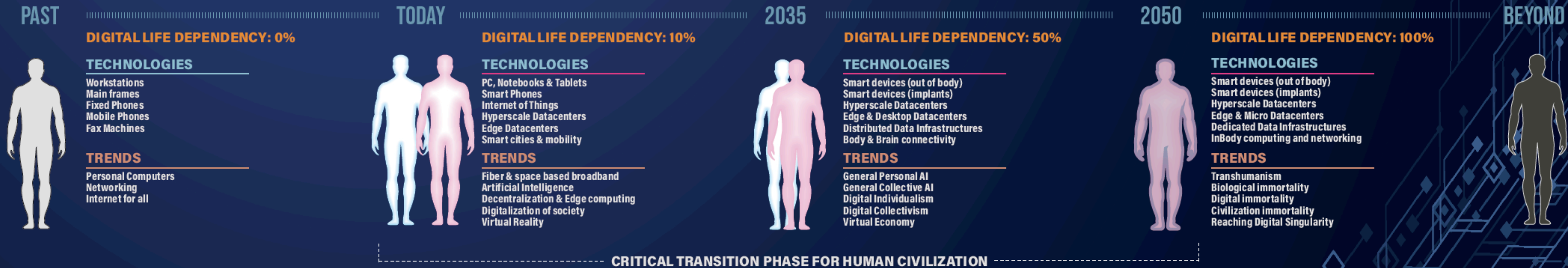
# THE BIG PICTURE

# OMEGA **FASE** FRAMEWORK

**Why do some systems – biological, social, or digital – survive while others collapse and disappear?**

**Synthetic evolution is exponential, not linear**

In the future humanity will seamlessly transition into a fully digital existence, where the distinctions between biological and digital life blur into a harmonious fusion. This convergence will unite them into an inseparable synergy, thriving as long as either endures. In this transformed landscape, precious data will flow as the life force within every individual, nurturing the vitality of entire civilizations



## THE QUESTION

- For 40 years we built the internet as a network that connects machines
- The next phase will connect intelligence (Human and Artificial).
- Autonomous agents + Humans on a shared common infrastructure.

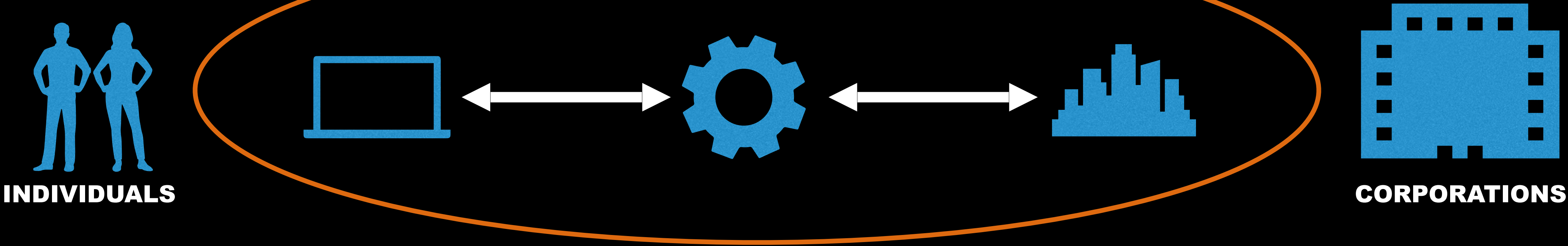
# OMEGA **FASE** FRAMEWORK

**What infrastructure do we need when intelligence itself becomes a networked phenomenon and when some of that intelligence is no longer human but artificial?**

**Perhaps we need a new layer? Let's call it the sovereignty plane**

# OMEGA **FASE** FRAMEWORK

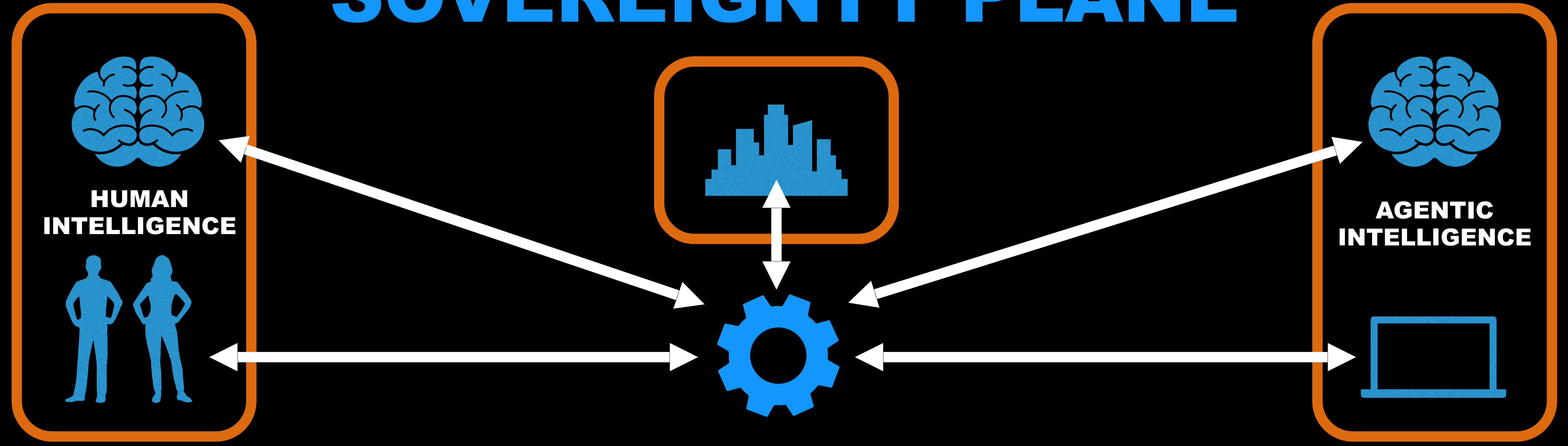
## INFRASTRUCTURE FOR COMPUTERS **TODAY**



# OMEGA **FASE** FRAMEWORK

**HUMANS - INFRASTRUCTURE - AGENTS**

## **SOVEREIGNTY PLANE**

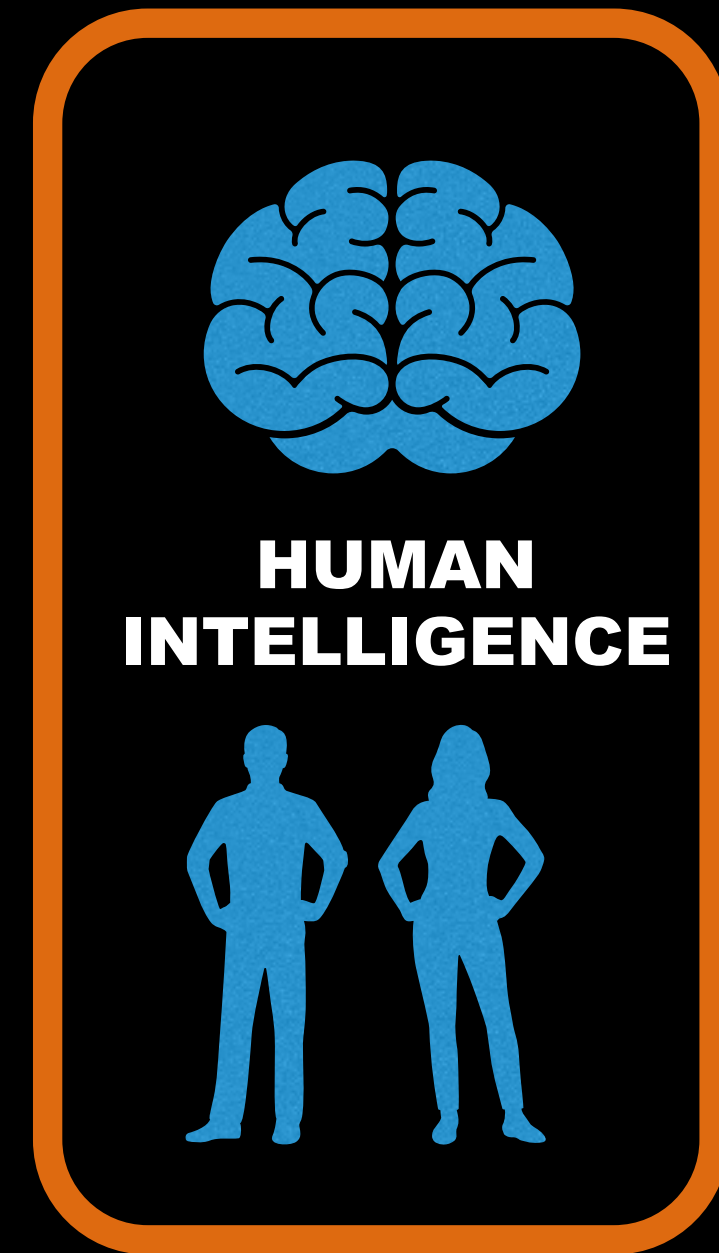


# OMEGA **FASE** FRAMEWORK

**HUMANS - INFRASTRUCTURE - AGENTS**

**ACCOUNTABILITY**

**ENTANGLEMENT**



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There is no protocol level mechanism to answer 3 fundamental questions about any agent operating on the network

**HUMANS - INFRASTRUCTURE - AGENTS**

## **ACCOUNTABILITY**

**Who is responsible for this agent?**

Which human or organization bears accountability for its actions?

**What are its boundaries?**

What is it authorized to do, and what is it not?

**How is it identified?**

Not the machine it runs on, but the agent itself as a persistent, accountable entity.

This is not a feature gap. It is an existential architectural deficit

**ARCHITECTURAL DEFICIT?**

**OMEGA FASE  
FRAMEWORK**

**If every autonomous agent is not entangled with a responsible human or organization, bound to them through cryptographic identity, accountability protocols, and enforceable boundaries, then we are building a network of unaccountable intelligences.**

**Every agent must be entangled with a human principal, and critical data needs to remain under human control**

# CONVERGING PRESSURES

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- **DATA GRAVITY**
  - The data corpus is becoming the most valuable asset individual possesses
  - Yet it resides entirely inside infrastructures they do not control
- **AGENT PROLIFERATION**
  - Agentic AI are persistent agents with memory, planning capabilities, etc.
  - Each of them needs context, identity and trust boundary
  - The current architecture provides none of these
- **SOVEREIGNTY DEMAND**
  - Individuals, organizations and governments are increasingly unwilling to cede control over identity, data environments, and computational context to handful of hyperscalers
  - It is **NOT** a political sentiment. It is a structural requirement for any system where autonomous agents operate on behalf of principles

The center of gravity of computation and crucially, of accountability, should shift closer to the individual and to the edge of the infrastructure. Decentralisation should become mandatory!

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## INTERNET DO WE NEED A NEW LAYER?

### The Internet Layer Split

**SOVEREIGNTY & EDGE LAYER**

**CLOUD & VIRTUALIZATION**

**CARRIER**

It consists of personal and organisational compute environments that maintain local data, etc.  
= agency, accountability, and human control

**The Internet does not disappear. Its role clarifies. The carrier plane transports. The cloud plane computes. The sovereignty plane governs mission critical agency.**

# OMEGA **FASE** FRAMEWORK

## Federated Artificial-Substrate Evolution (FASE)

### Comprises of 4 Axioms

- Measurable
- Discussion on falsifiability
- Unites 3 disciplines rarely joined:
  - Complex systems
  - Information physics
  - Ethics of technology

**Persistence**

**Adaptive complexity**

**Tensile stability**

**Continuity**

**The Internet does not disappear. Its role clarifies. The carrier plane transports. The cloud plane computes. The sovereignty plane governs mission critical agency.**

# OMEGA **FASE** FRAMEWORK

## FASE Axiom I: Persistence Law

Every system that endures must continuously restore order faster than disorder consumes it

$$\frac{dI}{dt} > \frac{dU}{dt}$$

I: the system's usable information (working knowledge about itself and its environment)

S: entropy (accumulated disorder and uncertainty) is replaced here by U as a general symbol for uncertainty

t: time

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## FASE Axiom II: The Adaptive Complexity Law

Evolution favors systems that maximize information gained per unit of energy

$$\eta = \frac{\Delta I}{\Delta E} = \left(\frac{dI}{dt}\right) / \left(\frac{dE}{dt}\right)$$

$\eta$ : prediction efficiency

I: mutual information about survival-relevant status

E: energy expended

t: time

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## FASE Axiom III: The Tensile Law

$$\textit{Stability condition } T < T^* \quad T = (I \cdot P \cdot A) / \varepsilon$$

T: the tensile load

T\*: the threshold where the system's error-amplifying capacity exceeds its error-correction and monitoring capacity

I: informational grasp

(how well the system models itself and its environment)

P: power

(magnitude and speed of action)

A: autonomy

(freedom to act without external approval)

$\varepsilon$ : ethical damping

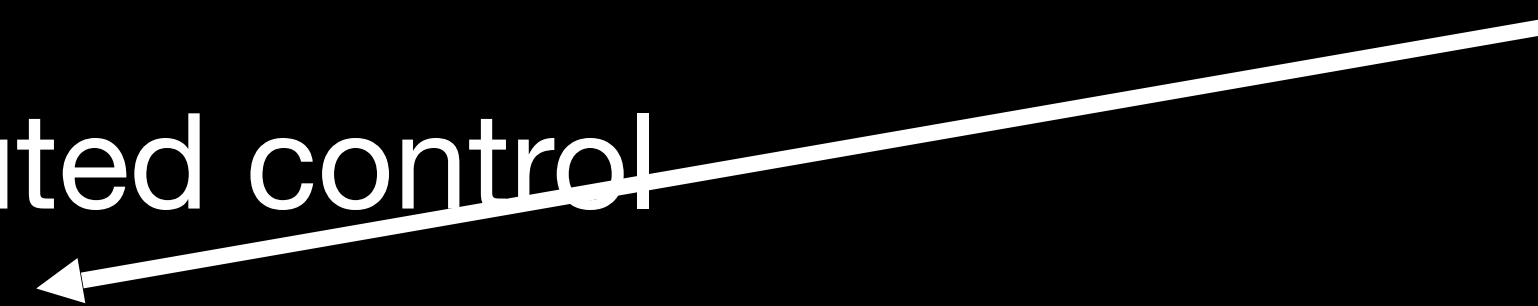
(internalised constraints that slow, soften, or block harmful actions)

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## FASE Axiom IV: The Continuity Law ( $\Omega$ )

DINRG scope  
... in context

Stability at scale requires distributed control



$$\varepsilon_{eff} = \Omega \cdot \varepsilon \quad T = (I \cdot P \cdot A) / (\Omega \cdot \varepsilon)$$

$\varepsilon$ : ethical damping (the constraints: the gates, limits, approvals)

$\Omega \geq 1$ : oversight distribution factor (dimensionless; degree of independent, diverse enforcement)

$\varepsilon_{eff}$ : effective damping (amplified by distribution)

# OMEGA FASE FRAMEWORK

## DIGITAL LIFE

A way of life in which digital technologies are an integral part of all aspects of human life. Your valuable data and its related information is the essence of your personal digital life.



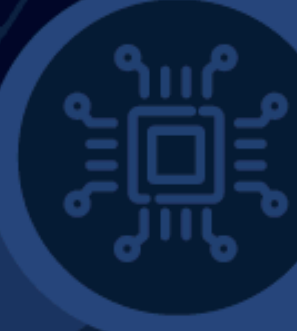
WHAT DRIVES THE NEED?

OWNERSHIP - CONTROL - SECURITY - LEGACY  
**DATA SOVEREIGNTY**

WHAT DRIVES THE NEED?

## Artificial Intelligence

Artificial Intelligence is destined to integrate seamlessly into all human activities, necessitating a dedicated ecosystem for model training, data storage and local processing.



## DIGITAL ASSETS

Data or information, characterized by its ability to store, transfer, or represent value in the digital realm, including tokenized versions of physical or financial products that are inheritable.



## DIGITAL IDENTITY

The scope of digital identity encompasses the full range of data produced through an individual's activities in the digital space and in its real life. In the future both become entangled.



## VIRTUAL REALITY

Virtual reality is a simulated 3D environment that enables users to explore and interact with a virtual surrounding in a way that approximates reality. It is also referred to as Metaverse.



## Internet of Things

The Internet of Things (IoT), characterized by the exponential growth of interconnected physical objects and devices, will produce an ever growing amount of unstructured data.



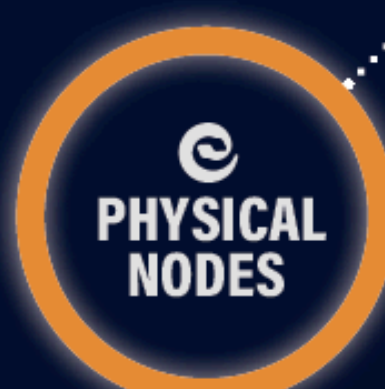
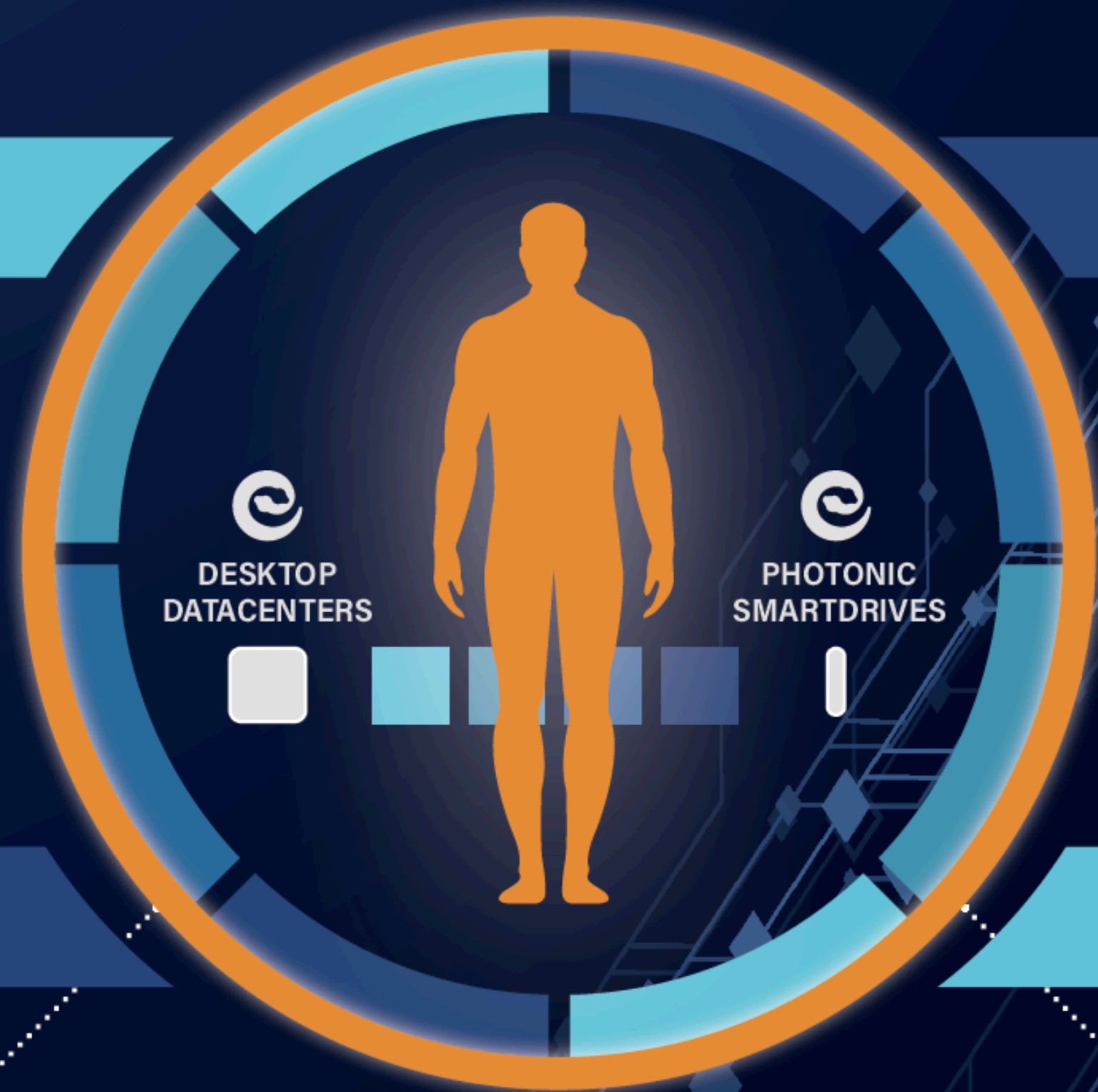
## Medical & Health

The medical sector is poised for a data explosion due to the rapid advancements in technology, leading to an unprecedented increase in patient-generated health data and genomics information.



## Brain Connectivity

Brainchip implants will alter our methods of interacting with machines and fellow humans. It is essential that data processed and exchanged with the brain be handled in a highly secure setting.



**DATA SOVEREIGNTY PERIMETER**  
BASED ON THE ETROM PARADIGM



# OMEGA **FASE** FRAMEWORK

## RESEARCH AGENDA

Agent-to-principal binding

Sovereign node authentication

Agent interoperability

Distributed computation

Identity portability

# OMEGA **FASE** FRAMEWORK



**HUMAN  
INTELLIGENCE**



**AGENTIC  
INTELLIGENCE**



## **MANAGING AGENCY**

**Will humans remain sovereign nodes in the network of intelligence, or will we become passengers in a system we can no longer govern?**

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# **THANK YOU**