

## Market Analysis & Outcomes

Andrei-Vlad Constantin

Realworld Eastern Europe, Romania

# Intent-driven NaTive AI architecturE supporting Compute-Network abstraction and Sensing at the Deep Edge

## Market Analysis & Outcomes

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The Market Analysis and the Business Model for the complex scenario of an Intent-driven Native AI architecture is consolidated around the following key topics:

- Distributed, Intent-driven Management & Orchestration plane (DIMO) that supports multi-tenancy and multi-stakeholder ecosystems
- Service & Resources Ordering
- Multi-domain orchestration, APIs based configuration
- Dynamic resources and dynamic service management and orchestration, applied to multi-tenant network and compute fabric domains
- Intent based network (IBN), the software-enabled automation process, intelligence applied for Intent driven service fulfillment in autonomous networks
- Benchmarking in relation to the centralized multi-vendor and multi-domain orchestration for dynamic services and resource management

6G-INTENSE approach is based on the following Key Market Drivers:

- **Growing Demand for Rapid and Efficient Processing** - Enhanced processing speed is critical in various sectors such as large data centers, telecommunications, gaming, automotive, healthcare, and governmental agencies.
- **Surge in Data-Heavy Applications** - Industries are experiencing an increase in data-intensive applications, driving the need for more efficient processing solutions.
- **Technological Advancements in GPUs and RISC-V Processors** - Innovations in graphics processing units (GPUs) and RISC-V processors are crucial for meeting the increasing processing demands.
- **Increasing Need for Customizable Solutions** - There is a growing need for solutions that can be tailored to specific industry requirements and applications.
- **Industrial 5G and Automation** - Enabling applications such as mobile robots, autonomous logistics, and driverless transport systems within factories.

- The native AI market, valued at around \$142.3 billion in 2023, is growing rapidly with a projected CAGR of 37.3% by 2030, driven by its adoption in sectors like healthcare, finance, retail, and manufacturing. This growth is fueled by demand for workflow-integrated AI solutions, requirements for edge computing advancements, the adaptability of AI tools for industry-specific applications, as well as significant investments in hyperscale data centers by companies like Google, Amazon, and Microsoft.
- The NCF market, valued at \$2.3 billion in 2022, is expected to reach \$5.5 billion by 2027 due to growing demand for high-performance computing (HPC) infrastructure, AI workloads, and multi-cloud environments. The NCF enables monetizable innovations across industries, supporting new services like the Internet of Senses. With 6G on the horizon, NCF will allow communications service providers (CSPs) to bundle multi-domain services for diverse customer segments. Technologies like smart contracts and distributed ledgers will streamline partnerships, enabling broker-less models and facilitating as-a-service offerings within complex ecosystems.

- The current approach to Management and Orchestration in industry involves varied models, supported by ETSI MANO, for automating service ordering, orchestration, and assurance across different domains.
- There is a trend toward focusing on the “Product layer” rather than the “Service layer” for end-to-end orchestration. The multi-domain approach faces challenges in automation due to complex dependencies on single-domain orchestration and inventory management systems.
- AI and Autonomous Network technologies are being integrated to optimize resources across domains, using Intent Management to enhance operational efficiency for planning, deployment, and business operations.
- The proposed DIMO model, evolving from MANO, supports a decentralized and multi-tenant approach, where the NCF framework unifies resources across domains, and Intent APIs enable autonomous self-configuration and optimization.
- Key innovations include separating service and resource orchestration, allowing tenants their own management functions, and translating intents from tenants to infrastructure.
- The DMO oversees network service life-cycles, while tenant-specific DMOs (t-DMO) manage vertical service hosting. The NCF enforces DMO decisions, abstracting infrastructure to support efficient, intent-based resource utilization.

## Value Proposition

- Separation of service (or application) orchestration from resource orchestration
- Concrete native AI toolkit
- NCF abstraction framework / sustainable infrastructure sharing
- Multi-stakeholder, decentralized ecosystems based on DIMO concept
- Network-of-networks concepts
- Internet-scale, under operator federations

- Infrastructure/resource provider

Owner of various 6G resources, exposing them via API, using an LMO

- NCF

Abstracts the 6G resources to the DMO and takes charge of enforcing a 6G service, composed of a set of applications and network functions, on top of the 6G infrastructure

- DMO

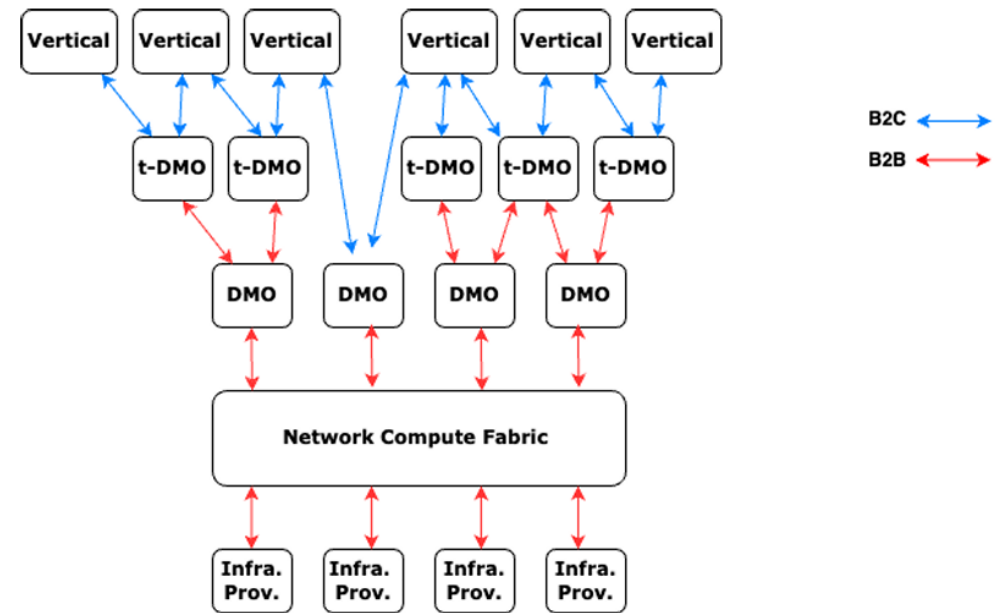
Has the role of translating the vertical requests and needs, via the t-DMO or directly, into a service-level mesh, enforcing it using the resources exposed by the NCF

- Tenant-DMO (t-DMO)

Reduces the complexity of the service management plane by delegating some functions to the vertical service owner; without owning infrastructure or being in charge of enforcing the 6G service

- Verticals

Entities that aim to deploy their applications or services as a 6G service on top of the 6G infrastructure





Actor	Value Chain Component	Value Proposition
MNOs, MVNOs, Private Networks	DMO, NCF	The separation between service and resource management afforded by the DMO and NCF components leads to increased efficiencies and opportunities for future coverage expansion, by abstracting the process of dynamically adding or removing resources.
Owners of Cloud, Edge, IoT infrastructures	NCF, Native AI toolkit	Owners of computational resources can seamlessly offer their resources within resource pools, with automated API translations offered by the native AI toolkit.
Vertical app providers	DMO, Native AI toolkit	The DMO offers automatic service onboarding, while instantiation and assurance is offered by the native AI toolkit.
Resource brokers	DMO	The DMO facilitates new Network Infrastructure as a Service (NlaaS) business models, where resource brokers expose third party resources to MNOs / MVNOs via a DMO deployment.
Consumers	Native AI	The native AI toolkit helps ensure SLA compliance despite the much higher dynamics and resource volatility.

- **Revenue Metrics**

Monthly Recurring Revenue (MRR): Monthly revenue from services subscription fees.

Annual Recurring Revenue (ARR): Annual revenue from services subscription fees.

Average Revenue Per User (ARPU): Average monthly revenue per customer.

Yearly Revenue Growth Rate: Rate of increase in revenue over a year.

- **Financial Metrics**

Gross Margin: Difference between revenue and cost of solutions, as a percentage of revenue.

Operating Expenses Ratio: Ratio of operating expenses to total revenue.

Net Profit Margin: Percentage of revenue that remains as profit after all expenses.

- **Business Service Level Agreements metrics**

Successful implementation of business-related services: solutions operations efficiency and delivered services related metrics.

- **Market Penetration Metrics**

Market Share: Percentage of the target market using provided services.

Geographic Reach: Number of regions or countries with active customers.

Industry Penetration: Percentage of target industries using the services.

- **Innovation and Development Metrics**

R&D Spending: Amount spent on research and development.

Solution Development Cycle Time: Time taken to develop and deploy new solutions.

Number of Patents Filed: Number of patents related to 6G and AI technologies.

- **User Engagement Metrics**

Daily Active Users (DAU): Number of unique users interacting with the platform daily.

Monthly Active Users (MAU): Number of unique users interacting with the platform monthly.

## Business benefits of separation between service and resource management and orchestration

The 6G NCF concept is poised to disrupt the CDN market by empowering Telecom Operators with optimized resource allocation and streamlined expansion capabilities, allowing dynamic scaling of cloud and edge resources.

- 6G-INTENSE aims to expand the 6G value chain by incorporating edge and deep edge resources, enabling European microelectronics, IoT industries, and cloud and edge infrastructure owners to access new revenue streams and compete with U.S. cloud providers.
- This initiative will bolster Europe's position in the rapidly growing Edge Computing and IoT markets, supporting the deployment of advanced 6G use cases that enhance services for end-users, particularly in edge and far-edge applications.

## Business benefits of the native AI toolkit

**6G-INTENSE introduces a concrete Native AI framework, for the first time,** that leverages advanced Machine Reasoning and Zero-Touch automation to optimize complex 6G network management and orchestration, significantly reducing operational costs and accelerating 6G service deployment across diverse infrastructure resources.

- OPEX-reducing innovations, such as optimized resource utilization and energy-efficient AI model training, enhance infrastructure and telecom competitiveness by cutting overprovisioning, boosting energy efficiency, and enabling extreme 6G use cases with improved QoS and reduced SLA breaches, thereby accelerating revenue growth and market expansion.
- Reducing OPEX in digital technologies strengthens EU competitiveness against U.S. companies, supports digital sovereignty, and boosts the strategic telecommunications sector, which underpins all economic and societal

## Business benefits of the DMO

The 6G-INTENSE DIMO innovation introduces a decentralized orchestration model that overcomes 5G's scalability issues by separating service from resource orchestration, enabling extensive coverage across diverse domains and supporting operator federations through inter-DMO APIs and intent-driven service mesh mapping.

- The 6G-INTENSE architecture enables high-value European industry services by meeting extreme use-case demands, such as extended reality, through optimized deployment and orchestration across the NCF and Deep Edge.
- This approach, along with proposed SD-WAN advancements, aims to disrupt the CDN market, support telecom operators in capturing part of the growing SD-WAN sector, and create a sustainable, federated 6G value chain that opens new revenue opportunities for IoT, SMEs, and the Edge Computing market in Europe.

Thank You!!!



ANDREI-VLAD CONSTANTIN



[andrei.constantin@realworld-systems.com](mailto:andrei.constantin@realworld-systems.com)



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