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The Present and Future of AI-Powered Industries: Redefining Productivity Through Data Innovation

Netcompany-Intrasoft

Data Week Luxembourg

December 10th, 2024

Dr. John Soldatos
Research & Innovation Expert

Agenda

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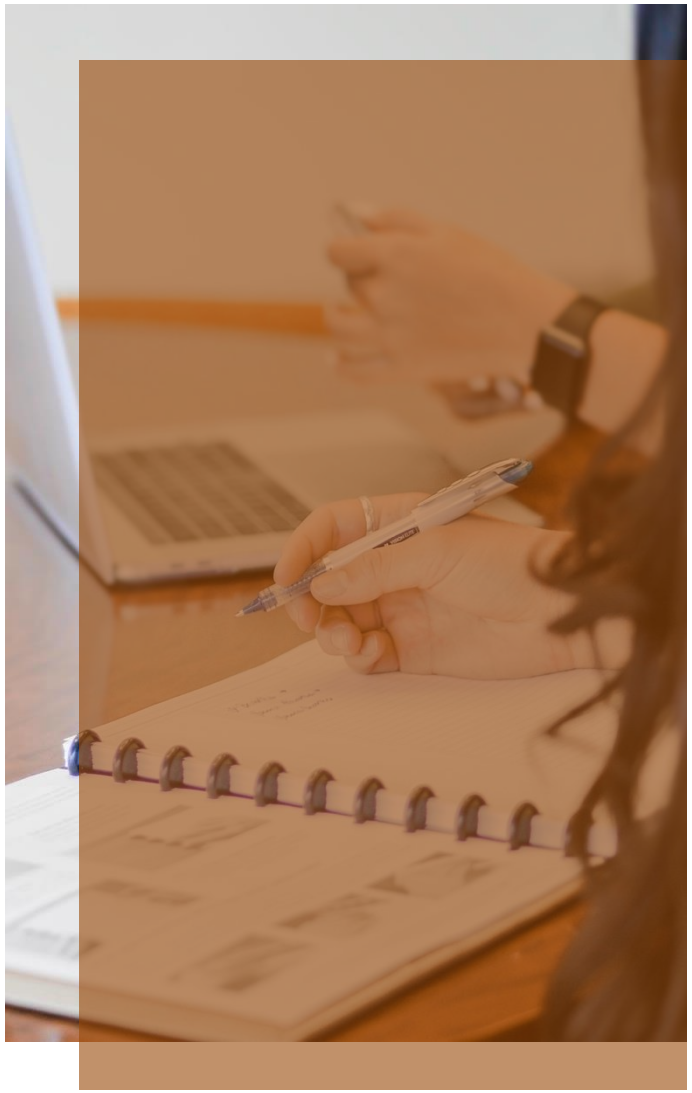

01

BACKGROUND AND MOTIVATION

VISION – BUSINESS PAINS - WHO WE ARE IN DATA & AI

02

OUR APPROCH TO ENTERPRISE AI/ML DEPLOYMENTS

Deployment Approach: From Data to Business Value

03

LLM- AUGMENTED MULTI-AGENT SYSTEMS

OrbitIntel & LLM-AUGMENTED SOLUTIONS

04

The FUTURE: AUTONOMOUS AGENTIC PROCESSES

NEXT EVOLUTIONARY STEP

AI R&I in Netcompany-Intrasoft

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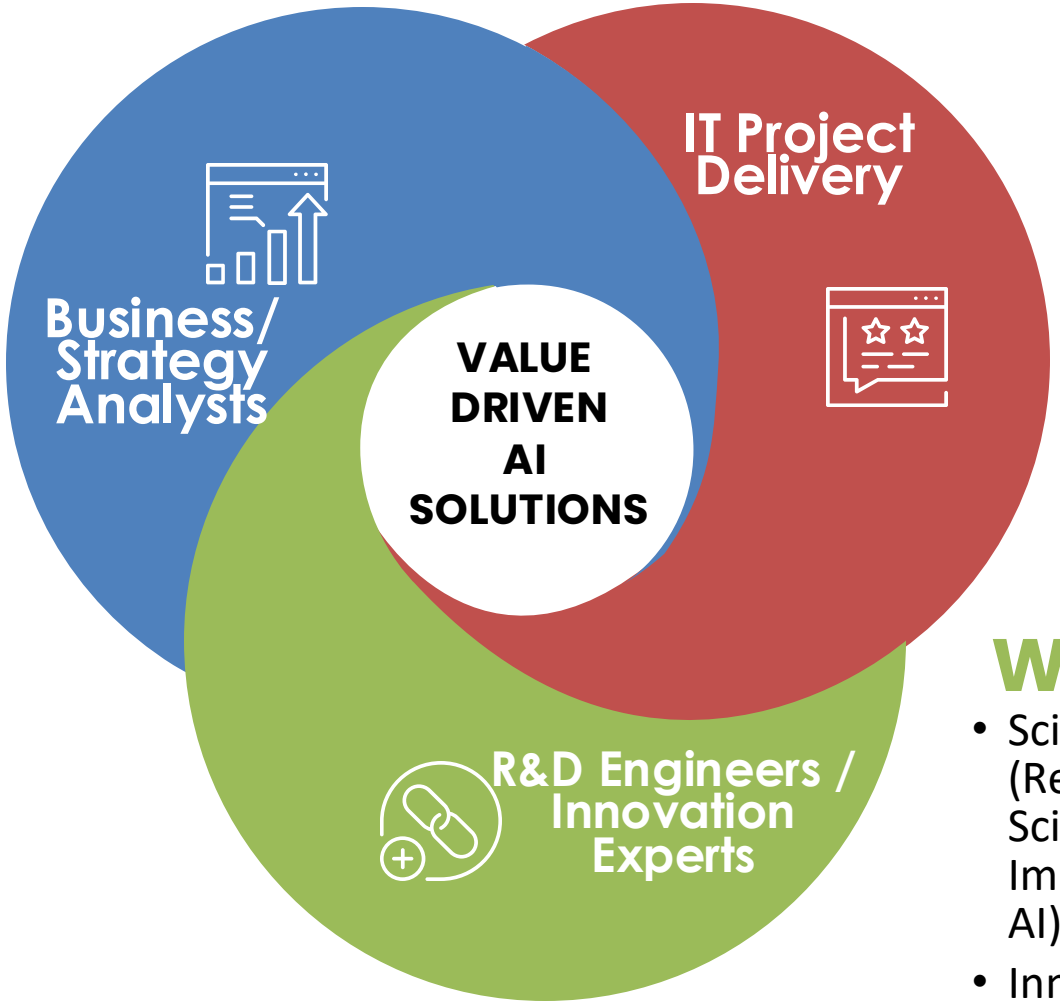
WE KNOW

- Deep understanding of various domains
- Inside view of customer needs
- Multitude of large projects for EU institutions,
- Public and Private sector



WE DELIVER

- IT excellence
- Project Execution (>2000 engineers, data-analytics & cyber/security experts)
- Proven, hands-on experience on all technology fields
- Numerous large, complex, multi-disciplinary IT projects

WE EXCEL

- Science-driven team (Researchers and Scientists, Tens of Impactful Publications in AI)
- Innovative PoC / MVP development

Our Customers' Business Pains

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1. Few Full-Scale Deployments

88% of Customers Report Lack of End-to-End Solutions from Data Infrastructure to User Insights

2. Legacy Integration

43% of Organizations report Lack of a Streamlined Approach for Legacy Compliance

3. Lack of Tailored Solutions

From generic AI to AI tailored to business needs

4. Drowning in Data without Business Value & Insights

Large Volumes of enterprise data – Limited Exploitation of the Data

5. Security & Privacy

Important for EU Institutions and other organizations holding sensitive data

6. Skills Gap

AI has widened pre-existing skills gaps (millions of software engineers vs. thousands of AI engineers)

Agenda

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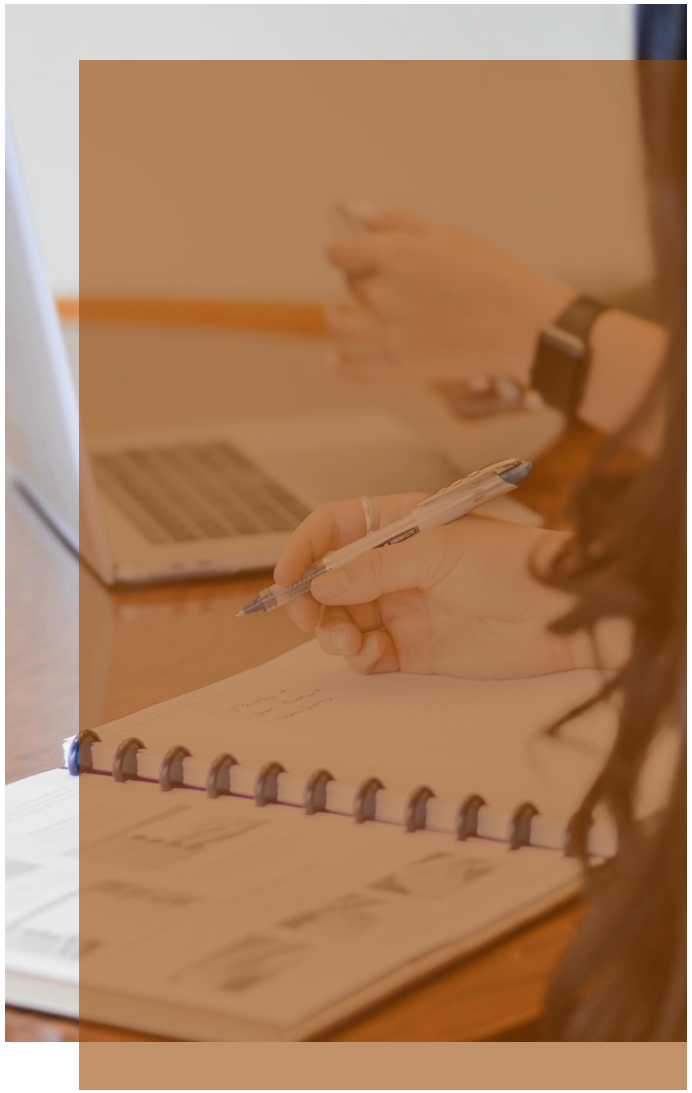

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Deployment Approach: Transforming Data and AI into Tangible Business Value

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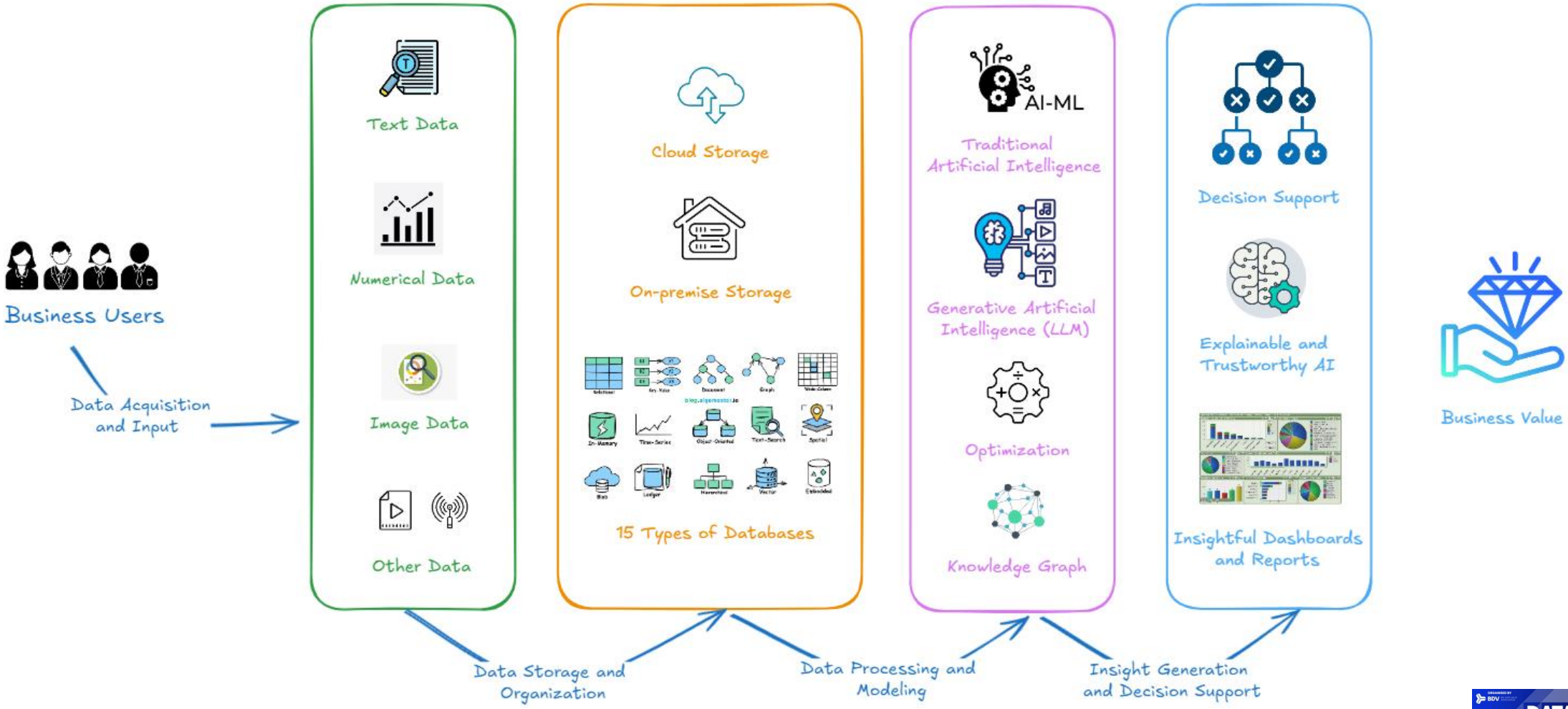

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R&I Projects: Our AI Innovation Fuel (Examples)

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15+ Recent AI H2020/HEU Projects

End-to-End Trusted AI for Industrial Applications

- AI Cybersecurity
- Explainable AI (XAI)
- Reinforcement Learning
- Tech for AI Act Compliance

Neurosymbolic Learning

- Advanced Human-Centred Machine Learning Paradigms
- Formal Verification

AI Orchestrator

- Trusted and Energy Efficient
- AI across the Cloud-Edge-IoT Computing Continuum

Transparent and Explainable AI for Policy Makers

- Virtualized Policy Making Environment – Visual Tools
- Explainable AI for Smart Cities
- AI Act Compliance

Best Case Award

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https://interoperable-europe.ec.europa.eu/collection/public-sector-tech-watch/best-cases-award-all-submitted-cases

Responsible Public Sector
Organisation: Municipality of Burgas (Local)

ML over cheap vibration sensors on water pipes to train ML models to automatically detect the presence of leakages with very high accuracy

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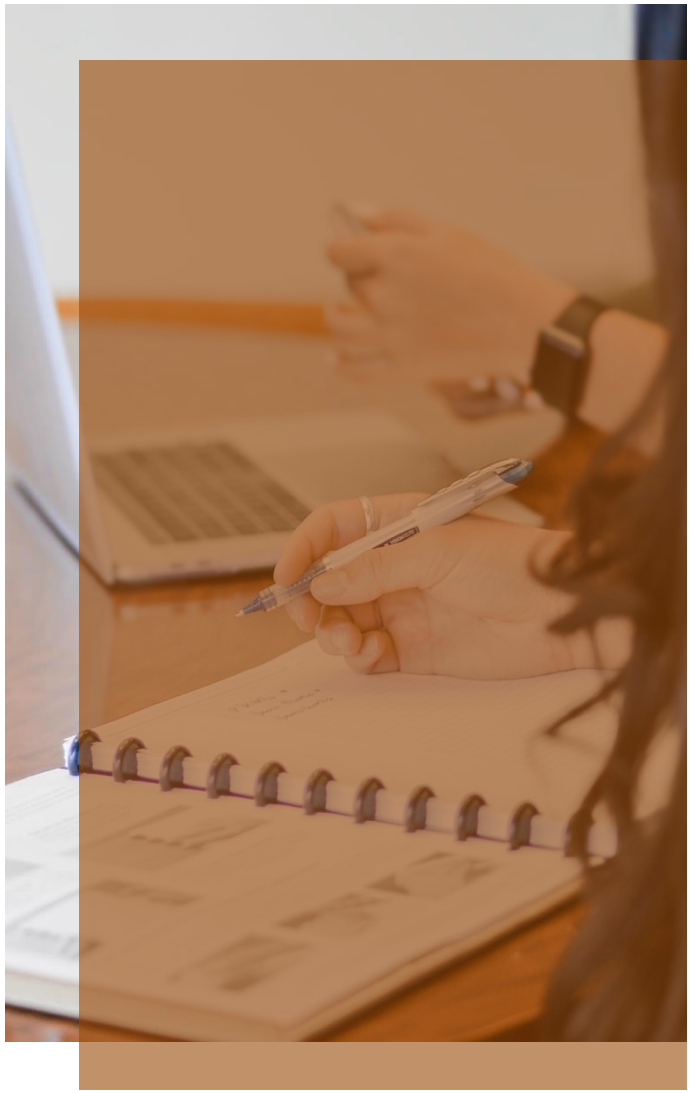

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AI and LLM-augmented Multi-Agent System

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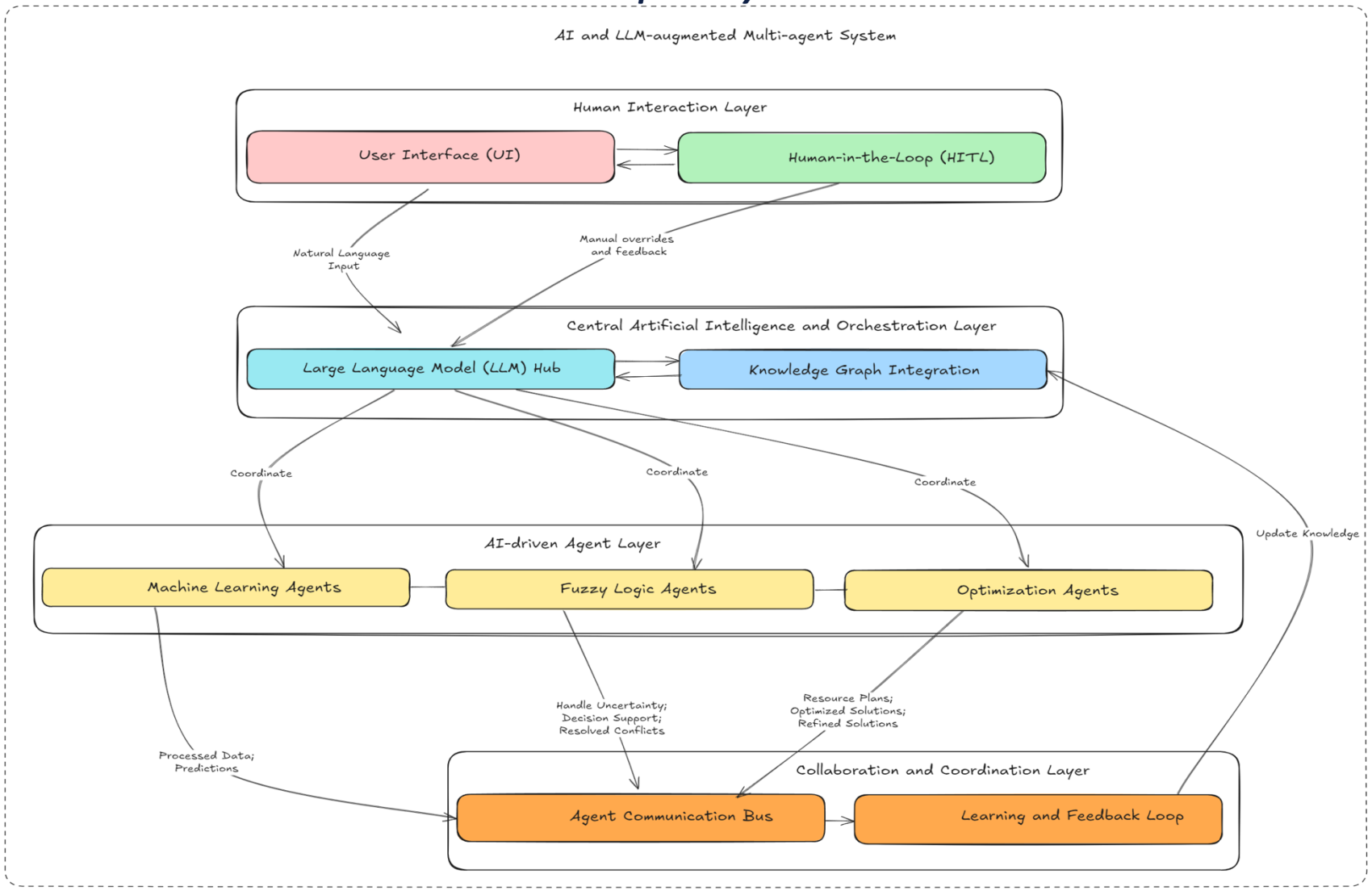
Advanced AI technologies to improve operational efficiency, decision-making, and transparency.



Human Interaction Layer

- **Advanced UI**
- **Real-time insights** via **Visualization Dashboard**

Central AI & Orchestration Layer

- Orchestrates **operations** using **NLP Engine, Decision-Making Engine**, and **Knowledge Graph Query Processor**

AI-Driven Agent Layer

- Specialized agents for **Machine Learning, Fuzzy Logic**, and **Optimization**

Collaboration & Coordination Layer

- Supports **inter-agent communication** for **continuous learning** and **adaptation**
- **Learning & Feedback** Loop to **refine models** and **operations**

AI/LLM-augmented Multi-Agent System: Value Propositions

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On-premise	• **Data privacy**
Versatile and Adaptable	• **Tailored solutions for any complex *or* simple business needs.**
Security and Flexibility	• **No vendor lock-in, secure, and adaptable to any LLM model.**
Modular Design	• **Scalable and Modular system for various use cases.**
Human-Centric Decision Support	• **Intuitive interfaces for informed decisions.**
Operational Efficiency	• **Agile resource management** improves **productivity** and reduces costs.
Proactive Quality Assurance	• **Predictive planning for long-term success.**

Netcompany-Intrasoft's OrbitIntel Solution

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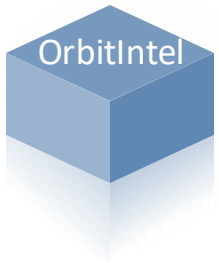

Training open-source LLMs with domain-specific data to build your on-premise LLM

Open-source Generative LLM → Your Own Data → AI-powered Exploratory Data Analysis → Your Business Logic → Your Customized, On-premise AI Solution for your Use Case

Prioritizing Data Privacy

Scope

Build an **on-premise, domain-specific LLM solution as a Digital assistant, enriched with additional AI-enabled modules**, to continuously increase business value, considering organizational/corporate data, procedures and policies.

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OrbitIntel: The Value Stems from the Data

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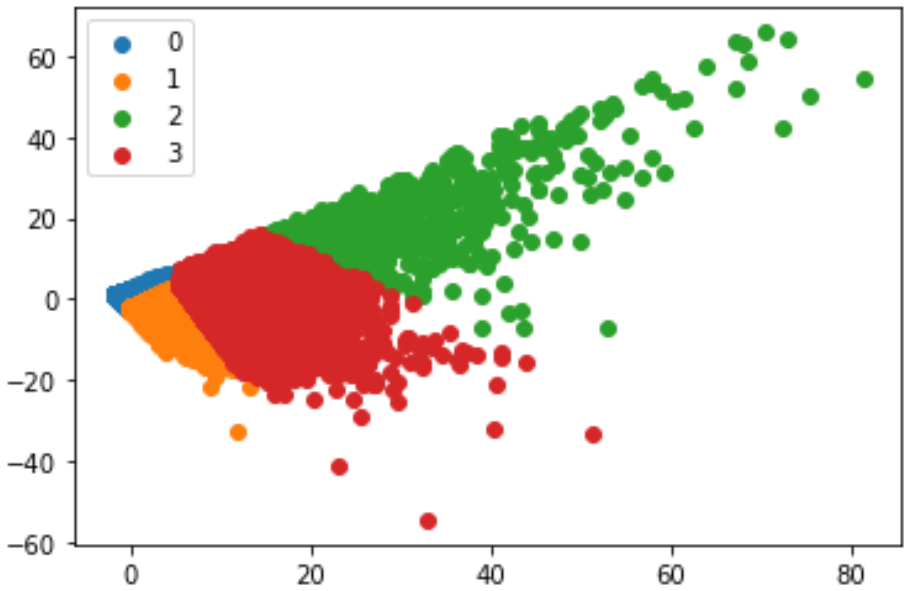
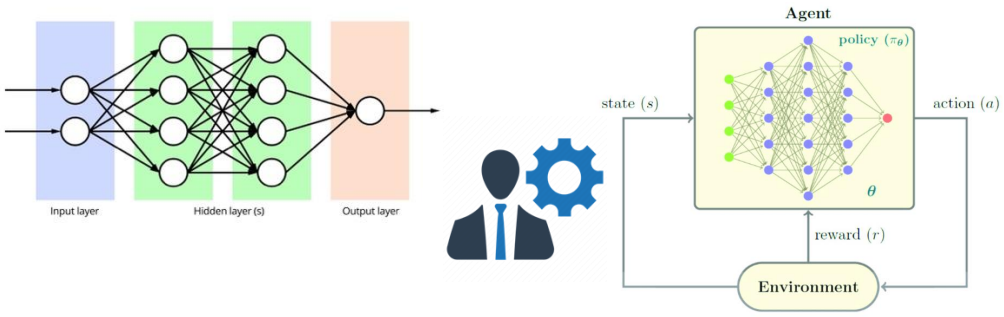
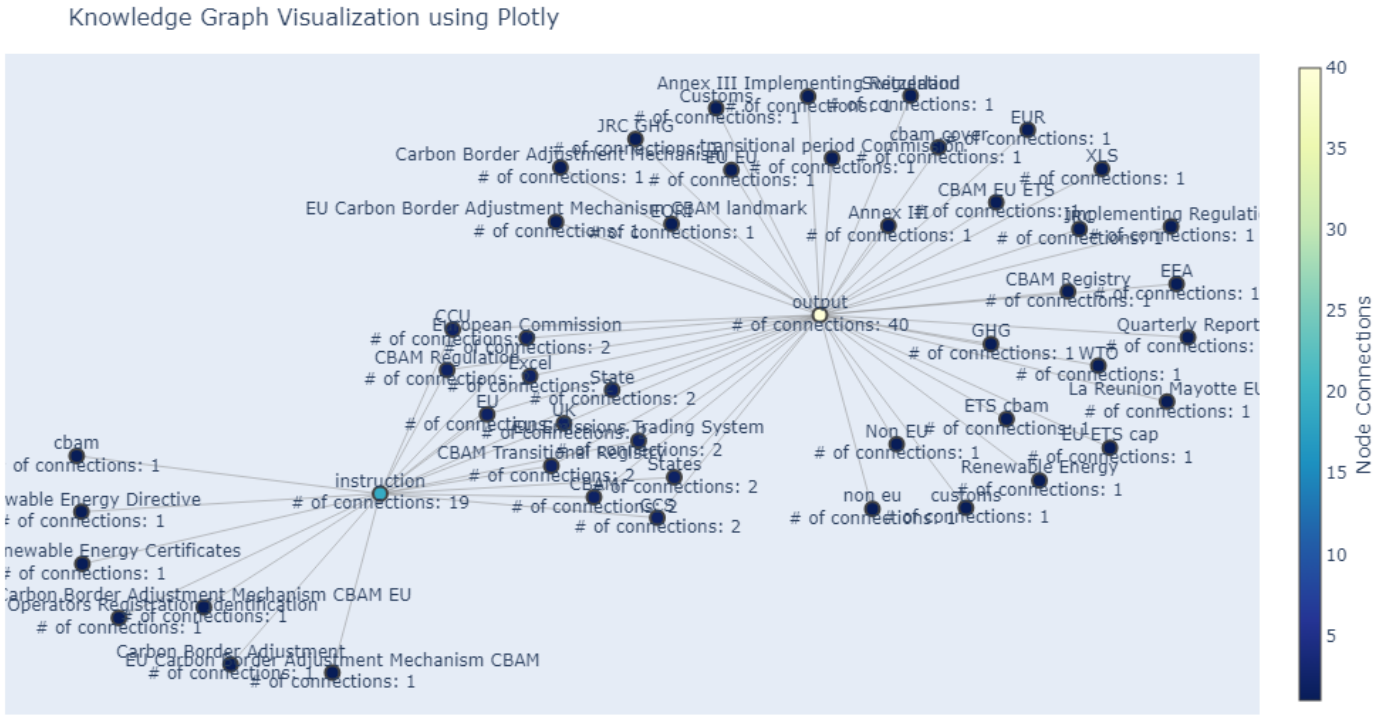


Explore your own data in depth *to identify hidden patterns and discover knowledge*



Human-in-the-loop *AI Modeling*



Construct and visualize ***knowledge graphs*** *as concept maps with respect to your own data in an automated fashion*

Combine cutting edge technologies and best data science practices to increase your business value using your own data

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POCs & Application Examples with Commercial Relevance

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1. EU Institutions: POC of Digital Assistant for EU's Carbon Border Adjustment Mechanism

2. Energy: Electricity Consumption Predictor for Transmission System Operator

3. IT/Software: AI-powered code assistant

4. Food: Predictive Food Safety and Fraud Prevention

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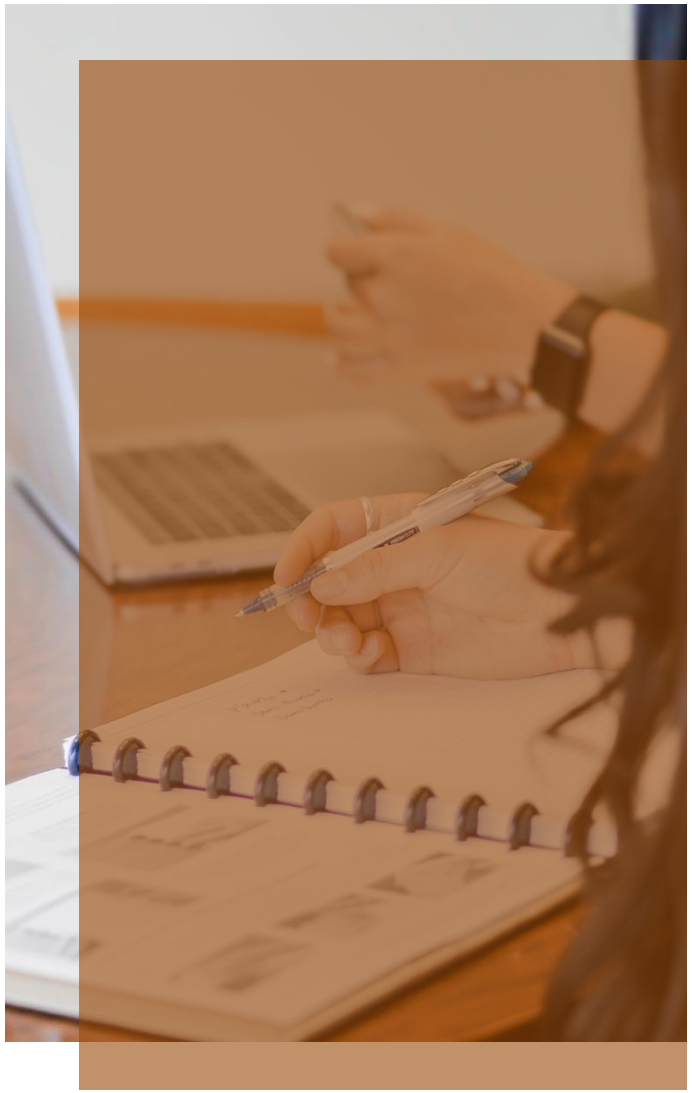

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Levels of AI Development: Towards (Powerful) AGI

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Future Vision: All Organizations will seamlessly leverage a layer of Data-Drive AI-based Intelligence

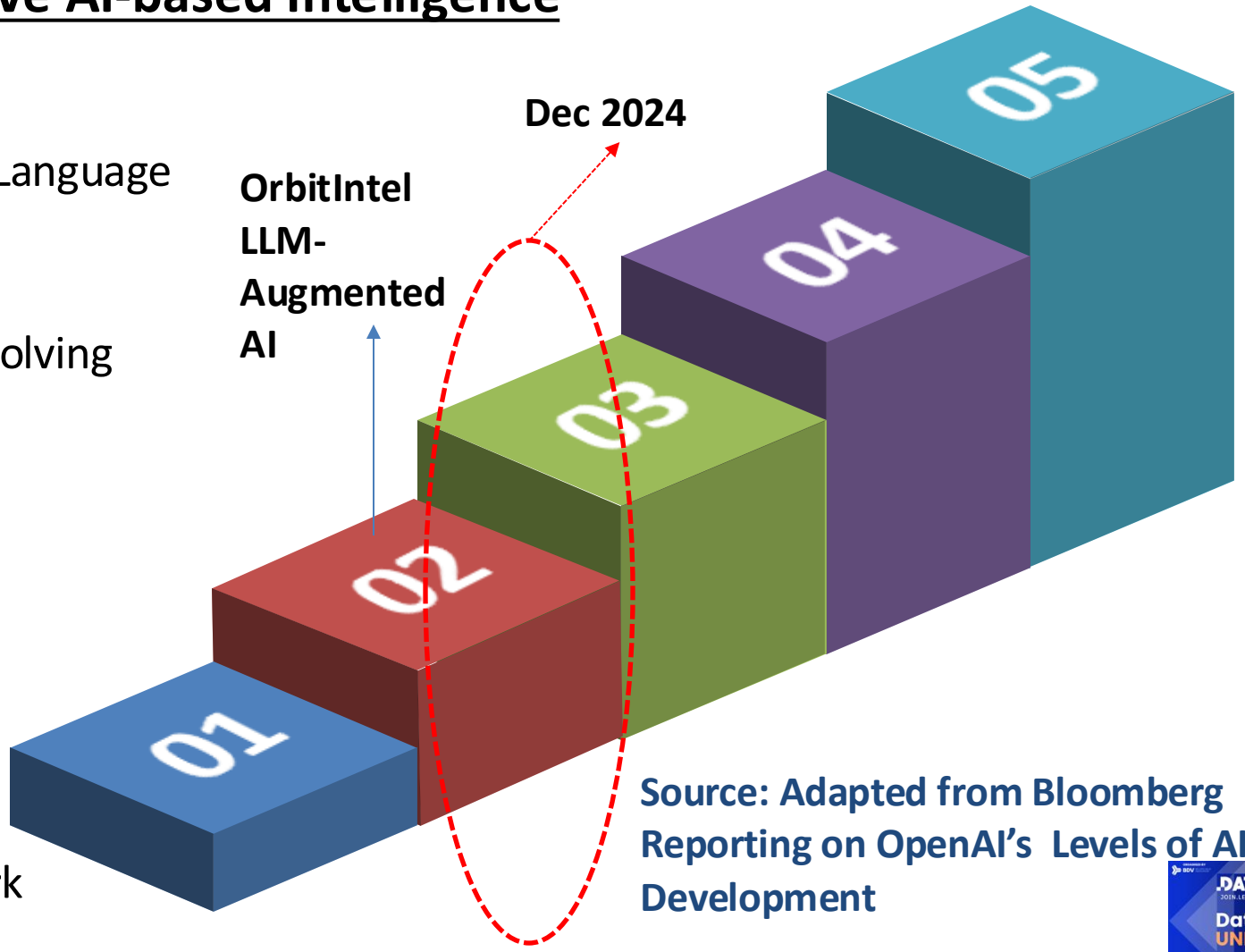
Level 1
01 Chatbots & AI with Conversational Language

Level 2
02 Reasoners: Human Level Problem Solving

Level 3
03 Agents: Systems that Take Action

Level 4
04 Innovators: AI that aids innovation

Level 5
05 Organizations: AI that does the work of an entire Organization



Source: Adapted from Bloomberg Reporting on OpenAI's Levels of AI Development

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R&I Projects and Opportunities

Artificial General Intelligence

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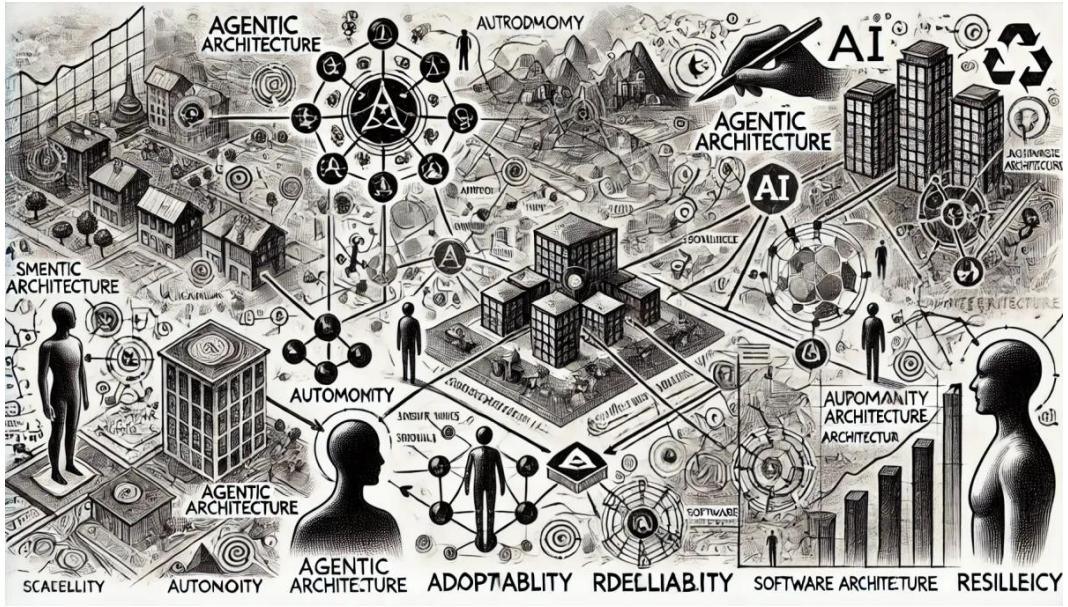
Upcoming R&I Projects e.g.,:
Example: HORIZON MOSAICO (**Start Date: 01/01/2025**)
(Management, Orchestration and Supervision of AI-agent COmmunities for reliable AI in software engineering)
Agentic Infrastructures for Collaborative Software Development

Upcoming R&I Calls:
HORIZON-CL4-2025-04-DATA-02: Empowering AI/generative AI along the Cognitive Computing continuum (RIA) (AI/Data/Robotics Partnership)
HORIZON-CL4-2025-04-DATA-03: Software Engineering for AI and generative AI (RIA) (AI/Data/Robotics Partnership)
HORIZON-CL4-2025-04-DIGITAL-EMERGING-04: Assessment methodologies for General Purpose AI capabilities and risks (RIA) (AI/Data/Robotics Partnership)



Questions?

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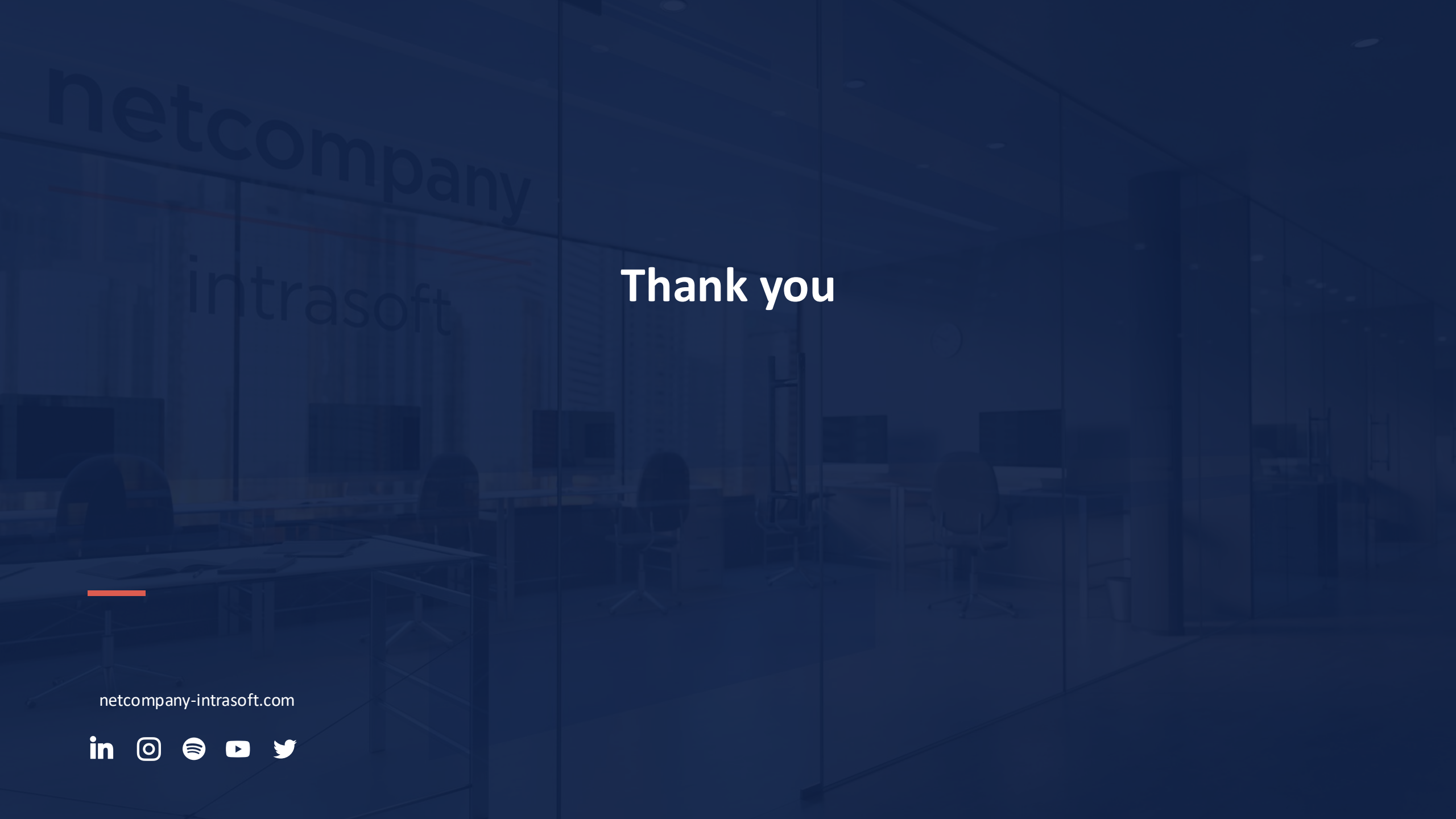

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