

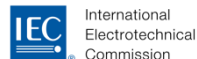
# AUTONOMOUS AGENTS IN CONTROL

**A standardized, holistic Framework on Industrial Agent  
and Multi-agent Systems**

**Christoph Legat**

*Cognitive Autonomy & Predictive Intelligence, Technical University of Applied Sciences Augsburg, Germany*

in collaboration with



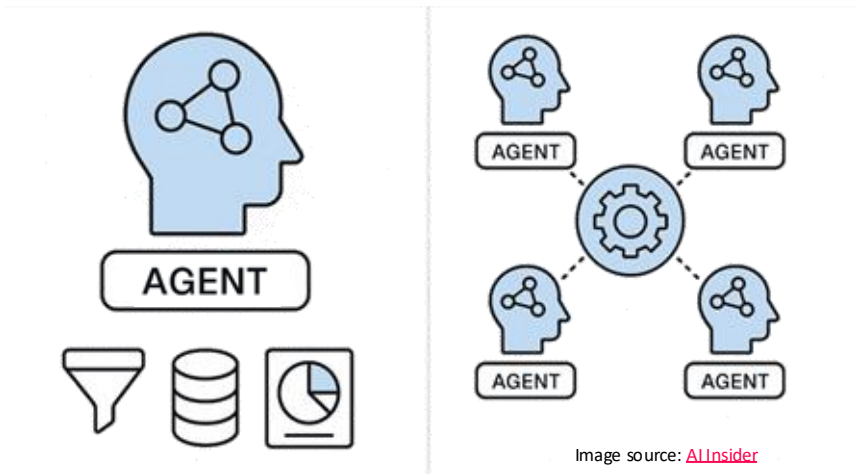
# MOTIVATION

## Agent and Multi-Agent Systems: Autonomous Systems Research since Decades

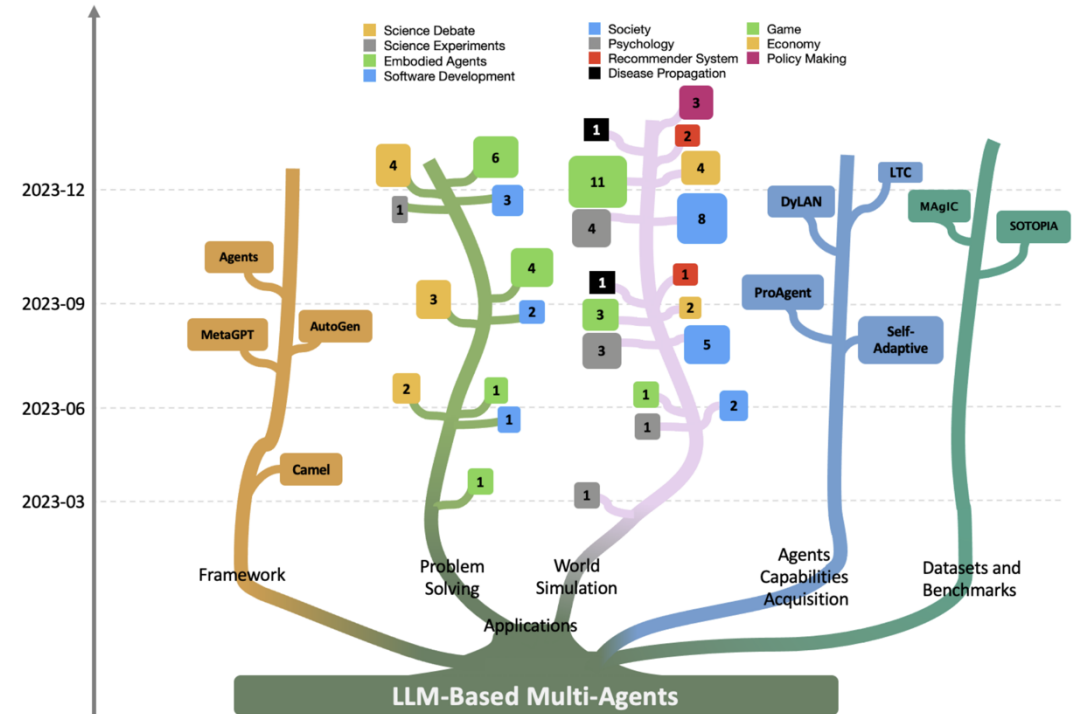
### Backbone of AI Research and Methodologies

➤ Agents (aka AI Agents)

➤ Multi-Agent Systems



### 2nd Wave Revival due Transformer Models / LLMs



# AGENTS IN INDUSTRIAL APPLICATIONS

## Industrial Applications exhibits special requirements an Artificial Intelligence

Industrial Applications enroll special requirements:

- ↗ Terminological clarity
- ↗ Efficient and targeted industrial applicability  
(from engineering to operation)
- ↗ System characteristics, as e.g. auditability, explainability, transparency, safety, reliability, ....
- ↗ Investment security
- ↗ Interoperability

➔ Need for standardization



...

# INDUSTRIAL AGENTS IN STANDARDIZATION

## History Landscape Report: Standards on International Level



2005: IEEE-FIPA  
2005: IEEE IEC TC IA



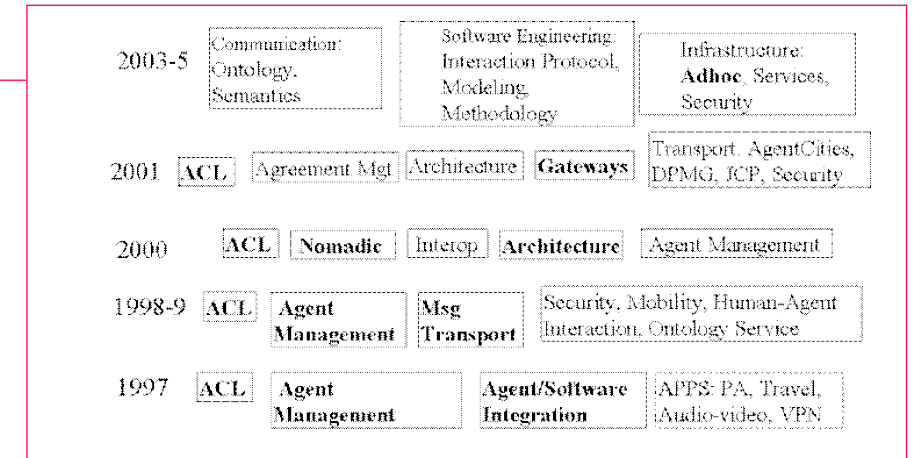
*Practical considerations, discussions, scientific exchange but no specs so far*



*ISO/IEC SC42 „Artificial Intelligence“ not yet considering agents; SC not related to industrial applications.*



*IEC TC65 „Smart Manufacturing“ no WG on Industrial Agents so far.*

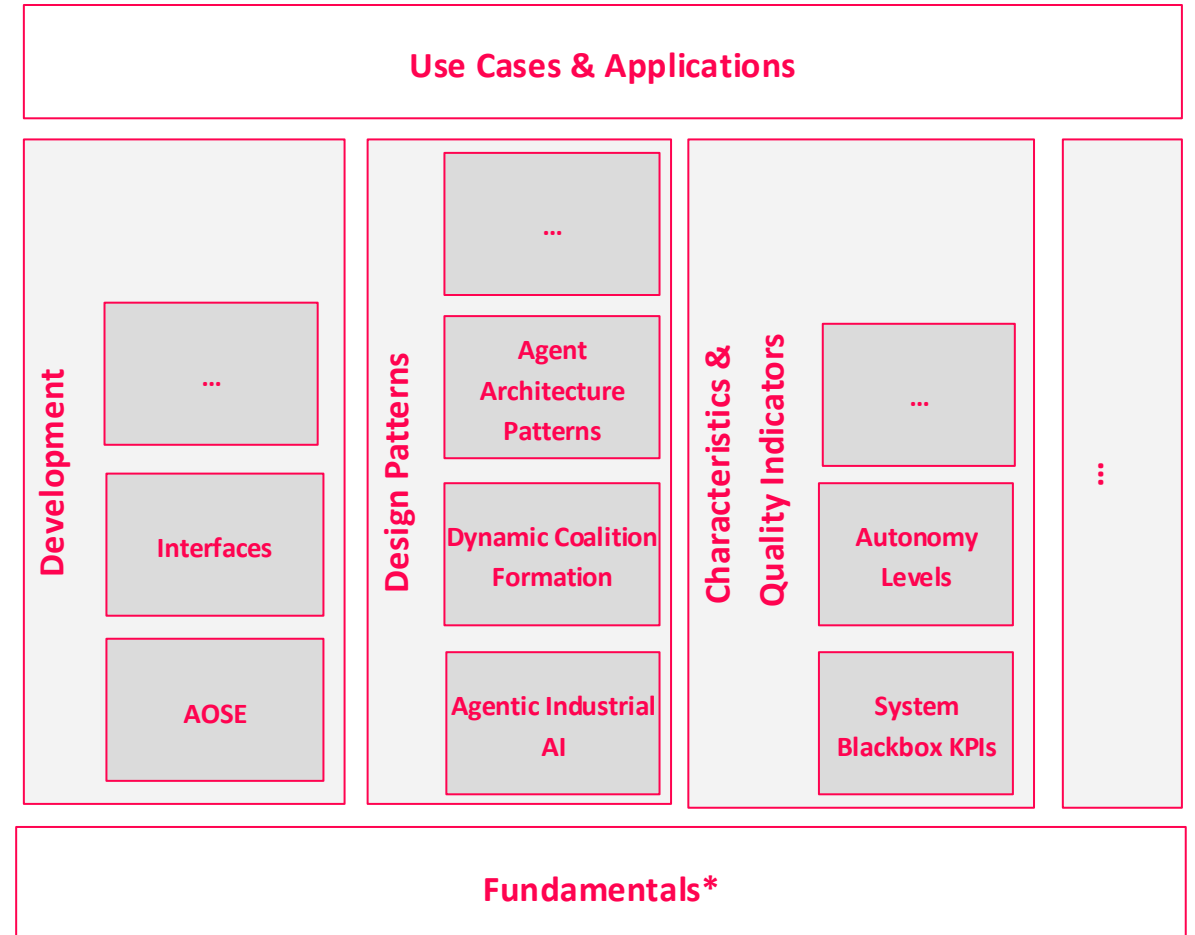


**2660.1-2020 - IEEE Recommended Practice for Industrial Agents: Integration of Software Agents and Low-Level Automation Functions**

➔ Need for international standards

# INDUSTRIAL AGENTS IN STANDARDIZATION

IEC TC65 WG31 “Industrial AI Agent and Multi-agent Systems” | IEC 63718 series



\* ongoing project, all others in preparation

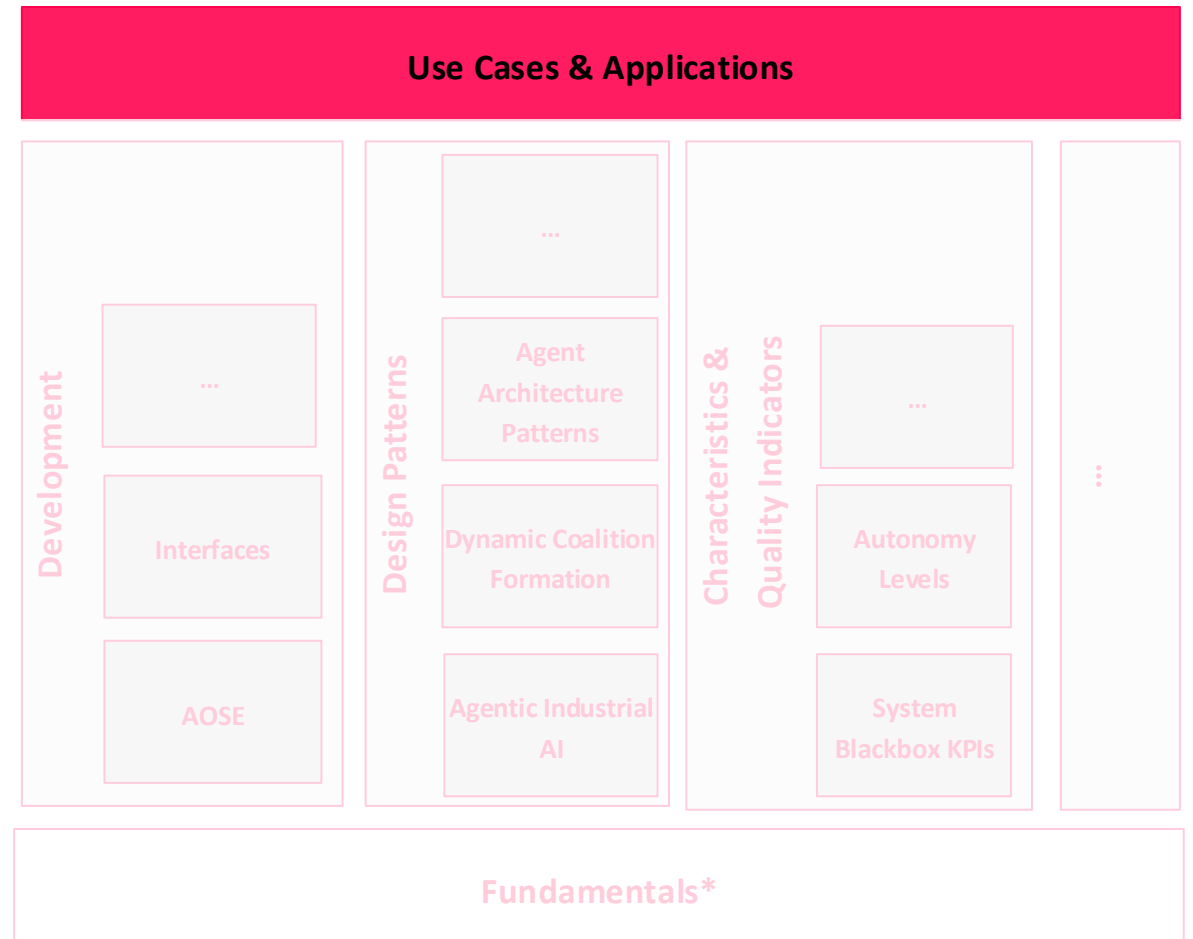
# INDUSTRIAL AGENTS IN STANDARDIZATION

Industrial? Industrial AI? Industrial AI!



# INDUSTRIAL AGENTS IN STANDARDIZATION

Industrial? Industrial AI? Industrial AI!



\* ongoing project, all others in preparation



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