Introduction of AI system life cycle processes

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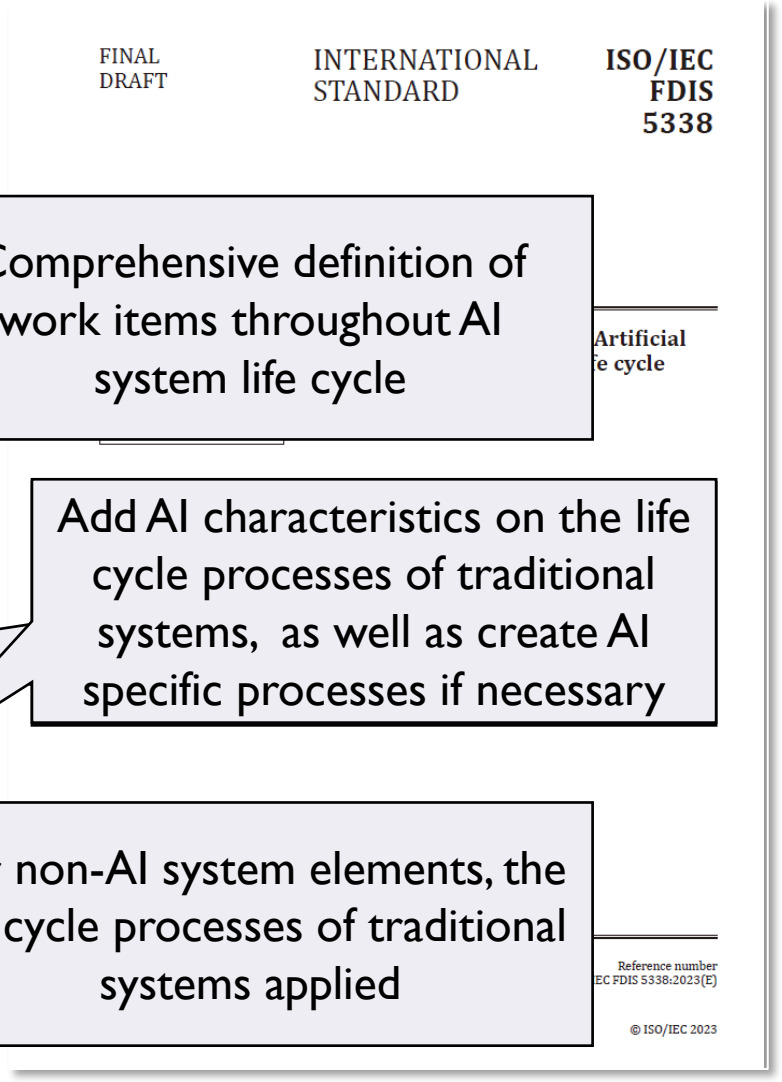
Motivation: Why need International Standard of AI system life cycle processes?

- The life cycle processes for a software system (includes AI systems) can have a significant effect on any of QCD (Quality, Cost, and Delivery).
- A standard of AI system life cycle processes can be the “common language” for stakeholders’ communication in AI system development.
- By providing an AI system life cycle processes standard, it becomes easier to secure social acceptance of AI systems by promoting mutual understanding between developers and users of AI systems.

ISO/IEC 5338 Information technology — Artificial intelligence — AI system life cycle processes

- Status : Under publication
- Scope (summary)
  - This document provides processes that support the definition, control and improvement of the AI system life cycle used within an organization or a project.
  - Processes are based on ISO/IEC/IEEE 15288 and ISO/IEC/IEEE 12207 with substitutes for and additions of AI specific processes, whose foundation is based on ISO/IEC 22989 and ISO/IEC 23053.
  - When an element of an AI system is traditional software or a traditional system, the software life cycle processes in ISO/IEC/IEEE 12207 and the system life cycle processes in ISO/IEC/IEEE 15288 may be used to implement that element.



Comprehensive definition of work items throughout AI system life cycle

Add AI characteristics on the life cycle processes of traditional systems, as well as create AI specific processes if necessary

For non-AI system elements, the life cycle processes of traditional systems applied

Content of ISO/IEC 5338

- Introduction
- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Abbreviated terms

Concepts of System life cycle processes (refers to ISO/IEC/IEEE 15288 and 12207)

Concepts of AI system (refers to ISO/IEC 22989)

- 5 Key concepts
- 5.1 General
- 5.2 AI system concepts
- 5.3 AI system life cycle model
- 5.4 Process concepts
- 5.4.1 Criteria for processes
- 5.4.2 Description of processes
- 5.4.3 Conformance

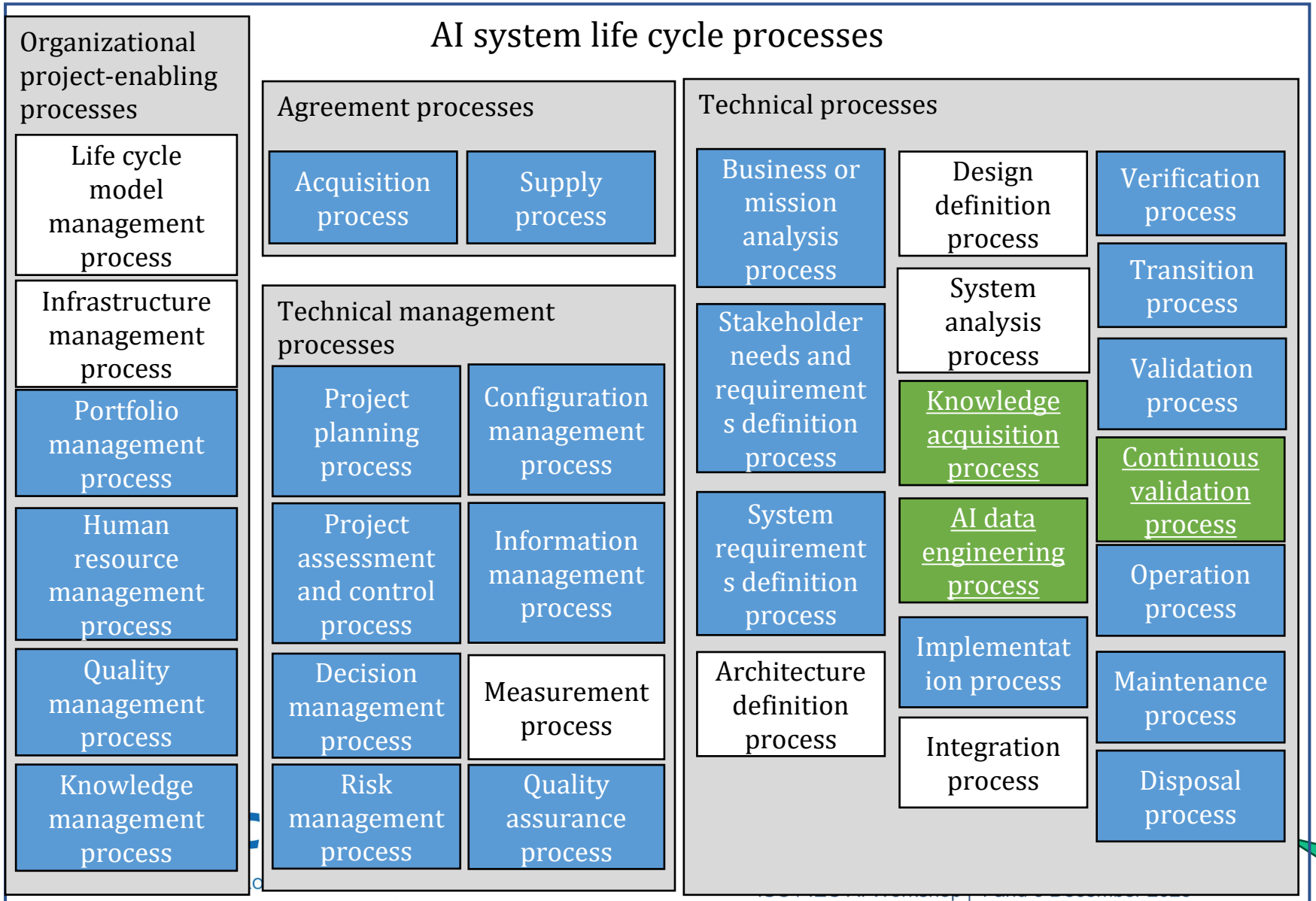
Description of AI system life cycle processes (four groups of processes)

- 6 AI System life cycle processes
- 6.1 Agreement processes
- 6.2 Organizational project-enabling processes
- 6.3 Technical management processes
- 6.4 Technical processes
- Annex A Observations based on use cases in ISO/IEC TR 24030

Representative features of AI system life cycle process descriptions

- Provides references to international standards for AI involved in each life cycle process
  - E.g., ISO/IEC 22989, ISO/IEC 23053, ISO/IEC 5259, ISO/IEC 5339, ISO/IEC 5392, ISO/IEC 23894, ISO/IEC TR 24027, ISO/IEC TR 24030, ISO/IEC 25059, ISO/IEC 38507, ISO/IEC 42001, IEEE 7000-2021
- Add AI-specific particularities, such as: data, risk management, reliability, and explainability perspectives, to existing life cycle processes
- Applicable for machine learning based AI system and heuristic (knowledge) based AI system (E.g., Implementation process; Verification process)

Types and groups of AI system life cycle processes



3 types

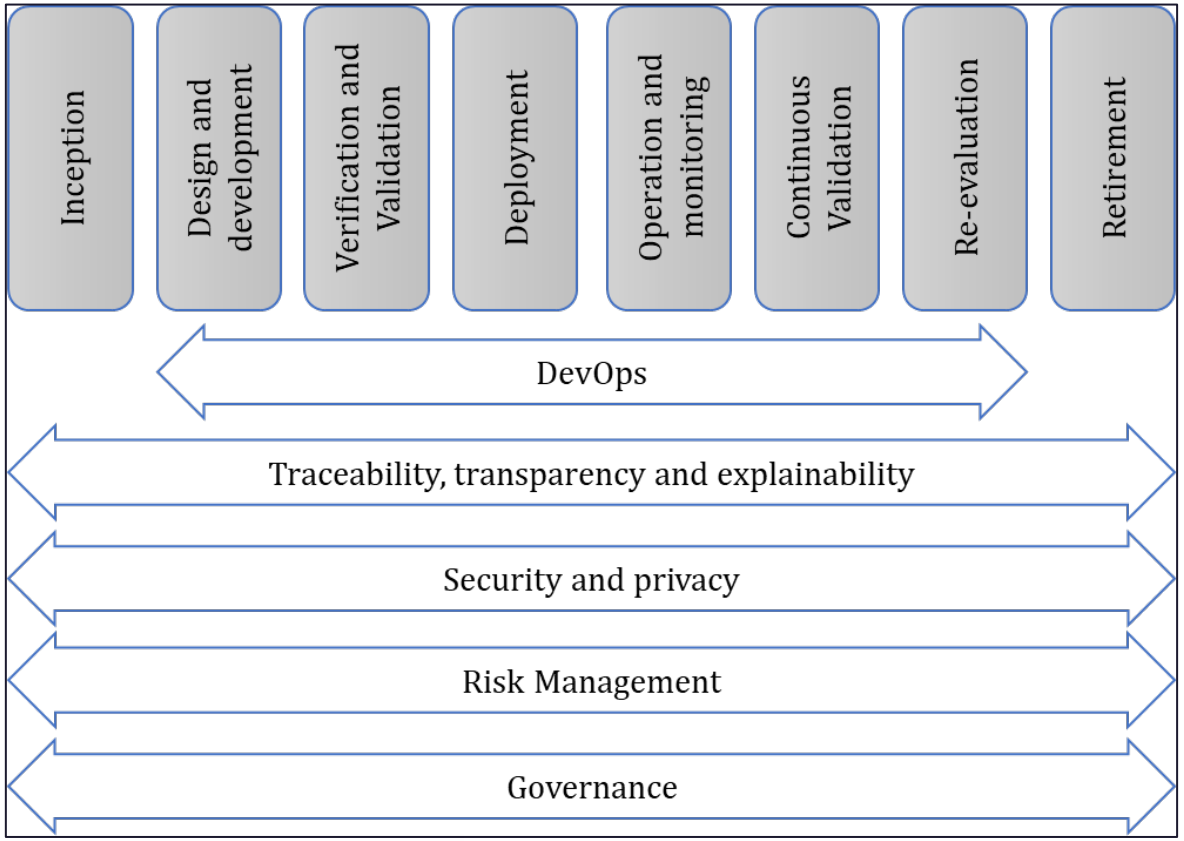
Generic: Processes that are identical to the traditional system life cycle processes (7 processes)

Modified: Processes where elements are modified, added or removed from the traditional system life cycle processes (23 processes)

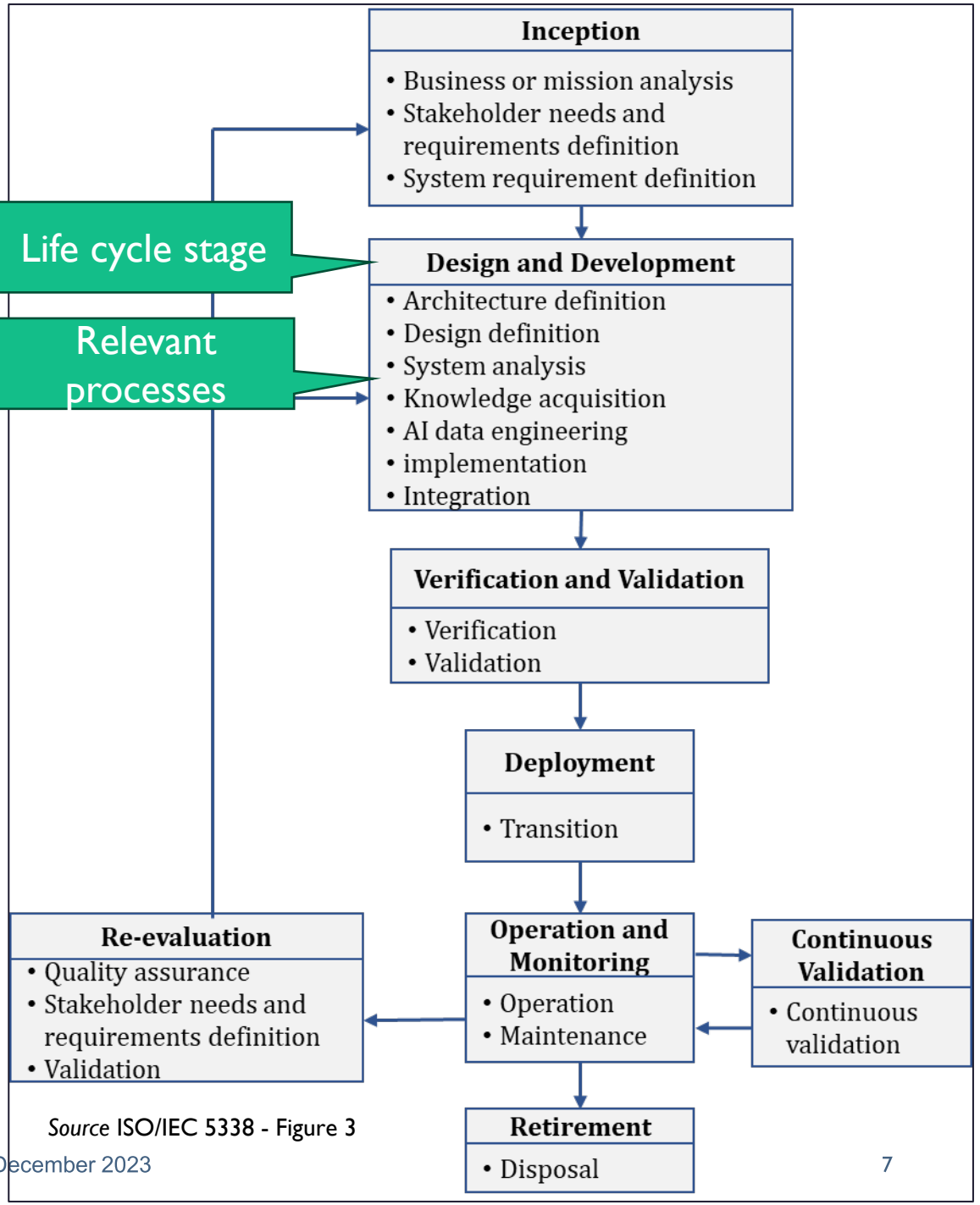
AI Specific: Processes that are specific to characteristics of AI systems but are not defined yet (3 processes)

33 processes,
4 process groups

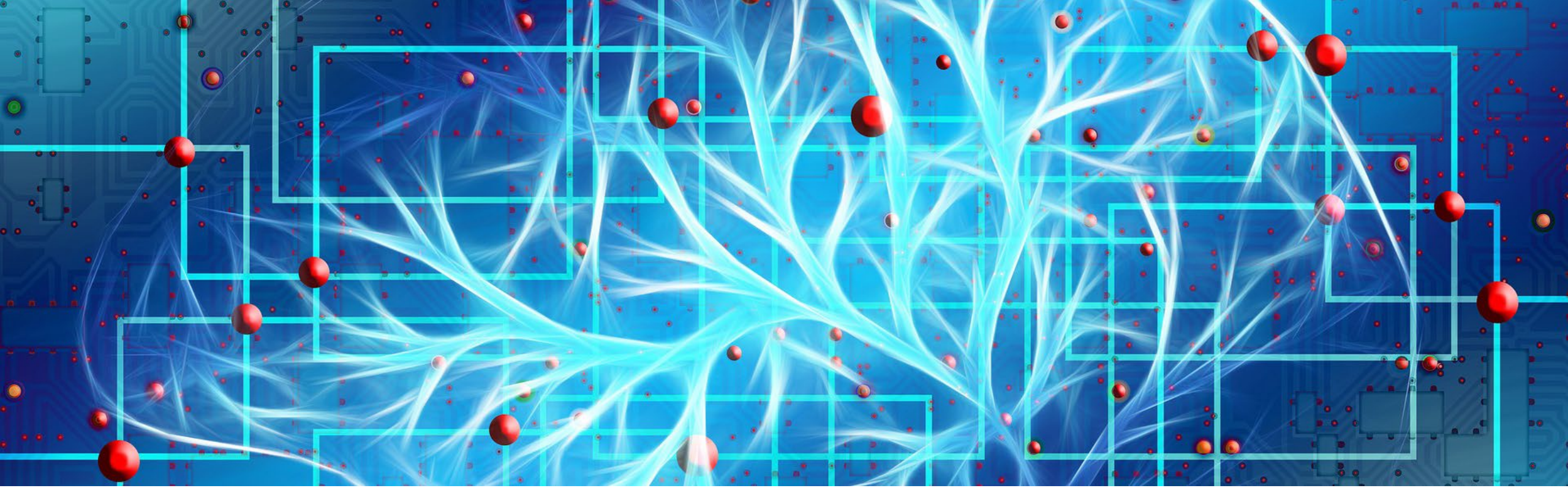
AI system life cycle model and processes



Source ISO/IEC 5338 - Figure 2, which refers to ISO/IEC 22989, Figure 3



Source ISO/IEC 5338 - Figure 3



Summary

While traditional hardware and software life cycle processes are broadly applicable to AI systems, they require the introduction of new processes and the modification of existing processes to accommodate specific AI

ISO/IEC 5338 extends the current generic life cycle process International Standards (ISO/IEC/IEEE 15288 and 12207) to make them applicable for AI systems so that the AI system life cycle can benefit from established models and existing practices.

This standard defined three types of life cycle processes: Generic processes (7),Modified processes (23), AI-specific processes (3)

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Thank you

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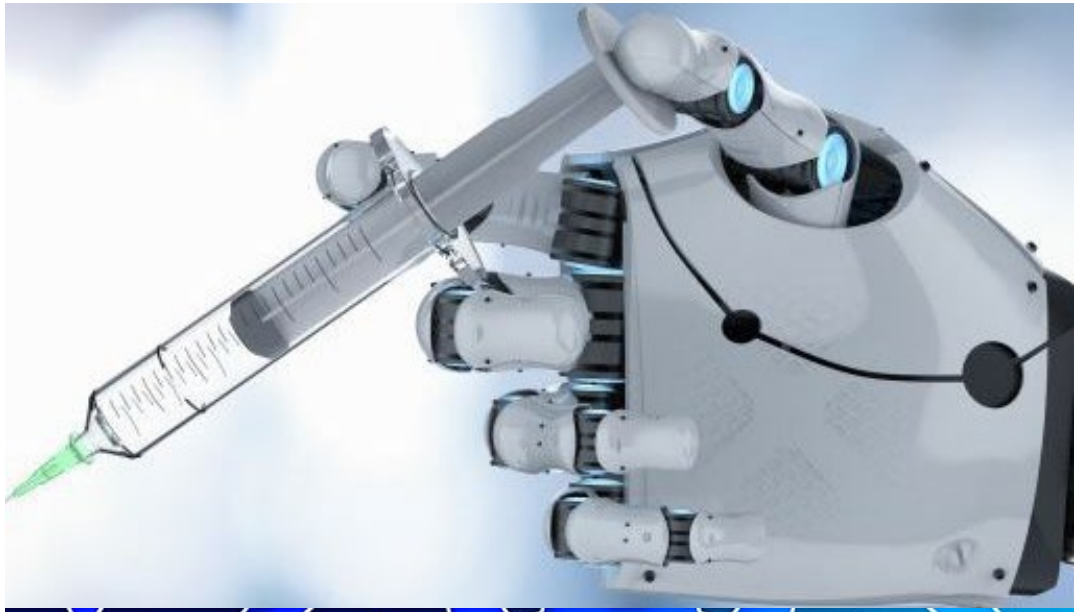

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