Crosswalk between NIST AI RMF 1.0[1] and ISO/IEC 5338:2023 AI system life cycle processes[2] and ISO/IEC 5339 Guidance for AI applications[3]

The AI RMF and the two international standards were developed independently with some shared foundations with ISO/IEC 22989:2022[4]. This document highlights their areas in common and where the AI RMF can be used to inform readers and users of ISO/IEC 5338 and ISO/IEC 5339.

AI Risk Management as the Foundation of Responsible Development and Use of AI systems

Figure 1 shows the ***Make***, ***Use*** and ***Impact*** perspectives of the stakeholders on an AI application and its context from ISO/IEC 5339. Indicated ***in red*** in the Figure are where these perspectives could be enhanced by taking the risk management advice and the fundamental aspects of risk from AI RMF.

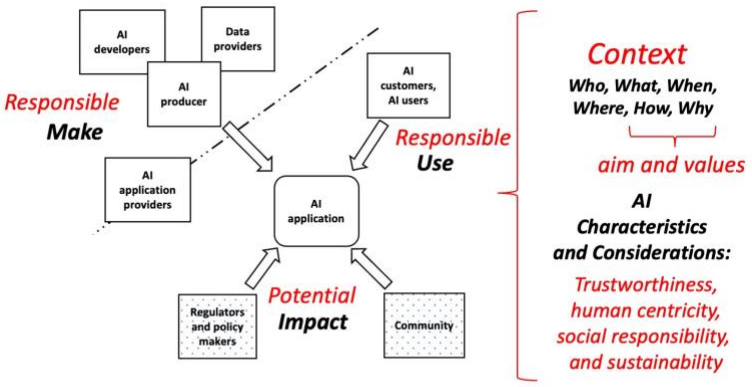
AI RMF	ISO/IEC 5339
"AI risk management is a key component of *responsible development and use* of AI systems. *Responsible AI practices* can help align the decisions about AI system design, development, and *uses with intended aim and values*. Core concepts in responsible AI emphasize *human centricity, social responsibility*, and sustainability. AI risk management can drive responsible uses and practices by prompting organizations and their internal teams who design, develop, and deploy AI to think more critically about *context* and *potential* or unexpected negative and positive *impacts*. Understanding and managing the risks of AI systems will help to enhance *trustworthiness*, and in turn, cultivate public trust." ([1] page 1).	 AI Application – stakeholders' perspectives (from [2] Figure 2)

Figure 1. Stakeholders' Perspectives with Risk Management Considerations

AI system life cycle, application context and its audience

Figure 2 shows the life cycle stages of an AI system in AI RMF aligned with those used in ISO/IEC 5338 and ISO/IEC 5339.

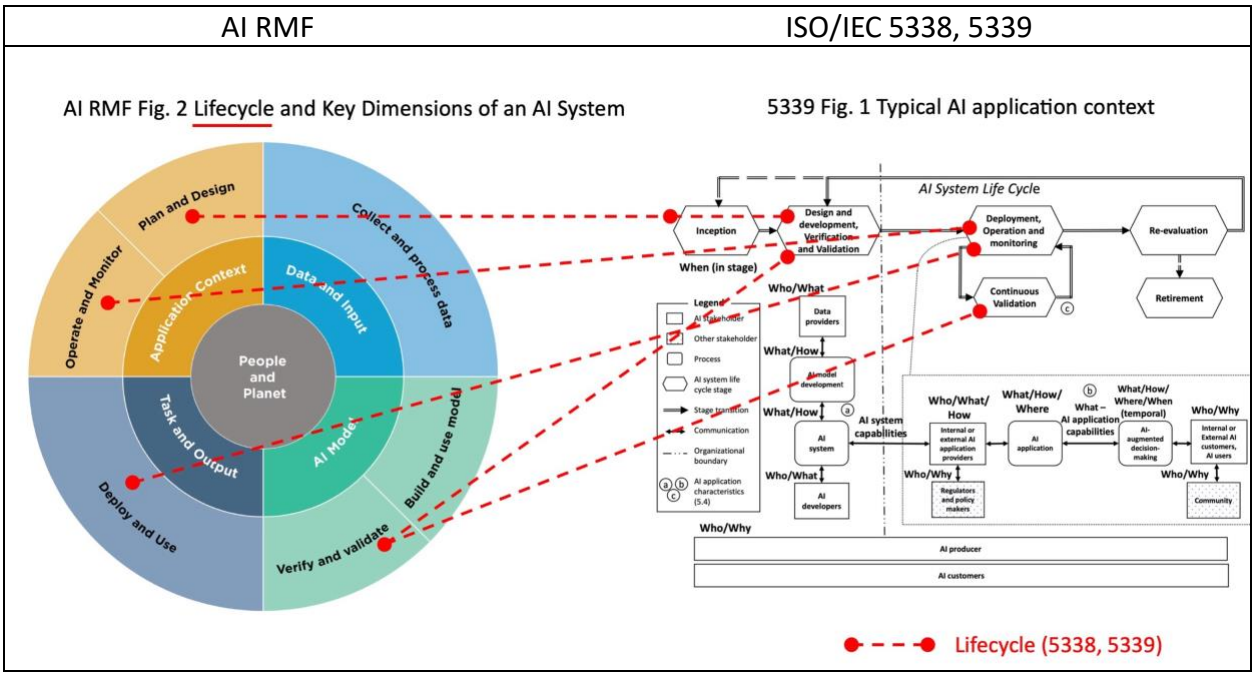


Figure 2: AI system lifecycle in [1], [2], and [3]

Figure 3 shows the key dimensions and context of an AI system from AI RMF aligned with the processes (5.3.4) and context (5.2) described in ISO/IEC 5339.

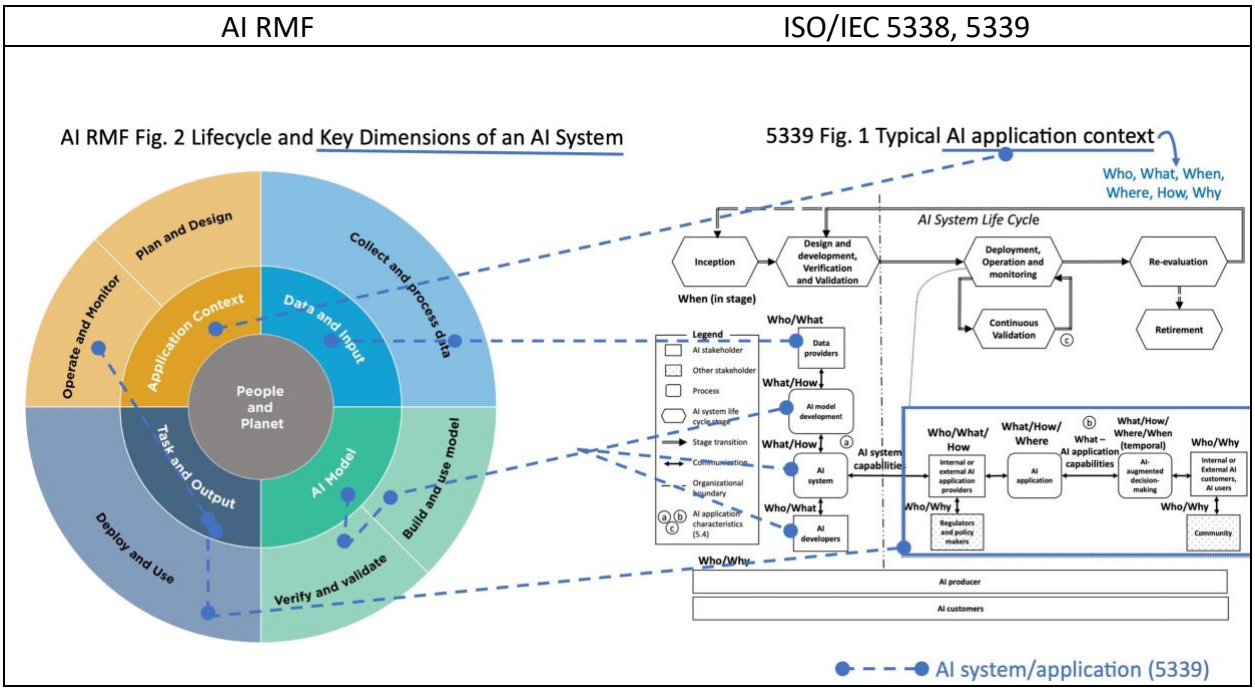


Figure 3. Key Dimensions of an AI System and Its Context in [1], [2], and [3]

Figure 4 shows the alignment between the people and planet dimensions from AI RMF and the impact on various stakeholders in ISO/IEC 5339 (5.3.2, 5.3.3). The AI actors in AI RMF (Appendix A) are also similar to the stakeholders in ISO/IEC 5339.

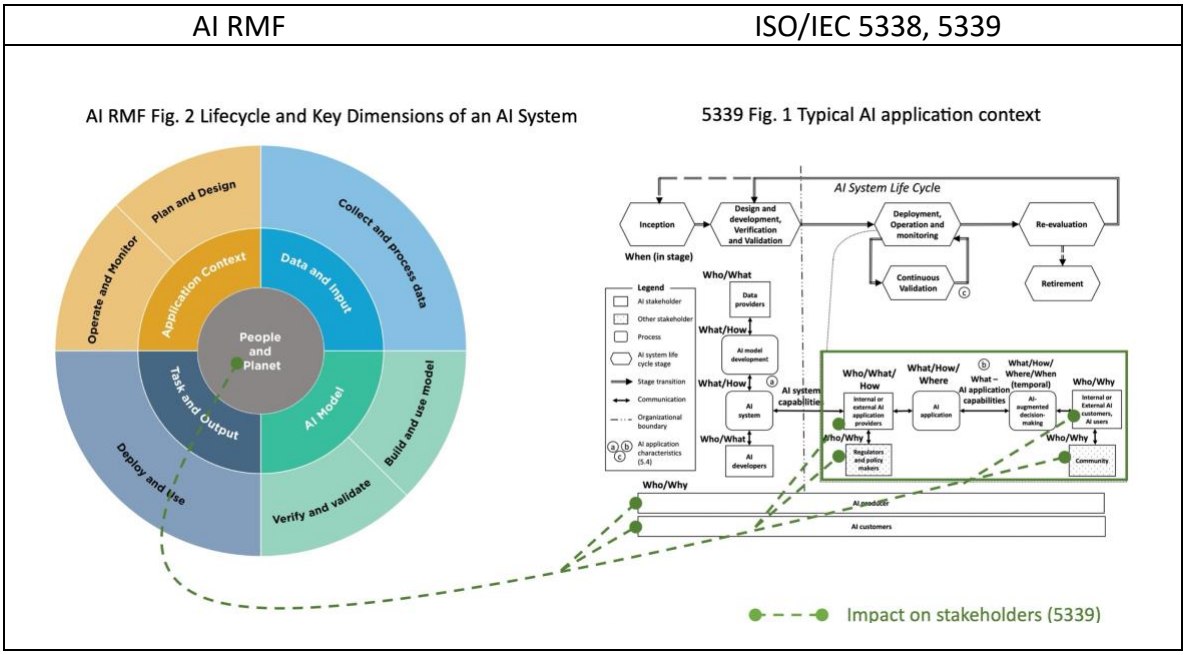


Figure 4. AI System's impact on People and Planet [1] mapped to AI Application Stakeholders [3]

The characteristics of trustworthy AI systems in AI RMF and the discussion of trustworthiness in ISO/IEC 5339 are compared in Table 1. The discussion of trustworthiness in ISO/IEC 5339 were mostly derived from ISO/IEC 22989 and ISO/IEC 24028 so it does not align exactly with those from AI RMF. The AI RMF characteristics of trustworthy AI systems are socio-technical system attributes. In contrast, ISO/IEC 5339 refers to comparative characteristics as AI application non-functional characteristics.

Table 1. Comparison of Trustworthiness Characteristics from [1] and [3]

AI RMF – *Characteristics of Trustworthy AI Systems (Section 3)*	ISO/IEC 5339 - *Trustworthiness (5.5.2) (mostly derived from ISO/IEC 24028 [5])*
Valid and Reliable	5.5.2.9, 5.5.2.3, 5.5.2.2
Safe	–
Secure and Resilient	5.5.2.4
Accountable and Transparent	5.5.2.8
Explainable and Interpretable	5.5.2.6
Privacy-Enhanced	–
Fair - with Harmful Bias Managed	5.5.2.10
–	Controllability (5.5.2.7)
–	Predictability (5.5.2.7)
–	Dependable (5.5.2.1)

Figure 5 shows the relationship between the AI RMF Core (GOVERN, MAP, MEASURE, MANAGE) and the AI application stakeholders' perspectives from ISO/IEC 5339. The AI RMF Core represents a very high-level view and "Governance is designed to be a cross-cutting function to inform and be infused throughout the other three functions" ([1] Figure 5). The MAP function can inform the *Make* perspective. The MEASURE function can inform the *Use* perspective. The MANAGE function can inform the *Impact* perspective.

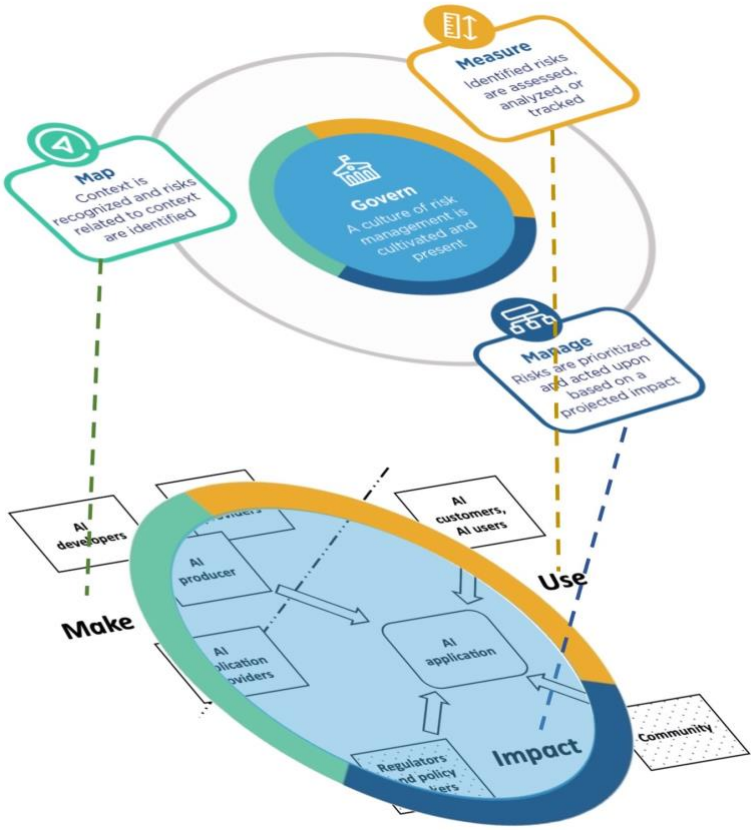


Figure 5. Relationship between AI RMF Core [1] and ISO 5339 AI application stakeholders' perspectives [3]

References

[1] Artificial Intelligence Risk Framework (AI RMF 1.0), NIST AI 100-1, January 2023.
[2] ISO/IEC 5338:2023 *Information technology — Artificial intelligence* — AI system life cycle processes.
[3] ISO/IEC 5339:2024 *Information technology — Artificial intelligence — Guidance for AI applications.*
[4] ISO/IEC 22989:2022 *Information technology — Artificial intelligence — Artificial intelligence concepts and terminology.*
[5] ISO/IEC TR 24028:2020 *Information technology — Artificial intelligence — Overview of trustworthiness in artificial intelligence.*