Ontology-based Questionnaires

Legends:
- **Requirement category** – The corresponding requirement category within Dimension 1 of the RE4AI ontology. Questions that did not correspond to a specific category but encompassed broader aspects spanning multiple categories were categorized as "general."
- **RE stage** – The corresponding requirement stages within Dimension 2 of the RE4AI ontology. Questions which correspond to whole stages are labeled "Full".
- **Stakeholders' roles** – The corresponding requirement stages within Dimension 3 of the RE4AI ontology. This column specifies the stakeholders to whom the survey question is intended to be directed. Questions which correspond to multiple stakeholders are labeled "Multiple".
- **Question** – States the question(s) to be asked. Rephrased or new questions added in response to experts' validation are highlighted in Table 2 with a bracket - 'EV'.

SQ #	Requirement category	RE stages	Stakeholders' roles	Question
1	General	Elicitation	Customer	1.1 – (EV-rephrased) What was the business need or motivation that caused the initiation of the AI-driven project? 1.2 – What are the factors that influence the decision to use AI over conventional methods?
2	General	Full	Multiple	2.1 – (EV-rephrased) What are the effective methods, procedures and tools for developing and managing the complete requirements for AI-powered systems?
3	General	Full	Multiple	3.1 – What are the roles and responsibilities of different stakeholders in the process of developing requirements of AI systems, both functional, quality, performance and design? 3.2 – (EV-rephrased) How can we ensure and encourage their effective participation and collaboration, ensuring that their feedback is properly considered and integrated?
4	General	Analysis	Multiple	4 - How can we assess the readiness and suitability of AI solutions for specific tasks and contexts?
5	General	Validation	Multiple	5 - What are the tools and techniques that can be used for verifying and validating the requirements of AI systems?
6	General	Management	Multiple	6 - (EV-rephrased) What are the primary causes of requirement changes in AI-powered systems, and what are the best practices for managing these changes?
7	Contradictions and trade-offs	Analysis, specification	Multiple	7.1 – (EV-rephrased) What are the interdependencies and contradictions between different requirements categories? 7.2 – What are the common trade-offs that need to be handled? 7.3 – How are they prioritized, balanced, resolved and managed?
8	Model	Full	Developers, AI experts, data scientists.	8.1 – What challenges and best practices should be considered when selecting the most suitable AI model? 8.2 – (EV-rephrased) What is the projected evolution of the model, and how can this evolution be managed? 8.3 - How can we verify that AI model deviations or failures of the system are properly detected and addressed?
9	Data	Full	Multiple	9.1 – (EV-rephrased) What are the most critical data qualities? 9.2 - What data preparation steps are necessary for the successful implementation of AI capabilities? 9.3 - What are the requirements for measuring and evaluating data quality and data drifts along the system life-cycle?

				9.4 – (EV-rephrased) What data and model requirements are necessary to prevent biases that could affect the system's fairness? 9.5 – (EV-new) How does noisy data impact system performance, and what strategies can be implemented to mitigate its effects? 9.6 - What are the requirements for designing and implementing the data governance and management system for AI systems?
10	Data	Full	Data scientists, data engineers, AI experts	10.1 – What are the roles and responsibilities of data personnel in the requirement development process for AI systems? 10.2 – (EV-rephrased) How data scientists are involved in the agile project development?
11	Performance	Elicitation, specification, validation	RE and system engineers, customers, users, AI experts	11.1 – (EV-rephrased) What methods and techniques are used to define performance metrics and key performance indicators (KPIs) in the project's initial phase, and how is success criteria determined? 11.2 – How do stakeholders overcome the challenge of defining performance expectations without the ability to observe the performance until the conclusion of the training period? 11.3 - What are the most effective methods and tools for validating the performances? 11.4 - In what stages along the system lifecycle do you validate the performances?
12	Explainability	Elicitation, analysis, specification	Users, AI experts, domain experts, ethical and safety experts, regulators	12.1 - How do you define the level of explanation required for different stake-holders based on their roles? 12.2 – (EV-new) What are the requisite levels of explainability for diverse stakeholders, particularly users and developers? 12.3 What methods are used for explainability? 12.4 – (EV-rephrased) How does the need for explainability impact the selection of models and the decision to opt for traditional methods? 12.5 - Could the explainability requirement issue be a "show stopper" for the decision not to use AI for a specific task?
13	Ethics	Analysis, validation, management	System engineers, ethical experts, AI experts, ethical experts, developers	13.1 – How can we ensure that ethical considerations are effectively integrated into the development and deployment of AI systems? 13.2 – How can we ensure that ethical requirements are managed along the system life-cycle? 13.3 - How can we measure and validate the fairness of AI systems? 13.4 – How can we hold the system responsible for any violations of ethics?
14	Trust	Elicitation, validation	Users, domain experts, ethical experts	14.1 – What are the key factors that contribute to user trust in AI systems? 14.2 – How do these factors vary across different contexts and applications? 14.3 - What are the best practices for evaluating and measuring user trust in AI systems?

15	Privacy	Elicitation, specification	AI experts, data scientists, data engineers, designers, security experts, ethical experts	15.1 - How can existing privacy frameworks and regulations, such as GDPR, be adapted and extended to effectively govern the use of AI systems and protect privacy? 15.2 - (EV-new) What is the impact of including privacy requirements on system design and performance?
16	Trainability	Specification, validation	AI experts, data scientists, architects and designers	16.1 - What are the factors that should be considered when defining the frequency of retraining an AI-powered systems? 16.2 - How can we effectively design, measure, and evaluate the trainability of AI systems to ensure optimal performance?
17	Human-system interaction	Elicitation, analysis	Users, ethical experts, safety experts, regulators	17 - (EV-new) What is the anticipated level of human involvement in the system?
18	Security	Analysis, specification	AI-experts, cyber security experts	17 - (EV-new) What vulnerabilities arise from using AI models?