Comparison and Analysis of 3 Key AI documents:
EU proposed AI Act, the Assessment List for Trustworthy AI (ALTAI), and ISO/IEC 42001 AI Management System

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Multiple AI regulations, standards, and guidelines are being developed separately

Highly fragmented landscape → Regulatory and market confusion

There is a need to Identify the commonality, inconsistencies, and gaps across AI documents

3 Key AI Documents

ALTAI: Assessment List for Trustworthy AI

Questions assessing trustworthy AI requirements

ISO/IEC 42001
AI Management System

Demonstrate management of AI system and AI risk management – certify products and practices

EU's AI Act: Regulating Artificial Intelligence

Obligations and prohibitions based on high-risk, maintaining documentation

RQ 1. To what extent can **ALTAI's trustworthy AI requirements** be integrated into **ISO/IEC 42001's AI management system** activities?

RQ 2. To what extent can **AI Act's high-risk AI obligations** be integrated into **ISO/IEC 42001's AI management system** activities?

Methodology for Comparison and Analysis

Upper-level ontology for mapping trustworthy AI documents
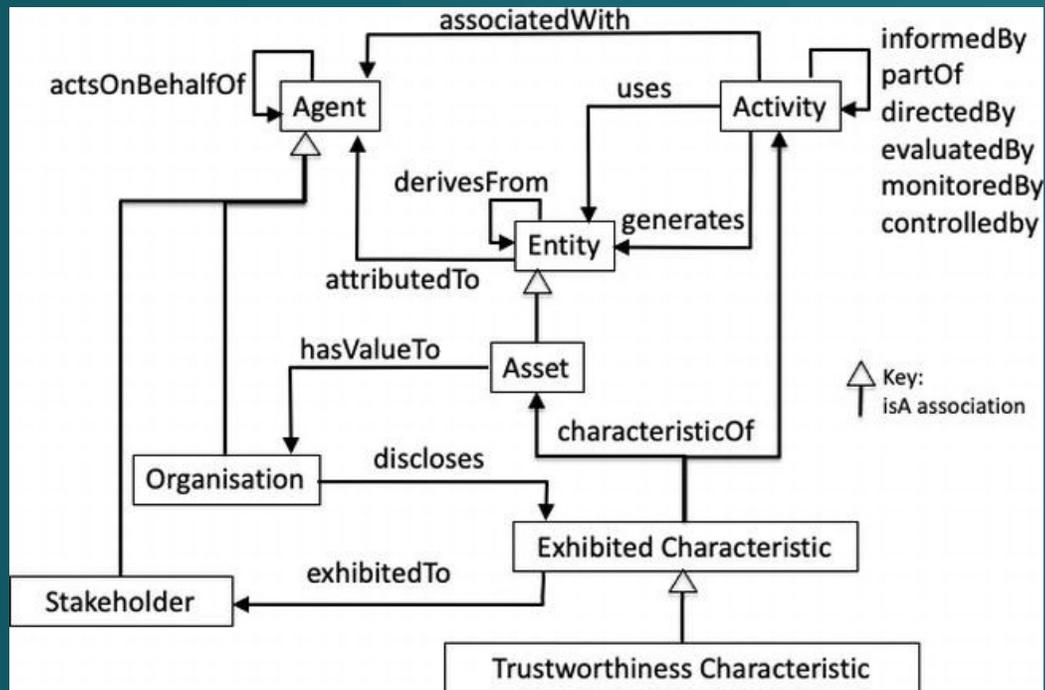
Steps

1 Document analysis, extraction of trustworthy AI activities and modelling them as Activity

2 Linking activities using partOf relationship

3 Analysis of the overlaps and potential conflicts
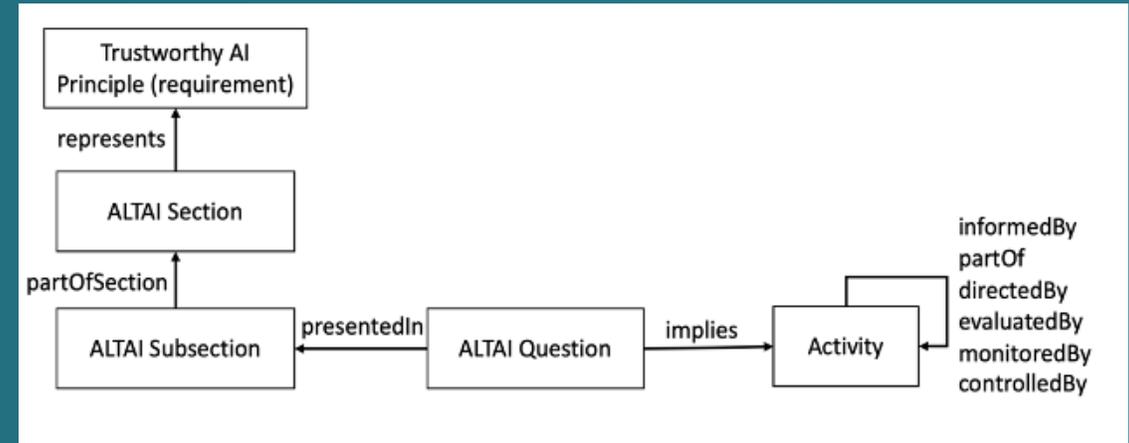
Comparison of ALTAI with ISO/IEC 42001

Extracting activities from ALTAI questionnaire

ALTAI question:

"Are end-users or other subjects adequately made aware that a decision, content, advice or outcome is the result of an algorithmic decision?"

ALTAI activity:

Inform end-users or other subjects that a decision, content, advice or outcome is the result of an algorithmic decision

Comparison of ALTAI with ISO/IEC 42001

No.	ID	AIMS activity (label)	HS clause (see also)
1	UOC	Understanding organisation and its context	4.1
2	USE	Understanding stakeholder needs and expectation	4.2
3	DS	Determine AIMS scope	4.3
4	EIMI	Establish, implement, maintain and continually improve management system and its processes	4.4
5	DLC	Demonstrate leadership and commitment to the management system	5.1
6	EP	Establish AIMS policy	5.2
7	ARRA	Assign roles, responsibilities and authorities	5.3
8	ARO	Address risks and opportunities	6.1
9	EPAO	Establish and plan to achieve AI objectives	6.2
10	ARRA	Assign roles, responsibilities and authorities	6.3
11	DAR	Determine and allocate resources for AIMS	7.1
12	DEC	Determine and ensure competence of people affecting AI performance	7.2
13	PA	Promote awareness	7.3
14	DC	Determine AIMS communication	7.4

Identifying AI management system activities from ISO **'harmonised structure'** for management system standards defined in ISO/IEC Directives on procedures for ISO technical work

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ID	ALTAI activity structure	partOf (AIMS activity)
AG1	Assess the impact of the AI system	ARO
AG2	Assess the system vulnerabilities or threats	ARO
AG3	Assess whether the AI system respects a specific right	ARO
AG4	Establish processes to test or monitor AI impacts or risks	PCP & ARO & MMAE
AG5	Establish processes to measure and assess AI risks	PCP & ARO
AG6	Establish processes to mitigate, rectify, or avoid AI risks	PCP & ARO
AG7	Establish processes to achieve an AI objective	PCP & EPAO
AG8	Assess whether an AI objective is achieved	EPAO & MMAE
AG9	Establish processes to test and monitor AI objectives	PCP & EPAO & MMAE
AG10	Establish processes to measure and assess AI objectives	PCP & EPAO & MMAE
AG11	Provide information about a design decision	UOC
AG12	Determine compliance / Align the systems with a specific standard or guideline	PCP & UOC
AG13	Designate a role	ARRA
AG14	Establish a broad (e.g. ethics review board)	ARRA
AG15	Provide employee training / Ensure workers competence	DEC
AG16	Communicate with or inform users or third parties	DC
AG17	Inform staff and employees about the AI policy	PA

Comparing ALTAI and ISO/IEC 42001

AIMS activity	AIMS activity (label)	Nos. ALTAI activities
ARO	Address risks and opportunities	73
PCP	Plan and control AI processes	54
EPAO	Establish and plan to achieve AI objectives	44
DC	Determine AIMS communication	22
MMAE	Monitor, measure, analyse and evaluate AI	20
UOC	Understanding organisation and its context	12
DEC	Determine and ensure competence of people affecting AI performance	7
ARRA	Assign roles, responsibilities and authorities	2
PA	Promote awareness	2

ALTAI adopts a risk-oriented approach for trustworthy AI: **~50%** activities relate to **risk management**

Comparing AI Act with ISO/IEC 42001

AI Act risk management activity	partOf (AIMS)
Establish risk management system	DC & EIMI & ARO
Implement risk management system	EIMI & ARO
Document risk management system	EIMI & ARO & CUCD
Maintain risk management system	EIMI & ARO
Identify/ Analyse/ Evaluate/ Mitigate Risks	ARO
Communicate Residual Risk to Users	PA & AIRO
Identify Impact On Stakeholders (e.g. children)	USNE & ARO

Most activities were mapped into:

- Establishing management systems,
- Addressing risks,
- Creating documentation,
- Communication with external entities.

Semantic Modelling of Activities
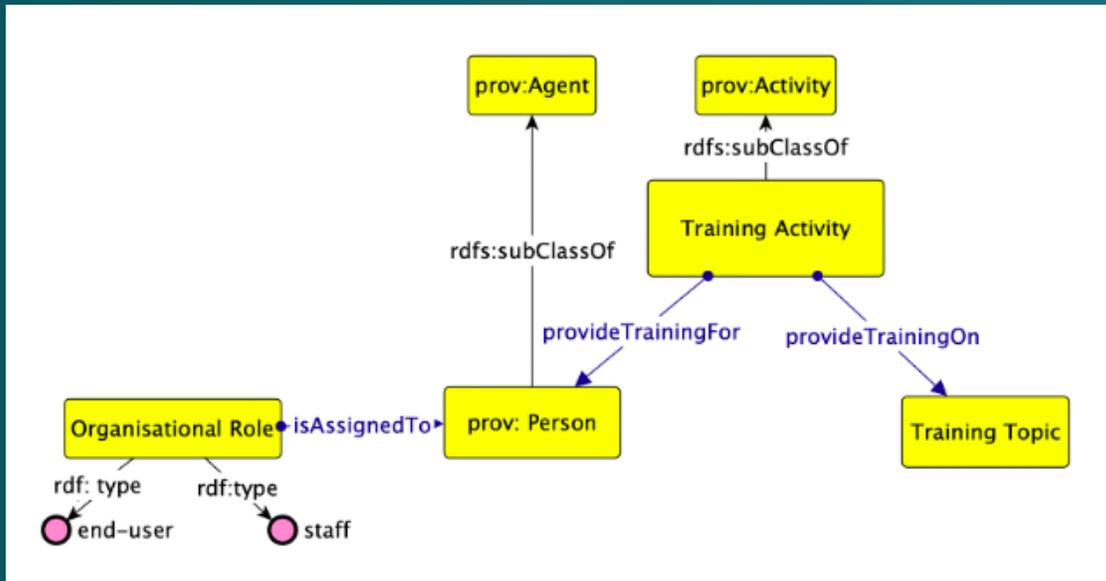
- Modelling relevant 'patterns' as as an ontology design pattern (ODP)
- Helps systematise "ontologies" by identifying concepts and relations, and expressing compliance information

Ongoing Work

AIRO: an Ontology for Representing AI Risks based on the Proposed EU AI Act and ISO Risk Management Standards.

Delaram Golpayegani*, Harshvardhan J. Pandit, Dave Lewis. International Conference on Semantic Systems (SEMANTiCS, 2022).
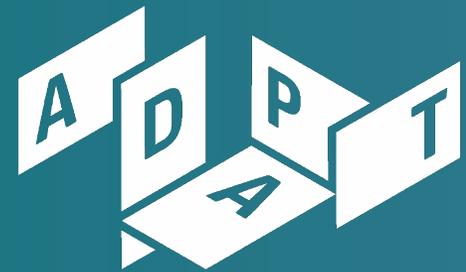
https://doi.org/10.3233/SSW220008 AIRO - https://w3id.org/AIRO

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Engaging Content
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