Towards a Common Semantic Data Model to Support *Slaintecare* in Ireland: Tackling the Interoperability Problem

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About ELITE-S

- ELITE-S relates to providing leadership for ICT standardisation in the EU offers training and scholarship through Marie Curie. 16 fellowships awarded across the EU

- Our focus is on creating a common semantic data model (CSDM) and providing access to open source resources for knowledge sharing and advancing data interoperability.

https://elite-fellowship.eu/

About ADAPT and CeIC

Adapt SFI Research Centre in Dublin with experts producing ground-breaking digital media innovations
https://www.adaptcentre.ie/

• CeIC DCU focuses on HOW to solve problems with data interoperability for *eIntegrated* care in order to improve health and wellbeing https://www.ceic.ie/

Engaging Content
Engaging People

Researchers

Dr. Pamela Hussey
Centre Director
School of Nursing, Psychotherapy &
Community Health

Subhashis Das
PostDoctoral Researcher

- Nursing
- NSAI-HISC
- Funded Investigator of ADAPT
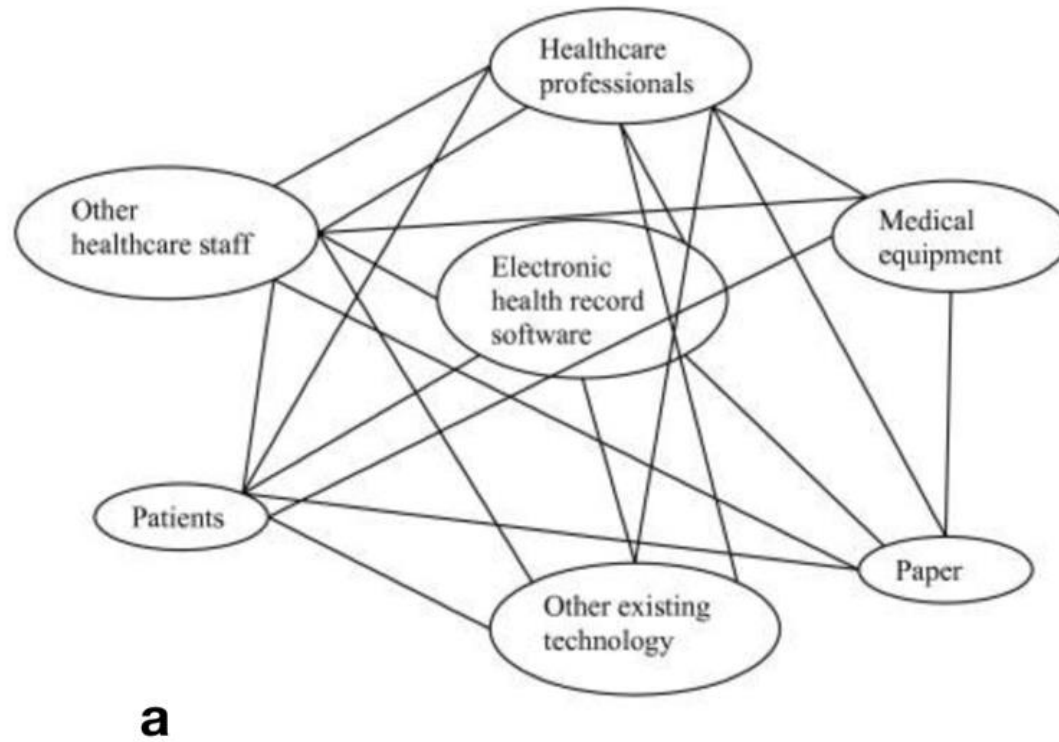- Associate Prof. Faculty of Health Sc.

https://www.dcu.ie/snpch/people/pamela-hussey.shtml

- Ontology
- EU project International Patient Summary
- Research Fellow CeIC & ADAPT

https://www.dcu.ie/snpch/people/Subhashis-Das.shtml

Existing Approach

CSDM Approach

a

b
After implementation of ontology

a https://link.springer.com/article/10.1186/1472-6947-10-67

b https://elite-fellowship.eu/fellows/subhashis-das/

CSDM Potential for Impact
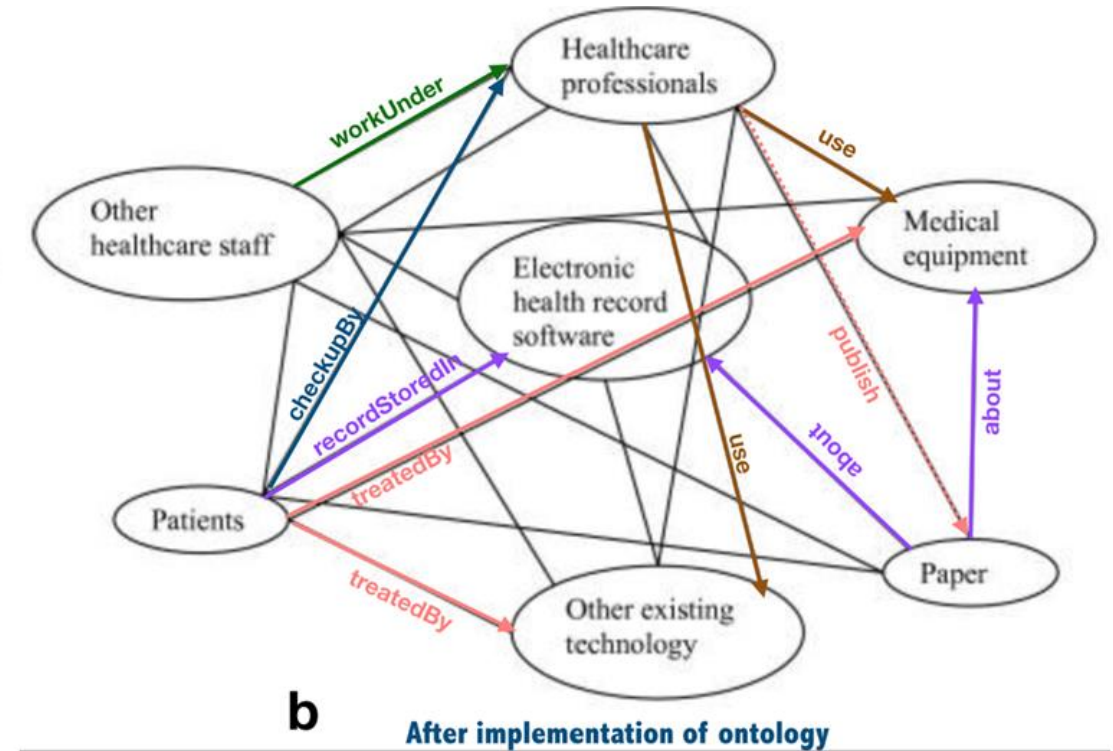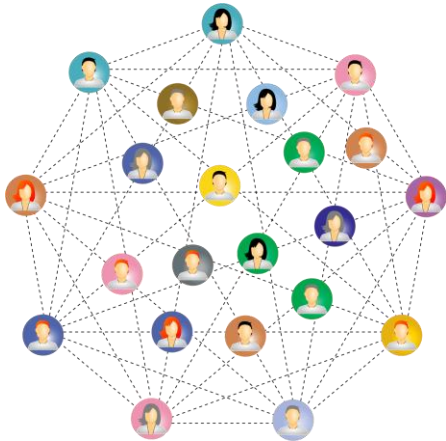
- Knowledge translation on standards NSAI HISC - CEN TC 251 & ISO 215
- Design for interoperability using different standards at different junctions of the project lifecycle.

- Building on existing experts
- Task Force ISO 13940
- Tooling for demonstrators on open standards for interoperability

- Conduct ontological scrutiny of the standard ISO 13940 Contsys UML model https://contsys.org/page/default
- For example in Contsys the explicit relationship name for use in a system needs to be identified in our case we provide the following example

Missing Link
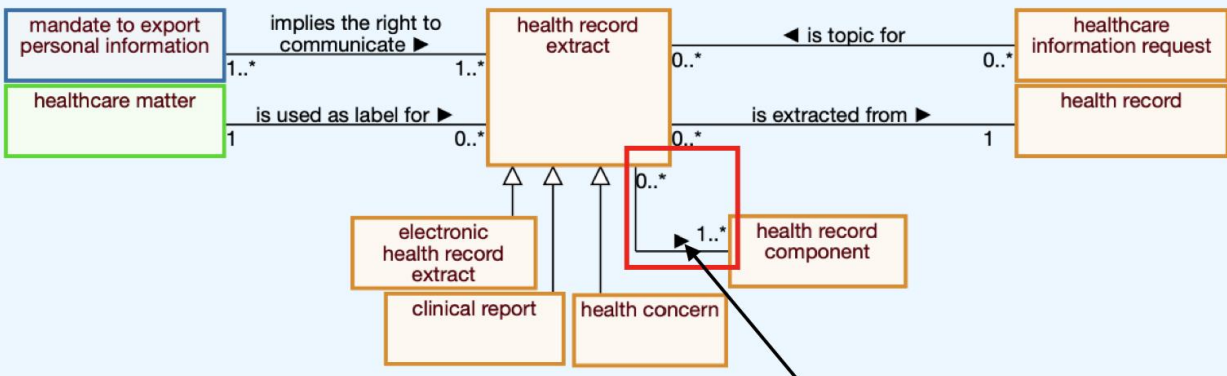
Explicit Link

Missing relationship name
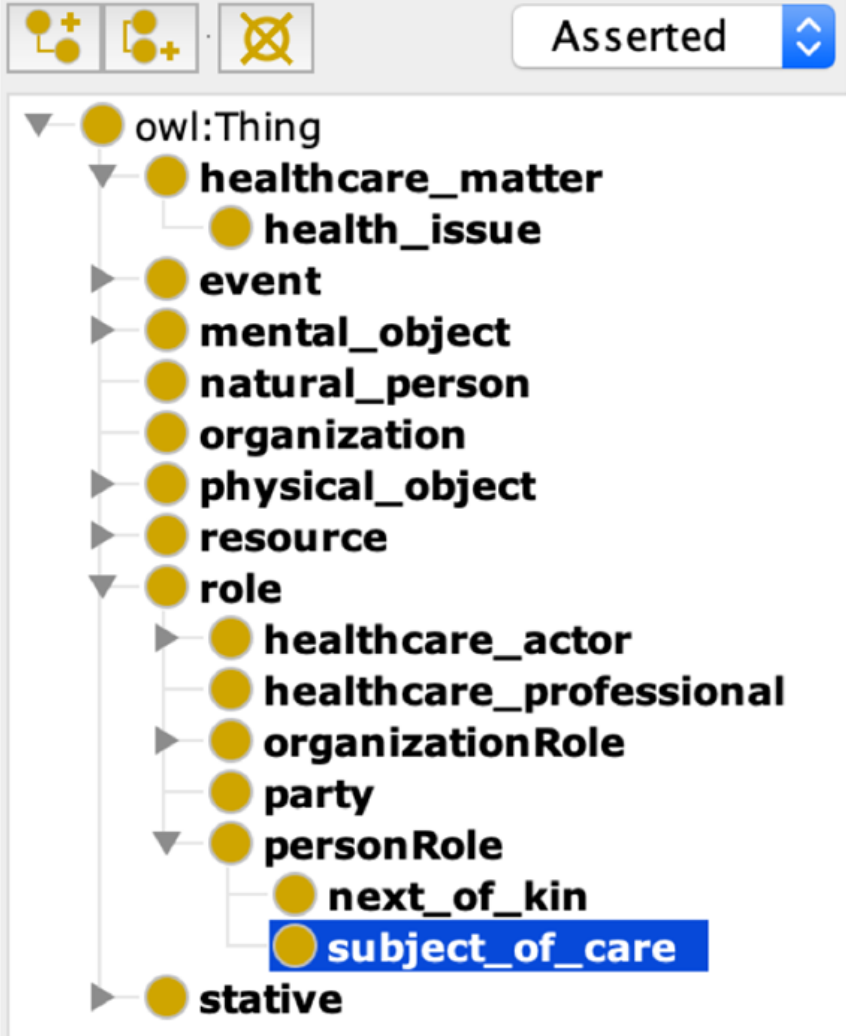

Description: health_record_extract

Equivalent To ⊕

SubClass Of ⊕

- extracts **min** 1 health_record_component
- isExtractedFrom **exactly** 1 health_record
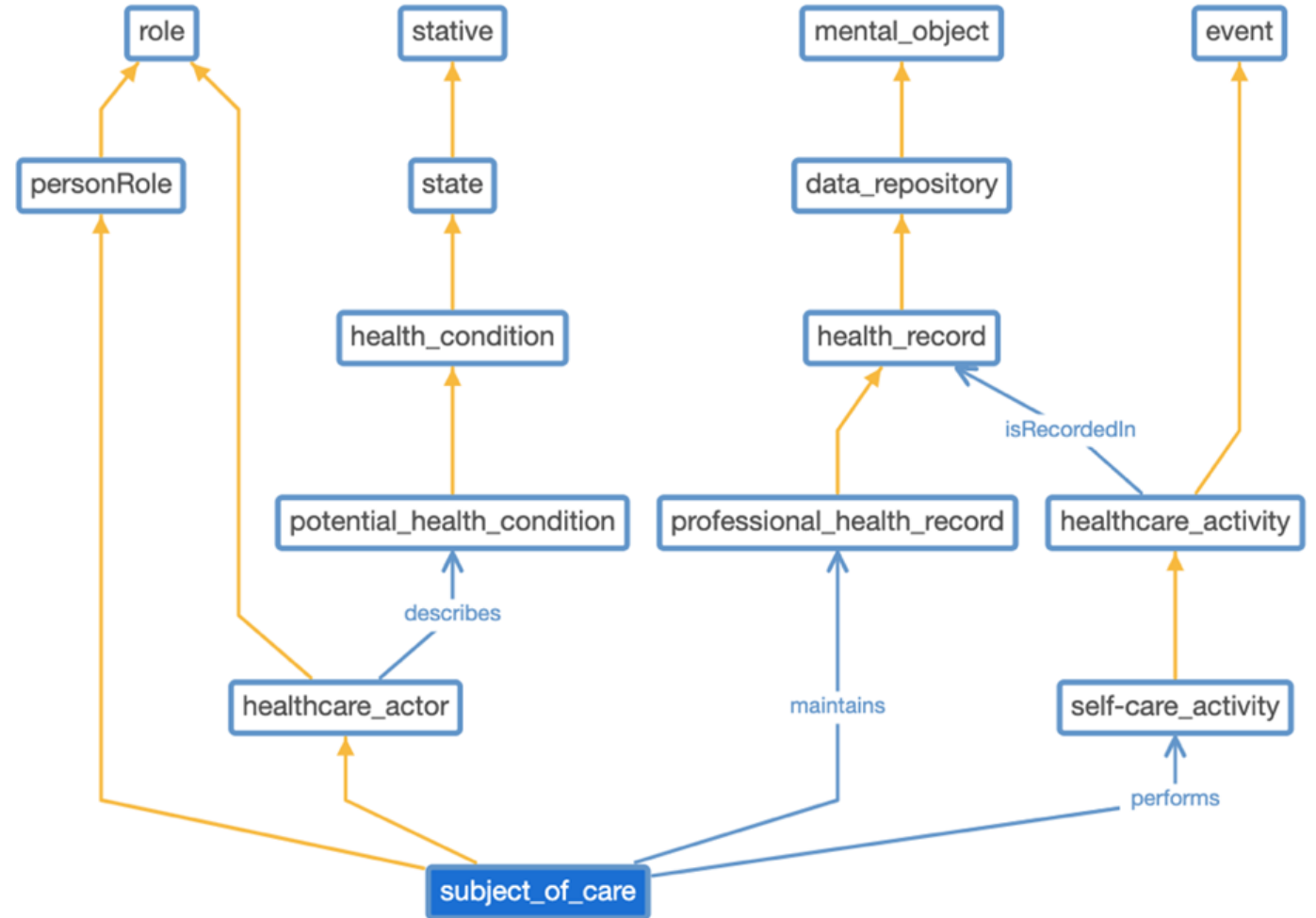- mentalObject

The CSDM seeks to

Top-Level Alignment

Explicit relationship

Standards & Techniques	Category	Framework Development Utility
ISO 22272	**Enterprise**	Used to define Business mission aims and objectives , conceptual model and capacity building
Contsys ISO 13940 https://contsys.org/	**Computer**	Overarching ontology framework designed in OWL as a formalised web ontology (publish on May 2020) https://contsys.org/pages/Guest%20blog /FormalOntology
HL7 FHIR v.4 https://hl7.org/FHIR/	**Computer**	Used to specify Observation, MedicationStatement, MedicationAdministration, Medication DiagnosticReport, Patient
EHRcom ISO 13606	**Engineering**	Reviewed in terms of harmonisation of HI standards to describe distribution of objects and applications across platforms
IHE CCR https://www.astm.org/ Standards/E2369.htm	**Information**	Provides a patient health summary standard which facilitates timely and focused transmission of information across and between health professionals involved in the delivery of patient's care
Snomed-CT ICNP	**Information**	Formalised reference terminologies used for semantic mapping of concepts in health care systems
Graph DB http://graphdb.ontotext.com/	**Engineering**	Used as a specification with common functions providing a technology-neutral architectural framework and database support

•Relational databases in existence and GraphDB linkage
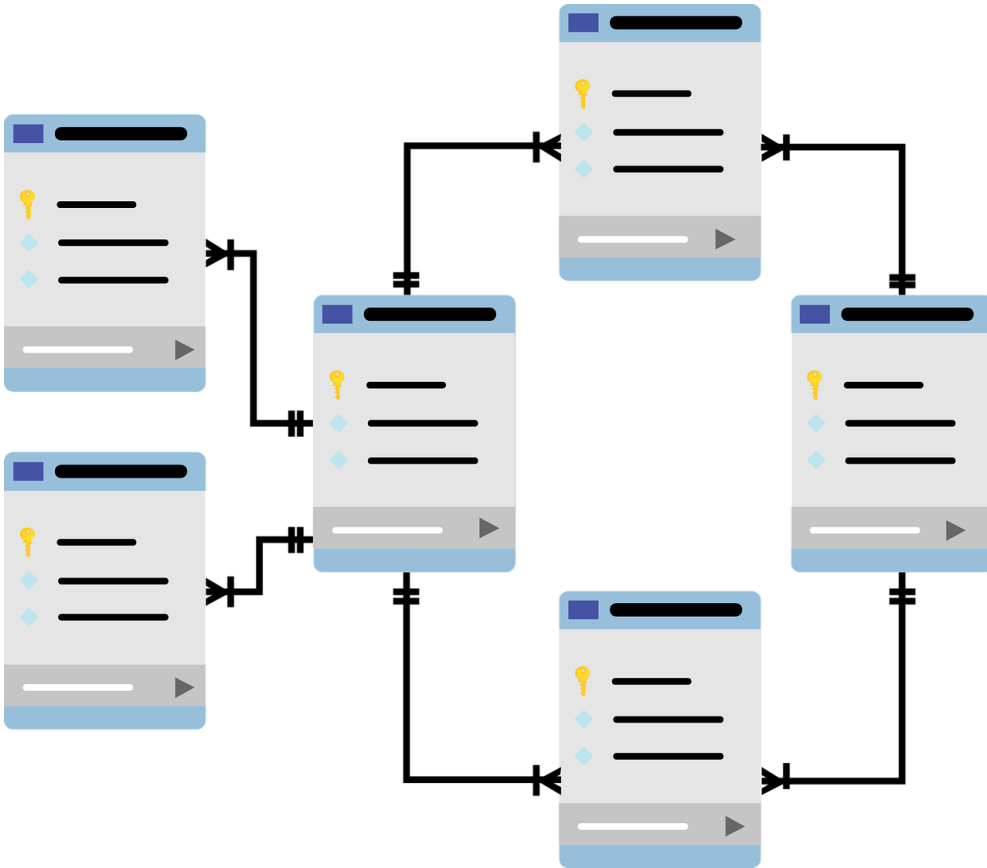
Relational Database

Graph Database

Additional Links
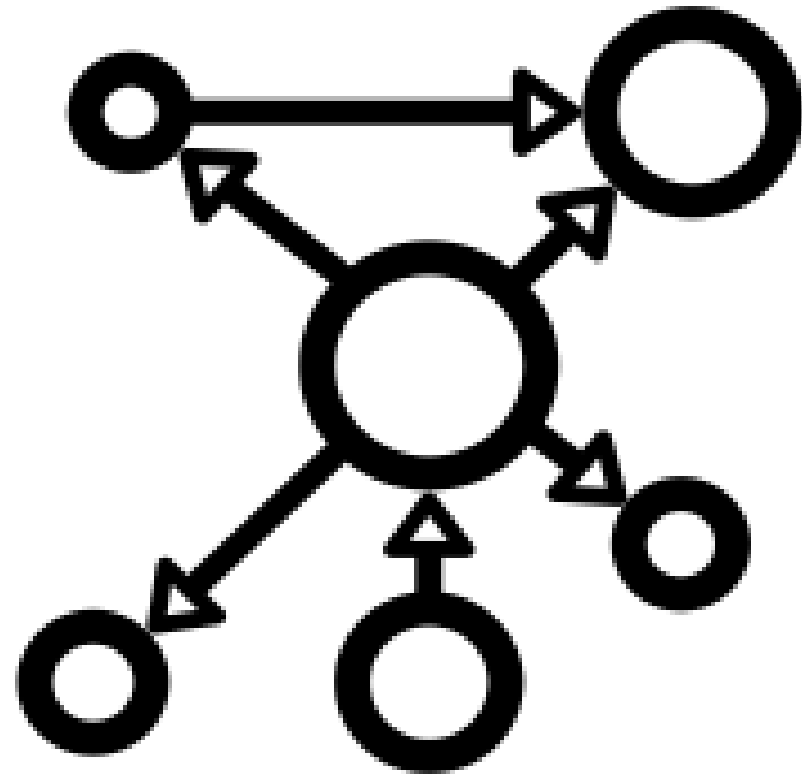
- Provide a summary of dissemination links for further reading

Linking with original task force participants through social media blog is available from
https://contsys.org/pages/Guest%20blog/FormalOntology

- Full formal ontology version 1.1 has been published and is available on bio portal
https://bioportal.bioontology.org/ontologies/CONTSONTO/?p=summary

- ADAPT McGlinn K. and Hussey P. paper on analysis of demographic data in the do

main to support semantic uplift https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7303677/

Research Partners

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Thank you!

www.adaptcentre.ie

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