national center for ontological research
ncor

Formal Disambiguation

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Outline

- Design Pattern Review
- Disambiguating Relations
- The Secret Structure of the World

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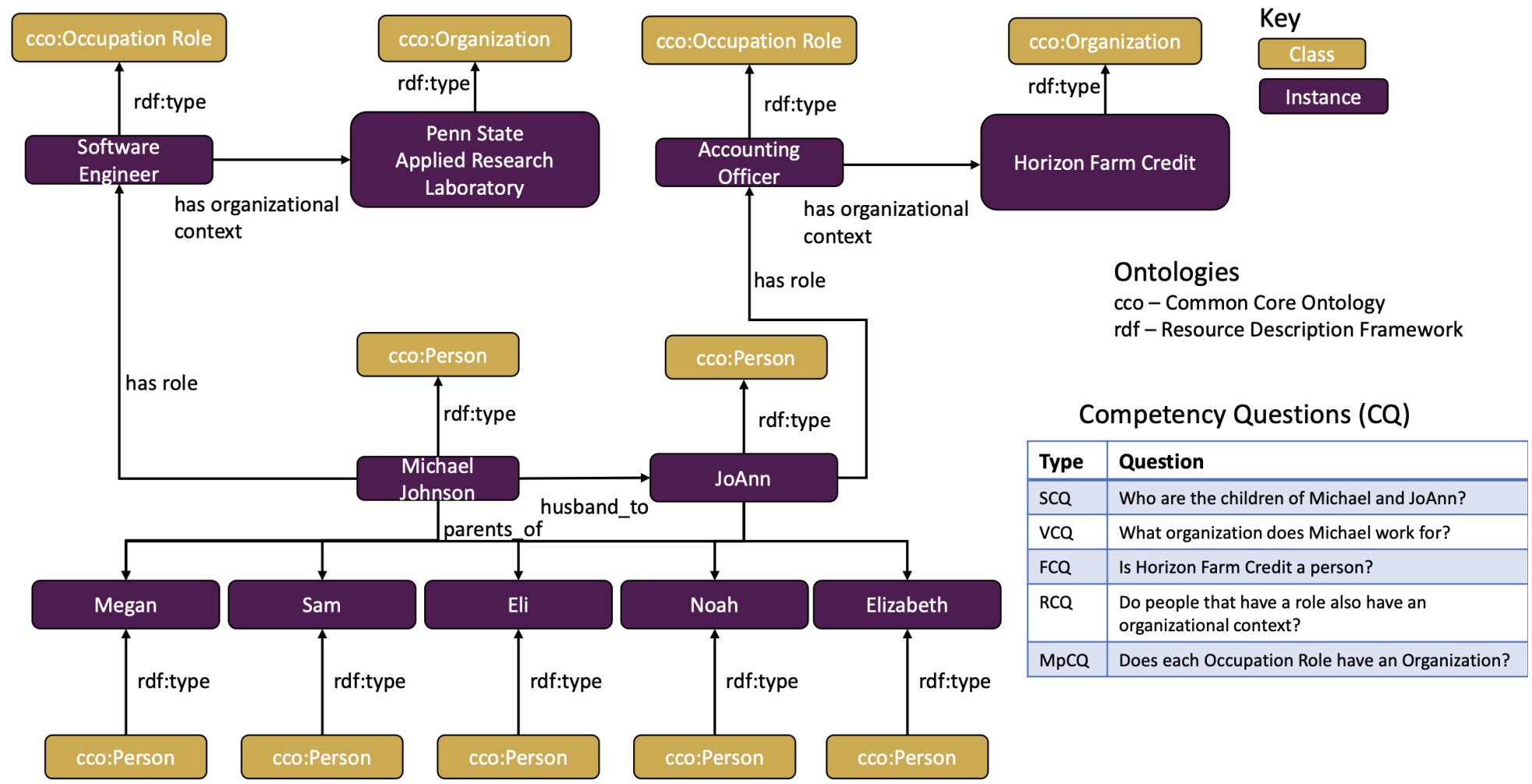
Extra Credit

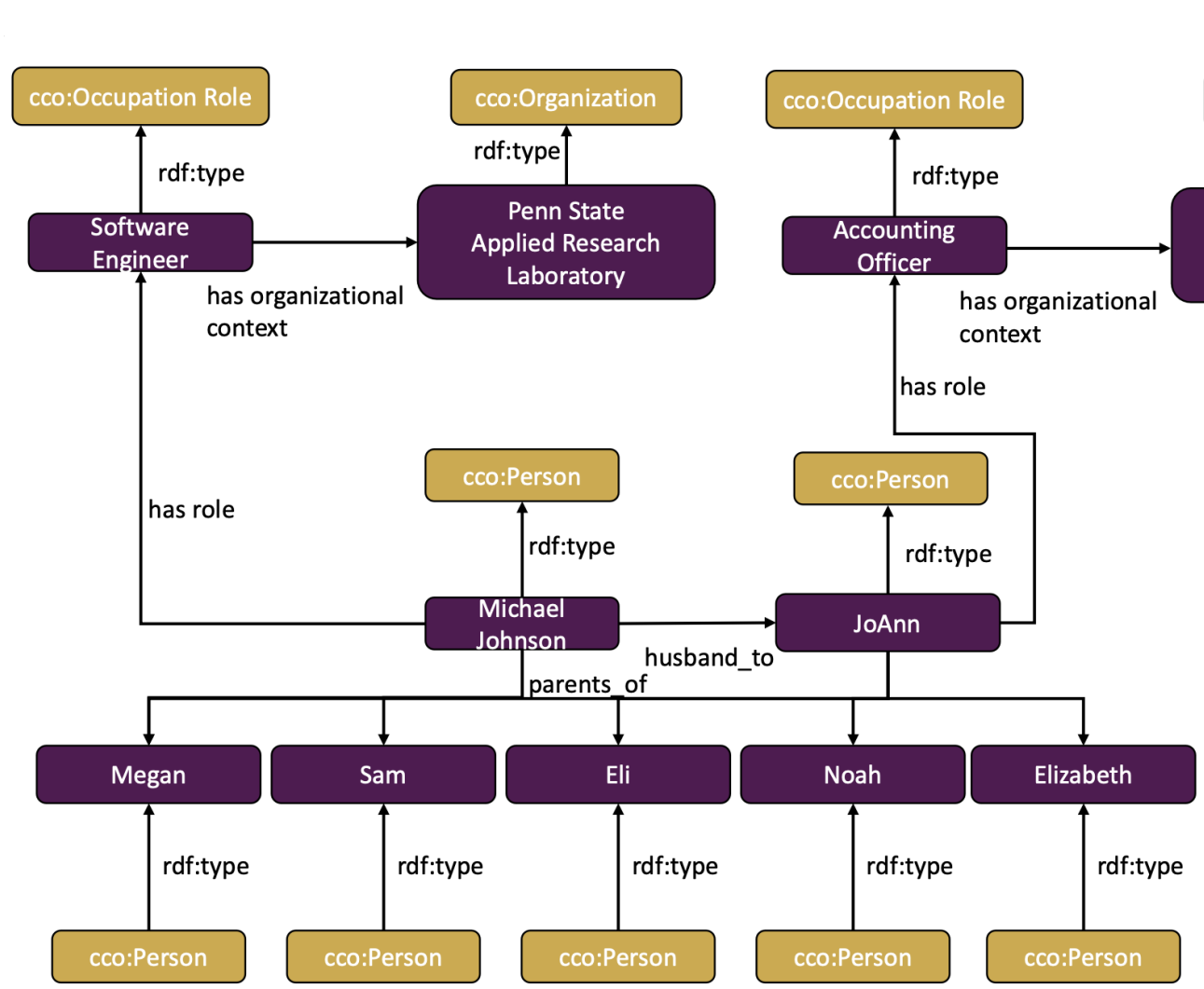


Ontologies

cco – Common Core Ontology
rdf – Resource Description Framework

Competency Questions (CQ)

Type	Question
SCQ	Who are the children of Michael and JoAnn?
VCQ	What organization does Michael work for?
FCQ	Is Horizon Farm Credit a person?
RCQ	Do people that have a role also have an organizational context?
MpCQ	Does each Occupation Role have an Organization?



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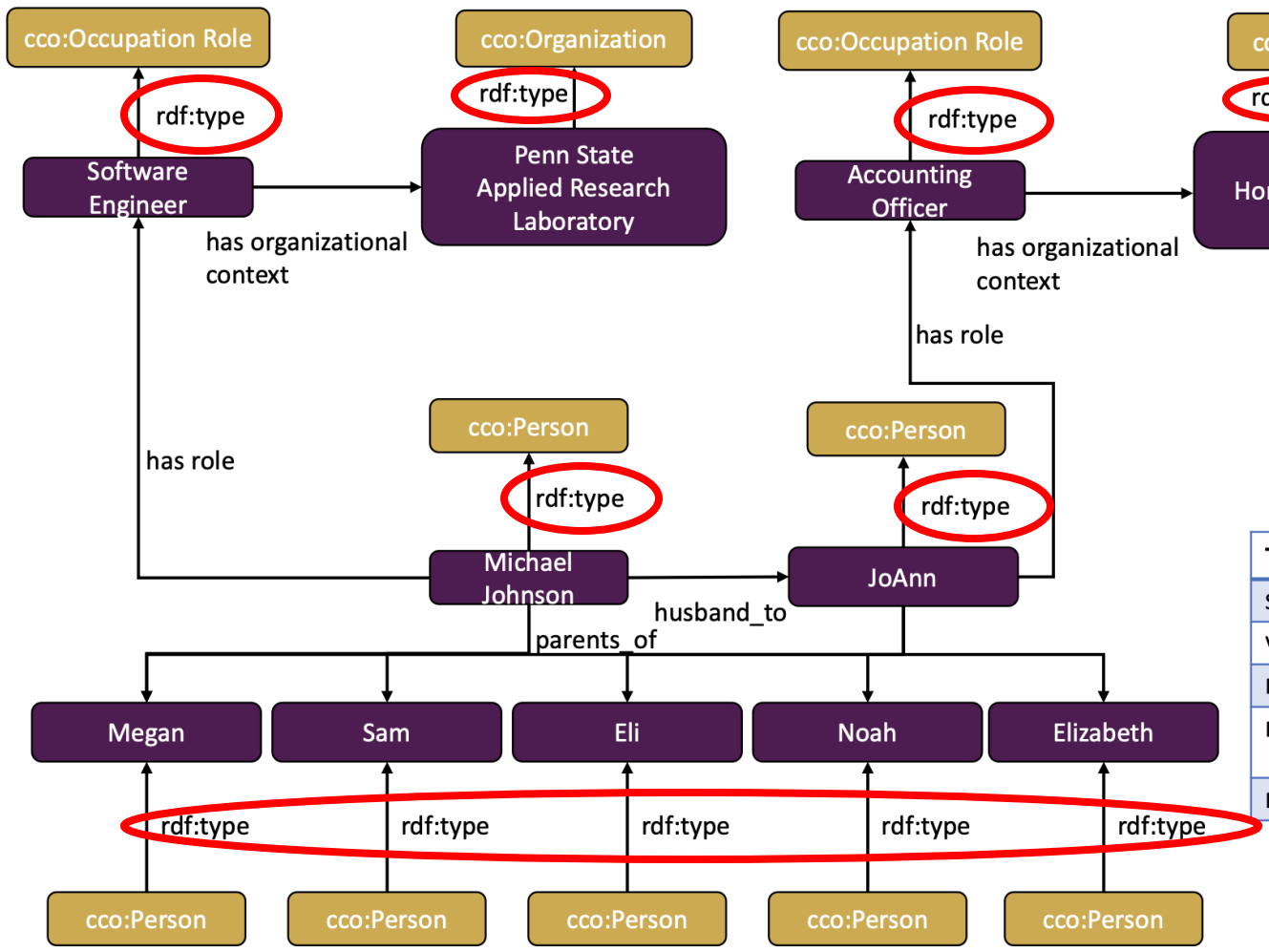
Points for legend!



Key

- Class
- Instance

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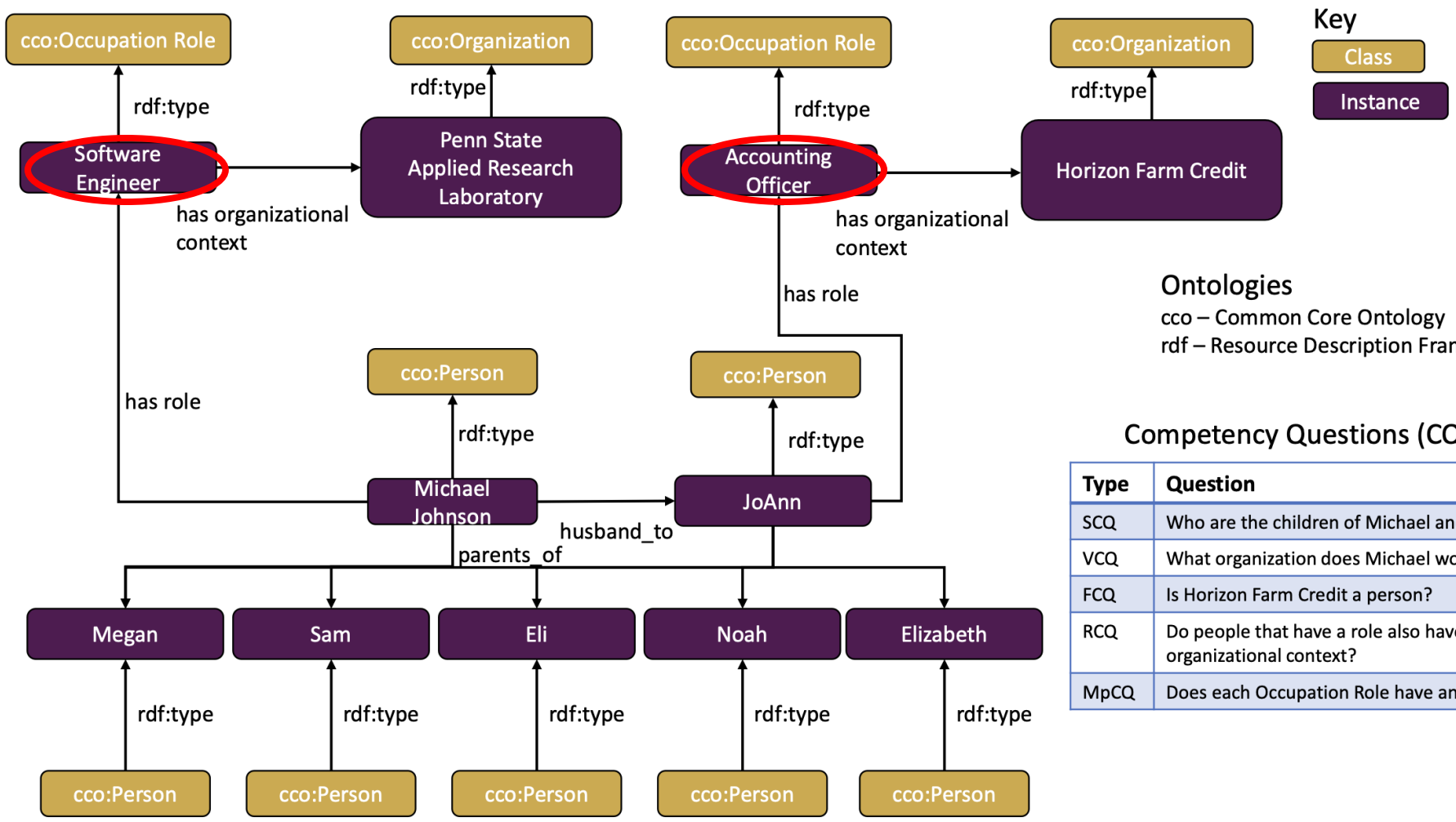
Use legend to minimize repetitions, e.g. bold arrows represent "rdf:type"



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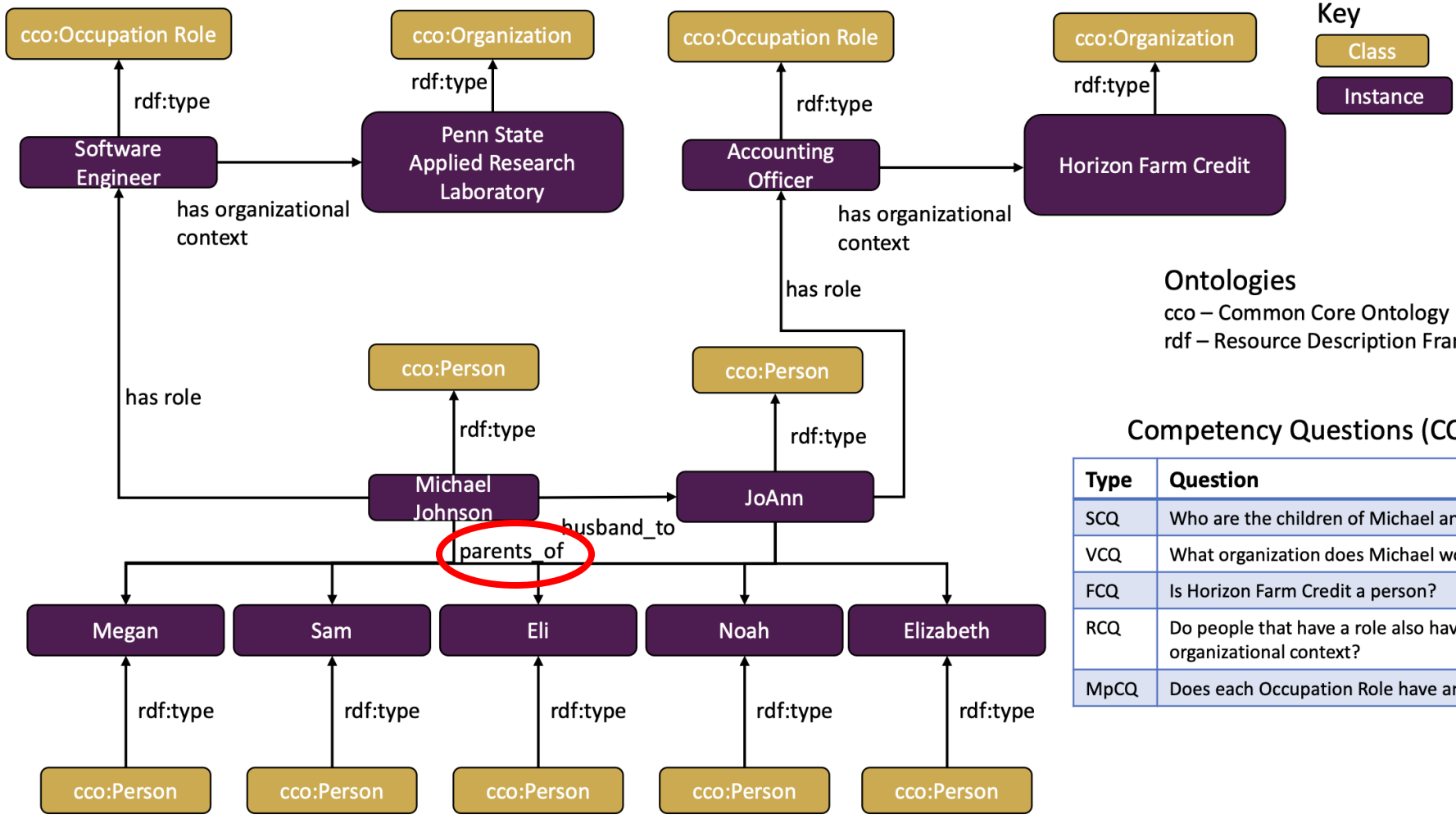
Avoid ambiguity with labels, e.g. "Accounting Officer Role" rather than "Accounting Officer"

You can always create an alternative label for subject-matter experts or developers; default to disambiguation



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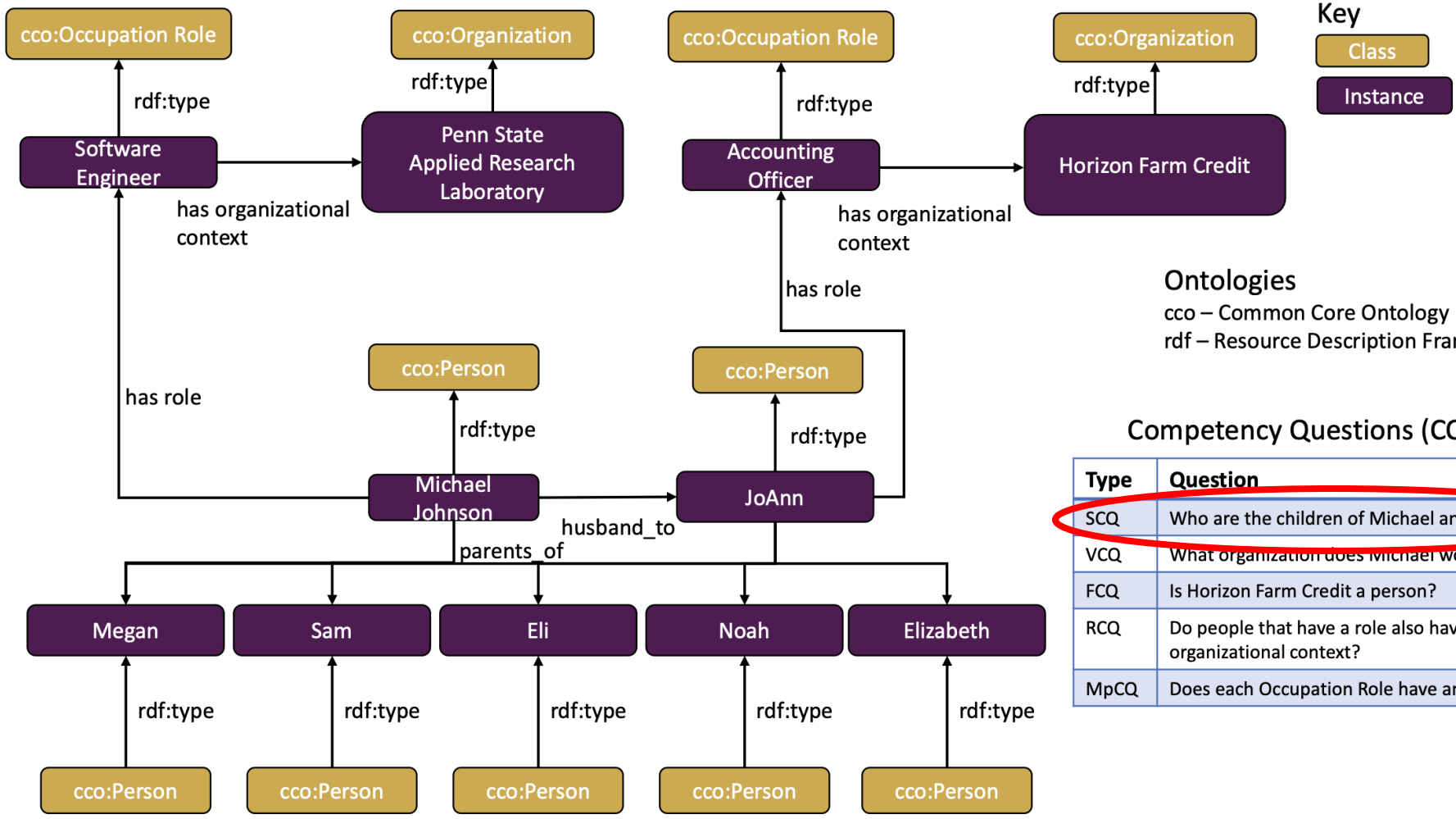
Pluralizing parents_of suggests this relates a couple to a child, yet there is no couple displayed as an instance. Rather, there is Michael and JoAnn with associated lines. I suspect you mean "parent_of".

Assuming this is correct, the lines extending from Michael and JoAnn shouldn't be connected.

Otherwise, there should be an instance such as "couple"



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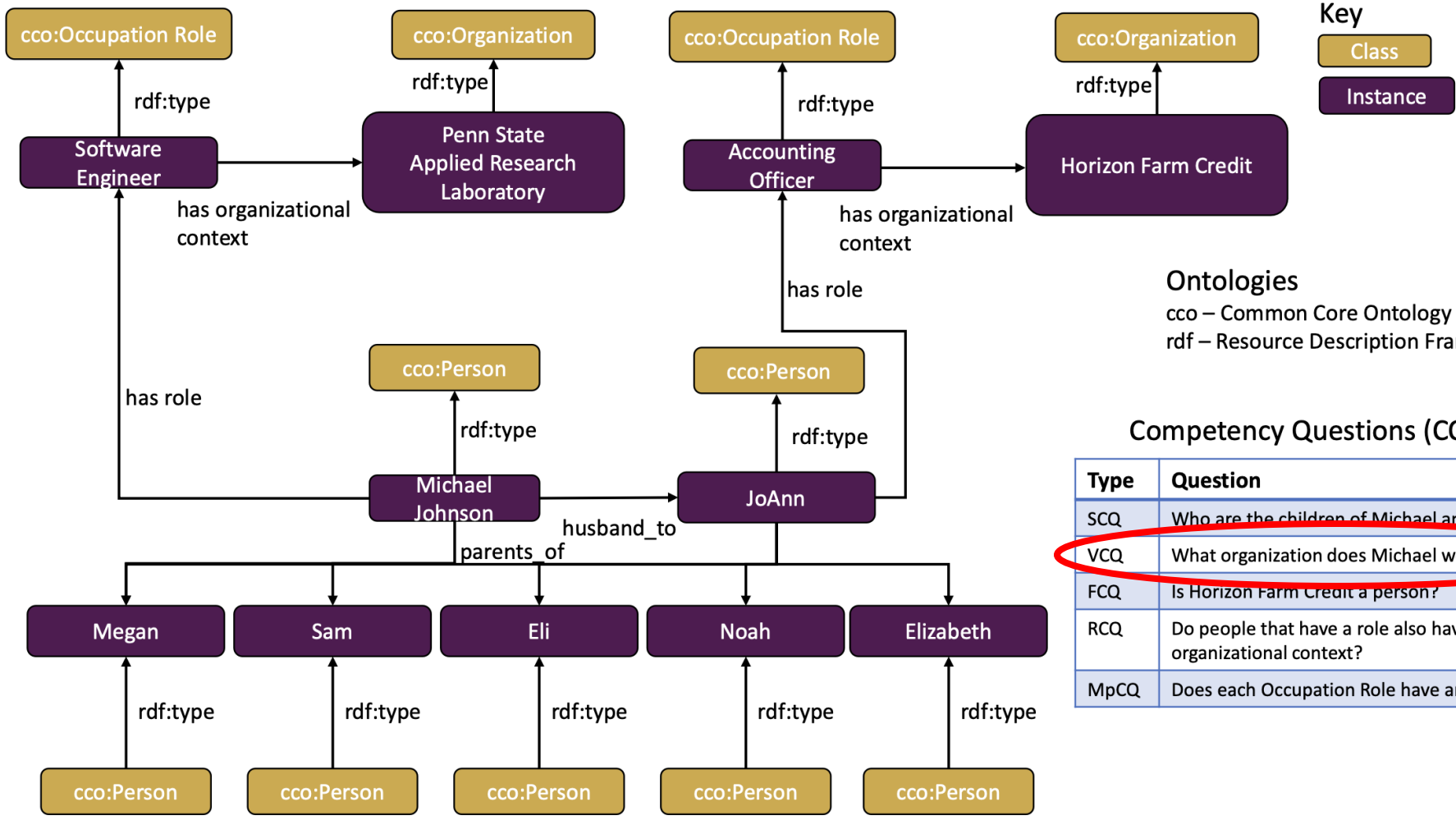
To answer the the SCQ, you need to assert that "parent_of" has inverse "child_of", e.g. if Michael is parent_of Eli then Eli is child of Michael and if Eli is child_of Michael then Michael is parent_of Eli.

This is because there is no mention of 'child' or 'children' in the diagram.

We of course assume that is the meaning...but ambiguities...



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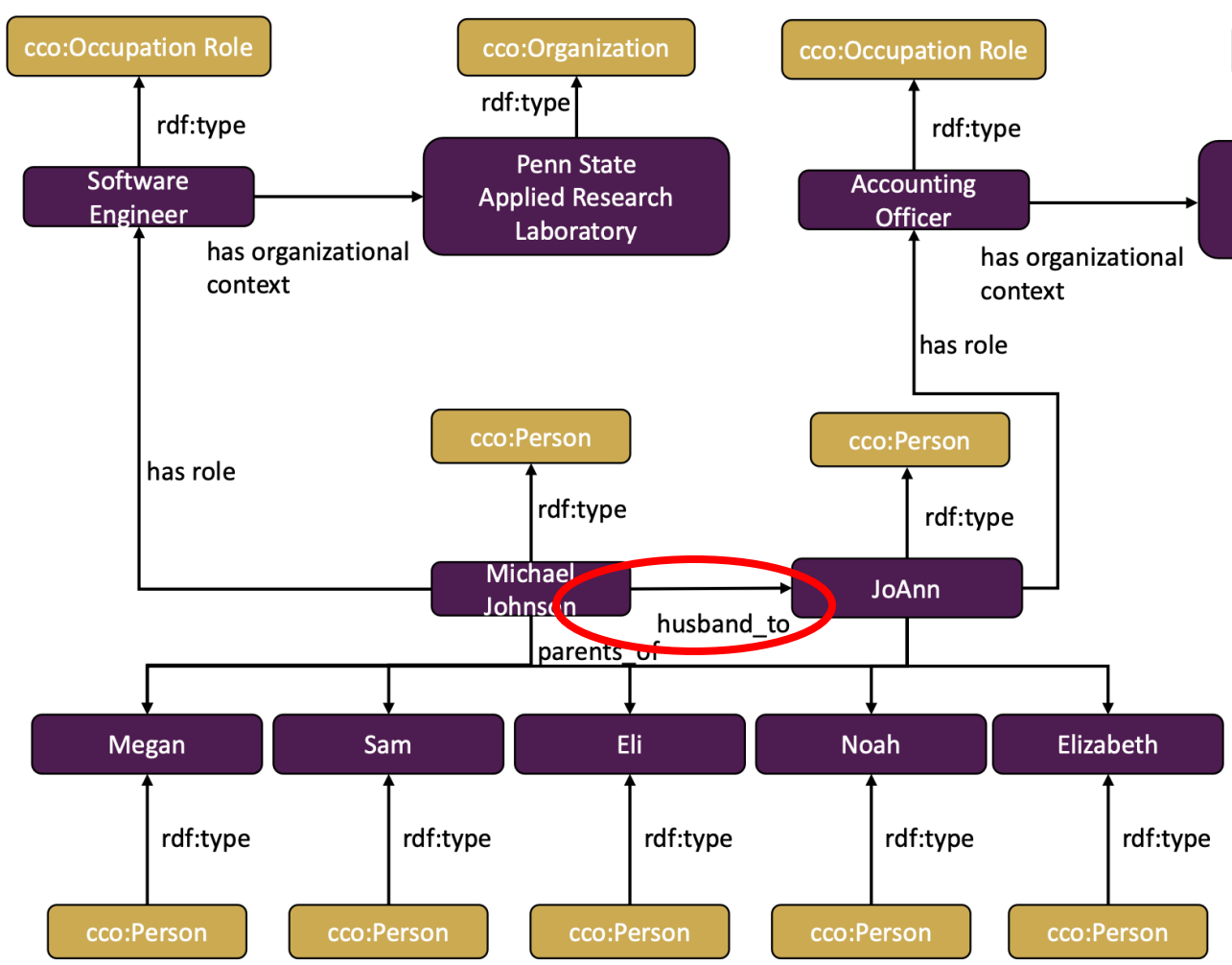
Similarly, you will need to make clear the relationship between an individual bearing a role an organizational context and 'work for'.



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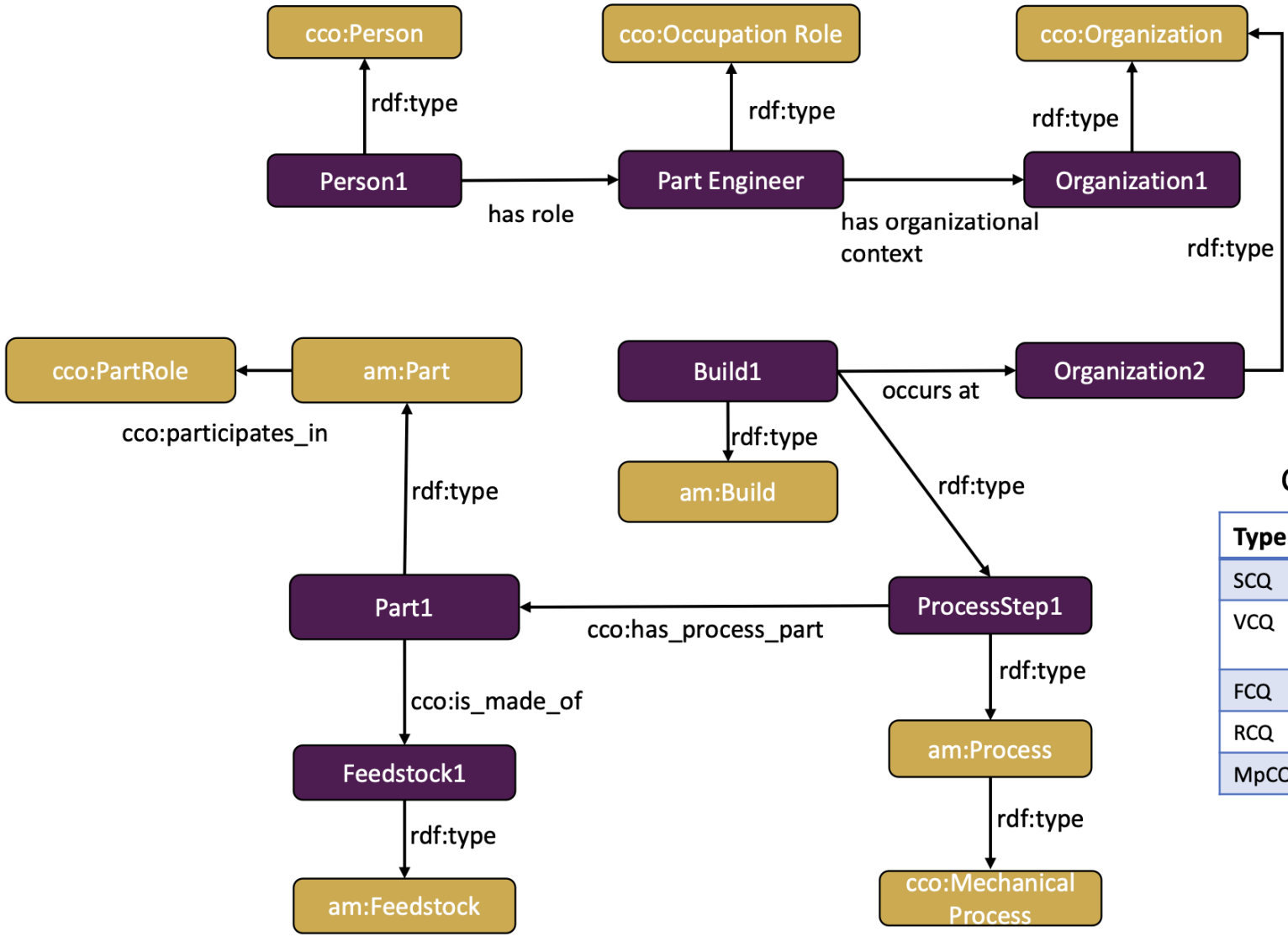
No CQs regarding the Michael being husband to JoAnn, so unclear why that relationship is asserted



Key

Class

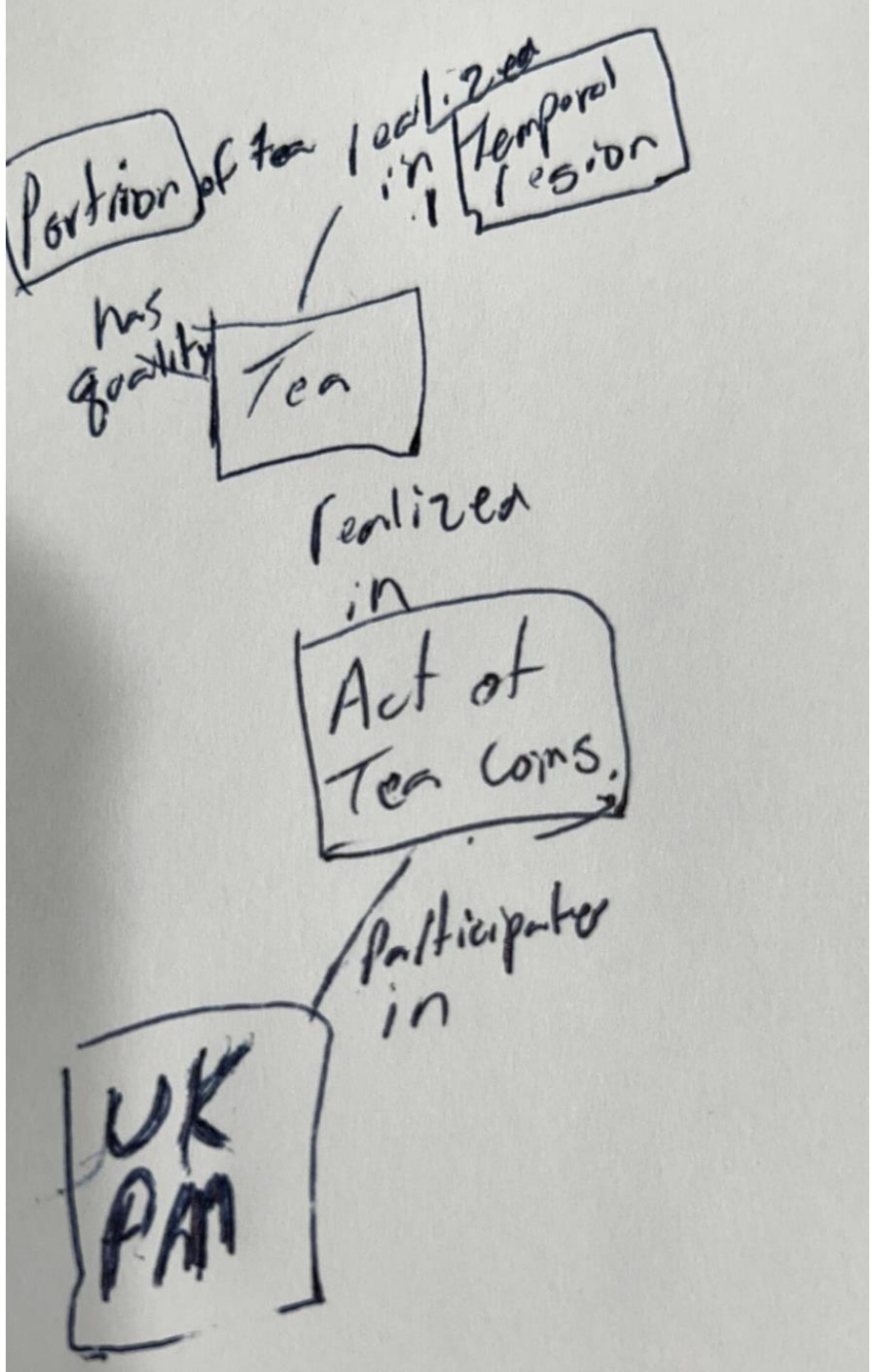
Instance

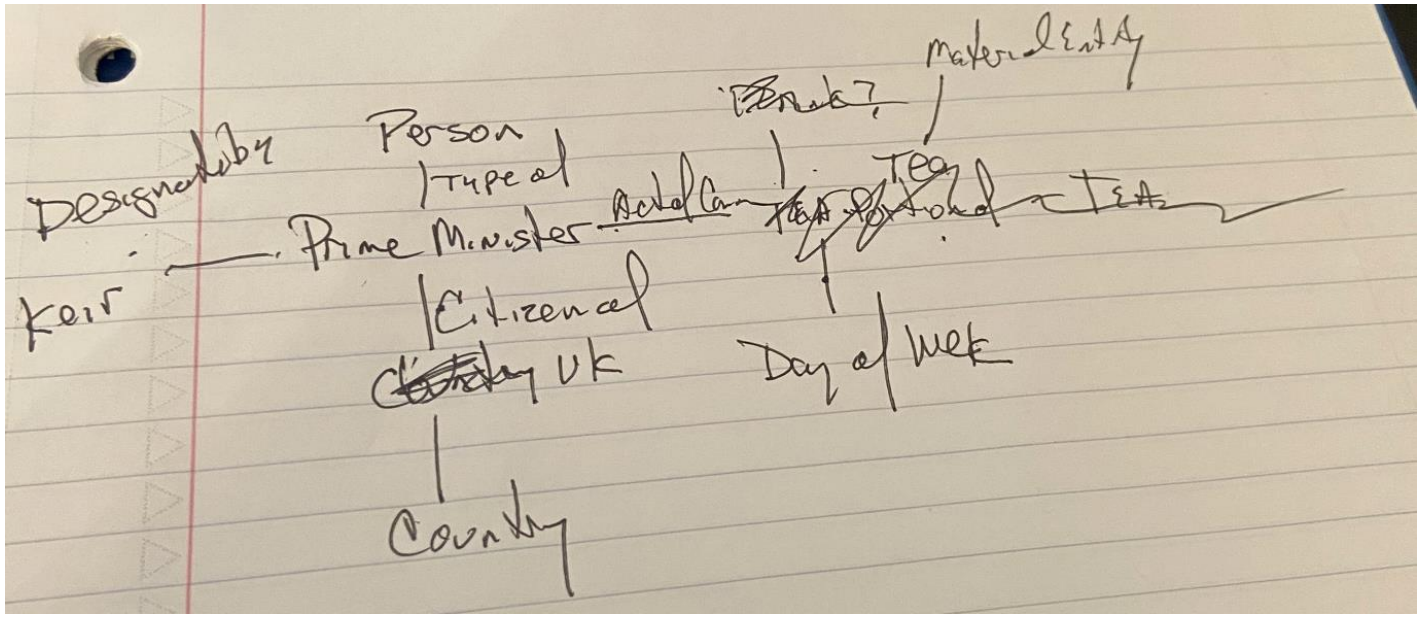
Ontologies

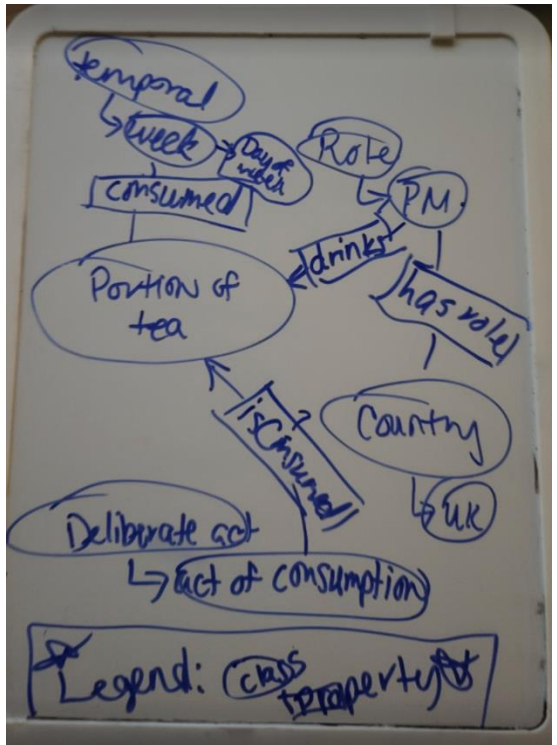
am – Additive Manufacturing
cco – Common Core Ontology
rdf – Resource Description Framework

Competency Questions (CQ)

Type	Question
SCQ	At what organizations are builds occuring?
VCQ	What feedstock is used for part1? Is build1 a type of process?
FCQ	Does person have a occupational role?
RCQ	Are parts part of a process?
MpCQ	Do builds occur at a geospatial location


Portion of tea
located in
Temporal region
has quality
Tea
realized in
Act of Tea Cons.
Participates in
UK PM


designated by
Person
Type of
Prime Minister
Citizen of
UK
Country
Tea
Day of Week


temporal
week
Day of week
consumed
Role
PM
drinker
Portion of tea
has value
isConsumed
Country
UK
Deliberate act
Act of consumption
Legend:

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Relations

concretizes
continuant part of
member part of
environs
exists at
first instant of
generically depends on
has continuant part
has member part
has first instant
has history
has last instant
has material basis
has occurrent part
has temporal part
has participant
has realization
history of
is carrier of
is concretized by
last instant of
located in
location of
material basis of
occupies spatial region
occupies spatiotemporal region
occupies temporal region
occurrent part of
temporal part of
occurs in
participates in
preceded by
precedes
realizes
spatially projects onto
specifically depended on by
bearer of
specifically depends on
inheres in
temporally projects onto

Checklist

- **Reflexive**, i.e. for every x is xRx
- **Irreflexive**, i.e. no x is such that xRx
- **Symmetric**, i.e. for every x and y, if xRy then yRx
- **Antisymmetric**, i.e. for every x and y, if xRy and yRx then x=y
- **Asymmetric**, i.e. for every x and y, if xRy then it is not the case that yRx
- **Functional**, i.e. for every x, y and z, if xRy and xRz then y=z
- **Inverse functional**, i.e. for every x, y, z, if xRy and zRy then x=z
- **Transitive**, i.e. for every x, y, and z, if xRy and yRz then xRz

Leibniz's Law

Leibniz's Law: If x=y then any property x has, y has

Symmetry

Relationship: "is symbiotic with"

If x "is symbiotic with" y, then x is a Organism, y is a Organism.

If x "is symbiotic with" y, then y "is symbiotic with" x. x!=y

The x!=y makes this not reflexive

Transitivity

Relationship: "is a"

All "is a" (BFO, Common core) relationships that make up a Taxonomy are transitive.

Reflexive

Relation: "likes"

Person A likes Person B. Person A likes Person A

Somebody can like themselves or can like another person. This would not be symmetrical or transitive. (since just because you like somebody does not mean they like you, similarly for transitive)

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BFO: Basic Formal Ontology

J. Neil Otte[1], John Beverley[2], and Alan Ruttenberg[3]

[1]Johns Hopkins University Applied Physics Laboratory
[2]Northwestern University
[3]University at Buffalo

CASE 6: *A marriage is a contract that is regulated by civil and social constraints. These constraints can change but the meaning of marriage continues over time.*

Marriage License

- In the U.S., states impose *eligibility requirements on individuals*, e.g. individuals entering marriage must be able to consent and above a certain age.

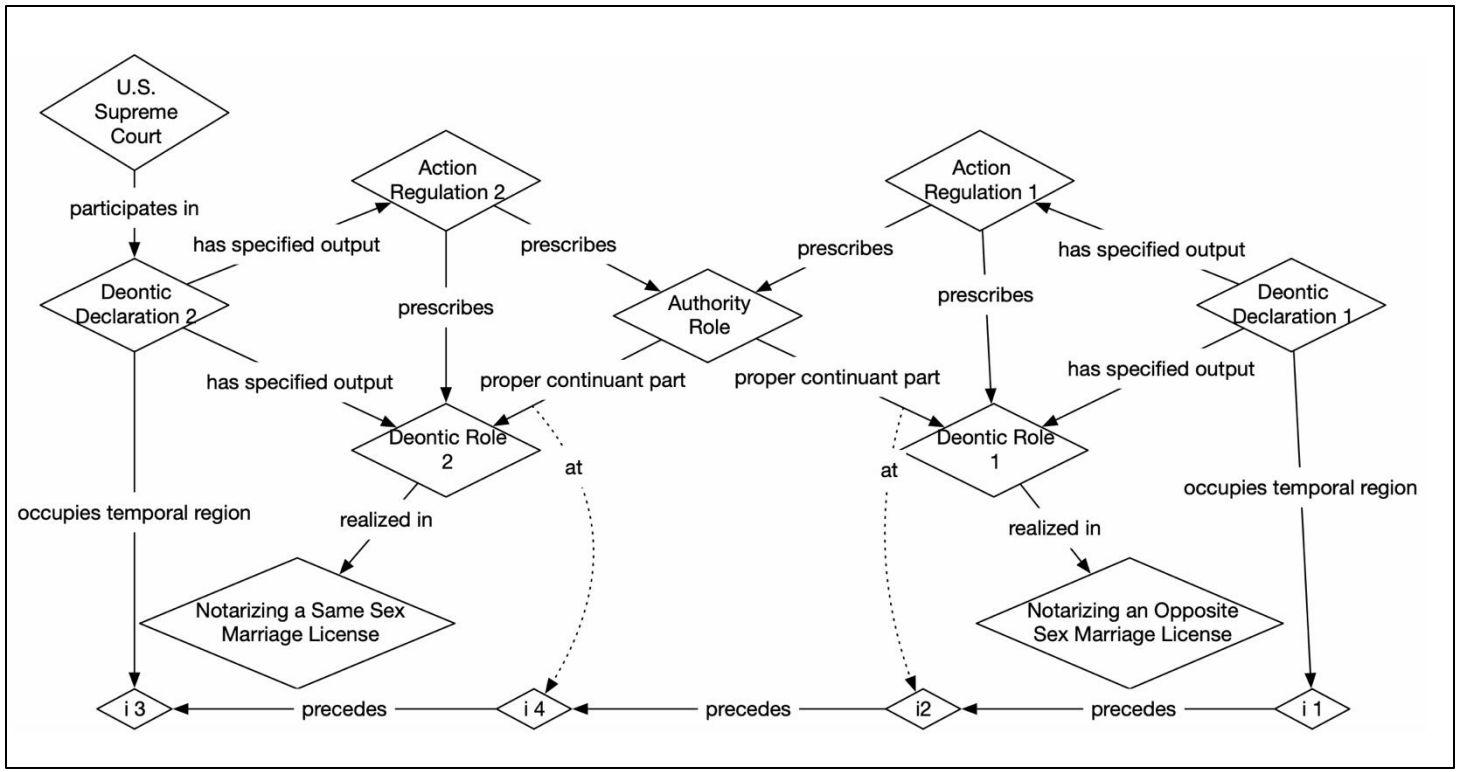
- States also impose *eligibility requirements on the couple*, e.g. one member of the union must be a U.S. citizen

Marriage License

- Before 1967, several states prohibited interracial marriage; until 2015 several prohibited same-sex marriage.

- Governments grant *obligations to spouses* - married partners bear financial responsibilities to one another - and *privileges* - married partners are not required to testify against one another in court.

CASE 6: *A marriage is a contract that is regulated by civil and social constraints. These constraints can change but the meaning of marriage continues over time.*



Class	Definition or Elucidation
document	a collection of information content entities intended to be understood together as a whole
government	an organization that exercises executive, legislative, or judicial authority over a region
marriage license	a document issued by a government, which legally binds agents as spouses, and invests them with associated **instances of** deontic role
deontic declaration	a social act that creates or **revokes** a deontic role
social act	a planned process that is carried out by a person or an organization, and is self-generated, directed towards another person or an aggregate of persons, an organization or an aggregate of organizations, and that needs to be perceived
deontic role	a role that **inheres in** a person and that is externally grounded in the normative expectations that other persons within a social context have concerning how that person should behave
action regulation	an information content entity that **prescribes** an act as required, prohibited, or permitted, and is the **output of** an act that **realizes** some authority role
authority role	a role that is **realized** by actions that create, modify, transfer, or eliminate action regulations or other authority roles, and **inheres in** an agent in virtue of collective acceptance of that agent's ability to issue binding directives