



Two Ontology Design Patterns toward Energy Efficiency in Buildings

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Requirements

- * What are the Qualities of a Feature of Interest?
- * What are the Qualities that affect a given Quality of a Feature of Interest?
- * Which Feature of Interest does a given Quality belongs to?
- * What are observations/actuators performed by a given Procedure?
- * What are observations/actuators performed by a given sensor/actuator?
- * What are the Procedures implemented by a given sensor/actuator?
- * What are the Feature of Interests of a given observation/actuation?
- * What are the Qualities sensed/actuated by a given observation/actuation?
- * What are the Feature of Interest of a given sensor/actuator?
- * What are the Qualities sensed/actuated by a given sensor/actuator?

Requirements

- * What are the Qualities of a Feature of Interest?
- * What are the Qualities that affect a given Quality of a Feature of Interest?
- * **Which Feature of Interest does a given Quality belongs to?**
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- * What are the Procedures implemented by a given sensor/actuator?
- * What are the Feature of Interests of a given observation/actuation?
- * What are the Qualities sensed/actuated by a given observation/actuation?
- * **What are the Features of Interest of a given sensor/actuator?**
- * What are the Qualities sensed/actuated by a given sensor/actuator?

1st Competency Question:

“Discover the relevant qualities that affect the environment of a given space”

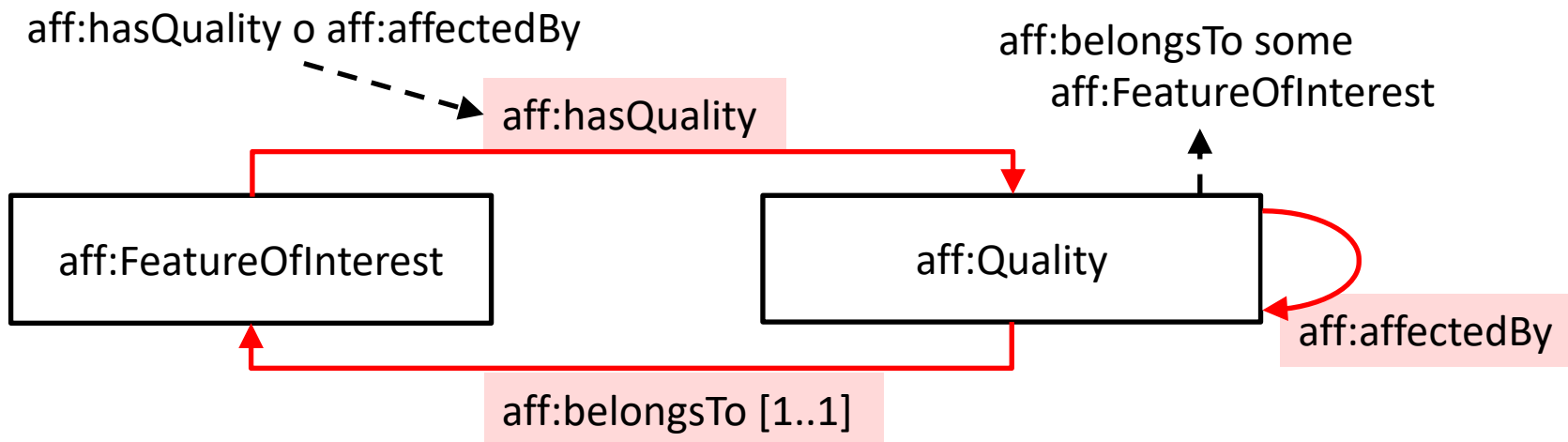
The AffectedBy ODP



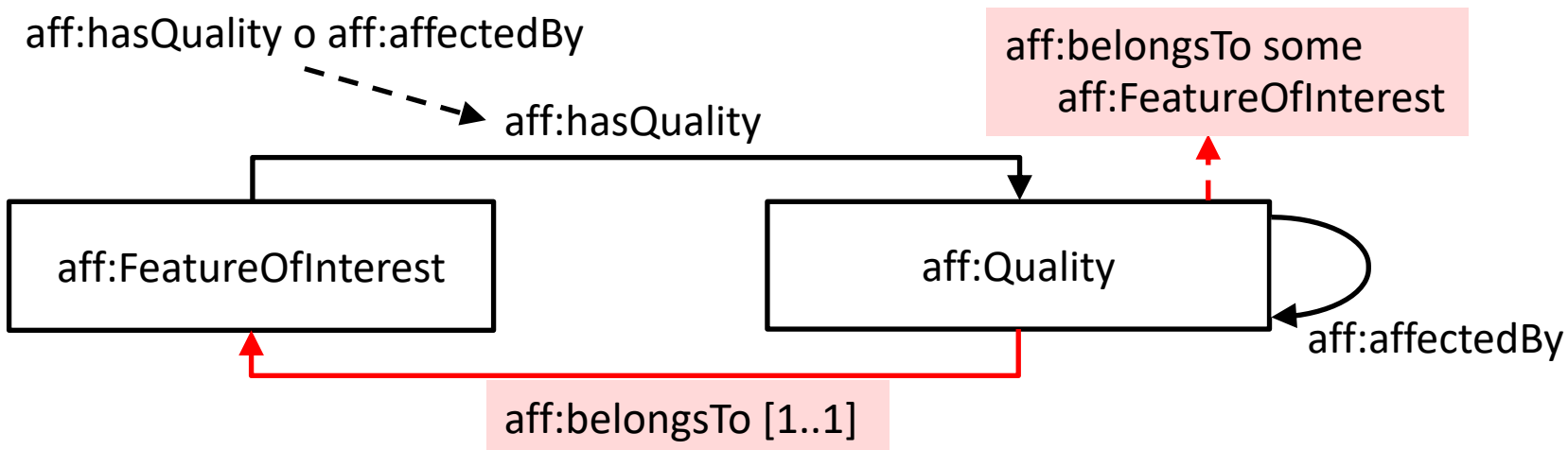
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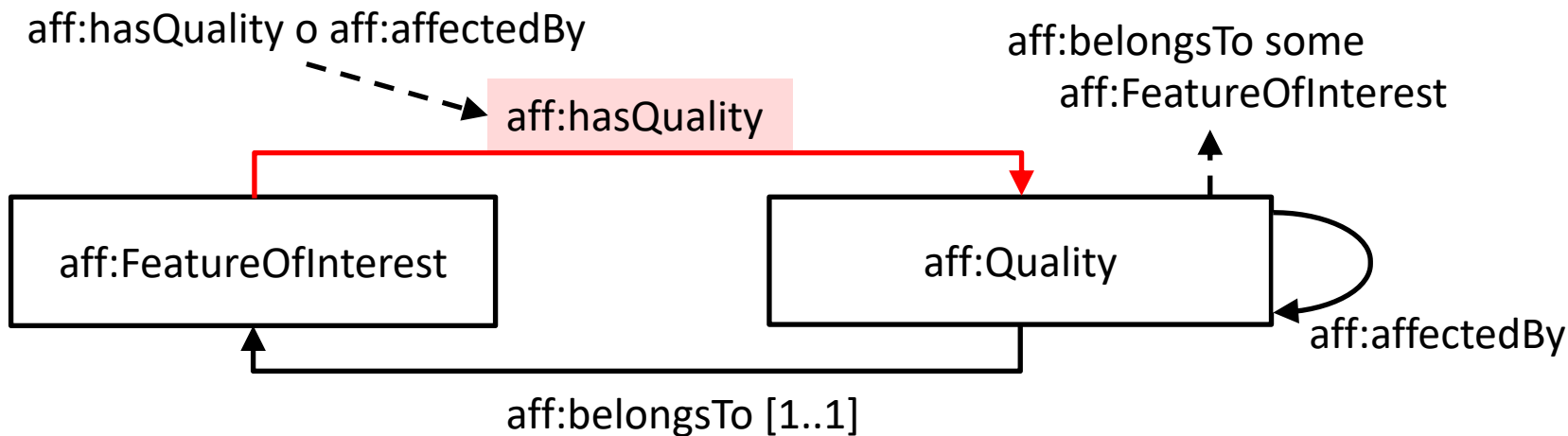
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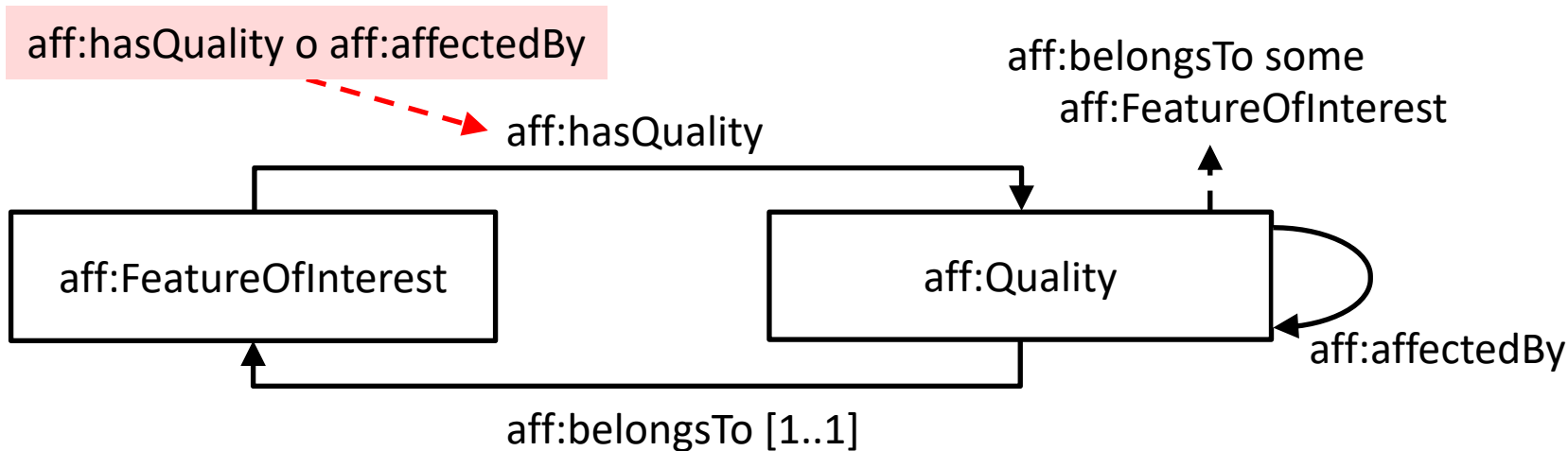
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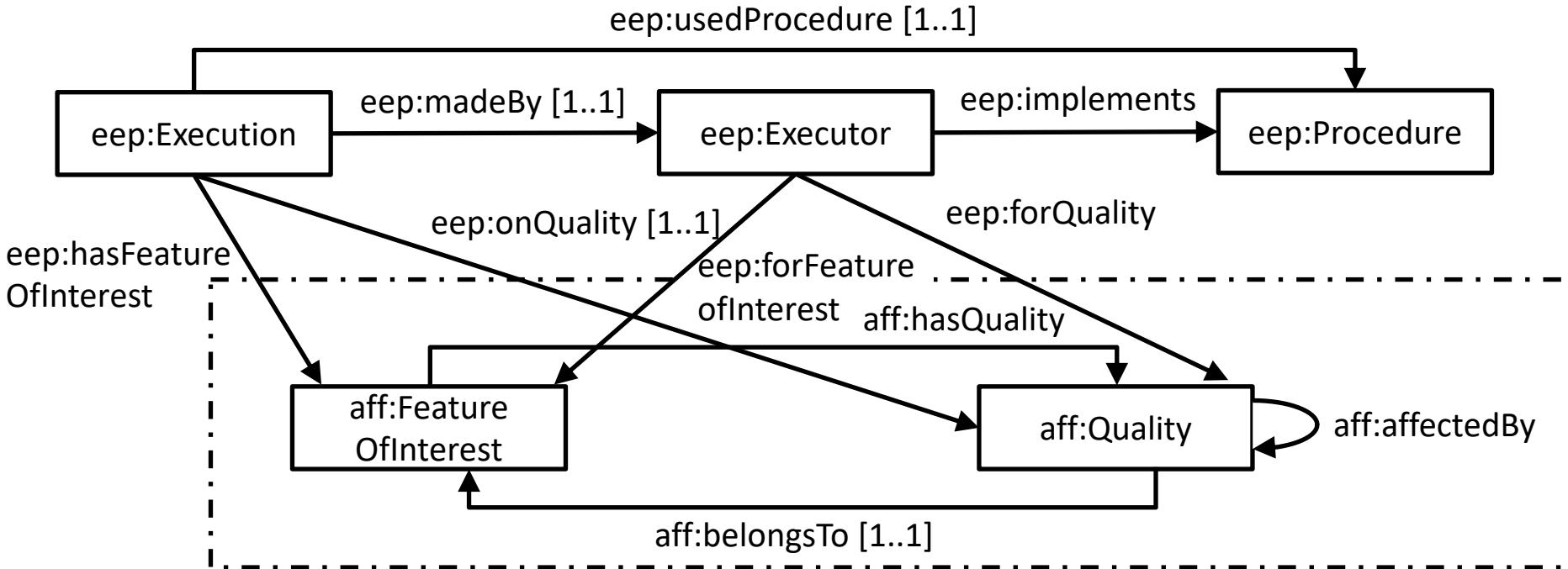
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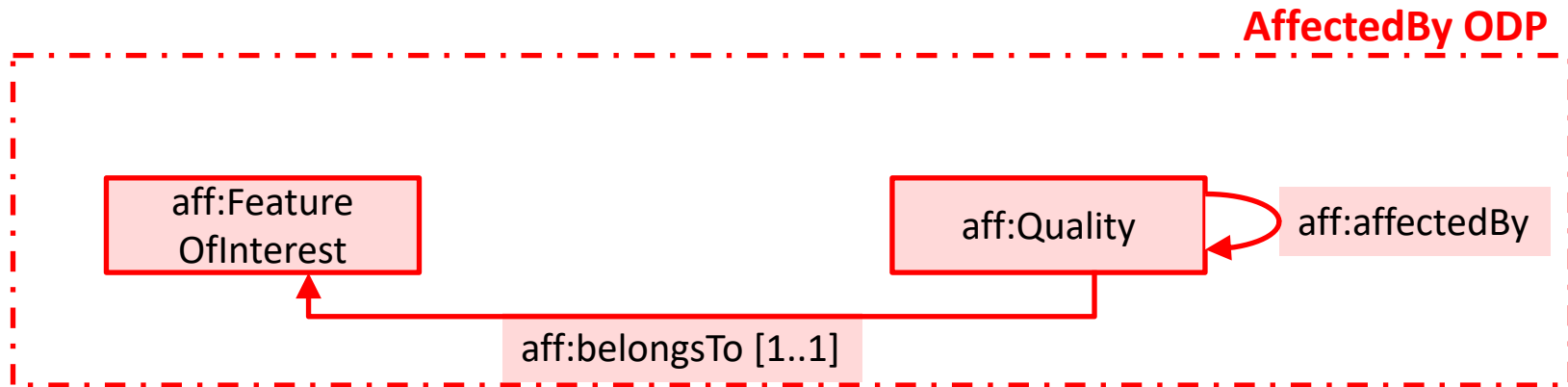
2nd Competency Question:

“Discover the sensors/actuators that observe/act on a given space”

The EEP (Execution-Executor-Procedure) ODP



The EEP (Execution-Executor-Procedure) ODP

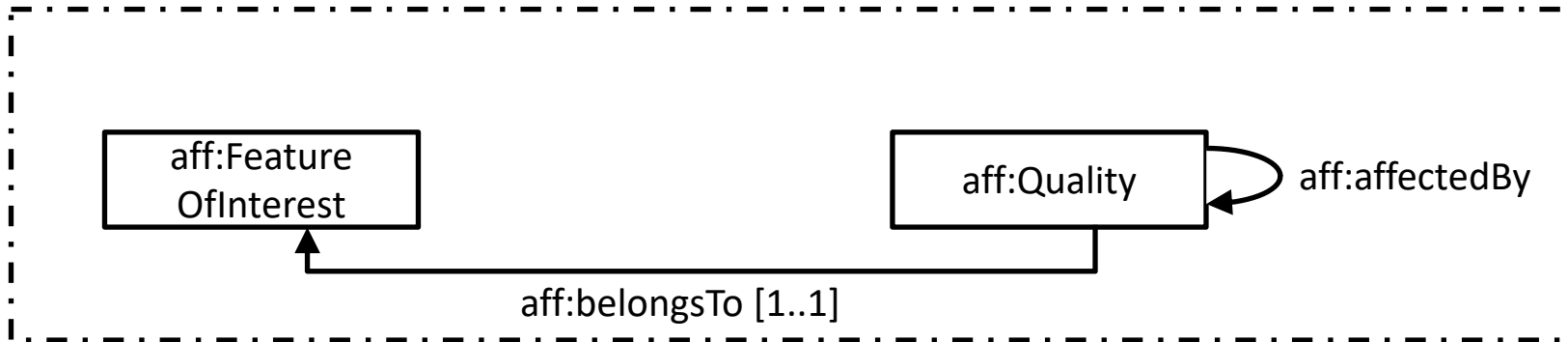


The EEP (Execution-Executor-Procedure) ODP

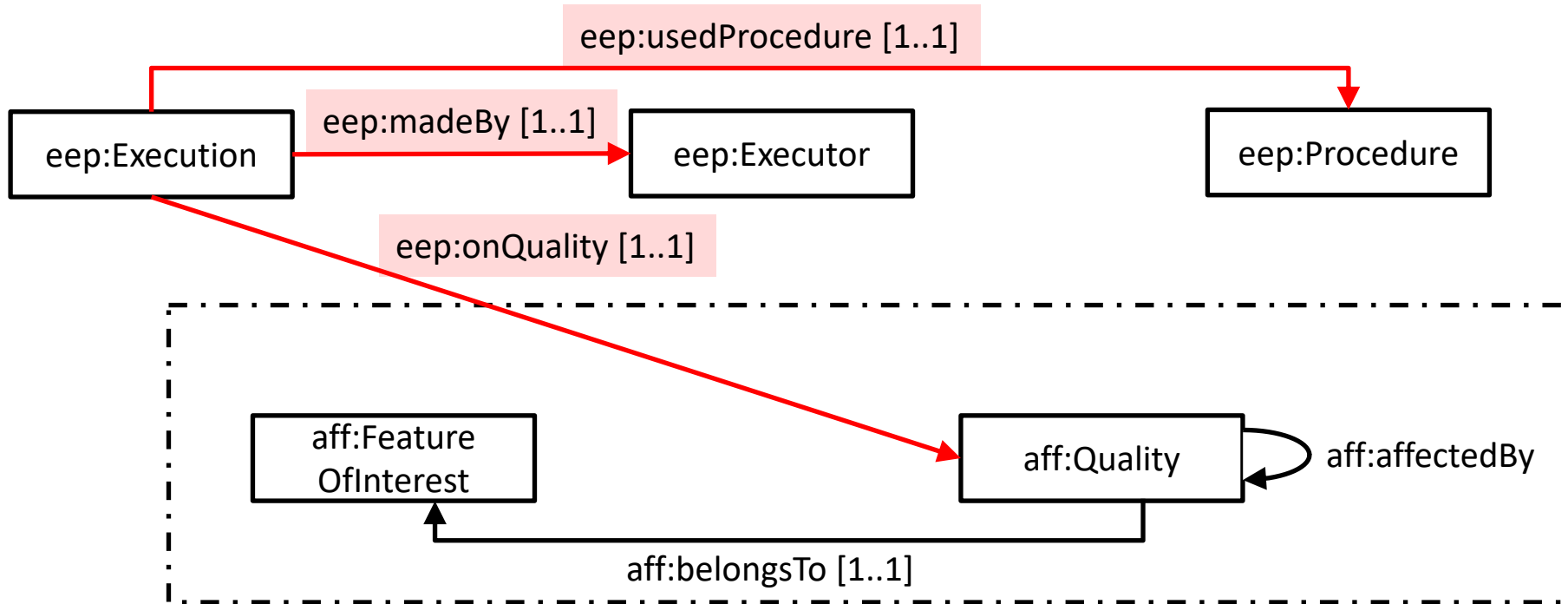
eep:Execution

eep:Executor

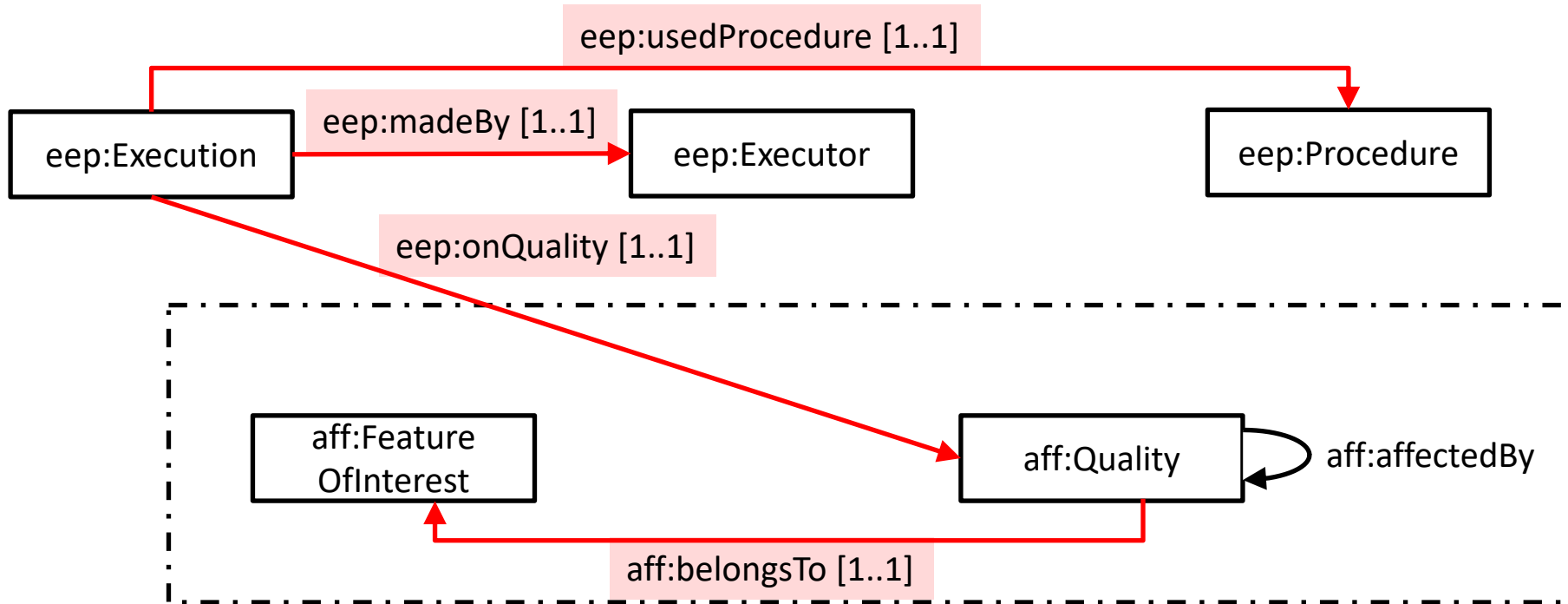
eep:Procedure



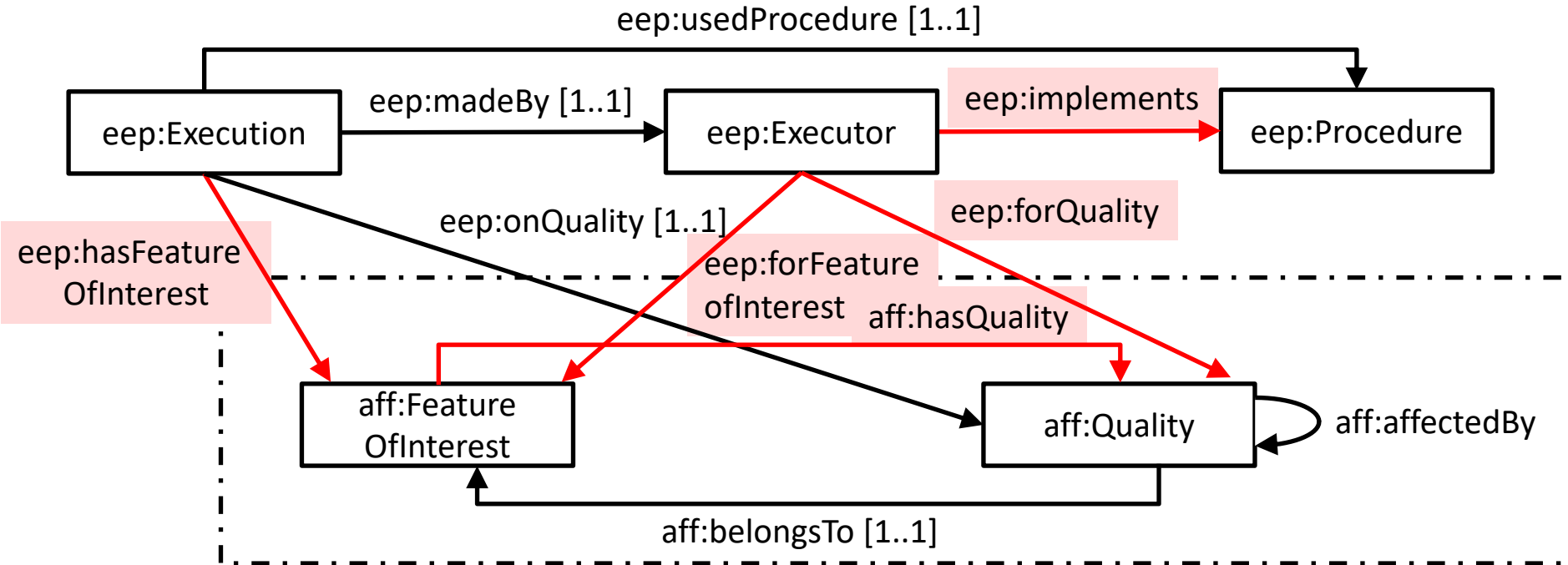
The EEP (Execution-Executor-Procedure) ODP



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The EEP (Execution-Executor-Procedure) ODP



Property Chain Axioms

The AffectedBy ODP

- * `aff:hasQuality` o `aff:affectedBy`
`rdfs:subPropertyOf` `aff:hasQuality`

The EEP ODP

- * `inverse` (`eep:madeBy`) o `eep:usedProcedure`
`rdfs:subPropertyOf` `eep:implements`
- * `eep:onQuality` o `eep:belongsTo`
`rdfs:subPropertyOf` `eep:hasFeatureOfInterest`
- * `inverse` (`eep:madeBy`) o `eep:onQuality`
`rdfs:subPropertyOf` `eep:forQuality`
- * `eep:forQuality` o `eep:belongsTo`
`rdfs:subPropertyOf` `eep:forFeatureOfInterest`

Competency Questions Solved

The AffectedBy ODP

- CQ1:** What are the Qualities of a FoI?
- CQ2:** What are the Qualities that affect a given Quality of a FoI?
- CQ3:** Which FoI does a given Quality belongs to?

The EEP ODP

- CQ1:** What are observations/actuactions performed by a given Procedure?
- CQ2:** What are observations/actuactions performed by a given sensor/actuator?
- CQ3:** What are the procedures implemented by a given sensor/actuator?
- CQ4:** What are the Fols of a given observation/actuation?
- CQ5:** What are the properties/qualities sensed/actuated by a given observation/actuation?
- CQ6:** What are the FoI of a given sensor/actuator?
- CQ7:** What are the properties/qualities sensed/actuated by a given sensor/actuator?



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The AffectedBy ODP

<https://w3id.org/affectedBy>

The EEP ODP

<https://w3id.org/eep>