

# Description Logic: Class-Forming Operations

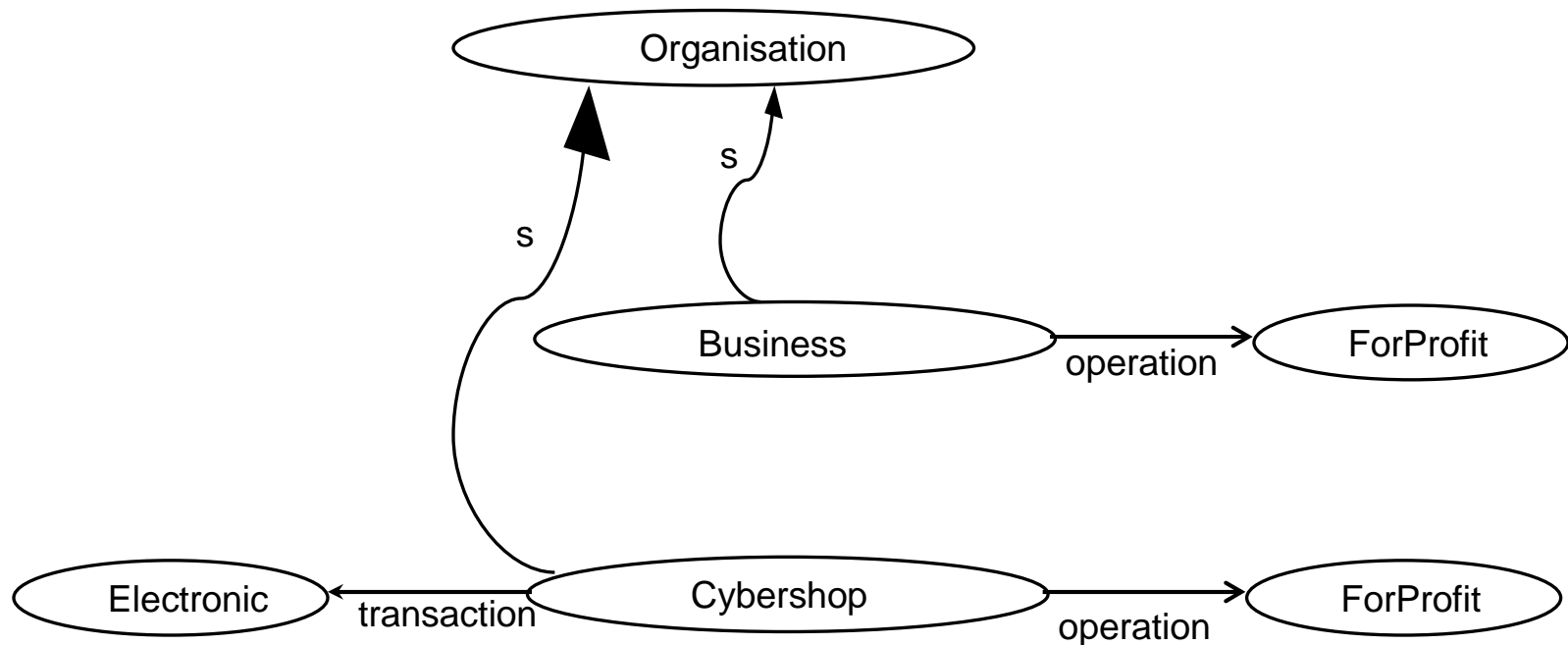
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Description Logic

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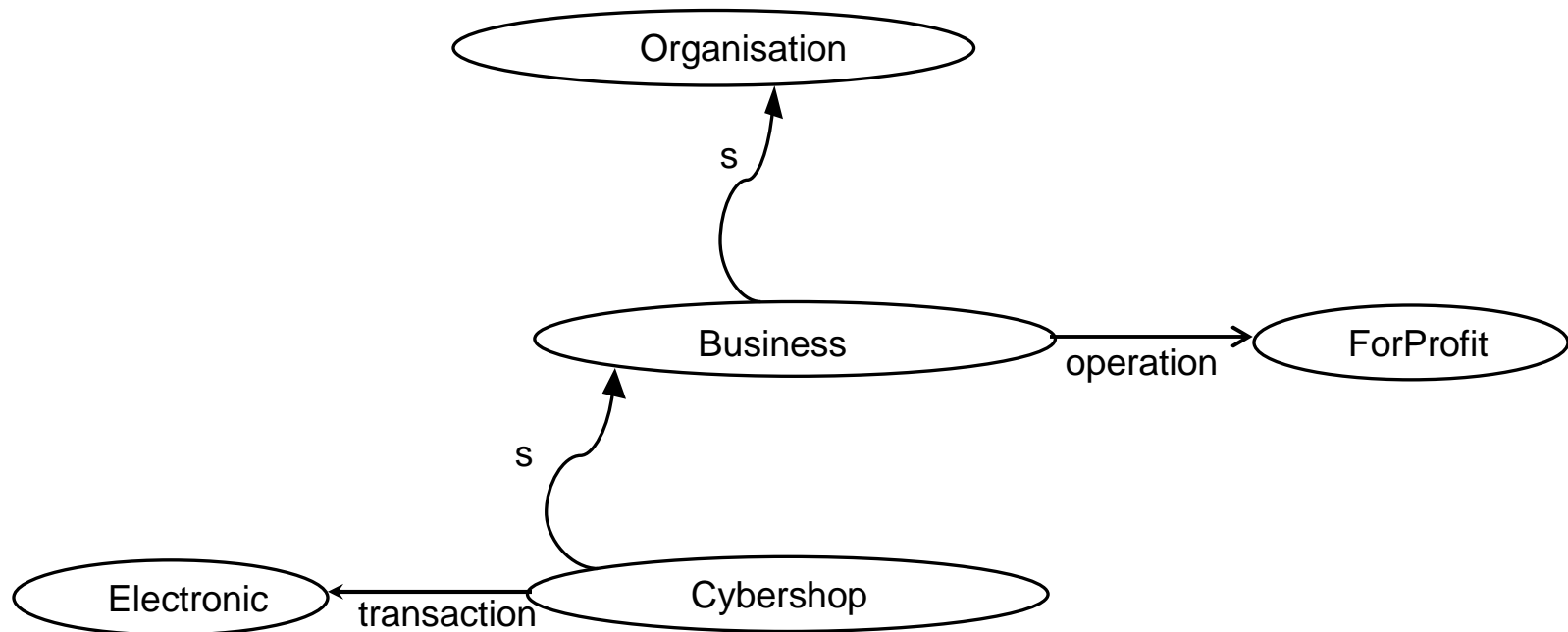
# e-Business Example in Description Logic: Classification - Before -

```
s = rdfs:subClassOf
```



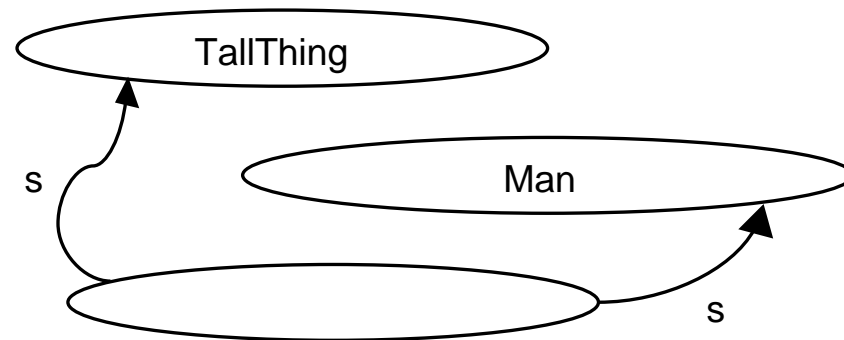
# e-Business Example in Description Logic: Classification - After -

```
s = rdfs:subClassOf
```



# Class Intersection: Example

```
s = rdfs:subClassOf
```



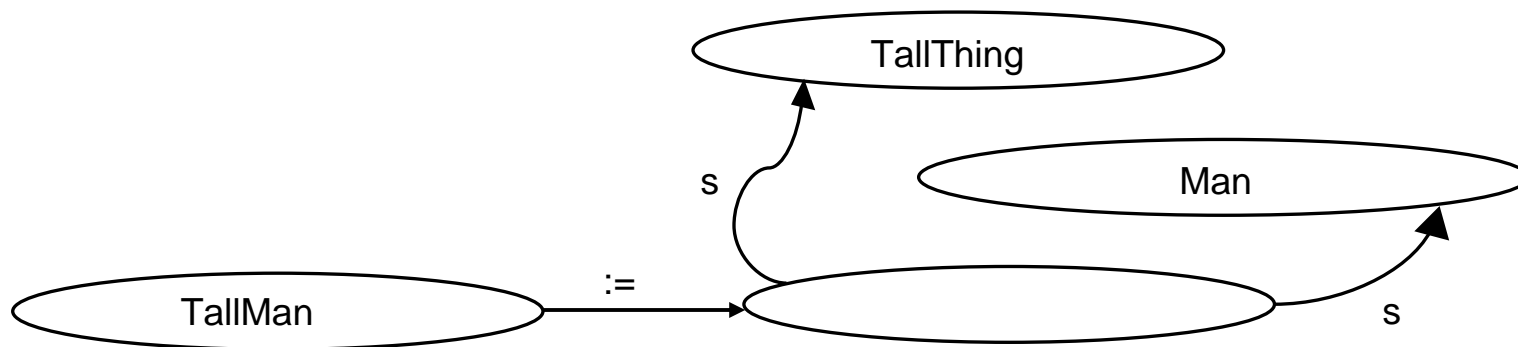
$\text{TallThing} \sqcap \text{Man}$

Intensional **conjunction** of classes:  $\text{TallThing} \sqcap \text{Man}(x) \Leftrightarrow \text{TallThing}(x) \wedge \text{Man}(x)$

Intensional **disjunction** of classes similar but computationally more complex

# Class Intersection and Definition: Example

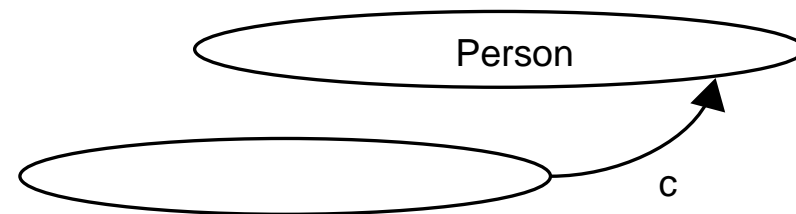
```
s = rdfs:subClassOf  
:= = daml:Class
```



$\text{TallMan} := \text{TallThing} \sqcap \text{Man}$

# Class Complement: Example

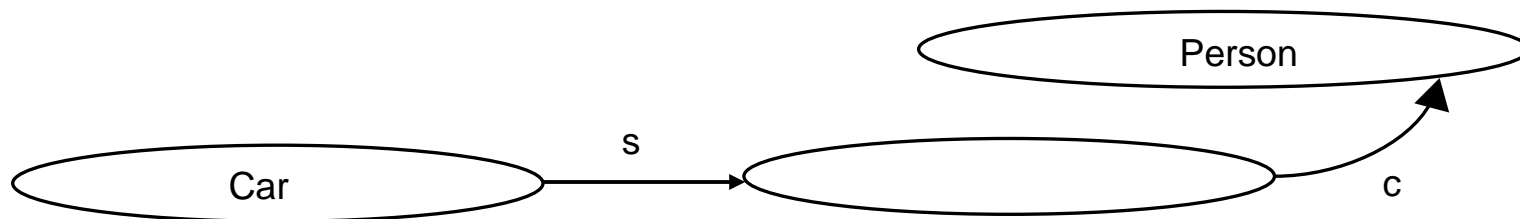
```
c = daml:complementOf
```



$\neg$ Person

# Class Complement and Subsetting: Example

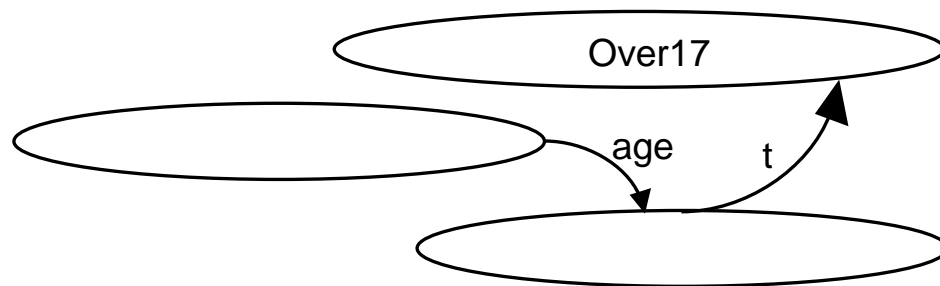
```
s = rdfs:subClassOf  
c = daml:complementOf
```



$\text{Car} \sqsubseteq \neg\text{Person}$

# Qualified Role: Example

`t = rdf:type`



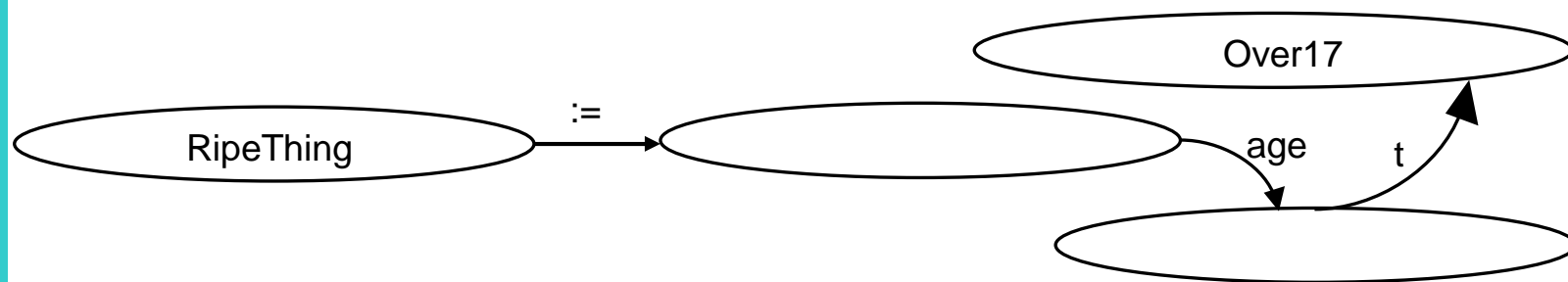
$\exists \text{age.Over17}$

**Existential** role:  $\exists \text{age.Over17}(x) \Leftrightarrow \exists y \text{ age}(x,y) \wedge \text{Over17}(y)$

**Universal** role similar

# Qualified Role and Definition : Example

```
t = rdf:type  
:= = daml:Class
```



$\text{RipeThing} := \exists \text{age}.\text{Over17}$