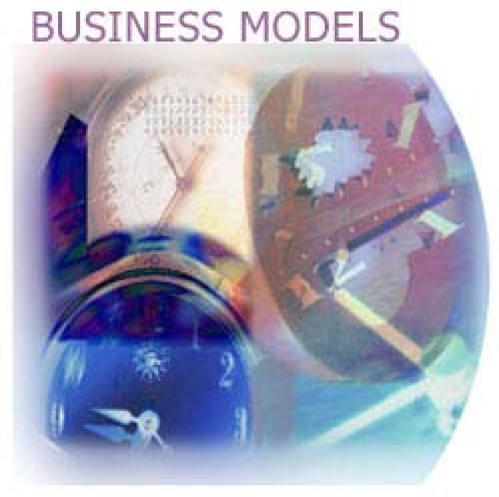
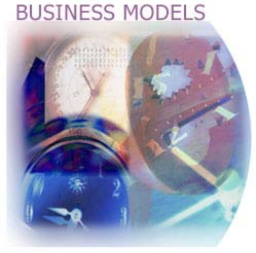


Reference Ontology for Business Models

Towards Interoperability between Business Modeling Ontologies

Licentiate Thesis

Tharaka Ilayperuma



Overview

- Motivation
- Business Models and Business Modelling Ontologies
  - – *BMO*
  - – *e^3-value*
  - – *REA*
- The Reference Ontology – How we model things?
- Facilitating interoperability between BM ontologies through the Reference ontology– the mappings
- Contributions

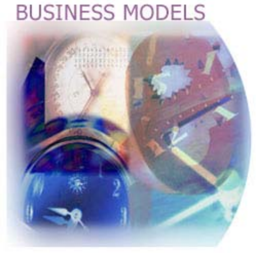
Motivation

- Basic requirement of an Ontology
  - Being a generic description shared by a community of users
- Interoperability between different business models

Business Models and Ontologies

“Business models describes how a company intends to create value in the market place …”

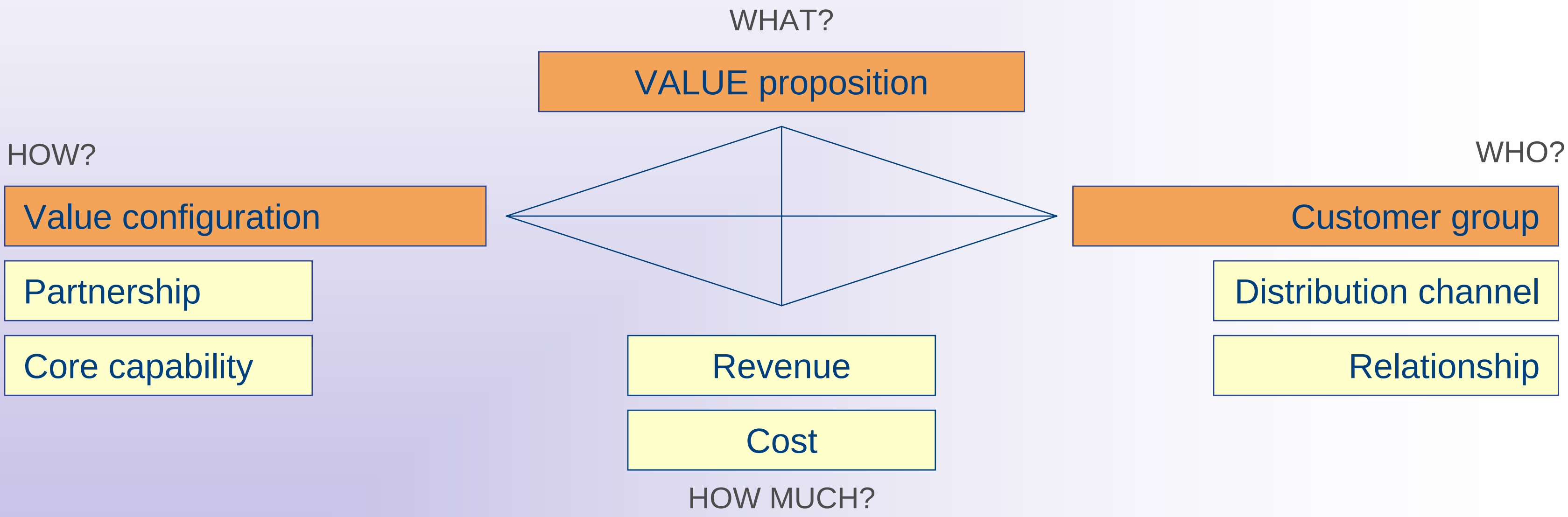
“Ontologies are viewed as increasingly important tools for structuring domain of interests. ”



Business Modelling Ontologies ..

- Business Model Ontology
- *e^3-value* Ontology
- Resource Events Agents (REA) Ontology

BMO Main Concepts



WHAT?

VALUE proposition

HOW?

Value configuration

Partnership

Core capability

WHO?

Customer group

Distribution channel

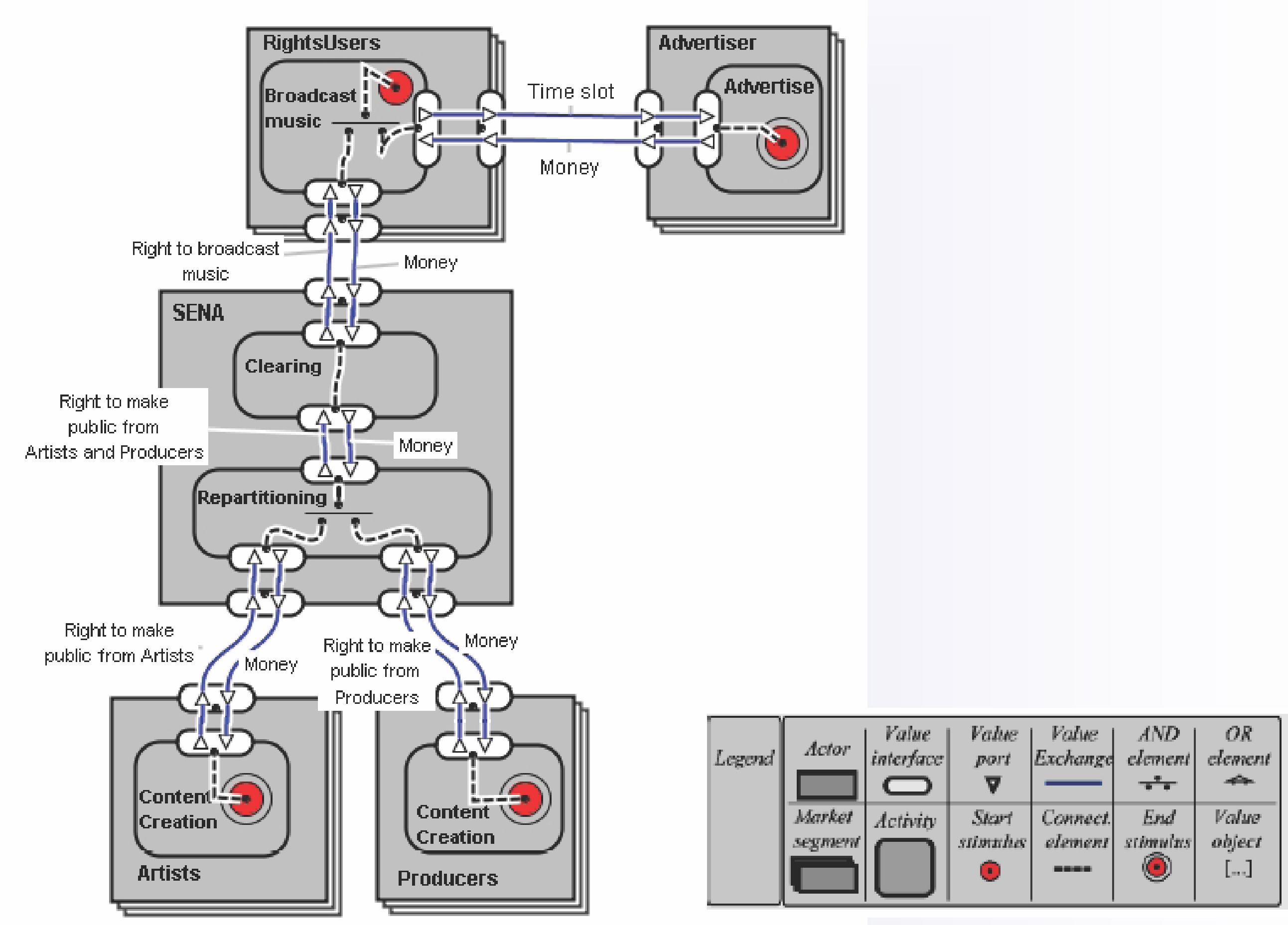
Relationship

Revenue

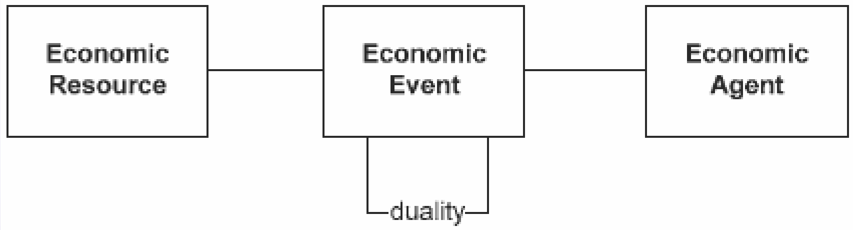
Cost

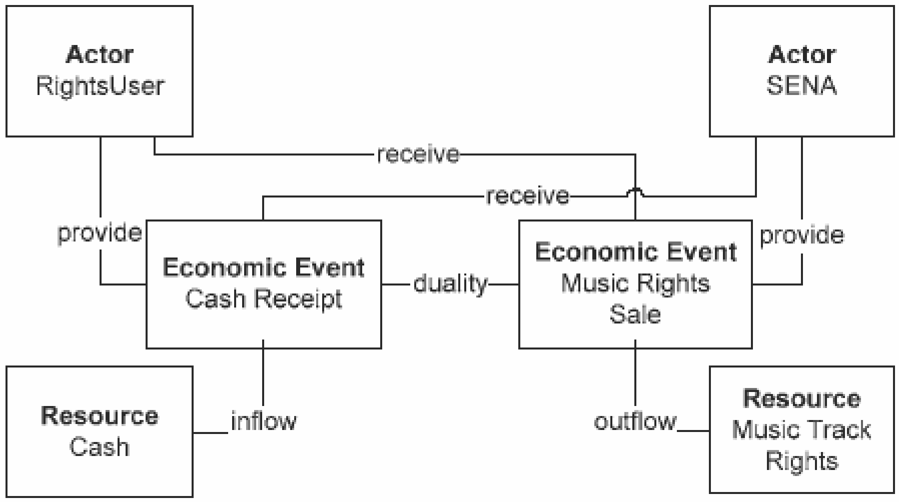
HOW MUCH?

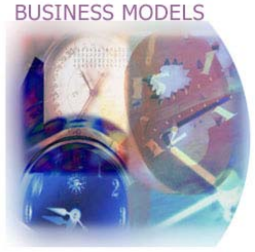
An e^3-value Business Model



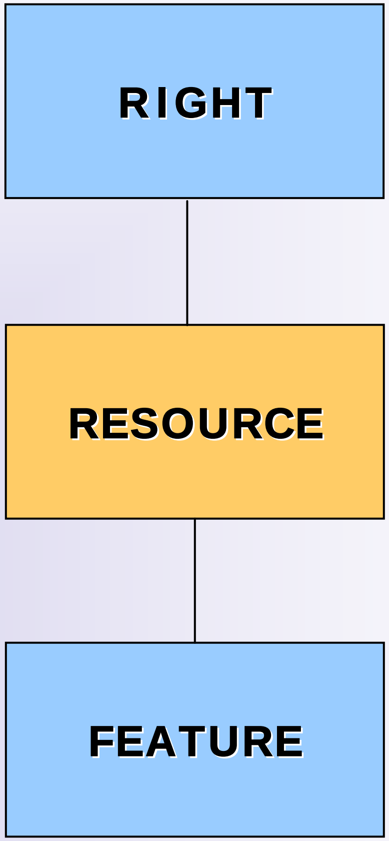
REA Ontology – An Example







Reference Ontology – Resources, Features, and Rights



An actor is entitled to handle a resource in a certain way

(use, income, transfer)

RIGHT

Own

Borrow

RESOURCE

Book

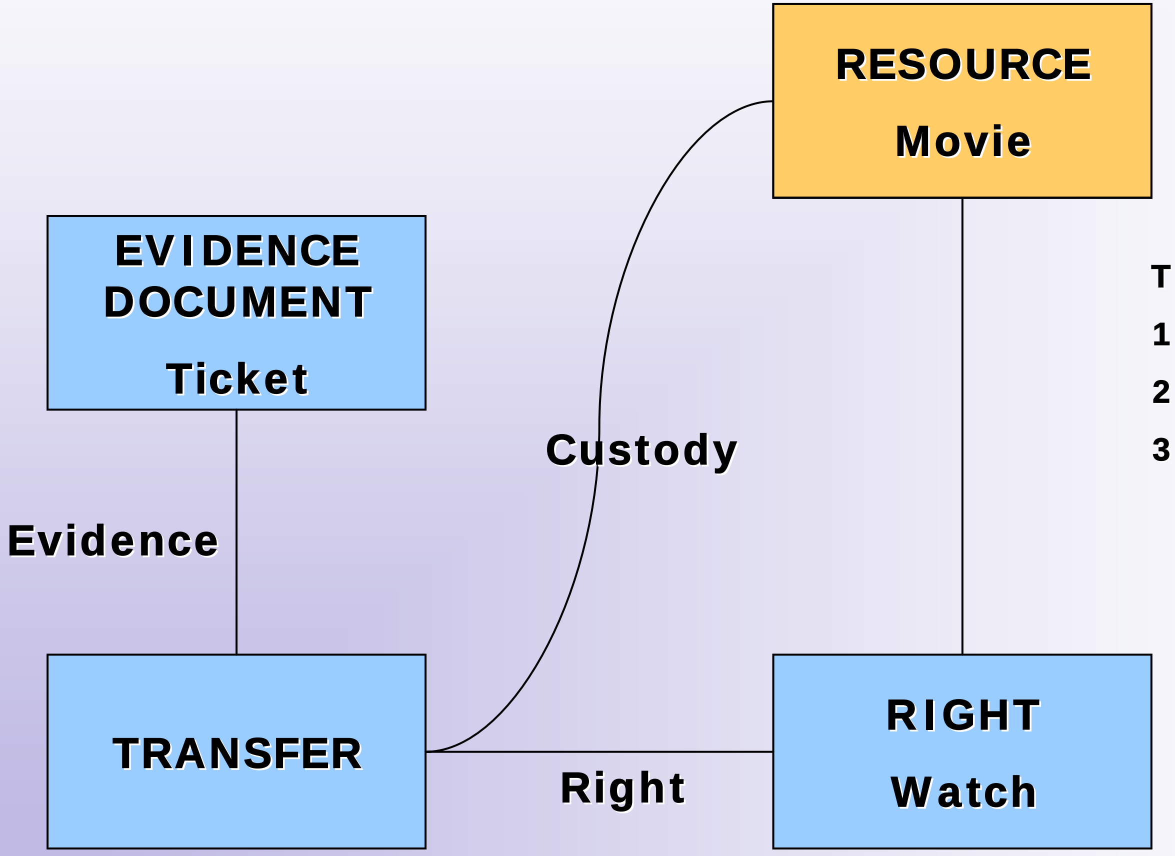
Any property or association of the resource

FEATURE

Weight

Number of pages

Three Components of a Transfer



Transfer of

1 Right

2 Custody (access, enabling)

3 Evidence of right

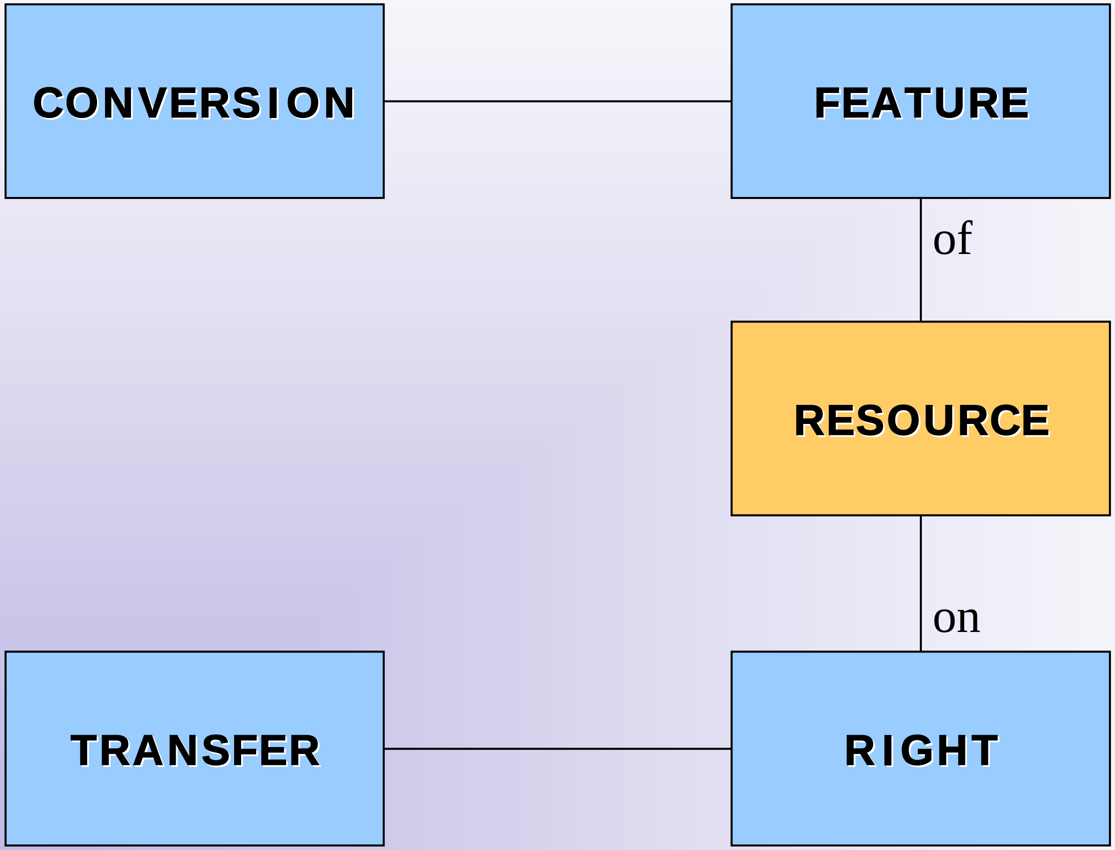
Goods

Services

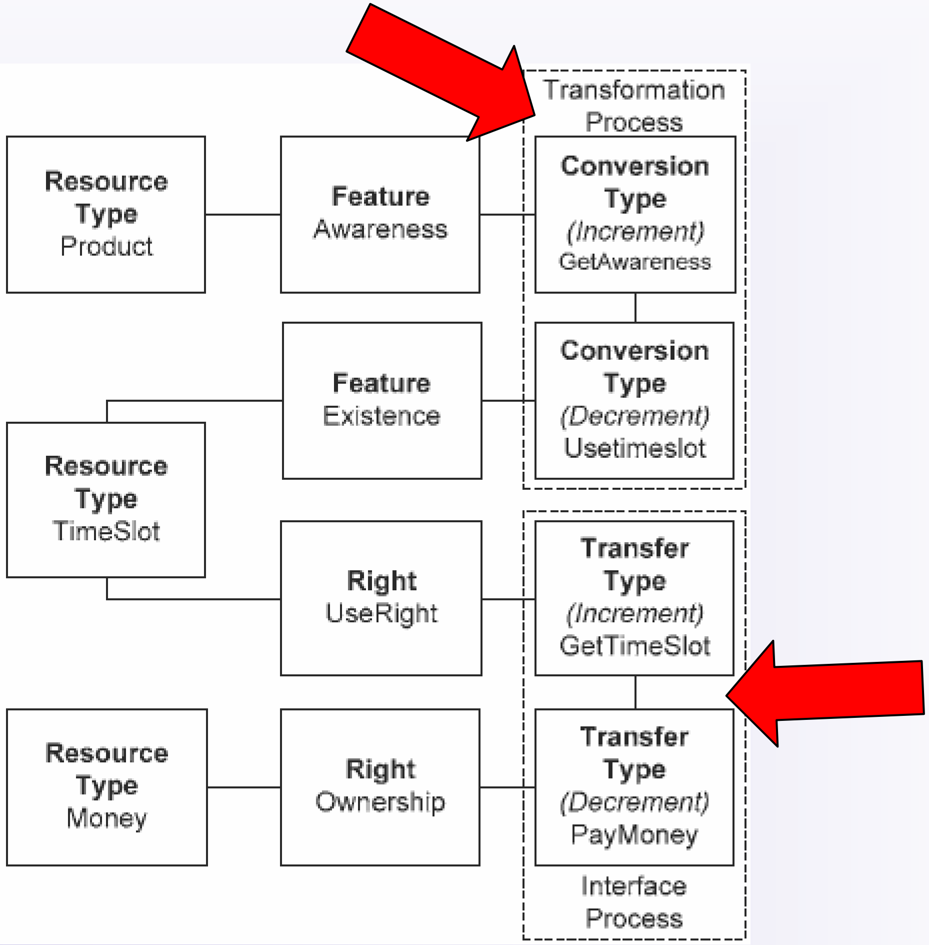
Information

Money

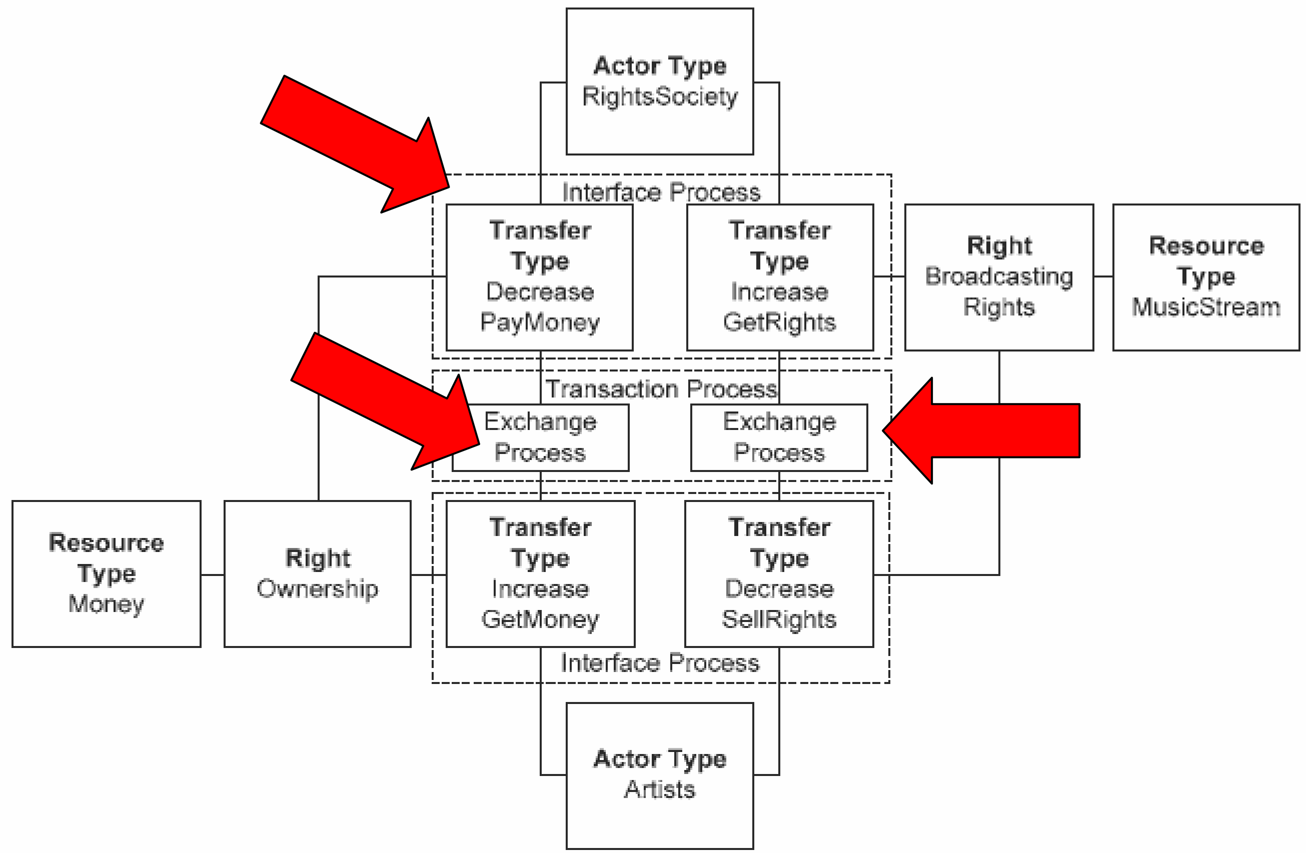
Transfer and Conversion



Grouping Transfers and Conversions – The Process Concept



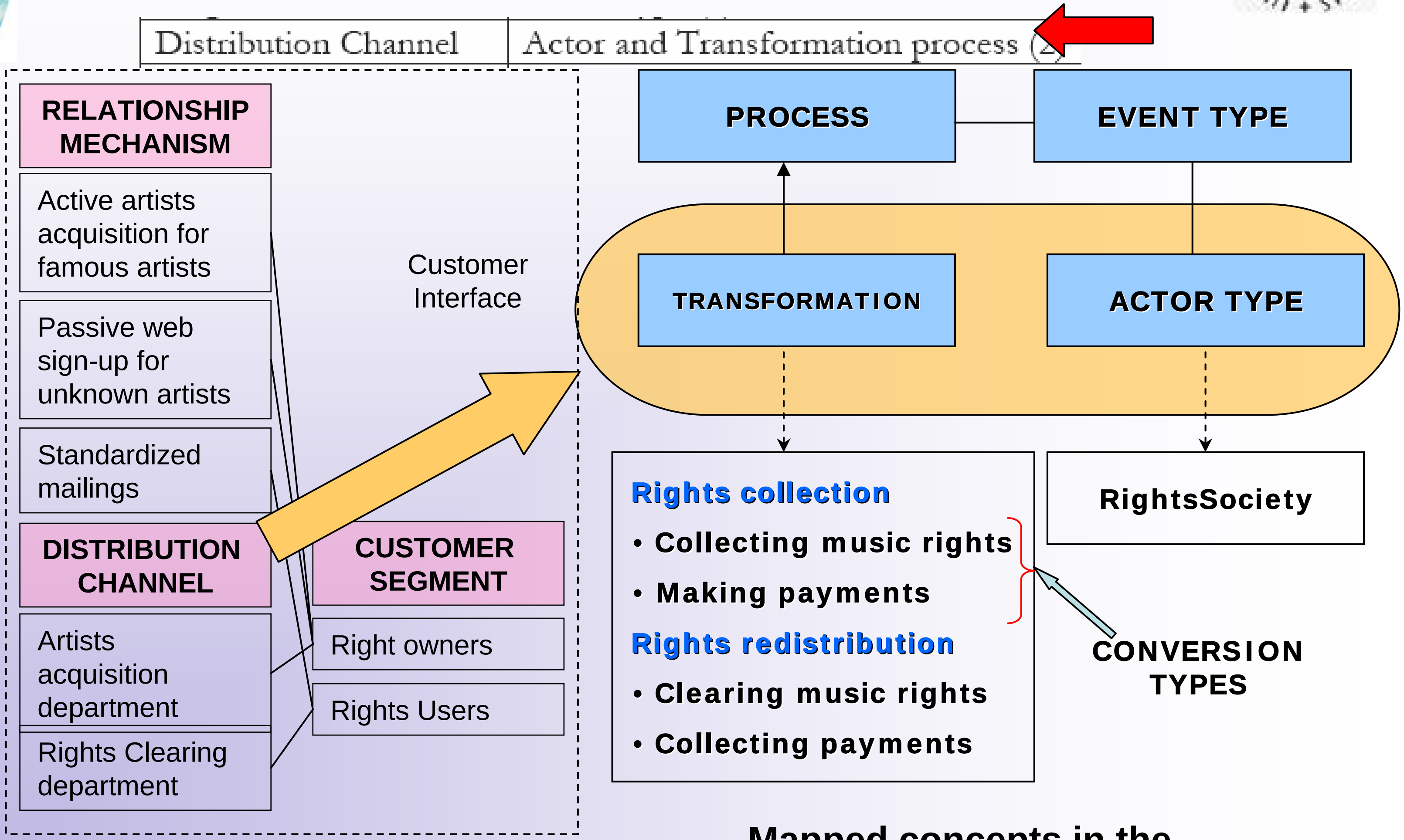
Grouping Transfers and Conversions – The Process Concept …



Creating Common Understanding

- Use of the Reference Ontology to map concepts in original ontologies.
  - Too many differences make it difficult to map one concept to another.
    - e.g. *Value Object* in e3-value and *Economic Resource* in REA

Example - BMO to Reference Ontology



Distribution Channel | Actor and Transformation process (2)

RELATIONSHIP MECHANISM

Active artists acquisition for famous artists

Passive web sign-up for unknown artists

Standardized mailings

Customer Interface

DISTRIBUTION CHANNEL

Artists acquisition department

Rights Clearing department

CUSTOMER SEGMENT

Right owners

Rights Users

PROCESS

EVENT TYPE

TRANSFORMATION

ACTOR TYPE

Rights collection

- **Collecting music rights**
- **Making payments**

Rights redistribution

- **Clearing music rights**
- **Collecting payments**

RightsSociety

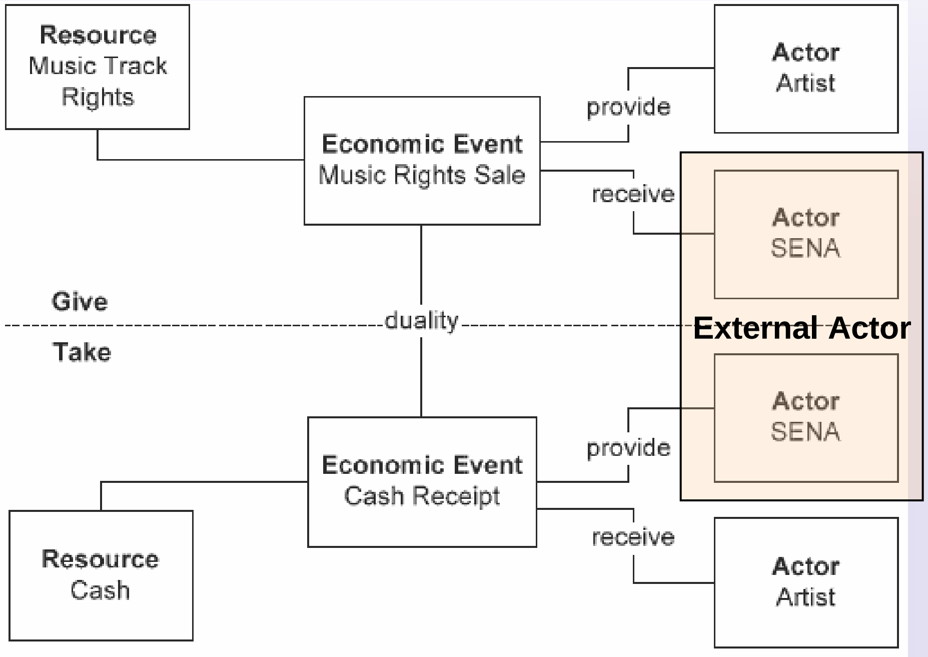
CONVERSION TYPES

BMO Example

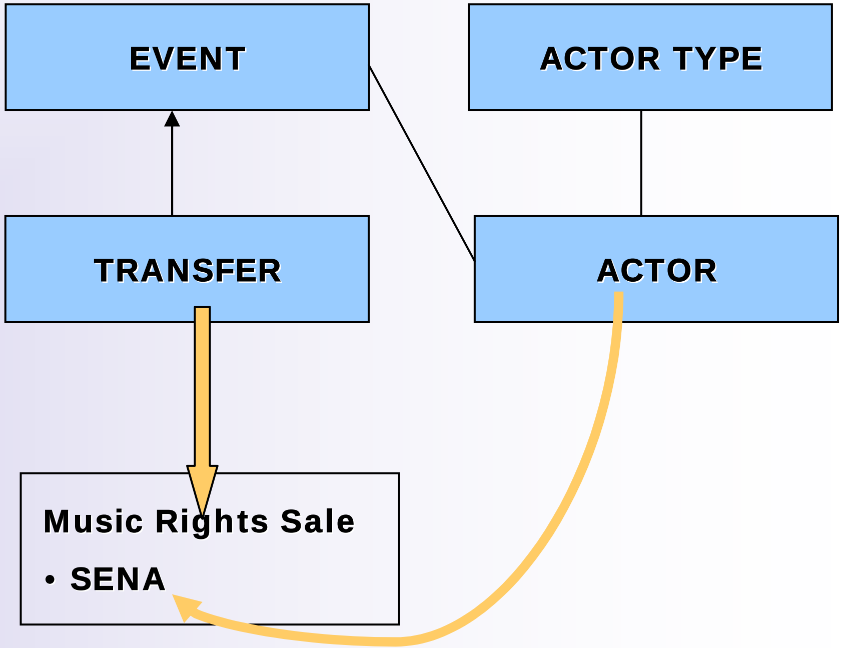
Mapped concepts in the Reference Ontology

Example –REA to Reference Ontology

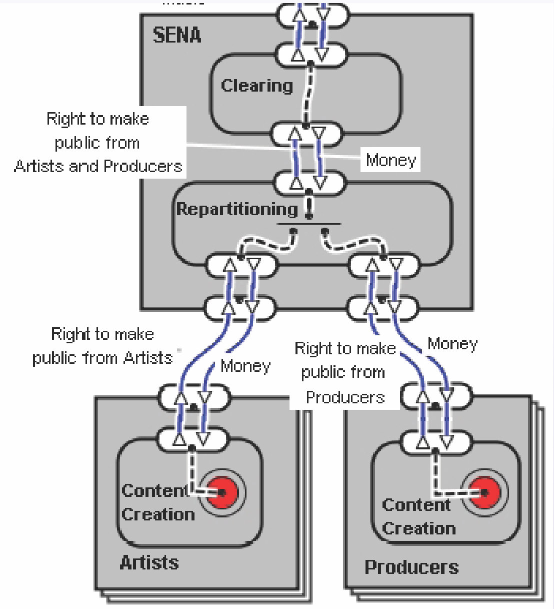
Economic Event	Transfer Event of an Actor (1)
Economic Resource	Resource
Economic Event Type	Transfer Type of an Actor Type (2)



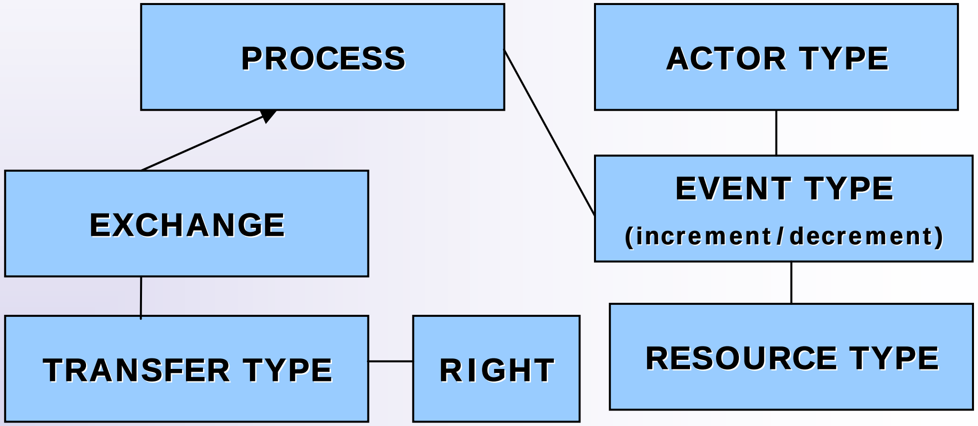
REA model for music rights case from an Artist’s perspective

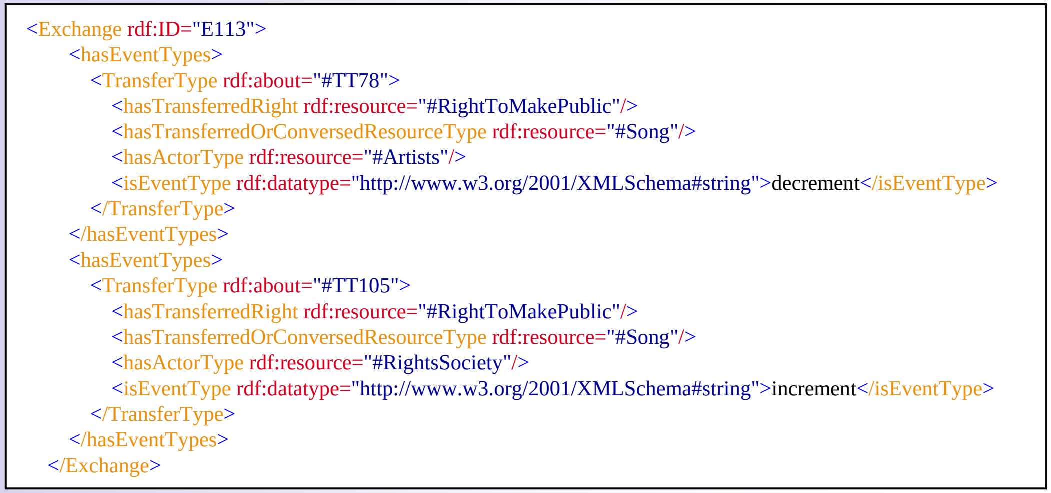


Example – e^3-*value* to Reference Ontology



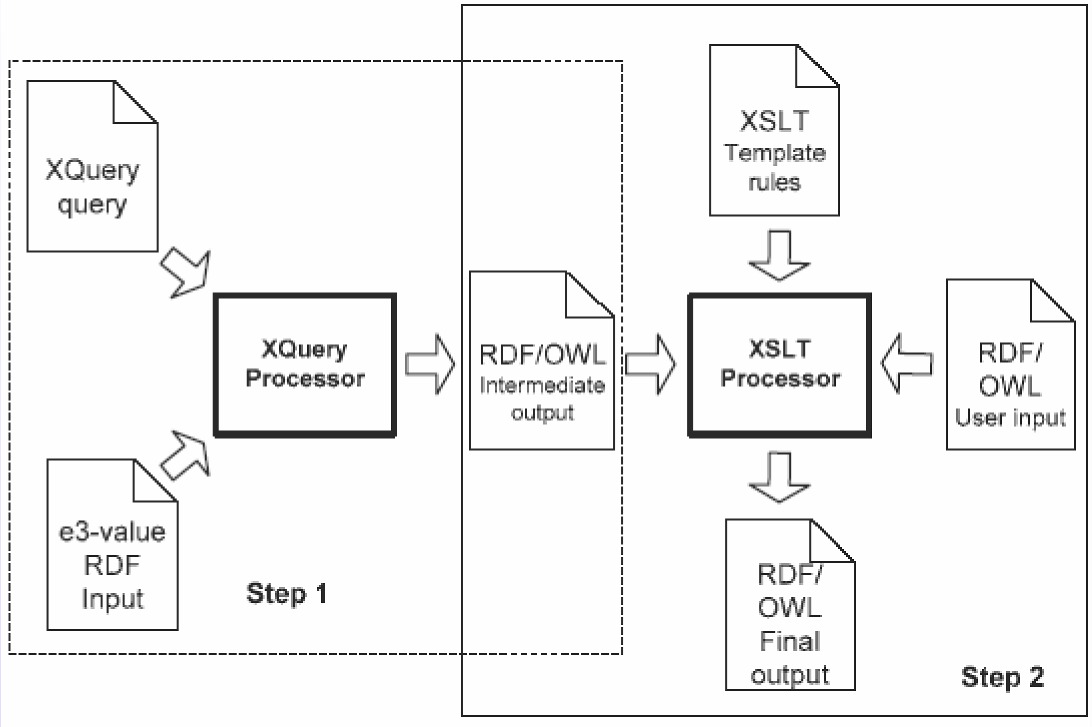
Value port	Transfer type (3)
Value exchange	Exchange (4)



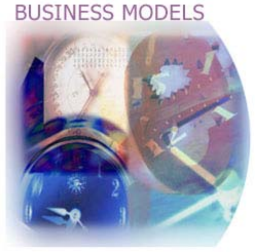


```
<Exchange rdf:ID="E113">
    <hasEventTypes>
      <TransferType rdf:about="#TT78">
        <hasTransferredRight rdf:resource="#RightToMakePublic"/>
        <hasTransferredOrConversedResourceType rdf:resource="#Song"/>
        <hasActorType rdf:resource="#Artists"/>
        <isEventType rdf:datatype="http://www.w3.org/2001/XMLSchema#string">decrement</isEventType>
      </TransferType>
    </hasEventTypes>
    <hasEventTypes>
      <TransferType rdf:about="#TT105">
        <hasTransferredRight rdf:resource="#RightToMakePublic"/>
        <hasTransferredOrConversedResourceType rdf:resource="#Song"/>
        <hasActorType rdf:resource="#RightsSociety"/>
        <isEventType rdf:datatype="http://www.w3.org/2001/XMLSchema#string">increment</isEventType>
      </TransferType>
    </hasEventTypes>
  </Exchange>
```

Realising Mappings



Two step mapping process



Realising Mappings

```
declare function local:getTransactionInterfaceProc

   let $docName := doc("musicRights.rdf")
   let $vi := $docName//a:value_interface


   for $j in (distinct-values(local:getTransactionTr
   let $q := fn:substring-before($j,"_")
   let $r := fn:substring-after($j,"_")
   return

   element Transaction {attribute rdf:ID {fn:conca
      for $vi1 in $vi return
            for $t in $q return
               if (string($vi1/@a:e3_has_uid) = $t )
                  for $i in (local:getExchnagesofInterfaces($t)) return
                     element hasExchanges {
                        element Exchange {attribute rdf:about{fn:concat("#E",$i)},
                        local:getExchangeRelatedValuePort($i)}

                        }
               else()
   }
};
```

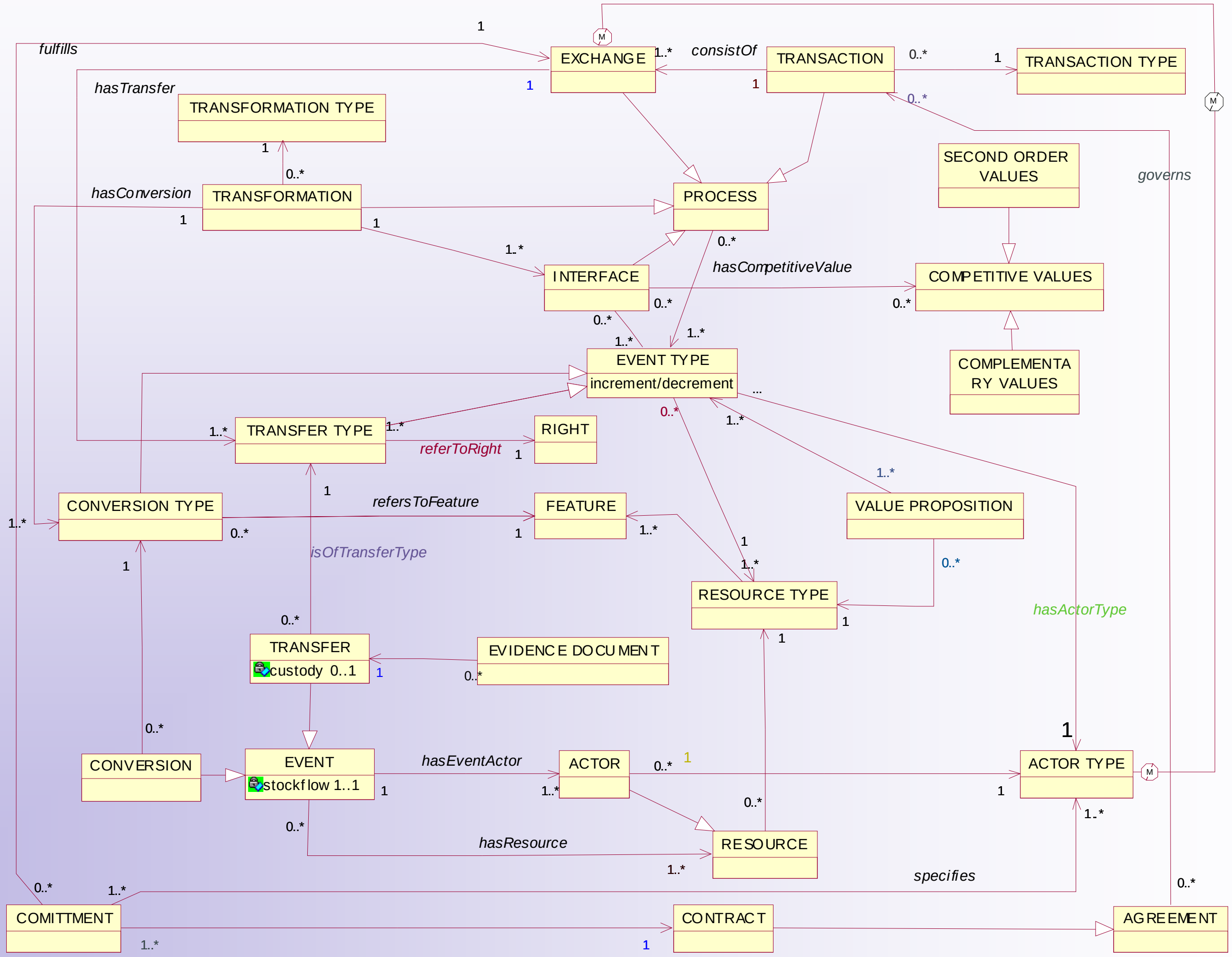
An XQuery function used in Step 1

```
<xsl:template match="Exchange//TransferType"
                  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
                  xmlns:owl="http://www.w3.org/2002/07/owl#"
                  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

      <xsl:param name="e_resource_id" select="current()/@rdf:about"/>
      <xsl:param name="e_transfer_id" select="substring-after($e_resource_id,'#')"/>
      <xsl:copy>
         <xsl:copy-of select="@*"/>
         <xsl:copy-of select="$file2//TransferType[@rdf:ID = $e_transfer_id]/*"/>
         <xsl:apply-templates/>
      </xsl:copy>
   </xsl:template>
……………..
…………….
……………..
```

An XSLT template used in Step 2

The Reference Ontology



Thesis Contributions

- Analysis of value transfers
- Facilitating the common understanding between similar concepts in different ontological approaches
- Realisation of mappings between *e*^{3}-*value* and the Reference Ontology

Thank you!

- Questions/Comments