
Open Digital Rights Language (ODRL)

Version: 0.5

Date: 2000-08-23

URI: <http://purl.net/ODRL/>

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0 Status

This document is intended to be a submission to the World Wide Web Consortium to propose the formation of a working group in the area of Digital Rights Management.

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1 Overview

Digital Rights Management (DRM) involves the description, layering, analysis, valuation, trading and monitoring of the rights over an enterprise's assets; both in physical and digital form; and of tangible and intangible value. Current methods of managing, trading and protecting such assets are inefficient, proprietary, or else often require the information to be wrapped or embedded in a physical format [HIGGS].

A key feature of managing online rights will be the substantial increase in re-use of digital material on the Web. The pervasive Internet is changing the nature of distribution of digital media from a passive one way flow (from Publisher to the End User) to a much more interactive cycle where creations are re-used, combined and extended ad infinitum. At all stages, the Rights need to be managed and honoured with trusted services.

Current Rights management technologies include languages for describing the terms and conditions, tracking asset usages by

enforcing controlled environments or encoded asset manifestations, and closed architectures for the overall management of rights.

The Open Digital Rights Language (ODRL) provides the semantics for DRM in open and trusted environments whilst being agnostic to mechanisms to achieve the secure architectures.

1.1 The Bigger Picture

It is envisaged that ODRL will “plug into” an open framework that enables peer-to-peer interoperability for DRM services. (See [ERICKSON] for an overview of this area).

The authors consider that traditional DRM (even though it is still a new discipline) has taken a closed approach to solving problems. Hence, we see a movement towards “Open Digital Rights Management” (ODRM) with clear principles focused on interoperability across multiple sectors and support for fair-use doctrines.

The ODRM Framework would consist of Technical, Social, and Legal streams as shown in Figure 1.

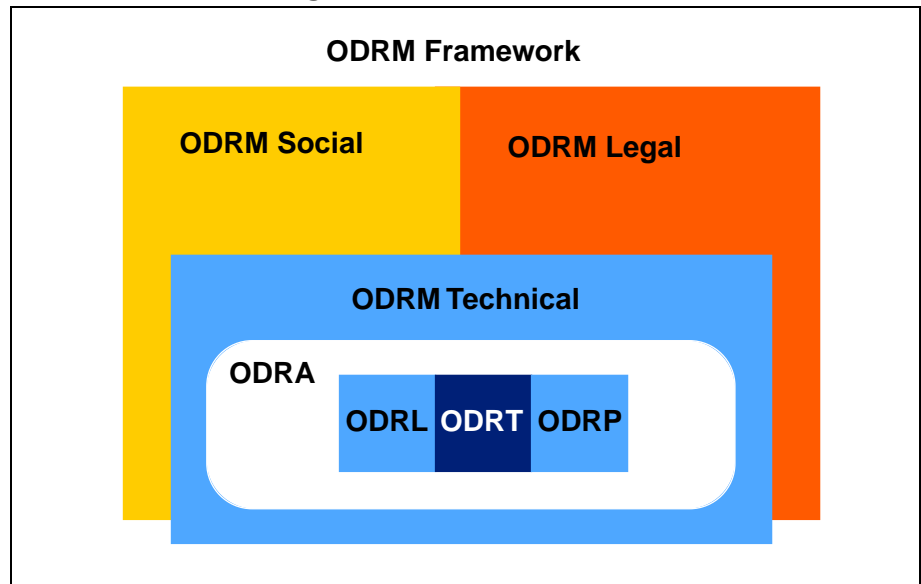


Figure 1. ODRM Framework

The ODRM Technical stream consists of an Architecture (ODRA), Trading Protocol (ODRT) and Protection (ODRP) mechanisms with ODRL clearly focused on solving a common and extendable way of expressing Rights within this Architecture.

2 ODRL

The ODRL complements existing analogue rights management standards by providing digital equivalents, and supports an expandible range of new services that can be afforded by the digital nature of the assets in the Web environment.

The ODRL is a standard vocabulary for the expression of terms and conditions over assets. ODRL covers a core set of semantics for these purposes including the rights holders and the expression of permissible usages for asset manifestations.

2.1 Scope

ODRL is focused on the semantics of expressing rights languages. ODRL can be used within trusted or untrusted systems. However, ODRL does not determine the capabilities nor requirements of any trusted services (eg for content protection and payment negotiation) that utilises its language.

ODRL defines a core set of semantics. Additional semantics can be layered on top of ODRL for third-party value added services.

ODRL does not enforce or mandate any policies for DRM, but provides the mechanisms to express such policies. Communities or organisations, that establish such policies based on ODRL, do so based on their specific business or public access requirements.

The ODRL model is based on an analysis and survey of sector specific requirements (models and semantics), and as such, aims to be compatible with a broad community base.

ODRL aims to meet the common requirements for many sectors and has been influenced by the ongoing work and specifications/models of the following groups:

- <indec> [INDECS]
- Electronic Book Exchange [EBX]
- IFLA
- DOI Foundation
- ONIX
- MPEG
- IMS

ODRL proposes to be compatible with the above groups by defining an independent and extensible set of semantics. ODRL does not depend on any media types as it is aimed for cross-sector interoperability.

2.2 Foundation Model

ODRL is based on a simple, yet extensible, model for rights management which involves the clear separation of Parties, Assets,

and Rights (Usage, Constraint, and Reward) descriptions. This is shown in Figure 2.

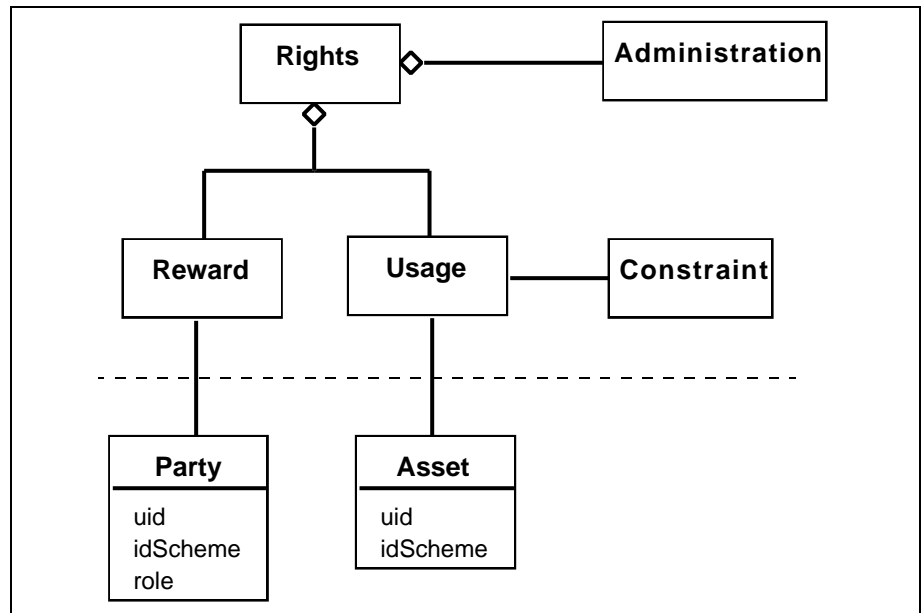


Figure 2. ODRL Foundation Model

The Rights entity consists of Usage, Constraint, and Reward which together enable the expression of digital rights over the identified Asset and their Rights Holders (parties). The Parties' Role with respect to their Rewards can also be expressed.

The description of the Party and Asset entities are outside the scope of ODRL. What is in scope is that these entities must be referenced by using unique identification mechanisms (such as [URI], [DOI], [ISBN] etc).

The Asset entity (sometimes referred to as a Work, Content, Creation, or Intellectual Property), is viewed as a whole entity. If the Rights are assigned at the Asset's subpart level, then such parts would require to be uniquely identifiable.

The Rights entity also consists of an Administration entity that captures the responsible party and validity of the Rights expression.

Complete and formal semantics for the ODRL Foundation Model properties and attributes are specified in Section 3 "Semantics" on page 9.

2.2.1 Example

The ODRL Foundation Model can be expressed using XML. A pseudo-example is shown below:

```

<rights>
  <usage>
    <asset idscheme="URI" uid="http://byeme.com/myasset.pdf" />
    <usage-type>
      ...
    <constraint> ... </constraint>
    <usage-type>
      ...
  
```

```

</usage>
<reward>
  <reward-type>
    <party idscheme="X500"
      uid="c=FOO;o=Federal Library;ou=Registry;cn=Maria Brown" />
    </reward-type>
  ...
</reward>
</rights>

```

Complete and formal syntactical examples are given in Section 4 "Syntax" on page 17.

2.3 Rights Usage Model

ODRL supports the expression of Rights Usages. This is the recognised set of allowable usage rights over the Asset. This is shown in Figure 3.

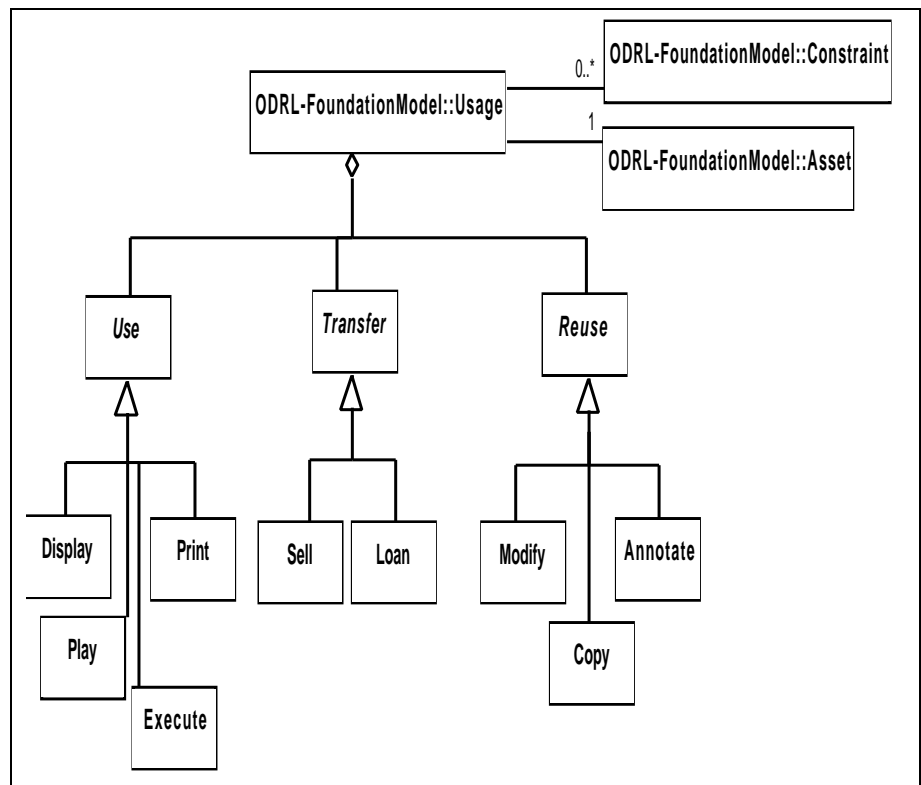


Figure 3. ODRL Usages Model

The Usage entity is an aggregation of three abstract entities:

- Use - indicates a set of usages in which the Asset can be consumed (realised with: Display, Print, Play, Execute).
- Transfer - indicates a set of usages in which the rights over the Asset can be transferred (realised with: Sell, Loan).
- Reuse - indicates a set of usages in which the Asset (or portions of it) can be re-utilised (realised with: Modify, Copy, Annotate).

A Usage must be associated with one Asset. A Usage can be associated with zero or more Constraints.

Complete and formal semantics for the ODRL Usage Model properties and attributes are specified in Section 3 "Semantics" on page 9.

2.3.1 Example

The ODRL Usage Model can be expressed using XML. A pseudo-example is shown below:

```
<usage>
  <asset idscheme="URI" uid="http://byeme.com/myasset.pdf" />
  <display/>
  <print>
    <constraint> ... </constraint>
  </print>
  <annotate/>
  ...
</usage>
```

Complete and formal syntactical examples are given in Section 4 "Syntax" on page 17.

2.4 Rights Constraint Model

ODRL supports the expression of Rights Constraints. This is the recognised set of restrictions on the usage rights over the Asset. This is shown in Figure 4.

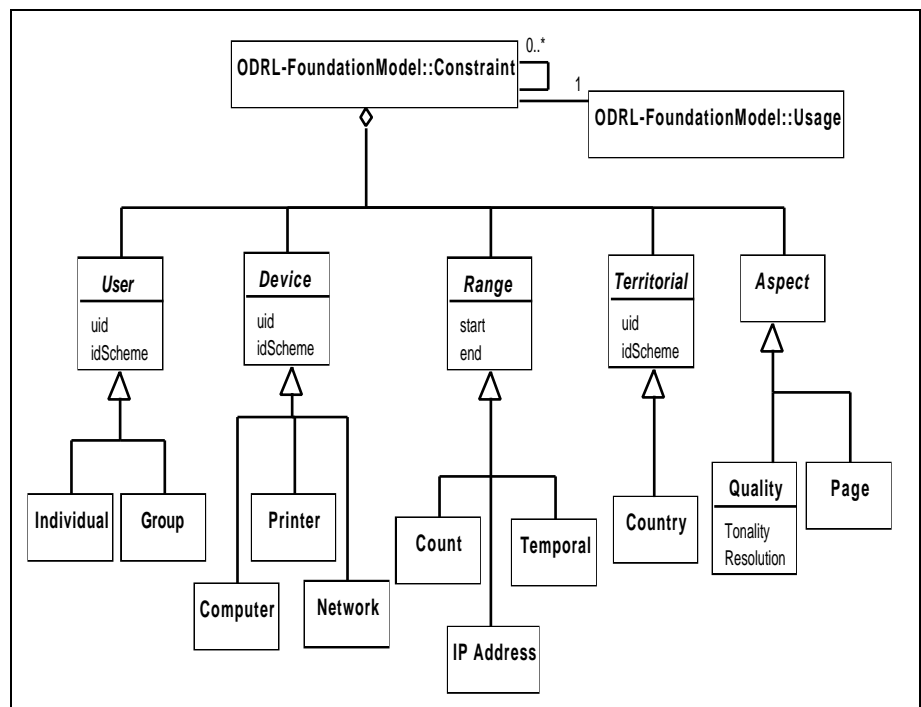


Figure 4. ODRL Constraints Model

The Constraint entity an aggregation of five abstract entities:

- User - indicates a set of constraints which limits usage to identified user(s) (realised with: Individual, Group).
- Device - indicates a set of constraints which limits usage to physical devices (realised with: Computer, Printer, Network).
- Range - indicates a set of constraints which limits usage to a fixed number or extent (realised with: Count, Temporal, IP Address).

- Territorial - indicates a set of constraints which limits usage to spatial boundaries (realised with: Country).
- Aspect - indicates a set of constraints which limits usage to distinct features of the asset (realised with: Quality, Page).

Additionally, all Constraints can be subject to an “Exclusivity” attribute that indicates if the constraint is exclusive or not.

A Constraint is associated with one Usages. Constraints can also have zero or more other Constraints.

Complete and formal semantics for the ODRL Constraint Model properties and attributes are specified in Section 3 "Semantics" on page 9.

2.4.1 Example

The ODRL Constraint Model can be expressed using XML. A pseudo-example is shown below:

```

<display>
  <constraint>
    <network>
      <constraint>
        <ipaddress start="111.222.333.1" end ="111.222.333.255" />
      <constraint>
    </network>
  </constraint>
</display>

```

Complete and formal syntactical examples are given in Section 4 "Syntax" on page 17.

2.5 Rights Reward Model

ODRL supports the expression of Rights Rewards. This is the recognised set of Party rewarding mechanisms for the usage of the Asset. This is shown in Figure 5.

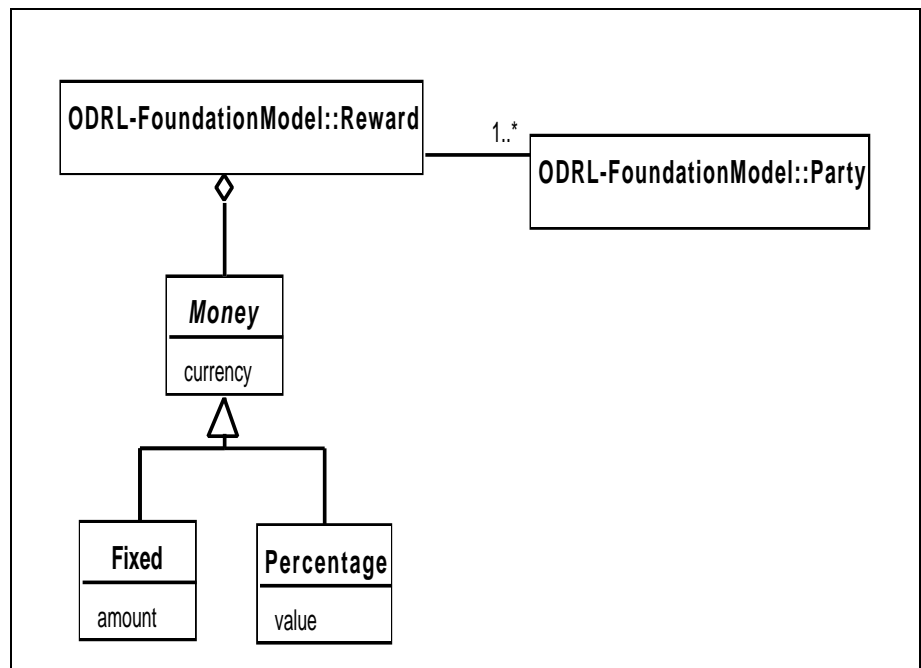


Figure 5. ODRL Rewards Model

The Reward entity is an aggregation of one abstract entity:

- Money - indicates a set of financial rewards associated with the usage of an Asset (realised with: Fixed, Percentage).

One or more Parties must be identified with the Rewards expression. The Role of the Party may also be indicated.

Complete and formal semantics for the ODRL Reward Model properties and attributes are specified in Section 3 "Semantics" on page 9.

2.5.1 Example

The ODRL Usage Model can be expressed using XML. A pseudo-example is shown below:

```
<reward>
  <percentage value="90" currency="AUD">
    <party idscheme="X500"
      uid="c=FOO;o=Federal Library;ou=Registry;cn=Maria Brown"
      role="Author">
  </percentage>
  <percentage value="10" currency="AUD">
    <party idscheme="X500"
      uid="c=FOO;o=Federal Library;ou=Registry;cn=Bye Me Inc"
      role="Publisher">
  </percentage>
</reward>
```

Complete and formal syntactical examples are given in Section 4 "Syntax" on page 17.

2.6 Rights Administration Model

ODRL supports the Administrative information about the Rights expression. This is shown in Figure 6.

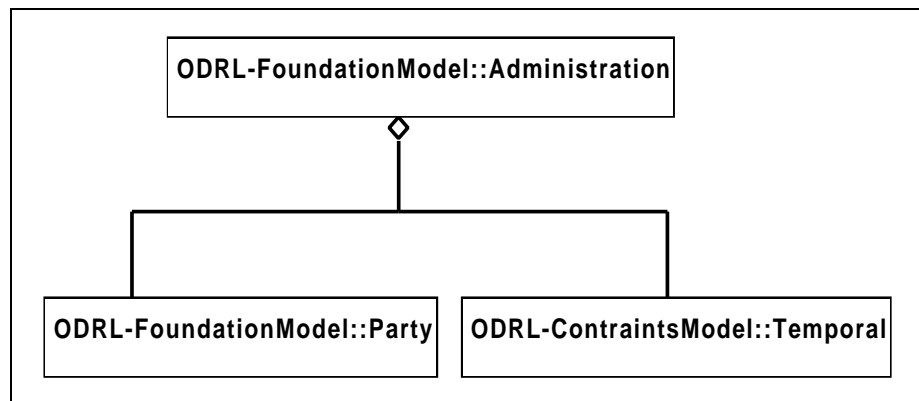


Figure 6. ODRL Administration Model

The Administration entity is an aggregation of two other existing entities:

- Party - indicates who is responsible for maintenance of this Rights expression).
- Temporal - indicates the valid date range for the Rights expression.

Complete and formal semantics for the ODRL Administration Model properties and attributes are specified in Section 3 "Semantics" on page 9.

2.6.1 Example

The ODRL Administration Model can be expressed using XML. A pseudo-example is shown below:

```
<rights>
  <administration>
    <party idscheme="X500"
      uid="c=FOO;o=Federal Library;ou=Registry;cn=Maria Brown"
      role="Rights Cataloguer">
      <temporal start="2000-01-01" end="2001-12-31"/>
    </administration>
    ...
  </rights>
```

Complete and formal syntactical examples are given in Section 4 "Syntax" on page 17.

3 Semantics

This section details the semantics of all the ODRL properties and attributes used in the ODRL Models.

3.1 Foundation Semantics

Name	Rights
Identifier	rights
Definition	The digital expression of intellectual property rights over an asset
Cardinality	mandatory
Content (entities)	usage reward administration

Name	Usage Rights
Identifier	usage
Definition	A defined set of actions or operations allowed over an asset
Cardinality	mandatory
Content (entities)	use transfer reuse asset

Name	Reward
Identifier	reward
Definition	Any form of value that may be exchanged for agreement to the conditions of the rights expressions
Cardinality	optional
Content (entities)	money party

Name	Asset
Identifier	asset
Definition	Any object (digital or physical) of value which rights can be assigned
Comment	Must be uniquely identifiable
Cardinality	mandatory
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Party
Identifier	party
Definition	An identifiable person or organisation to which rights may be assigned over assets
Comment	Must be uniquely identifiable
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid role - role played by the party

3.2 Usage Semantics

Name	Use
Identifier	use
Definition	A set of Usage rights pertaining to the end use of an asset
Comment	This entity is abstract and used to group common Rights Usages.
Cardinality	optional
Content (entities)	display print play execute

Name	Display
Identifier	display
Definition	The act of rendering the asset onto a screen or visual device
Cardinality	optional
Content (entities)	constraint

Name	Print
Identifier	print
Definition	The act of rendering the asset onto paper or hard copy form
Cardinality	optional
Content (entities)	constraint

Name	Play
Identifier	play
Definition	The act of rendering the asset into audio/video form
Cardinality	optional
Content (entities)	constraint

Name	Execute
Identifier	execute
Definition	The act of rendering the asset into machine-readable form
Cardinality	optional
Content (entities)	constraint

Name	Transfer
Identifier	transfer
Definition	A set of Usage rights pertaining to the exchange of ownership of an asset
Comment	This entity is abstract and used to group common Rights Usages
Cardinality	optional
Content (entities)	sell loan

Name	Sell
Identifier	sell
Definition	The act of allowing the asset to be sold for exchange of value
Comment	If the exchanged value is zero, then this is equivalent to “giving” the asset away
Cardinality	optional
Content (entities)	constraint

Name	Loan
Identifier	loan
Definition	The act of allowing the asset to be available for temporary use then returned
Comment	Time-based constraints are required
Cardinality	optional
Content (entities)	constraint (mandatory)

Name	Reuse
Identifier	reuse
Definition	A set of Usage rights pertaining to the re-utilisation of an asset
Comment	This entity is abstract and used to group common Rights Usages.
Cardinality	optional
Content (entities)	modify copy annotate

Name	Modify
Identifier	modify
Definition	The act of changing parts of the asset creating a new asset
Cardinality	optional
Content (entities)	constraint

Name	Copy
Identifier	copy
Definition	The act of copying parts of the asset for reuse into another asset
Cardinality	optional
Content (entities)	constraint

Name	Annotate
Identifier	annotate
Definition	The act of adding notations/commentaries to the asset creating a new asset
Cardinality	optional
Content (entities)	constraint

3.3 Constraint Semantics

Name	Constraint
Identifier	constraint
Definition	A restriction that applies to the Usage of an asset
Cardinality	optional
Content (entities)	user device range territorial aspect

Name	User
Identifier	user
Definition	Any human or organisation
Comment	This entity is abstract and used to group common Constraints
Cardinality	optional
Content (entities)	individual group

Name	Individual
Identifier	individual
Definition	An identifiable party
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Group
Identifier	group
Definition	A number of identifiable parties
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Device
Identifier	device
Definition	Any electronic or digital equipment
Comment	This entity is abstract and used to group common Constraints
Cardinality	optional
Content (entities)	Printer Computer Network

Name	Printer
Identifier	printer
Definition	An identifiable hard copy printer
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Computer
Identifier	computer
Definition	An identifiable computer system
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Network
Identifier	network
Definition	An identifiable network
Comment	If below attributes are not sufficient, then IP Address Range can also be used to limit the network.
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Range
Identifier	range
Definition	Any electronic or digital equipment
Comment	This entity is abstract and used to group common Constraints.
Cardinality	optional
Content (entities)	Count Temporal IP Address

Name	Count
Identifier	count
Definition	A numeric value range
Comment	If there is no "start" and/or "end" value, then the range is open-ended. Integer, Floats and negative numbers must be supported.
Cardinality	optional
Content (attributes)	start - the beginning of the range end - the end of the range

Name	Temporal
Identifier	temporal
Definition	A date-based range
Comment	If there is no “start” and/or “end” value, then the range is open-ended. W3C DateTime format [W3CDTF] must be supported.
Cardinality	optional
Content (attributes)	start - the beginning of the range end - the end of the range

Name	IP Address
Identifier	ipaddress
Definition	A network IP address range
Comment	There must be “start” and/or “end” values specified. The IP address format must be supported (Eg xxx.xxx.xxx.xxx).
Cardinality	optional
Content (attributes)	start - the beginning of the range end - the end of the range

Name	Territorial
Identifier	territorial
Definition	Any geographical range or extent
Comment	This entity is abstract and used to group common Constraints.
Cardinality	optional
Content (entities)	Country

Name	Country
Identifier	country
Definition	Specification of a Country code
Comment	Recommended best practice is to use the codes specified by the [ISO3166] Scheme.
Cardinality	optional
Content (attributes)	uid - unique identifier idScheme - scheme used for the uid

Name	Aspect
Identifier	aspect
Definition	Any distinct feature of the Asset
Comment	This entity is abstract and used to group common Constraints
Cardinality	optional
Content (entities)	Quality Page

Name	Quality
Identifier	quality
Definition	Specification of quality aspects of the asset
Cardinality	optional
Content (attributes)	tonality - the bit-depth resolution - the pixel size

Name	Page
Identifier	page
Definition	Specification of a page aspects of the asset
Comment	Recommended best practice is to use the codes specified by the [ISO3166] Scheme.
Cardinality	optional
Content (entities)	constraint

3.4 Reward Semantics

Name	Money
Identifier	money
Definition	Rewards in the form of financial payments
Comment	This entity is abstract and used to group common Reward types.
Cardinality	optional
Content (entities)	Fixed Percentage
(attributes)	currency - the currency for the amount (use [ISO4217] codes)

Name	Fixed
Identifier	fixed
Definition	A fixed monetary value
Comment	The total of the Fixed values (for a single) asset must not exceed the Retail Price.
Cardinality	optional
Content (attributes)	amount - the value of the payment

Name	Percentage
Identifier	percentage
Definition	A proportion of the value of the asset
Comment	The total of the Percentage values (for a single) asset must not exceed 100%.
Cardinality	optional
Content (attributes)	value - a number from 0 to 100

3.5 Administration Semantics

Name	Administration
Identifier	administration
Definition	Administrative information about the Rights expression
Cardinality	optional
Content (entities)	party temporal

4 Syntax

ODRL can be expressed in [XML] (see [DTD] in Appendix A and [XML SCHEMA] in Appendix B).

The ODRL [XML NAMESPACE] URI is:

<http://purl.net/ODRL/1.0>

NOTE: This URI should be considered experimental until the ODRL specification is formalised by an appropriate body.

The XML syntax will be explained via a series of Use Cases.

4.1 Ebook Use Case #1

Corky Rossi (an author) and Addison Rossi (an illustrator) publish their ebook via EBooksRUS Publishers. They wish to allow consumers to purchase the ebook which is restricted to a single CPU only and they are allowed to print a maximum of 2 copies. They will also allow the first 5 pages of the ebook to be viewed online for free.

The revenue split is \$AUD10 to the Author, \$AUD2 to the Illustrator and \$AUD8 to the Publisher.

Massimo DiAngelo from EBooksRUS Publishers is responsible for maintaining the Rights metadata which has a policy of one year validity on all its metadata.

The XML encoding of this in ODRL would be:

```
<?xml version="1.0"?>
<rights xmlns="http://purl.net/ODRL/1.0">
  <administration>
    <party idscheme="DOI"
      uid="doi://10.9999/EP/mdiangelo-001"
      role="Rights Manager">
      <temporal start="2000-07-01" end="2001-06-30"/>
    </administration>
    <usage ID="000001">
      <asset idscheme="DOI" uid="doi://10.9999/EB/rossi-0001" />
      <display>
        <constraint>
          <computer/>
        </constraint>
      </display>
    </usage>
  </rights>
```

```

    <print>
      <constraint>
        <count start="0" end="2"/>
      </constraint>
    </print>
  </usage>
  <reward href="#00001">
    <fixed amout="10" currency="AUD">
      <party idscheme="DOI"
        uid="doi://10.9999/EP/crossi-001"
        role="Author"
      </fixed>
    <fixed amout="2" currency="AUD">
      <party idscheme="DOI"
        uid="doi://10.9999/EP/arossi-001"
        role="Illustrator"
      </fixed>
    <fixed amout="8" currency="AUD">
      <party idscheme="DOI"
        uid="doi://10.9999/EP/ebbooksrus-001"
        role="Publisher"
      </fixed>
    </reward>
  <usage ID="000002">
    <asset idscheme="DOI" uid="doi://10.9999/EB/rossi-0001" />
    <display>
      <constraint>
        <page>
          <constraint>
            <count start="1" end="5"/>
          </constraint>
        </page>
      </constraint>
    </display>
  </usage>
  <reward href="#00002"/>
</rights>

```

4.2 Ebook Use
Case #2

To do...

4.3 Video Use
Case #1

To do...

5 Conformance

What are the requirements to conform to ODRL?

Use [RFC2119] wording (must, shall, may)

6 References

Technical Standards:

- [DOI] Digital Object Identifier
<<http://www.doi.org/>>
- [DTD] Document Type Definition
- [EBX] Electronic Book Exchange
<<http://www.ebxwg.org/>>
- [IFLA] Functional Requirements for Bibliographic Records
<<http://www.ifla.org/VII/s13/frbr/frbr.htm>>
- [IMS] Instructional Management Systems
<<http://www.imsproject.org/>>
- [INDECS] Interoperability of Data in Ecommerce Systems
<<http://www.indecs.org/>>
- [ISBN] International Standard Book Number
- [ISO3166] Country Names and Code Elements
<<http://www.din.de/gremien/nas/nabd/iso3166ma/codlstp1/>>
- [ISO4217] Currency Names
<<http://www.xe.net/gen/iso4217.htm>>
- [MPEG] Moving Picture Experts Group (WG 4,7,21)
<<http://www.cselt.it/leonardo/mpeg/>>
- [ONIX] ONIC International V1.1
<<http://www.editeur.org/onix.html>>
- [RFC2119] Key words for use in RFCs to Indicate Requirement Levels
<<http://www.ietf.org/rfc/rfc2119.txt>>
- [URI] Uniform Resource Identifiers (URI): Generic Syntax
<<http://www.ietf.org/rfc/rfc2396.txt>>
- [XML] Extensible Markup Language 1.0
<<http://www.w3.org/TR/REC-xml>>
- [XML NAMESPACE] Namespaces in XML
<<http://www.w3.org/TR/REC-xml-names/>>
- [XML SCHEMA] XML Schemas Part 1: Structures
<<http://www.w3.org/TR/xmlschema-1/>>
- [W3CDTF] Date and Time Formats
<<http://www.w3.org/TR/NOTE-datetime>>

Position Papers:

- [ERICKSON] Toward an Open Rights Management Interoperability Framework, John S Erickson.
<<http://www.oasis-open.org/cover/ericksonRT19990624.pdf>>
- [HIGGS] The Nature of Knowledge and Rights Management Systems, Peter Higgs.
<http://www.iprsystems.com/html/rights_management.html>

7 Contributors

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8 TODO

How to express “narrowing” of rights?

How to express “equivalent” Rights?

How to express Watermarking?

How to do Interval Ranges?

Where to set the retail price for the Asset?

Do we need a Scheme ID for Roles?

Add Exclusivity attribute.

Appendix: A ODRL DTD (Normative)

To do...

Appendix: B ODRL XML Schema (Non-Normative)

To do...

NOTE: The XML Schema will become Normative when the XML Schema becomes a W3C Recommendation.