



2015 LOD Touch Day

Linked **Open** Data

2015.4.30. 박진호(jino.kor@listinc.kr)

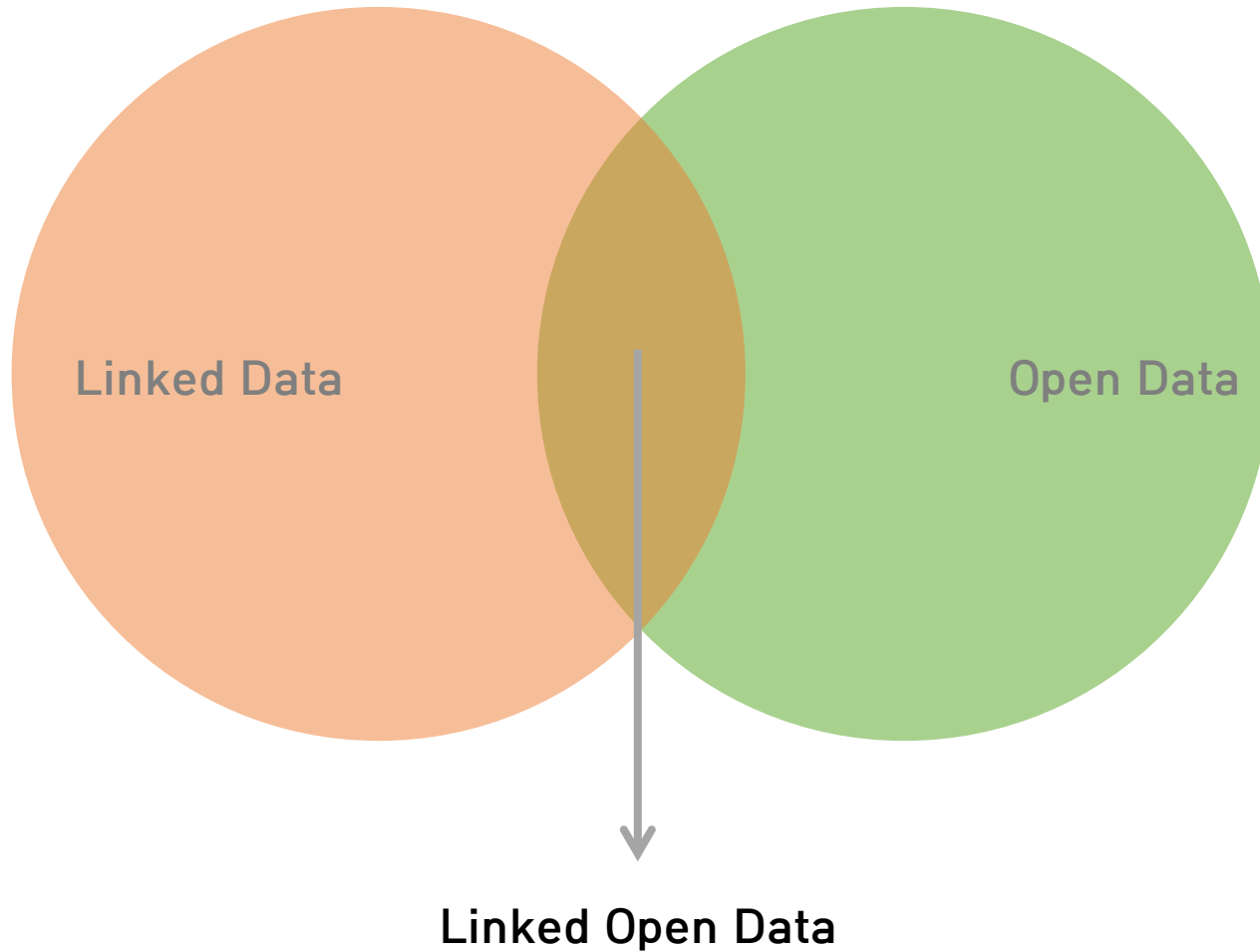
World Wide Web For Everyone! Access



Data, Data, Data

- Linked Data, Open Data, Big Data, Gov2.0 등 최근 화두가 되고 있는 용어들은 공통적으로 **가공된 정보(information)가 아닌 이전 단계의 데이터(data) 활용에 대한 가능성**에 중점
- 정보화 사회에서 데이터는 흔히 ‘새로운 오일(data is the new oil)’로 지칭하며, 경제적 파급효과 분석을 위한 노력이 계속되고 있음
- 데이터 경제(Data Economy)적 관점은 이러한 노력을 뒷받침할 수 있는 중요한 접근적임
 - ‘데이터’가 가져올 수 있는 실질적인 혜택과 구현은 어려움이 존재함

Linked Open Data



Open Data

- 저작권, 특허 등 다양한 조건들에 제약을 받지 않고 누구나 게시하고 모두가 자유롭게 사용할 수 있는 데이터



Linked Data

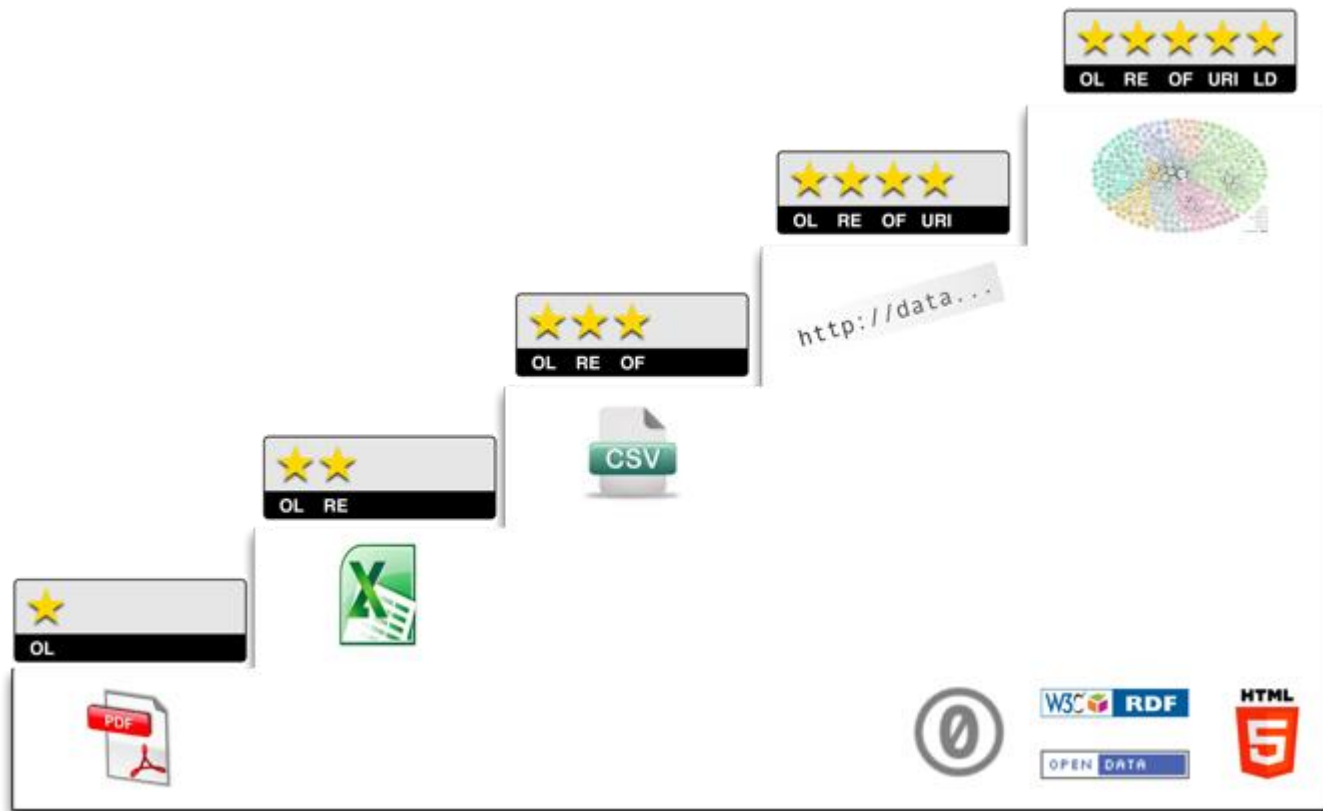
- Linked Data는 데이터를 개방하는 방식 중 이미 거대한 정보생태계를 갖추고 있는 웹(web)을 플랫폼으로 기계(machine)가 자동적으로 처리할 수 있는 데이터 형식임.
 - 이전에도 데이터, 정보를 개방하는 방식은 존재해 왔음(예, 활용을 위한 엑셀 등 파일형식과 기계적인 연계 처리를 위한 Open API).
 - 그러나 이전의 방식은 창조적 성과물 창출을 위한 가공, 정제 등 부가적인 노력(시간, 예산 등)이 필요했으며, 저작권 등 활용에 있어서 장애요소가 지속적으로 존재해 왔음.
 - Linked Open Data는 이미 거대한 정보생태계를 갖추고 웹(web)에 공통된 데이터 이해와 교환방식(linked data 원칙과 표준 용어집 활용)을 준수하는 개방형 데이터를 구축하는 것으로 다양한 창조적 아이디어 구현과 데이터를 기반으로 하는 새로운 서비스 실현이 가능한 **가장 적극적인 형태의 개방형 데이터임.**

?

웹은 이미 개방된 공간이 아닌가?

5 Star Open Data

- Tim Berners-Lee, 별점을 이용해 Open Data의 다섯 단계 표현.



5 Star Open Data

별점	설명	예제
★	데이터를 웹 상에 오픈 라이선스로 (포맷에 상관없이) 공개	링크
★★	구조화된 데이터로 제공(예, 표를 스캔한 이미지 파일 대신 엑셀 파일)	링크
★★★	비독점 포맷을 사용(예, 엑셀 파일 대신 CSV 파일)	링크
★★★★	사람들이 가리킬 수 있도록 개체를 나타내기 위해 URI를 사용	링크
★★★★★	데이터의 문맥과 배경을 제공하기 위해 다른 데이터와 링크	링크

한 마디로,

웹(web)을 모두가 자유롭게 쓸 수 있는 **글로벌 데이터베이스**로 만들자!!

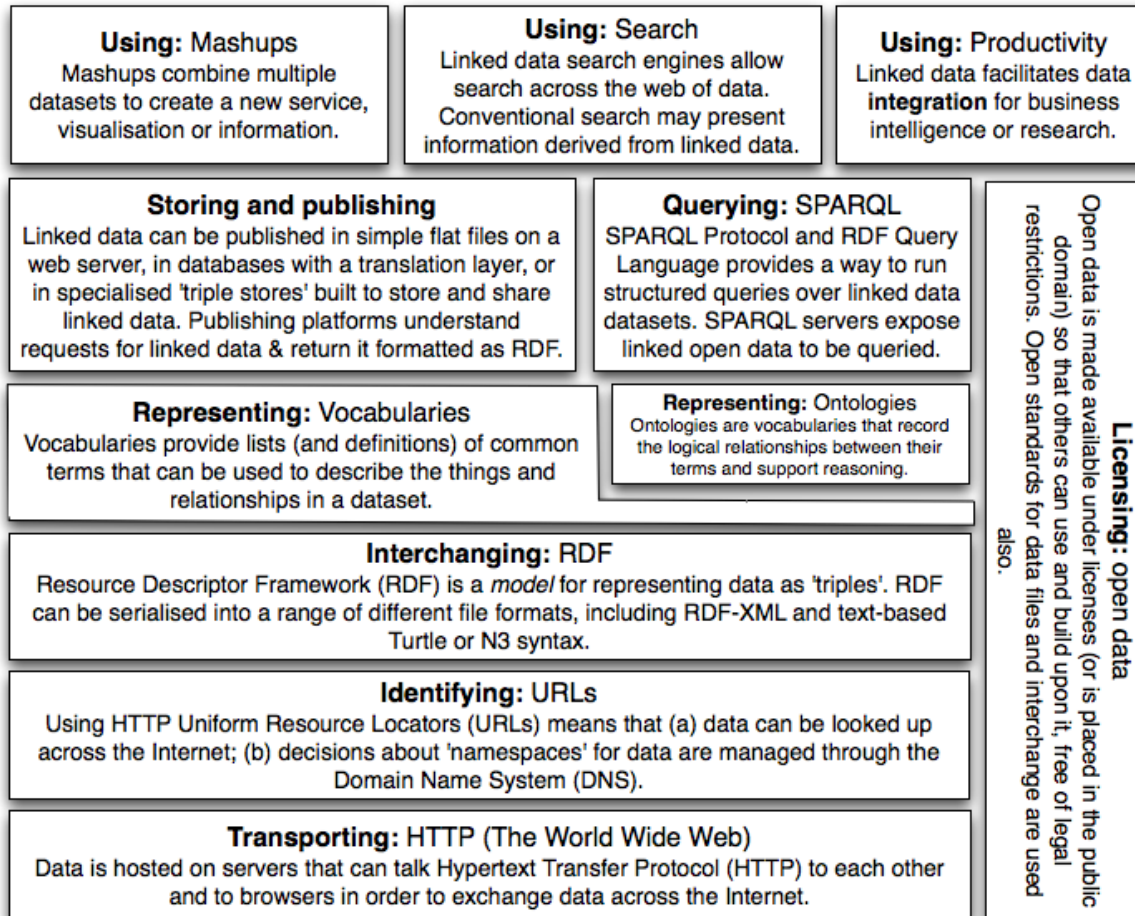
이런 일이 가능하도록 하는 최소한의 필수조건

Linked Data Principles

링크드 데이터 원칙

- 특정 개념(things) URI를 사용해서 명명함.
- HTTP를 활용해서 URIs로 명명된 자원에 접근할 수 있도록 함.
- URI로 정보를 찾았을 때 RDF(S), SPARQL과 같은 표준을 활용해서 유용한 정보를 제공해야 함.
- 또 다른 URI를 포함하고 있어서 더 많은 것(개념, things)들을 탐색할 수 있어야 함.

Elements of Linked Open Data Stack(revision 3)



Elements of the Linked Open Data Stack (revision 3) - 5th May 2011. CC BY-SA-NC
Draft sketch by Tim Davies (@timdavies / tim@practicalparticipation.co.uk) for IKM Working Paper on Linked Open Data for Development. Comments welcome. Search 'linked open data stack' on <http://www.opendataimpacts.net> for latest version.

Idea based on Semantic Web Stack at http://en.wikipedia.org/wiki/Semantic_Web_Stack

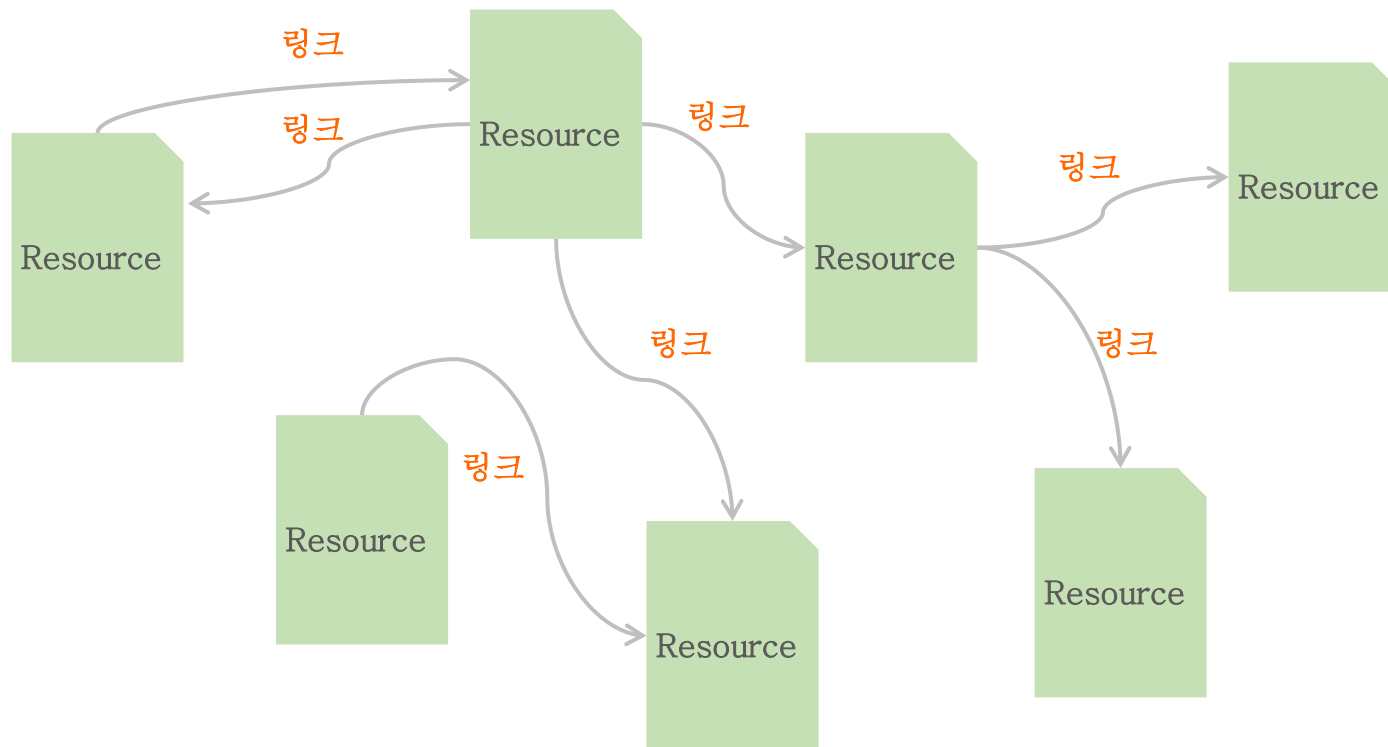


지금하고 무엇이 어떻게 달라지는가?

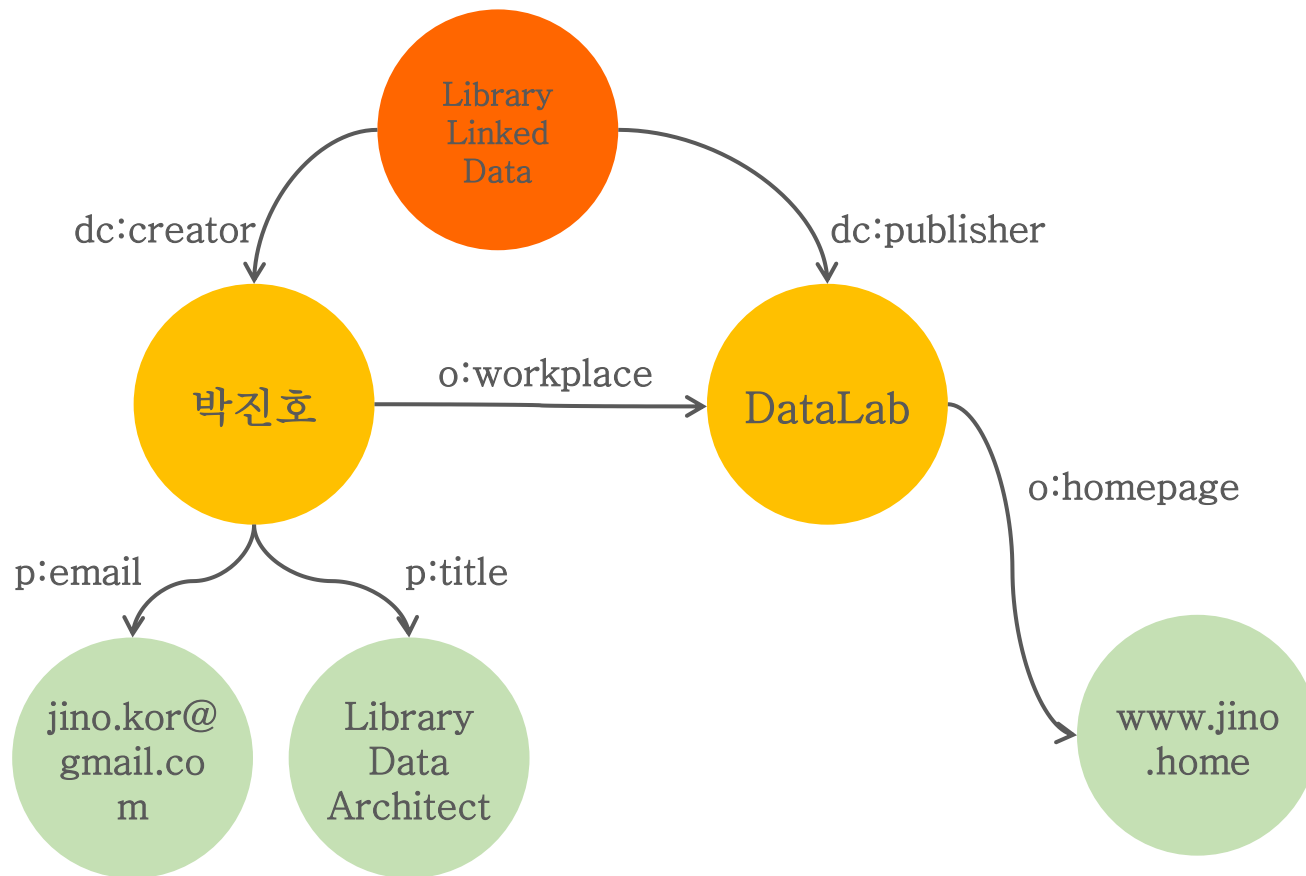
지금하고 뭐가 다른 거지?

Web of Documents Vs Web of Data

오늘날의 웹 : Web of Documents(HTML)



오늘 이야기하는 웹 : Web of Data





두 개가 전혀 별개의 것인가?

문서 중심의 웹이 사라지고 데이터 웹이 등장하는 것인가?

"The Semantic Web is an **extension** of the current web in which information is given **well-defined meaning**, better enabling computers and people to work in cooperation."

Tim Berners-Lee, James Hendler, Ora Lassila, The Semantic Web, Scientific American, May 2001

첫 번째 문제점 및 접근점

- 아직까지 웹의 문서들은 HTML로 작성, HTML은 문법으로 숨겨진 의미(Meaning, Semantics)를 표현하지는 못함
- 만약 컴퓨터가, 우리처럼 Meaning을 이해할 수 있다면, 우리(사람)의 정보검색(탐색)은 더 풍요로워질 것임



SEMANTIC WEB
THINKTANK

ENTER HERE

Mr. Hatem Mahmoud

Syntax is the study of grammar

Semantics is the study of meaning

Syntax is how to say something

Semantic is the meaning behind what you say

Different syntaxes may have the same semantic:

$$x += y$$

$$x = x + y$$

두 번째 문제점 및 접근점

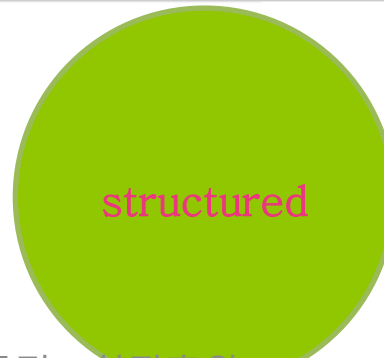
- 이미 구조화 된 데이터(정보원)를 비구적인 형태로 표현함
- 제공할 수 있는 많은 데이터(정보원) 중 공급자 중심에서 판단하고 서비스함

The Problem of Structured Data

- Modern Web Sites Built with 3 Tier Architecture
 - **Data Tier:** Database Where Content Lives.
 - **Presentation Tier:** HTML Document that is sent to user.
 - **Logic Tier:** Software that reads from the Data Tier and outputs the Presentation Tier.



**Logic
Tier**



Wikipedia Vs Dbpedia

http://en.wikipedia.org/wiki/Samul_nori

http://dbpedia.org/page/Samul_nori



WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Featured content
Current events
Random article
Donate to Wikipedia

▼ Interaction

Help
About Wikipedia
Community portal
Recent changes
Contact Wikipedia

► Toolbox

► Print/export

▼ Languages

Deutsch
Français
한국어
Bahasa Indonesia
日本語
Русский

Article **Talk**

Read **Edit** View history

Search



Samul nori

From Wikipedia, the free encyclopedia

Samul nori is a genre of traditional [percussion](#) music originating in [Korea](#). The word *samul* means "four objects" and *nori* means "play"; samul nori is performed with four traditional Korean musical instruments:

- Kkwaenggwan* (a small [gong](#))
- Jing* (a larger gong)
- Janggu* (an hourglass-shaped [drum](#))
- Buk* (a [barrel drum](#) similar to the [bass drum](#))

The traditional Korean instruments are called *pungmul*.

Samul nori has its roots in *nong-ak* (literally "farmers' music"), a Korean folk genre comprising music, [acrobatics](#), folk dance, and rituals, which was traditionally performed in [rice](#) farming villages in order to ensure and to celebrate good harvests. Specifically, samul nori music derives from *utdari pungmul* (the *gut*, or shaman ceremony rhythm of the [Gyeonggi-do](#) and [Chungcheong](#) provinces of [South Korea](#)), as well as the genres of [Yeongnam](#) folk music and [Honam](#) *udo gut*, combined with more contemporary improvisations, elaborations, and compositions.^[3] Such *nong-ak* is steeped in traditional [animism](#) and [shamanism](#), but also shows influences from [Korean Buddhism](#). While *nong-ak* often features the use of wind instruments, *samul nori* only features the aforementioned four percussion instruments.

Each of the four instruments represents a different weather condition: the *janggu* represents rain, the *kkwaenggwan* thunder, the *jing* the sounds of the wind, and the *buk* clouds. The idea of [yin and yang](#) is also reflected in these instruments: the *buk* and *janggu* (leather) represent the sounds of the earth, while the *jing* and *kkwaenggwan* (metal) represent sounds of the heavens. Although generally performed indoors, as a staged genre, samul nori depicts the traditional Korean culture, an agricultural society rooted in the natural environment.^[*citation needed*] Samul nori is characterized by strong, accented rhythms, vibrant body movements, and an energetic spirit.

Samul nori has gained international popularity, with many samul nori bands and camps worldwide. Since the 1980s in South Korea, there has been a marked increase in the amount of fusion music, combining samul nori and Western instruments.^[*citation needed*] Samul nori is also extensively used in the Korean musical [Nanta](#).

The most famous samul nori ensemble is the internationally famous South Korean ensemble called SamulNori, which is credited for bringing the music from a rural folk genre to the contemporary stage.^[1] The group was established in February 1978 by *janggu* player and former [Namsadang](#) star performer **Kim Duk Soo** (김덕수 [4]),^[2] with the remaining original performers being Kim Young Bae (*kkwaenggwan*), Choi Teo Hyun (*jing*), and Lee Jong Dae (*buk*). Following Kim Young Bae's death in 1985, he was replaced by Choi Jong Sil, and Lee Kwang Soo replaced Lee Jong Dae on the *buk*. [5] The group has collaborated and recorded with a number of non-Korean ensembles, most notably in 1987 with the Red Sun jazz band, with

Samul nori



A *samul nori* performance in Bremen, Germany

Korean name

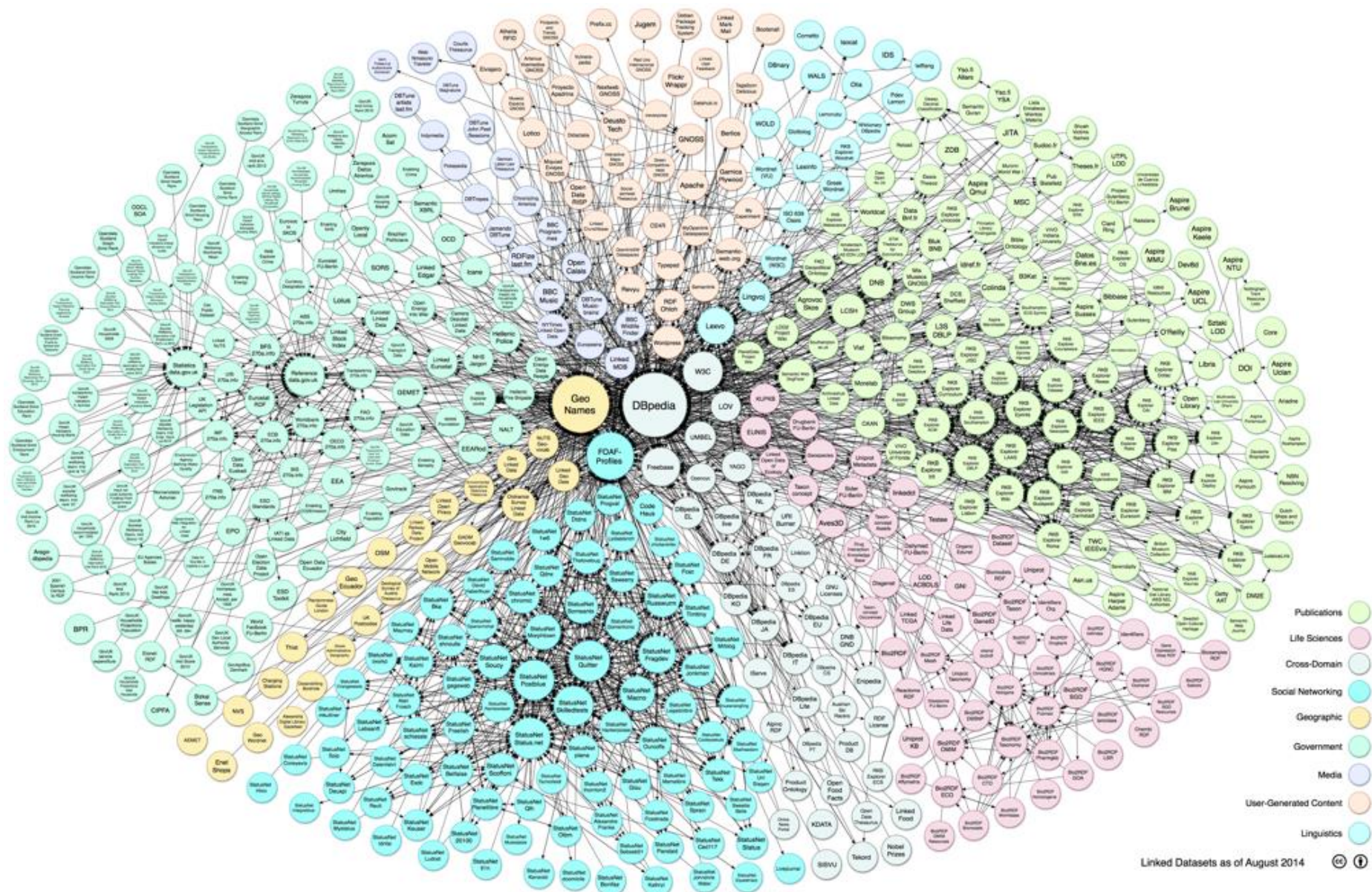
Hangul	사물놀이
Hanja	四物놀이
Revised Romanization	Samullori or Samul nori
McCune-Reischauer	Samullori or Samul nori

About: Samul nori

An Entity of Type : [Korean styles of music](#), from Named Graph : <http://dbpedia.org>, within Data Space : [dbpedia.org](#)

Samul nori is a genre of traditional percussion music originating in Korea. The word samul means "four objects" and nori means "play"; samul nori is performed with four traditional Korean musical instruments: Kkwaenggwari Jing (a larger gong) Janggu Buk The traditional Korean instruments are called pungmul.

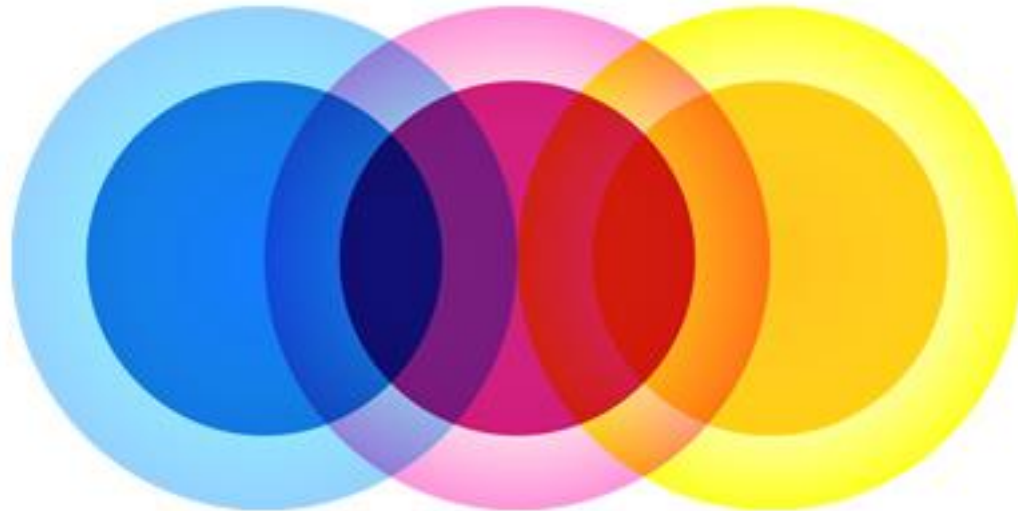
Property	Value
dbpedia-owl:abstract	<ul style="list-style-type: none"> Samulnori ist ein koreanisches Musikgenre und die moderne Bühnenform aus traditioneller koreanischer Perkussionsmusik. Samul nori is a genre of traditional percussion music originating in Korea. The word samul means "four objects" and nori means "play"; samul nori is performed with four traditional Korean musical instruments: Kkwaenggwari Jing (a larger gong) Janggu Buk The traditional Korean instruments are called pungmul. Samul nori has its roots in nong-ak (literally "farmers' music"), a Korean folk genre comprising music, acrobatics, folk dance, and rituals, which was traditionally performed in rice farming villages in order to ensure and to celebrate good harvests. Specifically, samul nori music derives from utdari pungmul (the gut, or shaman ceremony rhythm of the Gyeonggi-do and Chungcheong provinces of South Korea), as well as the genres of Yeongnam folk music and Honam udo gut, combined with more contemporary improvisations, elaborations, and compositions. http://www.lifeinkorea.com/culture/samul/samul.cfm?Subject=history Such nong-ak is steeped in traditional animism and shamanism, but also shows influences from Korean Buddhism. While nong-ak often features the use of wind instruments, samul nori only features the aforementioned four percussion instruments. Each of the four instruments represents a different weather condition: the janggu represents rain, the kkwaenggwari thunder, the jing the sounds of the wind, and the buk clouds. The idea of yin and yang is also reflected in these instruments: the buk and janggu (leather) represent the sounds of the earth, while the jing and kkwaenggwari (metal) represent sounds of the heavens. Although generally performed indoors, as a staged genre, samul nori depicts the traditional Korean culture, an agricultural society rooted in the natural environment. Samul nori is characterized by strong, accented rhythms, vibrant body movements, and an energetic spirit. Samul nori has gained international popularity, with many samul nori bands and camps worldwide. Since the 1980s in South Korea, there has been a marked increase in the amount of fusion music, combining samul nori and Western instruments. Samul nori is also extensively used in the Korean musical Nanta. The most famous samul nori ensemble is the internationally famous South Korean ensemble called SamulNori, which is credited for bringing the music from a rural folk genre to the contemporary stage. The group was established in February 1978 by janggu player and former Namsadang star performer Kim Duk Soo, with the remaining original performers being Kim Young Bae (kkwaenggwari), Choi Tae Hyun (jing), and Lee Jong Dae (buk). Following Kim Young Bae's death in 1985, he was replaced by Choi Jong Sil, and Lee Kwang Soo replaced Lee Jong Dae on the buk. http://www.lifeinkorea.com/culture/samul/samul.cfm?Subject=history The group has collaborated and recorded with a number of non-Korean ensembles, most notably in 1987 with the Red Sun jazz band, with one SamulNori/Red Sun CD selling 70,000 copies. http://www.asiaweek.com/asiaweek/magazine/nations/0,8782,165862,00.html http://times.hankooki.com/ipage/culture/200610/kt2006101117513511690.htm [En:Samul nori at Allmusic] They have also performed (in August 2000 at the Earth Celebration International Arts Festival on Sado Island in Japan) with the Japanese taiko group Kodo. http://www.outdoorjapan.com/features/ojfeature-ec2000.html About his choice to move from the more traditional outdoor performances to indoor venues, Kim Duk Soo states that at the time he established SamulNori, during the last years of the administration of former South Korean president Park Chung Hee, Korean traditional music was associated with the student movement, and anyone playing such instruments outdoors could be arrested. Thus, he developed the current version of the genre, which is generally presented indoors, on concert hall stages. http://english.seoul.go.kr/today/infocus/interview/1236715_5099.php In 1993, SamulNori expanded to include twenty performers, and changed its name to SamulNori Hanullim, Inc. ("Hanullim" meaning "big bang"). サムルノリ (Template:Lang) は、朝鮮の伝統楽器であるケンガリ・チン・チャング・ブクを用いた韓国の現代音楽。ブンムルノリと呼ばれる農村地帯の伝統的な農楽をもとに、1970年代末に舞台芸術としてアレンジされたパーカッション・アンサンブルである。名称は、1978年に結成された演奏グループ「サムルノリ」に由来し、4種の伝統楽器を用いた演奏そのものを指すようになった。韓国の農楽そのものをサムルノリと呼ぶのは誤用である。 Самульнорі — одно из интереснейших явлений в культуре Кореи, представляющее собой игру на самобытных ударных инструментах. Le Samul nori est un genre de musique coréenne.
dbpedia-owl:thumbnail	<ul style="list-style-type: none"> http://upload.wikimedia.org/wikipedia/commons/thumb/7/73/Bigthumb_DSC_1101.jpg/200px-Bigthumb_DSC_1101.jpg
dbpedia-owl:wikiPageExternalLink	<ul style="list-style-type: none"> http://www.samulnori.de http://www.samulnori.eu http://english.seoul.go.kr/today/infocus/interview/1236715_5099.php http://www.outdoorjapan.com/features/ojfeature-ec2000.html http://www.lifeinkorea.com/culture/samul/samul.cfm?Subject=history http://www.olsouparis.org http://www.poongmul.com http://www.asiaweek.com/asiaweek/magazine/nations/0,8782,165862,00.html



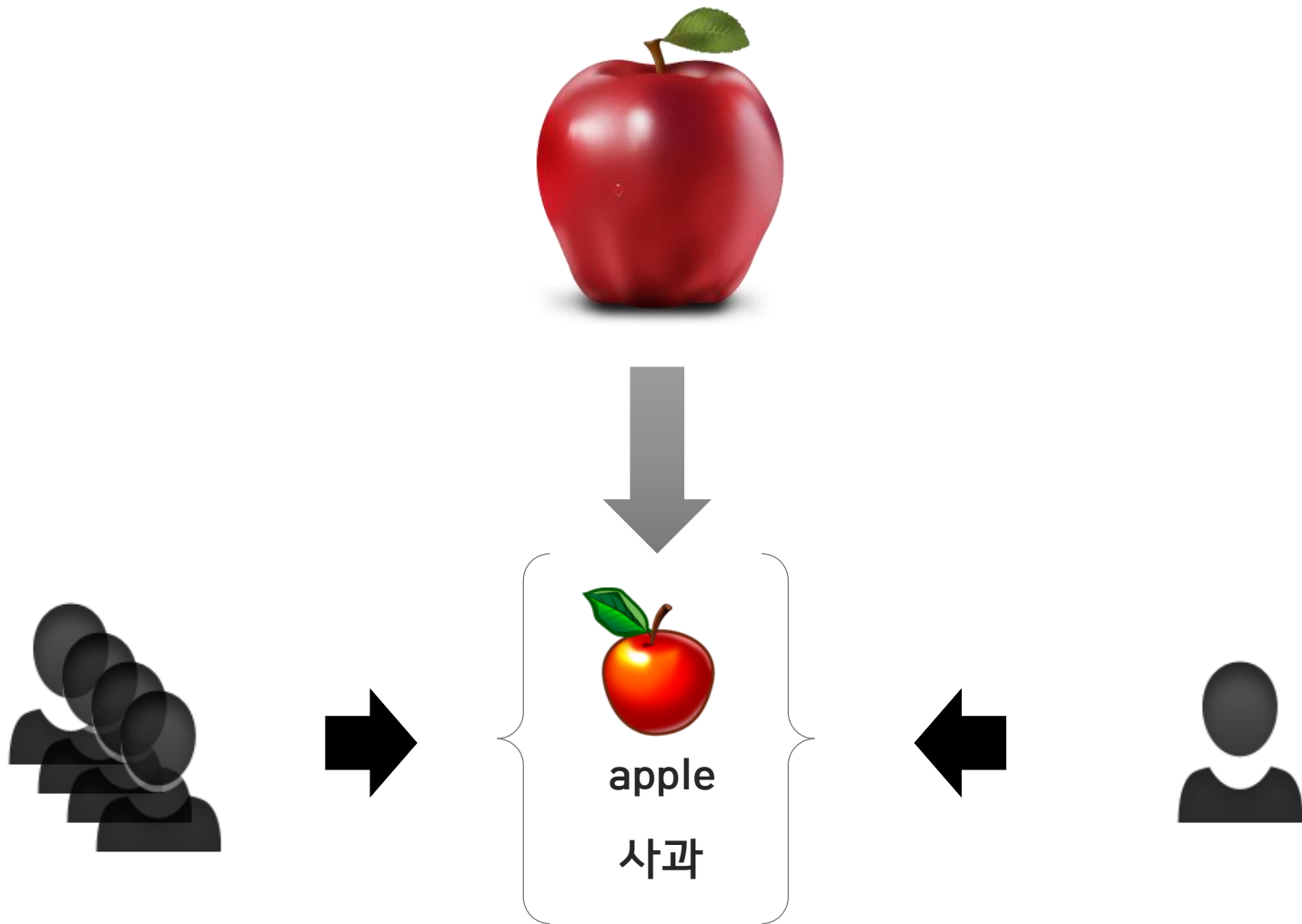
2015.4.29. 한국정보화진흥원, LOD
Touch Day

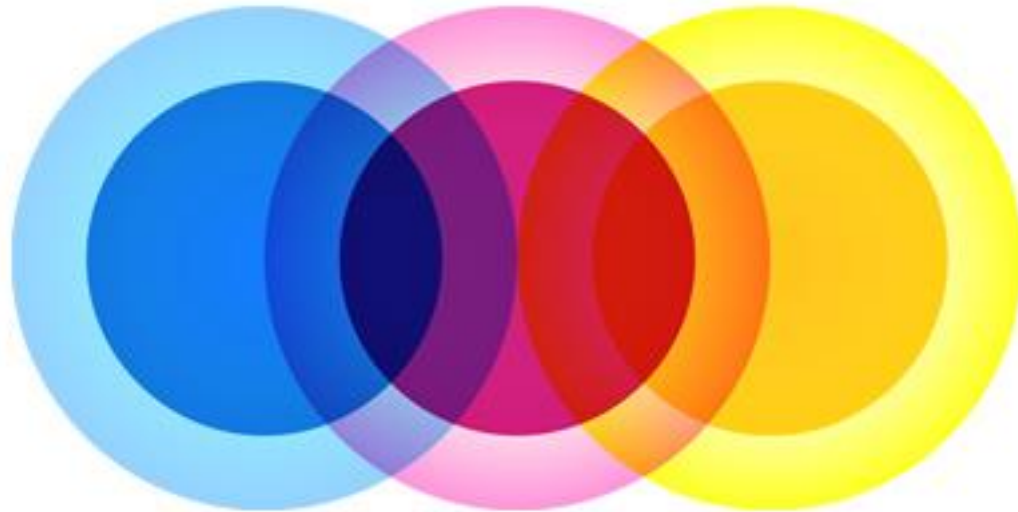


어떻게 Web을
Global Database로 활용할 것인가?



우리가 공유하고 있는 것.
한국어?





우리가 공유하고 있는 것.
동일한 개념.

RDF

- Resource Description Framework
- 웹 상의 자원을 기술하기 위한 W3C 표준
 - Resource: URI를 갖는 모든 것
 - Description: 자원(resource)들의 속성, 특성, 관계 기술
 - Framework: 위의 것들을 기술하기 위한 모델, 언어, 문법
- RDF는 컴퓨터 애플리케이션이 정보를 읽고 이해할 수 있도록 하기 위한 표준 방법
- RDF로 기술된 것은 웹에서 보여주기 위함은 아님

RDF 모델

- RDF는 SPO, 주어(Subject)/술어(Predicate)/목적어(Object)로 구성됨
- “인간에 대한 예의”의 “작가”는 “공지영”이다.

주어(Subject)

술어(Predicate)

목적어(Object)

- “<http://www.amazon.com/Human-Decency-Jiyoung-Gong/dp/8988095928>” has a creator whose value is “http://en.wikipedia.org/wiki/Gong_Ji-young”.

RDF 모델

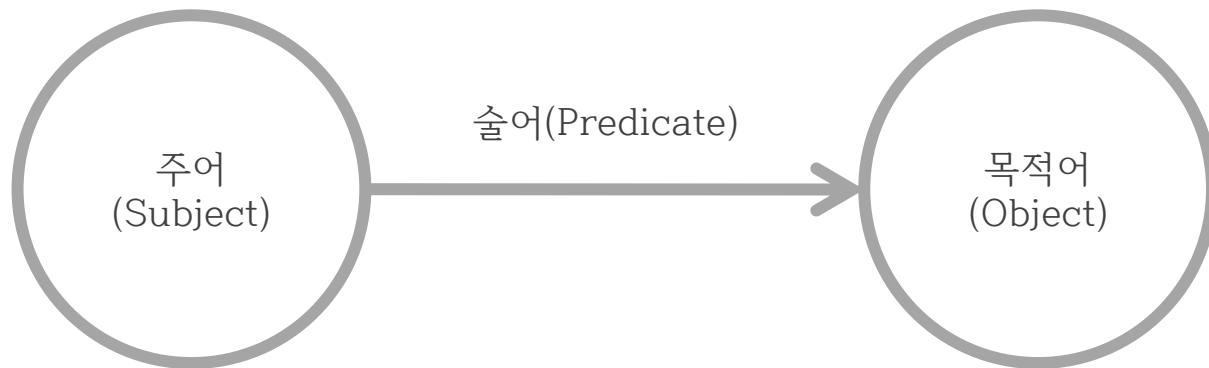
주어(Subject) → “<http://www.amazon.com/Human-Decency-Jiyoung-Gong/dp/8988095928>”

has a creator ← 술어(Predicate)

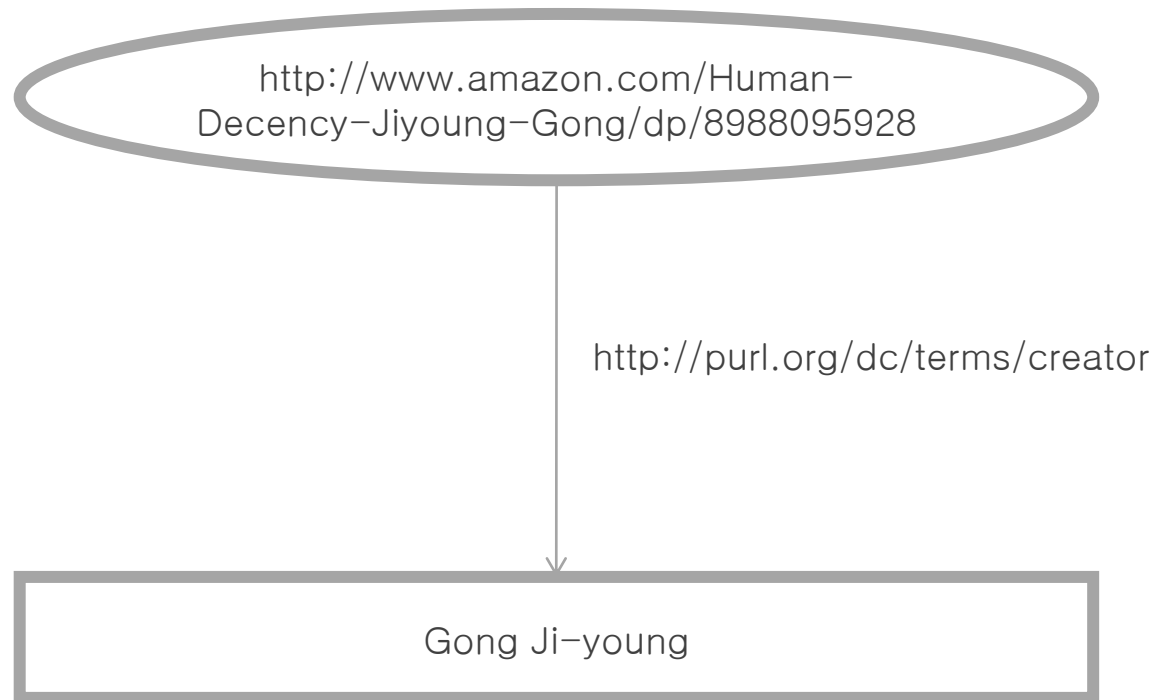
whose value is “http://en.wikipedia.org/wiki/Gong_Ji-young” .

목적어(Object) →

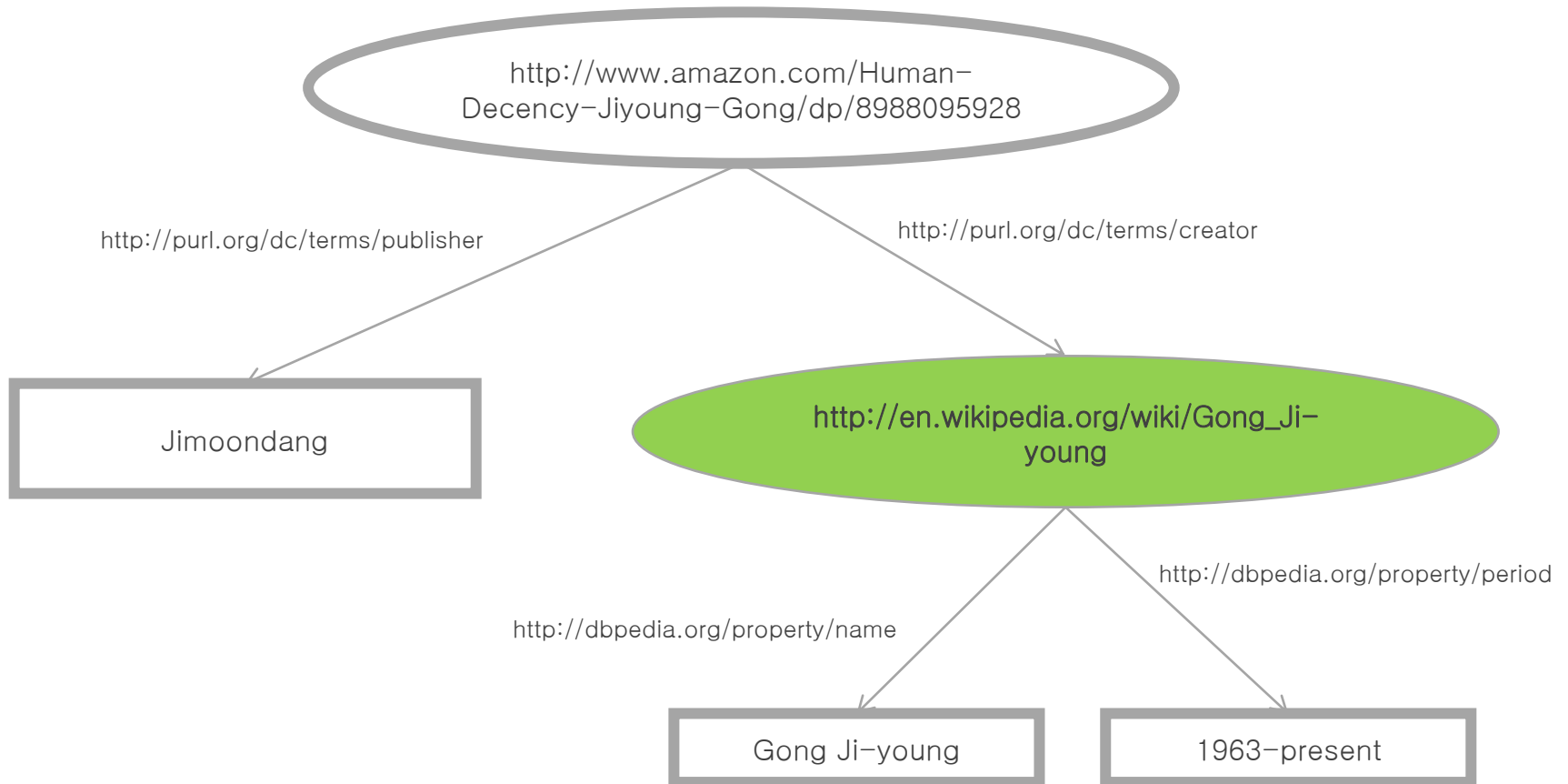
RDF Graph Model



RDF Graph Model



RDF Graph Model



RDF/XML로 표현

```
<RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
      xmlns:dc="http://purl.org/dc/terms/"
      xmlns:dbpprop="http://dbpedia.org/property/" >

  <Description about="http://www.amazon.com/Human-Decency-Jiyoung-
    Gong/dp/8988095928">
    <dc:publisher>Jimoondang</dc:publisher>
    <dc:creator rdf:resource="http://en.wikipedia.org/wiki/Gong_Ji-young"/>
  </Description>

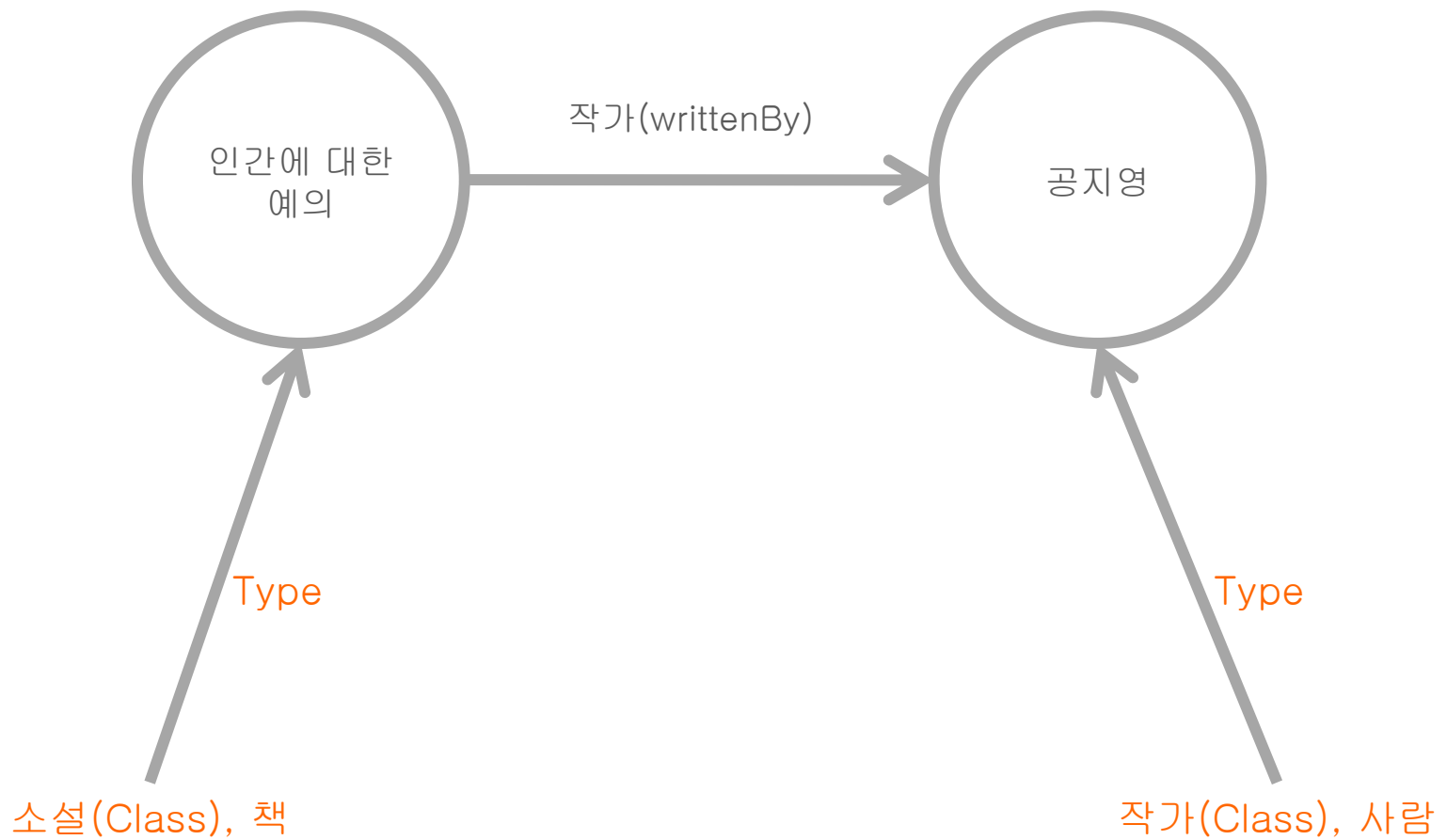
  <Description about="http://en.wikipedia.org/wiki/Gong_Ji-young">
    <dbpprop:name>Gong Ji-young</dbpprop:name>
    <dbpprop:period>1963-present</dbpprop:period >
  </Description>

</RDF>
```



명확한가? 충분한가?

우리는 충분히 대화가 가능한가?




Ontology

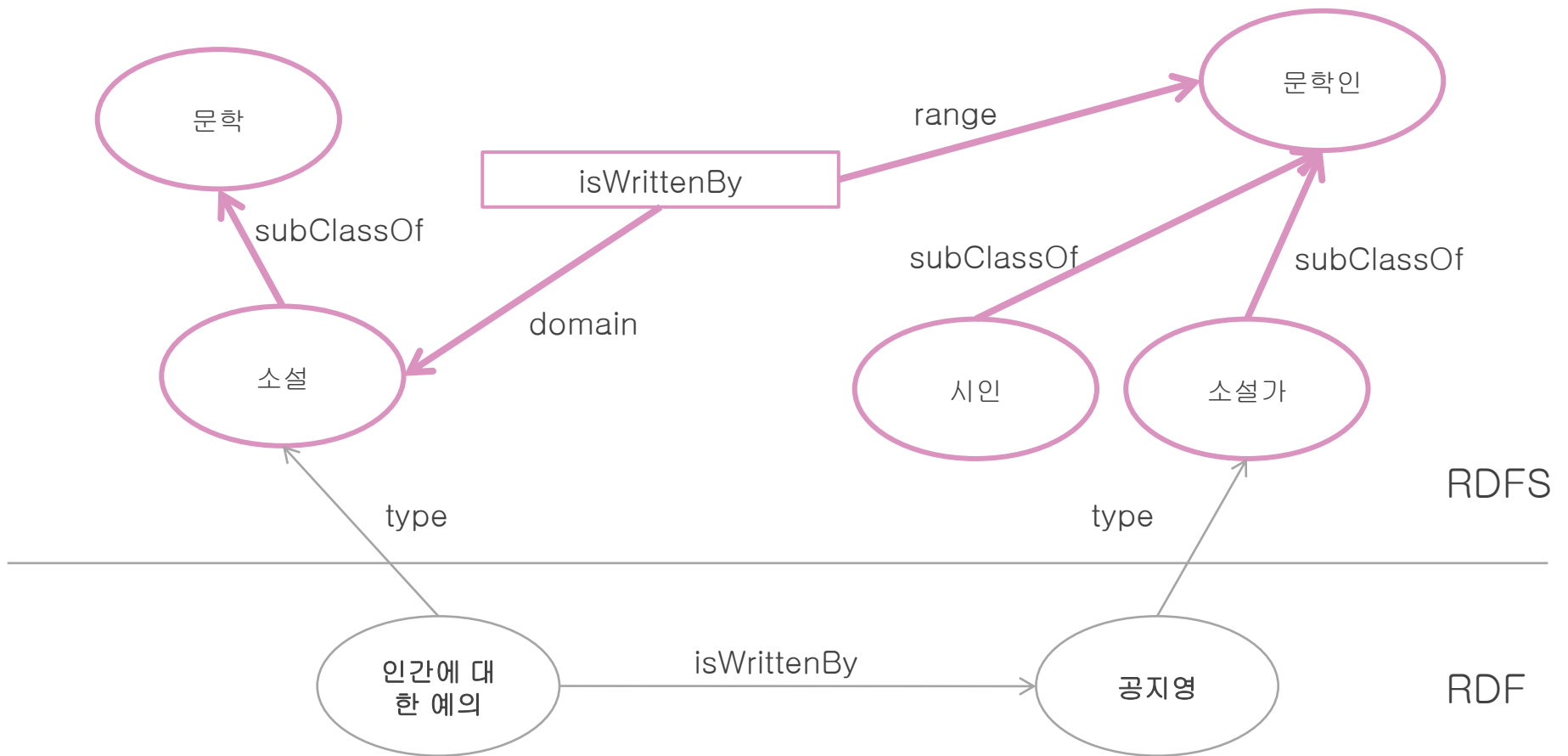
- 철학 : 존재론(存在論), 존재학(存在學)
 - Onto(being) + logos(word)
 - 세상의 구성요소에 대한 명확한 이해를 연구
- 언어학 : An ontology is a specification of a conceptualization.
 - 개념(화)의 명시적 명세, 시소러스의 확장 개념
- 컴퓨터, 웹 분야
 - an ontology is an explicit formal specification of a shared conceptualization(Gruber, 1993)
 - An ontology provides a shared vocabulary, which can be used to model a domain — that is, the type of objects and/or concepts that exist, and their properties and relations.(Arvidsson, 2008)
 - 공유된 개념의 명시적 형식(?)

Ontology

- an ontology is an explicit formal specification of a shared conceptualization
 - shared conceptualization: 인간과 컴퓨터가 공유하는 개념화
 - Explicit Formal: 기계가 읽을 수 있는 형식으로 상세하게 개념, 개념간의 관계 등을 표현
- 개념화
 - 우리 눈에 보이는 사물 혹은 추상적인 것들을 구체적인 집합으로 만들
 - SUV, 덤프트럭, 세단 = 탈것(Vehicle)
 - 남자, 여자 = 사람
 - 라이언헤드, 롭드와프, 더치 = 토끼



분류!!



RDF Schema

- RDF를 확장하기 위한 소규모의 Vocabulary를 정의
 - Class, subclassOf, type
 - Property, subPropertyOf
 - Domain, range

```
<?xml version="1.0"?>
```

```
<rdf:RDF
```

```
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xml:base="http://www.animals.fake/animals#">
```

```
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
```

```
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
```

```
<rdf:Description rdf:ID="animal">
```

```
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
```

```
</rdf:Description>
```

```
<rdf:Description rdf:ID="horse">
```

```
  <rdf:type rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
```

```
  <rdfs:subClassOf rdf:resource="#animal"/>
```

```
</rdf:Description>
```

```
</rdf:RDF>
```



HTML로도 가능하지 않을까?

RDFa, Microformats, HTML5 MicroData

HTML5 MicroData

Your web pages have an underlying meaning that **people understand** when they read the web pages. But **search engines have a limited understanding** of what is being discussed on those pages. By adding additional tags to the HTML of your web pages—tags that say: "Hey

search engine, this information describes this specific movie, or place, or person, or video"—you can help search engines and other applications better

understand your content and display it in a useful, relevant way.

Microdata is a set of tags, introduced with HTML5, that allows you to do this.

HTML5 MicroData



사라진 약혼자. 제각각 살인
그녀를 찾아야만 한다.

이선균 | 김민희 | 조성하
3월 9일, 첫번째 미스터리가 온다

화차 (2012) 상영중
火車 Helpless

영화정보 > 현재상영영화 > 화차

네티즌 평점 (927명 참여)
★★★★☆ 8.0 평점
주기

영화정보 > 현재상영영화 > 화차 책

요약정보 미스터리 | 한국 | 117 분 | 개봉 2012-03-08 | 15

홈페이지 국내 www.hwacha2012.co.kr

제작/배급 영화제작소 보임(제작), 필라멘트픽처스(배급)

감독 변영주

출연 이선균 (장문호 역), 김민희 (강선영 역), 조성하 (김종근 역), 김별 (한나 역), 최덕문 (하성식 역) [더보기](#)

예매하기 퍼가기  [모바일로 확인하는 영화정보!](#) 

HTML5 MicroData

itemscope and itemtype

```
<div>
  <h1>화차</h1>
  <span>감독: 변영주 (1966년 12월 20일 출생)</span>
  <span>미스터리</span>
  <a href="../movies/hwacha2012_trailer.html">예고편</a>
</div>
```

```
<div itemscope itemtype="http://schema.org/Movie">
  <h1>화차</h1>
  <span>감독: 변영주 (1966년 12월 20일 출생)</span>
  <span>미스터리</span>
  <a href="../movies/hwacha2012_trailer.html">예고편</a>
</div>
```

HTML5 MicroData

itemprop

```
<div itemscope itemtype="http://schema.org/Movie">
  <h1>화차</h1>
  <span>감독: 변영주 (1966년 12월 20일 출생)</span>
  <span>미스터리</span>
  <a href="../movies/hwacha2012_trailer.html">예고편</a>
</div>
```

```
<div itemscope itemtype="http://schema.org/Movie">
  <h1 itemprop="name">화차</h1>
  <span>감독: <span itemprop="director">변영주 (1966년 12월 20일 출생)</span>
  <span itemprop="genre">미스터리</span>
  <a href="../movies/hwacha2012_trailer.html" itemprop="trailer">예고편</a>
</div>
```


HTML5 MicroData

Embedded items

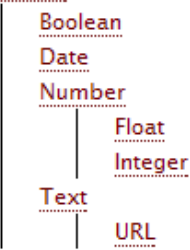
```
<div itemscope itemtype="http://schema.org/Movie">
  <h1 itemprop="name">화차</h1>
  <span>감독: <span itemprop="director">변영주 (1966년 12월 20일 출생)</span>
  <span itemprop="genre">미스터리</span>
  <a href="../../movies/hwacha2012_trailer.html" itemprop="trailer">예고편</a>
</div>
```

```
<div itemscope itemtype="http://schema.org/Movie">
  <h1 itemprop="name">화차</h1>
  <span>감독: <span itemprop="director" itemscope
itemtype="http://schema.org/Person">변영주 (1966년 12월 20일 출생)</span>
  <span itemprop="genre">미스터리</span>
  <a href="../../movies/hwacha2012_trailer.html" itemprop="trailer">예고편</a>
</div>
```

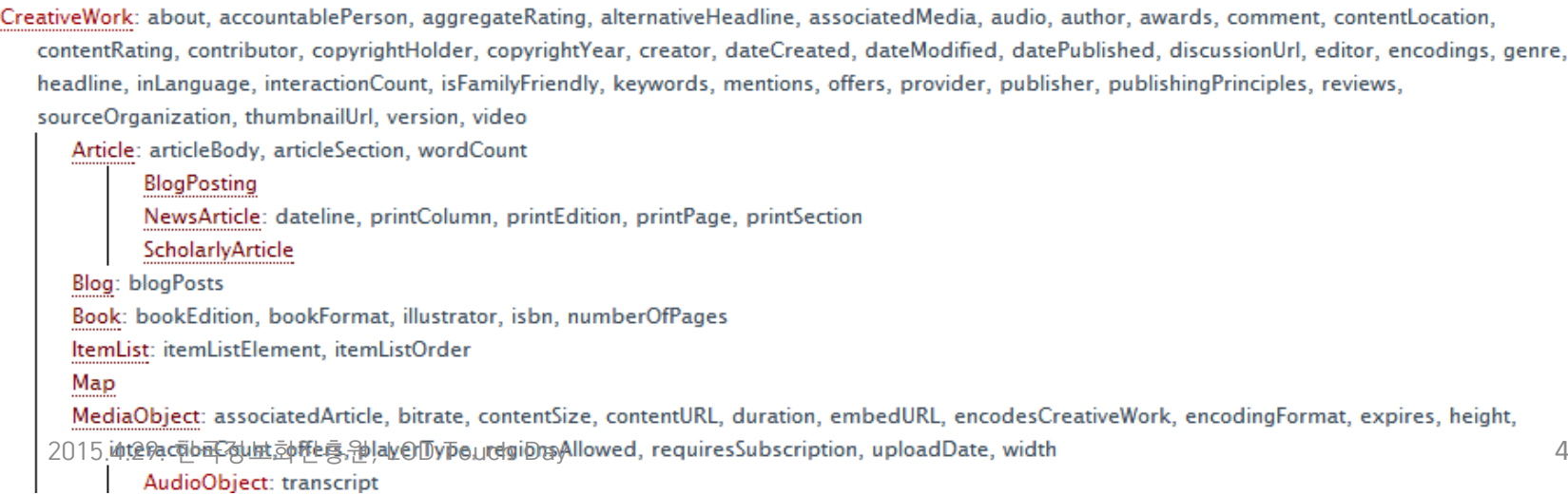
The Type Hierarchy

Here is the entire hierarchy in a single file.
Types that have multiple parents are expanded out only once and have an asterisk

DataType



Thing: description, image, name, url



Microdata
vocabulary

Microsoft,
Google,
Yahoo...

RDFa

- RDF in attributes
- XHTML 웹 문서 안에 RDF 메타데이터를 포함시킬 수 있는 메커니즘

XHTML

```
<div>  
  <h2>Linked Data</h2>  
  <h3>박진호</h3>  
</div>
```

RDFa

```
<div xmlns:dc="http://purl.org/dc/elements/1.1/">  
  <h2 property="dc:title">Linked Data</h2>  
  <h3 property="dc:creator">박진호</h3>  
</div>
```

RDFa

RDFa

```
<div typeof="foaf:Person" xmlns:foaf="http://xmlns.com/foaf/0.1/">
  <p property="foaf:name"> 박진호 </p>
  <p> Email: <a rel="foaf:mbox" href="jino.kor@listinc.kr"> jino.kor@listinc.kr</a></p>
  <p> Phone: <a rel="foaf:phone" href="tel:+82-2-2632-5133">+82 2 2632 5132
</a></p>
</div>
```

Microformat

- Microformat은 기존 HTML 태그의 확장으로 의미적인 정보를 강화함
- 웹 페이지에 있는 사람, 이벤트, 블로그 포스트, 리뷰와 같은 것들을 표현함
- 다음의 (X)HTML의 속성을 사용해서 표현 가능함
 - class , rel, rev
- Humans first, machines second

Microformat

HTML

```
<div>
  <div>박진호</div>
  <div>국립중앙도서관</div>
  <div>02-590-0792</div>
  <a
    href="https://www.facebook.com/jino.kor">https://www.facebook.com/jino.kor</
  a>
</div>
```

Microformats(XHTML)

```
<head profile="http://www.w3.org/2006/03/hcard">
<div class="vcard">
  <div class="fn">박진호</div>
  <div class="org">국립중앙도서관</div>
  <div class="tel">02-590-0792</div>
  <a class="url"
    href="https://www.facebook.com/jino.kor">https://www.facebook.com/jino.kor</
  a>
</div>
```



Open Data Protocol



There is a vast amount of data available today and data is now being collected and stored at a rate never seen before. Much, if not most, of this data however is locked into specific applications or formats and difficult to access or to integrate into new uses.

The **Open Data Protocol (OData)** is a Web protocol for querying and updating data that provides a way to unlock your data and free it from silos that exist in applications today. OData does this by applying and building upon Web technologies such as [HTTP](#), [Atom Publishing Protocol](#) (AtomPub) and [JSON](#) to provide access to information from a variety of applications, services, and stores. The protocol emerged from experiences implementing AtomPub clients and servers in a variety of products over the past several years. OData is being used to expose and access information from a variety of sources including, but not limited to, relational databases, file systems, content management systems and traditional Web sites.

OData is consistent with the way the Web works - it makes a deep commitment to URIs for resource identification and commits to an HTTP-based, uniform interface for interacting with those resources (just like the Web). This commitment to core Web principles allows OData to enable a new level of data integration and interoperability across a broad range of clients, servers, services, and tools.

OData is released under the [Open Specification Promise](#) to allow anyone to freely interoperate with OData implementations.

How to participate: Join the OData [mailing list](#) to ask questions about the protocol and discuss how it should evolve over time.

Ecosystem

[Consumers](#)[Producers](#)[Live Services](#)

Developers

[Libraries](#)[Articles & Videos](#)[Validator](#)

Documentation

[Protocol](#)[URI Conventions](#)[Atom Format](#)[JSON Format](#)

Community

[News](#)[FAQ](#)[Mailing List](#)

Netflix OData Catalog API Example

<http://odata.netflix.com/Catalog/>

Collections: Titles, TitleAwards, People, Genres, Languages, ...

The Metadata

.../**\$metadata**

Genres

.../**Genres**

Count of horror movies

.../**Genres('Horror Movies')/Titles/\$count**

Korean movies

.../**Languages('Korean')/Titles?\$filter=Type eq 'Movie'**

Horror movies from the '70s

.../**Genres('Horror Movies')/Titles?\$filter=ReleaseYear le 1979 and ReleaseYear ge 1970**

In JSON format: ...**&\$format=json**



복잡한 게 아닙니다. 기계가 이해할 수 있다(No)
사람과 기계가 같이 이해할 수 있는 공유의 장!
기계는 이해할 수 있다는 것은 사실

좀 더 엄격하고,
정확하고,
명확한 규칙과 정의를 공유하는 것.



중요한 것은,

RDF, RDFa, Microformat,
Microdata,
Odata를 공부해라? 배워라? 써라?

OPEN Standard Data

Data Platform

개념화 Metadata Vocabulary ...

의미있는 데이터 플랫폼(이용자 입장)

- 어떤 객체, 개념을 가지고 있는 지 알 수 있는가?
- 그 객체, 개념을 어떤 속성으로 관리하고 개방하고 있는지 알 수 있는가?
 - 개방하고 있는 정보가 정말 가지고 있는 모든 것인가?
- 범용적인, 혹은 내가 놓고 있는 플랫폼에서 활용 가능한가?(표준)
- 나도 (개발능력이 없는) 활용할 수 있는 플랫폼인가?
 - 나에게 어떤 노력을 기울이고 있는가?

LOD 구축 원칙

- Open이 먼저
 - 국립도서관의 데이터는 기본적으로 누구나 자유롭게 활용할 수 있는 공공데이터(Public Data)
 - 어떤 형태, 방식으로든 Open
- Open하되 되도록이면 개방형 표준을 활용
 - Linked Data Principle 준수
- Information Ecosystem에 기여
 - Web은 가장 보편화되고 일반적인 Platform이자 Ecosystem
- Linked data로 얻는 이득보다 글로벌 데이터베이스(Web) 세계에 기여한다는 마음이 우선
 - 개방으로 직접적으로 얻을 수 있는 이득 보다 우리의 데이터가 살아서 누군가에게 새로운 “가능성”을 열어 줄 수 있음을 우선 고려

LOD 구축 원칙

- 이용자를 생산자로
 - 단순한 데이터의 개방과 서비스를 넘어, 데이터를 만들고 자유롭게 활용할 수 있는 Data Literacy 교육

참고자료

- **이미지출처**
 - <http://blogs.loc.gov/digitalpreservation/files/2011/06/lod.jpg>
 - <https://www.flickr.com/photos/okfn/6419794587/>
- **참고자료**
 - <http://5stardata.info/>
 - <http://5stardata.info/kr/>