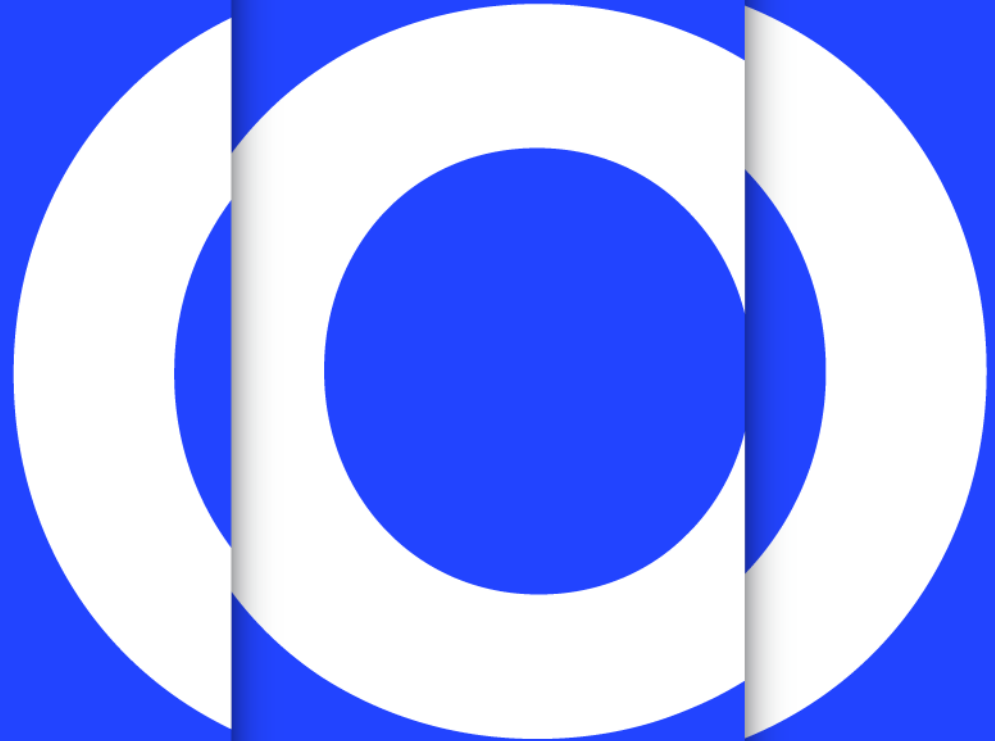
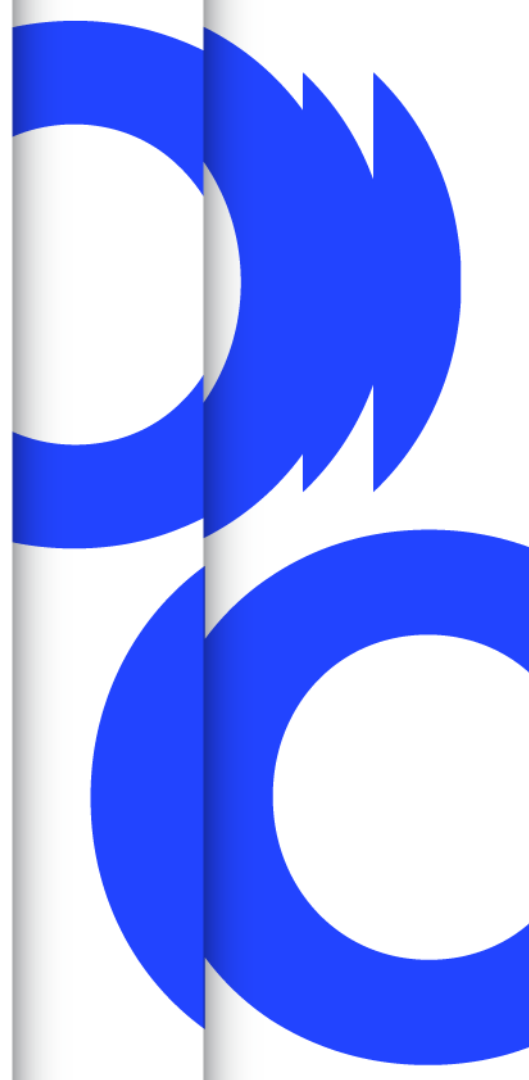


EBU

OPERATING EUROVISION AND EURORADIO



SEMANTIC TECHNOLOGIES IN BROADCASTING PRODUCTION



THE EUROPEAN BROADCASTING UNION (EBU/UER)



EUROVISION and EURORADIO networks (news, sports, music production and transmission)
TV and Radio co-productions
TECHNICAL advice (EBU **Technology & Innovation**)
LEGAL advice

Do you speak...

- In prose?
- In rhyme?
- Or in triples? And how bad is it if you don't?

What is the impact on broadcasters, do they care?

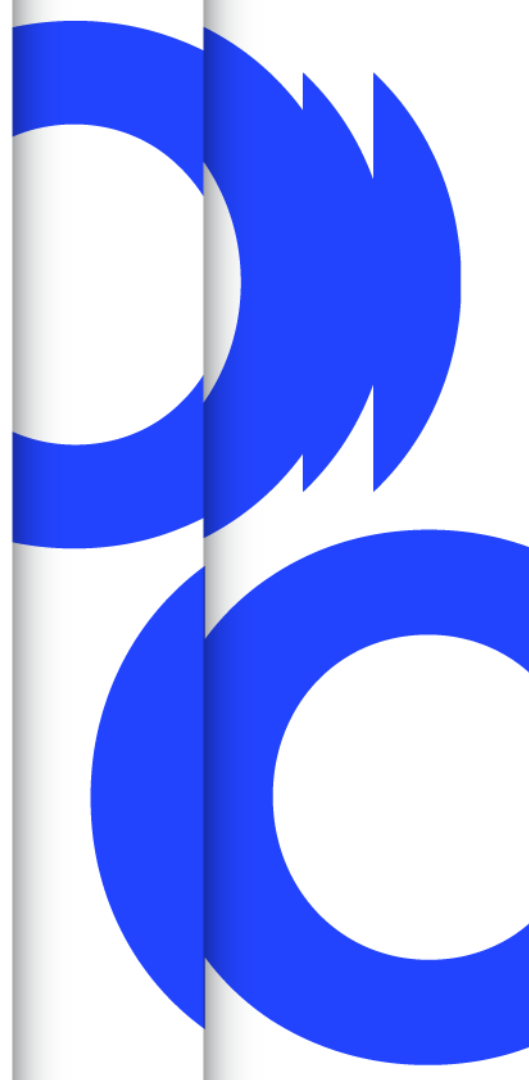
BROADCASTERS ARE BEING CHALLENGED PERMANENTLY

- Compete in fierce market sector (broadcast, online, mobile, etc.)
- Move from analogue to digital with file and now live IP stream-based production
- Innovate, improve quality (higher resolution, higher luminance, higher frame rate) and enrich the offer -> hybrid TV
- Manage larger files with always more detailed technical and descriptive metadata
- Address more media and formats, more platforms requiring the optimisation of workflows for a faster adaptation to market needs at lower cost
- Manage archiving and preservation
- All this with always less resources, expertise and funding

Short term investment prevails!

**In this context, promoting semantic data is a challenge,
data is not “visible”.**

OVERVIEW OF EBU ACTIVITIES



A LONG EXPERIENCE DEVELOPING SOLUTIONS FOR USERS WITH DIFFERENT NEEDS LIKE...

- I need to define data structures and digitise my data at low cost
- I need to aggregate and possibly centrally manage data from various sources, incl. from production silos, equipment and legacy data stores, in different formats
- I need to customise data (because the way I am doing it is the only right option) using classes and properties I am used to and extending standards is a must
- I need to publish and exchange data in a way comprehensible to others (but better if they are willing to understand my native format -> my vision of interoperability)
- I need to enrich data a low cost e.g. using automatic metadata extraction tools
- I need to search data to retrieve content / assets
- Etc.

FROM PAPER TO EBUCORE XML TO EBUCORE RDF/OWL

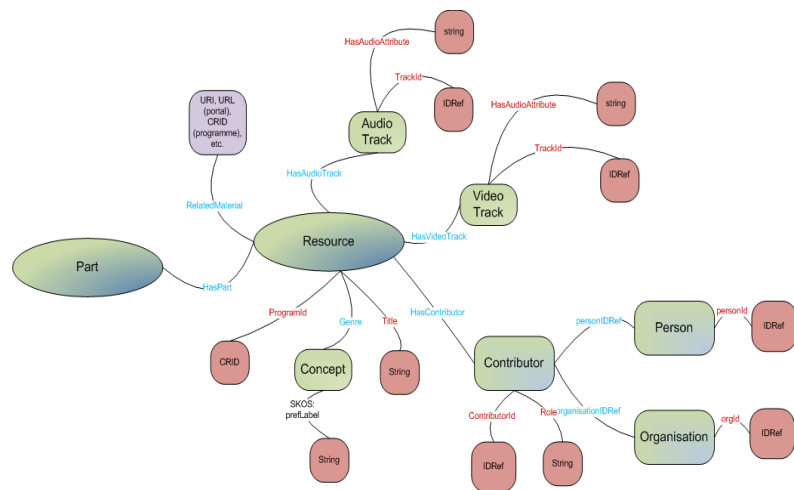
Describing audiovisual content using
common metadata

EBUCore schema The Dublin Core for MEDIA

A set of properties to describe objects
A set of relations between objects
Based on Dublin Core
With extensions for media

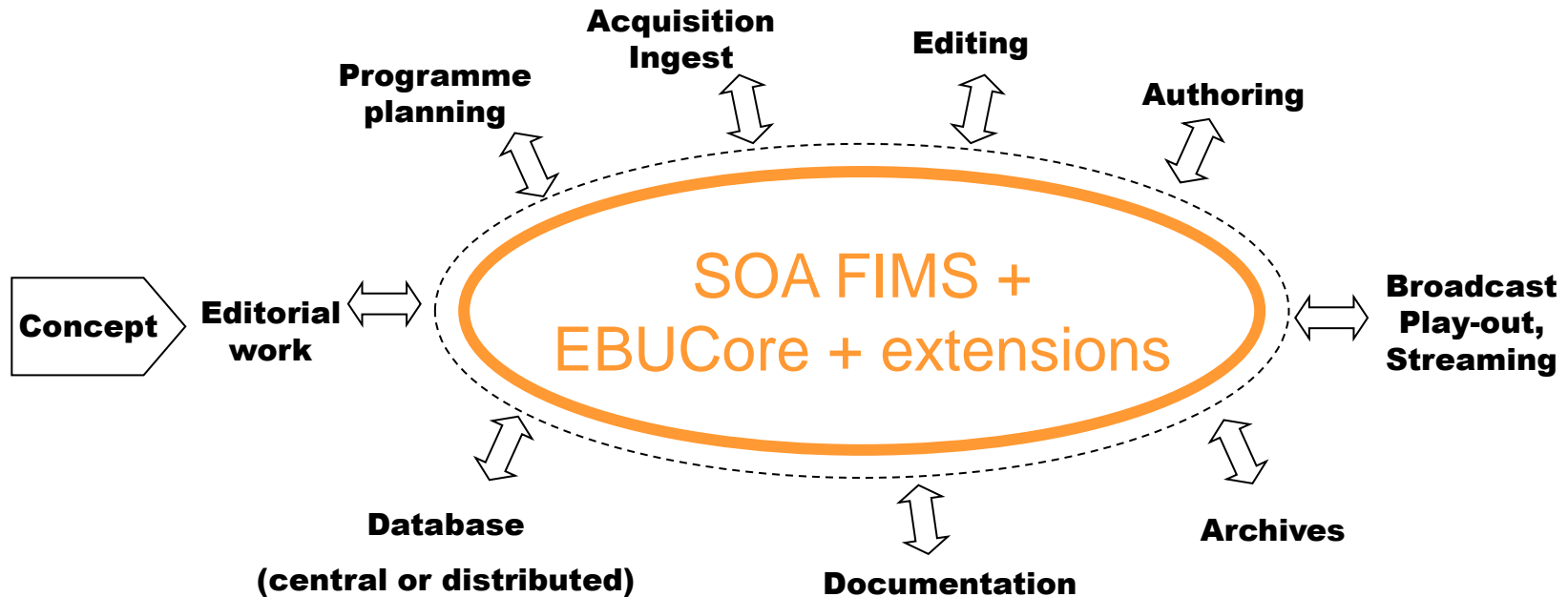
Transformation from  schema to RDF

EBU RDF – A class data model for media



Published as Linked Open
Vocabulary (LOV)

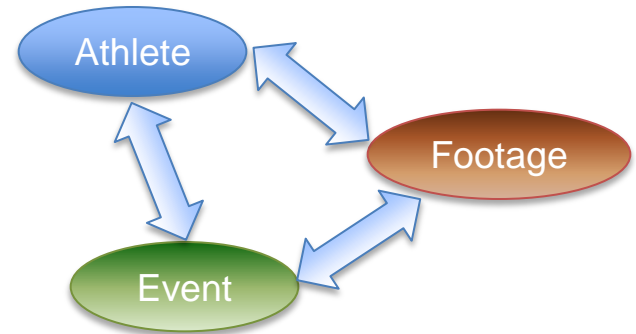
PROPOSITION: EBUCORE, A COMMON CORE SEMANTIC VOCABULARY



Different tools and business needs are inevitable:
Take all the benefits from RDF's flexibility and scalability !

THE PURPOSE OF MORE, BETTER DATA: SEARCH AND RETRIEVE CONTENT IN CONTEXT LIKE SPORT!

- On which events do I have data I can search?
- In which event / competition was an athlete involved?
 - *World cup, Olympics Games, Discipline, Phase? As an individual? In a team?*
- What results did the competitor or team obtain?
 - Personal best, season best, qualification best, new record?
- What is the history of a record?
 - *Per event, per athlete or team?*
- Is there associated material?
 - Interviews, video footage, pictures?
- Can I find information on special events?
 - E.g. incidents, injuries?
- Will information be used for live reporting, publishing, archives?
- Who are the stakeholders: federations, agencies, publishers, broadcasters, other professional users, consumers?



EBU SPORT IS BASED ON THE OLYMPIC DATA FEED STRUCTURE

- ODF:Olympic data feed
 - Used individually by many sport federations
 - Excel, xml, pdf, base64-encoded pdf packaged in xml...
- ODF content
 - Data reference: list of athletes, of records, etc... need correction
 - List of participants and event where they are registered as competitors, startlist, teams
 - Results: real time feed by increment, phase results and summary
 - Interviews, weather reports (per competition event),
- Good model with data structure common to several sports
- Video feeds and annotation come from providers like EBU and contracted third parties...

| MEN'S 100M | | WIND +1.500S |
|----------------|----------------------|--------------|
| RESULT - FINAL | | DR |
| 1 | JAM USAIN BOLT | 9.63 |
| 2 | JAM YOHAN BLAKE | 9.75 |
| 3 | USA JUSTIN GATLIN | 9.79 |
| 4 | USA TYSON GAY | 9.80 |
| 5 | USA RYAN BAILEY | 9.88 |
| 6 | NED CHURANDY MARTINA | 9.94 |
| 7 | TRI RICHARD THOMPSON | 9.98 |
| 8 | JAM ASAFA POWELL | 11.99 |

| MEN'S 100M | |
|--------------------|----------------------|
| START LIST - FINAL | |
| 1 | TRI RICHARD THOMPSON |
| 2 | JAM ASAFA POWELL |
| 3 | USA TYSON GAY |
| 4 | JAM YOHAN BLAKE |
| 5 | USA JUSTIN GATLIN |
| 6 | JAM USAIN BOLT |
| 7 | USA RYAN BAILEY |
| 8 | USA CHURANDY MARTINA |
| 9 | NED CHURANDY MARTINA |

ATHLETE

TopBraid Default Application - ebusport_odf

Class Hierarchy

- Agent
 - Contact
 - Athlete**
 - Guide
 - Participant
 - Competitor
 - Coach
 - Composer
 - Official
 - IOCMember
 - NOCPresident
 - NOVGeneral secretary
 - Staff
 - Group
 - Organisation
- Annotation
- Business object
- Event
- Location
- Medal
- Record
- Resource
- Result

Instances of Athlete

| Resource | Type |
|----------------|---------|
| # Eera , KIR | Athlete |
| # Kinaua , KIR | Athlete |

LEMAITRE Christophe , FRA

Annotations

label: LEMAITRE Christophe , FRA

Properties

Code: 235477
Country of Birth:
Date of birth: 19900611
Delegation: FRA
Discipline: AT
Family name: Lemaître
Gender: M
Given name: Christophe
ID picture: <http://www.ebu.ch/metadata/test/lemaitre.jpg>
IF-ID: 235477
Initial name: LEMAITRE C
Nationality: FRA
Participation records: [WC 2013 - Moscow, 100m - Men](#)
[WC 2013 - Moscow, 200m - Men](#)
[WC 2013 - Moscow, 4x100m Relay - Men](#)
Print Name: LEMAITRE Christophe
TV initial name: LEMAITRE C.
TV name: LEMAITRE Christophe
Wikipedia: http://en.wikipedia.org/wiki/Christophe_Lemaître
sameAs: [WC2013_Moscow_LEMAITRE Christophe - FRA - 452](#)
type: [Athlete](#)

Incoming References

is Athlete of:
is sameAs of: [WC2013_Moscow_LEMAITRE Christophe - FRA - 452](#)

Search for Athlete

Search any Text:

Properties

Accreditation:

Accreditation:

Additional information:

Affiliation:

Affiliation:

Agent address:

Career highlights:

Club name:

Coach:

Code:

Country of residence:

Search Results

| Resource |
|--|
| LEMAITRE Christophe , FRA |
| WC2013, Moscow; LEMAITRE Christophe - FRA - 452 |
| WC2013, Moscow; LEMAITRE Christophe - FRA - ATM001 |
| WC2013, Moscow; LEMAITRE Christophe - FRA - ATM002 |
| WC2013, Moscow; LEMAITRE Christophe - FRA - ATM401 |

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EVENT

TopBraid Default Application - ebusport_odef

Class Hierarchy

- Annotation
 - Tag
- Business object
 - Editorial object
 - Programme
 - Sport item
- Event
 - Breaking news
 - Ceremony
 - Competition
 - Competition event**
 - Divisional competition
 - Knockout competition
 - Medal competition
 - Multi stage competition
 - Round
 - Recurring competition
 - Interview
 - Official communication

WC 2013 - Moscow, 4x400m Relay - Women

Annotations

label: WC 2013 - Moscow, 4x400m Relay - Women

Properties

Competition: [WC 2013 - Moscow, 4x400m Relay - Women - Final](#)
[WC 2013 - Moscow, 4x400m Relay - Women - Round 1](#)
[WC 2013 - Moscow, 4x400m Relay - Women - Semi-Final](#)

Description: Competition event: 4x400m Relay - Women

Discipline: 4x400m Relay

Discipline gender: Women

End date & time: 13 August 2013

Event Name: WC 2013 - 4x400m Relay - Women

Event code: ATW404

Gender: Women

Parent event: [WC 2013 - Moscow Athletics](#)

Phase:

Start date & time: 10 August 2013

Team: [WC2013, Moscow, Bahamas - BAH - ATW404](#)
[WC2013, Moscow, Belarus - BLR - ATW404](#)
[WC2013, Moscow, Botswana - BOT - ATW404](#)
[WC2013, Moscow, Canada - CAN - ATW404](#)
[WC2013, Moscow, Czech Republic - CZE - ATW404](#)
[WC2013, Moscow, France - FRA - ATW404](#)
[WC2013, Moscow, Great Britain & N.I. - GBR - ATW404](#)
[WC2013, Moscow, India - IND - ATW404](#)
[WC2013, Moscow, Italy - ITA - ATW404](#)
[WC2013, Moscow, Jamaica - JAM - ATW404](#)
[WC2013, Moscow, Nigeria - NGR - ATW404](#)
[WC2013, Moscow, Poland - POL - ATW404](#)

Search for Competition event

Search any Text

Properties

Business object:

Competitor:

Competitor:

Description:

Discipline:

Discipline:

Discipline gender:

Discipline round:

Discipline round:

End date & time:

Search Reset #

Instances of Competition event

| WC 2013 - Moscow, 4x400m Relay - Women | Competition event |
|--|-------------------|
| WC 2013 - Moscow, 4x400m Relay - Women | Competition event |
| WC 2013 - Moscow, 4x400m Relay - Women | Competition event |
| WC 2013 - Moscow, 4x400m Relay - Women | Competition event |
| WC 2013 - Moscow, 4x400m Relay - Women | Competition event |
| WC 2013 - Moscow, 4x400m Relay - Women | Competition event |

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Search Results

Resource

| |
|--|
| LEMAITRE Christophe , FRA |
| WC2013, Moscow; LEMAITRE Christophe - FRA - 452 |
| WC2013, Moscow; LEMAITRE Christophe - FRA - ATM001 |
| WC2013, Moscow; LEMAITRE Christophe - FRA - ATM002 |
| WC2013, Moscow; LEMAITRE Christophe - FRA - ATM401 |

Page 1 of 1

FROM A COMPETITOR TO HIS RESULTS GOOD LABELS ARE IMPORTANT

TopBraid Default Application - ebusport_odf

Class Hierarchy

- Thing
 - Collection
 - Concept
 - ConceptScheme
 - Core data
 - Agent
 - Contributor
 - Competitor**
 - Participant
 - Team
 - Event
 - Venue
 - Record
 - Resource
 - Result

Instances of Competitor

| instance |
|---|
| WC2013, Moscow; ABAKUMOVA Maria - RUS - A1 |
| WC2013, Moscow; ABDELKARIM Abdoulaye - CH |
| WC2013, Moscow; ABDI Bashir - BEL - ATM100 |
| WC2013, Moscow; ABDI Omar Mohamed - SOM |
| WC2013, Moscow; ADE Tolataki - JPN - ATM014 |

WC 2013 - Moscow, 100m - Men - Round 1 Heat 1

Start date & time: 10 August 2013
Name: WC 2013 - 100m - Men - Round 1 Heat 1

Start list:

- [WC2013_Moscow_BAILEY-COLE Kemar - JAM - PB:09.96](#)
- [WC2013_Moscow_BOLOGO Innocent - BUR - PB:10.42](#)
- [WC2013_Moscow_HARRIS Adam - GUY - PB:10.16](#)
- [WC2013_Moscow_KANG LILLOONG Calvin - SIN - PB:10.52](#)
- [WC2013_Moscow_KELLER Martin - GER - PB:10.07](#)
- [WC2013_Moscow_LEMAITRE Christophe - FRA - PB:09.92](#)
- [WC2013_Moscow_MVUMVURE Gabriel - ZIM - PB:09.98](#)
- [WC2013_Moscow_SANNEH Suwaibou - GAM - PB:10.16](#)

Result:

- [WC 2013 - EventATM001_BAILEY-COLE Kemar - JAM - rank: 3 - result: 10.02](#)
- [WC 2013 - EventATM001_HARRIS Adam - GUY - rank: 31 - result: 10.30](#)
- [WC 2013 - EventATM001_KELLER Martin - GER - rank: 34 - result: 10.32](#)
- [WC 2013 - EventATM001_LEMAITRE Christophe - FRA - rank: 9 - result: 10.12](#)
- [WC 2013 - EventATM001_MVUMVURE Gabriel - ZIM - rank: 29 - result: 10.28](#)
- [WC 2013 - EventATM001_SANNEH Suwaibou - GAM - rank: 41 - result: 10.46](#)

Parent event: [WC 2013 - Moscow, 100m - Men - Round 1](#)

Search Competitor

Properties

- Accreditation:
- Athlete information:
- Bib:
- Coach:
- Competition:
- Event initial personal best:
- Event initial season best:
- Event personal best:
- Event qualification best:
- Event season best:
- Main function Id:
- Name:
- Nationality:
- event a points before:

Search [] Reset []


Search Results

Resource

- WC2013, Moscow; LEMAITRE Christophe - FRA - ATM001
- WC2013, Moscow; LEMAITRE Christophe - FRA - ATM002
- WC2013, Moscow; LEMAITRE Christophe - FRA - ATM401

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Results



0:46

Select (red arrow pointing to the search results table)

Search (red arrow pointing to the search input field)

ENRICHMENT



About: Christophe Lemaître

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

Christophe Lemaître is a French sprinter, who specialises in the 100 and 200 metres. He is the French 100 m and 200 m record holder with a time of 9.92 seconds and 19.80 seconds and is the first person of European descent to break the 10-second barrier in an officially timed event. At the age of 20, he won the 100 m, 200 m and the 4×100 m relay titles at the 2010 European Championships, the first French sprinter ever to triple, making him the fastest man in Europe.

| Property | Value |
|---|--|
| dbpedia-owl:Person/weight | ■ 74.0 |
| dbpedia-owl:abstract | ■ Christophe Lemaître ist ein französischer 100-Meter-Läufer in unter 10 Sekunden. ■ Christophe Lemaître é um atleta francês a prova dos 100 metros abaixo de 10 segundos. ■ Christophe Lemaître es un atleta francés. ■ Christophe Lemaître is a French sprinter. At the age of 20, he won the 100 m, 200 m and the 4×100 m relay titles at the 2010 European Championships, the first French sprinter ever to triple, making him the fastest man in Europe. |

athlete

http://dbpedia.org/resource/Georges_Lemaire

http://dbpedia.org/resource/Jacques_Lemaire

http://dbpedia.org/resource/Nicolas_Lemaigre

http://dbpedia.org/resource/Christophe_Lemaître

http://dbpedia.org/resource/Talemaitoga_Tuapati

http://dbpedia.org/resource/Edson_Lemaire

http://dbpedia.org/resource/Christophe_Lemaire

http://dbpedia.org/resource/Nicolas_Lemaire

http://dbpedia.org/resource/Pierre-%C3%89tienne_Lemaire

Virtuoso SPARQL Query Editor

[About](#) | [Namespace Prefixes](#) | [Inference rules](#) | [iSPARQL](#)

Default Data Set Name (Graph IRI)

<http://dbpedia.org>

Query Text

```
select ?athlete where {
  ?athlete rdf:type <http://dbpedia.org/ontology/Athlete>.
  FILTER regex(?athlete, 'ler ', ' ', 'i')
}
```

<http://dbpedia.org/sparql>

(Security restrictions of this server do not allow you to retrieve remote RDF data, see [details](#).)

Results Format: HTML *(The CXML output is disabled, see [details](#))*

Execution timeout: 30000 milliseconds *(values less than 1000 are ignored)*

Options: Strict checking of void variables

(The result can only be sent back to browser, not saved on the server, see [details](#))

Run Query

Reset

WHAT FUTURE FOR LINKED OPEN DATA (AGENTS, PLACES...)?

The proposition is interesting: more data cheaper -> but is this true?

Nothing comes for free:

- Is the data you get the data what you need?
- Is the editorial quality of this data appropriate?
- How persistent is this data and is it compatible with your application?

Solutions are being proposed to protect and retail data: the end of « open » data

- But maybe a solution to persistence, maintenance and better quality data
- Data has value

A trade-off has to be found!

USING SEMANTIC TECHNOLOGIES: A NO-BRAINER?

- It fulfils most of broadcasters' requirements:
 - Agility, flexibility, scalability in model/data enrichment and queries / reasoning / inference
- A healthy need to think about the data models
 - Both top-down and bottom-up modelling is facilitated
- Reusability: models and data can easily be imported
- Ultimate mash-up format: everything can be expressed as triples
- Tools are getting more usable with a smoother learning curve
 - although blank SPARQL entry points are still a potential killer for first-time users
- **Schema.org can help in more than one way to publish content and be found**

Then what are the real show-stoppers?

- Not enough R&D power and resources (just adopting XML now)
- Not enough expertise
- Short-term vs. long-term investment vision – more visibility on return is needed
- Lack of funding

But there is hope: users and vendors are looking at it

Hopefully implementations will follow.

Joint funded projects would certainly help!

Will Horizon 2020 provide opportunities?