

SElf Data For Enhancing Lifelong learning Autonomy

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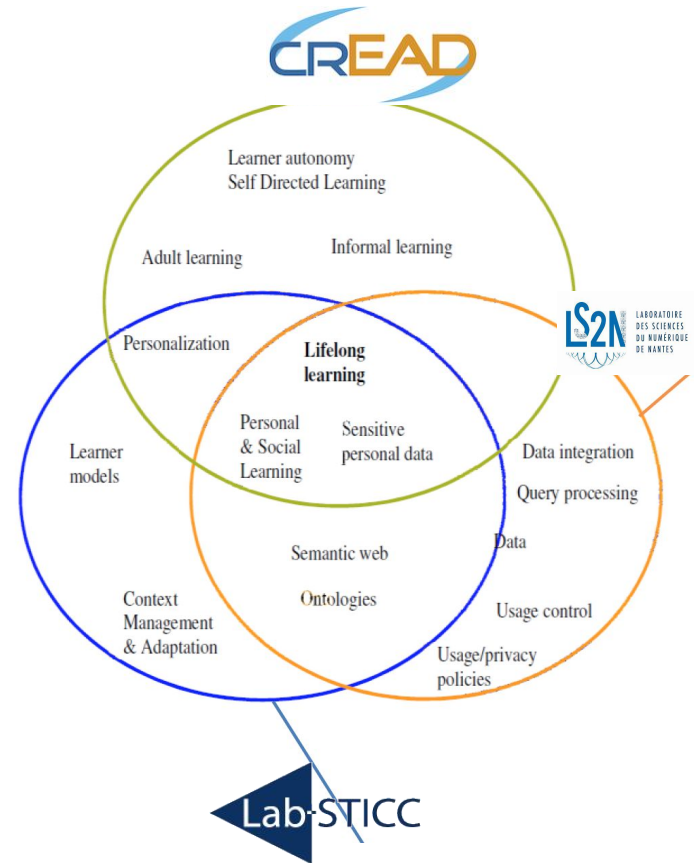
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SEDELA

Multidisciplinary project:
design and experiment
**self-regulated learning
process**, supported by
**semantic open learner
models** and **trusted
collaborative services**



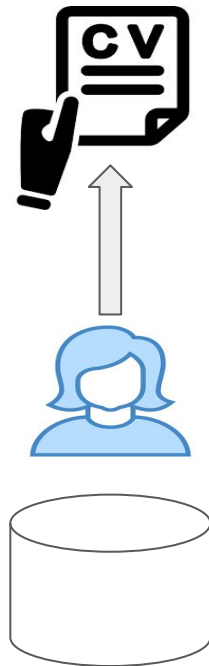
SEDELA Potential Use-Cases

- My Knowledge
 - Manage evidence of learning across learning and professional platforms to acquire and update learner models
- My Learn-in-progress
 - Manage learn-in-progress activities according to self-defined objectives
- Alumni Feedback
 - Automatic feedback for Higher Education Institutions



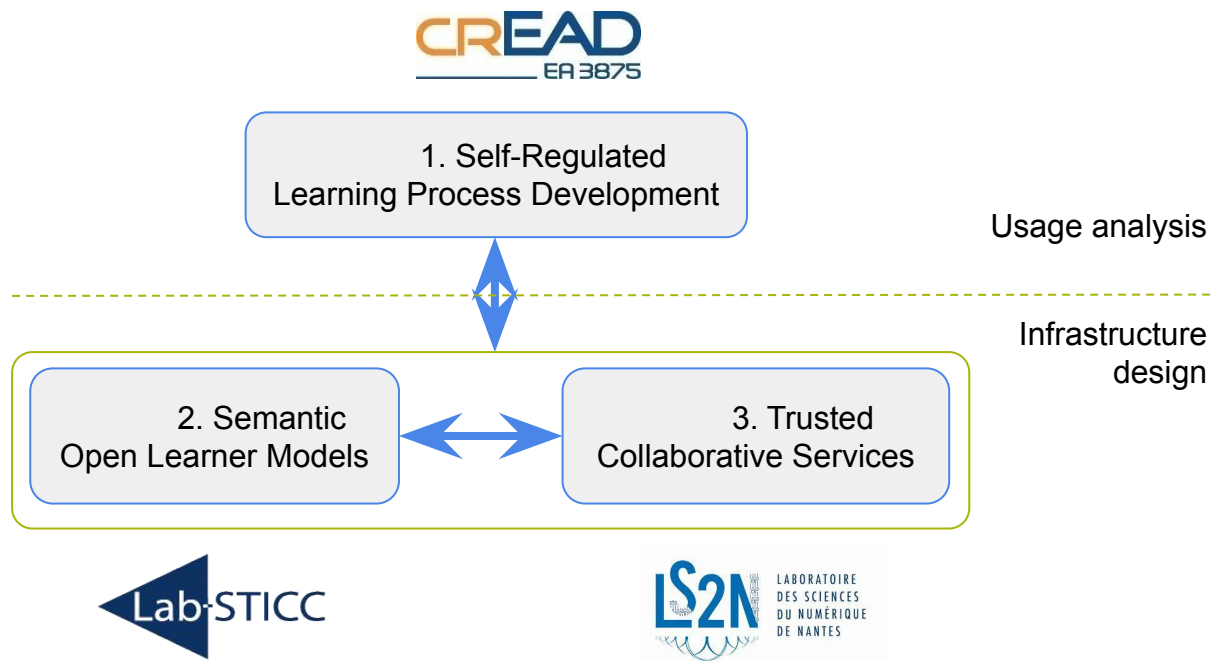
SEDELA Potential Use-Cases

- **My CVs**
 - Build and publish relevant CV according to a specific project
- **My Future Courses**
 - Identify new courses opportunities according to community knowledge
- **My Access**
 - Grant or revoke access to my data



Increase Learner Empowerment

Research Issues and Experimentations

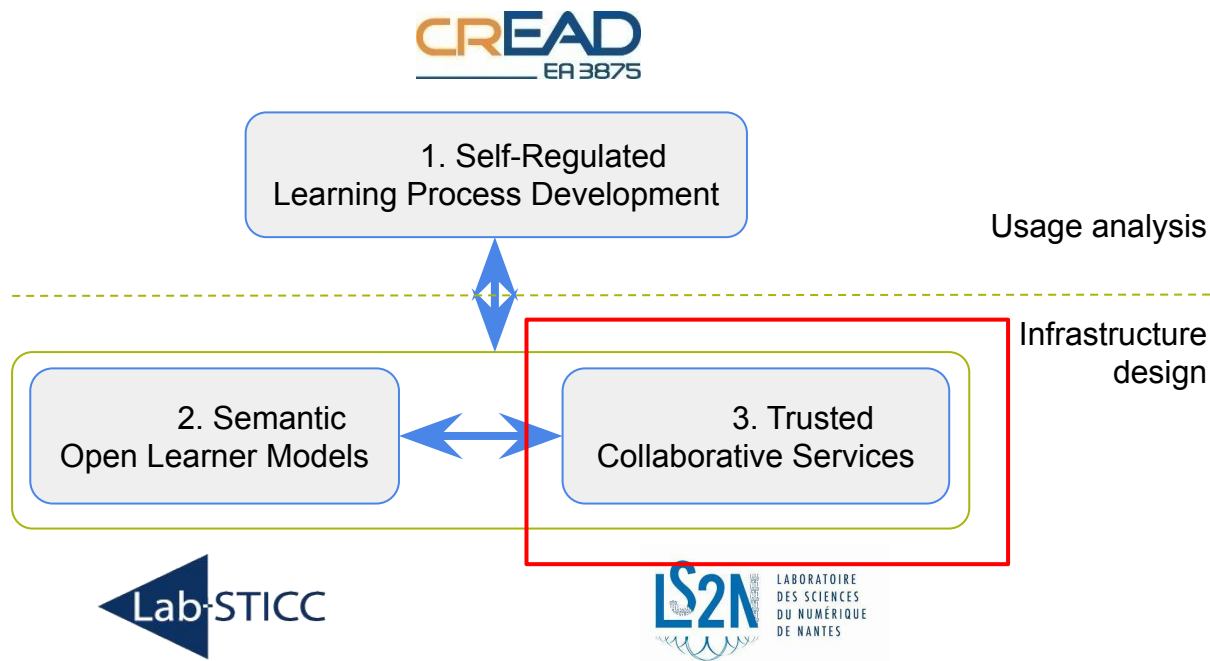


Experimental practice



Experimental infrastructure

Research issues and Experimentations



Experimental practice



Experimental infrastructure

**How to realise all Sedela
use-cases “easily” ?**

Use-case as queries

- **MyCv:** Give me my diploma and the year of obtention
- **Future Course:** Find MOOC followed by people I know that I did not follow



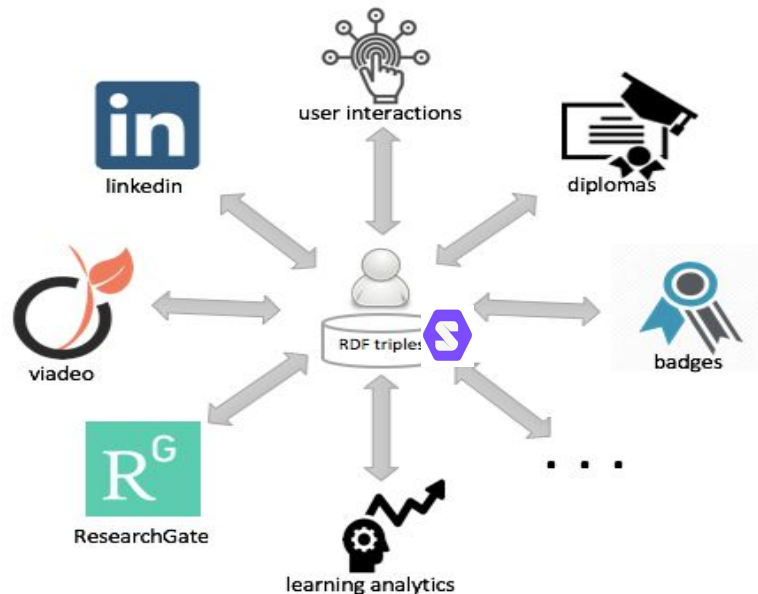
Problems

- Personal learning data are fragmented at different platforms
- Not possible to answer queries



Semantic Personal Information System (SPIMS) [1,2]

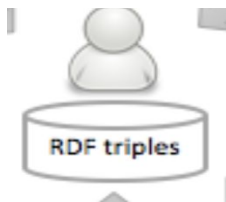
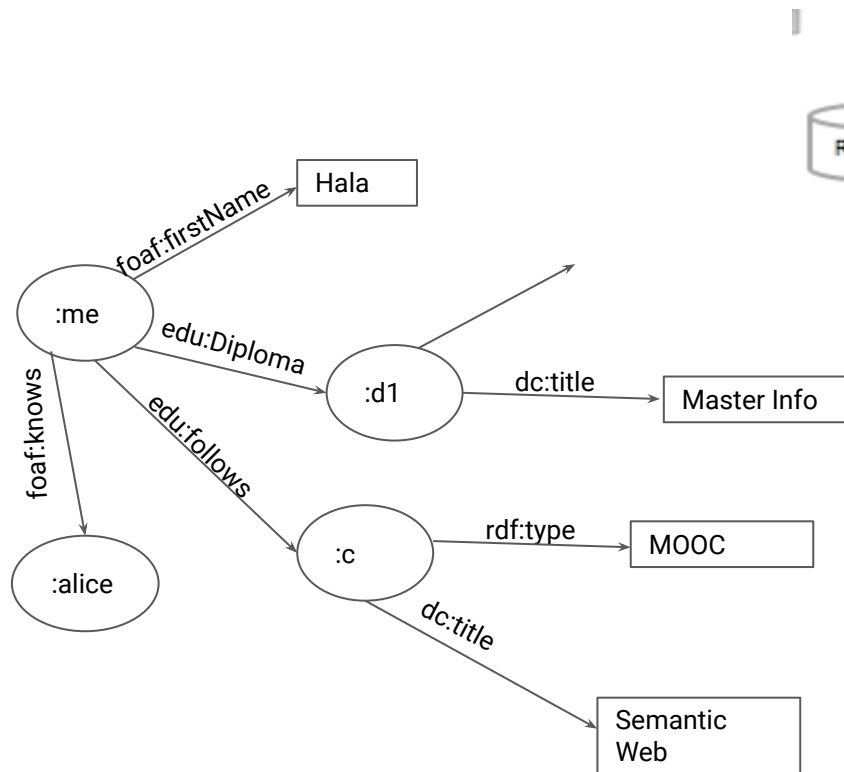
- Use Semantic Web:
 - RDF flexible data model
 - Ontologies facilitate data integration
 - SPARQL query language



[1] Abiteboul S., André B., Kaplan D. Managing your digital life with a Personal information management system. Communications of the ACM, 2015

[2] Infrastructure décentralisée et sémantique pour l'apprentissage tout au long de la vie. H Skaf-Molli, P Serrano-Alvarado, S El Hassad, E Desmontils, P Molli Atelier Web des Données (AWD) dans EGC. 2019

Learner Personal Knowledge Graph



subject	predicate	object
:me	foaf:firstName	Hala
:me	edu:Diploma	:d1
:d1	dc:title	Master Info
:me	foaf:knows	:alice
:me	edu:follows	:c
:c	rdf:type	MOOC
:c	dc:title	Semantic Web

Example: MyCV

```
select distinct ?d
where {
  :me edu:Diploma ?d .
  ?d dc:title ?m .
  Filter regex (?m, "^Master")
}
```

?d

Master Info

My SPIMS

Subject	predicate	object
:me	edu:Diploma	:d1
:d1	dc:title	Master Info
:me	foaf:knows	:alice
:me	edu:follows	:c
:c	rdf:type	MOOC
:c	dc:title	Semantic Web

Program of Master is not available in my KG

```
select distinct ?p
where {
  :me edu:aDiplome ?d .
  ?d dc:title "Master Info" .
  ?d fac:program ?p
}
```



My SPIMS

Subject	predicate	object
:me	edu:Diploma	:d1
:d1	dc:title	Manster Info
:me	foaf:knows	:alice
:me	edu:follows	:c
:c	rdf:type	MOOC
:c	dc:title	Semantic Web

If not all data can be locally hosted, query remote data

```
select distinct ?p
where {
  :me edu:aDiplome ?d .
  ?d dc:title "Master Info".
  ?d fac:program ?p
}
```

Subject	predicate	object
:me	edu:Diploma	:d1
:d1	dc:title	Manster Info
:me	foaf:knows	:alice
:me	edu:follows	:c
:c	rdf:type	MOOC
:c	dc:title	Semantic Web

?p

UE42:Data integration
UE404: Software Engineering



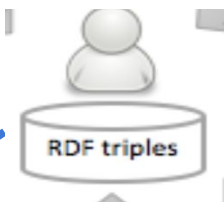
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Querying local and remote sources

- Virtual data integration:
semLAV : LAV mediator
[1]
- APIs to query non-RDF
[2]



```
select distinct ?p
where {
  :me edu:aDiplome ?d
  ?d dc:title "Master 2 ALMA".
  ?d fac:program ?p
}
```



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[1] G. Montoya, L. D. Ibáñez, H. Skaf-Molli, P. Molli, and M.-E. Vidal. SemLAV: Local-As-View Mediation for SPARQL. Transactions on Large-Scale Data- and Knowledge-Centered Systems, LNCS, Vol. 8420, p 33–58, 2014.

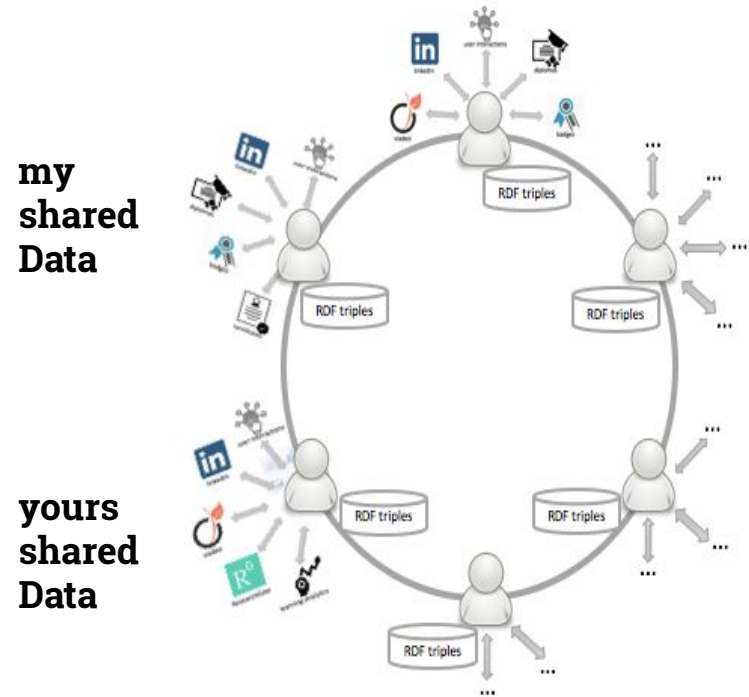
[2] Moreau, B., P. Serrano-Alvarado, E. Desmontils, et D. Thoumas (2017). Querying non-RDF Datasets using Triple Patterns. In ISWC. Demo paper 16

How to collaborate with other learners?

Collaborate with other learners

Find MOOC followed
by people I know that
I did not follow

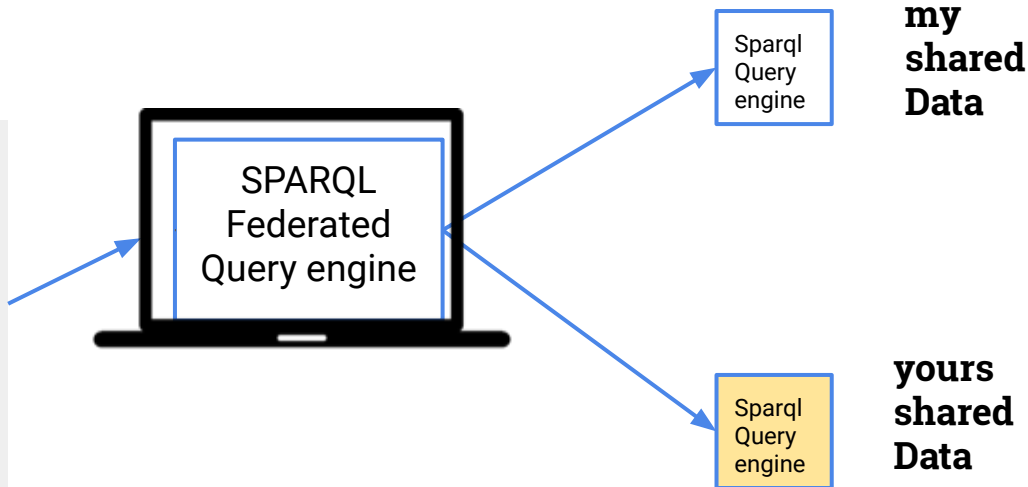
Shared data about
followed MOOC



A Federated Service on SPIMs

- Find MOOC followed by people I know that I did not follow

```
select distinct ?c
where {
  :me foaf:knows ?p .
  ?p edu:follows ?c .
  ?c rdf:type "MOOC" .
  filter not exists { :me edu:follow ?c }
}
```



Share With Usage Control

- Each learner adds usage control on her data

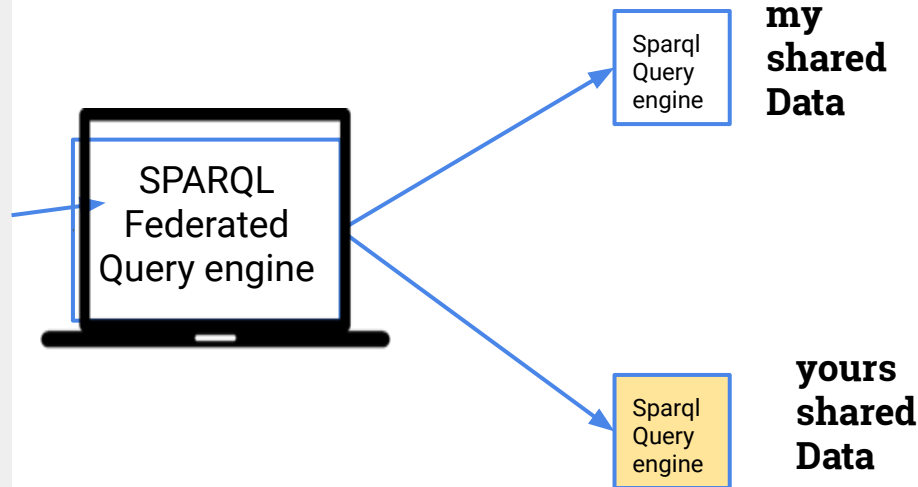
```
<mypod/linkedin/sparql> a odrl:Asset ;  
rdfs:comment "mes données collectés de LinkedIn" ;  
odrl:hasPolicy <licence1> .  
<mypod/badges/sparql> a odrl:Asset ;  
rdfs:comment "mes badges numériques" ;  
odrl:hasPolicy <licence2>
```

```
licence1 a odrl:Policy ;  
rdfs:comment "licence1" ;  
odrl:Permission  
  [ odrl:action  
    cc:read ; ] ;  
odrl:prohibition  
  [ odrl:action  
    cc:archive ] .
```

```
licence2 a odrl:Policy ;  
rdfs:comment "licence2" ;  
odrl:Permission  
  [ odrl:action ,  
    cc:read ; ] ;  
odrl:prohibition  
  [ odrl:action  
    cc:distribute ] .
```

License Compliant Federated SPARQL

```
select distinct ?c
:me foaf:knows ?p .
?p dbprop:follow "Web Semantic" .
?p dbprop:follow ?c .
filter not exists { :me dbprop:follow ?c}
?g odrl:hasPolicy ?l .
?l odrs:compatibleWith "query
licence"
}
```



Conclusion

- SEDELA is a multidisciplinary project for longlife learning
- Increase learner empowerment
- Services for managing learning data
- Experimentation with students in education sciences





```
select distinct ?c
where {
  :Me foaf:knows ?p .
  ?p dbprop:follow "Web Semantic" .
  ?p dbprop:follow ?c .
  filter not exists { :ME dbprop:follow ?c}
}
```



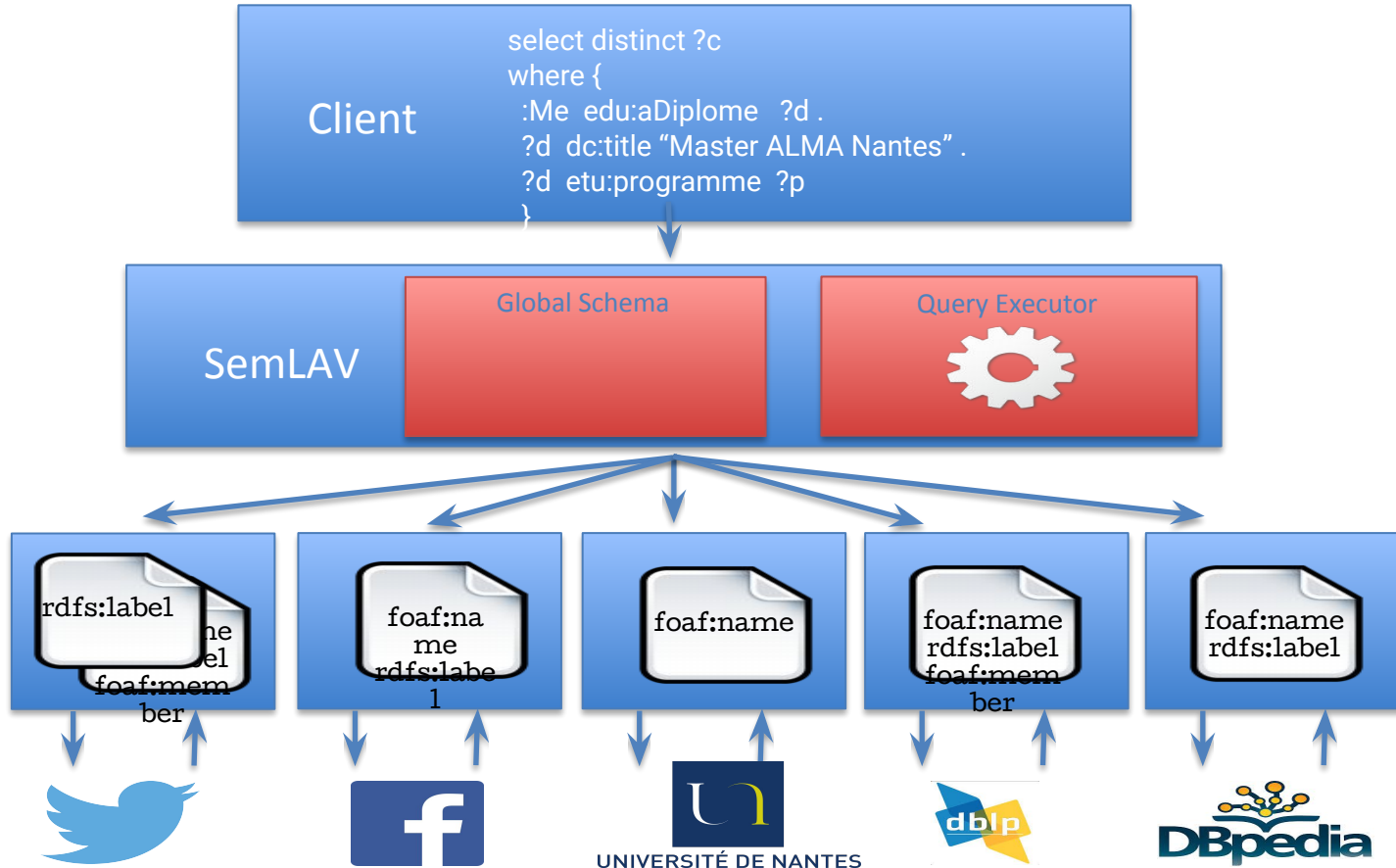
- Compétences**
- Expériences Professionnelles
- Formations**



- Diplômes
- Détails cours**

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semLAV Mediator

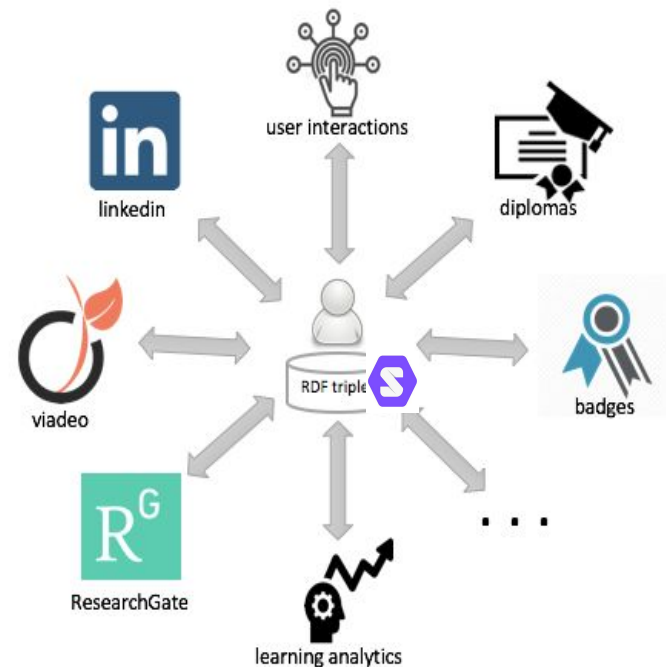


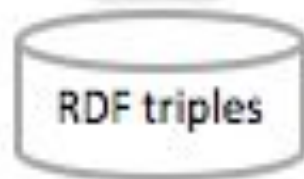
State of the art

	Learning Analytics	E-portfolio	PLE	Linkedin
My knowledge	Locally	Manual	No	Partial
My CV	No	Yes	No	Only one
My Learn-in-Progress	Locally	No	Yes	No
My Future Course	Locally	No	Manual	Coming Soon
My Access	No	Partial	No	No
Alumni feedback	Locally	No	No	Not published

Solid for SPIMS

- Learning data are transformed into RDF and stored into Solid [1]
 - Data are accessible online
 - Data are decoupled from applications
 - Any use-case can be answered by a SPARQL query





...

**But, what if the required data
cannot not hosted locally ?**

Scientific Challenges

- Explore new methods to enhance autonomy, self directed learning (SDL) and self-development
 - Narrative and reflexive methodologies
 - CSCL and SDL devices and tools for autonomization
- Semantic Learner Models
 - Ontology-based
- Semantic Data Management
 - Integrating personal data into SPIMs
 - Querying different SPIMs
 - Usage control

