Suggest a Topic Title	Describe the Topic	
Semantic structuring with ISO 15926	Starting with the upper ontology of ISO 15926-2, plus a reference data library derived from that, all life-cycle information can be integrated. The possible domain is determined by the reference data.	
Modelling issues vs. Technology issues	It is important to discuss what is better in an educational context: do the students need more theory and practise about how to model a particular domain? is it needed for students to explain them ontology editors? is it better to focus lectures on the modelling issues instead of showing them specific editors?	Main issue - as I see it - is that you have to have competences in a specific domain + basic logical knowledge; in addition, other modeling approaches hinder the intuitive understanding of graph modeling Oleg: it depends on the students, course prerequisite and the educational goal of a particular course. I doubt there is a single answer. It's better to set a specific aim (i.e. the students should learn to do X at the end of course) and then see what they need to learn to do it. But when teaching modeling it's always good to have the modeling goal in sight: models' quality can only be assessed in how well the model solves a task. Panos: It's important to teach semantic thinking, otherwise whatever tool we teach, the students will use it wrongly! I have several examples of this, OWL and Protege is one of them! Amanda: Definitely important. Also important to figure out where they are likely to be and the likely confusions.
Knowledge Graph Pipelines	Building applications with knowledge graphs (KG) requires pipelines that do ETL on KGs, with operation such as ingestion external sources into a KG, extracting parts of existing KGs, combining them in various ways, building analytics, query and visualization. The goal of the topic is to discuss the types of operations and pipeline support that practitioners need to make effective use of KG technology.	Sergio: This is interesting. The tools and pipeline that are needed depend on the domain and KG purpose. Many/different tools are required for different goals: metadata extraction, NLP, etc.
Query-Answering Over Knowledge Graphs	Knowledge graphs required efficient query answering with stored knowledge. Topic should highlight the best techniques to provide efficient query answering.	
Semantic Web for SEO	Google (=Dan Brickley) made the Semantic Web quite a success by doing schema.org and lobbying the search engine group to read the data. Thanks to this success, the SEO scene jumps on board by making money with it by selling products. As scientists, we can appreciate this success and spread the word. For example, by sharing these links and teaching people about this practical aspect of the Semantic Web: https://technicalseo.com/tools/schema-markup-generator/ https://moz.com/learn/seo/schema-structured-data https://moz.com/blog/structured-data-for-seo-1	
Courseware for vocational programs	Most institutions I am aware of do not cover Semantic Web technologies in associates degrees and BSc programs, yet they provide the bulk of those that will work as developers in industry. I want to discuss the development of "courseware" targeted at those students–a kit that a lecturer can integrate in their coursework or students can follow themselves.	
A Vision of Semantic Web from the World Wide Web	In this topic, I have planned to speak from evolution of WWW to Semantic Web. I found that freshers always suffering to understand the basic knowledge of SW so this topic will be a milestone for student, young researchers and academicians. Main content will be: Evolution of WWW Vision of Semantic Web Presenting Web of Data Ontologies and its Development Ontology Applications in Different Areas	
Questions with Advanced Feedback for Learning Formal Languages	We developed two open-answer question types for LMS Moodle that allow advanced answer templates (regular expressions) and feedback to the students about their mistakes and the way to fix them. These questions proved useful when teaching programming languages, but they can be used for teaching OWL, SWRL and other formal languages as well. If the community is interested in using them for teaching semantic technologies and/or research cooperation on it, I can make a quick demonstration of the questions' capabilities.	Oleg: This is a topic proposed by me. Please let me know if anyone is interested. Oleg: We also started to develop ontology-based educational tools, but these projects are in the beginning stages (see our posters at the main conference) but we like to invite collaborators. There, we teach ontologies to perform (via reasoning) the tasks we teach students to do, the tasks involving the concepts they must learn - and then the ontologies can compare student's solution with their and give explanatory feedback without teacher's intervention.
Corporate vs.	Many of us offer courses in semantic web, knowledge graph and related topics at a corporate level. We get small classes (usually) of people who are paying money and taking time out of their day to pursue the course. At the same time, there are universities that teach semester-long courses populated by full time students. For the most part, as far as I know, these efforts are rarely coordinated (I know of one coordinated	

Corporate vs academic training	For the most part, as far as I know, these efforts are rarely coordinated (I know of one coordinated program). Is coordination needed? What sort of coordination? What are the different needs of these two groups?	CD: This corresponds with the courseware for vocational programs, I think there could be a topic for different "flavors".
Pitfalls of semantic modeling for data	In this topic, we will discuss the most common pitfalls we fall into when we develop and apply semantic data models, and discuss concrete methods and techniques to effectively avoid them.	
Inverse teaching approaches	Students enrolled in Semantic Web courses have mostly already experienced imprinting in classical methods of data modeling. If one uses teaching methods that explain and build up the basics step by step, it is hard to overcome the established barriers of thinking in these structures and technologies. Inverse teaching methods confront the students with artifacts of the discipline - here the Semantic Web - and design teaching-learning situations around these artifacts, e.g. (i) reflected reverse engineering tasks, (ii) development of small teaching units with exercises on a new technology, (iii) analysis of scientific papers accompanied by discussions, (iv) guided exploration of a field of application (industrial research, standard specification, tool support etc.). In the context of Semantic Web technologies one always speaks of a steep learning curve. Although the inverse teaching approach makes the curve even steeper, it directly increases motivation. Learning becomes overcoming a steep climbing wall with fascinating viewing hatches.	CS: flipped classrooms are a definite favorite of mine. I'd be interested to hear about some of the experiences on this. JW: A note from first hand experience - I learned most topics I know about the Semantic web by developing an application. Certainly not an easy process but it means you're checking your knowledge as you go so it is very effective.
Representing and Managing Informed Consent with Knowledge Graphs	The expansion of the Internet of Things has allowed connecting everyday devices to a network that could be accessed at any time and has defined data as a new currency. Data sharing has been a research topic for many years but a unified solution that could be used as a standard has not been presented yet. Further, ways to enable data sharing and make the process fully transparent, from receiving consent until it is revoked, to the end user and compliant with laws such as the GDPR, are yet to be discovered.	
	Knowledge graphs are one possible solution. This session will raise awareness regarding semantics, data sharing, user consent and the implications of its issuing and withdrawal.	
Frameworks and best practises for developing Semantic Web applications	There are no widely accepted frameworks that provide the appropriate tooling for developers of Semantic web applications; this is despite the fact that some frameworks exist for specific projects such as the SOLID project. Consequently, the quality and quantity of Semantic Web applications may be reduced as a result of the extra overhead involved in their development. In addition, the lack of standardisation across such tools make them difficult to integrate together. As a community it may be beneficial to consider the development of frameworks that guide developers to adopt a commonly accepted set of best practises within their Semantic Web applications.	RT: Regarding standardization across tools, there's the RDF/JS CG that standardizes interfaces for JavaScript tools: https://github.com/rdfjs
Improving Developer Experience for Building Specification-Compliant Libraries	Guaranteeing compliance of software libraries to certain specifications is crucial for ensuring interoperability within the Semantic Web. While many specifications publish their own declarative test suite for testing compliance, the actual execution of these test suites can add a huge overhead for library developers. In order to remove this burden from these developers, we introduce a JavaScript tool called RDF Test Suite that takes care of all the required bookkeeping behind test suite execution. In this report, we discuss the design goals of RDF Test Suite, how it has been implemented, and how it can be used. In practice, this tool is being used in a variety of libraries, and it ensures their specification compliance with minimal overhead.	AV: Value here, and also: building a developer community that understands what compliance is and why it matters! Issues with non-compliance ofen hamstrings adoptions.
Industry adoption x resources for learning about both tools and principles	In an industry context, adoption paths (and non-adoption paths) are heavily influenced by the availability & findability of resources for learning about tools, principles, methods. On principles and methods, it's much, much harder to find resource to incorporate in a mentored "upskilling" path for semantic tech than it is, say, for java, big data, or machine learning. It's also very hard to find the info to enable good tool choice. Bad tool choice, though, undermines both learning and adoption. **Idea: rich KG of the tech, with both technical and business-oriented feature?**	

Developer

- Frameworks and best practises for developing Semantic Web applications
- Improving Developer Experience for Building Specification-Compliant Libraries
- Query-Answering Over Knowledge Graphs

Describe frameworks topics
Have 2 categories for tools - those for academia, those for industry. Those for academia tend to die a slow death.
Should be more incentive to keep maintained and make more open source.
There has been group working on RDFJS to have standards in Javascript
https://github.com/semantalytics/awesome-semantic-web
Need to improve communication between researchers and teams to prevent projects dying off, and maintaining multiple viable solutions. As a community need to endeavor to put our vision into practise
Thomas:
Good to have choices, but not really anywhere to go to determine the best resource for the job.
Don't really expect other people to chime in, collaborate etc.
There are not really the channels to organise, nor the incentive.

Ruben Decker
Solid is working on a development kit.
- To extract files in a pod, do basic interactions, set permissions on files. Sometimes it's blindly searching around npm repositories etc.
For solid the basic tooling is there; otherwise it's a bit harder. It's not always easy at the start.

Difficult to find the best thing for the layer in the stack that you need.

Action point
Need tutorials etc for someone coming in not necessarily from academia.

3rd point
It is interesting to do complex queries on knowledge graphs. Tooling to support different ways of querying a knowledge graph. Abstracting the query engine to the specific context to really query the data.

Does anyone have a small path language to query knowledge graphs?
e.g. an adapter for graphql on top of sparql
Ultragraph and hypergraphql?
w3c community group on graphql-rdf https://github.com/w3c/graphql-rdf. List of different approaches to query over graphs using graphql queries.

Q: Would you consider it to be useful to make a new query language or extend sparql for knowledge graphs so as to visualise or extract the query. Then you can automatically plot the data.
Something along the lines of design patterns of query objects to represent a query and build another query on top of that. Help developers to build systems. Bit less hard coded. Retrieve more data then you need to be flexible. Customise depending on class.
Could to something better structuring the application in a more intelligent way.

Back in the day you had a rel. database and then a specific interface to visualise. Guess it will be something similar for knowledge graphs. Maybe we need to define a standard to make some of these basic operations. There have been standards for attaching visualisations to some times of data - but they have been proposed by a single entity and not endorsed (approach by MIT, can attach some visualisation using XML + css).

There was talk last year where they had lots of complex modelling. The customers said it was difficult to use so they introduced shortcut links and the primary topic they wanted to talk about was an extra relation. Then all the details whether it was related in a certain way under a certain circumstance. No way to bind the rel. back to the complicated relation. Important that they are more structured - this is how you navigate the rule knowledge

Description of the Metaphacts visualisation way.

Maybe there could be a different way to browse a graph.

- Ruben T
- Jesse
- Phuc
- Sergio
- Ruben D
- Thomas L (but will leave at 16:00 CET)
- Miguel
- Thomas D

Pedagogy/Courses

- Modelling issues vs. Technology issues
- Courseware for vocational programs
- Corporate vs academic training
- Inverse teaching approaches

- Cogan
- Christophe
- Oleg
- Vera
- Juan
- Panos
- Rafael
- Amanda

Building Process

- Knowledge Graph Pipelines
- Semantic structuring with ISO 15926
- Pitfalls of semantic modeling for data

Adoption and Evangelism

- Industry adoption x resources for learning about both tools and principles
- Semantic Web for SEO

https://tdi.msu.edu/ toolbox dialogue initiative - trying to figure out what another person knows

Pedagogy/Courses Notes

Christophe:
- In Ireland, students who graduate with bachelors do not know anything about semantic web. Those topics are covered in Masters.
- Provide learning kits to community college.

Vera
- After bachelors, students learn one specific modeling approach and hard for them to think about others
- Interesting practical examples. Textbook examples are boring (movies, cooking).

Amanda
- There is commoditized teaching for base tech principles of other fields. Having that opens the door, and frees time/expertise to teach & learn semantics.

Juan
- Data consumers vs data producers
    - Big gap “knowledge engineering” between these two
    - Cleaning the data is more than just “date formats” and “spaces”

Panos
- Master’s is too late- what are some things to teach at earlier levels
- Tool side

- rdf/owl, there is no magic semantics

What should new hires already know?
- Amanda
    - Semantic thinking is hard to teach
    - Can they think what is going to be used with the data
    - Curious, more than just the surface level
    - How to model stuff so that it can be used in more than one way?
    - Model, deploy, someone else uses it, fast.

“We are talking about semantics, but in reality we are talking about modeling”

Course on semantic data modeling?

If you teach data modeling, you have to link it to machine learning. Without proper data modeling, lousy analysis.

Data as an asset, data reusability is huge.

Learning the collaboration is valuable

Data Producer <--> Knowledge Engineering/Science (data modeling, etc) <--> Data Consumer: if you are in the middle, you need to collaborate with both sides, and you will probably want to choose a preferred side.

Protege course
- Students:
- Industry: have an application in mind, they don’t have the training/expertise. Very specific goals
- They are trying to see if this solves problem X (gov, labs). Broad goals

Data Fusion as a illustrating task, (probably) watch it break down, as the lesson

What would be an ideal course (starting with assumption that there is a Bachelor’s Course missing)
Vera: What should be the domain when teaching a course?
- Juan: retail/ecommerce
- Panos: pop culture/job roles
- Christophe: young students want far fetched examples, senior students want things grounded in reality

Important to show the students the consequences of their actions. (dun dun dun)

Need real world anecdotes to understand the consequences

Knowledge Engineering for Data Producers
Knowledge Engineering for Data Consumers (machine learning)

Data modeling is a key part

- Different data model paradigms

If it's RDF, teach very carefully the pitfalls of blank nodes and the semantics, because otherwise … frustration.

Implementation/technology used: should do it in different tech in order to understand the differences. The companies are asking for knowledge about technology X, Y

Analogy with data structures course, where a programming language is used. Then later on you can take a course on PL, etc

From Christophe Debruyne to Everyone: 10:21 AM
Language, communication, terminologies, and definitions, etc. should be core to this course.

How to make this course sexy/attrative? Need to make sure that this is connected with usage of data

Knowledge Engineering Methodologies

Need to start with the real world pain points, to explain the need... and connect it to ML, to make it sexy/attractive

Discover new things in your data

AI-oriented data modeling

PRAXIS: https://github.com/cogan-shimizu-wsu/PRAXIS

Knowledge Engineering, The Course

Learning Objective: Learn to satisfy the needs of today, but also an unknown future. Future proof your data. Semantic Thinking.

1. Explain the pain
    a. Data consumer vs data producer
    b. Perspectives on Data (e.g. four different definitions of "customer" or three terms for the same concept)
    c. Data integrating
2. Data modeling and the different aspects
    a. RDB
    b. Ontologies
    c. Taxonomies
    d. UML
    e. Processes
3. Methodologies and their trade-offs
    a. Creating KG
    b. ...
4. Practical implementation side
    a. Data requirements
    b. Define success for data