



Man-machine
collaboration in
continuous
knowledge-construction
flows

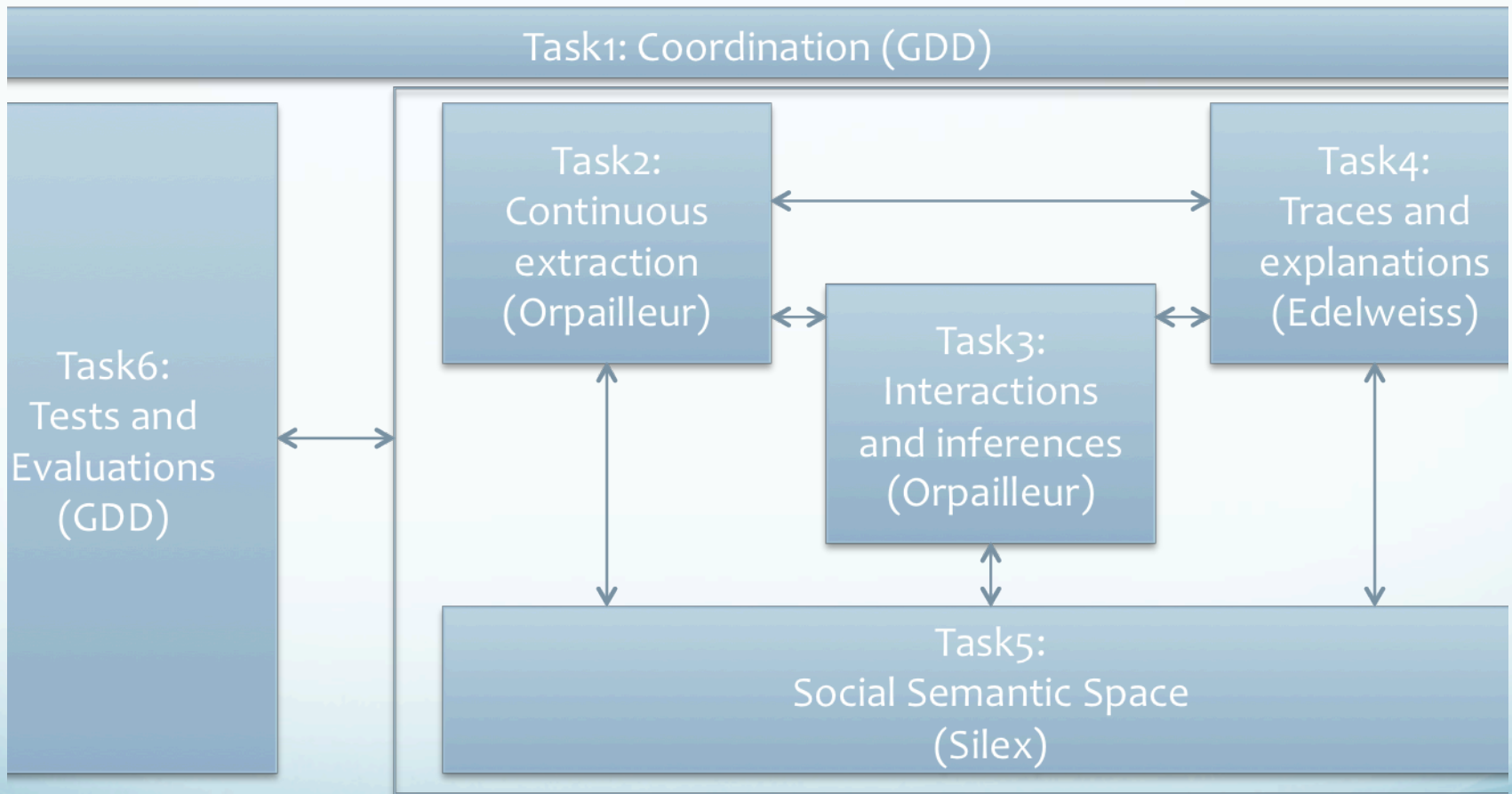
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Kolflow's Objectives

- **Build a social semantic space where humans collaborate with smart agents in order to produce knowledge understandable by humans and machines**
 - Humans are able to understand the actions of smart agents
 - Smart agent are able to understand and take into account actions of humans.
- **Human-Machine collaboration** should be the key to ensure **co-evolution** of contents and knowledge.




Task Diagram



Task 6: Test and Evaluations

- Objectives:
 - Deliver Man-Machine collaboration scenarios
 - Evaluate each year which part of the scenarios can be evaluated

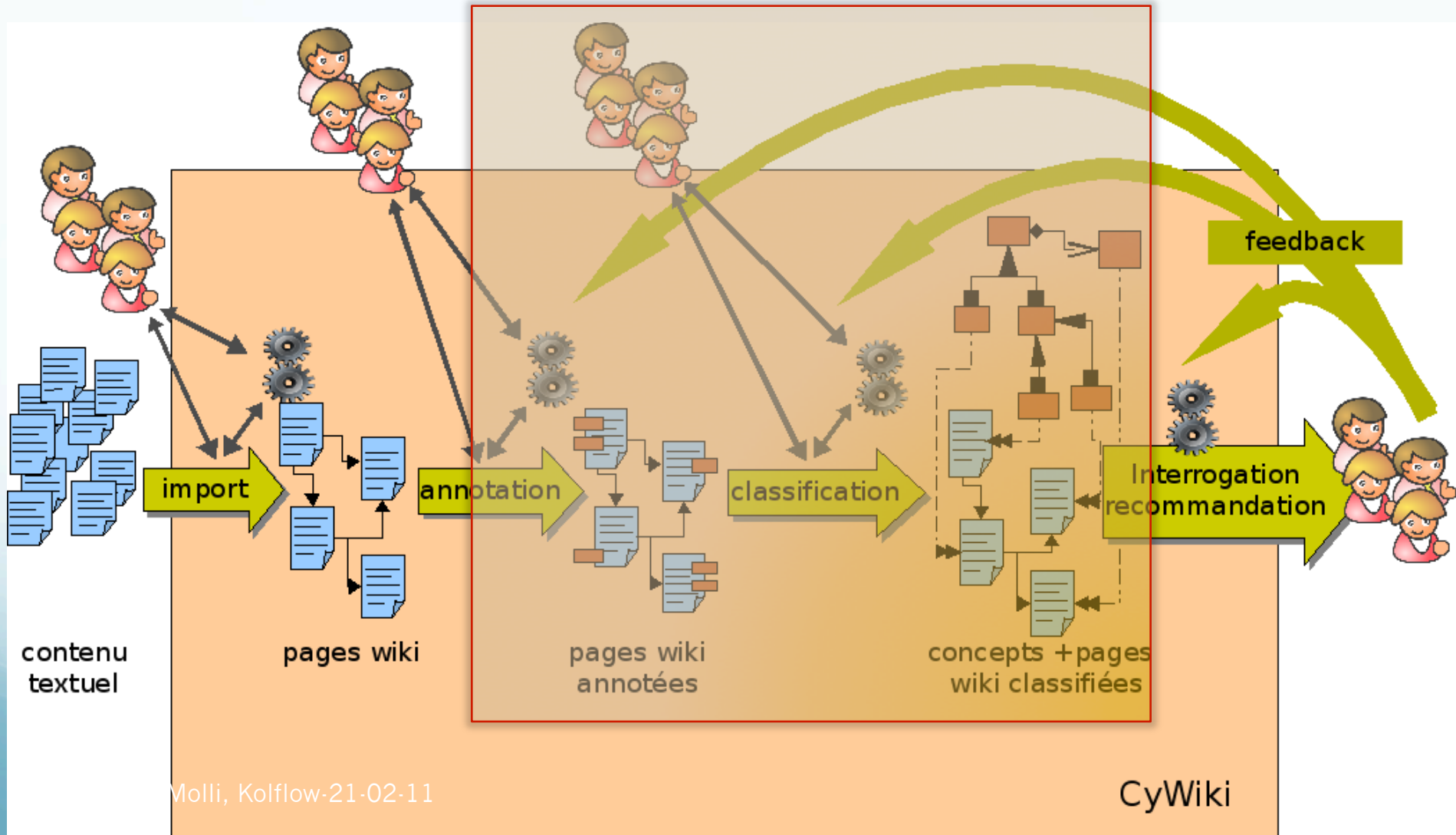
Deliverables :

	 description	 Feb2011+months
D61	Man-machine collaboration scenarios	6
D62	Man-machine collaboration scenarios progress report	12
D63	Man-machine collaboration scenarios progress report	24
D64	Man-machine collaboration scenarios progress report	36

Task 6: Scenarios and Evaluations

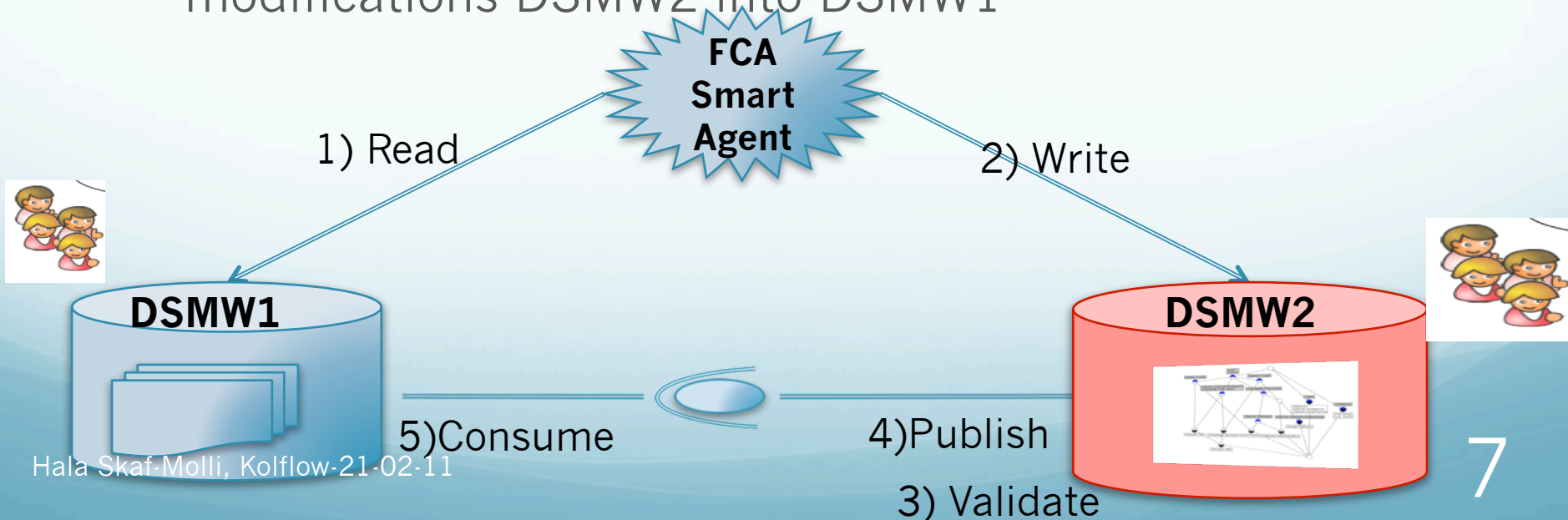
- Applications domains:
 - Educational content (CyWiki)
 - Cooking recipes (Taaable)

Education Content: CyWiki Project



Scenario of Human-Machine Collaboration [SemWiki2010]

- Initial Wiki DSMW1, FCA agent creates the lattice in DSMW2
- Humans correct, refine the content of DSMW2, push the content of SMW2 of a push feed
- Administrator of DSMW1 can pull validated modifications DSMW2 into DSMW1



DSMW1: Initial Semantic Wiki

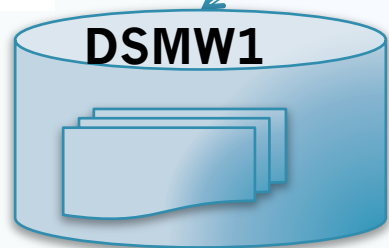
- 4 Categories, 2 subcategories, 2 Properties, 11 Individuals
- Category:
 - Professor, Topic, Course, Level
 - Level has two subcategories: Master1 Level and Master 2 Level
- Property:
 - isTaughtBy(Course, Proessor) , isAbout(Course, Topic)

Individual	Content
Prof. Smith	[[Category: Professor]]
Prof. Jones	
Artificial Intelligence	[[Category: Topic]]
Software Engineering	
Networks	
Knowledge Discovery	[[Category: Course]] [[Category: Master1 Level]] [[isAbout::Artificial Intelligence]] [[isTaughtBy::prof. Smith]]
Design Patterns	[[Category: Course]] [[Category: Master1 Level]] [[isAbout::Software Engineering]] [[isTaughtBy::prof. Jones]]

Individual	Content
Semantic Web	[[Category: Course]] [[Category: Master1 Level]] [[Category: Master2 Level]] [[isAbout::Artificial Intelligence]] [[isTaughtBy::prof. Smith]]
Semantic Wiki	[[Category: Course]] [[Category: Master2Level]] [[isAbout::Artificial Intelligence]] [[isTaughtBy::prof. Smith]]
Network Administration	[[Category: Course]] [[Category: Master1 Level]] [[isAbout::Networks]] [[isTaughtBy::prof. Jones]]
IPv6 Protocol	[[Category: Course]] [[Category:Master2 Level]] [[isAbout::Networks]] [[isTaughtBy::prof. Jones]]



1) Read



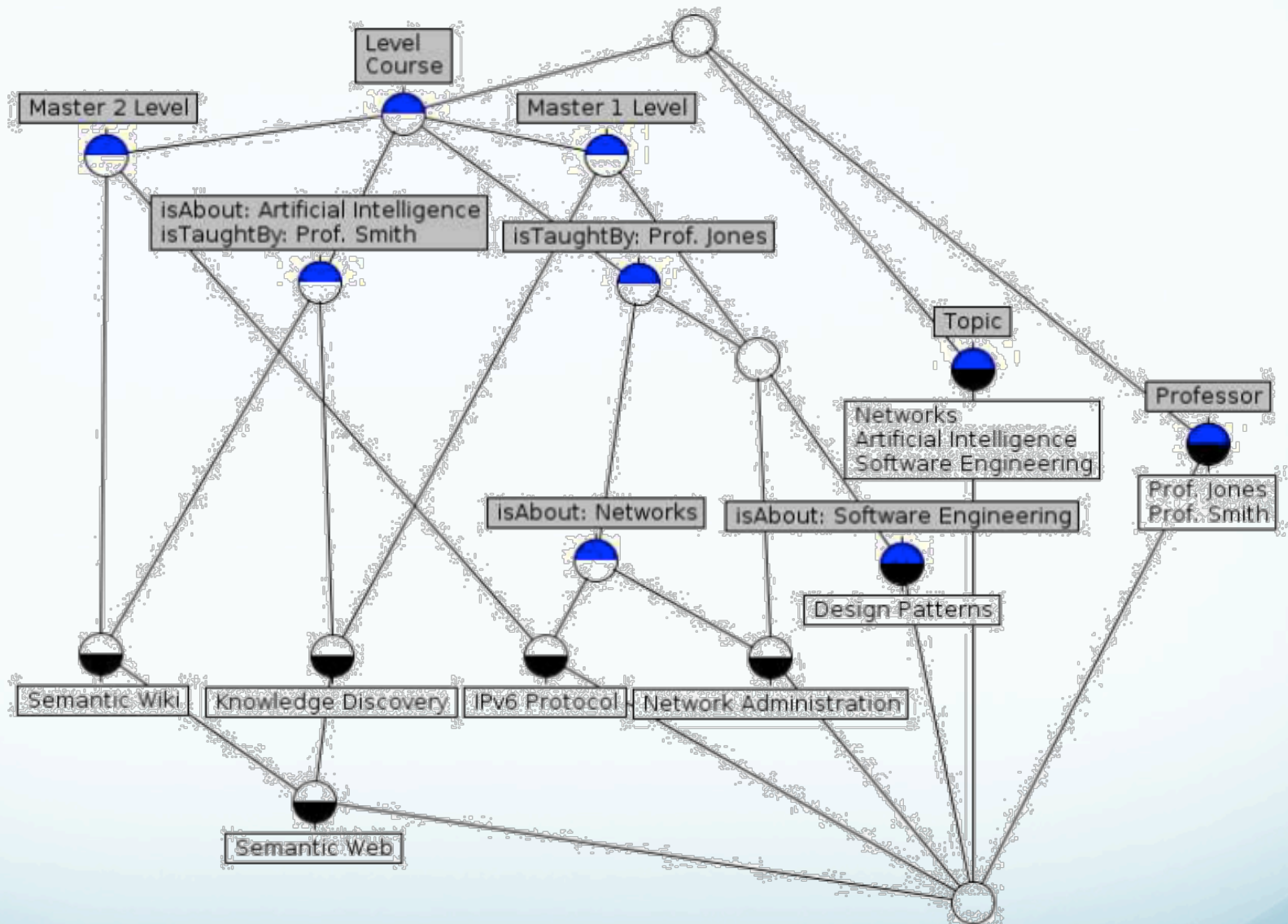
Wiki pages

	Professor	Topic	Course	Level	Master 1 Level	Master 2 Level	isTaughtBy:Prof. Smith	isTaughtBy:Prof. Jones	isAbout:Artificial Intelligence	isAbout:Software Engineering	isAbout:Networks
Prof. Smith	x										
Prof. Jones	x										
Artificial Intelligence		x									
Networks		x									
Software Engineering		x									
Knowledge Discovery			x	x	x		x		x		
Semantic Web			x	x		x	x		x		
Semantic Wiki			x	x	x	x	x		x		
Design Patterns			x	x	x			x		x	
IPv6 Protocol			x	x		x		x			x
Network Administration			x	x	x			x			x

Category

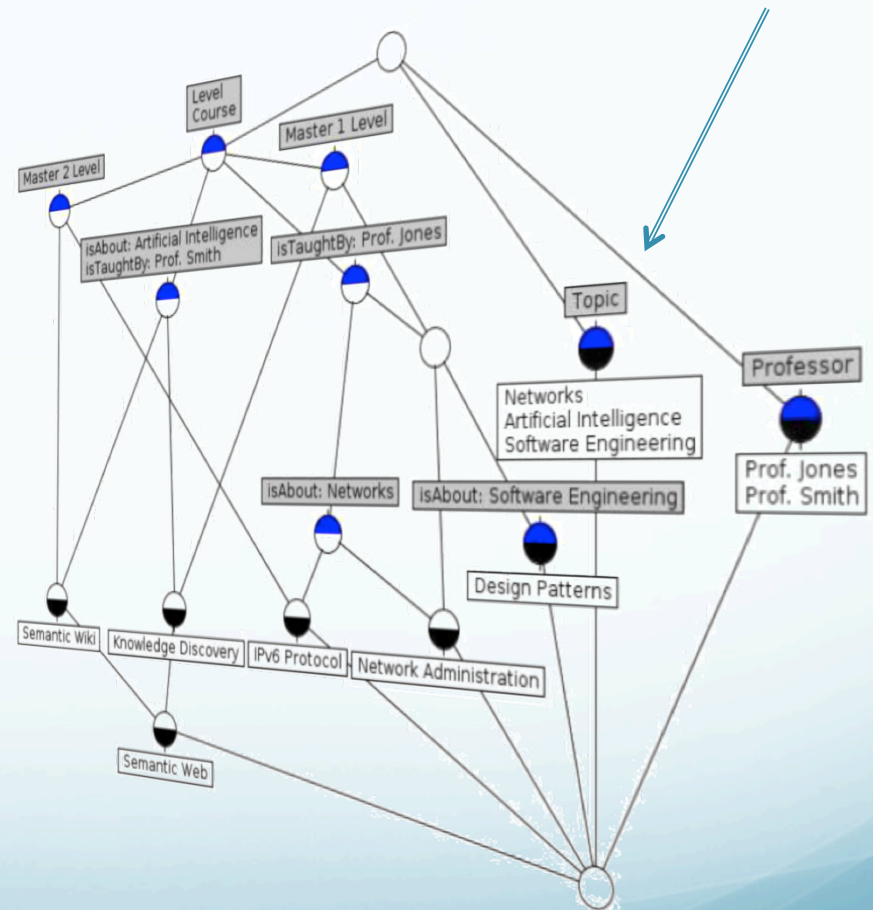
Property

Table 2. Context based on the wiki



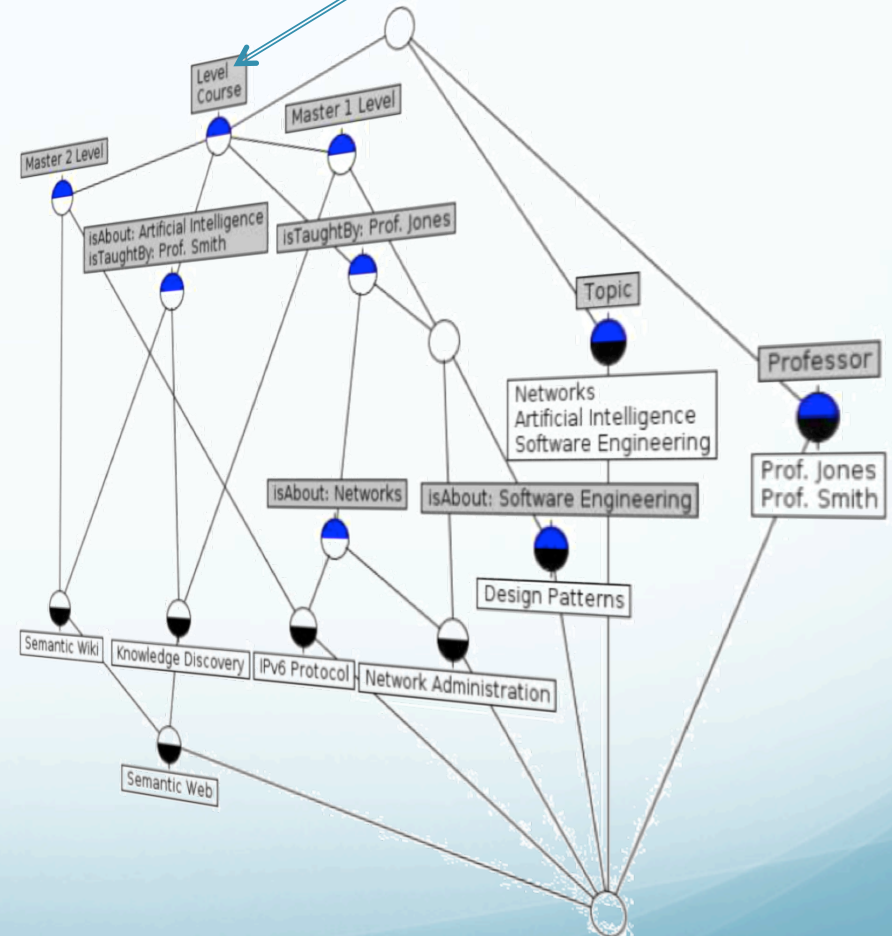
Mapping categories and lattice concepts (1)

- **Preserving original categories:**
- If a concept matches one and only one category
- Example: Category Topic



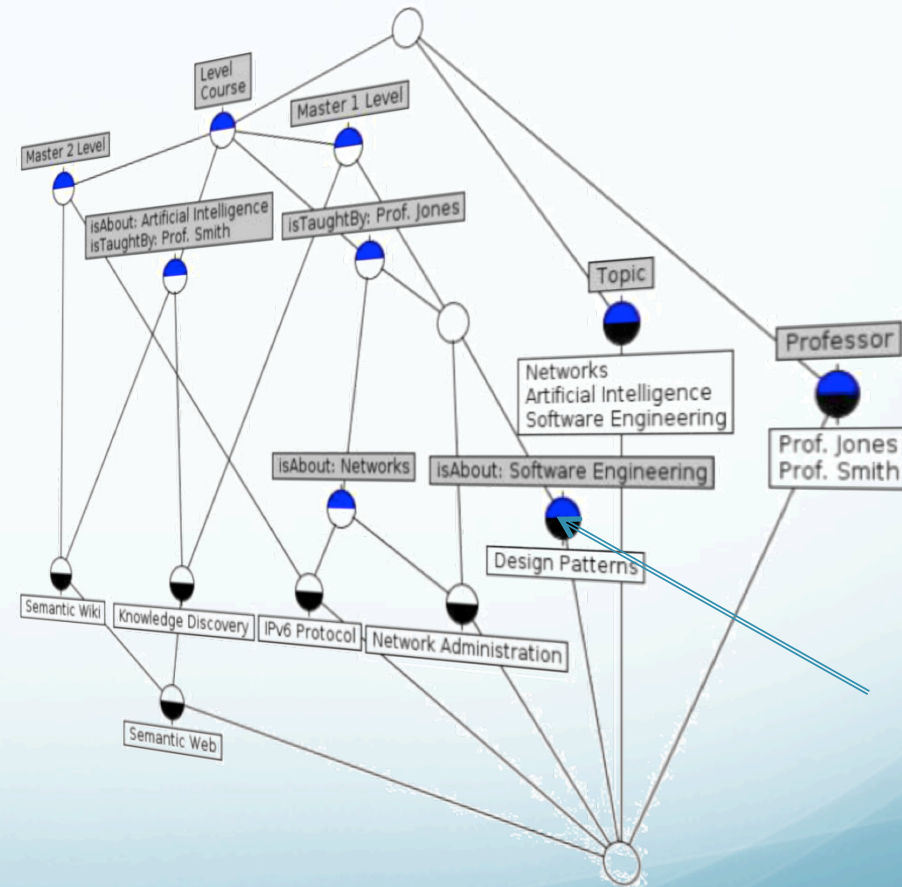
Mapping categories and lattice concepts(2)

- **Merging Categories:**
 - A concept matches two categories or more (several users use different terms) a new category is created
 - The content of this category is the concatenation of the content of merged pages
- Example: Course and Level



Mapping categories and lattice concepts(3)

- **Create new categories:**
 - A concept matches no category, a new one is created.
- Example:
 - Category about software engineering based on semantic property on the page Design Patterns courses (Category: New Category 42)



Mapping categories and lattice concepts(4)

- We add the content:
 - “The pages belonging to this category seems to have relation T with the page P”.
- Example: the page of the category : New Category 42 will contains the sentence:
 - “ The pages belonging to this category seems to have the relation Property:isAbout with the page Software Engineering”



Validation by Human (1)

- **Rename merged categories**
 - Example : Course and Level are merged (Course_Level).
 - Human can rename into Course and rename the subcategories :Master 1 Level and Master 2 Level into Master 1 Course and Master 2 Course
- **Rename created new categories**
 - Example : new Category : New Category 42
 - Human can use the content of the created category and rename it into “Software Engineering Course”

Validation by Human (2)

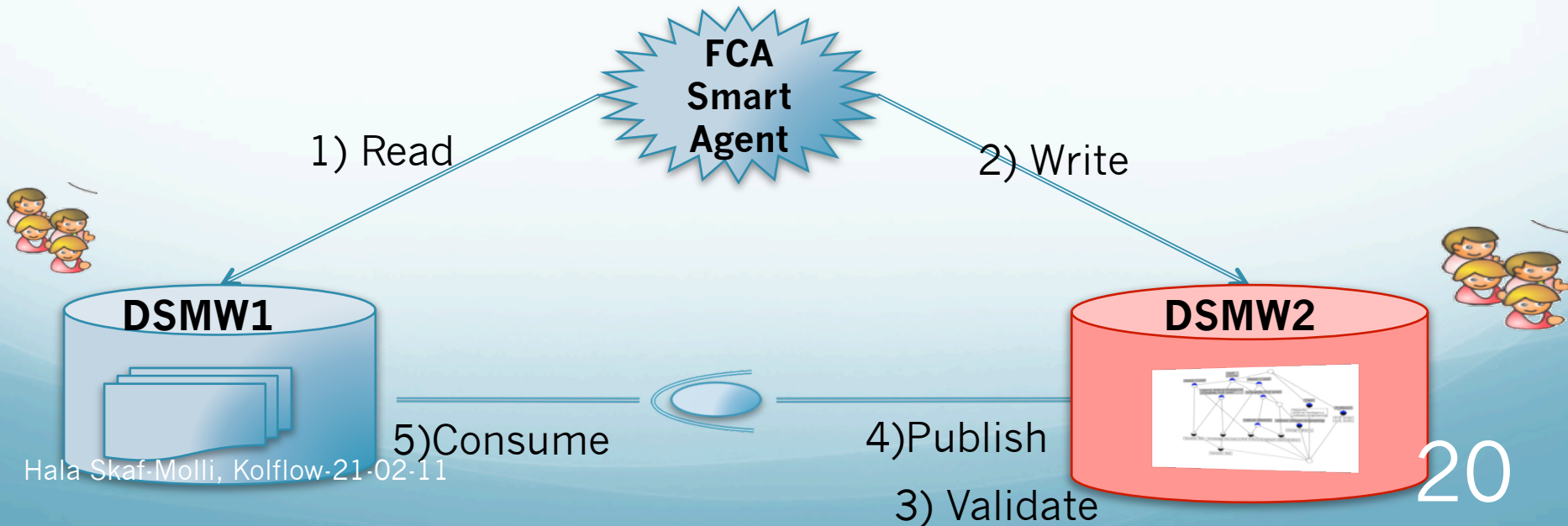
- **Remove irrelevant categories:**
 - Example : Master 1 Course and Prof. Jones' Course
 - Human can decide to remove this category from the wiki

Enriched Wiki

- Category:
 - Professor, Topic, Course, ~~Level~~
 - ~~Level~~ Course has two subcategories: Master1 ~~Level~~ Course and Master 2 ~~Level~~ Course
 - Artificial Intelligence Course SubCat of Course
 - Master 1 Artificial Intelligence Course subCat of Master 1 Course and subCat of Artificial Intelligence
 - Etc ..
- DSMW2 has 14 categories instead of 4 categories in the initial wiki (same individual pages, same properties as in DSMW1)

Human-machine collaboration

- Collaboration Scenario of FCA smart agent and human to enrich semantic wiki
- Smart agent tries to explain ..
- Human can validate/edit



Kolflow Issues

- Human-machine collaboration is a continuous process..
- How to ensure that human-machine collaboration ensures non-regression ?
 - FCA provides feedback to human
 - Smart agent does not have feedback from human : a rejected category can be recreated by the smart agent..
 - Smart agent has to be “history-aware” and has to use the information of the modification done by the human ...

