

Identification of User's Learning Goals in Workflows

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Overview

- ▶ Introduction: workflow- or task- embedded e-learning
- ▶ TEAL: system architecture
- ▶ Learning concept ontology (LCO)
- ▶ Identification of learning goals in task context
- ▶ Identification of learning strategies in task context
- ▶ Current and future research
- ▶ Conclusions

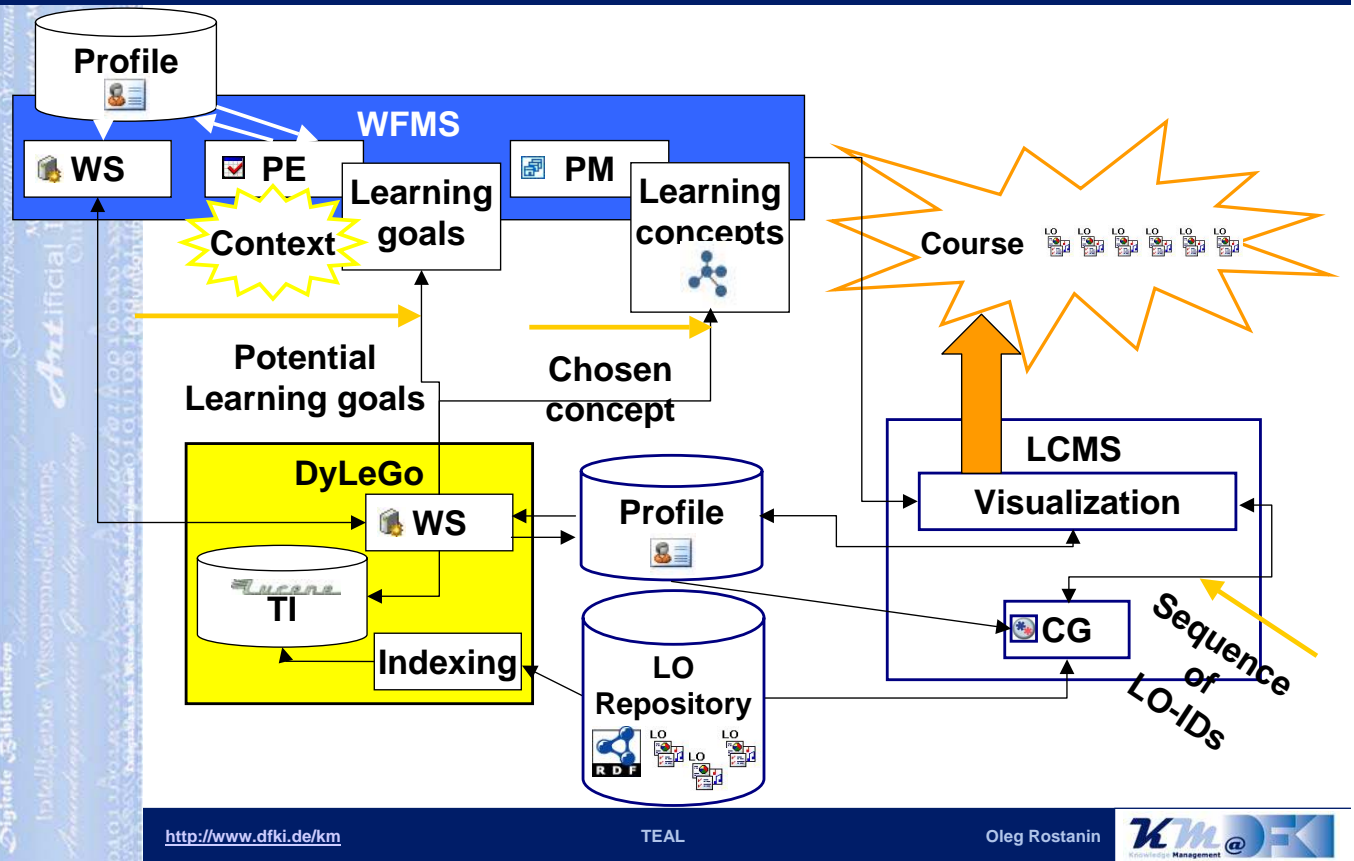
Introduction: workflow- or task- embedded e-learning

- ▶ The definition of “Workflow learning” was given by Sam Atkins. It assumes integration of enterprise software and e-learning into one workflow using service oriented architecture (SOA), generating learning tasks as part of the enterprise workflow and permanent control on the learning task execution.
- ▶ We prefer more lightweight approach of task-oriented context-specific proactive information delivery and would like to extend it by using up-to-date e-learning technologies enabling just-in-time delivery of goal-oriented, user-tailored learning curricula, helping employee to solve problems autonomously and competently. We call our approach workflow- or task- embedded e-learning.

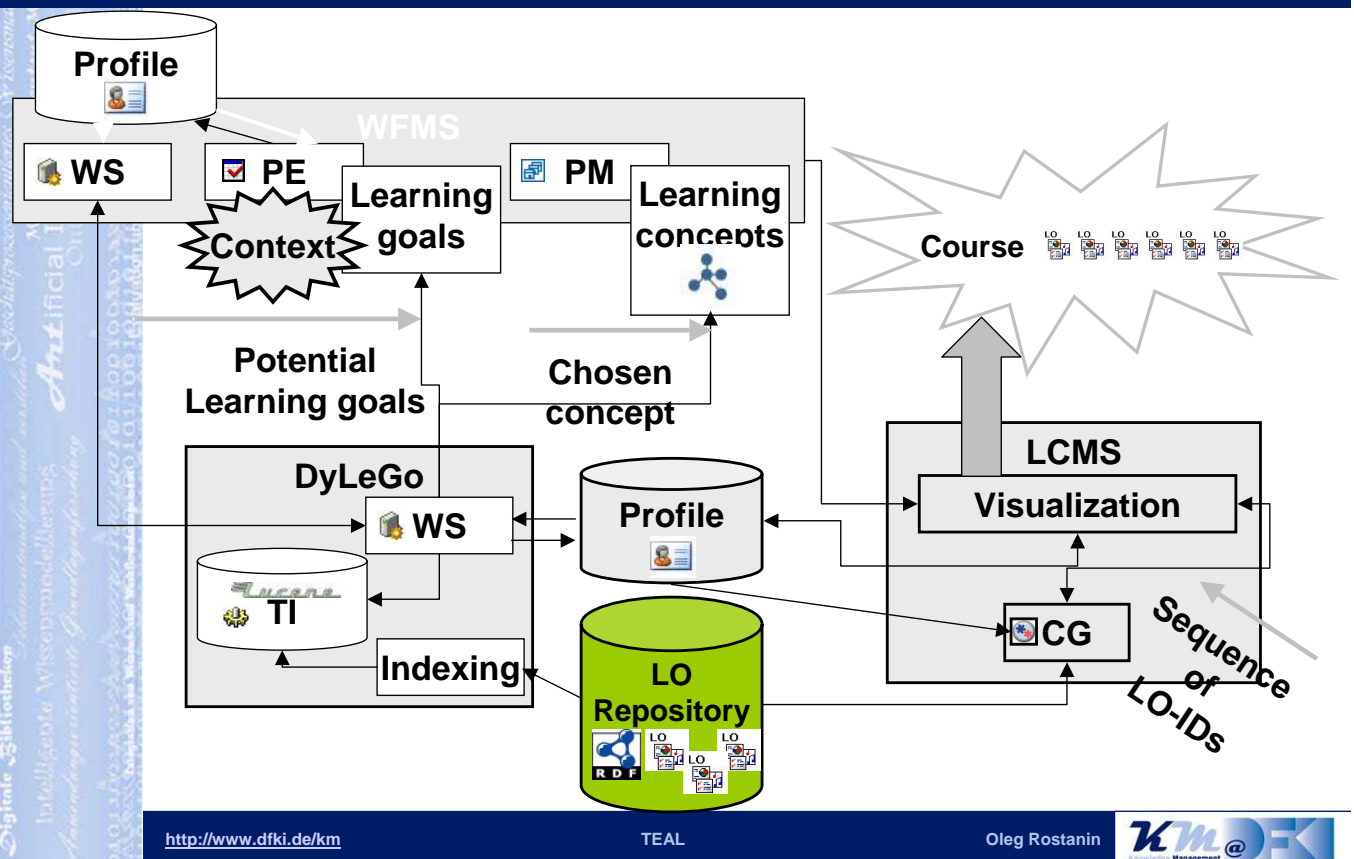
Introduction: workflow- or task- embedded e-learning

- ▶ Enterprise business processes set hard requirements to the task-embedded e-learning. The information delivered to workflow participants has to satisfy the current users' information needs (be just-in-time) but not to overwhelm them (be just-enough). Considering this facts, we argue that task-embedded e-learning has to be highly adaptive and goal-oriented.
- ▶ Methods for lightweight extraction of learning goals were a part of the research conducted in the project TEAL (Task-Embedded Adaptive e-Learning) at DFKI in 2005.

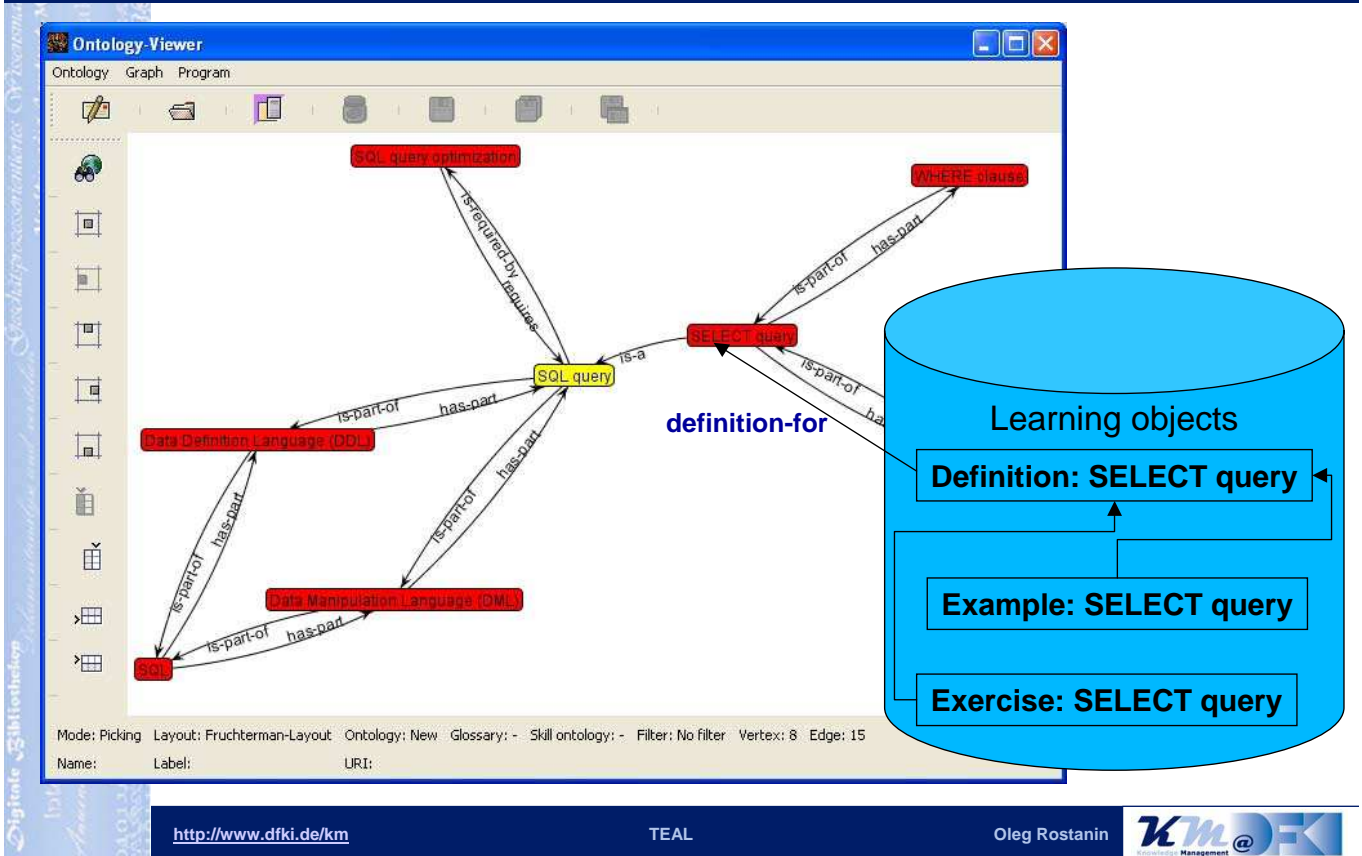
Task-embedded adaptive e-Learning: architecture



Learning object repository



Learning concept ontology (LCO) - Example



LCO - classes

default:concept		
default:conceptName	String*	
default:relatedTo	Instance*	default:conceptRelation

SQL-query,
SELECT-statement,
SQL-query optimization

default:relatedTo* default:relationConcept*

default:conceptRelation		
default:relationConcept	Instance*	default:concept
default:relationType	Instance*	default:relation

default:relationType*

default:relation	
default:relationName	String*

has-part, is-part-of
requires, is-required-by
is-a

Learning goal: formal definition

- ▶ We define a learning goal formally as

$$g = (c, s, m)$$

Where

g is learning goal

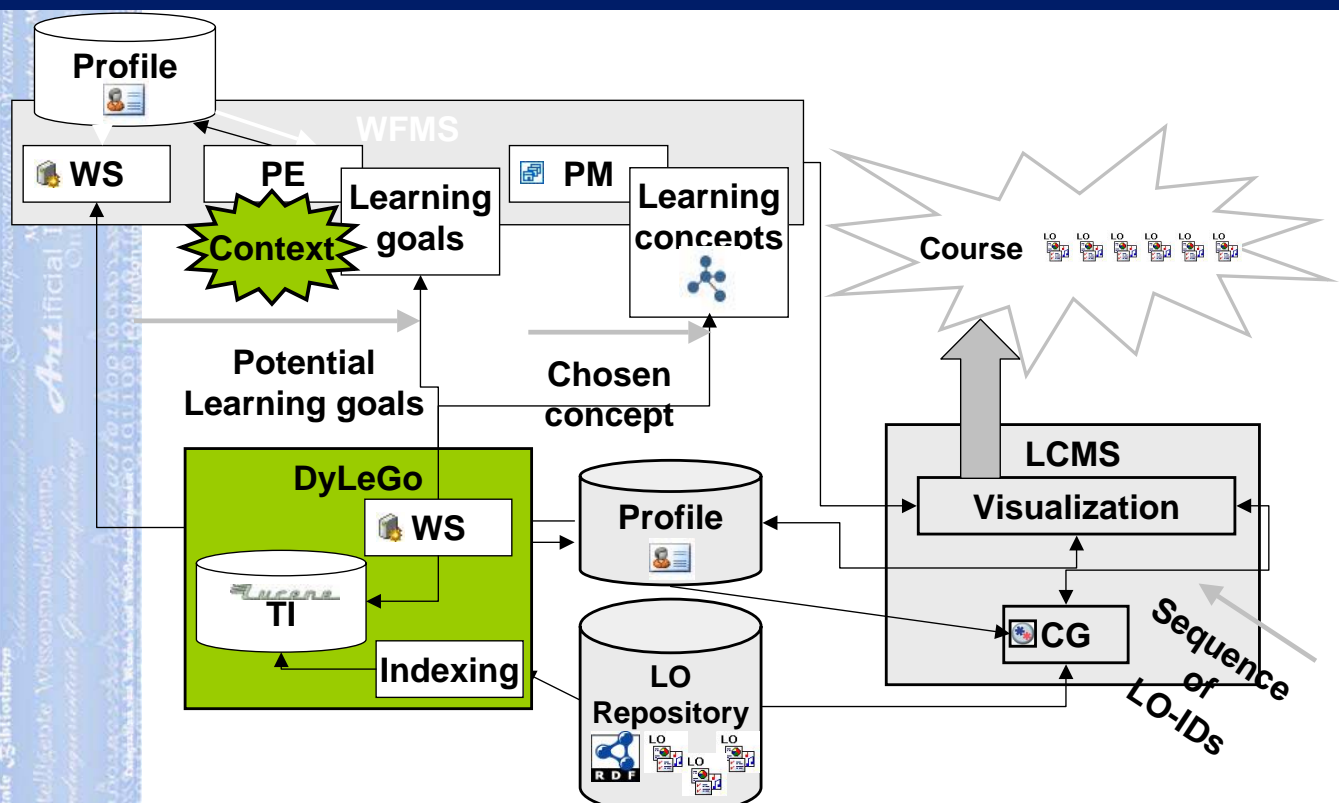
c is a concept from the learning concept ontology (LCO)

s is a learning strategy

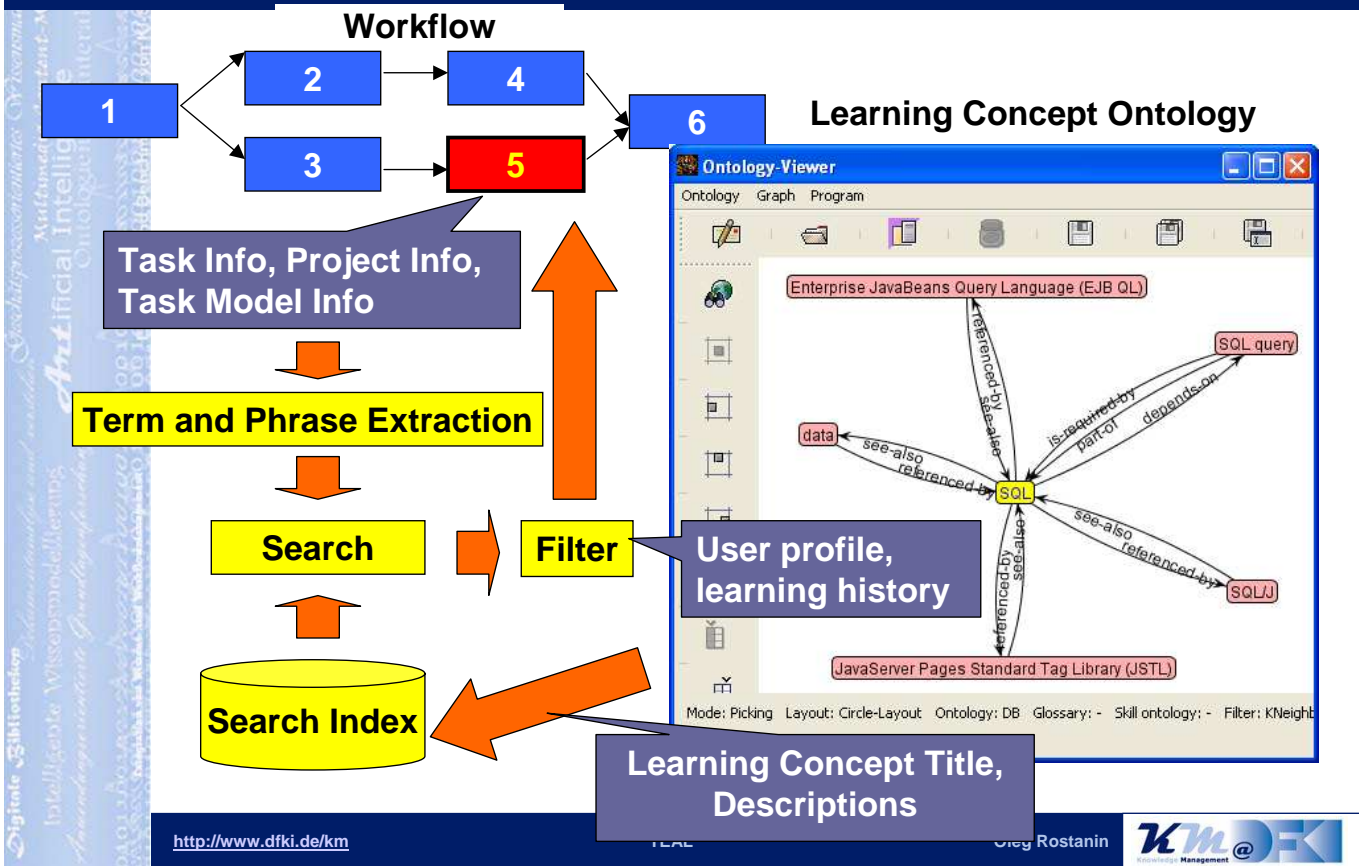
m is a motivation of user to achieve the goal (normally it is a motivation to complete certain workflow task)

If the learning goal was accepted by the user it receives runtime attributes like start date, date of achievement, current status.

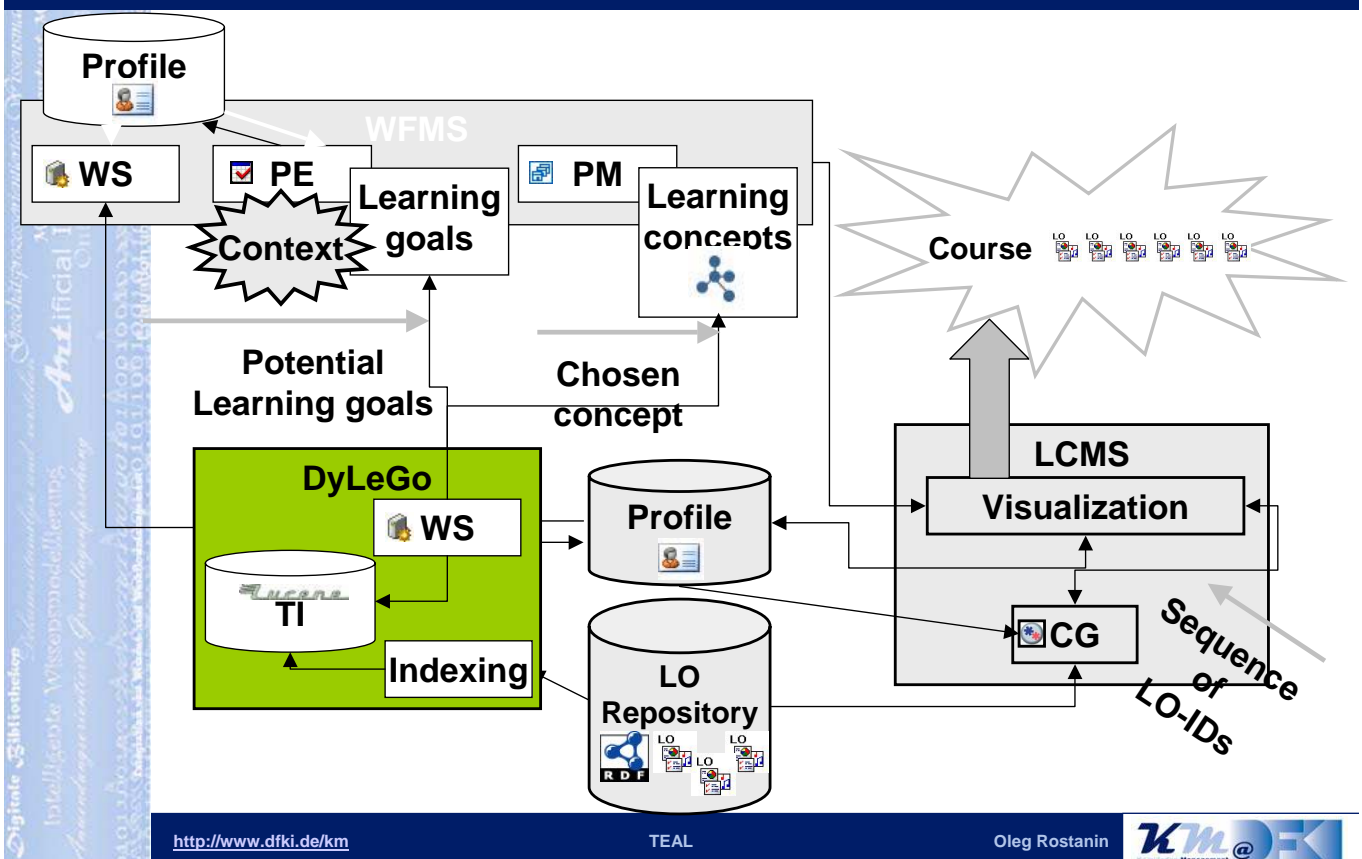
Identification of learning goals in task context



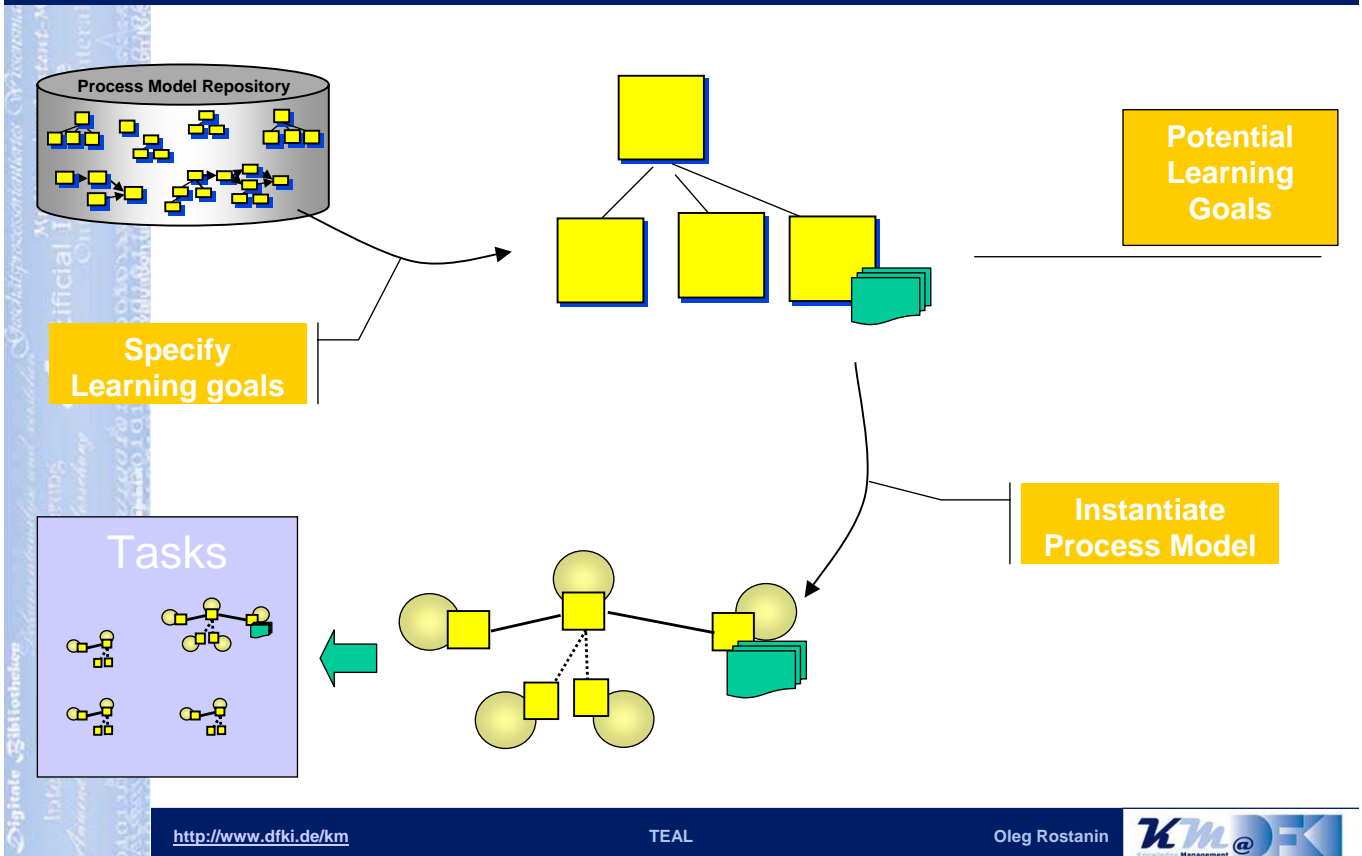
Learning concept retrieval



Learning goal reuse



Learning goal reuse: embedding potential learning goals into process models



Learning strategies in TEAL

- ▶ **Overview:** Very short description giving the general impression about the subject to be learned. One can compare this with glossary description. On the basis of the overview Bob should be able to judge whether he needs to learn this subject deeper or not.
- ▶ **Cursorily:** If the learner decided to learn the subject but he/she does not need to get expert-level knowledge on it, the cursorily strategy should be chosen. For instance, it would be the case if Bob's manager would like to get acquainted with possibilities of the SQL language.
- ▶ **Detailed:** Provides expert-level knowledge on the subject. If Bob would like to optimize a complex Oracle query and has no idea about optimization, a detailed course on Oracle SQL tuning should be delivered for him.
- ▶ **Repeat:** Serves as reference material on the subject. If Bob finished the course on Oracle SQL tuning he might still need a succinct reminder course on Oracle optimizer hints.

Learning strategy retrieval



- ▶ Based on so called concept-role-strategy mapping which is initially estimated by the author who introduced certain learning concept into the ontology.
- ▶ During its usage, the system learns which strategies were really chosen by which user roles and the mapping is continuously evolving.
- ▶ The system follows some rules, for example, if the concept was already learned by the user with the **Detailed** strategy, next time the strategy **Repeat** will be proposed to the user.

Conclusions

- ▶ A lightweight approach for learning goal identification in workflows was presented
- ▶ Learning Concept Ontology Tool was introduced. *Is being developed within an open source project LeCoOnt (<http://lecoont.opendfki.de>) under the BSD license.*

- ▶ Thank You for Your attention!
- ▶ If interested, please contact Oleg.Rostanin@dfki.de