Semestral Work Topics

October 9, 2017

This document lists some topics for EAR/WPA courses. First, **the preferred way is that you invent your own topic, based on your personal or professional interests**. If you don't have any such topic this document can help.

In addition to the standard topics listed in section Topics, we also offer a few advanced topics that are of particular interest to the work of the Knowledge-based and software systems group FEE CTU. These topics are more complex than the standard ones, but are motivated by practical problems that we solve as a part of our research project. These advanced topics are meant for students that would be interested in leveraging them into a bachelor thesis, or for those that already have significant experience in enterprise application design and implementation.

Topics

Journal Manuscript Preparation System A journal editorial board manages submission/publication process of journal articles. Its members ask experts to read and review papers. Each reviewer needs to be informed (e.g. by email) about a new paper assigned to him/her to review. He/she downloads the paper, prepares a review and writes notes into a single large text area or uploads a self-prepared PDF file. Editorial board, as well as authors want to know, which articles are already reviewed and which are under review.

Private Library The system serves for people that often lend books (or other content) to publicly advertise their books, including their design, content summary, or assessment by others. The system should provide also an overview of the library status (which books are lent, which are free, which are reserved). The system should support automatic notifications after some time period (e.g. 6 months). The system will allow easy management of books (insertion/removal), as well as reservations. It should distinguish different type of access (e.g. guest, librarian).

Vacation Planning System Small teams need to organize their vacations to avoid overlaps of important people. Each team member should be able to insert his/her request for vacations. A summary calendar-like view with highlighting of current day, state holidays, number of available team members, is expected. Each team

member should be informed about remaining number of holidays to be scheduled in the year. Optionally, various roles (manager, developer, technical support, etc.) of team members might be considered to highlight days where the role is missing.

Meeting Scheduler The system is similar to Doodle, but has more functions. The organizer offers several options for a meeting in terms of time slots and possible places. Each poll participant decides how much the offer is good for him/her (e.g. in terms of 0-10 points) and can fill in a remark.

School Information System The system is a simple version of KOS, maintaining courses, students, teachers, rooms. Teachers can create a course and schedule them into rooms that restrict the capacity of the course. Students can enroll into the course unless the course is no more capacity left. Students can list courses they are enrolled into, teachers can list courses that they teach.

System for bachelor/diploma/dissertation thesis reviewers During bachelor / diploma / dissertation thesis evaluation, one or more reviewers have to read and assess the thesis. The system should be able to manage reviewers (CRUD), together with their expert topics (Provided by means of a taxonomy), affiliation and contact. Guests can search reviewers based on the works they have reviewed and based on the topics matching their expertise.

Advanced Topics

Vocabulary Management System Management of terminology and vocabularies is inherent to each enterprise organization. The system should allow create/search new vocabularies. In each vocabulary, management of terms is supported. Once a new term, it is equipped with (multi-lingual) names, (multi-lingual) definitions, pictorial information and other relevant metadata, as well as track communication about particular terms among its users. The system should support SKOS import/export.

Dataset Dashboard The system should help people to find public data sets, to explore them and judge their usability for their use case. The datasets are described by means of so called descriptors computed from the actual content of the datasets. For each data set descriptors need to be managed, including their nature (temporal, spatial, ontology-based, etc.), way of construction (manual, automatic). Efficient search of the data sets/descriptors is necessary.

Web Application for Enterprise Issue Tracking The system should help managers to track innefficiencies/issues/problems/suggestions pointed out by their employees, together with their solutions. The system should support various (dynamic) categorizations of issues as well as solutions to them. Full tracking of the issue history together with solutions and their efficiency is needed. Mobile client for issue creation is preferred.

Integration of JSON-LD implementation with Jersey Implementation of JSON-LD serialization/deserialization in connection with core implementation. Jersey integration. See `https://github.com/kbss-cvut/jb4jsonld` and `https://github.com/kbss-cvut/jb4jsonld-jackson`.

Semantic pipeline editor *Semantic pipelines* is our framework for processing web content using Semantic web technologies. The pipeline is defined by oriented graph of modules that are executed in order defined by graph edges. "Semantic pipeline editor" should be able to visualize/edit pipelines and configuration of defined modules. Module configuration dialog can be automatically generated from definitions of modules using our existing library "Semantic forms". CRUD for module configurations, search over module types, integration with "Semantic forms".

Clinical trial manager CRUD for patients, doctors, studies, using JOPA (ontology-based JPA-like framework) for persistence, optional support for mobile devices.

S-forms designer S-forms (Semantic forms) is our javascript library for visualization of declaratively defined interactive forms[1]. S-forms designer should help with initial design of forms as well as redesign of existing forms. It should be possible to create new form questions or reuse existing questions from a pool of reusable questions. The designer can be optionaly used to manage form validation/visualization rules.

S-forms collaboration platform S-forms is our javascript library for visualization of declaratively defined interactive forms[1]. The collaboration platform should allow different experts to communicate over set of questions and their structure within a form. The platform should integrate with existing issue-tracking system (e.g. Redmine) where each issue should reference a form fragment that an issue assignee can review. Declarative nature of the forms makes it easy to keep track of history of the developed forms.

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[1]A preview of s-forms based application is available at `https://drive.google.com/file/d/0B4stBl1CzVTuYklxVm1Ba0F0Y1U/view?usp=sharing`