

Proposal of software project FlowOpt (Workflow Optimizer)

Project leader: Roman Barták, bartak@ktiml.mff.cuni.cz

Project goal: The aim of the project is to develop software for editing, visualizing, optimising, and analyzing workflows.

Project deadline: October/November 2010

Platform: Windows, C#, Prolog

Detail description: Workflow is a set temporally and logically connected activities describing some process, for example producing some artefact, organizing an experiment, booking a trip etc. Activities may require resources for execution, for example, machines, workers etc. The proposed software will allow creating a workflow from scratch or importing an existing workflow. Workflows can be visualised (described graphically), edited, and saved again. After creating the set of workflows and specifying available resources, the system will generate a schedule optimizing a specified criterion such as makespan or cost. The generated schedule will then be displayed as a Gantt chart and it will be possible to modify manually the schedule by moving activities in time and space (between resources) or by selecting alternatives. The schedules can be analysed by evaluating particular features, such as cost, makespan, resource utilisation, overtime etc. and these features can be compared between several schedules to select the best one according to user preferences.

In summary, the software will allow users to

- create a set of workflows describing processes including alternative process routes,
- schedule these workflows in time and allocate them to available resources (including selection among alternative process routes and resources),
- analyse generated schedules by evaluating and comparing their features,
- visualize the schedules in the form of Gantt chart which allows manual modification of the schedule

Expected architecture: The software will be built using modules responsible for particular tasks, namely Workflow Editor, Scheduling Engine, Gantt Viewer, and Schedule Analyser. The modules will share the same “philosophy” of the workflow so it is critical to synchronise the base concepts between the modules. The communication (including data sharing) between the modules will be realised through an orchestration level. The software is supposed to use a commercial system MAKE from ManOpt to do the orchestration (the modules will plug-in to MAKE) or a light orchestration level will be developed.

Proposed students’ team:

- Milan Jaška (Scheduling Engine)
- Matěj Klonfar (Schedule Analyser)
- Vladimír Rovenský (Workflow Editor)
- Tomáš Skalický (Gantt Viewer)