

## Evaluation of commercial workflow engine for modeling clinical processes in quality improvement and decision support

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**Background:** Workflow technology (WT) is a new emerging technology which offers support for modeling, execution and analysis of processes within information systems. WT has been successfully implemented in many industries resulting in increased efficiency and decreased variability and costs. Similar potential exist in healthcare, however the penetration of this technology, according to Gartner, is less than 5 %. Marshfield Clinic is considering integration of a workflow technology within their EHR system to enable user-friendly creation and customization of numerous EHR features.

**Methods:** We have evaluated the suitability of a commercially available workflow editor and engine for modeling clinical processes. The evaluated editor was used to model several sample processes (e.g., osteoporosis QI process and laboratory monitoring processes). Robustness of the features was evaluated with three target users in mind: programmer, designated workflow process engineer, and champion clinician. Compliance with the XPDL standard (XML process definition language) was also evaluated. Modeled sample processes were then loaded into the tested workflow engine and support for process deployment and execution was evaluated (specifically ability to interface with external databases, web

services and legacy systems). We have also briefly evaluated modules for process analysis and discovery (ability to mine process definition from existing healthcare event logs).

**Results:** We have successfully installed both the workflow editor and engine of a chosen commercial WT vendor and were able to execute several example processes. The installation of the engine required some assistance from the vendor. The evaluated workflow editor did not provide a separate perspective for a non-expert in WT (e.g., champion clinician) and lacked several graphical and modeling features. The tested editor did use XPDL as the underlying standard, however made heavy use of external attributes which is a special part of the standard for vendor-specific features. Deployment of interfacing processes required repeated assistance from the vendor and a few duplicate steps in the editor and the workflow engine.

**Conclusion:** Marshfield Clinic is one of the very few healthcare institutions pioneering the integration of workflow technology with an EHR system. Our results were shared with the vendor and further collaboration talks are planned.