Towards an integration of workflows and clinical guidelines

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Abstract and Objective

The integration of workflows (WFs) and clinical practice guidelines (CPGs) modeling healthcare processes is a hot topic of research in Medical Informatics. Many computerized approaches have faced this problem, mostly extending current WF or CPG approaches to represent and manage integrated models which merge the content of both CPGs and WFs. We devised a case study, showing that there are many differences between CPGs and WFs as regards contents, focus, goals, users and editors. On the basis of such an analysis, we propose a different approach to integration. Our approach reconciles (i) the need of performing inferences on the integration of WK and CPG knowledge, with the users' requirements (ii) to focus only with the aspects of knowledge they are interested in, and (iii) to have a user-friendly representation of such a knowledge.

Keywords:

Clinical practice guidelines, Workflows, Integration

Methods

Many recent computer-based approaches try to integrate workflows (WFs) and clinical practice guidelines (CPGs) modeling healthcare processes by extending current WF or CPG approaches to represent and manage integrated models which merge the content of both CPGs and WFs. For instance, within the WF community, it has been shown that the primitives provided by WF formalisms to cope with patterns of activities are expressive enough to deal also with the patterns in CPGs. Additionally, several WF approaches have extended their formalisms and execution engine to provide the flexibility needed in order to cope with CPGs and their execution.

We propose a different methodology to integration. We started from the analysis of a case study, namely vinorelbine treatment for advanced non-small cell lung cancer. We have considered both the WF and the CGP currently used in the Azienda Ospedaliera San Giovanni Battista, Turin. Such an analysis shows that there are many differences between CPGs and WFs as regards contents, focus, goals, users and editors, thus highlighting several limitations of *current* approaches. Among the others, such approaches do not consider the fact that each user (analysts vs physicians) wants focus only on the aspects she is more interested in (process organization and resources for analysts, clinical decision logic for physicians), and to see the knowledge in the form she prefers (WF formalisms for analysts, CPG formalisms for physicians).

Results

Having identified the above limitations of current frameworks, we propose the two-layer approach in Figure 1. A WF tool copes with "process-organization" aspects of the problem; a CPG tool copes with CPGs; both models are mapped onto a common system-internal representation, so that inferences requiring integration are performed on it, still maintaining the two separate views for analysts and physicians.
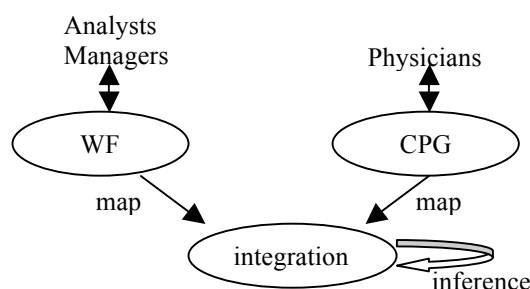

Figure 1-An architecture for integration

Conclusion

On the basis of a case study, we have identified several drawbacks of current approaches integrating WFs and CPGs in the healthcare domain, and we have proposed a two-layer software architecture overcoming such limitations. We are starting to devise an implementation of the general architecture in Figure 1 by taking advantage of iGrafXProcess to cope with WKs, of GLARE to cope with CPGs, and of Petri Nets to deal with integration. Future work regards further investigation about several open issues, including the integration of the (Petri Nets) models of WFs and CPGs, and the scalability of the approach.