Introduction to the Second International Workshop on Process-oriented Information Systems in Healthcare (ProHealth'08)

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Workshop Background and Goals

Healthcare organizations and providers are facing the challenge of delivering high-quality services to their patients, at affordable costs. High degree of specialization, prolonged medical care for the ageing population, increased costs for dealing with chronic diseases, and the need for personalized healthcare are prevalent trends in this information-intensive domain. The emerging situation necessitates a change in the way healthcare is delivered to the patients and healthcare processes are managed.

BPM technology provides a key to implement these changes. Though patient-centered process support becomes increasingly crucial in healthcare, BPM technology has not yet been broadly used in healthcare environments. This workshop elaborated both the potential and the limitations of IT support for healthcare processes. It furthers provided a forum wherein challenges, paradigms, and tools for optimized process support in healthcare can be debated. In Milan we brought together researchers and practitioners from different communities (e.g., BPM, Information Systems, Medical Informatics, E-Health) who share an interest in both healthcare processes and BPM technologies.

The success of the first ProHealth Workshop, which was held in conjunction with the 5th International Conference on Business Process Management (BPM'07) in Brisbane in September 2007, already demonstrated the potential of such an interdisciplinary forum to improve the understanding of domain specific requirements, methods and theories, tools and techniques, and the gaps in between that are yet to be closed. The ProHealth'08 workshop deals with different facets of process-oriented information systems in healthcare, and it gives insights into the technological challenges, applications, and perspectives emerging for BPM technology in this context.

Paper Selection Process

Submitted papers were evaluated on the basis of relevance, originality, technical quality, and exposition. Papers had to clearly establish their research contribution as well as their relation to healthcare processes. We accepted eight papers as full paper and one as short paper (out of twenty submissions). In addition to the nine regular talks we had a keynote by Silvana Quaglini from the University of Pavia, Italy.

Workshop summary

The Prohealth'08 workshop focused on IT support of high-quality healthcare processes.

In her keynote paper "Process mining in healthcare: a contribution to change the culture of blame", Silvana Quaglini explains how information and communication technology can help improve the quality of care. From decision-support systems that are based on evidence-based clinical guidelines, to the use of mining techniques used to discover non-compliance with guideline recommendations and the reasons for non-compliance. Using these approaches, practitioners need not fear the culture that blames individuals for their mistakes; instead, by reconstructing patterns of actions that lead to errors we could improve the clinical community of practice.

The following three papers focus on process assessment and management. Samrend Saboor and Elske Ammenwerth present a concept for the assessment of electronic communication in integrated information systems. In their paper they argue for a five level categorization of communication problems. The discussion revealed that communication problems and data

quality problems are often two sides of the same coin. The following paper by Danny Ammon, Dirk Hoffmann, Tobias Jakob, and Ekkehard Finkeissen is headlined Management of Knowledge-intensive Healthcare Processes on the Example of Clinical Basic Documentation. The authors propose an approach for knowledge management which is exemplified by system that makes use of clinical guidelines as template for documentation. The last paper in this section “From Paper Based Clinical Practice Guidelines to Declarative Workflow Management “ by Karen Marie Lyng, Thomas Hildebrandt, and Raghava Rao Mukkamala discusses the lack of integration between clinical process guidelines and IT-systems in healthcare.

The next three papers target process flexibility and integration. Flexibility is interpreted in different ways by the authors. The paper entitled "Petri Nets as a formalism for comparing expressiveness of workflow-based Clinical Guideline Languages" by Grando, Glasspool, and Fox, examines the question of which flexible control-flow patterns are supported by the PRO*forma* guideline modeling language. The authors define a mapping from the PROforma language to Colored Petri Nets (CPN) and utilize it to construct formal proofs that PROforma is capable or is not capable of expressing a standardized workflow pattern. A second interpretation of flexibility is given in the paper "Flexibility Schemes for Workflow Management Systems" by Mans, van der Aalst, Russell, and Bakker. They ask what types of flexibility occurs in healthcare processes and how these types could be supported by Workflow management systems. Using a case study of gynecological oncology, they compare the support of flexibility that is offered by different kinds of workflow management systems. The last interpretation of flexibility is given by Imam and MacCaull in their paper "Integrating Healthcare Ontologies – An Inconsistency Tolerant Approach". Here, flexibility is interpreted as providing clinicians with complete information which may be contradicting. They present a multi-valued logic based merging system that can merge two inconsistent terminologies without losing information and exemplify it on merging subsets of the SONMED-CT and ICNP terminologies.

The last three papers deal with cooperation in healthcare processes. The paper entitled "Session-aware Clinical Information Systems" by Nytrø, Sørby and Alsos introduces the *session* as a model capturing the interactions between clinical staff and healthcare information systems. Thereby a session constitutes a sharable, referable and persistent representation of the dialogues between one or more users and systems. In their paper “Promoting Process-based Collaborative Awareness to Integrate Care Teams”, Cabitza, Locatelli, and Simone present their approach to support distributed care based on integrated care pathways. The described CASMAS model targets at the design of collaborative healthcare applications by focusing on awareness promotion and by reducing information overload. Finally, the paper “Integrating Humans, Devices, and Events in Clinical Workflow Processes” by Kuhr, Pretzel, Vagts, and Aldred presents an approach integrating human tasks, devices and events in one process models. The authors illustrated this approach along the process of patient admission to an intensive care unit.

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