Integration of Clinical and Administrative Information in Medical Treatment
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ABSTRACT
The relevant information needed in medical treatment of patients is changing at fast pace. When a change in one process occurs it may have impact on several locations in dependent processes performed by medical or administrative personnel. Today the team is not able to recognize changing information in real time. For this reason we decided to build an information network to allow rapid change management and according transparency improvement. By using enhanced UML supported by a software engineering tool we were able to show that it is possible to reach these goals.

MOTIVATION
To reach efficient patient care the patient stays in hospitals are to be shortened whereas the quality of patient care should not decrease. Current information flow is incomplete. Mishaps like data losses and multiple data entries are very common. Also Computer applications are not flexible enough to adapt to rapidly changing circumstances.

SPECIFIC PURPOSES OF SERVICES
Our thesis is that the hospital workers themselves have to play an active role in the improvement of coordination. To do this, it is necessary to offer them a tool for integration of information that is user friendly and easy to adapt to new situations. The content of this information must not only cover standard tasks like material logistics or patient data management, but also information about the interaction between the different teams and a better coordination of the available resources.

SYSTEM DESCRIPTION
Change management must meet the following requirements: adding new objects like new roles, new relationships like cooperation between teams, and manipulating data like changing or deleting current information. If one of these functions listed above has been completed all concerned users must be able to easily understand and recognize the altered information. Therefore we have modeled the workflow that occurs in everyday hospital situations using basic software engineering tools like Together¹. Together supports UML as a modeling standard to present simply and quickly an overview and in-depth view of how the specific work processes look and how the processes are dependent on one another. With addition of meta-information we build an explicit information flow network from producer to consumer.

METHODOLOGY
To create this information network we classified hospital information focusing on especially challenging aspects² brought in from the outside world. With the help of this preparation participants were able to analyze and design the current work processes themselves. The next step was increasing the efficiency. Modeling with colors allowed us to emphasize certain activities of the designed sub-processes. If one color had a high frequency, then the colored activity had to be supported by special resources to increase efficiency. The possibility of adding new or changing existing information for a given situation to improve transparency was the last step. It was performed by using colors in case of newly added information and by adding a UML-note in case of eliminated information. To describe problems that often occur a special form was designed.

EVALUATION AND RESULTS
To evaluate the system eight different participating teams in medical treatment with different know-how had worked with it. The teams were able themselves to build and to change the information network, which was very well accepted. All participants could work better together because they knew the entire context and the latest information and they had a better understanding for the other participants. However it was up to the team members’ initiative when to search the network for eventual changes of the processes. Also when and how to reset the change highlighting is still to be solved.

CONCLUSIONS
By using the system the error rate decreased, and the motivation of the team as well as the all over efficiency increased. But an additional means should assure that all participants are made aware of the changes in a more guided manner.

References