A Diagnosis Interface for Decision Support in ICUs

Hannes Schulz[1], Martin Christof Kindsmüller[2]

[1]Research and Development
Dräger Medical AG & Co. KG
Moislinger Allee 53-55
23542 Lübeck
hannes.schulz@draeger.com

[2]IMIS
Universität zu Lübeck
Ratzeburger Allee 160
23538 Lübeck
mck@imis.uni-luebeck.de

Physicians and nurses working in ICUs and operating rooms have to deal with a huge amount of data. Several medical devices are producing alarms and information that have to be processed. Additionally, these devices often have a bad usability. Therefore, it is almost impossible to keep an eye on all devices and acknowledge alarms and critical incidents in time. The physicians and nurses are suffering from informational overload that leads to stress and, as a consequence, often to failure.

One possibility to improve this situation is to employ Decision Support Systems to assist clinicians. These systems have the potential to improve the overall quality in healthcare. A recent review [GA05] documents that Support Systems could increase the performance of clinicians in nearly two of three cases. However, the acceptance of these systems cannot be guaranteed.

In order to improve the clinicians' work and patients' safety, a prototype of a diagnosis interface was developed. This interface is meant to serve as a Decision Support System for clinicians. The device was designed in a User Centered Design process. This means, the user, his tasks and his workspace were analyzed to gather important information that should lead to an improved usability and acceptance. Usability tests, interviews, and heuristic testing were further steps that helped us to achieve the desired results. The clinicians have been asked for feedback on lo-fi prototypes, which were the results from short development and design phases.

Overall it was possible to create an interface with a good usability and acceptance. Eight out of nine clinicians told us that they would use this interface in everyday or special situations. It still has to be shown if this device can improve the clinicians' work and affect patients' safety. However, the results of our usability tests demonstrate that the User Centered Design process is crucial when it comes to designing new devices and that the design of new Decision Support Systems is important after all.

References

[GA05]   Garg, A. X.; Adhikari, N. K. J.; McDonald, H.; Rosas-Arellano, M. P.; Devereaux, P. J.; Beyene, J.; Sam, J.; Haynes, R. B. Effects of Computerized Clinical Decision Support Systems on Practitioner Performance and Patient Outcomes. A Systematic Review. Journal of the American Medical Association, 2005, 293(10), 1223-1238.