

System Design of Medical Decision Support for Intensive Care

Kristof Steurbaut

Department of Information Technology, Ghent University, IBBT

Supervisor(s): Filip De Turck, Johan Decruyenaere

Nowadays, physicians and nurses still perform time-consuming and complex data analyses on individual patient data for making medical decisions. Although commercial systems are able to replace paper-based patient records, advanced medical decision support is still moderate. The increasing complexity of medical procedures in the Intensive Care Unit (ICU) requires time- and data driven software services, on the one hand to reduce improper use of antibiotics and inappropriate therapies, on the other hand to offer earlier and more accurate detection of infections and antibiotic resistance. Services analyze daily findings and alert the clinicians immediately when critical patients need changes in their therapy or to signal worsening conditions. All these services contribute to an increased efficiency of patient care. Information Technology has the potential of improving quality of care, safety and cost-effectiveness of critical care medicine. To this end, automated service solutions have been designed and implemented for infection control and antibiotic management in the ICU. Examples include alerts of kidney functioning, antibiotic dosing and infection surveillance services. The services can be plugged in a service execution platform, offering generic functionality for data collection, event handling and service management. A web based service oriented architecture offers several advantages over classical software design approaches thanks to the flexible design of complex medical applications by integrating basic services, efficient distribution of services over the available workstations and the involvement of the physician in the software specification process.

