Technology in health care logistics

In most developed countries, hospitals are facing a major challenge – they have to provide more health care using the same resources. Due to the demographic trend and the increasing share of the population being in a more health-demanding age, the hospitals will have to deal with more patients in the future. It is therefore essential that the hospitals are more efficient in order to meet the requirement of providing more health for the same or less resources. Studies have shown that more than 30% of hospital expenditures are related to various logistics cost, making the logistics an area with huge efficiency potential. However, hospital logistics are facing two problems. 1) Hospital logistics have to a large extent been dealt with using a departmental approach resulting in sub-optimised logistics. 2) In industry, the use of different technological solutions to perform and control the logistical processes is very common. This has however not to the same extent been the case within hospitals, where technology primarily has been used within the clinical settings. There is therefore a large potential in using technology to improve the logistics. Based on these considerations the research presents an analytical model that can analyse the logistical system using a holistic approach, and explore the possibility of using technology to improve the current system. A logistical system is one of the different flows happening at a hospital. Included in the analytical model is a performance assessment tool, which has been designed to assess the performance of the logistical system, thereby pinpointing where the system is performing poorly. Additionally the model and tool makes it possible to evaluate various technologies that can be used to improve and optimise the existing system. The analytical model and performance measurement tool thus makes it possible for the hospital management to analyse the various logistical systems, and gain an insight of which parts of the logistical system will have the largest benefit from implementing new technology. Concurrently the model makes it possible to continuously assess the logistical systems in order to ensure continuous improvement and efficiency of the hospital. As a consequence of the project new technologies have been implemented in one case, and implementing technology is in the preliminary phases for other cases. The thesis is based on six scientific articles, and the main contributions and conclusions from the articles are presented in the thesis. The articles present the development of the results throughout the study, and how the results have been adjusted and adapted, as the model was tested and validated. The articles consist of three papers presented at scientific conferences, and three articles submitted to scientific journals. In addition to the results, the thesis presents a detailed description of the scientific approach taken, as well as considerations in relation to the scientific approach and the achieved results.