

Developing a conceptual framework for suitable Real-Time Location System implementation areas

A case study at Scania CV AB Oskarshamn to test the technology of RTLS in production in order to evaluate and identify suitable application areas for the technology

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In order to remain competitive, it is necessary for the organization to re-evaluate its technologies. Since implementation projects of information technologies are at risk of failure, it is important to investigate what value newly acquired technology such as Real-Time Location System (RTLS) can provide to the company and its operations before implementing it.

Scania CV AB is a world leading provider of sustainable transport solutions. As a part of Scania's track and trace strategy, the company is currently investigating the possibility of implementing RTLS in their operations and what strategic value it can contribute with. Therefore, the company is interested in *where* and *how* the technology should be implemented.

The purpose of this study is to (1) identify advantages, challenges, risks and requirements in regards to RTLS and to (2) evaluate and identify suitable RTLS application areas with the aid of a conceptual framework that has been developed.

In order to fulfill the purpose, two research questions were formulated: (1) *What advantages, challenges, risks and requirements do RTLS entail?*, and (2) *How can Scania use the RTLS technology and for which applications?* The research questions were answered by applying a research methodology combining both quantitative and qualitative data. Information was gathered from existing literature, interviews with local Scania employees and from several systems. Additionally, the RTLS equipment provided by Marvelmind Robotics was applied in selected logistics operations. Focus was on investigating what areas are more or less suitable for RTLS in the context of internal logistics.

The findings indicated that in regards to the first research question, RTLS was discovered to

entail a large variety of advantages, challenges, risks and requirements. These range from technological ones such as increased efficiency to more general such as resistance to change from the organization associated with the implementation of the technology. Answering the second research question it was found that Scania can apply RTLS for such applications where the purpose of applying the technology is aligned with what the technology is capable of.

A conceptual framework is presented which ensures the organization to have necessary prerequisites in place prior to a RTLS implementation. Furthermore, the framework categorizes four purposes of RTLS testing to be (1) safety evaluation, (2) regulation compliance evaluation, (3) evaluation of operational efficiency and (4) monitoring purposes. The intention of using RTLS is divided into either to use it as a tool for aftermath analysis or to real-time rely on the technology to carry out daily operations. The tracking capacity of the technology, the mounting method in use, the area interrelations and the size of area are aspects to consider carefully as well.

The overall conclusion is that the RTLS equipment tested during this thesis does not meet the requirements set by Scania. Nevertheless, Scania could still use RTLS where the purpose of using the technology is aligned to its capabilities. The conclusion is summarized in the following three key aspects: (1) additional beacons will improve data quality, (2) a clear purpose of using RTLS is crucial and (3) the organization must be onboard with the implementation of the technology. The full study is published in the report *"Evaluating implementation areas of Real-Time Location System (RTLS) in the production environment at Scania CV AB Oskarshamn"* at the Faculty of Engineering – LTH, Lund University.