Analysis of Risk Management methodologies applied to Container Terminal Operating System projects

Abstract
In the port industry the complexity of information that must be considered in order to provide an optimal container allocation and transport is an opportunity and challenge. Therefor, the complex planning of goods import-export through ship transport is often managed by a Terminal Operating System (TOS). The intricate adaptation and management of the software for each individual port case is performed by a highly-specialized team of TOS consultants, which assembles the program according to the customer needs. Consequently to the complexity of the information flow that has to be managed, a TOS implementation project has various kind of risks to be taken into consideration. An accurate research of the ISO 31000 and 31010 guidelines was performed to extrapolate the most appropriate risk identification strategies. As a result the CheckList Analysis, the Multi Criteria Analysis and the Scenario Analysis, as well as the practical field experience of TOS consultants, were used for the creation of a tool able to identify risks and thus, convert qualitative into quantitative data.

Objectives
A concrete deliverable, that can be used to facilitate the industry risks assessment procedure, has been elaborated on the base of Best Practice of Logistic and Engineering Management methodologies. The tool has to properly analyze the TOS environment and its structure, identifying for each unique port case the extent of each risk typology (from medium-high to high impact on the project) and its probability. This analysis is based on the risk analysis methodologies resummed in Figure 2 and provides a useful standardization of the risk management procedure. The skills of the deliverable include logistical considerations, problem solving, as well as forecasting scenario and its following impact.

The deliverable gives an immediate visual idea of the impact that each risk area has on the success of the project. Thus it permits an almost instantaneous discussion on the feasibility of each project.

Conclusion
Some criteria (identified in Figure 3 and 4 as roman letters), chosen using both the field experience of the TOS consultant on the most important areas of risks and a survey based on the needs and requirements of the customer, are evaluated thanks to a probability matrix (Figure 4). It was found that the majority of considered risks are in the red (high impact) and orange (medium impact) region. Through the use of the importance matrix of the AHP method, the TOS consultant using the tool TORA has the possibility to adapt the different weights in the developed risk analysis model, which permits an useful adaptability of the tool on different types of project (standard or special).

In Figure 3 is shown an example of the output the deliverable will give, considering the weighted risks and the customer’s answers. The higher risks areas are displayed through peaks and are immediately recognizable. Thanks to this tool it is possible to transform the qualitative considerations of TOS consultants and customers in quantitative standardized data.