TKI DINALOG
Dutch Institute for Advanced Logistics

EXPLORING SERVICE CONTROL TOWER CONCEPTS FOR MILITARY ORGANIZATIONS

CONCEPT DEVELOPMENT OF A CONTROL TOWER FOR THE DUTCH MINISTRY OF DEFENSE

The Dutch Armed Forces are specialized in operating in the most dangerous situations all around the world. Therefore, the Forces are equipped with highly advanced weapons and systems. The equipment requires a well-structured logistic network within the organization as a whole. To structure the logistics such as maintenance and delivering spare parts, a Control Tower can be a solution. Mart Willemse, BSc student at Dutch Defense Academy and lieutenant at the Royal Netherlands Navy, investigated in what way a Control Tower could contribute to the Dutch Armed Forces.

DEFINING THE CORE PROCESSES

Consider highly advanced air-defense and command frigates, submarines and landing platform dock ships for amphibious warfare of the Royal Netherlands Navy. All together they are called a fleet. Within a fleet, stock or spare parts are shared if possible. However, at this moment there is a lack of a common operational picture. Which means it is difficult to verify and monitor where equipment is located, what the status is and who needs certain equipment. This is where the Control Tower comes into play. A Control Tower is a central service-support system for physical assets that uses information from multiple sources in order to monitor relevant aspects of goods, anticipate on various issues and support operational decisions.

In the research, interviews took place with several respondents from the Dutch Armed Forces, as well as some experts on Control Towers. In this way, the actual needs where defined and compared to the definition and capabilities of a Control Tower. This gave the opportunity to create a model which showed a concrete idea of what the Control Tower could look like.

RESULTS

The research developed a model in which the needs of the organization are defined and transformed to core processes (Table 1). The needs for a Control Tower are an integrated overview of all flows of goods and services in the organization (the common operational picture), securing all information in various areas, creating decision-making authority for the Control Tower (to decide who needs certain equipment or maintenance), optimizing the organization, and changes to organizational structures.

Needs	Conditions
Integrated overview	• Central information point (possibly physical location) • Continuous supply of information (aiming for real-time data)
Information security	• User profiles • Acceptance of all parties
Decision-making power Optimization	• Mandate for operations • Integrated overview • Continuous supply of information to one system
Structure	• Research into investing processes (internal / external) • Communication

Table 1: Needs for a Control Tower, defined with conditions

Figure 1: Matrix with core processes compared to needs

Core processes and thema's

		Control					Information		Operations					Servicesupport			
		Central point/fysical location	Dashboards & visibility: Userprofiles: Strategic: Integrated view	Dashboards & visibility: Userprofiles: Strategic: Once-a-day data update	Dashboards & visibility: Userprofiles: Operational: Limited visibility	Dashboards & visibility: Userprofiles: Operational: Real-time data	Data-management	One integrated system	Mandate	Operations planning: Real-time data	Operations planning: Dashboard pere user	Maintenance planning: Real-time data	Maintenance planning: Integrated overview (limited acces)	Dashboards: Real-time data	Dashboards: Per united user	Supply contracts: Communication	Supply contracts: Actual maintenance
Needs (requirements)	Overview	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Information security	x	x	x	x		x				x	x		x			x
	Decision making power	x		x		x		x	x	x	x			x			
	Optimization	x	x			x	x	x		x		x		x	x	x	x

These needs have led to a conceptual model with four core processes, namely: Control, Information, Operations and Service Support (Figure 1). In the figure these core processes are operationalized in key elements.
The core processes contribute to the continuous development of the Control Tower. This development takes place through three levels;

- **Level 1** are the basic skills, in which the Control Tower is able to make a link between supply and demand.
- **Level 2** is the management of changes, in this level the Control Tower is able to support change in various ways. Using units receive new assignments and exercises, which means that other goods or services are requested, the Control Tower supports this.
- **Level 3** is achieving synergy, in this level the Control Tower is able to help different parties with different backgrounds. The Control Tower generates new insights and makes autonomous decisions. Processes are optimized and costs are saved.

The aim of the model is to reach the highest level in which the Control Tower is capable of creating synergy and making autonomous decisions. The core processes will have an influence at each level, but their interpretation will change for each level.

- At the first level, the Control Tower will focus on the relatively "simple" activities. Execution of these activities and mapping the data flows in the organization are crucial before the Control Tower can proceed to the second stage.
- At the second level the Control Tower will take charge of more advanced tasks which will focus on managing changes in data flows.
- At the last level, the Control Tower is able to independently perform activities and make decisions about them. The Control Tower is no longer only internally oriented, but can also link up with external parties. This allows, for example, external suppliers to be mapped, so that processes (from original supplier to user) can be optimized by for example algorithms.

It is important that the Control Tower takes every level step by step so that they are carried out as carefully as possible. In conclusion, a Control Tower can make an enormous contribution to improving the management of the logistic network of the organization. However, the most important condition is a continuous supply of data.

NEXT STEPS

As mentioned in the beginning, the research investigated in what way a Control Tower could contribute to the Dutch Armed Forces. This does not mean that this conceptual model is the only possible way. Because of that, the research can be seen as a starting point for future research on this topic.

To integrate the system of a Control Tower much needs to be done. To implement a system that could change the entire logistic structure of the organization, further research is necessary.
At this moment the Dutch Armed Forces have too little knowledge of the technical aspects of a Control Tower. In addition to the technical side of the story, the Dutch Armed Forces also have to deal with a hierarchical structured organization. The research shows that hierarchy can influence the system of the Control Tower; further research can reveal in what way the hierarchy can contribute. In the end, also the main suppliers have to be taken into consideration before making any decisions on how to implement the system.

The theoretical focus of this research is necessary because in this stage of doing research there is a need to investigate what a conceptual model would look like and what their possibilities will be. In the future, this theoretical part will decrease and multiple parties will get involved in defining the Control Tower. These parties will mainly exist of the actual users from the organization and IT-suppliers for software.

Topsector Logistiek

FACTS

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