WAREHOUSE SIMULATION FOR AN EFFICIENT MANPOWER PLANNING

INDUSTRY
Logistics

APPLICATION AREA
Warehousing

COUNTRY
The Netherlands

CHALLENGE
Provide more insight into how the resources in one of the freight buildings of KLM Cargo could be controlled to improve the efficiency of workload management

RESULT
The management of KLM Cargo can make well–considered decisions about the manpower planning.

KEY TO SUCCESS
Manpower scheduling is a complex activity and with limited information even very complex. With simulation software KLM CARGO was able to model the different processes and run different scenarios in order to find the most efficient method.

KLM Cargo used Enterprise Dynamics to evaluate the workload at a large cargo terminal and set up an efficient manpower planning.

KLM CARGO

KLM Cargo is the freight division of KLM, the Royal Dutch Airlines. The home base is at Amsterdam Airport Schiphol, where this project took place. It has a hub–function, where freight arrives and departs by truck as well as by aircraft. The study focused on freight building World Port, that handles freight that has to be flown to an intercontinental destination.

Terminal manpower costs are the largest among all operating costs, so efficient management of manpower resources helps terminals to improve manpower utilization and reduce operating costs accordingly. Designing an efficient work schedule is a complex activity due to a lot of (stochastic) variables that need to be taken into account.

COMPLEX ENVIRONMENT

In a freight terminal freight changes from one modality to another. For the transport of freight by aircraft special cargo carriers are needed. These standardized cargo units are called Unit Load Devices(ULDs) and they can be divided into three different types: T–ULDs, M–ULDs and BBs.

- T–ULD: is filled with one destination and ready for flight.
- M–ULD: this type should be broken down, due to the fact it contains shipments with multiple destinations
- BB ULD: not all the space on the ULD is used, there is some space left to add more shipments with the same destination

At the freight building, freight can be delivered by truck at the Moving Truck Dock (MTD) entry (freight from Europe) or at the export entry (freight from the Netherlands) and by aircraft (freight from intercontinental destinations). After handling the freight it will be flown further to an intercontinental destination. When we zoom further in into the processes at the freight building, there are beside uploading two other main processes recognizable; breaking down and building up of pallets. Depending on the type of freight it needs complete these processes or not. The time to perform these processes mainly depends on the number of employees working.

ENTERPRISE DYNAMICS

By using Enterprise Dynamics the following output can be analysed:

- The amount of packages or ULDs handled at each of the processes per hour/shift/day.
- The utilization at each of the processes per hour/shift/day.
- The staying time at each of the processes per hour/shift/day
- The waiting time at each of the processes per hour/shift/day
- The size of the queuing line at each of the processes per hour/shift/day
- The overall on–time performance

CONCLUSIONS OF SCENARIOS

In this study, four different scenarios were performed. Important conslusions were made regarding:

- The effect of the planning and number of employees on the performance.
- The effect of the amount of freight on the performance.
- The effect of the type of Unit Load Devices that were handled.
- The effect of changing the start trigger to break down a pallet.