HOW INTELLIGENT DATA SYSTEMS CHANGE THE WAY COMPANIES WORK

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In 2016, Künz started designing the new Künz Information System (KIS), which is based on the Senseforce Software.

The idea was that KIS would empower Künz in its strategy to become a data-driven company that utilizes the data generated by container handling cranes.

All new generation cranes have multiple sensors and components, which constantly produce data, and with new technology, Künz was able to transfer the data to the cloud and from it into different departments using an intelligent analyzing tool.

The vision was that KIS would fulfill different data interests from people inside Künz and its customers.

We do not know what we want to know tomorrow, but that was the requirement for the system, and KIS has fulfilled this aim by changing the way people and companies operate through closing the data gap between the machine operator and manufacturer.

DESIGNS ACCORDING TO DATA

Cranes are designed according to codes and standards, but in the future that will change, as the newest generation of components and cranes will be designed according to real data, which will make the parts more suitable for an application.

The data will allow the engineers to better understand how the machines work and therefore allow them to find solutions for different problems.

The benefit for the crane customers is that they will get machines which fit their needs and not have designs which are based on old codes and standards.

Künz is designing its first components according to current data, and will continue this into the future.

UNDERSTAND YOUR TERMINAL

A customer will usually carry out a simulation when building a new terminal, and purchasing equipment, commissioning the cranes and commencing operations will follow.

During the start-up phase, and during operation, it is important to find out the bottlenecks of a terminal.

Data transparency is key, and KIS makes sure it takes place, as the system is totally flexible and can create widgets and a dashboard that will identify the bottlenecks.

The entire system is live, and changes in the parameters of the system will be recognized immediately.

Through its analysis, KIS can increase the capacity of an intermodal terminal by several percent just by increasing the gantry speed of a crane and without investment costs for the customer.

The first step is to recognize crane operation bottlenecks, then find out the past usage of the gantry motors, and if, for example, the motors were over dimensioned, we can increase the gantry speed.

After the gantry speed is changed, Künz and its customer can review the outcome on a daily basis and take one week to confirm whether there has been an increase in the terminal's capacity.

This manual optimizing was only the start, as future algorithms will do the manual work in finding parameters which need to be changed, resulting in automated analysis phases that recommend what needs to be done.

MIXING CRANE AND TOS DATA

KIS's flexibility makes it possible to integrate additional data points into one system such as with the TOS data.

By feeding more information into one system, we can answer more questions and optimize each system to increase the performance of terminals.

Transparency will help all of us better understand systems.

CRANE INTEGRATION

KIS is based on technology from Senseforce, an Austrian-based company that has designed a system for machine manufacturers to fill the data gap between the operators and manufacturers.

For most customers, it is important that different cranes from different suppliers can be integrated into the same platform.

Senseforce is the answer to that, as it gives the customers an ultimate overview of their entire crane fleet instead of heaving several systems from different suppliers.

Sensforce's software comes with a small PC, which connects directly to different machines.

It also accommodates different interfaces.

OUTLOOKS

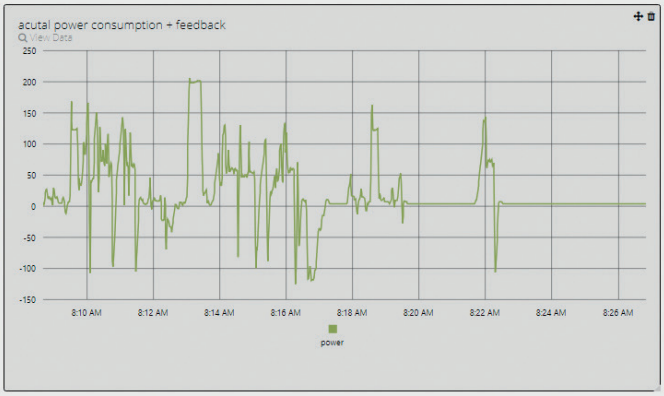
The next phase of KIS will be to implement an ever increasing amount of automation into the software. Künz has already begun testing supervised machine learning, with the first results showing that condition based maintenance can be done without installing new sensors.

Installing sensors is crucial because each one can create alarms and save money as maintenance tasks such as the re-greasing of bearings is based not on operational hours or kilometers driven, but on the condition of the grease and the system.

Another big factor is the predictive change of parts, which KIS will be able to improve by combining different parameters in algorithms and predicting the lifetime of key components.

All in all, data analyzing tools will be changing the way companies work in the future, and entire systems will become more transparent and give equipment suppliers and their customers a lot more opportunities in the future.

Power consumption from a typical Künz Intermodal Crane

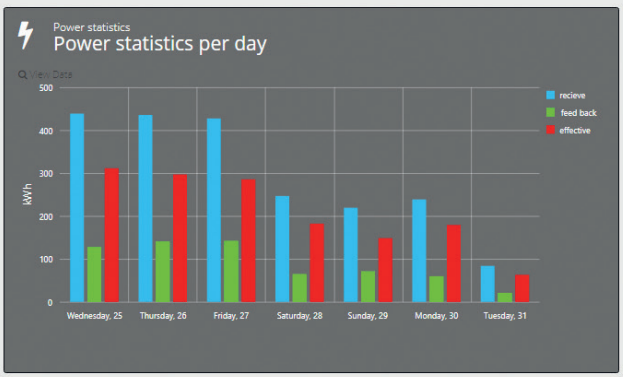


Peak power statistics table
Peak power

max. peak power
560 [kW]

date
10. Juli 2018

Date [timestamp]	peak power [kW]
31. Juli 2018	458
30. Juli 2018	457
29. Juli 2018	521
28. Juli 2018	486
27. Juli 2018	472
26. Juli 2018	498
25. Juli 2018	467



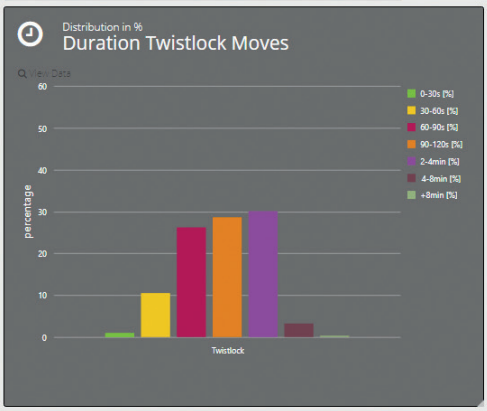
Power statistics table
Energy consumption/move

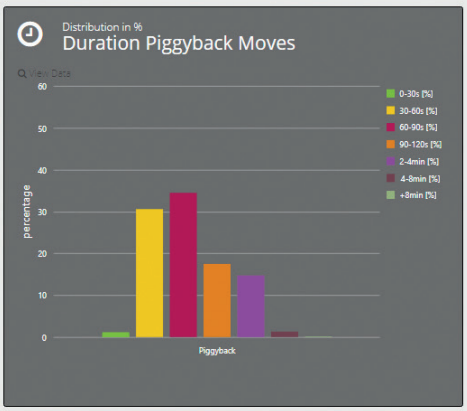
time	feedbackfactor	powerpermove [kW/h]
2018-07-31	0,25	3,65
2018-07-30	0,25	3,32
2018-07-29	0,32	2,74
2018-07-28	0,26	3,08
2018-07-27	0,33	2,70
2018-07-26	0,32	2,74
2018-07-25	0,29	2,91
2018-07-24	0,28	3,11
2018-07-23	0,25	3,27

Average moves for twistlock and piggyback moves on an intermodal terminal

Moves per timefilter

Twistlock	Piggyback	Moves total
15.602	3.218	18.820





ABOUT THE AUTHOR

David Moosbrugger is Managing Director of Kuenz. David is in charge of the engineering and R&D group at Kuenz. Before becoming Managing Director of Kuenz, Moosbrugger worked several years in engineering, project management and sales. He also lived several years in the US, working for Kuenz America.

ABOUT THE ORGANIZATION

Kuenz was founded in 1932 by Hans Kuenz who succeeded in creating a significant and successful mechanical engineering company in a very short period of time.
The company started out manufacturing tower construction cranes. The focus later shifted towards manufacturing container cranes, followed by hydro power equipment. Kuenz is one of the oldest and most prestigious mechanical engineering companies in Austria.

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