LiDAT® smartApp
Maritime Technology

14th ASEAN Ports and Shipping 2016

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Presentation outline

- **Company Overview**
- **Challenges in Age of Digitalisation**
- **Introduction of LIDAT smartApp**
  - **Utilisation of Available Data**
  - **Features & Applications**
- **Summary**

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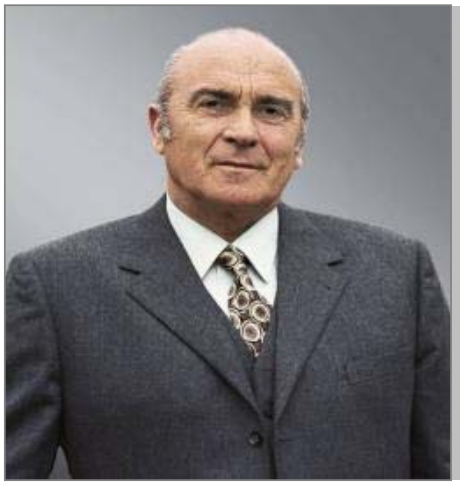
Liebherr – a Family Business

- Company founded in 1949 by Dr.-Ing. E.h. Hans Liebherr
- The Liebherr Group today:-
  - over 140 companies worldwide
  - over 42,000 employees
  - about € 9.2 billion turnover (2015)

    (Record group revenue – approx. 4.8% increase)
- Investments of € 746 million in production sites and in sales and service organisation
- Holding company: Liebherr-International AG, Bulle, Switzerland
- Businesses managed by 2nd and 3rd generation



Dr. Hans Liebherr

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Liebherr-International AG

Divisional Structure

- Earthmoving and Mining
- Tower Cranes and Mixing Technology
- **MCCtec GmbH**
  Port equipment, Offshore Cranes, Ship cranes, Construction machinery
- Mobile Cranes
- Aerospace and Transport Technology
- Machine Tools and Material-Flow Technology
- Domestic Appliances
- Components
- Hotels

- **LWN**
  Austria, Nenzing
- **LCC**
  Ireland, Killarney
- **MCR**
  Germany, Rostock
- **LSW**
  Great Britain, Sunderland

INTEGRATION OF EXPERTISE

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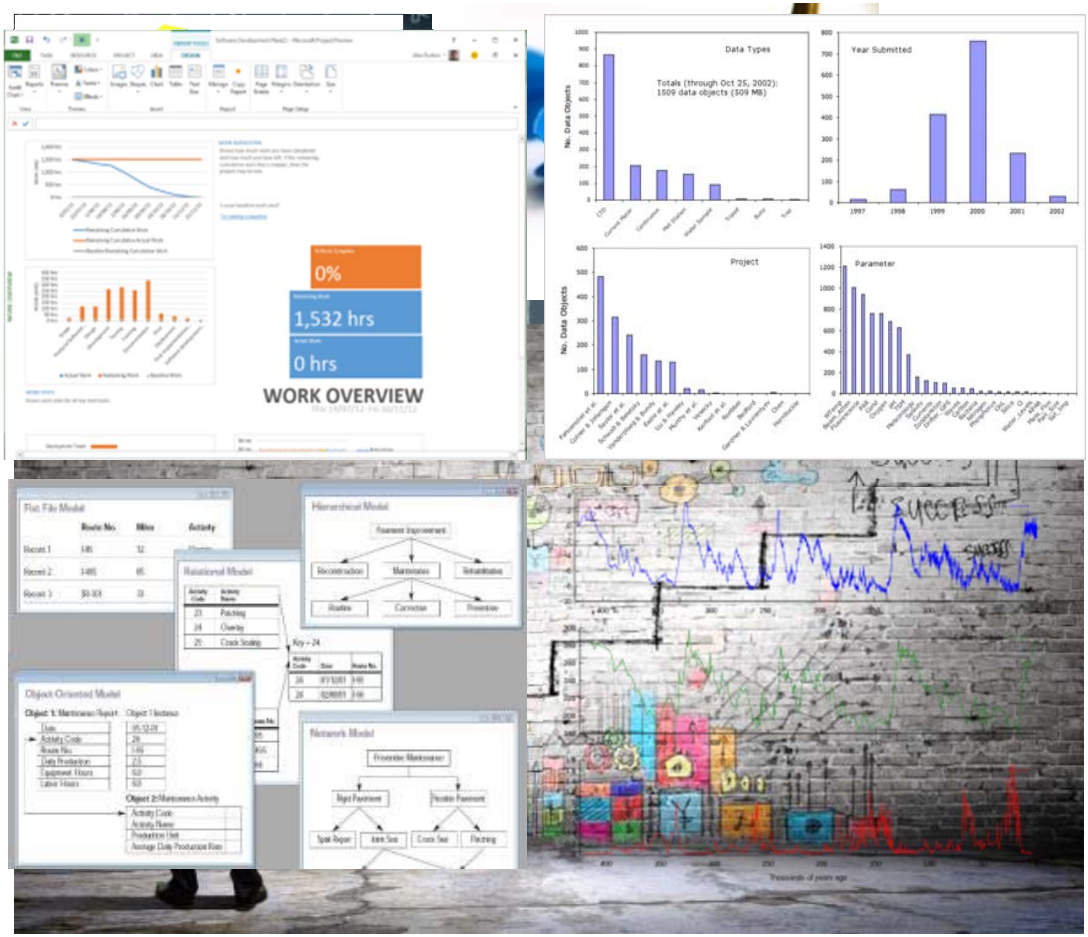
Age of Digitalisation - Abdundance of Available Data



- **Information level - Abdundance of Data**
  - Numbers are everywhere in our lives, e.g. system reports, past statistics, live machine data, etc
  - Lack of right tools to covert these statistics into useful information which we can take action upon
- **Improving Work Processes**
  - Properly represented data are more than just numbers
  - Machine trends – MTBF, servicing interval, machine trending, anomalies, etc
- **Leveraging on Right Information**
  - Getting the right information at the right time is the key to optimise efficiency
  - Increased efficiency leads to better profitability

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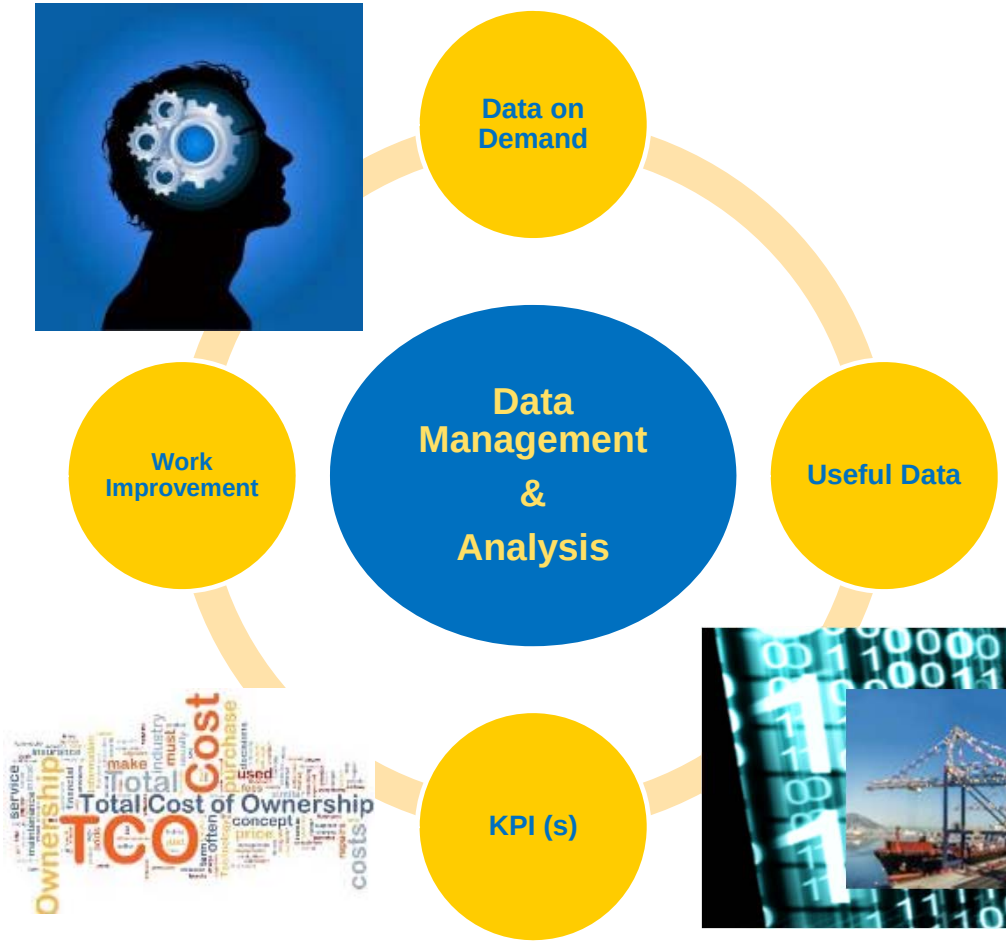
Converting Raw Numbers into Machine Knowledge



- **Big Data Analysis**
- Value added data – Available on demand and real time data for customers
- Focus on making useful data instead of volume of data
- Breaking down the numbers into key performance indicators (KPIs)
- Machine trends to improve work processes
- Reducing total cost of ownership

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Converting Raw Numbers into Machine Knowledge

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Solution – LiDAT smartApp

Examines large data volume

Direct feedback

Immediate decisions

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Big data analytics examines large amounts of data to uncover hidden trends, anomalies and other insights

Getting direct feedback almost immediately after real time analysis, e.g. Crane utilisation and defining rental rates, service status, maintenance intervals, machine alerts, etc.

Optimise your performance with big data analytics

Helps to make immediate sound decisions for competitive edge, e.g. Crane positioning, unloading paths, operators‘ deployment, refuelling window, fleet management, maintenance planning, etc.

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Solution:

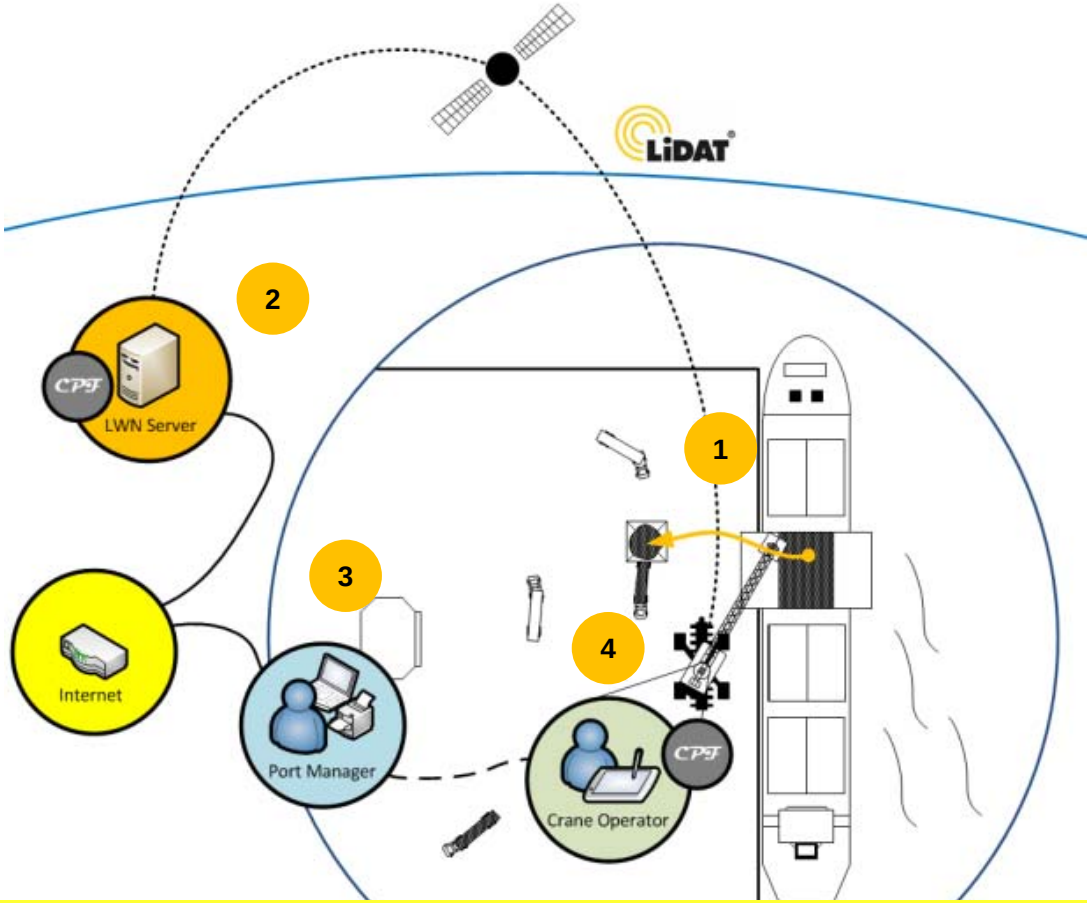
Operating Principles:-

1. The online work cycle detection on the crane records specific values during the crane operation

2. Process data are transmitted in real time to the LiDAT® server centre, where the analysis is taking place.

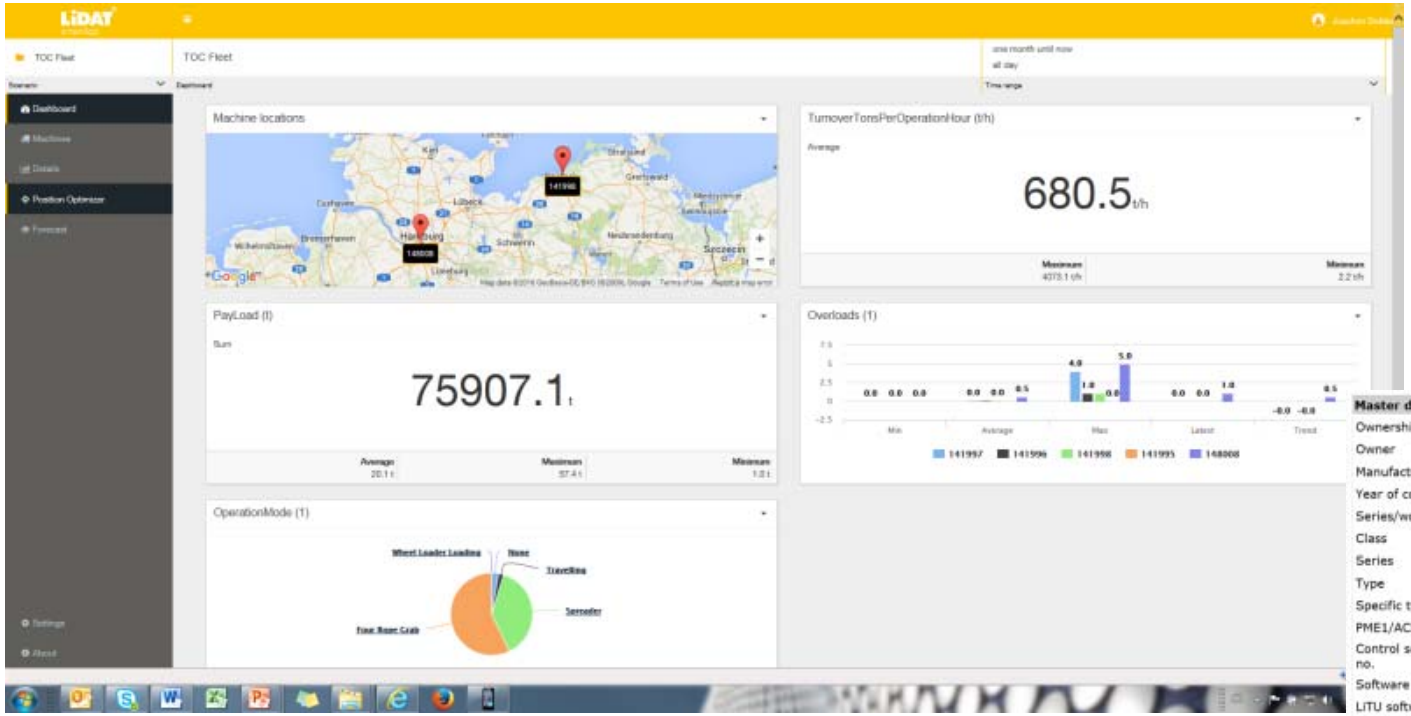
3. With LiDAT® smartApp all relevant data/variables are displayed as key performance indicators (KPIs) on any device (PC, tablet, smartphone, …).

4. The result of the analysis can be fed back to the crane/driver via LiDAT®. The results are shown on the operators display.



Feedback upon each cycle time – 2 to 3 minutes

Customised Real-Time Status Report - On Demand Basis



Master data

Ownership type	Owner
Owner	LWN
Manufacturer	Liebherr
Year of construction	2015
Series/work number	141
Class	Mobile harbour crane
Series	LHM
Type	LHM 280
Specific type	280.3
PME1/AC500S	✓
Control software ID no.	10518508
Software version	083
LiTU software ID no.	93012175
LiTU software version	028

Key data

Based on transfer from	06/03/2015 07:55:04
Time zone	GMT+01:00
Operating mode:	Normal lift with spreader
Average daily OH	1 h, 35 min
Fuel level	18.0 %
Operating hours	333 h, 52 min

maintenance details

Next due maintenance

Name	machine maintenance 500 operating hours r
Date	22/06/2015

If necessary, additional tasks and inspections, which are not indicated in the confines of the maintenance schedule, must be performed. The relevant maintenance tasks on the machine are documented in the maintenance schedules and instructions in the operating manual.

Actions

New construction site deployment...
Change alias...
Edit master data...
Group...
Comments...
Maintenance...
Configure transfer...
Assign modem...
Edit restrictions...
Sell...
Request data transfer...

Reports

Customer maintenance planner
Deployment schedule
Geo-Track
Machine details
Machine list
Machine logbook
Machine use
Safety report
Service maintenance planner

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Status reports

- Customise your dashboard (KPIs)
- Monitor your cargo handling process in real time

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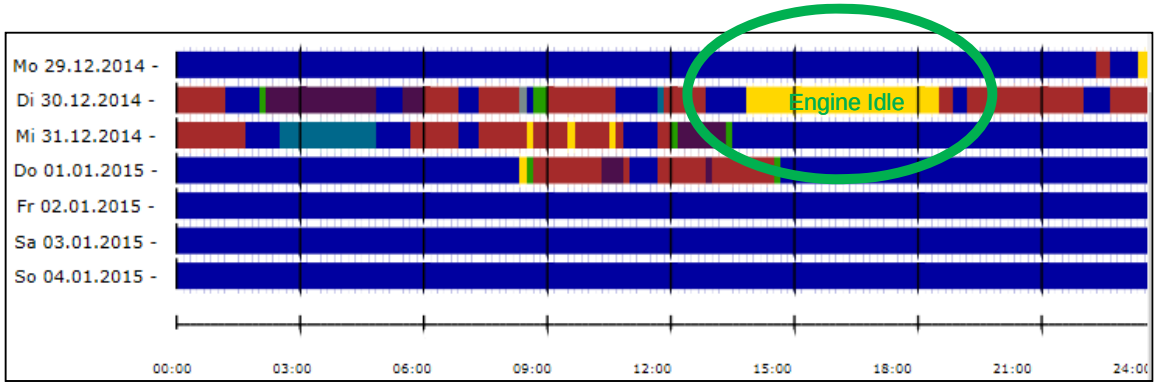
Customised In-Depth Status Report

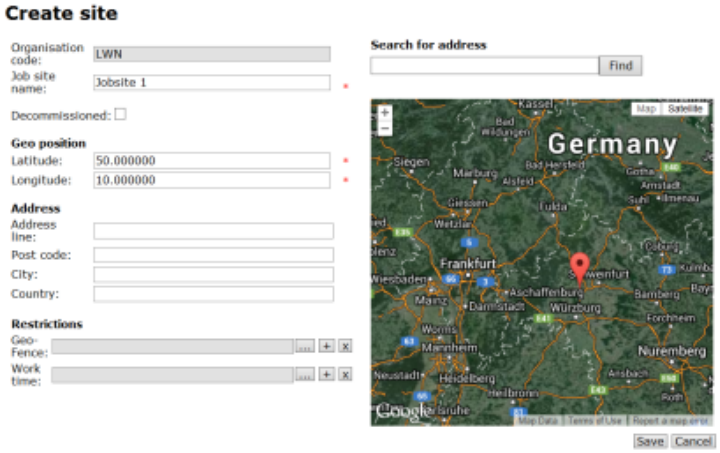


Engine Utilization

Detailed view

- In depth analysis
- Detailed view of variables
- Comparison between multiple operation profiles, cranes and/or operators

Deployment Schedule



Safety and Turnover Report

Fleet Mgmt – Equipment Deployment

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System Integration – Efficient Use of Equipment Resources

Operational planning 01/01/2015 - 15/01/2015 Liebherr-Werk Nenzing GmbH (LWN)

Overview of deployments (Organization time)

Machine	Capacity utilisation	January 2015
1	0%	
2	100%	

Site · Rental · Maintenance · There are no planned deployments.

Deployment details (Machine time)

Machine	From	To	Type of use	Location	Oh
2	26/05/2014 06:46:00	26/05/2017 23:59:59	Rental	LWN	276 h

Machine details

Machine	Series	Type	Serial no.	Capacity utilisation	Position	Address	Groups
1	LiftCrane	LR 1160		0%			LWI
2	LiftCrane	LR 1100		100%			LWI

System integration

- SmartApp calculates forecasts
- SmartApp proposes optimisation measures, e.g relocates to increase by 10% of turnover
- Results can be sent to the crane/driver for immediate action

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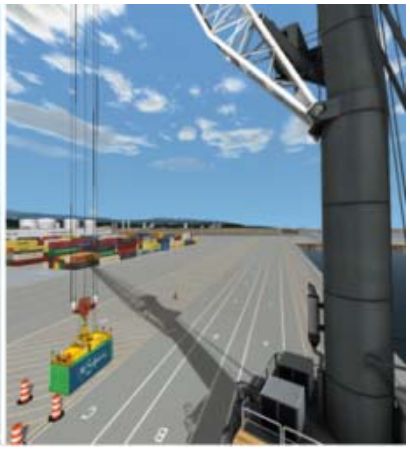
Use of Data Trend - Training and Simulation







- **Training & simulation**
- Data can be used to create realistic training scenarios on a simulator
- Improve operating skills in a safe environment
- Simulator based training can be monitored

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Summary

1. • *Easy Installation and handling; integrates into most systems*
   • *Utilisation of Available Data into Useful Information*
2. • *Decisive actions efficiencise based on instant feedback*
   • *Increased machine availability / efficiencies*
3. •*Customized data are shared to individual stakeholders*
   •*Data is secured and worldwide available*
4. •*Targeted optimization of machine and operator performance*
   •*Increased efficiencies leading to higher revenues*

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