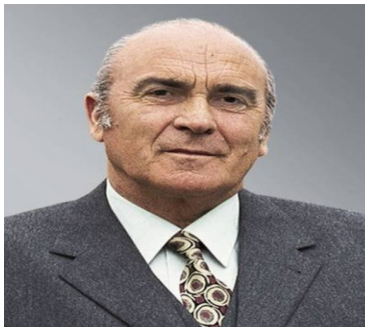
LiDAT® smartApp
Maritime Technology

LIEBHERR

Liebherr - a family business

- Company founded in 1949 by Dr.-Ing. E.h. Hans Liebherr
- The Liebherr Group today: over 130 companies worldwide, almost 41,500 employees and € 9.2 billion turnover (2014)
- Holding company: Liebherr-International AG, Bulle/Switzerland
- Decentralised structure with straightforward, autonomous corporate units (divisional structure)



Company founder
Dr.-Ing. E.h. Hans Liebherr

Left to right: Patricia Rüf, Stéfanie Wohlfarth, Jan Liebherr, Sophie Albrecht, Isolde Liebherr and Willi Liebherr

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We are a family-owned company – our core values

- We are independent
- We are a trustworthy partner
- We are innovative
- Our employees are a key factor in our success
- Highest quality in everything we do
- We accept responsibility

Wide range of products












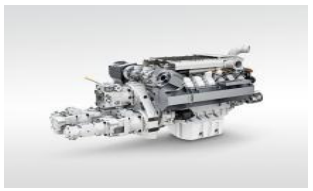





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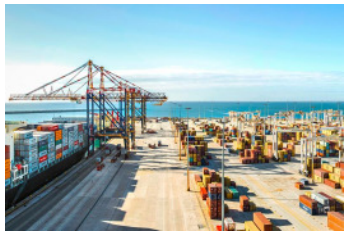
Liebherr maritime cranes



Port equipment

The diverse product range offers optimal solutions for handling of materials in seaports and inland ports. Mobile, rail-linked and permanently installed cranes and stackers enable freight transportation with state-of-the-art technology.

> Port equipment

Offshore cranes

The series of offshore cranes comprises innovative rope luffing gear cranes. The high technology cranes are offered in a wide range of sizes and are adapted to cater for customer-specific requirements,

> Offshore cranes

Ship cranes

The ship cranes series offer material handling solutions on a wide array of vessels as well as solutions for barges and transshippers. The product range comprises wire luffing and cylinder luffing ship cranes, grab-, gantry- and heavy lift cranes.

> Ship cranes

Floating transfer solutions

With a comprehensive range of innovative pontoon and barge cranes for use on transshippers or barges, Liebherr offers efficient customer-specific and tailor-made solutions for all kinds of material handling.

> Floating transfer solutions

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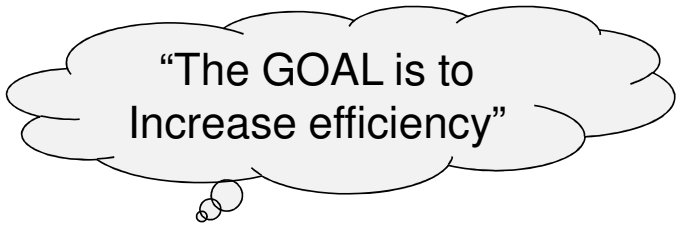
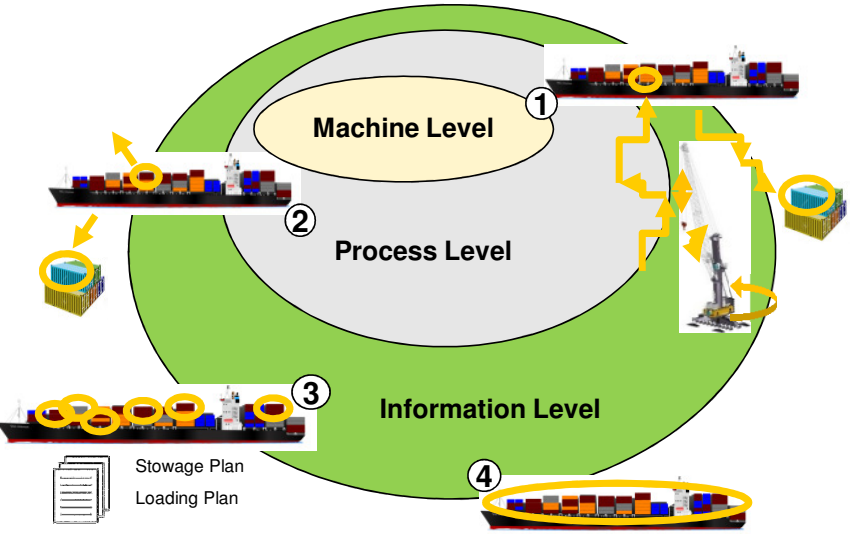
Background/ Different Levels of Efficiency





Machine Level

- Generally speaking: **More** turnover **with less** energy spend

⇒ Physical limit (can't cheat physics)

⇒ Economical limits (the closer to optimum the more expensive improvements are)

⇒ System limits (like bad logistics, wrong tool, …)

Process Level

- **Efficiency limits are set by environmental conditions**

(e.g. no trailer, no turnover – independent of machine capabilities)

Big leverage on process level (literature states +30%!)

Information Level

- Information is the key of **understanding, analyzing** and **acting**
- **Connecting** Machine & Process Level (3rd dimension)

The Art is breaking down numbers to useful information to understand, analyse & act

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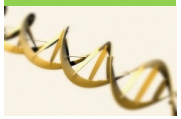
Motivation/ Potentials of Knowing "What's going on"

"Numbers are everywhere in our lives, and statistics is about turning these numbers into useful information on which we can take action"

David Hand

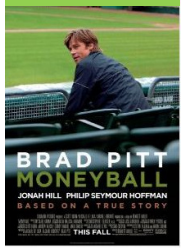
Genetics



Marketing

Fraud Detection

Sports



⇒ **Properly represented** data are more than just numbers – it is information

- ⇒ Structures / Clusters
- ⇒ Dependencies
- ⇒ Trends
- ⇒ Anomalies

⇒ To create benefits for our customers data have to be available **on Demand**

- ⇒ Everywhere
- ⇒ Anytime
- ⇒ Up to date – as real time as possible
- ⇒ Independent of devices (Tablet, PC, SmartPhone, …)

Today's question is not amount of data, but how to gain something useful out of it

Data Mining (Retrieve unknown information from data)

- Data Mining has already broadly entered our daily life
- Methods are freely available

⇒ *We think the **time to apply this to maritime needs, is right now***

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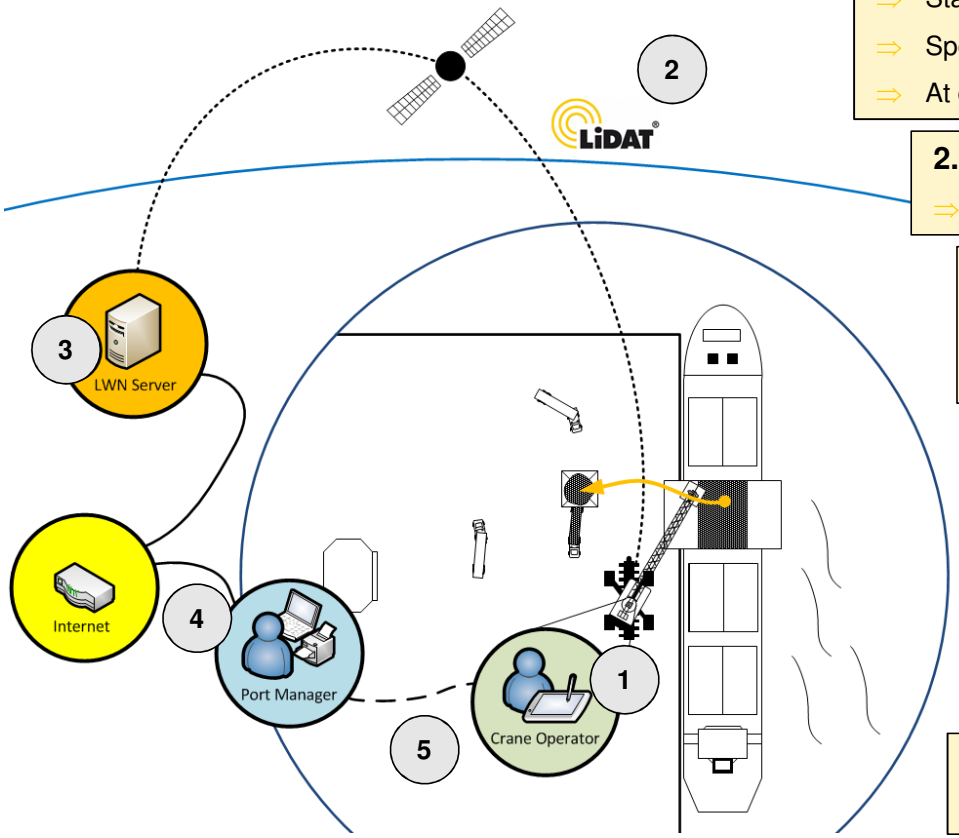
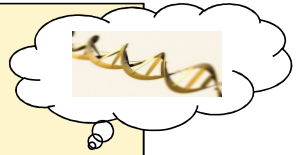
Combine Technologies and Transfer Logic from Machine to Server



1.) Online Work Cycle Detection on Machine



- ⇒ Start/Stop of any turnover cycle is automatically detected
- ⇒ Specific values during working cycle are recorded
- ⇒ At cycle-stop data packet including all specific values are recorded by LiDAT

2.) Data Transfer per LiDAT

- ⇒ Data are transmitted real time to LiDAT data server

3.) Data Storage & Algorythmic

- ⇒ Process data are stored on LiDAT Server
- ⇒ Algorithmic for of analysis / optimization can be transferred to Server

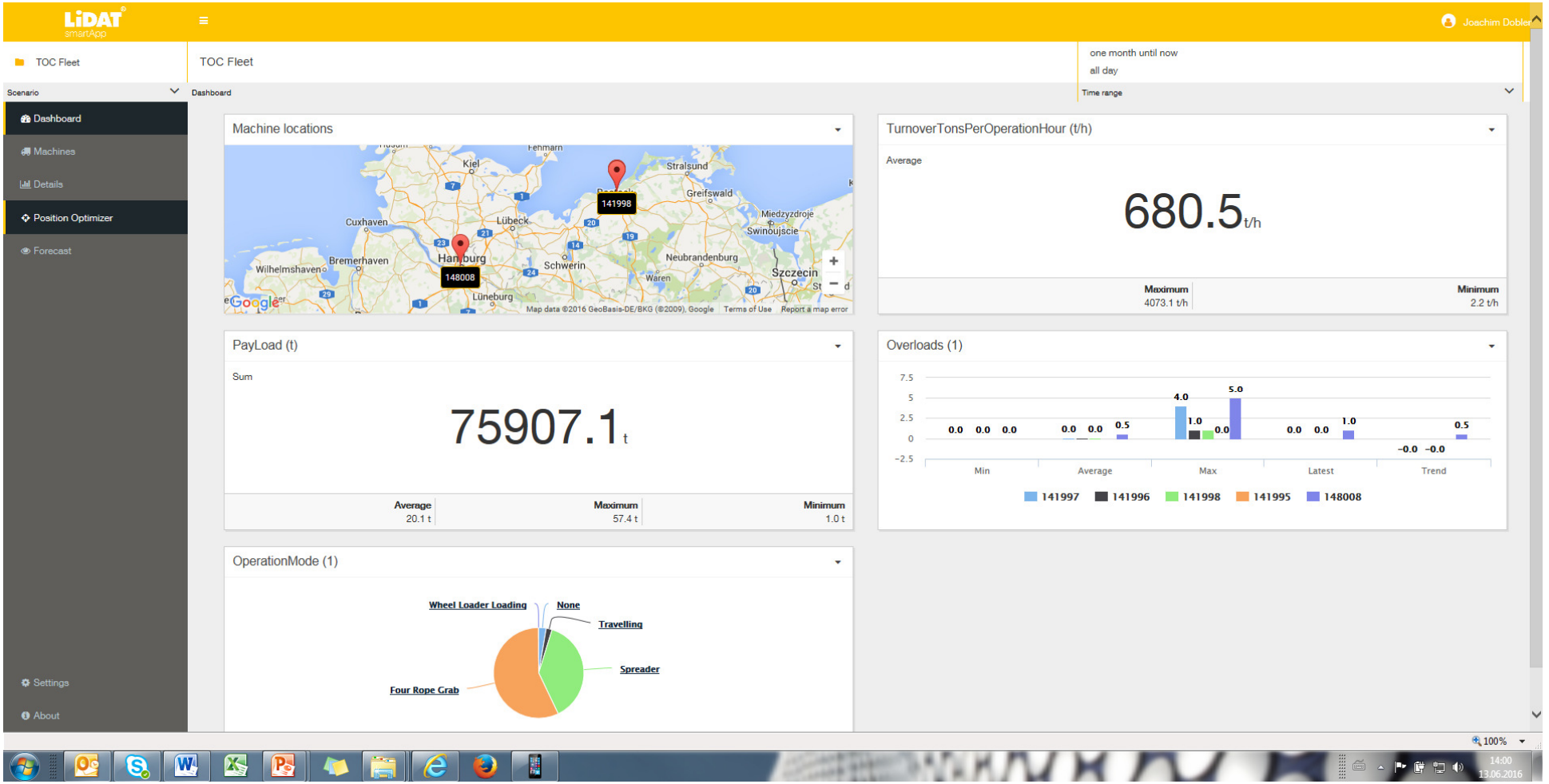
4.) *Access to Data*

- ⇒ Access to data / analysis reports is available
  - ⇒ Anytime
  - ⇒ Real-time
  - ⇒ Independent of device (PC, Tablet, Smartphone, …)

  Trough WebApp

5.) Send Information Back to Machine

- ⇒ Results of Analysis can be fed back to the machine via LiDAT


LiDAT
smartApp
Joachim Dobler
TOC Fleet
TOC Fleet
one month until now
all day
Scenario
Dashboard
Time range
Dashboard
Machines
Details
Position Optimizer
Forecast
Settings
About
Machine locations
141998
148008
Kiel
Stralsund
Greifswald
Cuxhaven
Lübeck
Miedzyzdroje
Swinoujscie
Bremerhaven
Wilhelmshaven
Hamburg
Schwerin
Neubrandenburg
Szczecin
Waren
Lüneburg
Map data ©2016 GeoBasis-DE/BKG (©2009), Google
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Report a map error
TurnoverTonsPerOperationHour (t/h)
Average
680.5 t/h
Maximum
4073.1 t/h
Minimum
2.2 t/h
PayLoad (t)
Sum
75907.1 t
Average
20.1 t
Maximum
57.4 t
Minimum
1.0 t
Overloads (1)
7.5
5
2.5
0
-2.5
0.0 0.0 0.0
0.0 0.0 0.5
4.0 1.0 0.0 5.0
0.0 0.0 1.0
-0.0 -0.0 0.5
Min
Average
Max
Latest
Trend
141997
141996
141998
141995
148008
OperationMode (1)
Wheel Loader Loading
None
Travelling
Spreader
Four Rope Grab
100%
14:00
13.06.2016

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Features and benefits:

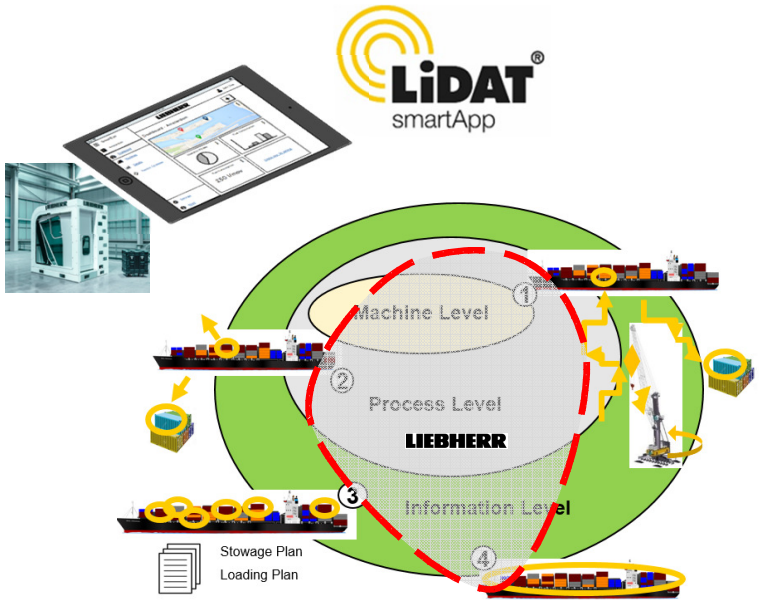
- **Status reports**
- Customise your dashboard (KPIs)
- Monitor your cargo handling process in real time

- **Detailed view**
- In depth analysis
- Detailed view of variables over time, dependencies and distribution
- Compare multiple cranes

- **System integration**
- SmartApp calculates forecasts
- SmartApp proposes optimisation measures
- Results can be sent to the crane/driver for immediate action

- **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

Summary/ Conclusion



Making process data available on demand

- ⇒ Everywhere
- ⇒ Anytime
- ⇒ Up to date
- ⇒ Independent of devices (Tablet, PC, SmartPhone, …)

+ Artificial Intelligence (Data Mining, Machine Learning, Big Data …)

= Leverage for next evolutionary progress in efficiency

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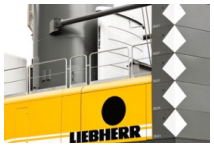
Maritime Technology (optional)

Intelligent grabbing

The algorithm-based system detects the properties of the bulk commodities and optimises the grab filling rates at any outreach.

> SmartGrip



Hybrid drive

The energy storage system ensures double lifting speeds and a significant reduction in fuel and emissins.

> Pactronic

Synchronised lifting

One system, two cranes and only one crane operator: Sycratronic brings the deployed cranes together as one functioning unit.

> Sycratronic

Sway-free load

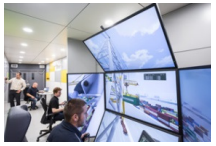
Ongoing calculations anticipate the path of the load. Pendulum movements are compensated for before they develop.

> Cycoptronic / Teach-In / Vertical Line Finder

Auto-deceleration

Lowering speed controll assistant for less impact on cargo and equipment as well as increased safety.

> Soft Touch Down



Crane simulator

Our simulators ensure efficient and realistic operator training for the entire maritime product portfolio.

> LiSIM

Maritime telematics

Optimise your performance with big data analytics

> LiDAT smartApp

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“If you are not mining your data for all it is worth, you are guilty of underuse one of your company’s greatest assets”

Joseph Bigues

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Thank you
for
your attention ☺

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