On the road to a comprehensively digitized service

ISLA European Conference Vienna

Dr. Bernd Garbe
15.05.2018

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KSB production sites

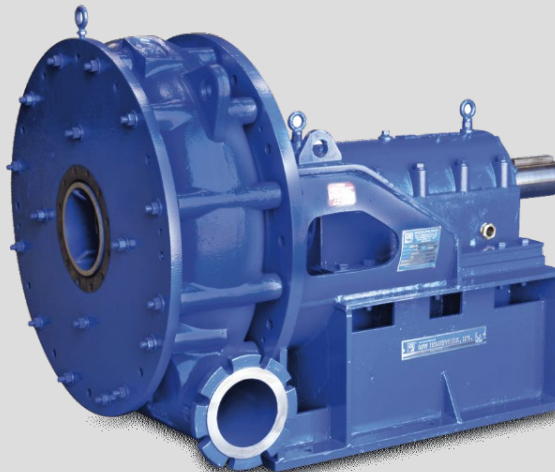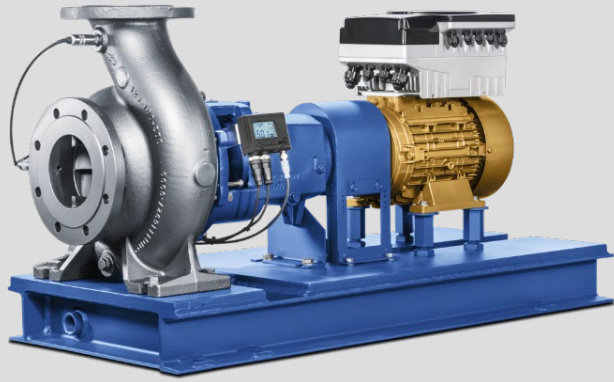KSB sales and service sites

KSB Group
About Us

- KSB is one of the world's leading manufacturers of pumps and valves, providing a comprehensive range of service offerings.

- 33 production and assembly sites and active in more than 100 countries

- Sales revenue: € 2,205.0 million

- Earnings (before taxes): € 104.2 million

- Employees: 15,455

Wide product range for different applications

- Process engineering
- Building services
- Energy conversion
- Water transport
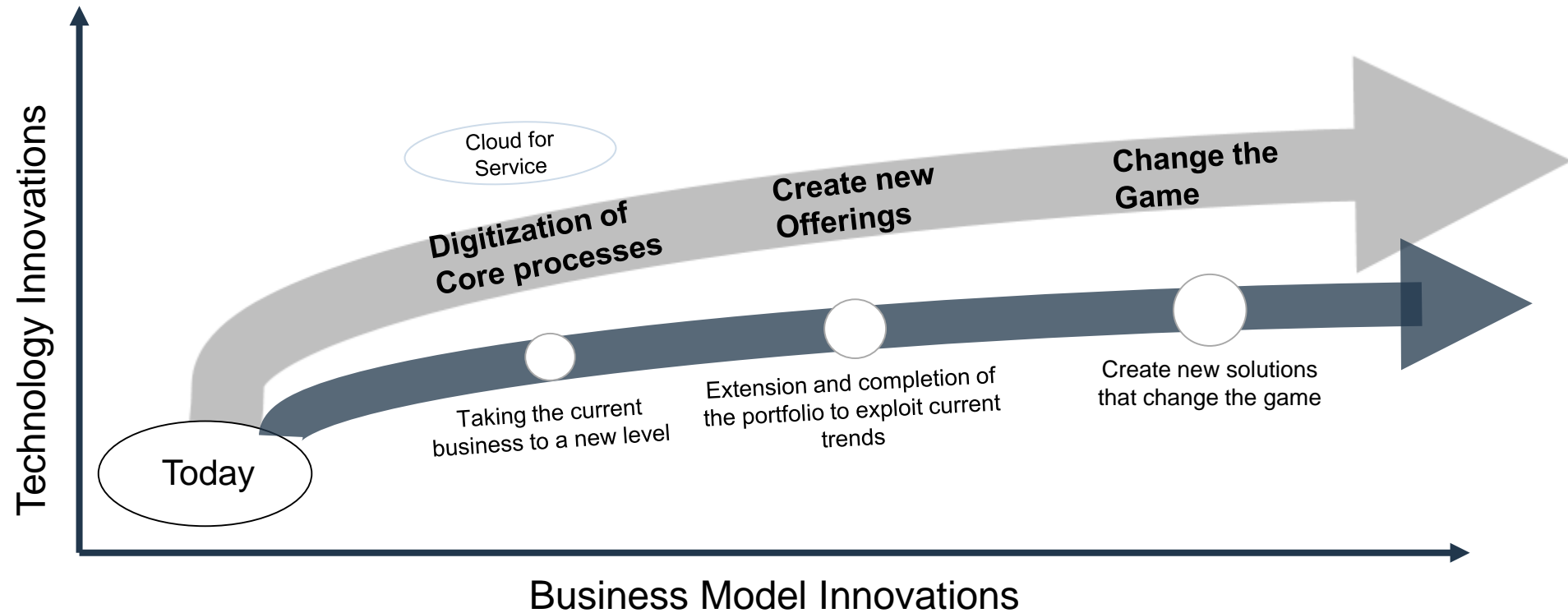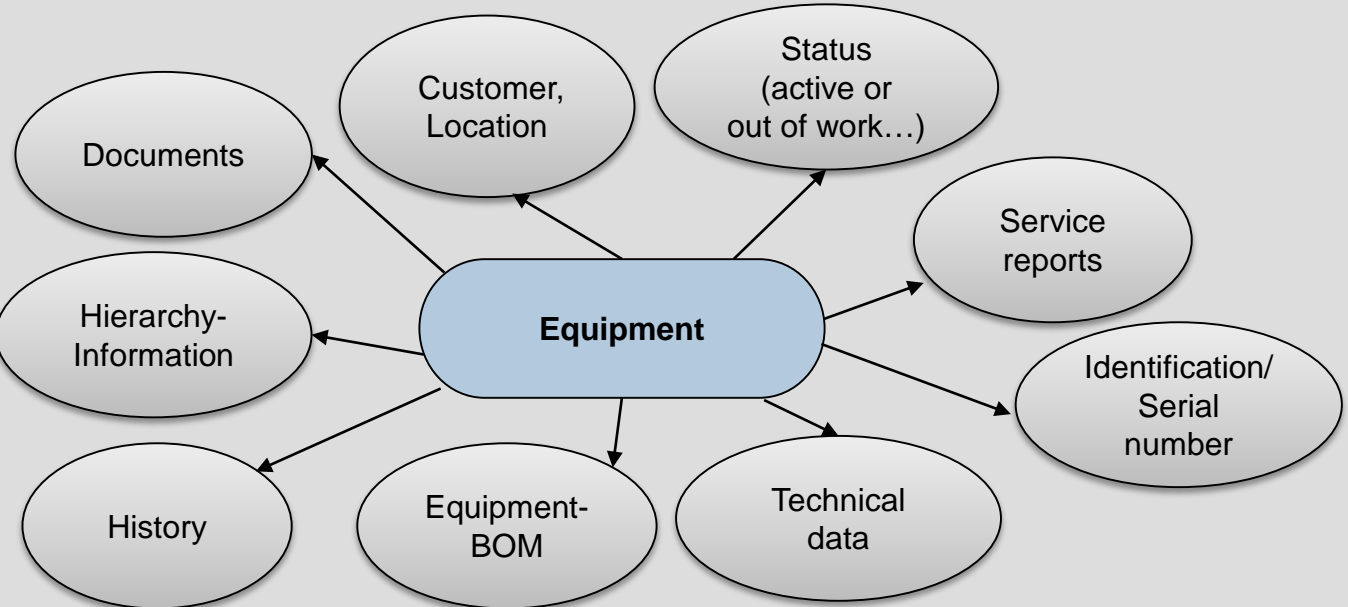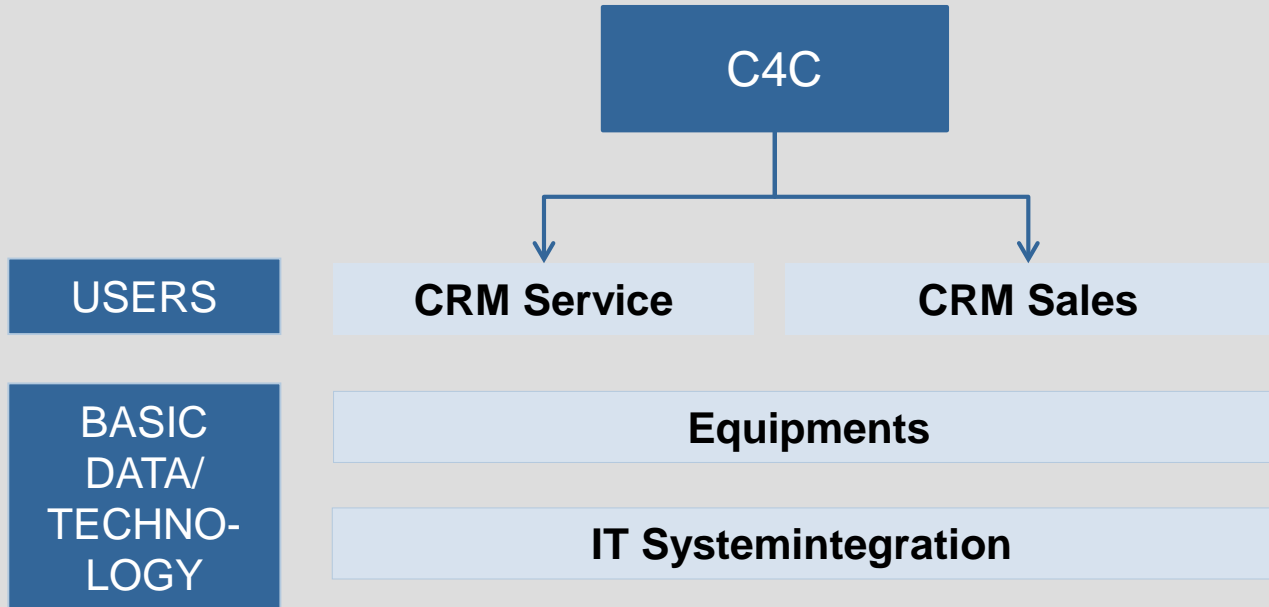- Waste water treatment
- Mining

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Quick on site – worldwide

KSB runs more than 170 service centers around the world. More than 3,000 service personnel around the world are deployed for our customers.

In addition, there are about 2,000 service personnel at our service and pump partners.

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Digital services and solutions have the potential to change the positioning of the complete company

Cloud for Service

Digitization of Core processes

Create new Offerings

Change the Game

Technology Innovations

Today

Taking the current business to a new level

Extension and completion of the portfolio to exploit current trends

Create new solutions that change the game

Business Model Innovations
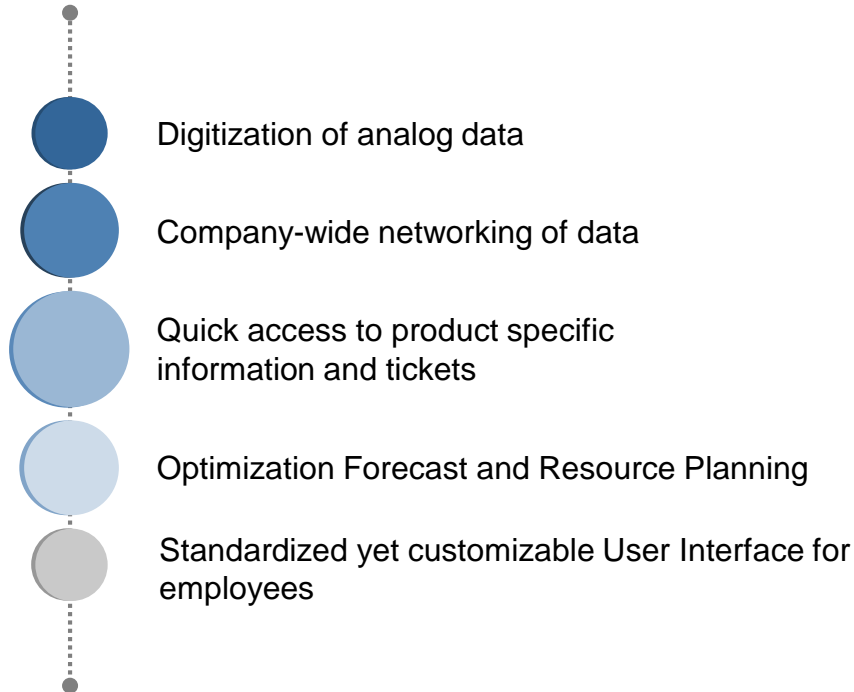
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Common processes with C4C

The C4S project is actually the most important project of our digitization journey in Service business.

Through C4S our service people are not only able to do their service work more efficient and paperless, they have also access to the full equipment data of the products installed at our customers.

Cloud for Customer project combines implementation of software as well as preparation of Master Data for Equipment
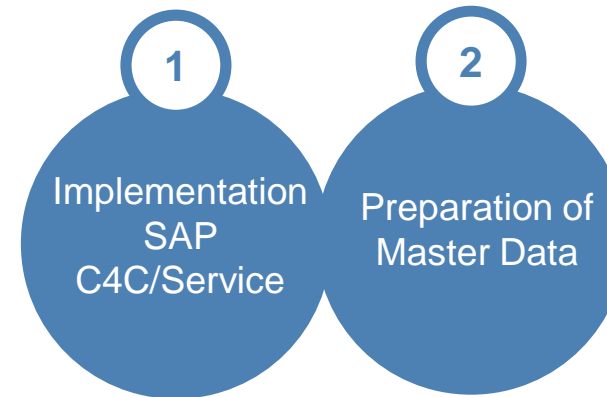
DESIRED SOLUTION

- Digitization of analog data
- Company-wide networking of data
- Quick access to product specific information and tickets
- Optimization Forecast and Resource Planning
- Standardized yet customizable User Interface for employees

APPROACH

Two Projects to replace the existing CRM Software:

1 Implementation SAP C4C/Service

2 Preparation of Master Data

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Deep Dive Implementation SAP C4C

DESIRED SOLUTION

Standardized User Interface

Field Service	Back Office
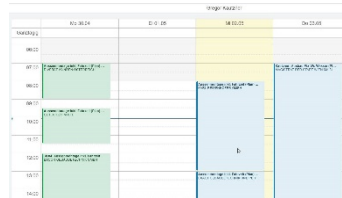
Field Service

- Standardized calendar
- Time Recording
- Spare Parts Consumption
- Checklists for service assignment
- Voice input
- Photo documentation
- Digital Signature
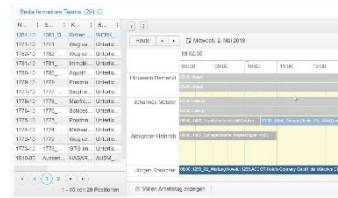
Back Office

- Standardized ticket processing
- Operational planning
- Inter-departmental data availability
- Efficient workflows
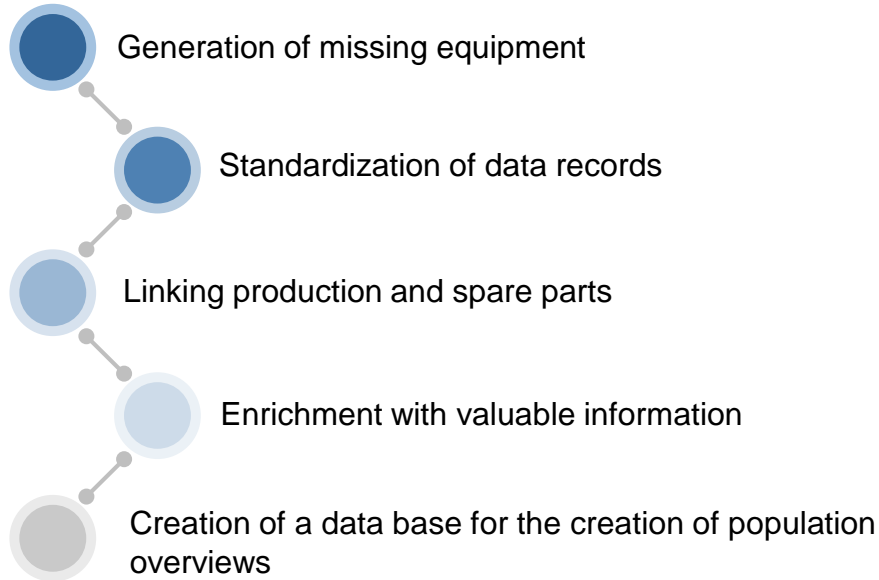
APPROACH

Service

- SAP-Standard was used, to drive the Business Change forward.

- With agile piloting to successful enterprise-wide deployment:
  1. KSB Austria (Go Live: 11/17)
  2. KSB Munich (Go Live: 04/18)
  3. KSB Pegnitz (Go Live: 05/18)
  4. Next Step: International Roll Out

Sales / Marketing

- Highly adapted SAP C4C solution, to support existing processes

- Big Bang: Go Live 10/17 for 2.500 employees

- Training concept (attendance training + E-Learning)

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Deep Dive Equipment Project

Preparation of Master Data

DESIRED SOLUTION

- Generation of missing equipment

- Standardization of data records

- Linking production and spare parts

- Enrichment with valuable information

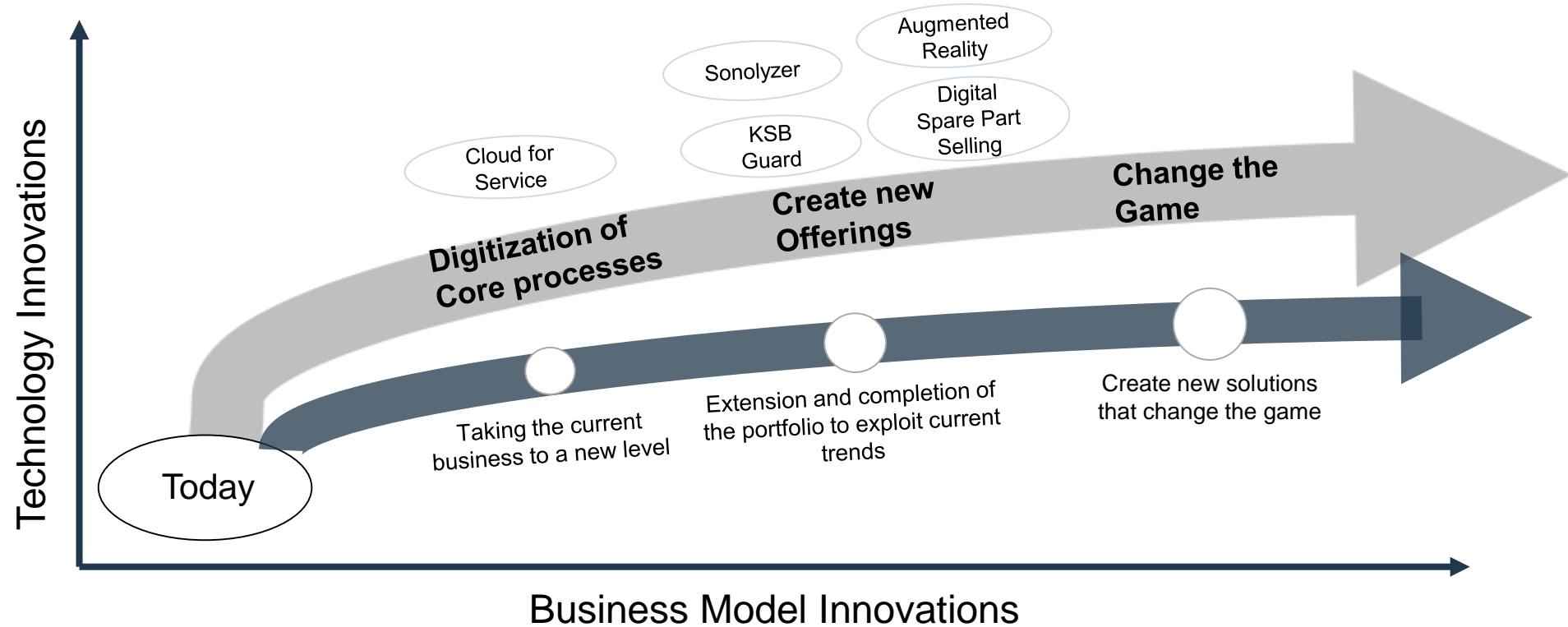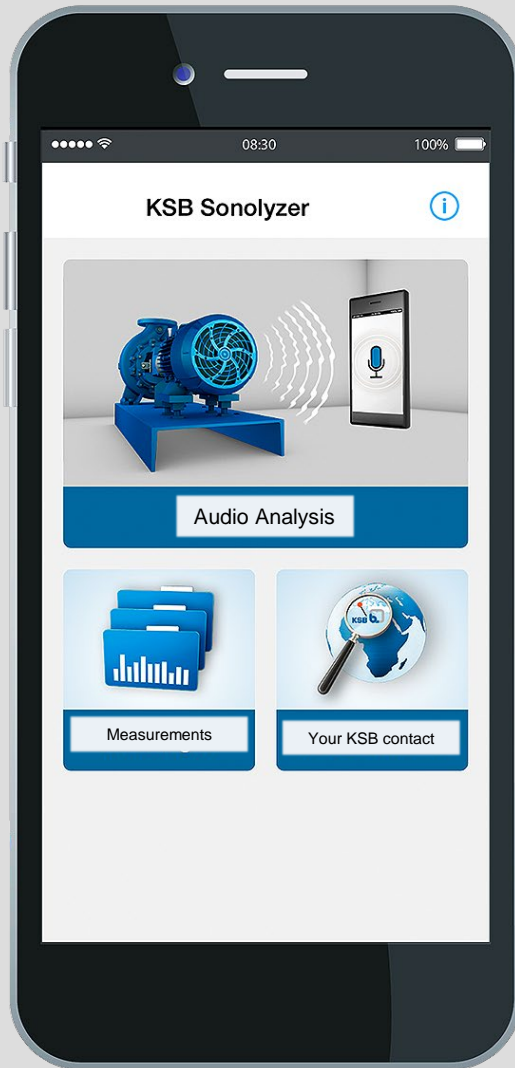- Creation of a data base for the creation of population overviews

APPROACH

- <u>Generation</u> of Master Data based on all available SAP ERP data

- Master Data <u>Update</u> based on all available SAP ERP data
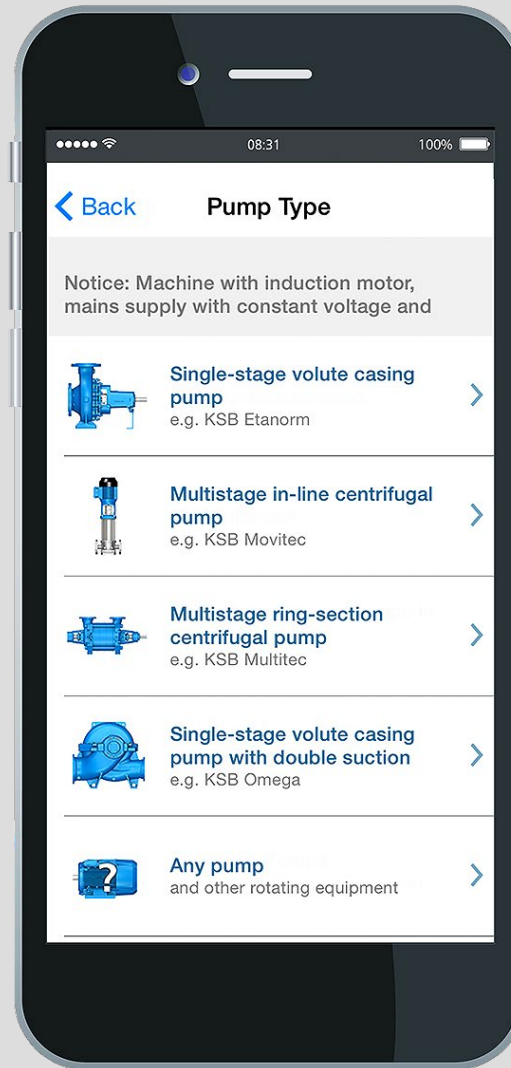
- Implementation of QR-Code-Systems

April – May 2018:
Generation/Adaption of **more than 5 Mio.** Master Data Records in SAP ERP and replication in SAP C4C/Service

Digital services and solutions have the potential to change the positioning of the complete company


Technology Innovations

Augmented Reality

Sonolyzer

Digital Spare Part Selling

Cloud for Service

KSB Guard

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Start Screen
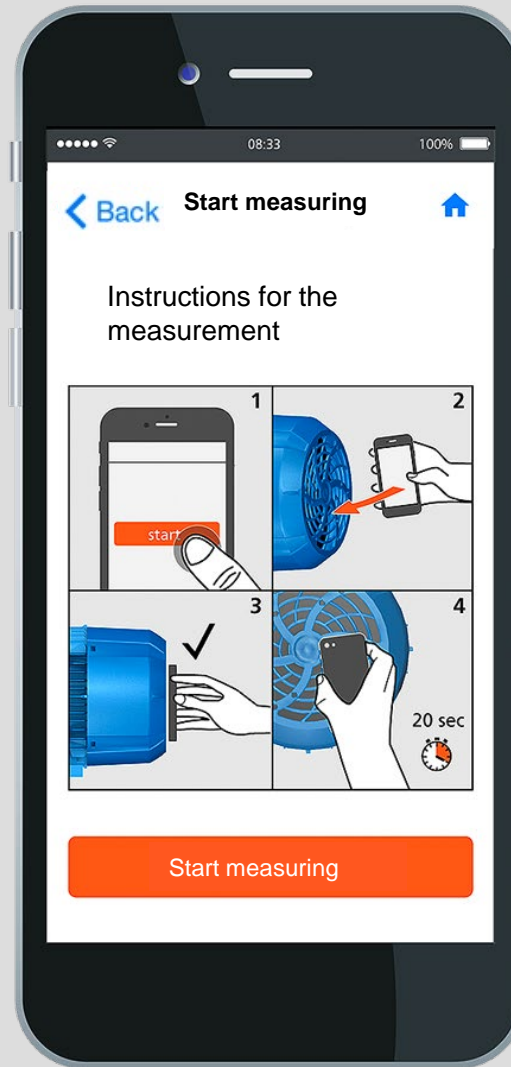
Select Pump Type

Step by Step...

... Reveal the optimization potential of your systems with the KSB Sonolyzer App
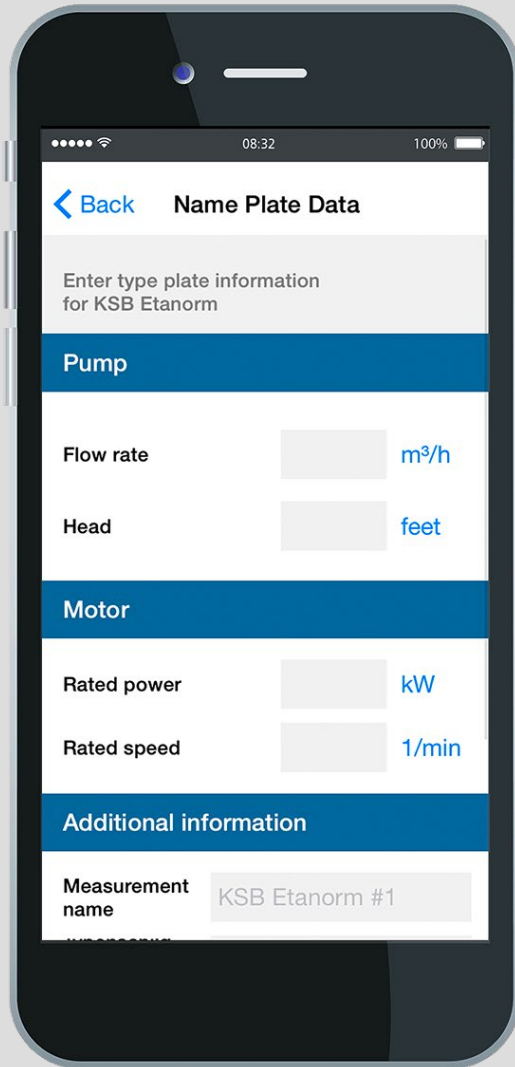
Enter Pump Specifications

Start measuring
Hold the Smartphone to the engine
Analysis result in only 20 seconds

Sonolyzer
Step by Step...

... Reveal the optimization potential of your systems with the KSB Sonolyzer App

FAQ for frequently asked questions:

www.KSB.com/sonolyzer

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Sonolyzer
Step by Step...

... Reveal the optimization potential of your systems with the KSB Sonolyzer App
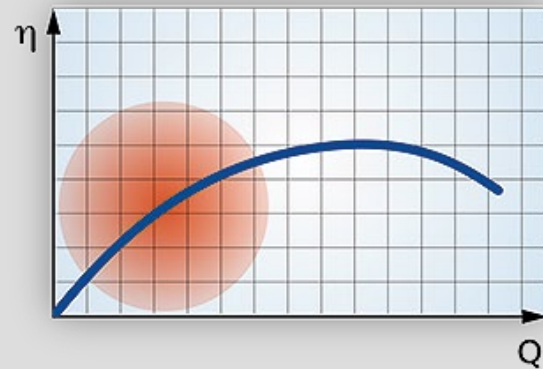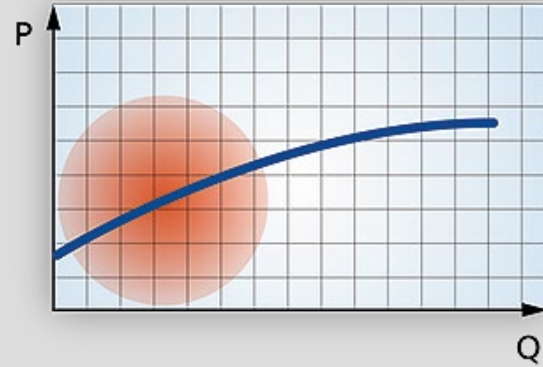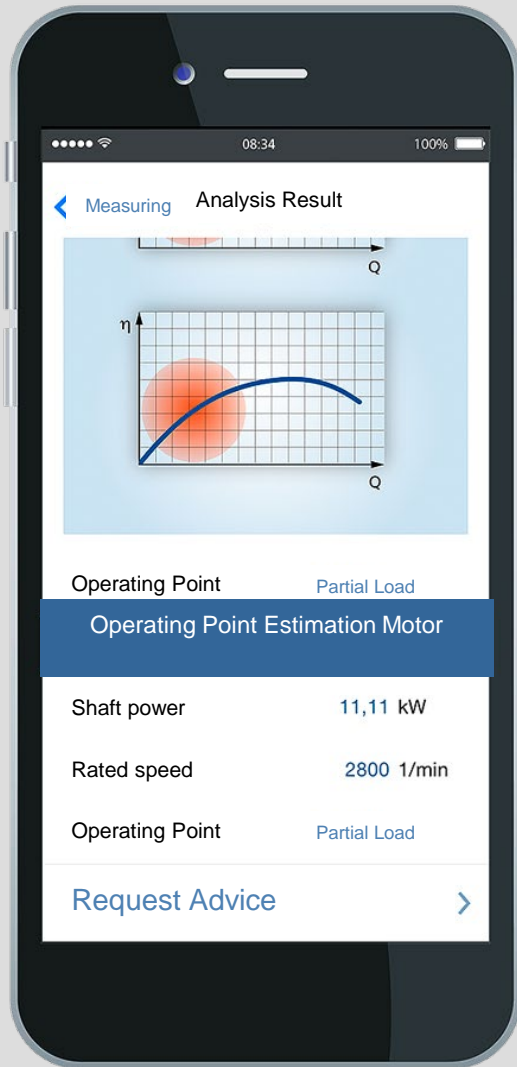
The result of the measurement indicates, whether the operating point is within or outside the partial-load range.

Pump monitoring system KSB Guard

- **Monitoring of vibration and temperature** at the pump
  - Sensor unit at the bearing bracket or the drive lantern
  - Separate transmission and battery unit
- Data processing in the **Cloud**
- Information of all monitored pumps can be accessed via a **mobile phone, a tablet or a PC**

Pump monitoring system KSB Guard

- **Remote monitoring** of pumps

- **Quick and easy access** to all pump information

- **Warnings/alarms** in case of excessively high RMS values or temperatures and to lubricate/replace bearings

- **Vibration (RMS values) and temperature**

- **Load conditions and load profile** (for fixed-speed pumps)

- Access to **pump documents** (e. g. manuals or exploded views)

- Possibility to document and track work on a pump with just a few clicks

- **Quick and easy installation!**

➔ *Higher availability of the system*
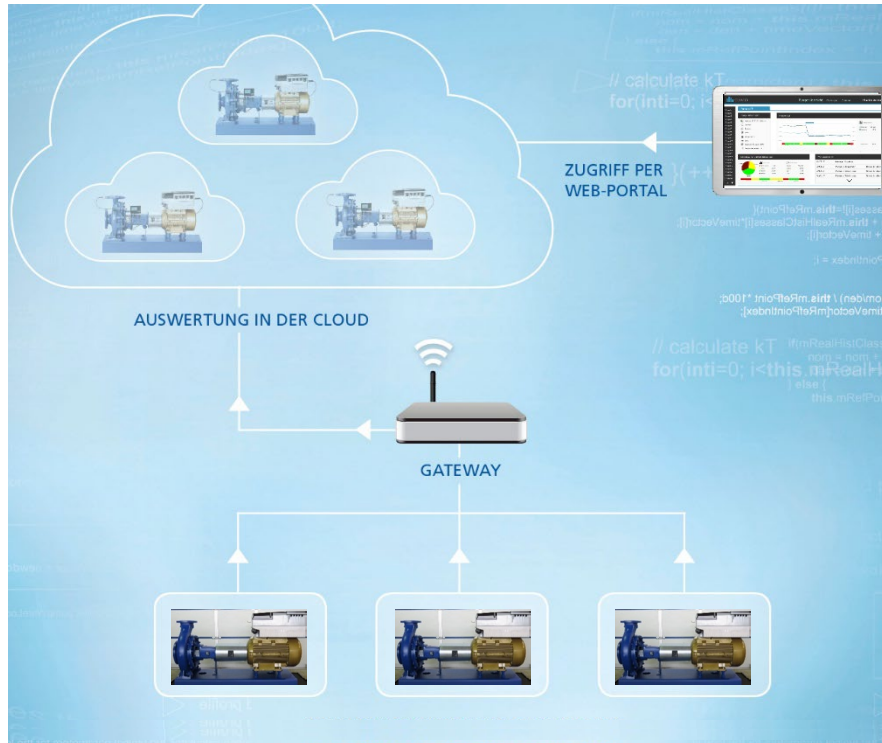
➔ *More efficient maintenance works*

Basis for new business models

Efficiency

Availability

- Precise Monitoring and Management of Pumps

- Vibration, Temperature and Loadprofile are measured

- Manufacturer independent

- Remote Services (Web, App)

- No Installation costs because of batterie mode

- continuous, codified communication

DIGITALE GESCHÄFTS-MODELLE

INDIVIDUA-LISIERUNG

E-COMMER

ZUGRIFF PER WEB-PORTAL

AUSWERTUNG IN DER CLOUD

GATEWAY

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Augmented Reality (AR)
Guidance instead of travelling

Definition Augmented Reality (AR):

A computer-assisted perception respectively representation, which augments the real world by virtual aspects.
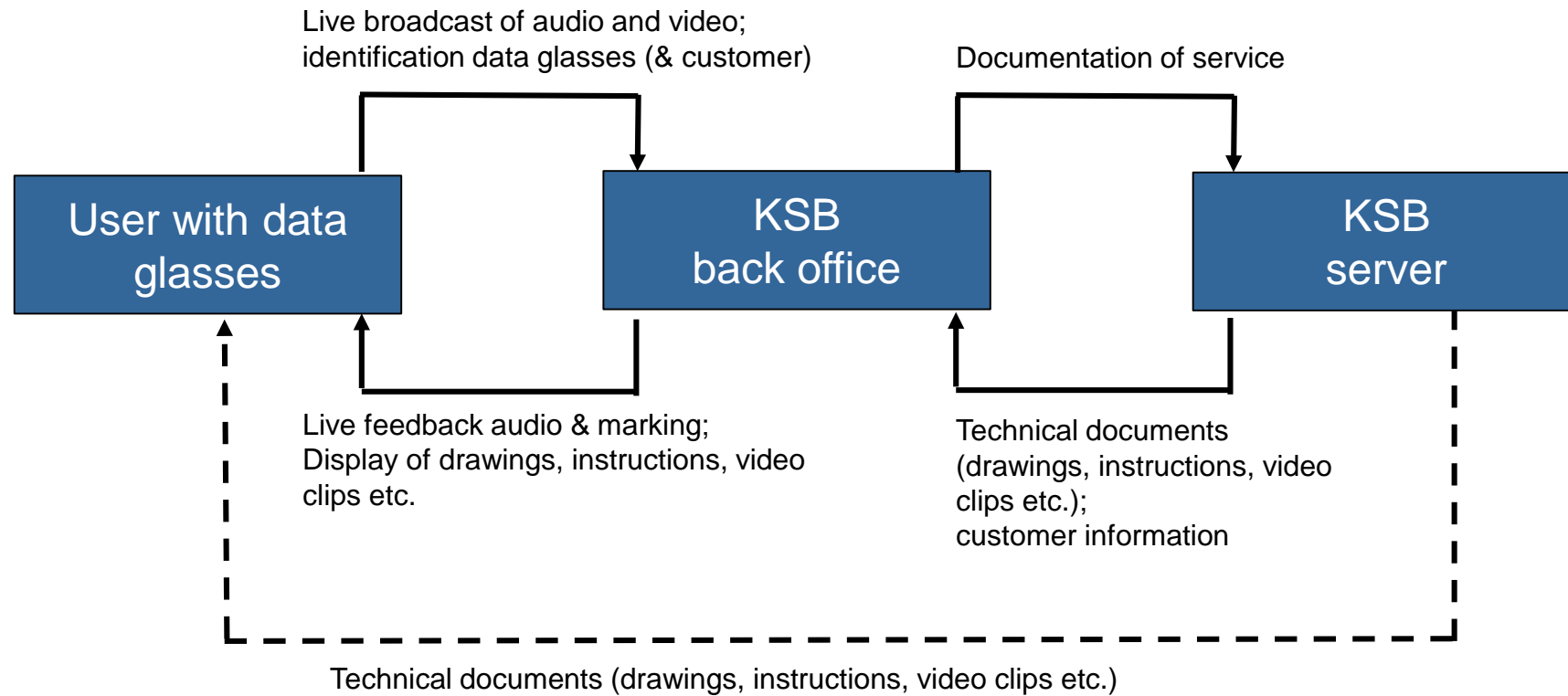
Goal:

The user (e.g. service technician on site) is supported live by a KSB expert via data glasses.

External and internal:

Not only the KSB service technicians but also customers and service partners can be supported by Augmented Reality Services.

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What does Augmented Reality Services (ARS) add

Live broadcast of audio and video;
identification data glasses (& customer)

Documentation of service

User with data glasses		KSB back office		KSB server

Live feedback audio & marking;
Display of drawings, instructions, video clips etc.

Technical documents
(drawings, instructions, video clips etc.);
customer information

Technical documents (drawings, instructions, video clips etc.)

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Digitalisation of spare part ordering process

- Agile development of a new and easy solution to order spare parts online

- Ordering is possible through an App on all mobile devices (Smartphones and Tablets for Android and IOS) as well as on a homepage via desktop

- The functions implemented in the first version are based on customer needs derived out of customer interviews

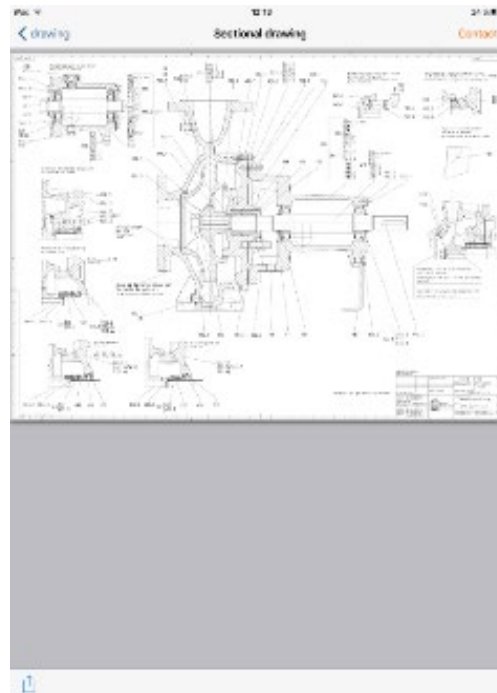- Key customer groups are small and medium sized operators, municipalities and independent repair workshops

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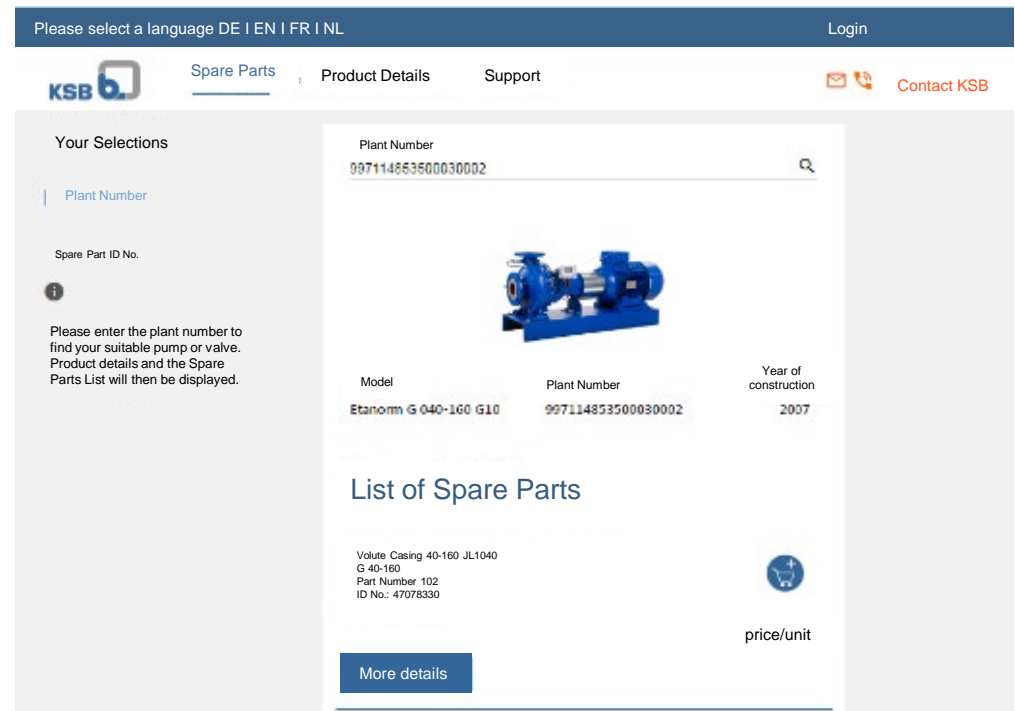# The digitized KSB Spare Part process
Screenshots

Support
Screenshot IPhone
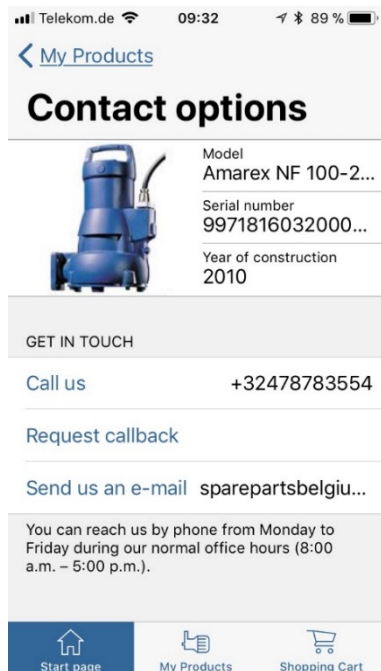
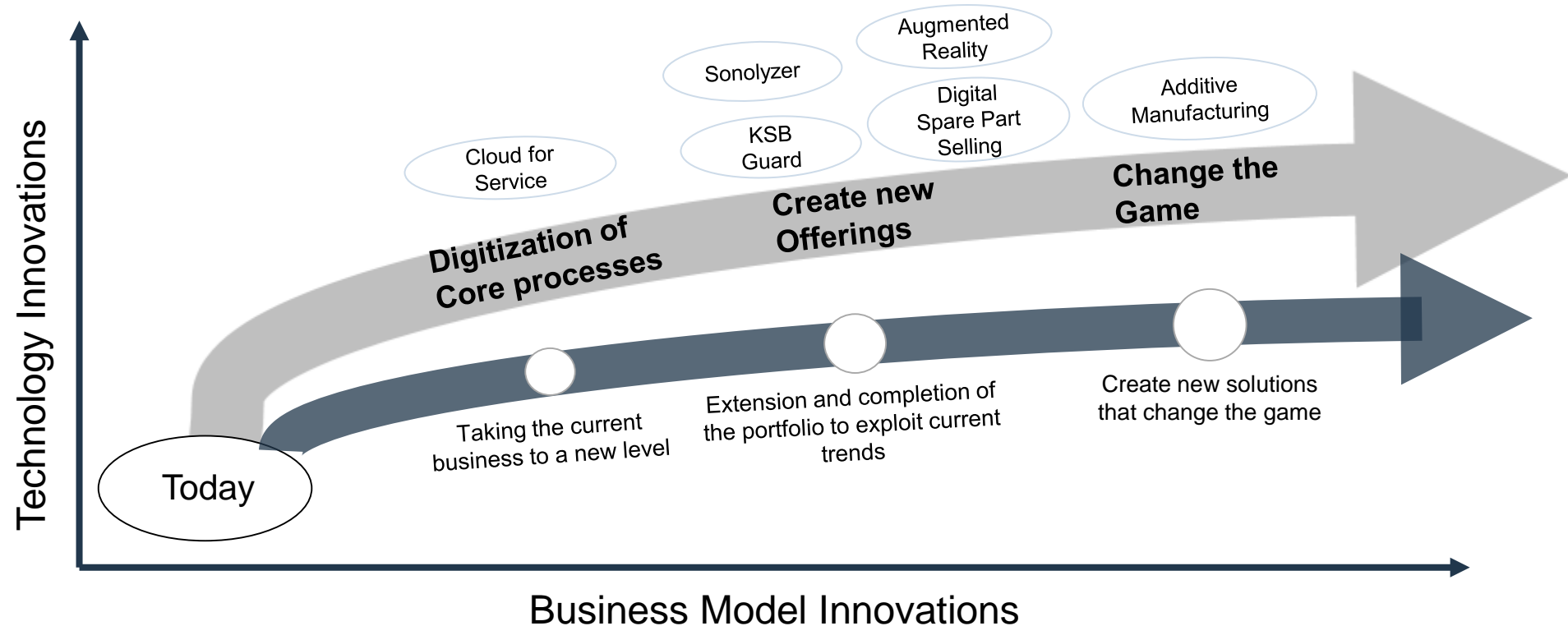**Product information**
Screenshot IPad

Spare parts
Screenshot webpage

KSB Spare Parts Platform

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Additive Manufacturing

KSB Guard

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Business Model Innovations

Source: Concept Laser

Facilities at KSB in Pegnitz

X-Line 200R

Standard material:

- 1.4404 (316L)

Max. component size:

- 800 x 400 x 500 mm

Laser:

- 2x 1kW

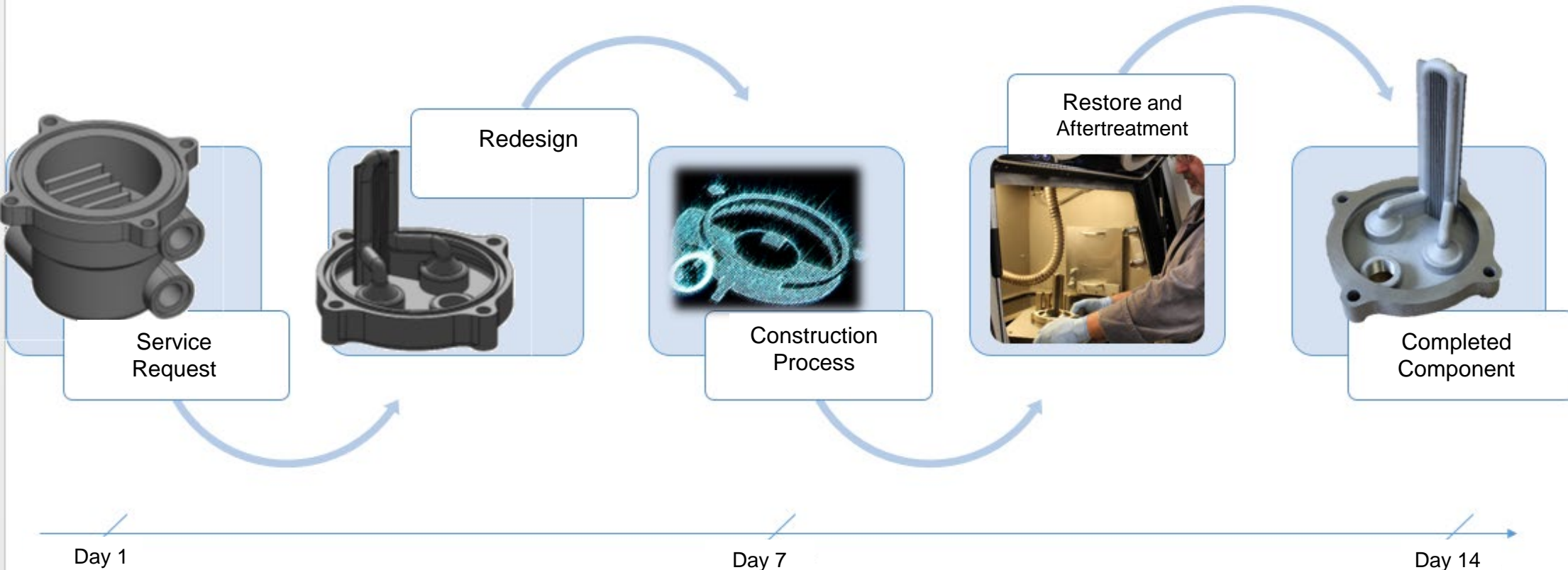Target:

Establish KSB as market leader in 3D-printing for pumps and valves esp. spares

Redesign of oil cooler for KSB-Service
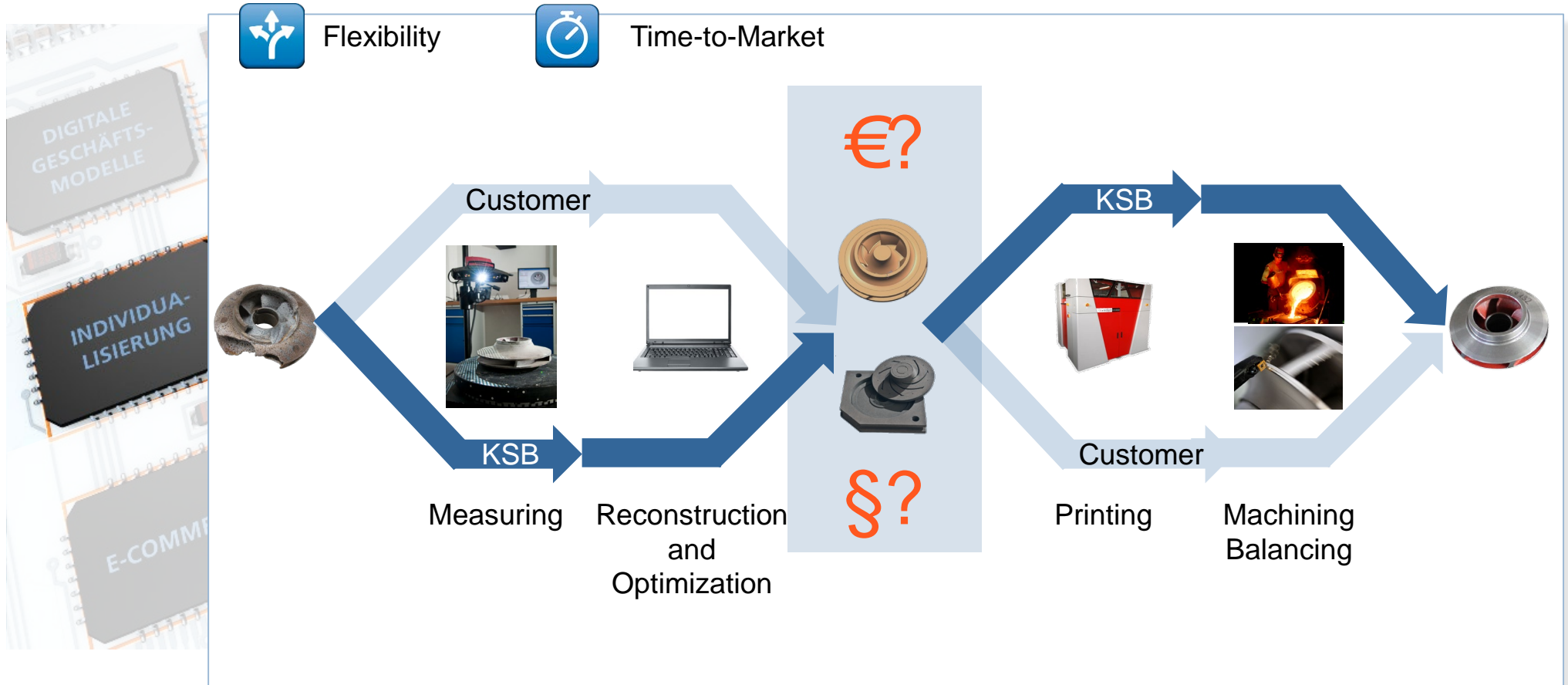New design provides better cooling characteristics and reduced weight

Service
Request
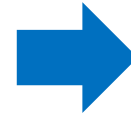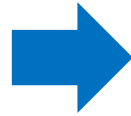
Redesign

Construction
Process

Restore and
Aftertreatment

Completed
Component

Day 1

Day 7

Day 14

Aftermarket/Service

Opportunities	Threats
▪ High quality components can be provided with **short delivery times** ▪ Typically the delivery time can be reduced significantly (compared to cast components) ▪ Product individualization possible ▪ Engineered Spare parts ▪ Additive manufacturing enables decentralized production ▪ Challenge: digitize and provide the Spare Parts	▪ Digitized information could be used by other suppliers ▪ Customers print the Spare Parts by themselves

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This technology will define new Business Models

Flexibility

Time-to-Market

€?

§?

Customer

KSB

Customer

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Measuring

Reconstruction
and
Optimization

Printing

Machining
Balancing

Close cooperation with customers in development and application

Source: www.elleta.net

Customer

Development of partnerships

Testing of printed impeller in comparison with cast-impeller at the customer's successfully finished

Field test

Digital services and solutions have the potential to change the positioning of the complete company