Smart Maintenance

The Key to higher Product Quality and Ability to Supply

Mannheim, February 28th, 2018

DAIMLER

IAS MEXIS GmbH

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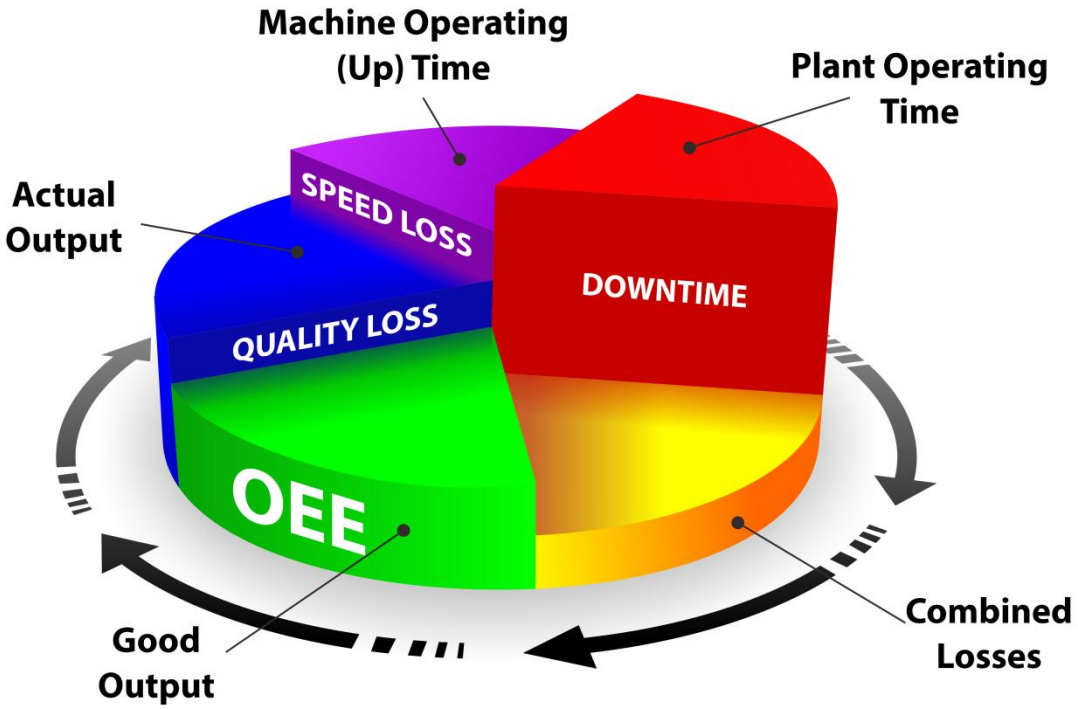
TOP ISSUE: OEE

- The **O**verall **E**quipment **E**ffectiveness (OEE) indicates the equipment's overall operational performance.
- OEE is the multiplication of: % Availability x % Performance x % Quality.



TOP ISSUE: SMART MAINTENANCE

Direct impacts of well maintained equipment:

- high availability
  - key pain indicator: unplanned downtimes
- better performance rate
  - equipment will handle higher output
- higher quality
  - total number of good parts produced will increase

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1977: FOUNDATION

I nstitut für

A nalytik und

S chwachstellenforschung

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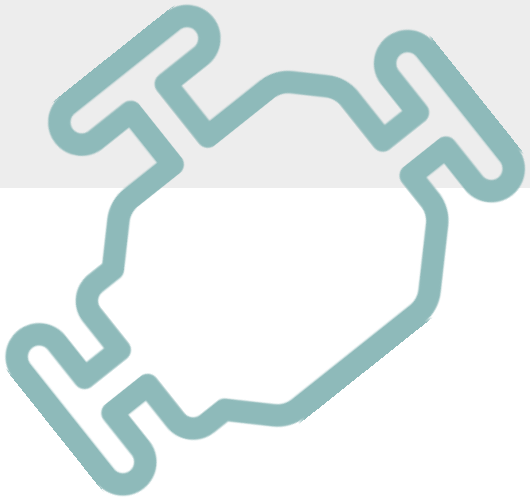
FUNDAMENTAL CONSIDERATION:

Single components are responsible for unplanned downtimes.



HISTORY

1977 TO 2018

40 YEARS

1,000 STUDIES

70 Mio. DATA

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Introduction of a

MATHEMATICAL-INTELLIGENT

Software Solution for a

AVAILABILITY-CONTROLLED

Maintenance!

DIVA™ DYNAMICS

HISTORY

2013 - COMPANY TAKEOVER

Institute for Analytics and Weak Point Researches

Research Association for innovative user-oriented Systemtechnology for Maintenance mbH

LOCATION:	**LUDWIGSHAFEN**
BUSINESS FORM:	**GMBH**
FOUNDED:	**2013**

EXTRACT OF CUSTOMER LIST

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DAIMLER

DAIMLER AG, Engine Plant Mannheim, 1.250 Clients

OSRAM

OSRAM GmbH, Main Plant Herbrechtingen, 280 Clients
OSRAM SYLVANIA, Hillsboro, New Hampshire, 160 Clients

SIEMENS

SIEMENS AG, Generator Factory Erfurt, 275 Clients

hilcona

Hilcona AG, Schaan, Lichtenstein, 140 Clients & 80 Smartphones
Hilcona AG, Orbe, Schwitzerland, 130 Clients & 70 Smartphones

Ottakringer

Ottakringer Brewery AG, Vienna, Austria, 110 Clients

case tech

CaseTech GmbH, Bomlitz, Legnica/Polen, Willowbrook, USA, 260 Clients

MAINTENANCE ACCORDING TO DIVA™

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1. **Determination of desired availability**

2. **Categorization and structuring of a production plant**

3. **DIVA‘s Component Library (Expert System)**

4. **DIVA calculates your maintenance cycles**
   - A) Hours of operation
   - B) Environmental parameters
   - C) Component characteristics

5. **Optimized Maintenance Intervals**

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DETERMINATION OF THE PARTICULAR **STARTING MAINTENANCE INTERVALS**

- empirically proven **Algorithms**
- with reference to the **Strategy** (reactive vs. preventive/predictive)
- focus on the desired **Availability**

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MAINTENANCE INTERVALS
WILL BE PROACTIVELY OPTIMIZED VIA
ARTIFICIAL INTELLIGENCE
AND THE FUNCIONALITY OF
LIFELONG LEARNING

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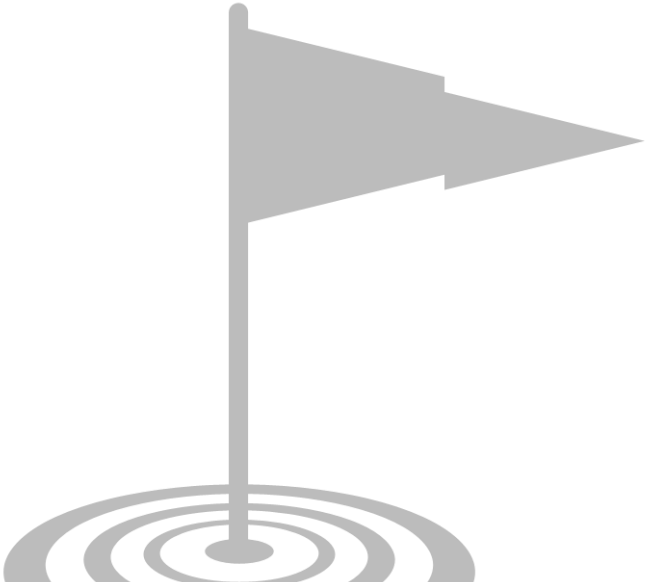
FROM REACTIVE TO

PREVENTIVE/PREDICTIVE

MAINTENANCE



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IMPACTS:

- short implementation time
- high availability, product quality and ability to supply
- reduction in maintenance & spare parts costs
- increase of the OEE

SMART MAINTENANCE

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Most important effects by the example OSRAM:

Short implementation time	**4 MONTHS**
Reduction in repair costs	**25 %**
Saving potential in spare parts inventory	**80 %**
Payback-Time	**< 1 YEAR**

MAINTENANCE ACCORDING TO DIVA™

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DIVA® DYNAMICS

MAINTENANCE-
SOFTWARE (CMMS)

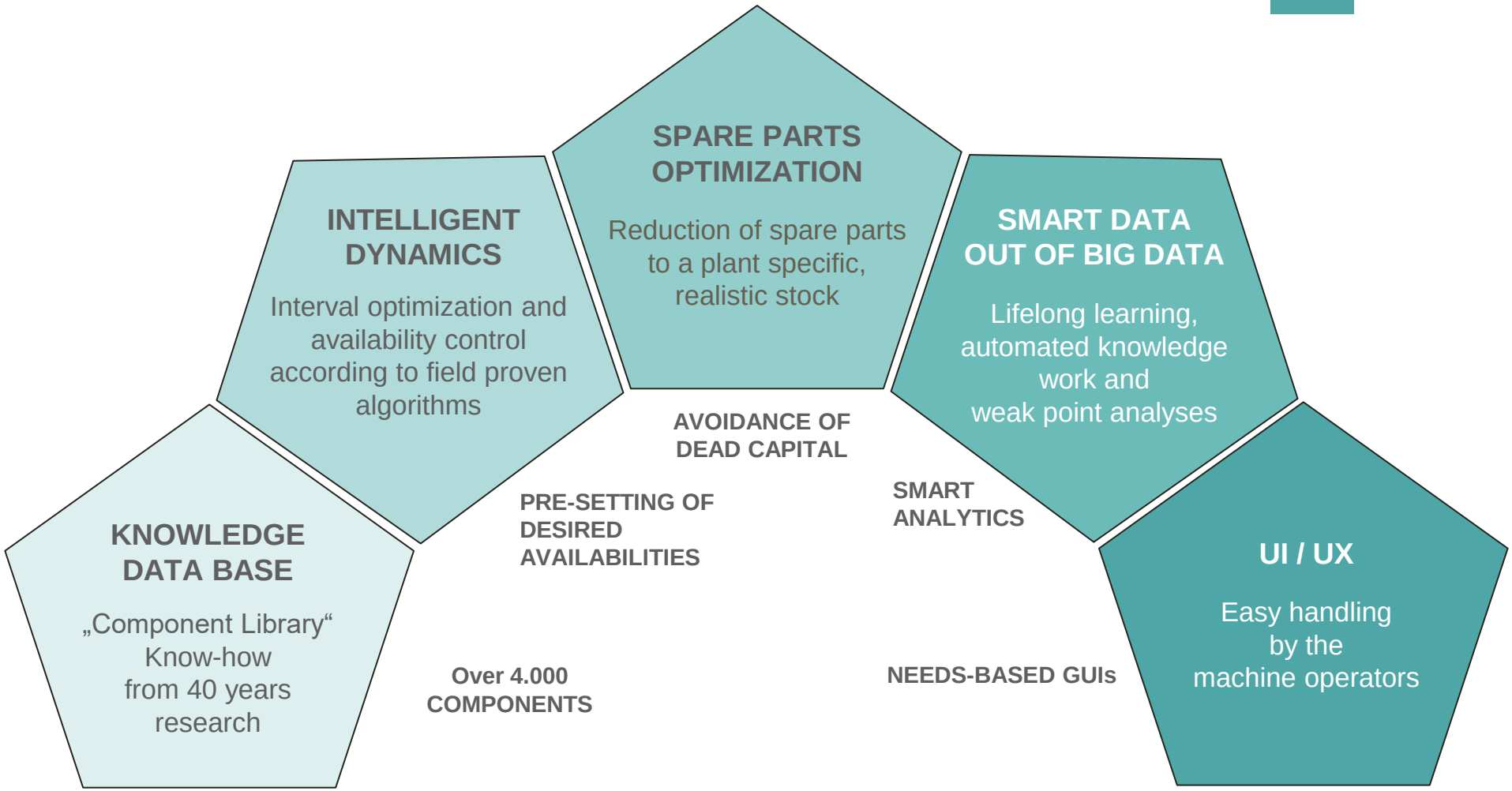
- Weak Point Analyses
- Contractor Management
- Tool Maintenance
- Environment Assessment
- Warehouse Management
- Mail-Control-Center

DIVA® GO

MOBILE SOLUTIONS

- Notification System
- App for Android, IOS, Windows

CHARACTERISTICS OF DIVA™ DYNAMICS



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SET UP A PILOT AT YOUR PAIN POINTS!

TYPICAL PROJECT WORKFLOW - PILOT

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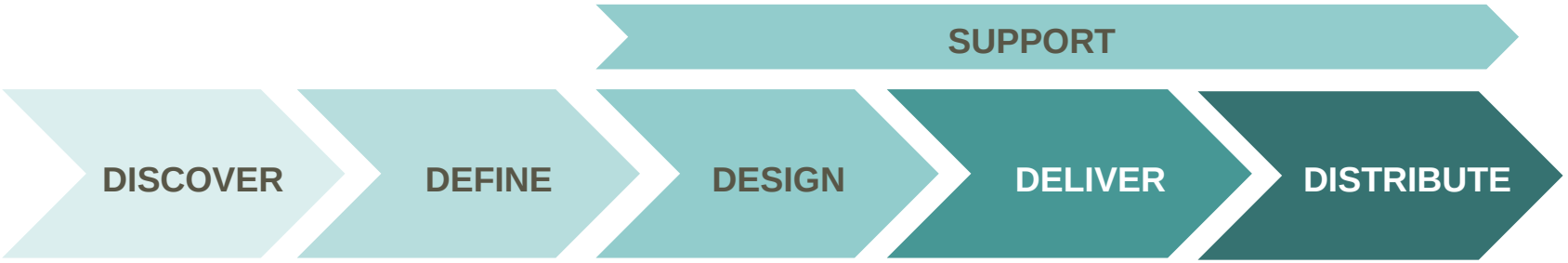

- Situation Analysis Weak Points
- Wish list
- Demands

- Target definition
- Selection of an appropriate area
- Selection of team
- Process modeling

- Installation
- Structuring
- Migration

- Train-the-Trainer
- Reflection workshop
- Roll-out

- Analyses
- Optimization
- Roll-out

What can we achieve together?

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