

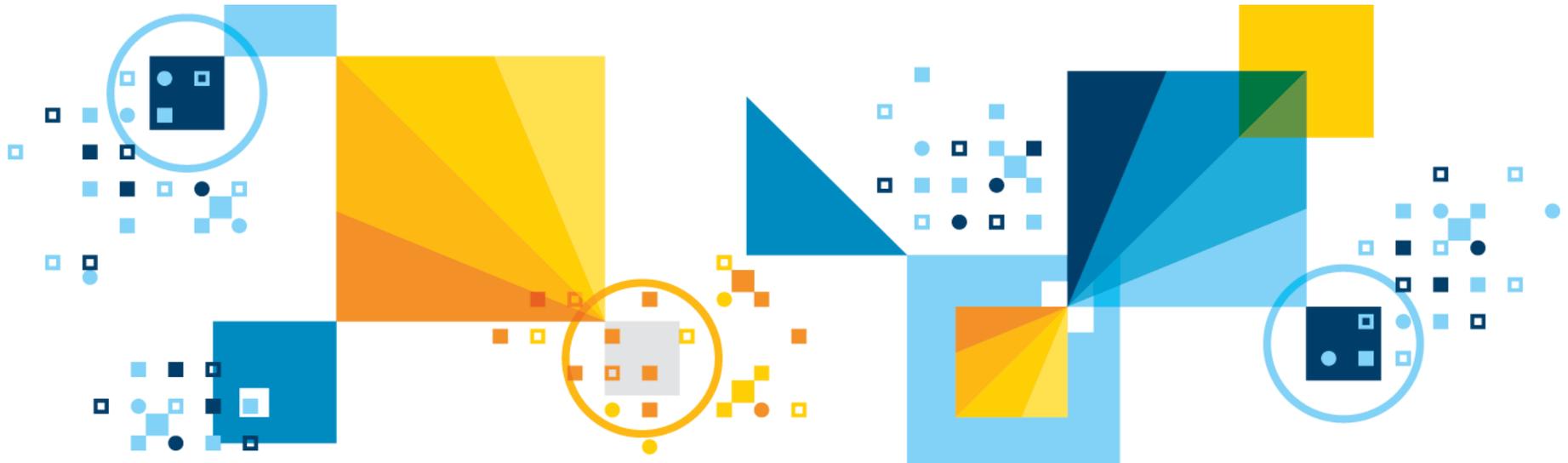
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# Konkrete Umsetzung von Industrie 4.0

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# Pratt & Whitney, an aircraft engine manufacturer, uses predictive analytics to prevent costly aircraft-on-ground engine events

## 97% prediction

ability to predict delays & cancellations within 12 weeks

## 97% accuracy

ability to predict an in-flight shutdown within a year



## Solution components

- IBM® Predictive Maintenance and Quality
- IBM DB2® V9
- IBM Cognos® Business Intelligence V10
- IBM SPSS® Modeler
- IBM Global Business Services® – Business Consulting Services



**Business challenge:** This US-based aircraft engine manufacturer **collects a vast amount of data about its engines through various databases and sensors**, but it had no holistic way of integrating and analyzing the information to proactively address engine issues.

**Solution:** An analytics platform **creates predictive models that automatically alert the manufacturer to different types of impending engine events**. These alerts, and a **360-degree dashboard visualization of engine-fleet health and risk status**, enable the company to take proactive measures such as ordering and arranging preventive maintenance. These can help prevent a range of engine issues and potentially help the company's customers **avoid millions of dollars in costs associated with grounded planes**.

***The analytics solution helps us answer, at a glance, the big question: how is our engine fleet doing today?***

# Daimler, an auto manufacturer in Germany, uses predictive models to make the right production adjustments and meet tight tolerances

## 25% increase

in the overall productivity of the cylinder-head production line

## >50% reduction

in the time required to ramp up the process to target levels

## 100% payback

achieved within two years



**Business challenge:** This auto company's managers had an anecdotal understanding of which variables were tied to product-quality issues in the company's cylinder-head production line, but not enough to change it. What they needed was a way to more precisely identify the complex patterns in machine settings, material temperatures and equipment maintenance activities that adversely affected product quality so that they could take preventive steps to minimize production-line waste.

**The smarter solution:** Each day, production-quality analysts run the more than 500 production-line variables they track through predictive models that tell them which specific parts of the line need to be adjusted to ensure that products remain within their tight tolerances. The solution also provides predictive insights on which production assets should be preventively maintained to avoid future problems.

*By gaining a far deeper understanding of the many factors that affect production quality, proactive steps can be taken to maximize it.*

## Solution components

- IBM® SPSS® Modeler
- IBM SPSS Lab Services

# A major US-based oil and gas company gains near-real-time insight into well-field data to help prevent problems that hinder production

## Tens of millions

of dollars in lost revenue saved by preventing oil well collapse

## Proactive action

facilitated through near-real-time analysis of well-field data

## Maximizes revenue

while safely extracting oil

## Solution components

- IBM® Cognos® Business Intelligence V10
- IBM InfoSphere® Streams
- IBM SPSS® Modeler
- IBM Global Business Services® – Business Consulting Services



**Business challenge:** To extract heavy oil, steam is injected into the oil well to warm and thin the oil. If too much steam is used, or used too quickly, the well can collapse. Despite collecting sensor and other data from wells and production equipment, a lack of near-real-time data integration and analysis meant that the company could use the data only for remedial, not preventive, action.

**The smarter solution:** A Big Data and Analytics solution processes and conditions extremely large data volumes at unprecedented speeds, while analytical capabilities enable the oil company to identify well-field production anomalies in near-real time, before they can result in major problems. For example, sensor-data analysis can identify a seismic anomaly and immediately alert the operator to shut down the injection process before the well collapses.

*The solution provides the insight needed to stop minor problems from developing into major production issues.*

# SIDAP Projekt

Eine Zielsetzung besteht in der Erhöhung der Verfügbarkeit von Aggregaten in der Produktion mit Bestimmung der Restlaufzeiten durch BigData und Analytics Methoden



[www.sidap.de](http://www.sidap.de)

- Finanziert vom Bundesministerium für Wirtschaft und Energie (BMWi)
- Als Teil der Smart Data und neuen High-Tech Strategie und der Digitalen Agenda der Bundesregierung
- Projekt Konsortium mit führenden Firmen aus der Prozess-Industrie (z.B. Bayer, Evonik, Samson, Krohne, IBM – unter Führung der TU München) ([www.sidap.de](http://www.sidap.de))
- Langzeit Partnerschaft und Projektlaufzeit von 2015 - 2018

Starke Reduzierung der Routinearbeiten und der täglichen manuellen Maschinen-Interaktionen. Integration von Diagnose- und vorausschauenden Informationen.



SIDAP Initiativen



„Smart Manufacturing Execution System“ (MES) durch die Integration von Daten aus verschiedenen Quellen.

Effizienzsteigerung durch strategische Partnerschaften und Engineering Feedback-Schleifen

Globale Remote-Services mit Wissenstransfer

## Industrie 4.0 / IOT Internet-of-Things @Logistics

### Integration von Kunden am Beispiel Autoindustrie

Optimierte Belieferung von Presswerken und Fertigungsstrassen in Automobilwerken mit Coils durch horizontale Integration des liefernden mit dem abnehmenden externen Werk. Materiallieferung werden vernetzt mit den individuellen Coil Daten zur Optimierung der Produktion.

### Extended Supply Chain Collaboration

#### Business Challenge

- Merger of key competitors and increase competition
- Need to protect key customers

#### What's Smart?

- Leverage on the Internet, real-time analytics and advanced matching algorithm to identify deviations between supply and demand

#### Smarter Business Outcome

- Real-time visibility of supply and demand deviation
- Ability to react much faster – from 4 days to 1 day
- Reduced inventory across the chain
- Differentiated relationship with key customer

