Navigating the data maze - tools & techniques for successful prognostics

1. Best Practices for Successful Predictive Maintenance Projects

- Maintenance Strategies
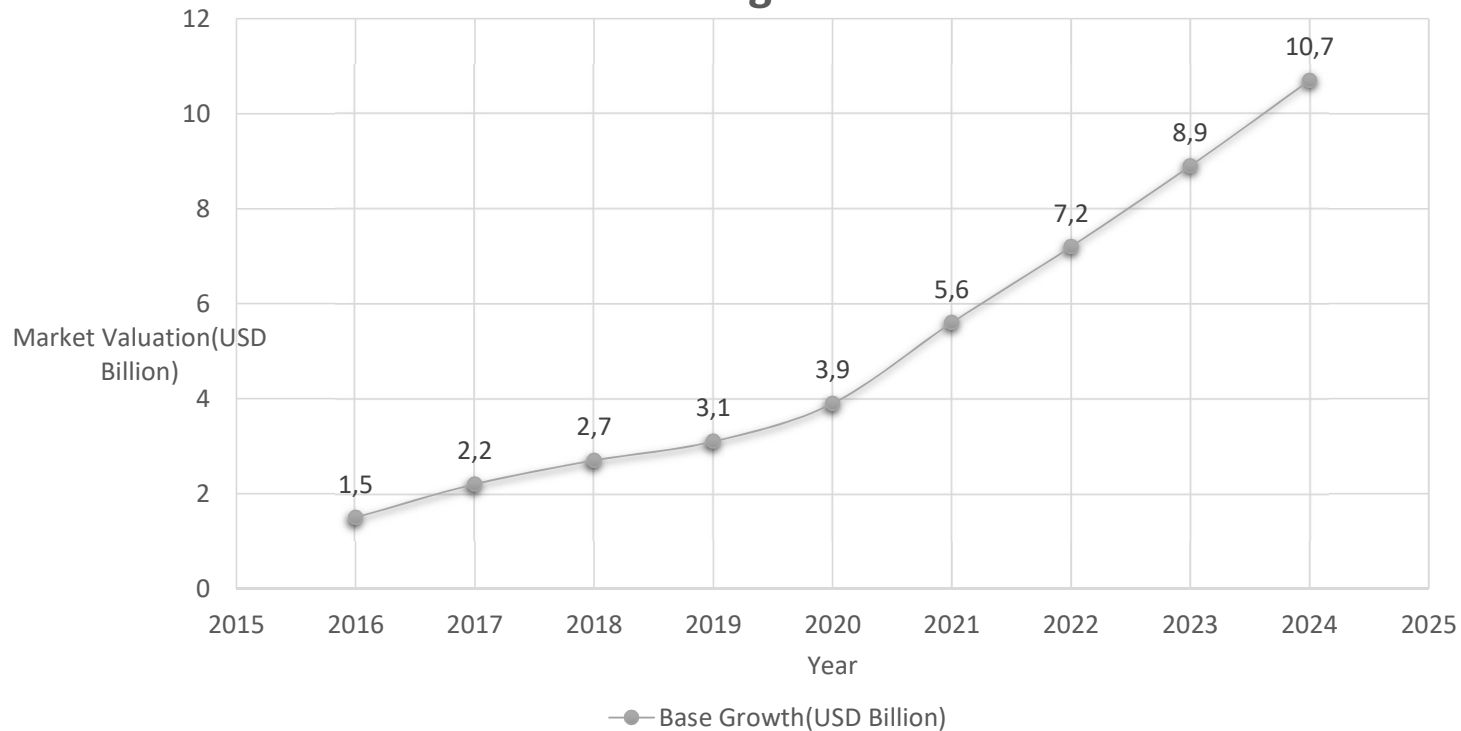- Model for Predictive Maintenance Projects
- Benefits & Challenges

Triggers → Pre-Conditions → Implementation → Benefits → Challenges

2. Case Study

- Predictive Diagnostics of Spark Plugs

The 'Why' part – Market Outlook

Predictive Diagnostics – Trend

By 2024

$10.7Bn

CAGR Growth

>28%

Source: MarketsandMarkets.com
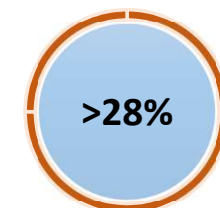
Changing Customer Orientation and Business Models

From   ..to

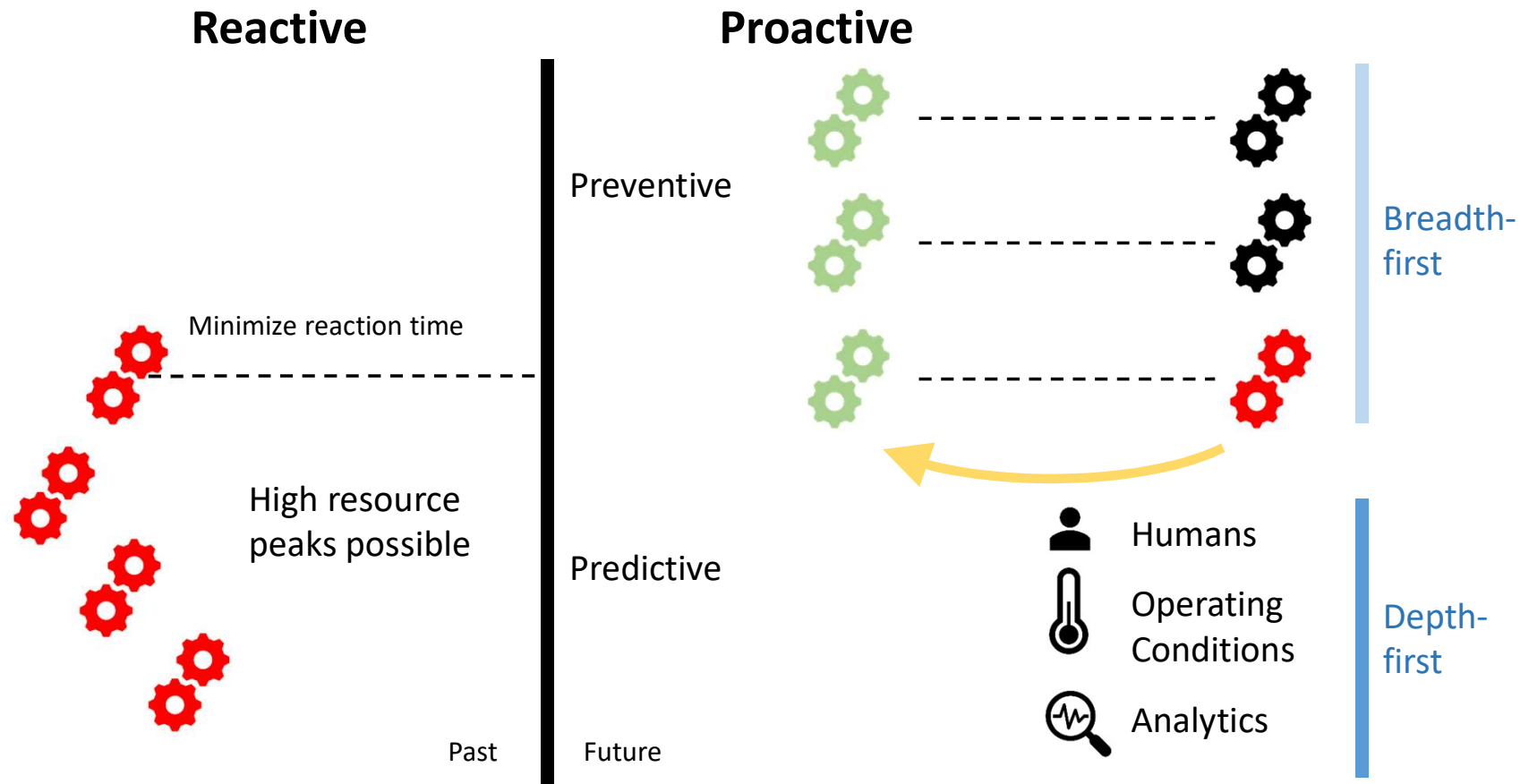Asset Ownership   ➡   Usage of Assets
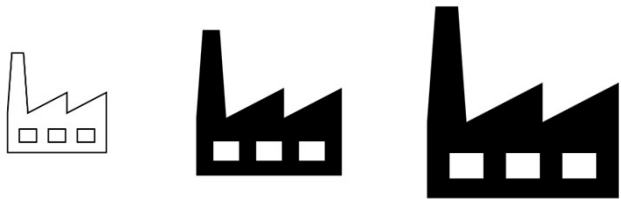
Exclusive Access   ➡   Shared Access

Goods-   ➡   Service-
Orientation   Orientation

Maintenance Strategies

Reactive

Proactive

Preventive

Minimize reaction time

High resource
peaks possible

Predictive

Breadth-
first

Past   Future

Humans

Operating
Conditions

Analytics

Depth-
first

Research Question

What are best practices for successful predictive maintenance projects ?

Empirical Study

Medium-sized and large enterprises

February 2017 to September 2018

Manufacturing and Communication sector

Best Practice Model for Predictive Maintenance Projects

Triggers → Pre-Conditions → Implementation → Benefits → Challenges

Project Triggers

Potential interruption of production / service provisioning with severe impact on revenue and profit	Potential interruption of production / service provisioning with severe impact on reputation and customer loyalty	No Risk Mitigation possible
• Missing deliveries • Violated Service Level Agreements • Contractual penalties	• Customers may spread information on interruptions • Customer loss (not relevant for monopolies)	• E.g. hot-standby too resource-consuming

Pre-Conditions

Data available	Data accessible	Management support
• Item-Data • Process Data • Environment Data	• Privacy of clients ? • Intellectual property • Trade secrets	• Often huge resources necessary

Implementation

Cloud-based integration

Advanced Analytics

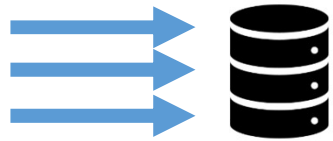**Data-driven process automation**

Visualization

Benefits

Process efficiency and effectivity improved	Improvement of the maintenance processes itself	Increased lifetime of the machinery

Challenges

Integration of data from various sources	Concerns of employees	Safety and security aspects

Conclusion

Clear Benefits from Predictive Maintenance Projects

Structured approach ensures the success of projects

Challenges must not be ignored