Envisioning Workshop
Smart Maintenance

Smart Maintenance,
where to start?

Predict your maintenance activities based on data? You have probably already intended to start with smart maintenance. Or maybe you are already working on this. Certainly, in the technical services and manufacturing industry, smart maintenance is a term that is becoming more common.

Smart maintenance involves optimizing maintenance processes using smart Artificial Intelligence (AI) algorithms and data analysis. Such projects can yield enormous benefits, **but where do you start?**

1. Reduce downtime with proactive alerts
2. Detect and address issues through analytics
3. Plan optimal technician with Field Service
4. Ensure first-time fixes
5. Self-learning feedback loop

Smart Maintenance:
Start changing your focus

Where most providers of predictive maintenance technology assume the prevention of that **one fatal error**, in practice these errors are **very rare.** Most companies for whom uptime is crucial have already vastly optimized their production chain. Preventing that one failure, which may occur once every ten years, **won't quickly recoup your investment** in predictive maintenance.

Instead, we say: **look further**, at the indirect, perhaps **'smaller' effects** that do deliver a high return on investment. I like to make a comparison with the tire pressure of a car. Instead of doing everything you can to prevent a blowout that might happen to you once in a lifetime, it's better to make sure that you always drive with optimal tire pressure. That's safer and you'll also save a lot of fuel, and therefore money.

Smart Maintenance:
Common questions

The following questions probably pop-up in your mind while you are thinking of implementing Smart Maintenance:

Is my **organization** ready?

What are the first steps for **servitization**?

Are my **customers** ready?

How to make the **shift** from preventive to predictive maintenance?

How to connect assets with **IoT**?

What **data** should we collect for future use?
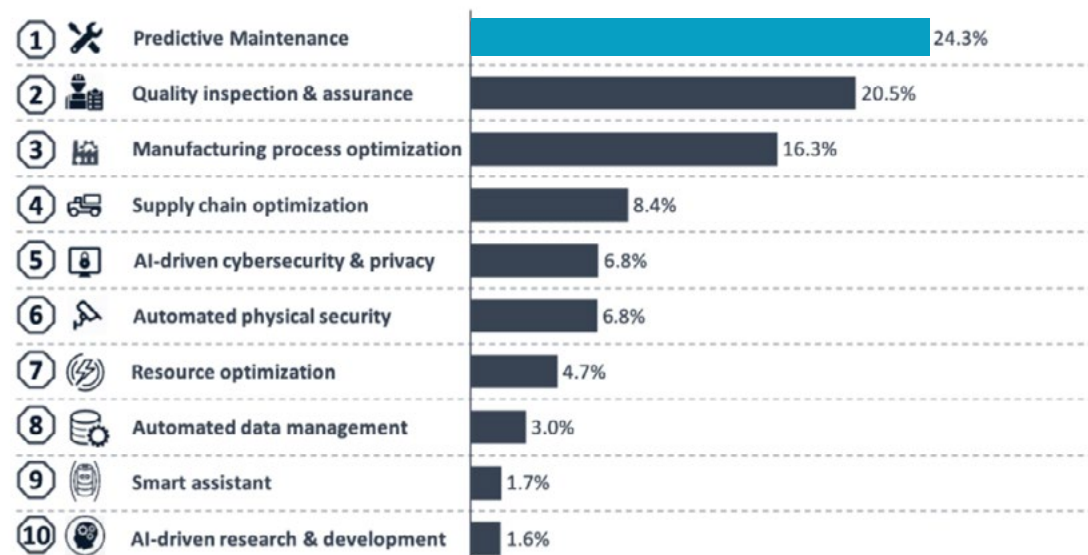
How to define the **value of data**?

Should we **invest** in new IT platform?

How to define a **business case**?

The huge potential
of Smart Maintenance

The McKinsey 2020 AI survey shows that artificial intelligence (AI) has become a revenue driver and companies are planning to invest even more in AI the coming years. AI is not only generating revenue but also results in cost reductions. At research done by IoT Analytics also shows that **Predictive Maintenance is by far the most common use case** in Industrial IoT.

Top 10 industrial AI use cases

#	Use case	Share
1	Predictive Maintenance	24.3%
2	Quality inspection & assurance	20.5%
3	Manufacturing process optimization	16.3%
4	Supply chain optimization	8.4%
5	AI-driven cybersecurity & privacy	6.8%
6	Automated physical security	6.8%
7	Resource optimization	4.7%
8	Automated data management	3.0%
9	Smart assistant	1.7%
10	AI-driven research & development	1.6%

Note: The percentage indicates the share of the global "Industrial AI" market in 2018 as estimated by the IoT Analytics analyst team. The percentages do not add up to 100% because other use cases that cannot be classified into these 10 categories were not included. **Source:** IoT Analytics Research 2019 – Industrial AI Market Report 2019 - 2025

Benefits of Smart Maintenance

- ✔ Pay by the hour/meter
- ✔ Performance bonus
- ✔ Predict High risk events
- ✔ Condition based Maintenance
- ✔ Optimized planning and logistics
- ✔ Customer Satisfaction
- ✔ Returning customers
- ✔ Improved accuracy
- ✔ Improved quality
- ✔ Reduce waste & energy
- ✔ Utilization

Smart Maintenance:
How to overcome the pilot phase?

You see the potential and you have probably already intended to start with smart maintenance but so far you don't know how to overcome the pilot phase as it is difficult to find the right use-case or get the involvement of the right stakeholders to really benefit from the potential of AI.

Our answer:
"Keep it small but think big."

✔ Start with use cases that can be concretely named and can be approached pragmatically

✔ Discover and be open minded

✔ Data exploration and cleaning are key

✔ Involve domain experts & stakeholders

✔ Disrupt data quality myths

✔ Apply an agile way of working

Smart Maintenance:
HSO approach

Big Data and AI have been hot topics for quite a while, but as is often the case: bringing them in practice is more difficult. Some organizations have been gathering data for years. However, very often, they do not have the appropriate software to interrogate data in-depth. As a result, initiatives do not lead to results, or nothing happens.

So how do you develop an AI business case that delivers added value for your organization?

HSO has developed a unique approach to help you find out exactly what the impact of AI will be in your company.

Which use cases can you start working on immediately and what will be the expected impact on your business?

What do you need and what does it deliver?

We translate abstract technology into concrete applications, that you can start using immediately.

Workshop Agenda:
4 sessions, 8 hours

Session 1

Duration: 150 mins

Introduction and Background
- Facilitating Team
- Workshop objectives
- Desired outcome

Customer Current Situation
- Vision Statement or Value Hypothesis
- Existing Initiatives and Deployments Review
- Observations and Discovery
- Challenges & Opportunities

led by customer

Inspiration session
- Use case Inspiration & Business understanding

Session 2

Duration: 150 mins

Business needs Ideation (Design Thinking)
- Review the homework submissions
- Leverage whiteboard to collate new ideas, benefits and pain points
- Concept Cards and initial use case definitions

Value needs Ideation
- Use case visualization and value understanding

Homework:

Concept Cards & Use cases scoping

Session 3

Duration: 120 mins

Concept Prioritization
- Review concepts and define use case KPI's
- Identify top priorities & define approach

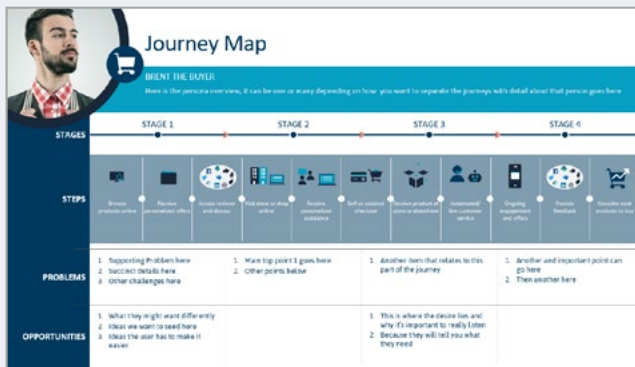**Feedback survey**

Session 4

Duration: 60 mins

Reporting
- Aspirational timeline Smart Maintenance PoC
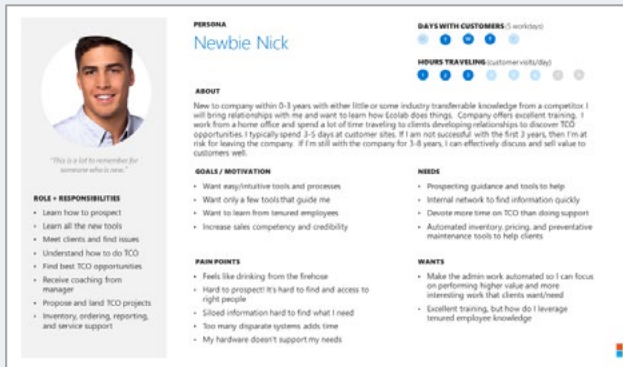- Next Steps, Actions and Owners

Envisioning Workshop:
a conceptual overview

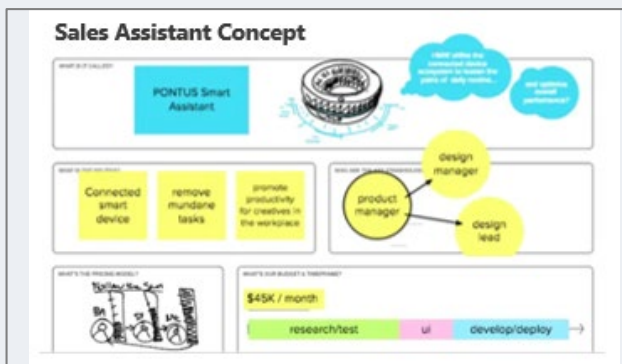### Document the current situation

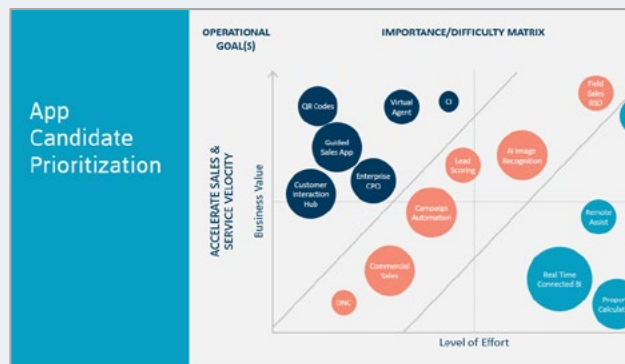### Understand the business needs

Art of the Possible – find opportunities
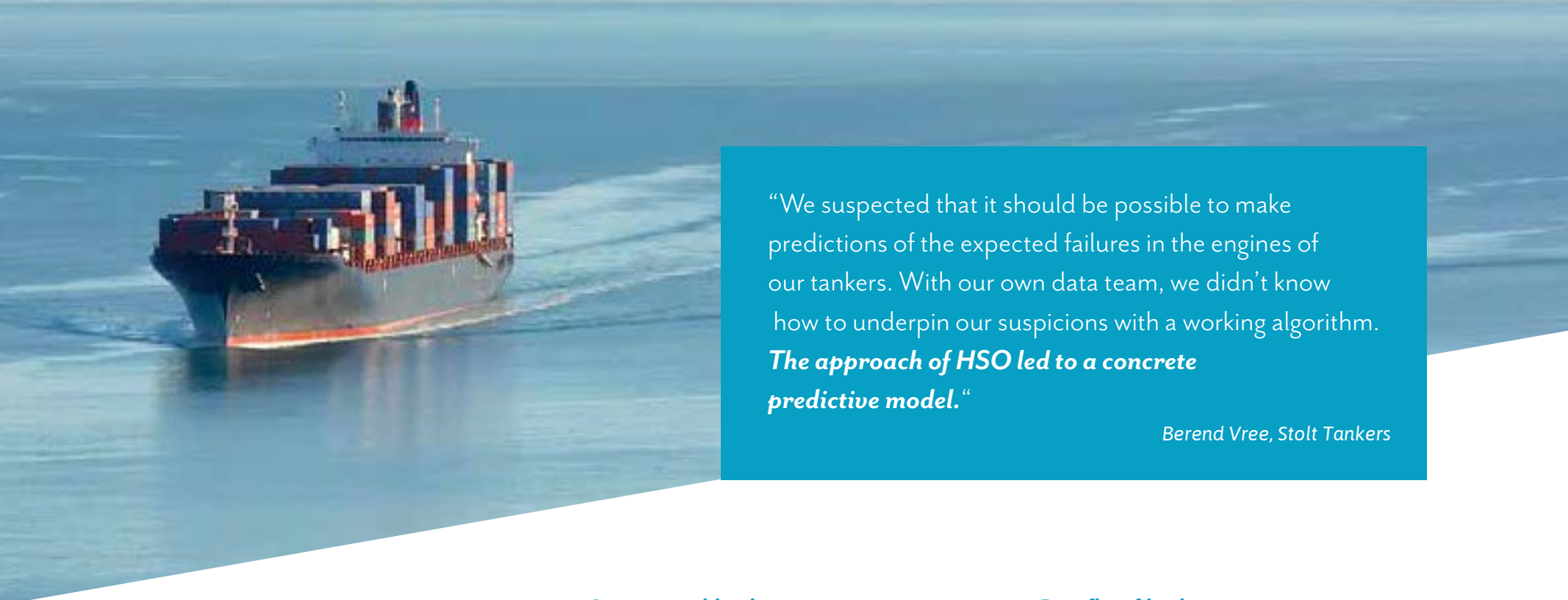

Teams Develop AI use case Concepts

Assess use case concepts – impact & feasibility

Use case Candidate prioritized

> "We suspected that it should be possible to make predictions of the expected failures in the engines of our tankers. With our own data team, we didn't know how to underpin our suspicions with a working algorithm. *The approach of HSO led to a concrete predictive model.*"
>
> *Berend Vree, Stolt Tankers*

An example:
Stolt Tankers

Corporate objectives
- ✔ Improve operational uptime & forecasting
- ✔ Enhanced risk management
- ✔ Competitive advantage
- ✔ Voyage management capabilities

Project deliverables
- ✔ Scope use case
- ✔ AI technical architecture
- ✔ Data insights and visualizations
- ✔ IOT data discovery
- ✔ Machine learning models for predicting engine status and failures

Benefits of business case
- ✔ Prevent 1-2% of fuel inefficiency loss
- ✔ Controlled and guaranteed up-time
- ✔ Cilinder liner lifetime has been extended
- ✔ Active voyage management
- ✔ Strategic sourcing of spare parts

Experiences from customers

"We are now able to prioritize maintenance on (expensive) assets to prevent downtime using asset risk scores."

"We have never overcome the pilot phase of possible AI use cases, the Envisioning workshop from HSO helped us to streamline our ideas, plan it in time and define the next concrete steps. A well spent 8-hours!"

"The envisioning workshop completely changed our way of thinking of possible use-case. We have stopped thinking of that one fatal error that can occur, but started thinking of indirect, maybe smaller, effect that do deliver a higher return on investment in the long run."

![Hso - the results company]

Would you like to know more about this workshop?

Our experts are ready to help you.
Feel free to contact us.

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