EURO MAINTENANCE 4.0

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Session : 2.1.1

Predictive Maintenance trends & insights based on a 2018 market survey in North-West Europe

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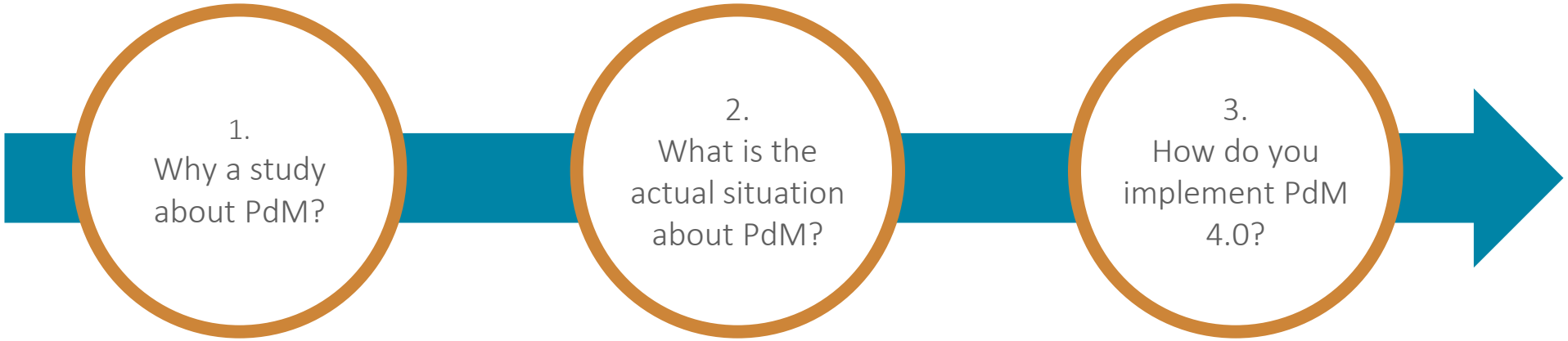
Agenda

Steps



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Predictive Maintenance (PdM) is not new…

Visual inspection

Instrument inspection

Real time condition monitoring

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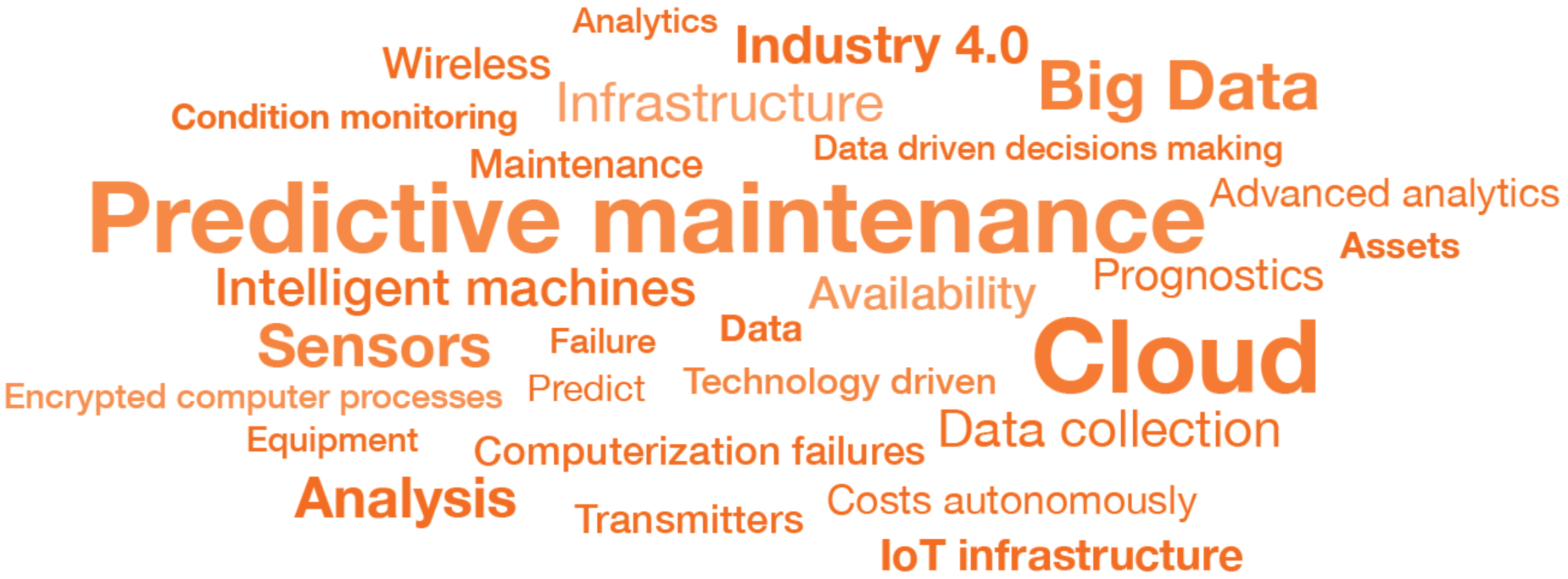
The digital revolution creates new opportunities



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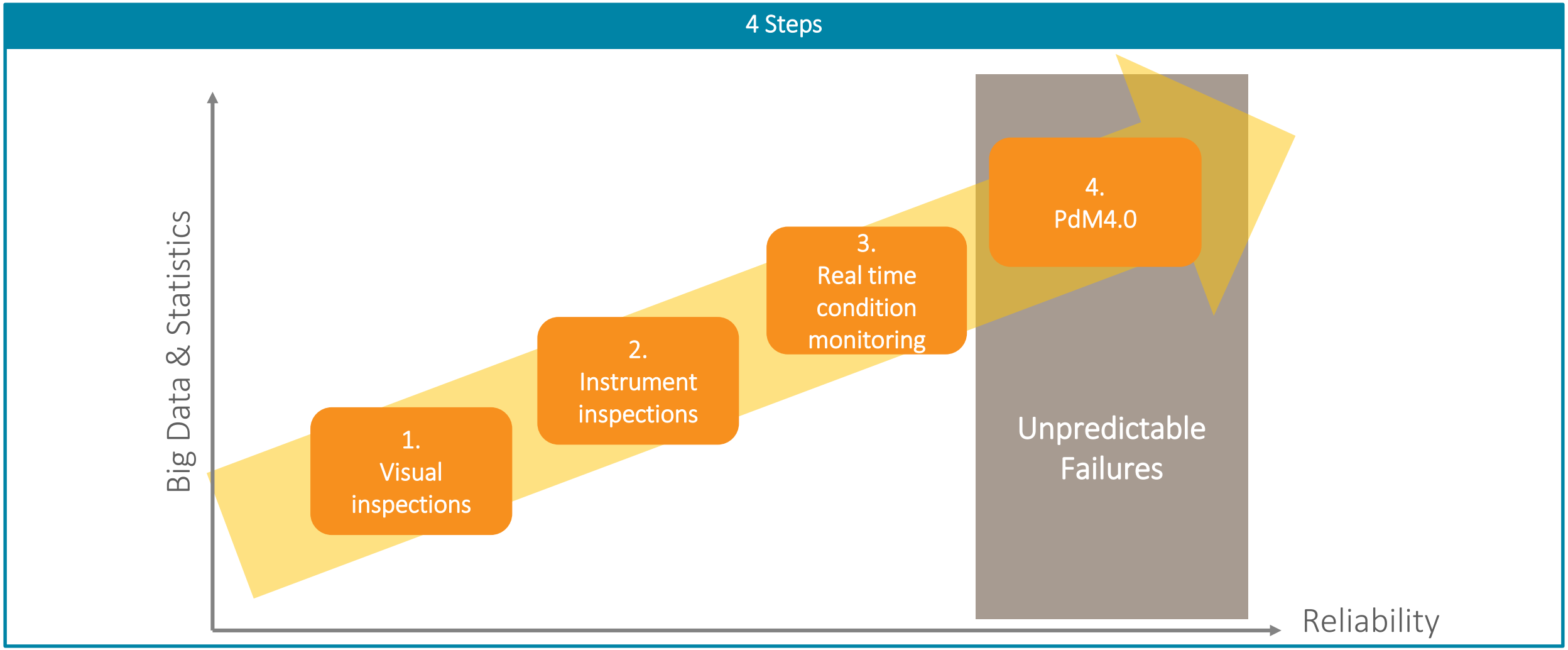
The PdM Maturity Matrix



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Definition of PdM 4.0

PdM 4.0

Definition

- **Predicting** future failures of an installation and **prescribing** the most effective preventive measure (when and what) by applying advanced **big data analytics** techniques with data about :
  - Technical **condition** of the installation
  - How to **use** the installation
  - The **environment** of the installation
  - The maintenance **history**
  - Standard maintenance **tasks**
  - **Comparable installations** inside and outside the company

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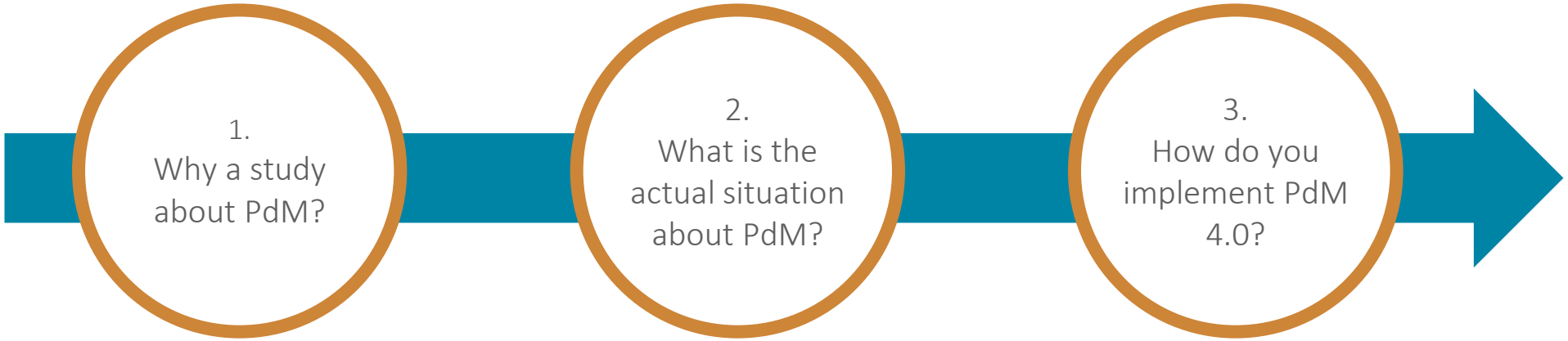

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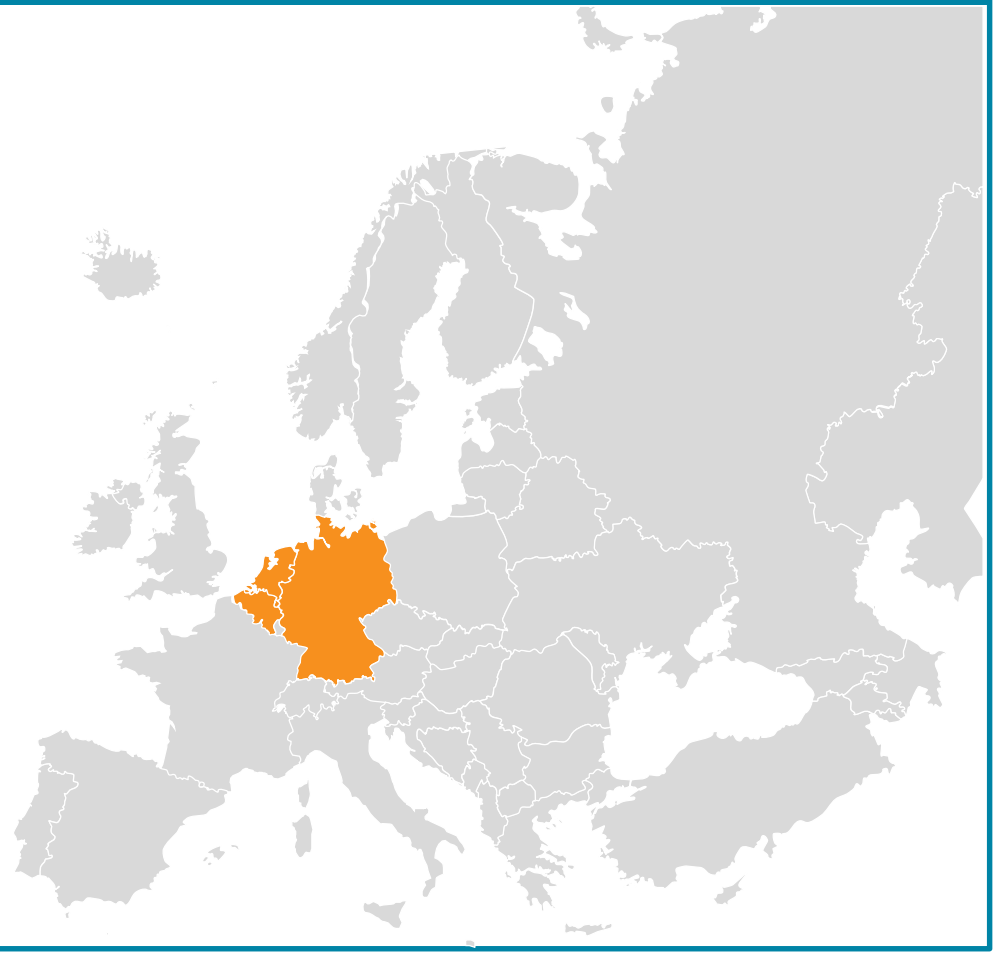
PdM Market Survey

Country focus



Insights

- Goal: Measure the **PdM maturity and –strategy**
- Involved countries:
  Belgium, The Netherlands & Germany

- Feedback 2017: **282 companies**
- Feedback 2018: **268 companies**
- Organizers: **Mainnovation & PwC**
- Survey executed by: **Kantar TNS**

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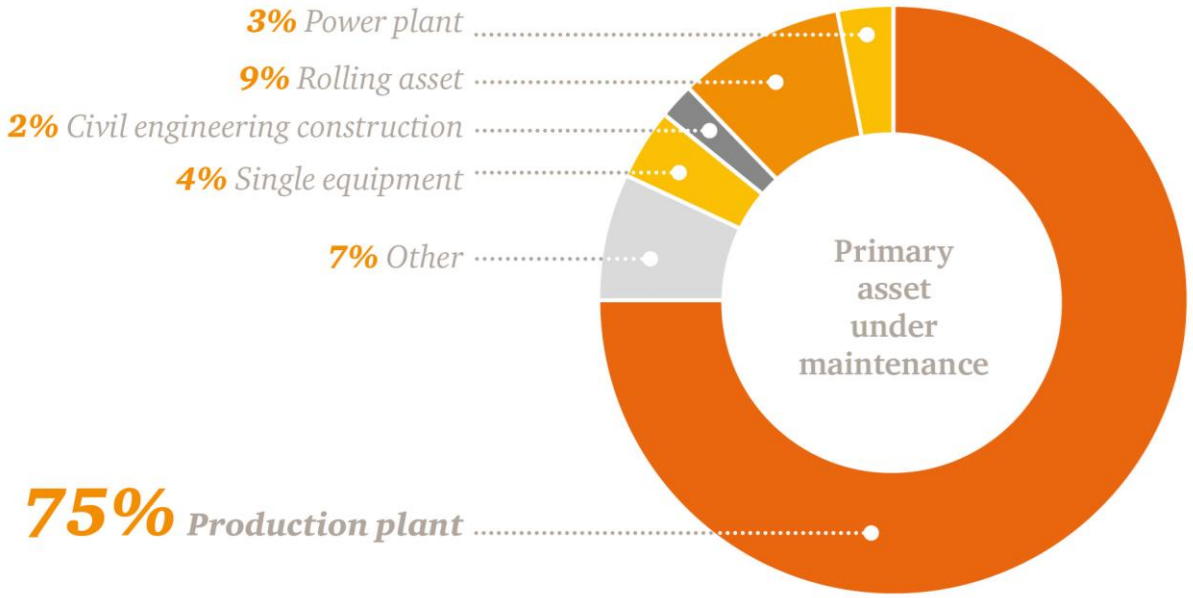
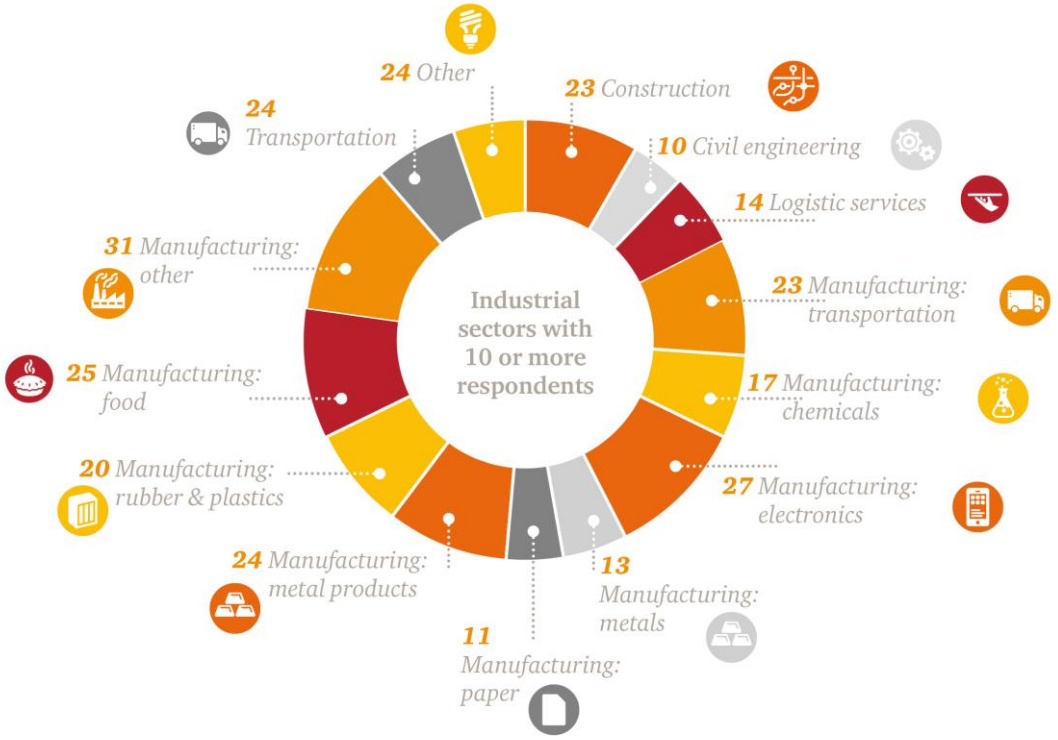
2018: Feedback from 268 companies

Distribution of the involved sectors & industries (all companies > 100 FTE)

Country	Respondents
The Netherlands	102
Germany	95
Belgium	71

The survey was conducted during June and July 2018.





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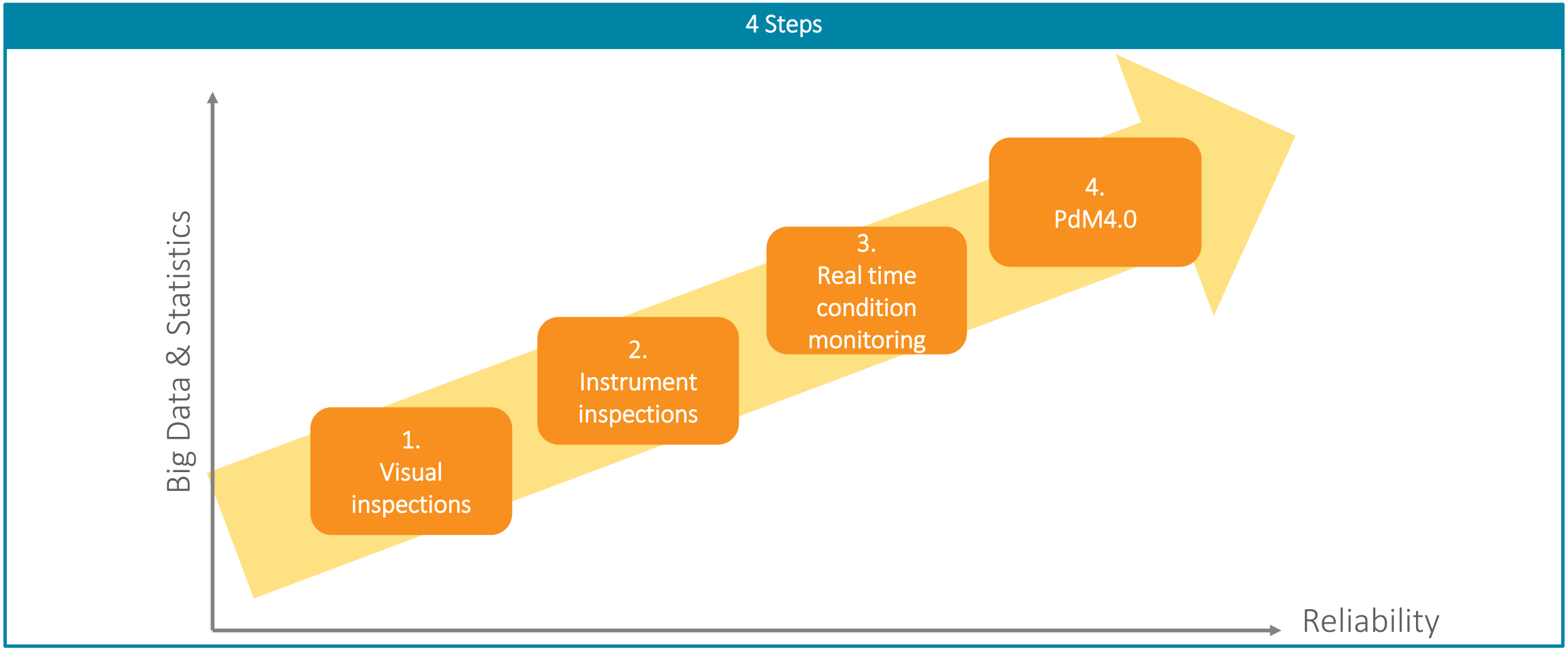

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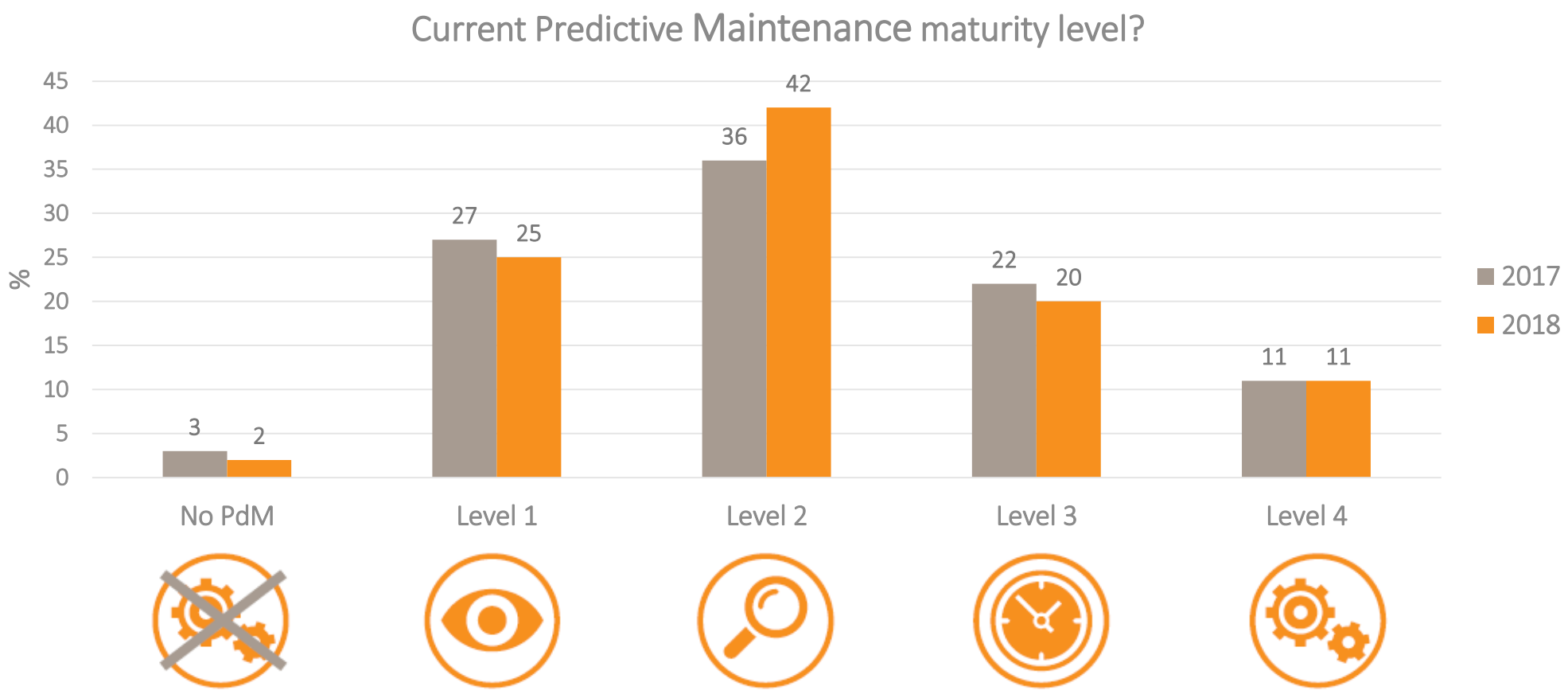
Current Maturity in PdM

Different levels



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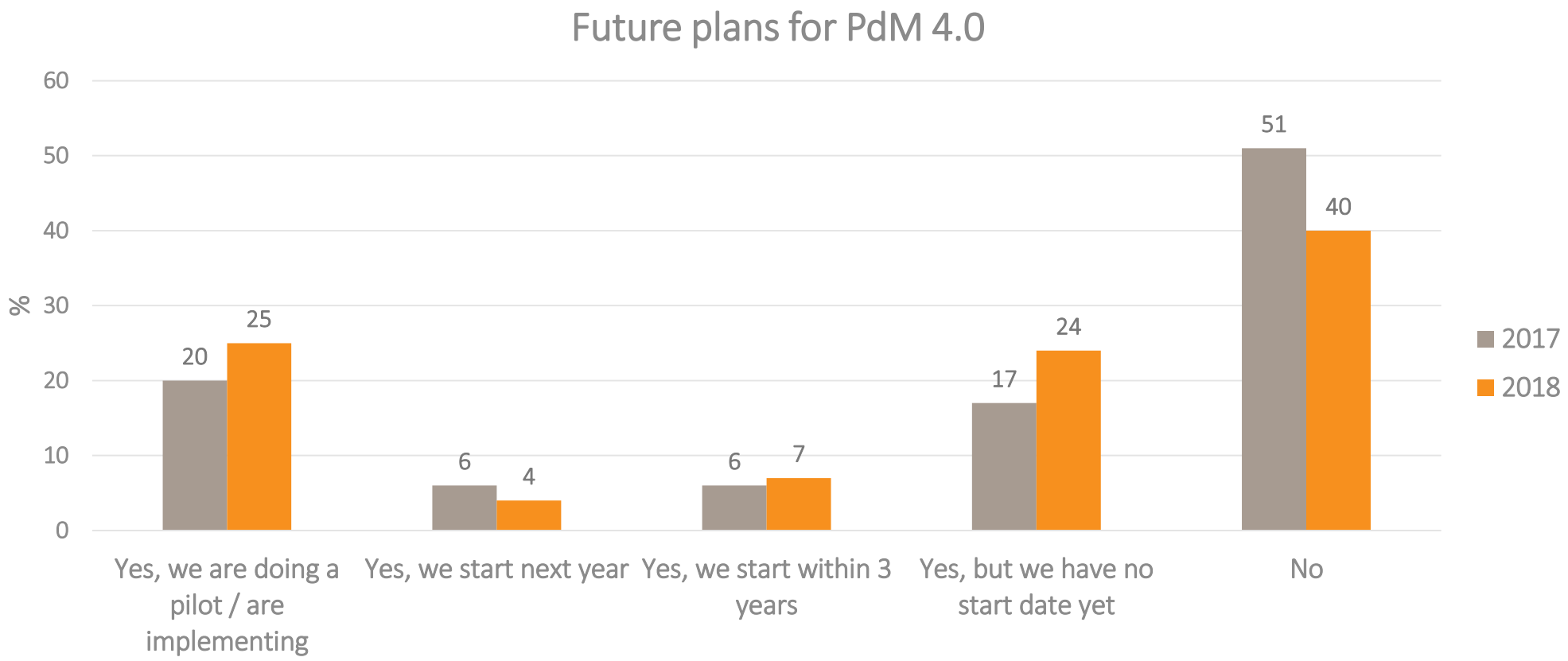
Plans for PdM 4.0

Is PdM 4.0 on the agenda?



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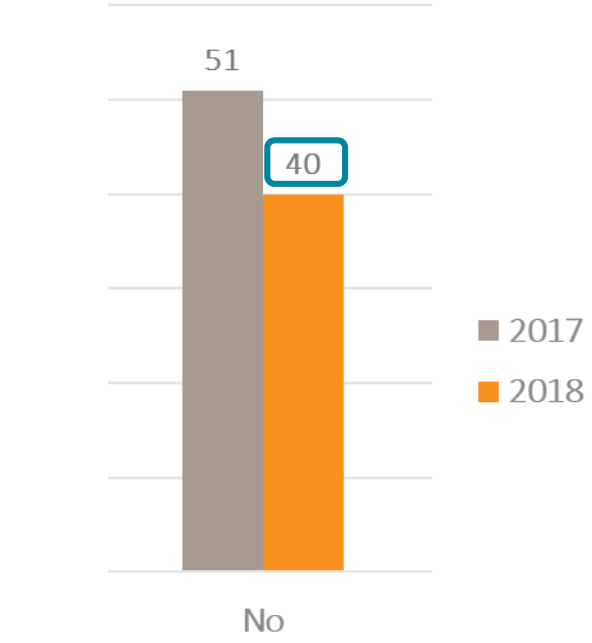
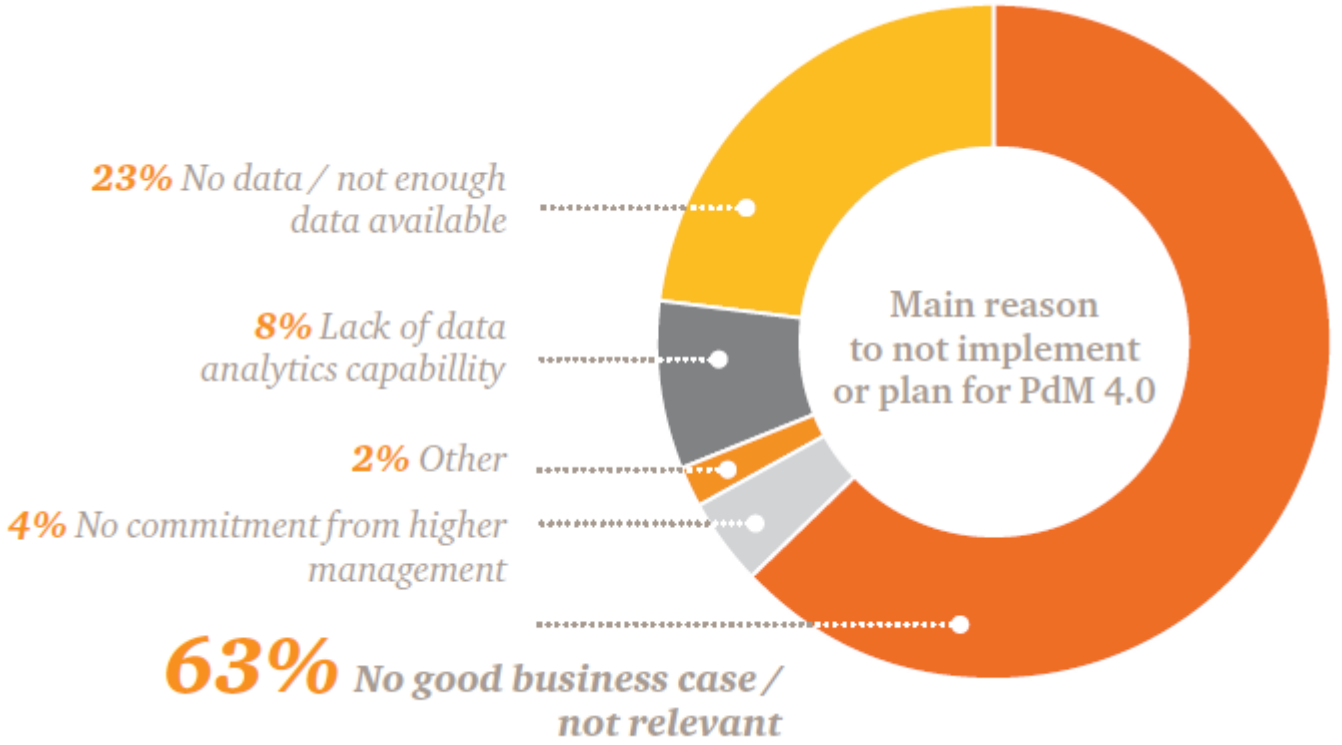
No Future plans for PdM 4.0

Why companies do not want to implement PdM 4.0?





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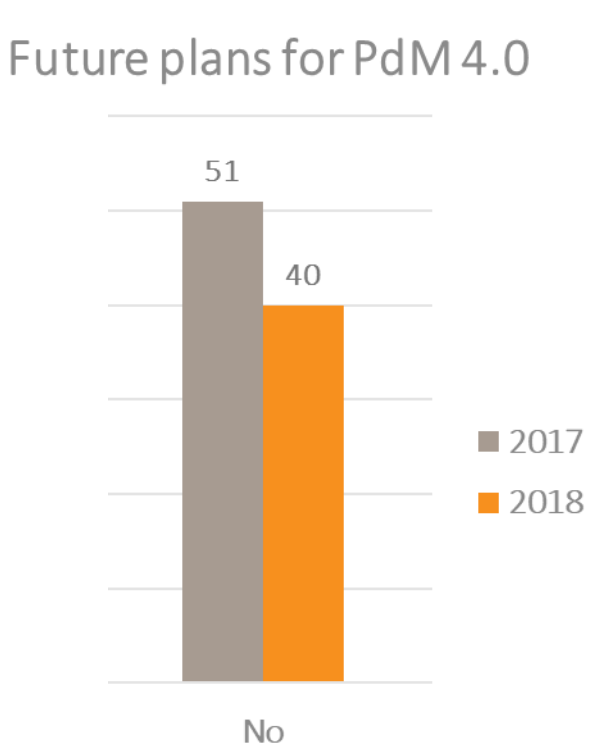
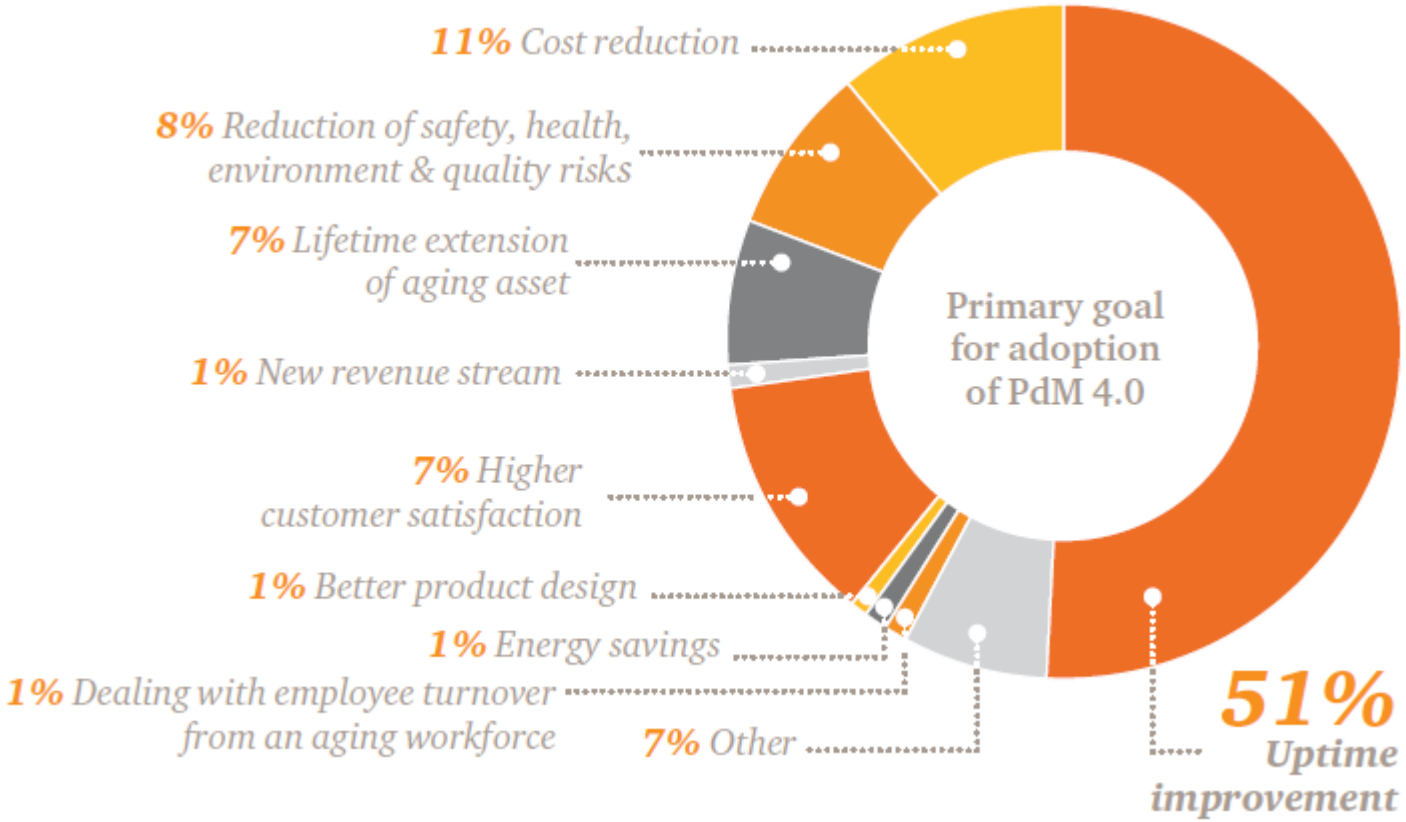
Yes, future plans for PdM 4.0

Companies' goals for adopting PdM 4.0?





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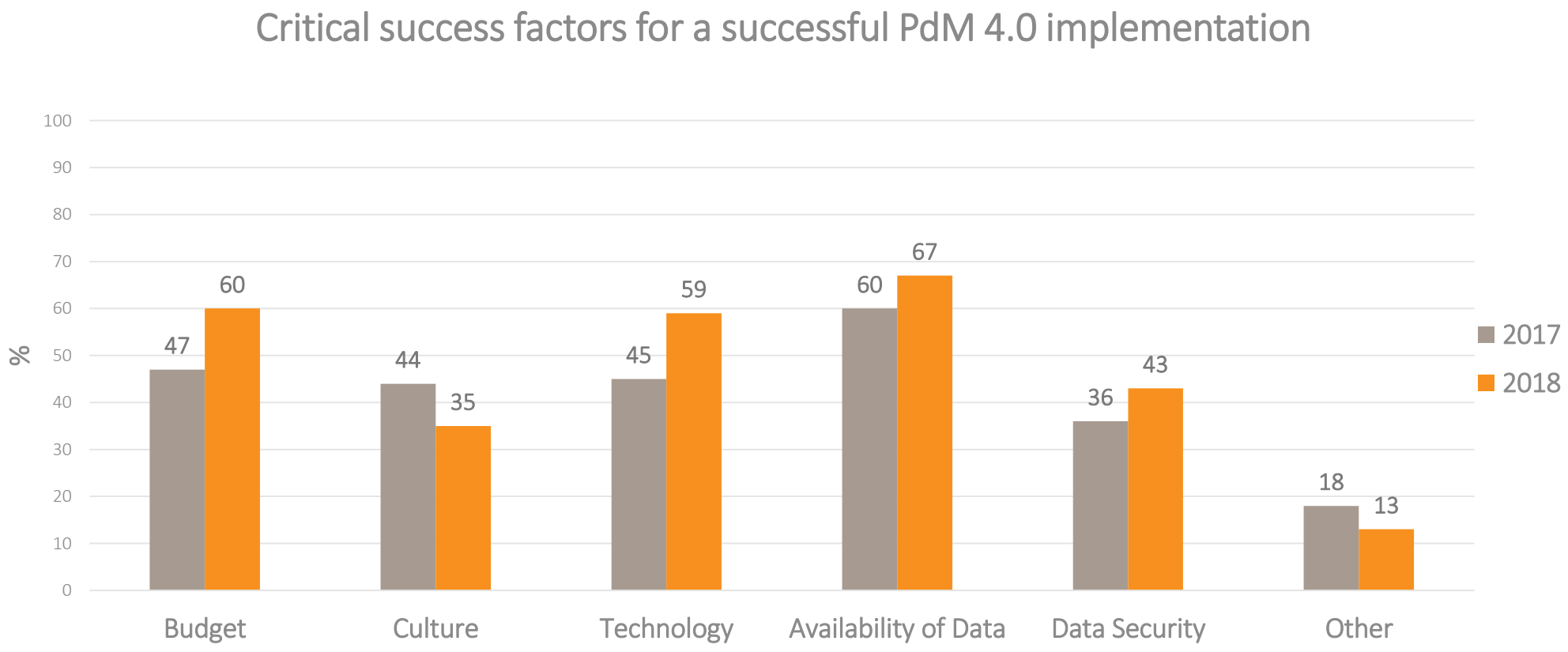
Critical success factors

Success factors?



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PdM Maturity Stages

Capability	1. Visual Inspections	2. Instrument Inspections	3. Real Time Conditions Monitoring	4. PdM4.0
Processes	- periodic inspection (physical) - checklist - paper recording	- periodic inspection (physical) - instruments - digital recording	- continouos inspection (remote) - sensors - digital recording	- continuous inspection (remote) - sensors and other data - digital recording
Content	- paper based condition data - multiple inspection points	- digital condition data - single inspection points	- digital condition data - multiple inspection points	- digital condition data - multiple inspection points - digital environment data - digital maintenance history
Performance Measurement	- visual norm verification - paper based trend analyses - prediction by expert opinion	- automatic norm verification - digital trend analyses - prediction by expert opinion	- automatic norm verification - digital trend analyses - monitoring by CM software	- automatic norm verification - digital trend analyses - prediction by statistical software - advanced decision support
IT	- MS Excel/MS Access	- embedded instrument software	- condition monitoring software - condition database	- condition monitoring software - big data platform - wifi network - statistical software
Organisation	- experienced craftsmen	- trained inspectors	- reliability engineers	- reliability engineers - data scientists

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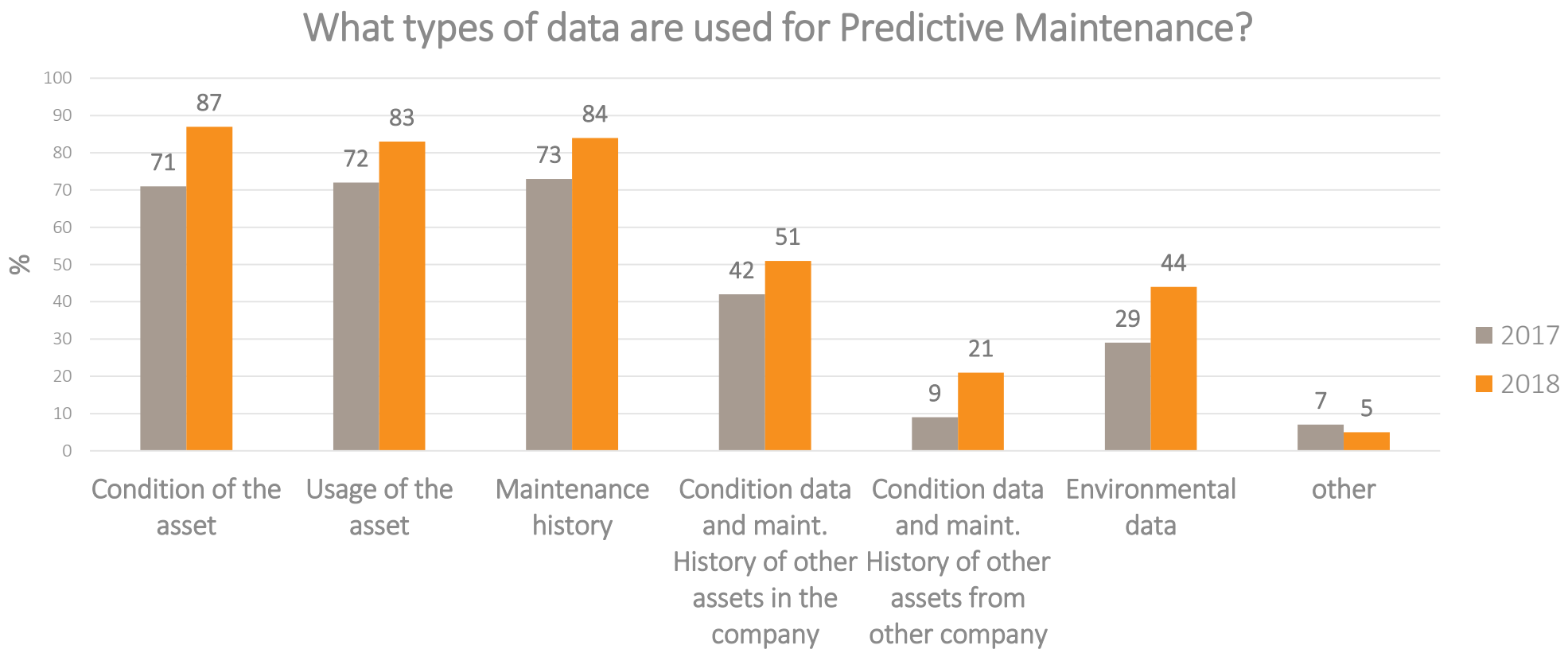
Current use of data for PdM

What data do we use?



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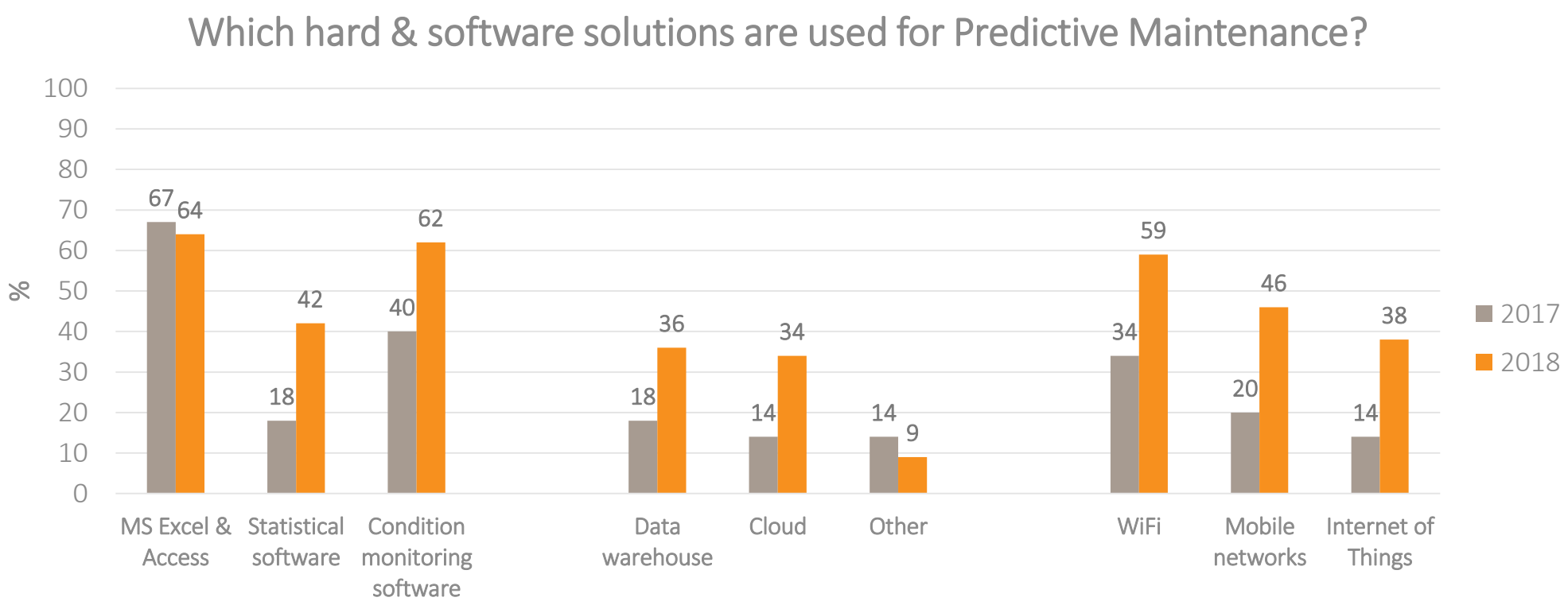
Actual IT solutions for PdM

IT solutions



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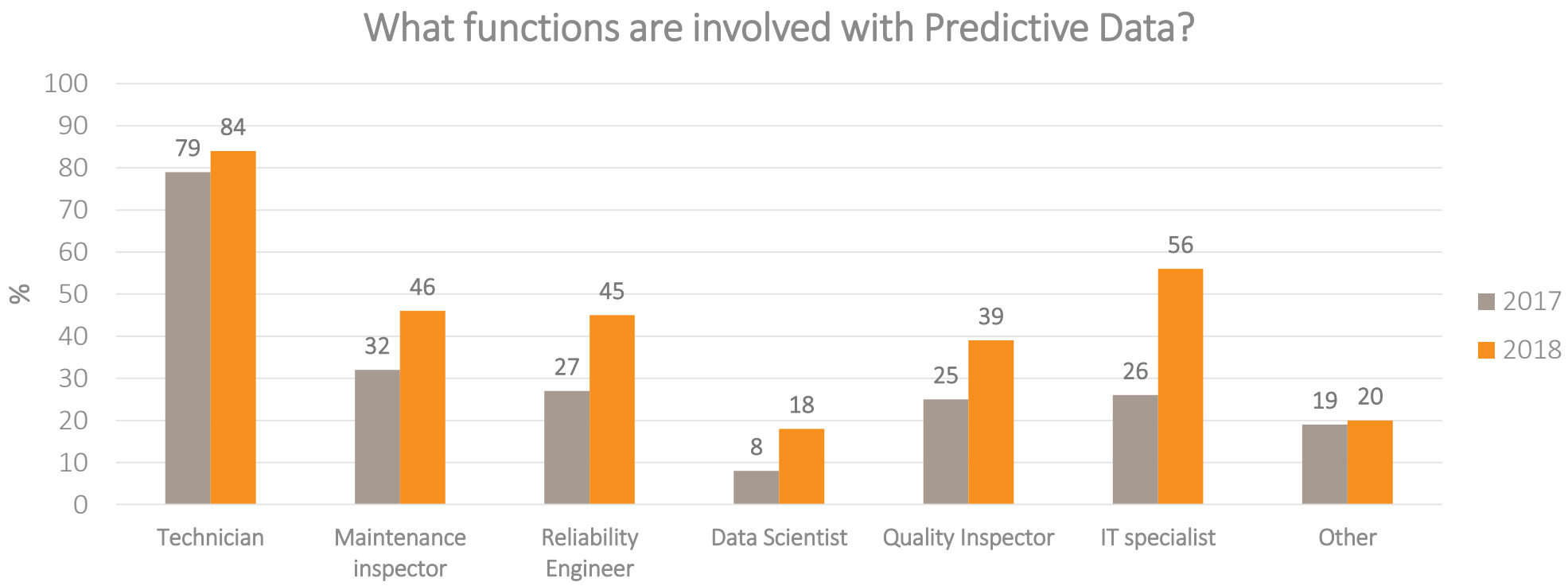
Actual roles involved with PdM

Involved roles?



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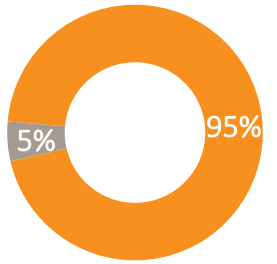
The added value of PdM 4.0

Contribution

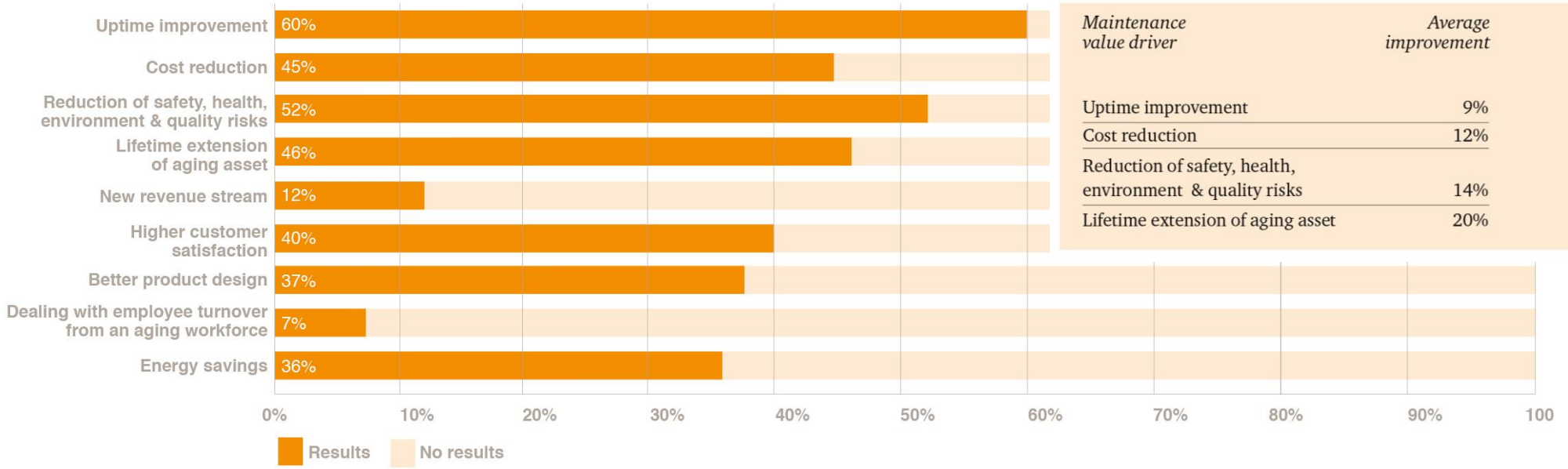
Results of PdM 4.0?



Positive results

No results (yet)

Results from PdM 4.0 (percentage of respondents that report results for each value driver)



Maintenance value driver	*Average improvement*
Uptime improvement	9%
Cost reduction	12%
Reduction of safety, health, environment & quality risks	14%
Lifetime extension of aging asset	20%

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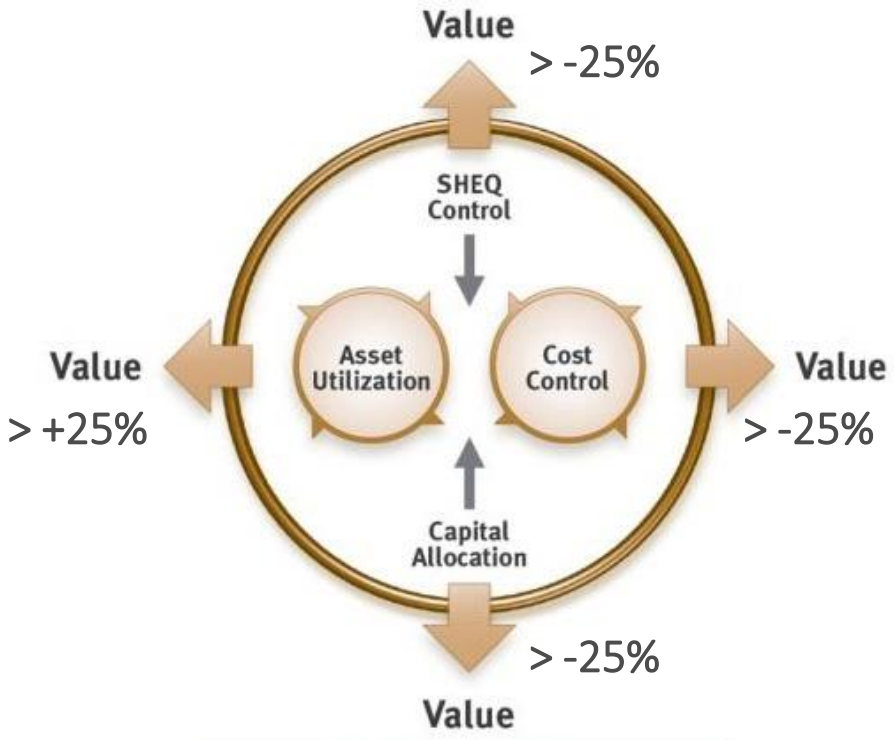
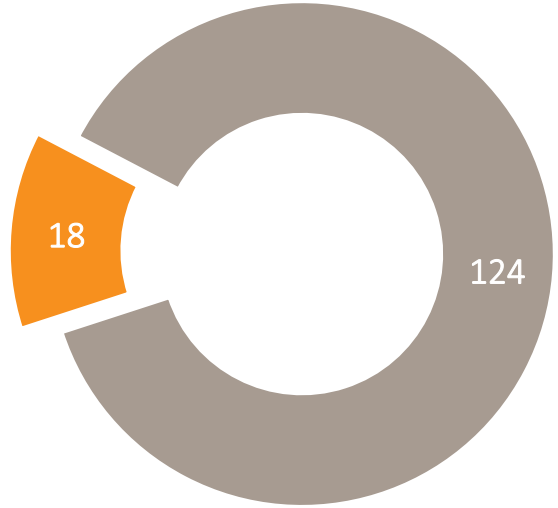
PdM 4.0 Champions

Criteria for a PdM 4.0 Champions



PdM 4.0 Champions

142 PdM 4.0 Companies



PdM 4.0 Champion Others using PdM 4.0

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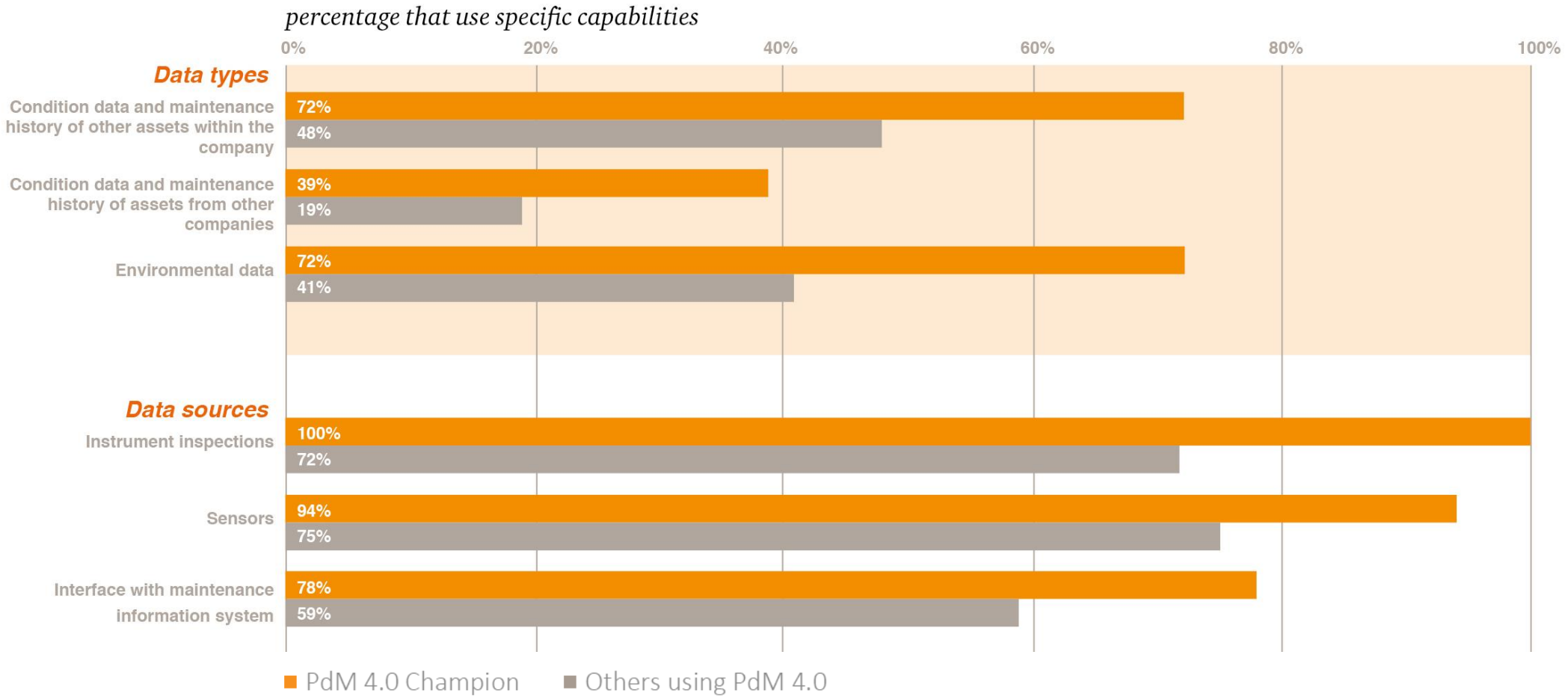
PdM 4.0 champions versus others using PdM 4.0 (1/2)

Use of Data types - Data sources



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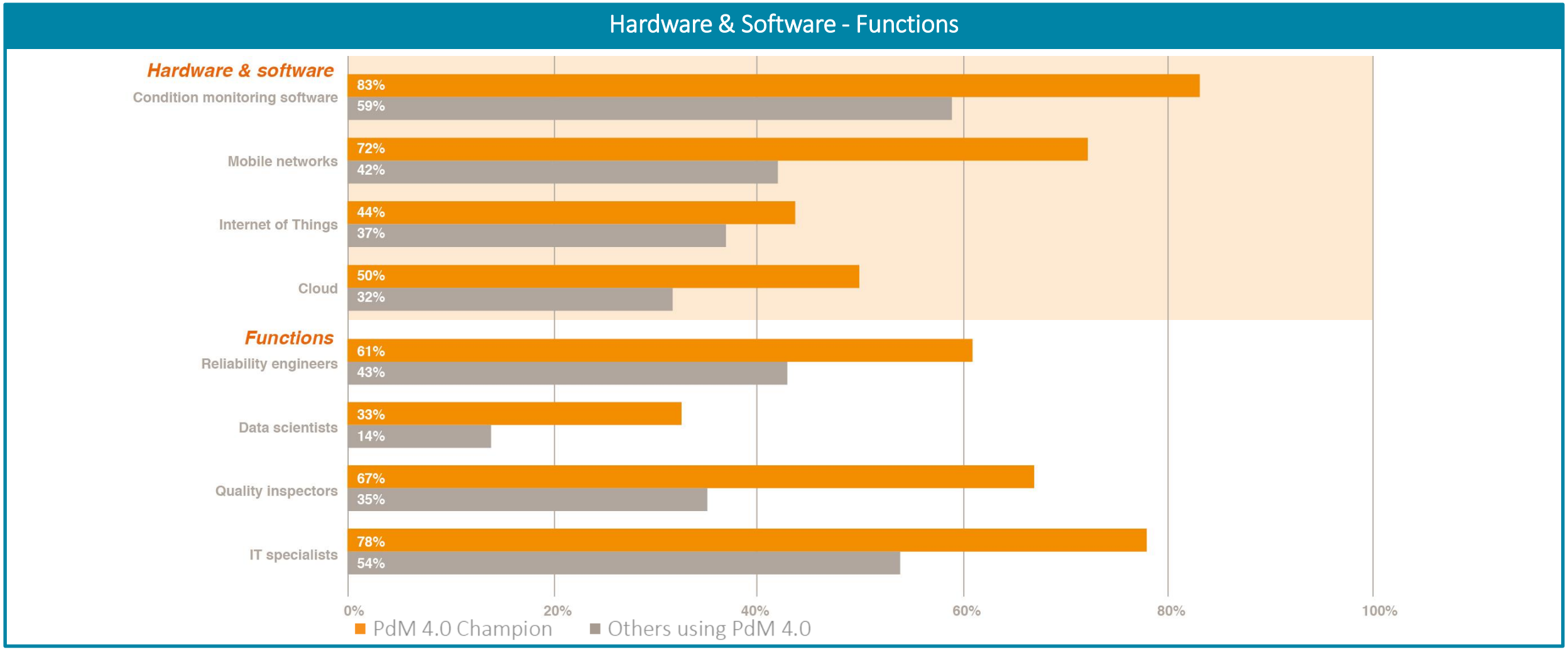
PdM 4.0 champions versus others using PdM 4.0 (2/2)



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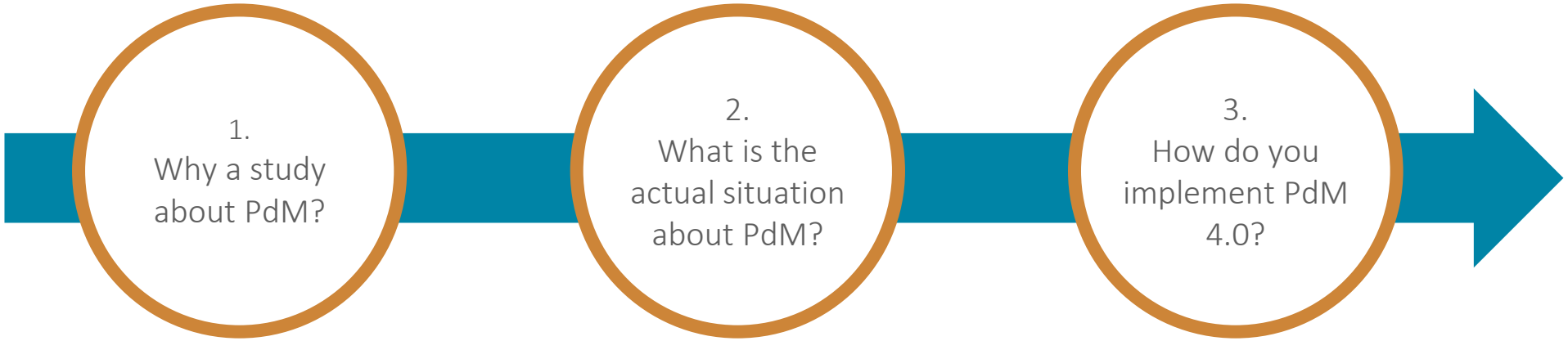

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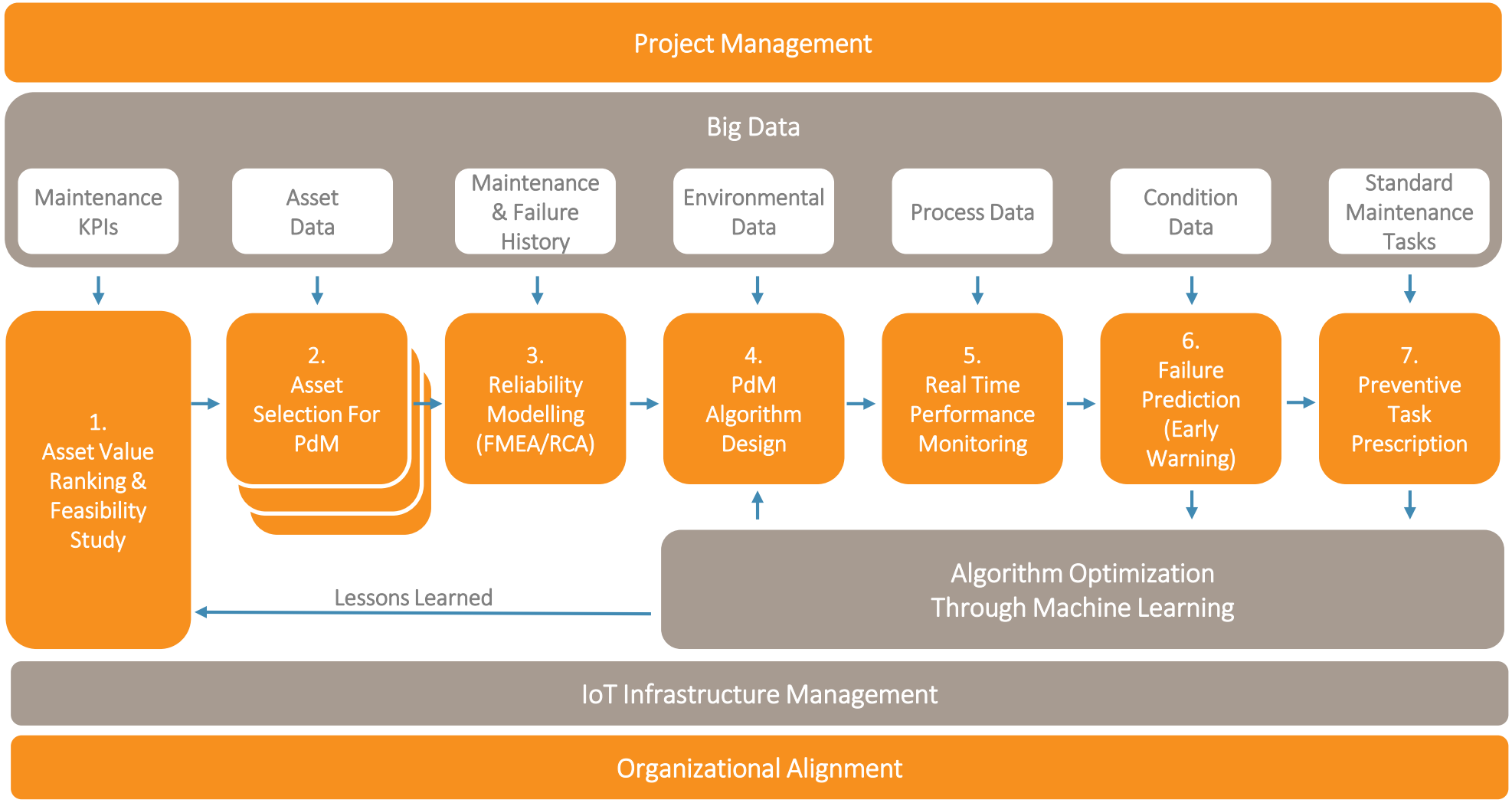
Implementation approach for PdM4.0



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Call To Action

Blueprint for PdM 4.0 success

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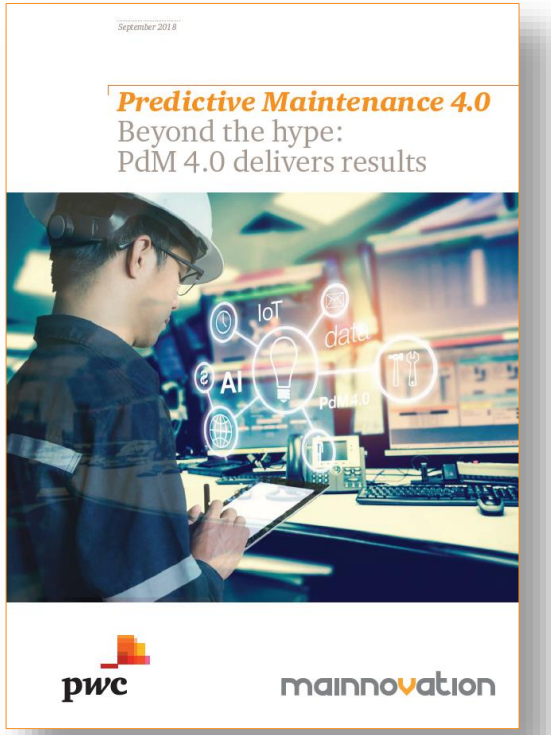
Conclusions

PdM 4.0: Beyond the hype

- Predictive Maintenance is **not a hype**: More and more companies show interest in PdM 4.0
- These companies use **new data sources**, new **hard & software** solutions. New **roles** in maintenance & asset management are created
- **95%** of the companies with experience in PdM 4.0 have tangible **positive results**. On average:
  - + 9% Uptime
  - - 12% OPEX Costs
  - -14% SHEQ Risks
  - +20% Lifetime extension of aging assets
- The **PdM 4.0 Champions** can be used as **role model** to tune your future plans
- **PwC and Mainnovation** can help you in this journey

Free copy of the study?



- Mainnovation: booth C1-3
- PwC: booth A1-1

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