Asset Performance 4.0

AN INITIATIVE OF BEMAS

Session: 1.1.4

Towards a ‘Pareto’ toolset for Reliability Engineering in the digital age

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Key findings

We already have all the data we need

Simple tools help to get the flywheel moving

Getting from 0 to 1 takes more than technology

Agenda

The objective
The context
The solution
The challenge
The results

In god we trust, all others bring data

W. Edwards Deming

The objective

Understand key equipment performance figures

Use data and facts

Reduce number of breakdowns

The context

Fully automated container terminal

Fully electric power supply

High level of data availability

The context

Ship to Shore: Container from ship to emplaned on shore

Shore to Stack: Container moves to stack

Stack to Ship/Barge/Train/Truck: Container from stack to modality

The context

The context – TAM organization

Lean (Kaizen) is the main improvement tool

Root Cause Analysis

Data analysis from CMMS

A. Bad actors (but not specific…)
B. Data analysis for specific cases
C. Weekly breakdown analysis

➕ Improvements

➖ Business implementation

The context

Achieving improvements hindered by lack of:

- Framework
- Tools and guidelines
- Collective memory

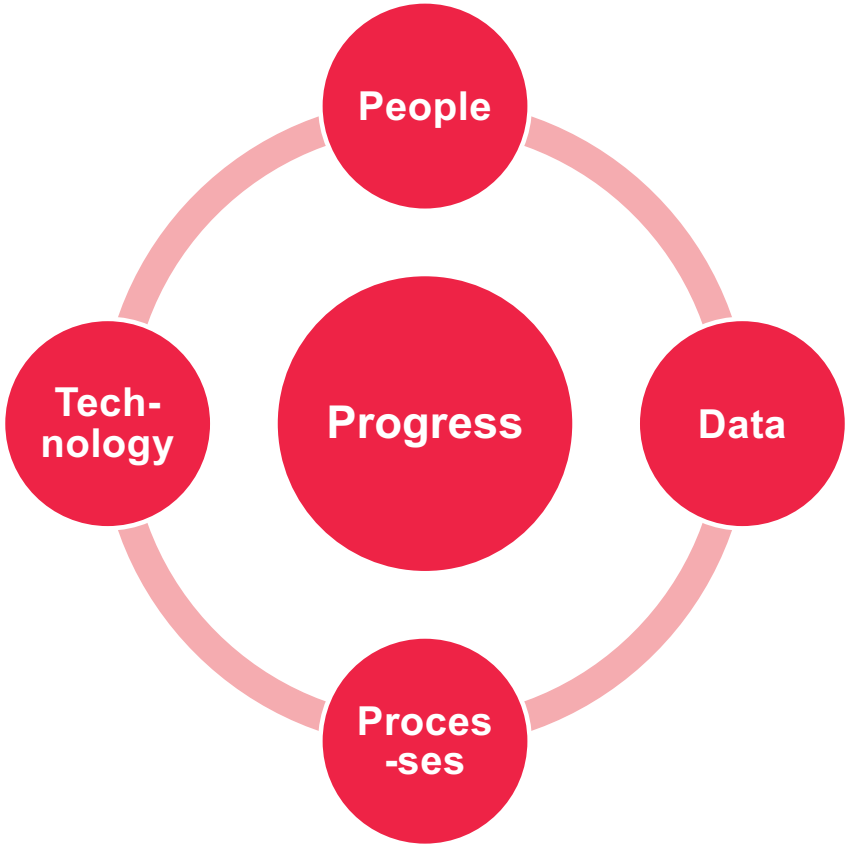
The ‘tactical asset management gap’

Fast changing environment

The solution

A toolset that is:

- Pragmatic
- Easy to use & understand
- Provides helicopter view



The solution

A ’Pareto’-toolset:

80% of results achieved by 20% of effort
Involve the business
Standardize and implement
Then add more complexity

The solution

MVP: toolset + business process

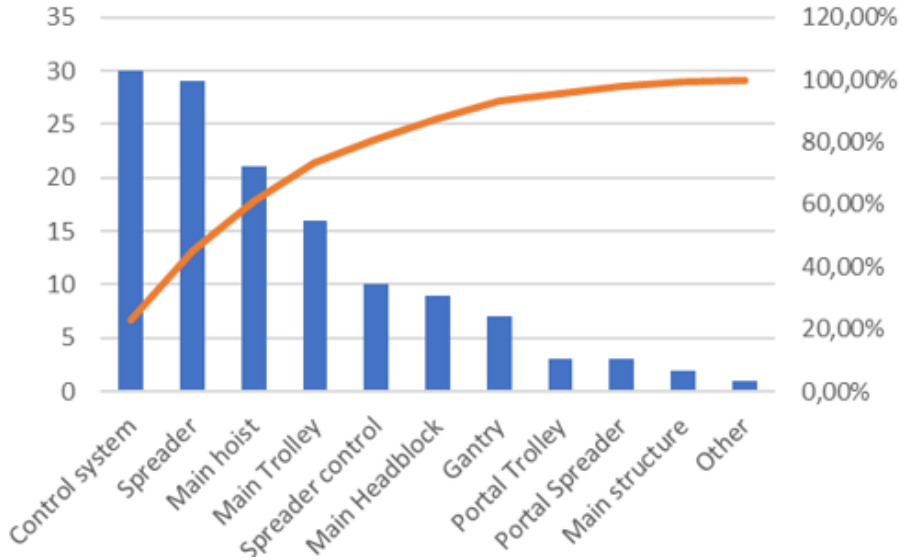
Three-step basic toolset:

1. Identify problematic events
2. Identify trends in system behaviour
3. Analyse repair performance

The solution

1. Problematic events: bad actors

I. Data extraction
II. Sorting
III. Labeling events
IV. Highlight bad actors
V. Discuss & decide
VI. Start RCA process



The solution

Example: positioning sensor

- Stubborn ‘worst actor’ in the fleet
- Event labeling: manual task…
- Fault remedy
  - 80%: reset or re-adjustment
  - 20%: actual breakdown
- What do possible improvement measures look like?

The solution - Trends

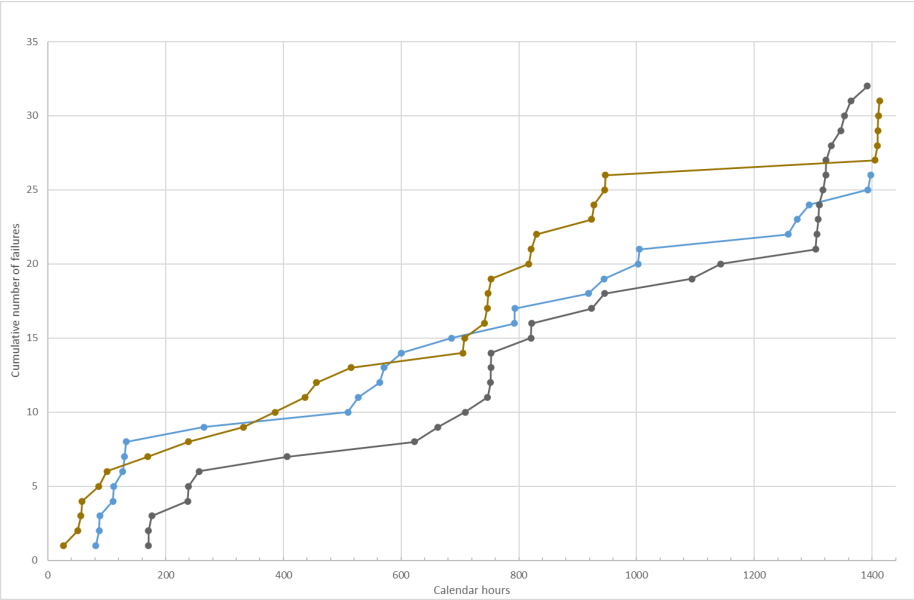
2. Trends in system behaviour

Calendar time on x-axis

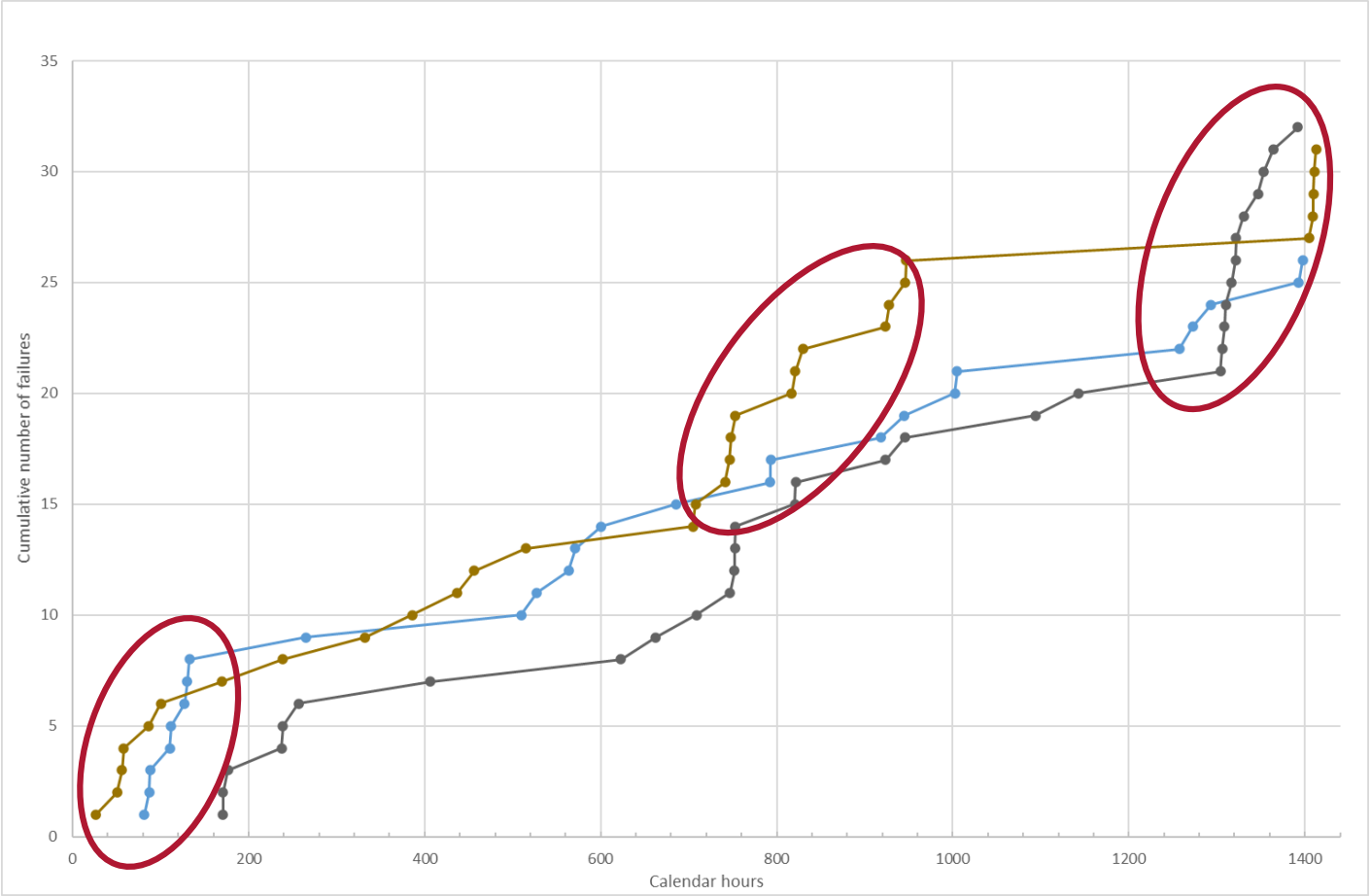
Cumulative number of failures on y-axis

Steep increase: reliability problem

Horizontal lines: high reliability



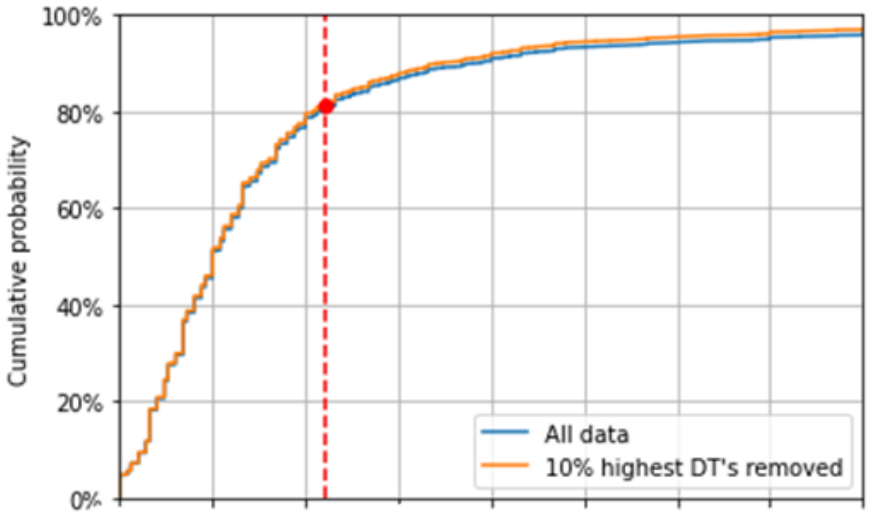
The solution - Trends



The solution

Trend in repair time – 80% of breakdowns solved within target

Next step – is this is a satisfactory target?

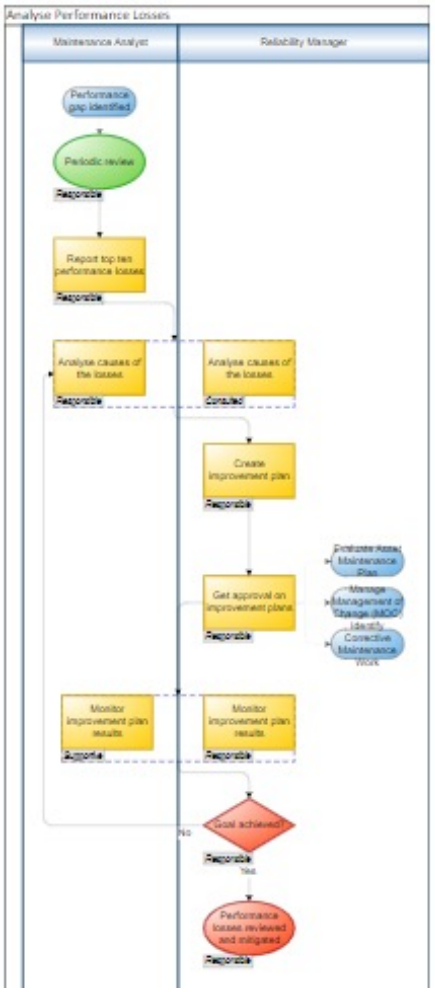


The solution

A tool without a proces is…

The business process tells **what**
The toolset tells **how**

Alignment of **what** and **how**
Communication, trust building
& breaking down silos



The challenges

Data in multiple systems

Migration to new ERP system

Business process standardization

- Global framework
- Local implementation

The results

Improved insights in performance reporting for key operational equipment (cranes and automated vehicles)

Standard approach for

- Problem identification as input for problem solving process
- Model machine

Enhanced understanding of failure bevahiour

Summarizing

Don’t skip the ‘simple’ tools

Getting from ‘’What’’ to ‘’How’’

Create a common language

Add complexity when the business is ready

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