tset Calculated Value

How Software-Driven Insights Enhance Cost Engineering Accuracy and Decision-Making in the Age of Automation

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About Tset

Empowering the traditional manufacturing industry with an innovative and sustainable approach to product cost simulation.

2018
Founding year

100+
Technology experts and mathematicians

1
Single focus: All-in-one cost and CO_2 solution

Our client base

BMW GROUP

HEXAGON

ZF

AGCO
Your Agriculture Company

brose

chiron

ROTAX.

KTM

DMG MORI

SCHWEIZER

RIEDL
AUFZÜGE

VOLTAIRA

STABILUS

tset

Manual calculations are slowing you down

Manual calculations

Slow and error-prone

- Frequent updates and corrections
- High risk of errors and version conflicts

Limited scalability

- Hard to manage complex cost structures.
- Requires repetitive data entry.

Reactive, not predictive

- No instant cost simulations.
- Cannot adjust to price and other cost driver fluctuations.

Automated product costing

Fast and accurate

- Eliminates errors with real-time calculations.
- Automatically updates with the latest data.

Scalable for complexity

- Handles large datasets and multiple variants.
- Centralized data, no duplicate work.

Proactive decision-making

- Enables cost scenario analysis.
- Instant cost visibility for negotiations.

Mathematical challenges

- Classification

  – Which shape resembles a given 3d model / photo / technical drawing?

  – How to resolve an undercut?

  – What are the best-practice process parameters?

- Regression

  – What are the best-practice process parameters?

  – How much scrap material needs to be planned?

- Anomaly detection

  – Is user input reasonable?

  – Is an estimated price reasonable?

  ⟶ Models need to be transparent and robust.

- Transfer machine learning

  – Can models be transferred to different domains?

- Algorithm development (computational geometry)

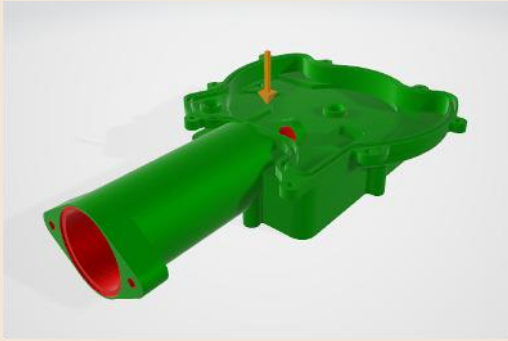# Typical work on anomaly detection
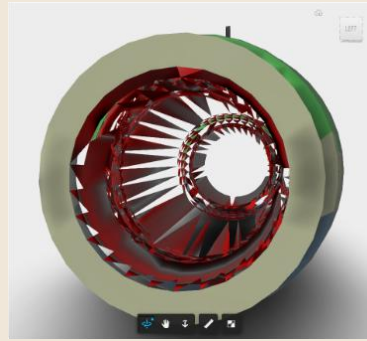
Typical work on anomaly detection
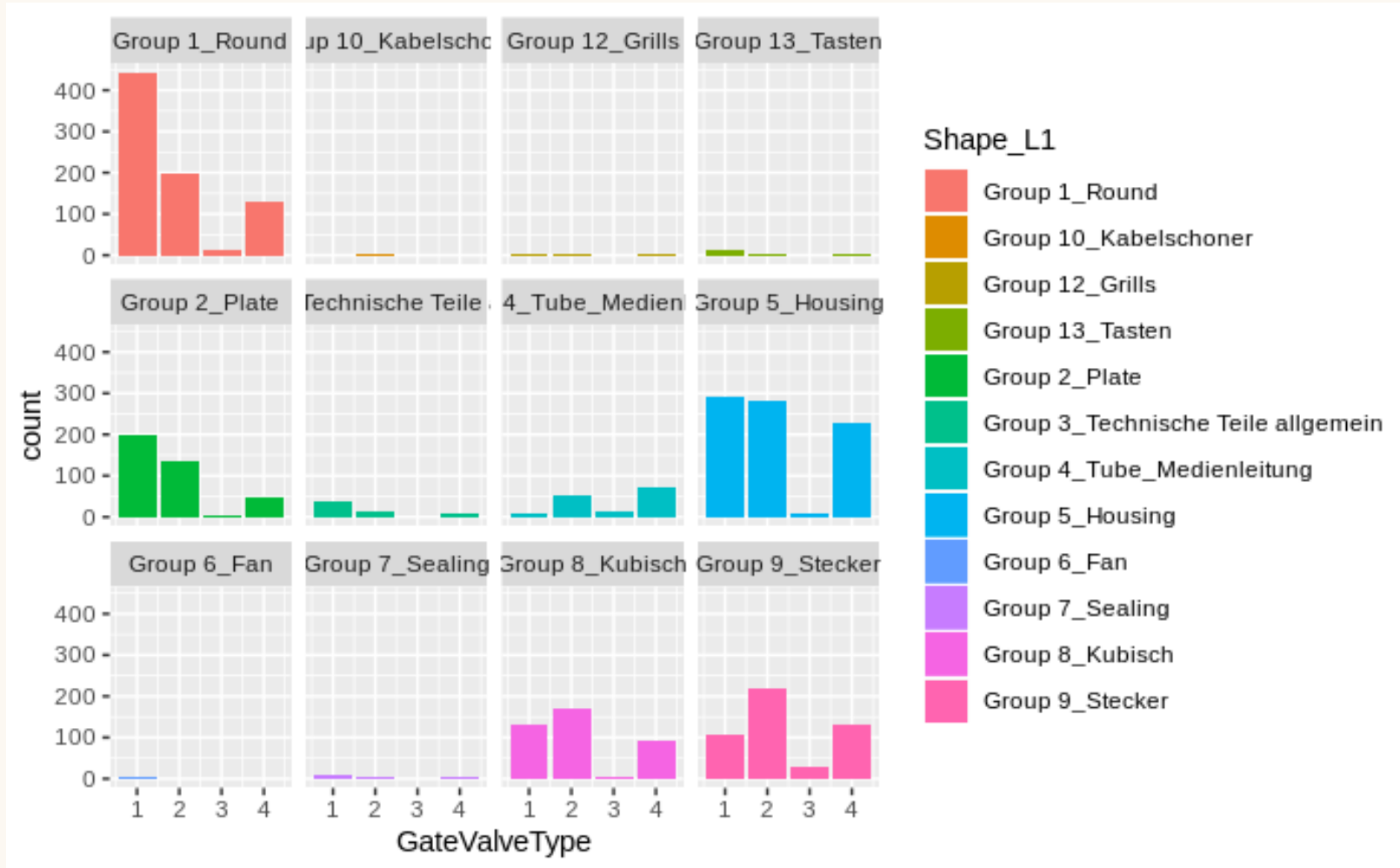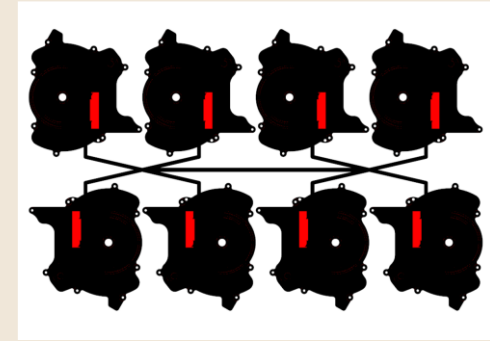
Computational geometry

Solving algorithmic problems such as feature engineering or optimization in a fast and reliable way.

Optimal positioning in mould for high-pressure die casting including identification and classification of all undercuts.

Repair of broken 3d models.

Optimal positioning of part in a multi-cavity mould for high-pressure die casting ensuring homogeneous solidification.

Technologies covered by Tset calculation modules

Casting
- ☑ Sand Casting
- ☑ Core Shooting
- ☑ Aluminum Die Casting
- ☑ Magn. Die Casting
- ☑ Chill Casting
- ☑ Precision Casting
- ☑ Furan resin/large c.

Sheet Metal Forming
- ☑ 2D Cutting & Bending
- ☑ Progressive
- ☑ Transfer

Plastic Injection
- ☑ Single Component
- ☐ Multi Component
- ☑ Micro Injection
- ☑ Silicon Injection
- ☑ Rubber Injection
- ☑ Foaming

Forging
- ☑ Hatebur Forging
- ☑ Die Forging
- ☑ Precision Forging
- ☑ Ring Rolling
- ☑ Cold Extrusion
- ☑ Cotter Key Rolling
- ☑ Rotary Swaging

Tooling[1]
- ☑ Casting
- ☑ Plastic Injection
- ☑ Forging
- ☑ Sintering
- ☑ Sheet Metal Forming

Machining
- ☑ Turning
- ☑ Gearing
- ☑ Grinding
- ☑ Sawing/Shearing
- ☑ Milling Cycle Time Calc.

Others
- ☑ Aluminum Extrusion
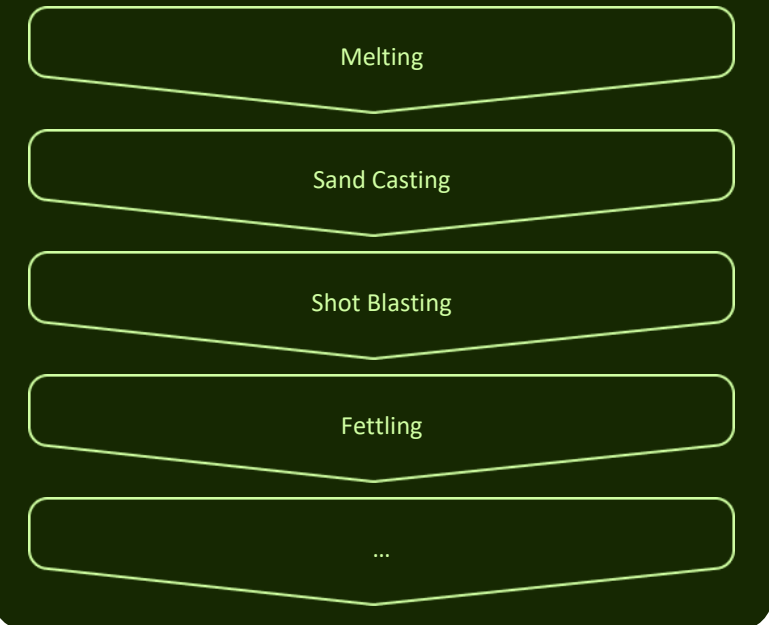- ☑ Sintering
- ☑ Packaging
- ☑ Welding Cycle Time Calc.

Electronics
- ☑ PCB[2]
- ☑ PCBA
- ☑ Electronic Components[2]

Electromechanics
- ☑ Lamination Stacks
- ☑ NdFeB Magnets

Sand Casting Calculated Steps

Melting

Sand Casting

Shot Blasting

Fettling

...

☑ Automated calculation module already available for both cost and CO_2

1. Cost automatically estimated on rough level as part of raw part calculation (e.g., invest, maintenance, life-time) | 2. No CO2 support for PCB and electronic components
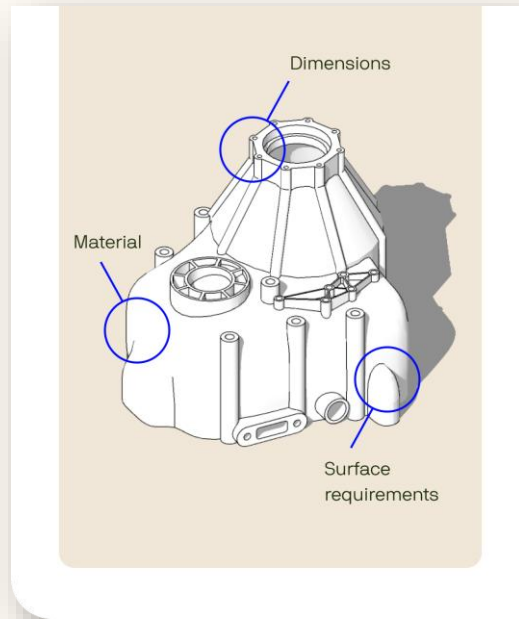
Used technologies

Nearly everybody in the firm knows how to write code

- R, Python
- Java, Kotlin
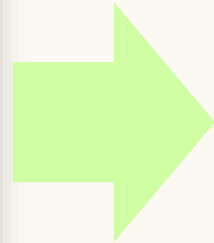- TypeScript (Angular, Vue.js)
- PostgreSQL, MongoDB
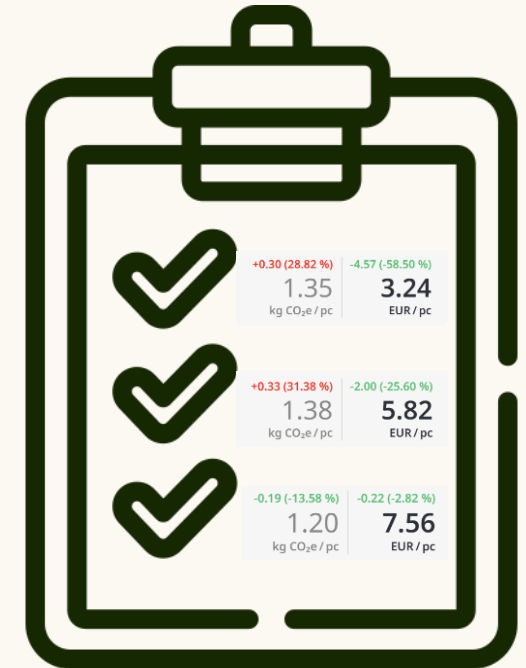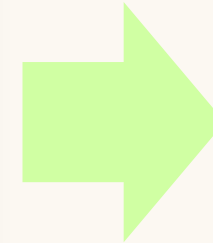
Improvements to automatic cost models

Automatically perform scenario and sensitivity analysis to identify most cost-effective options (region, volume, supplier, etc.) respecting CO2 consideration

1. Specify part

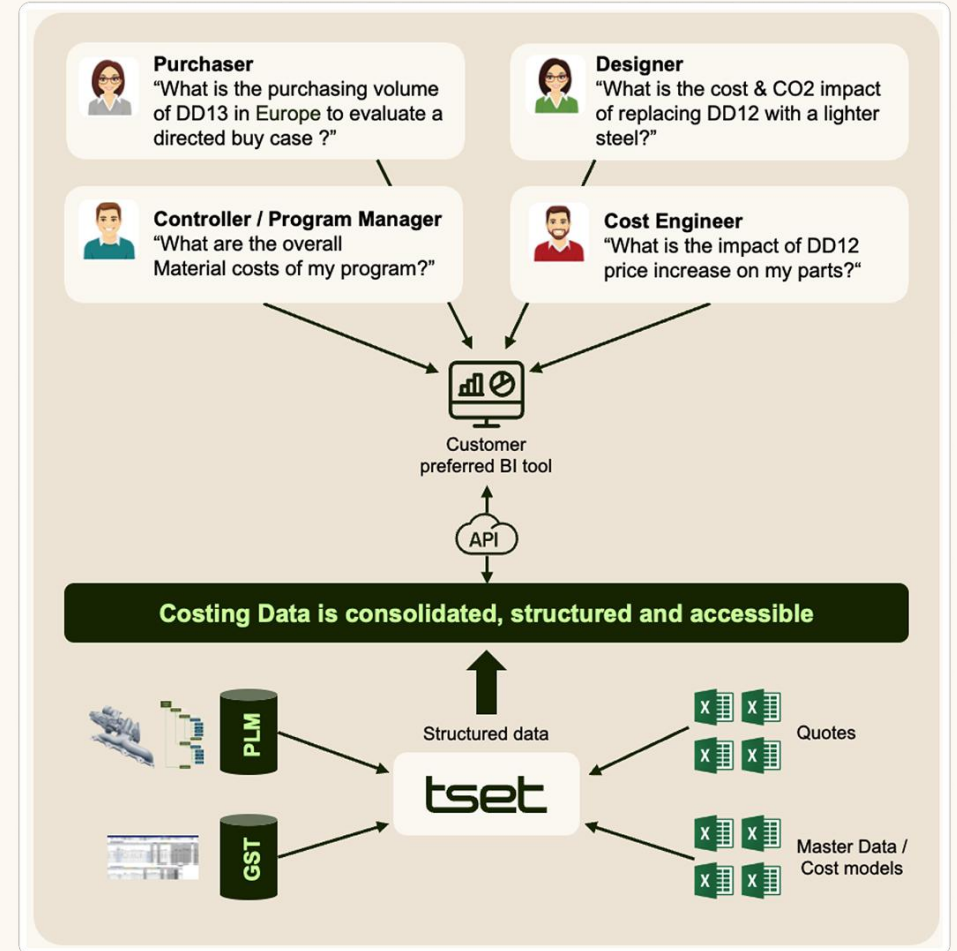2. Tset runs automatically a variety best-fit scenario

3. User can study suggestions and cherry-pick. Optionally re-run second step with new premises

Data Intelligence

Solution

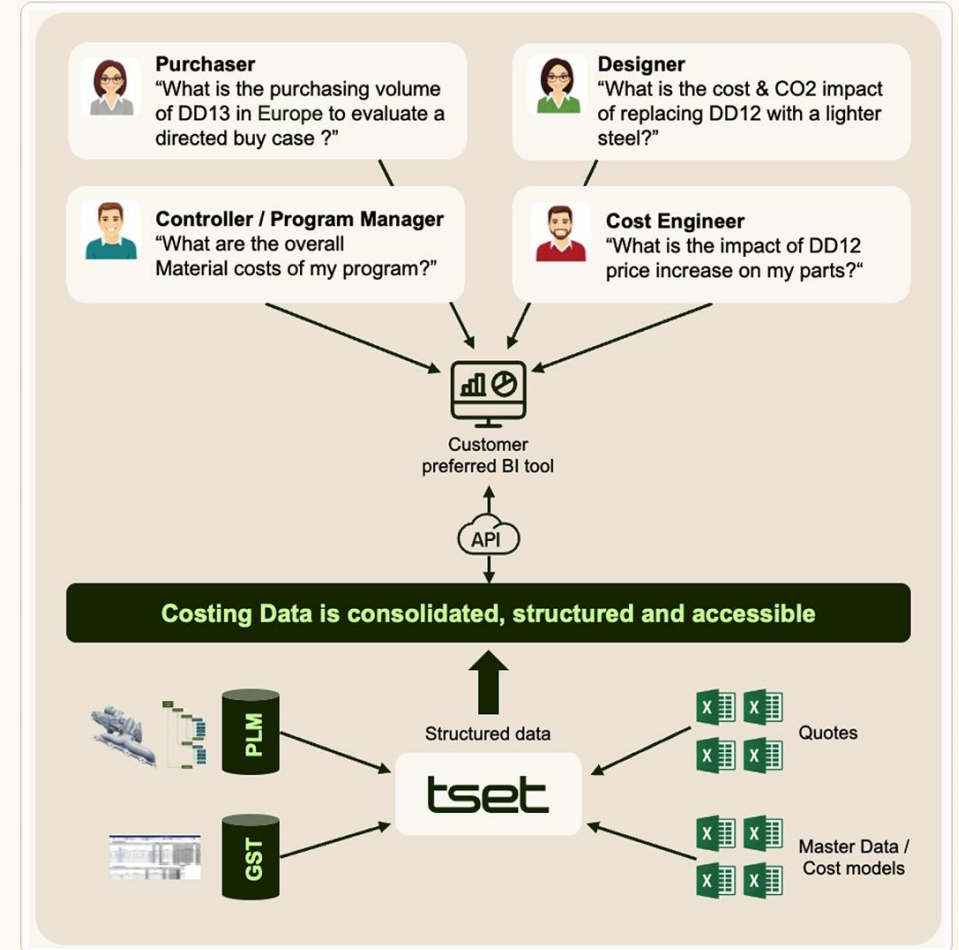Tset is the company-wide platform to enable powerful costing and co2 insights since the data is:

- **connected** by integrating all necessary data into the tset platform (BOM/CAD, all master data (labor rates, overhead rates, actual prices, etc..), supplier quotes, cost engineering targets and estimates
- **structured,** since standardized classifications are applied to parts, raw materials, manufacturing processes, etc. to enable efficient re-use and comparability
- **retrievable,** since industry standard APIs allow to integrate tset into your BI landscape

Purchaser
"What is the purchasing volume of DD13 in Europe to evaluate a directed buy case ?"

Designer
"What is the cost & CO2 impact of replacing DD12 with a lighter steel?"

Controller / Program Manager
"What are the overall Material costs of my program?"

Cost Engineer
"What is the impact of DD12 price increase on my parts?"

Customer preferred BI tool

API

Costing Data is consolidated, structured and accessible

PLM

GST

Structured data

tset

Quotes

Master Data / Cost models

Data Intelligence

Key takeaways

- Integration of key data sources is critical for advanced analytics

- Well designed classification structure is crucial to enable powerful slicing and dicing of the data

- Data access must be easy and intuitive to ensure high acceptance by users

- Reporting demands are very customer specific and require high flexibility