Non-Linear Performance Pricing (NLPP)

The smart price analysis solution

smarter | better | faster
THE SAPHIRION MISSION:
OUR CLIENTS MAKE **OPTIMAL DECISIONS** BASED ON THE MOST PRECISE INSIGHT INTO THEIR DATA.
COMPANY PROFILE

- Founded 2006 in Germany
- Since 2011 located in Zug, Switzerland
- 100% privately owned & self financed
- Team members have 15+ years of experience in management, purchasing consulting, software development & mathematics
NLPP METHOD
NLPP analyzes all kind of product prices according to customer value/benefit/performance and shows you immediately which products or services have a good or bad price/performance ratio.
For an NLPP analysis, the performance / value of the products is specified by the features & characteristics important for the user.

- Number of Cylinders
- Power
- Capacity
- Life time mileage
- Gas mileage
- Weight
- Torque
- Max. Revolution
- Charging Time
- Capacity
- Volume
- Voltage
- Weight
- Life Time
- Volume Efficiency
- Part Design
NLPP uses the magic of mathematics in order to find out how selected product properties influence the price and comes up with a target price formula using those selected properties.

**Targetprice** = 0,345 × **Charging Time**
+ 1,256 × **Capacity**
+ 0,044 × **Life Time**

- **Charging Time**
- **Capacity**
- **Volume**
- **Voltage**
- **Weight**
- **Life Time**
- **Volume Efficiency**
- **Part Design**

Any sufficiently advanced technology is indistinguishable from magic.  
— Arthur C. Clarke, (1917–2008), English science fiction writer
NLPP benchmarks prices by customer value and performance, hence shifts your focus from a “discussion about supplier costs” to a “discussion about customer value”.

**Manufacturer**

Pricing is resource driven and based on cost-calculation (Cost of Production)

**Purchasing**

Seeks for parts with specific functions and properties with the best price performance ratio.

**Cost → Value (NLPP)**
NLPP calculates prices by customer value and performance, hence shifts your focus from a “discussion about price” to a “discussion about customer value”.

Customer: Prices are consistent with the performance and comparable.

Sales: Argues with benefits and uses consistent price-performance ratio.

Value ↔ Price

(NLPP)
Since NLPP evaluates performance changes in monetary terms, your engineering perspective expands to include market and customer information for optimal product design.

**Market Information (NLPP)** ➔ **Engineering (NLPP)** ➔ **Customer Information (NLPP)**

Evaluation of alternatives while maximizing customer value at optimal costs.
NLPP thus connects purchasing, engineering and sales through a uniform method which quickly and accurately assesses the value of prices & costs.

Purchasing
Benchmarks, potential savings, relocation, price consistency

Engineering
Price estimates, similar parts, cause effect relationships

Sales
Value based argumentation, consistent pricing

Which products have potential savings and how big are these?

What is a justified price for a new specification?
NLPP MECHANISM & BACKGROUND
The „magic“ about NLPP is that it finds the best price predicting formula using your data and calculates the target price for every part number which equals the product value.

\[ \varepsilon = p_0 + p_1 x_1 + p_2 x_2 \]
NLPP calculates three price benchmarks from your data and shows which products are more expensive (above benchmark line) or cheaper (below benchmark line) than the three benchmarks.

- **Worst-Practice**: 25% more expensive / 75% cheaper
- **Target**: 50% more expensive / 50% cheaper
- **Best-Practice**: 75% more expensive / 25% cheaper
Regression methods provide reliable results only if their mathematical pre-conditions are fulfilled and the method correctly capture the structure of the input data.

1. It is easy to calculate many different regression models which do not capture the structure of the input data, but still calculate an (unreliable and incorrect) result for each part number.

2. Only correct "performance pricing models" can represent the product preferences (defined by the selection of the performance drivers) and the market situation (part numbers with parameters, quantity and price).

3. The methods used must extract the maximum amount of information from the input data (gain of knowledge) in order to calculate a result model with the best possible predicting power.

Only models that capture the structure of the input data and extract as much information as possible give reliable and usable results.
Depending on your input data NLPP automatically selects the regression method & product properties that gain most information from your input data for the best possible price predicting model.

LPP-LSM (linear, least squares method) is the simplest and most common regression method.

The five additional methods are uniquely available in NLPP.
In 96% of all cases, only one of the five unique NLPP methods can ensure that the information contained in the input data reaches the target price formula correctly and accurately.

Notes

- Basis: Calculation of the best target price formula for 107 data sets from different industries and product families.
- NLPP-QR method (37%) has more share than all LPP methods (31%) together.
- For the LPP cases, LPP-CR has a significant higher share than any other LPP method.
- The standard LPP-LSM method is only the best method in 4% of all cases, in 96% of all cases, one of NLPP's unique advanced calculation methods gives a better predicting model.
A statement like "LPP-LSM may not give a perfect result, but still good enough" leads to the use of unrealistic results and puts operational purchasing at a high risk.

- 96% chance that LPP-LSM models are unrealistic.
- An LPP-LSM would be significantly more unrealistic ($\geq 20,000$ times) in almost all cases than the best NLPP model.
- Results calculated with unrealistic models have random characteristics and weigh the user in false security.
- An unrealistic model uses only a fraction of the information contained in the input data.

Good Input $\rightarrow$ Bad Output

„If all you have is a hammer, everything looks like a nail“
To find potential savings and to calculate price predictions, **NLPP** offers many advantages compared with other methods.

<table>
<thead>
<tr>
<th>Focus</th>
<th>NLPP</th>
<th>Cost analysis / Cost structure analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Focuses at the price in proportion to customer value</td>
<td>Tries to understand the costs of the supplier</td>
</tr>
<tr>
<td>Data</td>
<td>Uses the data treasure of many different parts</td>
<td>Concentrates upon few part numbers</td>
</tr>
<tr>
<td>Time</td>
<td>Results for thousands of part numbers are quickly available and useable</td>
<td>Approach doesn’t scale for many part numbers</td>
</tr>
<tr>
<td>Information</td>
<td>Only uses clearly defined &amp; measureable properties of parts</td>
<td>Many assumptions, estimates, “black box” databases, production know-how</td>
</tr>
<tr>
<td>Robustness</td>
<td>Gives stable and robust results with already few and not perfect data</td>
<td>The value of one parameter can strongly influence the calculated costs / prices</td>
</tr>
</tbody>
</table>
The benefits of **NLPP** are the universal methodology and calculation speed of precise target prices per part number, providing deep insights into complex parts portfolios.

1. **Smarter**
   - Only one method for many use cases rather than many different \( \rightarrow \) Benefits from learning and experience are significantly greater, because nobody becomes expert in many different methods.

2. **Better**
   - Consideration of entire parts portfolios, with clear and precise results per part number \( \rightarrow \) Concrete measures with clearly defined implementation targets.

3. **Faster**
   - **NLPP** results can not be achieved with other methods \( \rightarrow \) **NLPP** potentials can not be found differently \( \rightarrow \) Not using NLPP = lagging behind the possibilities.

4. Many use cases of which "finding savings" is only a simple one \( \rightarrow \) Much bigger and structured knowledge gain for part families than through the "I do it my way in Excel" approach.
CLIENT REFERENCES & USE-CASES
Turned parts are one of the most common commodities and is therefore always in the focus of optimization efforts, nevertheless NLPP analysis can reveal significant potentials.

- Top-100 turned parts, ca. 7 Mio. EUR PV \(\rightarrow\) -11.6% potential savings identified, actions on 30 part numbers which covered 96% of identified savings.

- 180 turned parts of top commodity, ca. 170 Mio. EUR PV \(\rightarrow\) 6 Mio. EUR potential savings \(\rightarrow\) ca. 4.3 Mio. EUR realized by different measures \(\rightarrow\) ca. 1.3 Mio. EUR (30%) of those savings only because of NLPP usage possible.

**Used Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
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<tbody>
<tr>
<td>Projected Area (mm²)</td>
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<tr>
<td>Operating Weight (g)</td>
</tr>
<tr>
<td>Diameter (mm)</td>
</tr>
<tr>
<td>Length (mm)</td>
</tr>
<tr>
<td>Material (textuell)</td>
</tr>
<tr>
<td>Sum Drilling Length (mm)</td>
</tr>
<tr>
<td>Number of Drill-Holes (#)</td>
</tr>
<tr>
<td>Machined Volume (mm³)</td>
</tr>
<tr>
<td>Number of End Faces (#)</td>
</tr>
<tr>
<td>Surface Treatment (yes/no)</td>
</tr>
<tr>
<td>Heated (yes/no)</td>
</tr>
</tbody>
</table>

PV = purchasing volume
The structure of many part groups is unfavorable for a classic and simple analysis approach, in this environment **NLPP** can show its full power.

### Used Parameters

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<tr>
<th>Parameter</th>
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<tbody>
<tr>
<td>Material (textual)</td>
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<tr>
<td>Number of clamping arrangements (#)</td>
</tr>
<tr>
<td>Machined Volume (mm$^3$)</td>
</tr>
<tr>
<td>Number of Tools (#)</td>
</tr>
<tr>
<td>Surface Roughness (R)</td>
</tr>
<tr>
<td>Surfacearea Freeform Surfaces (mm$^2$)</td>
</tr>
<tr>
<td>Number of Axis (#)</td>
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<tr>
<td>Surfacearea (mm$^2$)</td>
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<tr>
<td>Weight (g)</td>
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<tr>
<td>Length (mm)</td>
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<td>Width (mm)</td>
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<td>Height (mm)</td>
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**Milled Part**

- 1976 milled parts, small quantities (3-7), ca. 400 TEUR PV, 13 price drivers (among them delivery time) → 111s calculation time, -21% potential savings identified, target-price formula used for new part estimates → RFQ answers for new parts and calculated price estimates differed by < 2,5%.
Due to the high computing speed, NLPP can deal very well with extensive parts portfolios and creates a very clear picture of the current situation with little expenditure of time.

- 3000 screws, 30 Mio. EUR PV → -10% potential savings identified, distributed over ca. 1000 part numbers, 80% of potential savings realized, total effort 0.5 days.

- Tender of 1600 part numbers (5.3 Mio. EUR PV) with 5 suppliers to find optimal allocation pattern → -22% reduced costs due to smarter part number allocation.

### Used Parameters

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<tbody>
<tr>
<td>Length (mm)</td>
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<tr>
<td>Weight (g)</td>
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<tr>
<td>Diameter (mm)</td>
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<tr>
<td>Tightening Torque (Nm)</td>
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<tr>
<td>Thread Type (textual)</td>
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<tr>
<td>Head Type (textual)</td>
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<tr>
<td>Tip Type (textual)</td>
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<tr>
<td>Surface (textual)</td>
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<tr>
<td>Thread Pitch (mm)</td>
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<tr>
<td>Thread Length (mm)</td>
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<tr>
<td>Surface Length/Area (mm/mm²)</td>
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<tr>
<td>Thread Diameter (mm)</td>
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<tr>
<td>Thread Tolerance</td>
</tr>
<tr>
<td>Hardness</td>
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<tr>
<td>Drive Type (textual)</td>
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In principle, every product group is suitable for an NLPP analysis and the selection should be based on the objective pursued.

- At least 20-25 part numbers with different properties: With less variance, the amount of information about the parts is too small, so that probably no correlations can be found.
- Analyzed purchasing volume (PV) should be based on the effort of data collection: In order to identify enough potential savings, parts portfolios starting from 0.5 to 1 million EUR PV make sense.
- The addressable PV should be about 40% -50% of the analyzed PV targeting the planned implementation time. With this portion, a meaningful amount of identified HotSpots, which can be implemented, is given.
ANALYSIS WORKFLOW
The NLPP workflow consists of a few simple steps. As result NLPP presents new evidence from your pricing and product information.

1. **Compile** the properties of your products which you expect to influence the price in an XLS sheet.

2. **Import** your data into NLPP and select the product properties NLPP should use for calculation.

3. **NLPP calculates** the best formula in a couple of seconds and uses it to calculate target prices for all records.

4. Use **NLPP's analysis** functions to drill down into your data and see what you've been missing.

5. **Use** the result to develop and effectively implement your purchasing strategy, negotiation tactics etc.
With the Saphirion “Data extraction service”, we take care about the first step, so that your data quickly becomes an immediately usable NLPP model.
From your 3D CAD data you can already read out a lot of information and link it to other data from which NLPP calculates a target price formula.

3D CAD Models → CSV Part Data File
You automatically classify your CAD data into parts groups and extract all kind of property data into a CSV file.

Part Data → Target Price Formula
You import the part data into NLPP and calculate any number of target price formulas.

Target Price Formula → IT
You use your approved target price formulas in other IT systems.
PRODUCT OVERVIEW

smarter | better | faster
Your NLPP license consists of software, training and documentation. On top it covers unlimited personal access to our team of experts for support and consulting.
From data import to the result, you will be guided through our **NLPP workflow** and receive hints and automatic help to get the best possible **NLPP result**.

**Cluster**

**Part Number Records**

**NLPP Workflow**
With the help of the interactive evaluation and visualization capabilities of NLPP, you will quickly find all HotSpots that should be subjected to a thorough review.
**NLPP** results give you an information advantage, as inconsistent pricing between products as well as portfolio benchmarks are revealed. This information you can easily use in negotiations.

You are no longer trying to convince the supplier to give you a lower price, instead you...

🔍 ...simply point out hotspots with inconsistent prices.
🔍 ...ask the supplier to explain to you why a part price is that high compared to other parts with different performance.
🔍 ...lead the supplier to those hot-spots you want to discuss.
🔍 ...know upfront what is a worse, realistic or best practice price for every new or existing part.
IMPLEMENTING NLPP
NLPP is accepted most quickly when it is applied and the findings are used promptly to make success visible.

<table>
<thead>
<tr>
<th>Options</th>
<th>Expert-Team</th>
<th>Key-User</th>
<th>Field-Roll-Out</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pro</strong></td>
<td>1..N NLPP users perform analyzes for colleagues as an internal service</td>
<td>Per Commodity / Departement 1..N NLPP users</td>
<td>1..N NLPP users as part of the corporate strategy &quot;Digital Transformation&quot;</td>
</tr>
<tr>
<td><strong>Contra</strong></td>
<td>- Results of the expert teams not buyers</td>
<td>- More resistance at the beginning</td>
<td>- Strategic management decision necessary</td>
</tr>
<tr>
<td></td>
<td>- Rejection is simplified</td>
<td>- More demanding leadership</td>
<td>- Impact on target systems and communication likely</td>
</tr>
<tr>
<td></td>
<td>- Group separation “we / they”</td>
<td>- “Wrong” key users prove that approach does not work</td>
<td>- Perseverance necessary</td>
</tr>
<tr>
<td></td>
<td>- Scaling difficult</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Fast Know-How gain</td>
<td>+ Broad Know-How gain</td>
<td>+ Broad Know-How gain</td>
</tr>
<tr>
<td></td>
<td>+ Easy to organize</td>
<td>+ Easy to organize</td>
<td>+ Sustainable “Digital Transformation”</td>
</tr>
<tr>
<td></td>
<td>+ Convenient for all “not involved”</td>
<td>+ Easier “to cross the chasm”</td>
<td>+ Motivating employees</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+ Biggest ROI</td>
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