



Automated production cost prediction using AI

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How artificial intelligence accelerates cost calculation and production planning

Quotes that take too long to send out. Incorrect cost prices. Customers who go elsewhere. The bar is set high in the manufacturing industry, and any error in costing has an impact on your profitability and planning. Yet estimating production times remains one of the most difficult steps in the production process.

This is even truer in the machining industry, where every product is unique and every finish is different. Many companies still rely on the knowledge of a few experienced employees to prepare quotations. But what if that knowledge is lost? Or if the workload becomes too high? Today, artificial intelligence offers an alternative that combines speed and accuracy.

The limitations of traditional cost calculation

For large or complex orders, where every minute counts, production times are often still painstakingly worked out. In the Belgian manufacturing sector, where smaller production runs and

customisation are the norm, this is rarely feasible: such calculations are time-consuming and rely heavily on experience, increasing the risk of inaccuracies.

Systems are therefore needed that will automatically learn from historical data and supplement or replace human estimates with objective predictions.

AI brings new possibilities

In recent years, more and more commercial solutions have emerged that use artificial intelligence to automatically predict production times and cost prices. Conventional costing is based on a process analysis with features, operations and actions; by contrast, AI learns to make direct connections between product characteristics and time or cost parameters.

Some typical patterns that AI models automatically recognise:

- The more holes a product has, the longer the drilling operations take
- The tighter the tolerances, the greater the likelihood of additional reworking
- The more complex the geometry, the longer the setup and machining times

From process analysis to pattern recognition

The principle behind this approach isn't new. Sirris investigated the topic as early as 2010 in a collective VLAIO project with a group of companies. However, the method is now making a real breakthrough due to three recent developments:

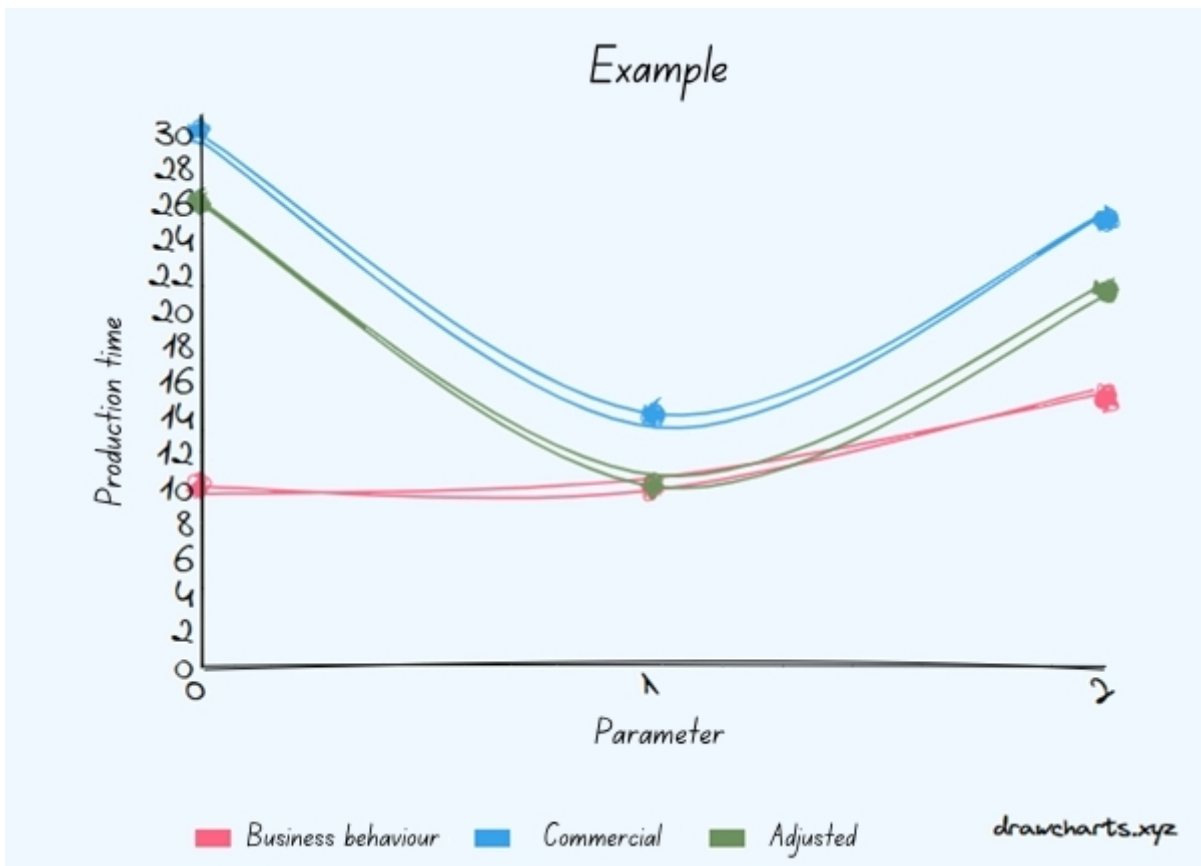
1. **More and better data:** digitisation means that production times and machine status are automatically recorded. Companies finally have the data needed to train reliable models.
2. **Stronger algorithms:** recent software developments have increased the accuracy and robustness of predictions, even for complex products.
3. **Accessible solutions:** international players are launching user-friendly platforms, meaning also SMEs can pick up this technology.

Real-life examples from the manufacturing industry

One of the pioneers in this field is the German company **Spanflug**. Two years ago, it presented its platform at the EMO trade fair in Hannover. Its AI model, trained on data from multiple manufacturing companies, uses a 3D model (step file), a 2D drawing and a few parameters such as material and batch size to calculate an accurate cost and time estimate in a matter of seconds.

The system automatically recognises geometric characteristics through feature recognition, a technique also used in CAM packages. At the same time, OCR (optical character recognition) reads tolerances and material codes from PDF drawings. This data is combined to draw up an estimate that's comparable to that of an experienced costing manager, but fully automated.

Other providers, such as the Swiss company **Imnoo**, are working with a similar concept in which AI is directly integrated into the costing process.



Limitations of commercial models

However, commercial solutions have a drawback: they are trained on market data and therefore provide an average cost curve. While this makes them quick to deploy, they are not necessarily accurate for every company.

Manufacturers that operate more efficiently than the market average will overestimate their costs, while those that produce more slowly may set them too low. Some systems offer correction factors, but these merely shift the formula, they don't take all the specifics of a company into account.

Training your own model on your own data

Manufacturers that want maximum accuracy can develop their own model based on company data. All the tools for this already exist:

- **OCR** for automatically reading drawings
- **Feature recognition** from 3D models
- **Data techniques** to identify correlations and train AI models

The key lies in the data itself. Companies that systematically record their production parameters and actual machine times can quickly build a model that accurately reflects their processes.

With artificial intelligence they can get faster, more consistent and more objective cost and time estimates. Using data from CAD/CAM systems, drawings and production processes, companies are able to accelerate and improve their cost calculation process. Companies that can train their

own models will gain a lasting competitive edge.

Conclusion

Automatic production cost forecasting is no longer something for the distant future. With the right data, tools and expertise, any manufacturing company can take steps towards automated cost calculation today. As well as saving time, this will strengthen its competitive position in an increasingly fast-moving market.

Sirris and Vives continue building practical solutions

In the [VLAIO-COOCK+ "4.0 Maturity Acceleration" project](#), Sirris and Vives University of Applied Sciences are working together on methods for predicting and optimising machining processes. Estimating production times using AI is an important part of this.

[Discover the 4.0 Maturity Acceleration Project](#)



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