The Ultimate Guide to Dynamic Pricing 2024

For Omni-Channel Retailers

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What is dynamic pricing?

Dynamic pricing is a method wherein retailers continuously and (semi-)automatically adjust the prices of their products to match market demand in order to increase sales opportunities and optimize profits. In other words, variable prices are used instead of fixed prices.

In order to gage the optimal price for a given product, pricing solution software evaluates relevant factors like demand, inventory and competitors' prices. Based on the retailer's pricing strategy, the algorithm adjusts product prices to increase and/or maximize sales and profits.

Static VS. Dynamic Pricing

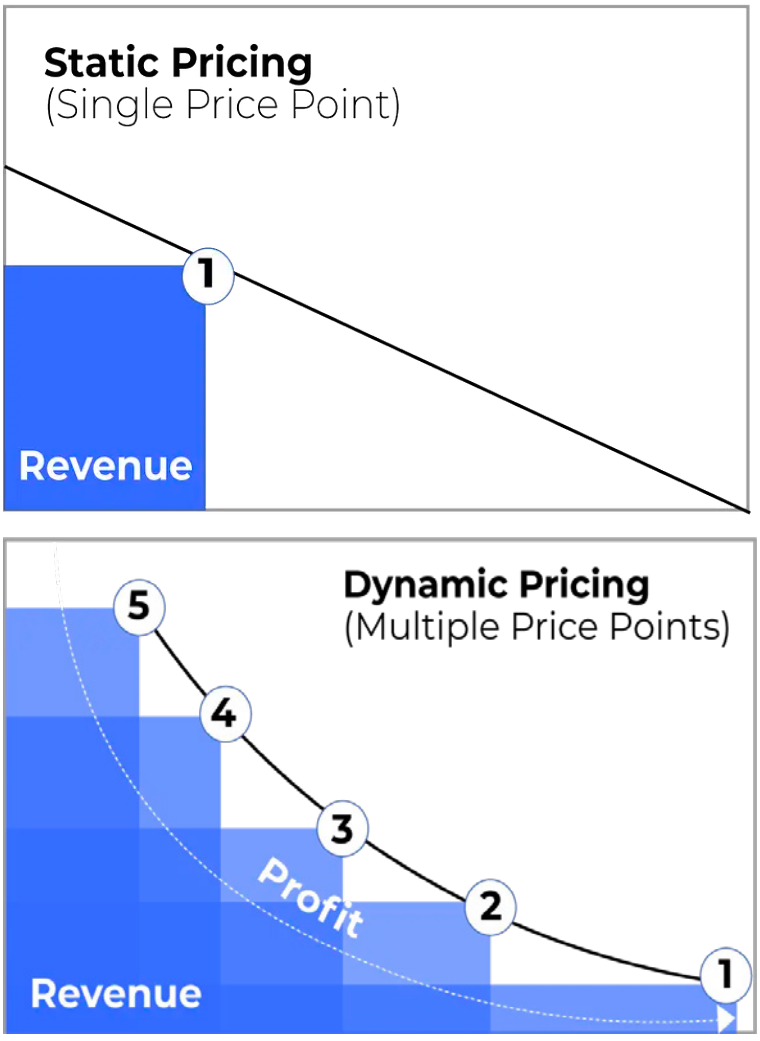


Figure 1: Two diagrams show the influence of price on sales under static and dynamic pricing

Why is dynamic pricing so important?

For any **omni-channel retailer**, the optimal price for a product depends on a variety of factors, including seasonality, competition and the company's current inventory. There is a **wealth of data** that must be taken into account when calculating optimal prices, including large, growing assortments with thousands of products, the speed of market shifts, and the price transparency that online shoppers can view with just one click. In order to avoid being **outperformed by the competition**, retailers have to respond to this dynamic market environment and quickly adjust prices to its ever-changing conditions.

Manual pricing processes are generally too slow to react and aren't privy to the massive amount of data needed to effectively **optimize retail prices**. This means that automation with the help of suitable pricing solutions is imperative. **Advanced pricing solutions** use machine learning algorithms to exploit the full potential of available data.

What are the advantages of dynamic pricing?

Those who use a **dynamic pricing software** are able to react more quickly to a rapidly changing market. Advanced dynamic pricing solutions are based on **intelligent algorithms** that take all relevant external factors into account, seamlessly adapting to the market conditions and to the retailer's strategy. The price-setting process is almost completely automated, allowing the retailer to focus on more strategic tasks. This means retailers can become more competitive, increase profitability, strengthen their price image and successfully implement set **KPIs (key performance indicators).**

The advantages of dynamic pricing at a glance

Increase competitiveness by:

- Responding rapidly to current demand
- Making offers in line with the market
- Consolidating your own price and brand image on the market
- Avoiding price distortions

Maximize KPIs by:

- Defining a clear strategy for setting prices
- Optimizing the use of existing data

Become more profitable by:

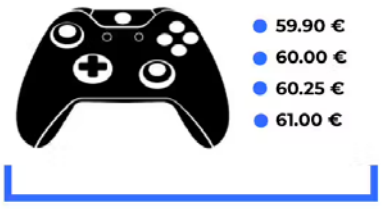
- Identifying high- and low-performing products
- Identifying products to which customers are less price-sensitive
- Fully utilizing customers' willingness to pay
- Promoting the sale of certain products
- Using strategic price reductions and increases
- Employing intelligent discounts

What role does price elasticity play?

Most **advanced pricing solutions** use price elasticity to determine optimal prices. Simply defined, price elasticity is the change in demand for a product as the price changes. Calculating the price elasticity of a given item becomes complicated when other mitigating factors such as marketing expenses or **competitive prices** change at the same time as the price.

Advanced pricing solutions can calculate price elasticity with **extreme accuracy** and predict how price changes might affect revenue.

For more on this, check out our blog post, "The path to optimized prices".



A controller at different price points depending on willingness to pay

What factors are decisive when it comes to Dynamic Pricing?

Rule-based approaches to pricing (rule engines) often only **calculate competitive prices** (price matching) or costs **(cost-plus pricing)**. Advanced dynamic pricing solutions take into account a variety of factors that influence price elasticity and demand. These include:

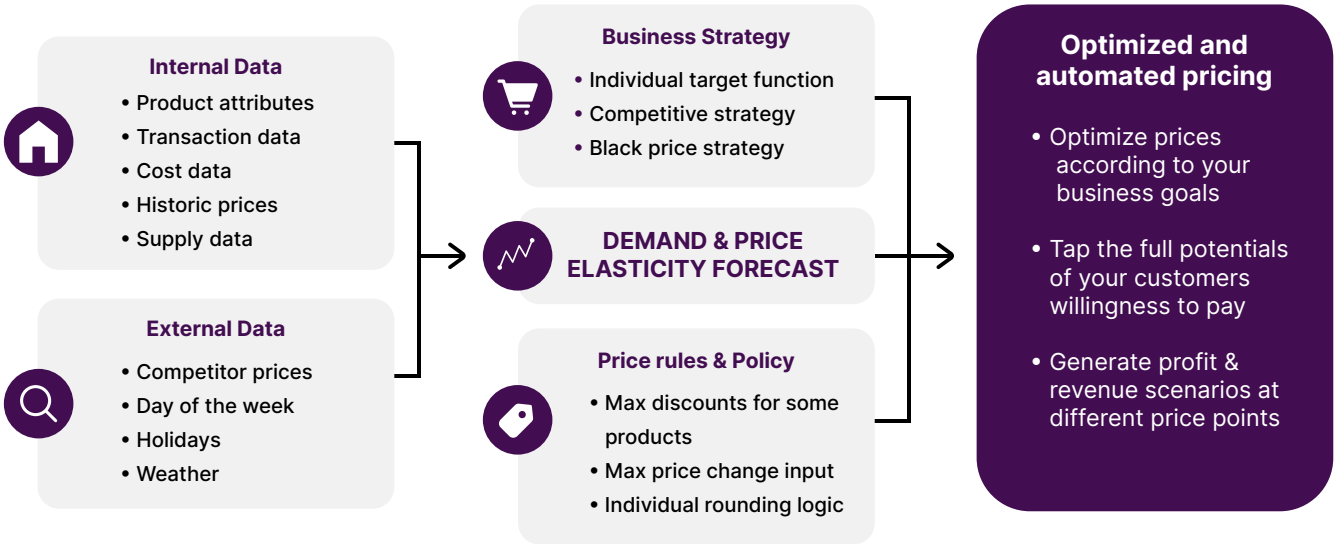
External factors

- Competitors' prices
- Discount promotions such as shopping days or sales
- Regional factors
- Season, weather, day of the week, time of day
- Brand image

Internal factors:

- KPIs and company goals
- Product master data such as purchase price and conditions, price limits, etc.
- Goods and stock
- Past sales data
- Marketing activities (e.g. coupons)

Machine Learning: important data sources



What is rules-based pricing?

For a long time, rule-based pricing was state-of-the-art in retail and online commerce. This involves the static implementation of certain **pricing rules** set by the retailer i.e. ensuring a close link to the competitor's price: the price of sneaker X should always be 5% cheaper than competitor Y. Prices are constantly reviewed and adjusted, which means they can change daily or even several times an hour. The **competitive price** is the most decisive factor..

Rule-based pricing solutions often allow the combination of **different pricing rules**. Thus, it is possible to set both a link to the competitive price and the minimum margin at the same time. In the case of a large product range however, the rule system can become highly complex.

What are the disadvantages of rules-based pricing?

Ominchannel commerce is a highly complex and dynamic environment. Managing static pricing formulas requires immense **manual effort** – especially making sure that the rules set are delivering good results. This involves making pricing decisions for thousands of products, keeping an eye on the competition and constraints such as inventory levels, and taking into account influencing factors such as marketing activities or **couponing**.

Furthermore, pricing rules often take into account a small number of parameters that- while easy to measure- do not allow for accurate measurement of customer behavior and their willingness to pay. Retailers who use rule-based pricing are thus giving away profit and revenue potential because their pricing is not based on their **customers' willingness to pay**. In addition, product-level differentiation is often not possible with a large assortment, meaning that rules are set across product categories. As a result, additional profit potential is untapped. Since prices are often based on the competition, there is a risk of a downward price spiral and so retailers will undercut each other.

Consequently, this method is not efficient as the systems cannot learn from new data and adapt flexibly – in contrast to machine learning-based pricing.

What are the benefits of machine learning-based pricing?

Advanced pricing solutions use machine learning algorithms to determine optimal prices. These can measure **customers' willingness to pay** using price elasticity for any given product. In combination with forecasting algorithms, the price-demand curve of each item can be forecasted. Based on this, companies can automatically steer prices toward their **KPIs (business objectives)**. As pricing reacts dynamically and automatically to a change in customer behavior, discounts can be applied in a more differentiated and intelligent way.

To calculate the price elasticity of products, data from past sales activities is also evaluated. Sales and profits as well as all relevant influencing parameters – from competitors' prices to weather and seasonality – are taken into account by the software when calculating optimal prices. It can also simulate different pricing scenarios and forecasts revenue, sales and profit results for specific targets. Advanced **pricing software** can simulate different strategies for selected categories where, for example, a quick sale is desired.

Compared to more traditional, rules-based pricing, dynamic pricing offers highly accurate predictions and enables differentiated, smart pricing, which in turn leads to higher sales and profits.

Rule-based pricing vs. machine learning-based pricing

Rule-based pricing

1. Set price rules	2. Price changes
• **Rule #1** Minimum margin of 20%	• Competitor A reduces price by 20%
• **Rule #1** Price=competitor A price -1€	• Price rule adjusts price automatically to beat price

Machine-Learning-based pricing

1. Learning from historical data	2. Profit and revenue forecast	3. Optimization towards goals
Algorithm learns from	**Algorithm forecast**	**The Algorithm**
• ...historic data (e.g. transactions, marketing speed, competitor prices)	• ...revenue at different price points • ...profit at different price points	• ...selects price according to goals • ...optimized over all products possible • ...takes into account stock

What role does big data play in dynamic pricing?

In the last few years, we've seen explosive **growth in data generation**, and it is likely that this growth rate will continue to increase. In the retail sector in particular, customers leave a data trail every time they shop online. Plus, there are other data sources such as competitor prices, weather data, and internal company data, like the data gathered on the company's marketing activities.

Advanced dynamic pricing tools make it possible to compile this enormous amount of data and use it to implement a comprehensive strategy. It's not just about collecting a large amount of data, but using the collected data to optimize your pricing. More and more retailers are moving toward using this **wealth of data** to make better pricing decisions and to increase pressure on their competitors. The massive amount of data available is therefore also a great **driver of dynamic pricing.**

Expert opinion

> "Consumer industries such as retail and high tech will tend to see more potential from marketing and sales AI applications because frequent and digital interactions between business and customers generate larger data sets or AI techniques to tap into. E-commerce platforms, in particular, stand to benefit. This is because of the ease with which these platforms collect customer information such as click data or time spent on a web page and can then customize promotions, prices, and products for each customer dynamically and in real time."

(McKinsey Global Institute, Notes from the AI frontier , 2018)

What role do artificial intelligence (AI), machine learning, and intelligent algorithms play?

Big data is like an uncut diamond in the rough, and artificial intelligence (AI) the machine that shapes and polishes it. A self-learning algorithm identifies data patterns and is able to calculate the ideal price for each item based on the collected data and pricing factors, such as **competitor prices or inventory**. In doing so, it takes into account all previously defined targets and frameworks. Prices can be continuously adjusted and optimized automatically and in real time. Users benefit from an application that is simple and straightforward, and they are always in complete **control of the settings**, which include, for example, the user's inventory.

The use of a machine learning algorithm also leads to a higher degree of automation. Why? Because the influencing factors are not limited to a few easily measurable values (e.g. competitors' prices), but rather take into account just about all available data features (e.g. past transactions, profitability data, etc.).

55%
of respondents report that their companies have implemented AI in at least one business function

Determination of the profit-optimal price

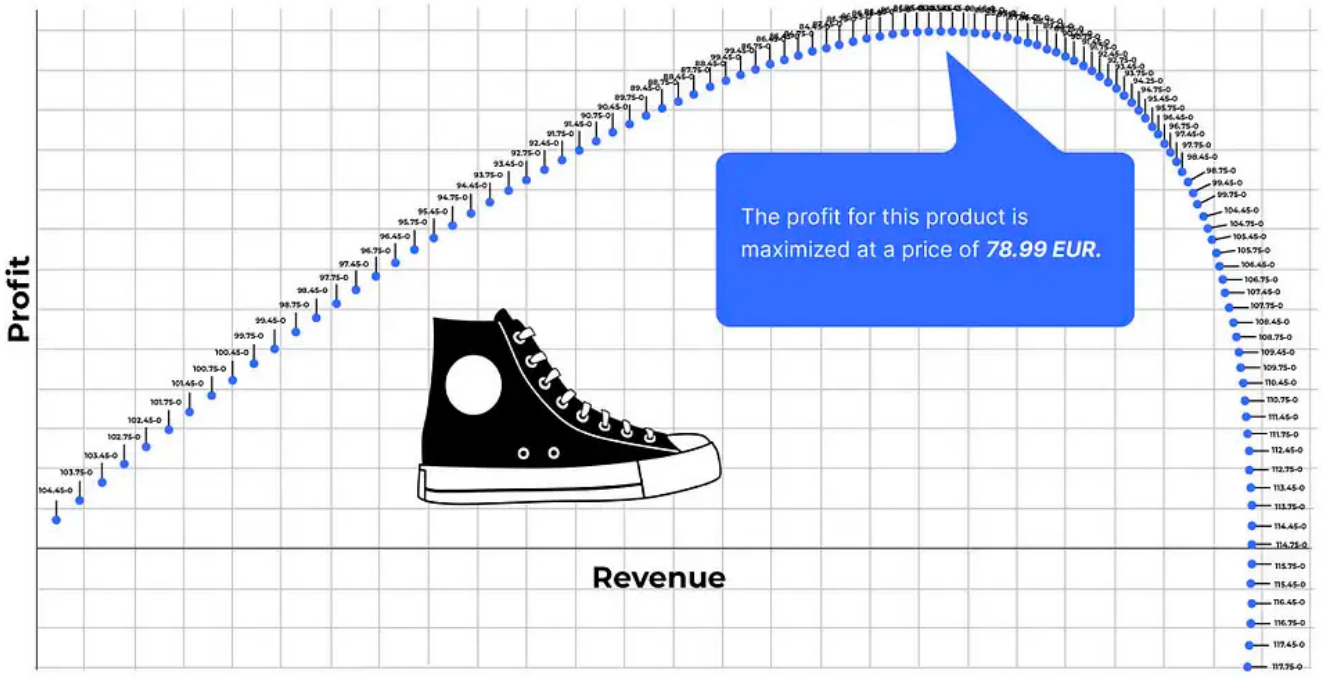


Figure 4: Diagram with profit on the x-axis and sales on the y-axis showing how different prices influence these variables

How do you control prices with machine learning-based algorithms?

Controlling prices with **machine learning-based pricing solutions** is fundamentally different from traditional, rule-based pricing approaches. In rule-based pricing, the focus is on the pricing rules. The definition of optimal rule sets in specific, requires enormous effort and needs constant management and monitoring.

With a machine learning-based solution, prices can be controlled in a targeted manner. Moreover, the **pricing tool** can provide a forecast of how certain pricing decisions will affect sales, revenue and profit. The user is not concerned with setting rules, but only needs to define the goal they want to achieve. In addition, adjustment with pricing rules is possible, but not necessary, to achieve **optimal prices.** The manager can focus on defining a specific strategy and business goals. Pricing managers can calculate different scenarios with different objectives within a few minutes and subsequently align them with top management.

How are marketing and dynamic pricing related?

Although pricing is part of the **marketing mix**, the responsibility for pricing is often with other functions for retailers, such as the purchasing department. Nevertheless, there is a close link between marketing activities, as well as **SEA** (search engine advertising), **SEO** (search engine optimization), and pricing decisions. These must also be taken into account for **dynamic pricing**.

Marketing and pricing are closely related in two respects in particular:

- **Measuring price elasticity:**

  to measure price elasticity – the most important factor in determining optimal prices – you need to understand how marketing activities (e.g., coupons, SEA) affect demand.

- **Optimal use of growth budget:**

  Growth managers must decide where to invest their money. Marketing activities and discounts are two main options.

Rule-based pricing does not consider marketing activities as an input factor and therefore cannot filter out their effects. Machine learning-based algorithms are able to measure **price elasticities**. In addition, you can determine the effect of different marketing activities on demand. Consequently, this provides the opportunity to compare between spending on marketing activities with spending on price discounts and thus optimize accordingly.

What is personalized pricing?

Personalized pricing refers to prices that vary individually depending on the **customer segment**. For example, a person using a Mac might be less price sensitive and thus have a higher willingness to pay than a person using a Windows PC.

Many retailers use **coupons** to encourage certain groups of customers to buy, such as new customers. A personalized pricing approach, where all prices are played out on a customer-specific basis, can easily lead to high levels of customer **dissatisfaction**. At 7Learnings, we recommend a coupon-based approach – you can use our pricing solution to determine the optimal coupon levels.

Varying prices show that retailers are using technology to offer personalized pricing.

What are the legal limits of dynamic pricing?

Most applications of dynamic pricing are legal, widespread, and an accepted practice. But there are a few limits to dynamic pricing:

- In the U.S., it is illegal to raise prices for basic needs in an emergency situation (e.g., during a natural disaster). These practices are considered immoral and are illegal.

- Similarly, **Article 102 TFEU** prohibits exploiting a dominant position to set disproportionate prices. Since retailers usually do not have a dominant position, this case is extremely rare.

- In Europe, the **General Data Protection Regulation** (DSGVO or DS-GVO) applies: If a retailer wants to use personal data for personalized prices, it must obtain the customer's consent.

How can 7Learnings help you optimize your pricing?

7Learnings offers an **intelligent SaaS solution** for optimizing your dynamic pricing. Our software uses advanced machine learning technology to predict revenue and price elasticity. The algorithm takes all relevant data into account and evaluates it in order to identify current demand and price elasticity drivers for your entire assortment, optimizing sales and revenue for each individual product.

The software accurately **forecasts sales, revenue and profits**. With just one click, our customers can generate market-based prices designed to **maximize target sales** while taking restrictions like current inventory into account. Your company's unique pricing strategy and pre-defined KPIs are used to set up the algorithm so that you can maximize profits, expand your market share, and strengthen your company brand. Automating prices saves you time and frees you up to focus on more exciting tasks.

You can learn more about 7Learnings here.

7Learnings

Maximize Your Results With Predictive Pricing

Our price optimization software increases your revenues and profits by up to 10%. See tangible benefits in a matter of weeks - not months or years.

Schedule a 30 minute demo now:

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