The art of data science

Why forecasts, pricing and promotions need the human touch

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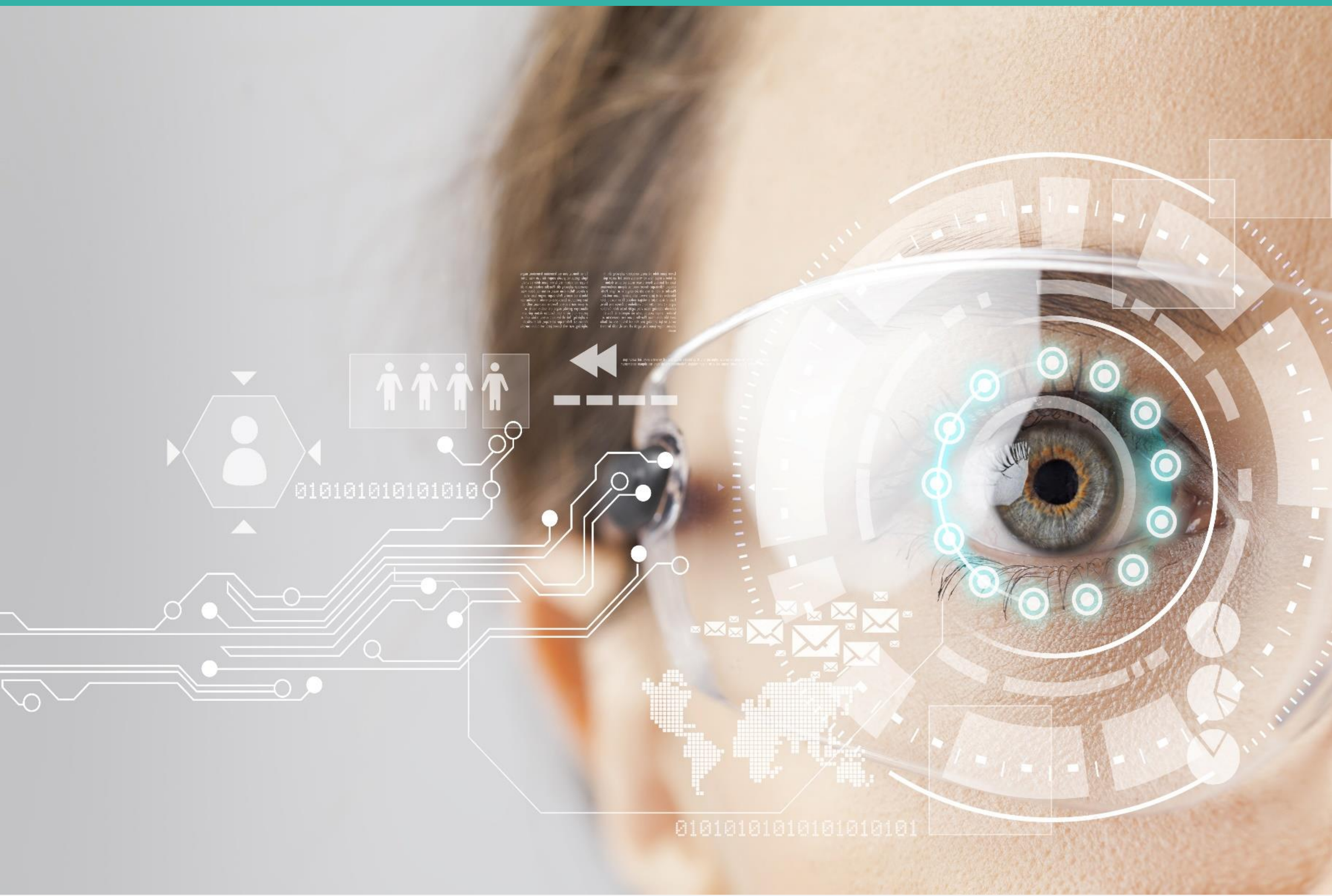

Five simple but profitable questions every retailer should be asking

1. Do you end the season, quarter or month with a significant performance gap between forecast and actual demand?
2. Are your prices fully based on customer insights and business goals, or rather tactically driven by considerations about cost and competition?
3. Did you invest significantly in promotions and temporary price reductions to clear excess inventory?
4. Are your retail forecasts leaving substantial margin value on the table?
5. Last, but not least – can you accurately measure the answers to these questions in a way that can guide future trading decisions?

Introduction

Few industries are as brutal as retailing.

The challenges include hyper-competitive multi-channel markets, combined with the complexities of global sourcing within the context of broad ranges that have strong inter-relationships across products, categories and competitors. Additionally, all this is often masked by high volatility in sales data and seasonality at both the macro and micro-levels.

This is the minefield facing retailers who are asked to place forecasting bets an entire season, or at least months, in advance.

While promotions and markdowns – relatively blunt tools – can be used to reduce waste and sell through excess inventory at a hopeful profit, they also create additional complexity in monitoring demand and impacts. At the end of the year, the majority of a retailer's margin is made – or lost – depending on the size of the gap between forecast and actual demand.

This white paper looks at the ways retailers can improve forecast accuracy and price / promotion decisions. Fixing each of these areas can produce powerful standalone results but, when managed together, the synergy is unstoppable.

Why forecasting should not rely on spreadsheets alone

At the heart of successful retailing lies the challenge of balancing statistical 'data science' with intuitive, consumer-leaning and forward-looking commercial 'art'.

Commercial trading teams are often some of the most numerate and data-friendly people in the business. However, being numbers-driven today is not sufficient anymore. In markets that are becoming increasingly complex and volatile, historical data can reveal the past with great accuracy but it is often a poor predictor of what is going to happen tomorrow – or, even more so, in the next season.

Effective forecasting is about balance: understanding past sales patterns, but also anticipating future potential changes in the marketplace.

Unfortunately, decisions about inventory forecasting, stock allocation, pricing and promotional planning are often made by different teams with diverse goals and responsibilities. Demand management is often owned by the marketing or trading functions, while supply management is managed by the operations team With each arm of the organization aiming solely to improve their own performance, the net outcome of this blinkered approach is usually detrimental to the overall profitability of the company.

This separation of ownership creates gaps within the closely-linked retail ecosystem where, for example, a forecasting error may lead to excess stock, in turn potentially resulting in aggressive markdowns even when demand for a certain size or style might exist in another part of the retailer estate.

Given the need to constantly re-evaluate the complex trade-off between risk of stock-outs and cost of inventory, it is not surprising that spreadsheets cannot keep up with fast-paced trading requirements.

To address these challenges, the key is to embrace both the science <u>and</u> art of forecasting – combining the rigour of data science with the insight of trading intuition, using a systematic and structured approach.

How many organisations can claim to have mastered this level of proficiency?

More profit from accurate forecasting

Looking holistically, retailers must at the same time make strategic decisions over the medium term:

- What items to sell
- In what quantities
- How to merchandise the items by channel
- What target retail price to establish

and also, in the short term:

- Tactical promotions and price changes
- Temporary price reductions to sell through excess stock
- Changes in inventory levels and product assortment

This holistic view shapes a structured approach to value creation:

1. More accurate inventory forecasting	Predicting future demand is difficult at the best of times. Overlaying seasonality, regionality, changing consumer interests and needs, to organic growth year on year, and the task becomes near-impossible. The keys to success include leveraging as many sources of relevant data (internal and external) as possible, and then building up a set of self-learning algorithms that constantly correlate these data sets to sales. Building on this base, Trading can overlay their views on whether the future is likely to be materially different from the past, always operating within well-established constraints (for example, no merchant ever expects a line item to fail, although this inevitably happens and must be accounted for)
2. Better assortment ranging and stock allocation	Allocating items and stock levels to stores is absolutely crucial to achieving solid sell-through rates and reducing excess inventory that needs to be cleared at low / no margin. The key is to match rate of sale / replenishment planning with allocation decisions – often benefitting from the input of individual store managers who may understand trading patterns and local shopper profiles far better than the head office support team.
3. Setting more accurate target price points	Establishing the link between pricing and expected sales is often much harder than common sense would suggest. Just as every merchant believes that all lines will succeed, commercial teams believe that most items will be sold through at their target retail price. However, a price point can be a highly effective positive or negative trigger to the shopper, indicating where in the value ladder each item falls, but also guiding the shopping decision. Calibrating prices can greatly benefit from a systematic approach based on data science: – How distinctive the item is against competition – Whether it can be easily substituted for another product – How it sits within the overall basket All of these considerations lead to an accurate view on the expected probability of sale at different price points.

4. Relevant, effective promotions & markdowns	Achieving relevance with the promotional strategy ensures that discounting is not detrimental to the long-term brand value of the retailer. Promotions are the lifeblood of retail – often representing more than half of total sales volume across the year. It is easy to see promotions as a negative – but when operated in combination with effective target price points and clear messaging, they can provide both volume and profit contribution while reinforcing the retailer's consumer promise. Sadly, most promotions are less deliberate – poorly planned, delivered without passion and not properly evaluated afterwards. As a result, a reported 59% of grocery promotions actually destroy shareholder value i.e. lose money through a combination of the cost of price reduction and lost margin opportunity.

The key to success: joining up science, people and tools

Forecast accuracy must be an ongoing process, rather than a one-off task. To achieve this, successful organisations master three equal capabilities:

- Scientific leadership – mining and integrating a variety of multi-source data, to learn from past errors systematically and continuously improve accuracy based on new insights and modelling approaches. Accounting for stock-outs, seasonality, substitution and changes in trend by customer segment, requires specialist skills and capabilities.
- People leadership – analysing data may help retailers learn from the past, but not necessarily win in the future. From store managers helping to guide item-level stock reallocation through to Trading teams helping to predict next season's trends, people are critical to the success of a forward-looking forecasting capability.
- Decision support tools – leveraging tools is critical to sustaining long-term impact. Retailers are the busiest people in business - nobody is looking for additional work. The right systems can help automate routine forecasting decisions and deliver user-friendly reports to support (but not define) day-to-day trading decisions.

About Evo Pricing

Our exciting formula: Success = Data x Artificial Intelligence x Human intuition.

Our world-class, but also simple to use, predictive tools help our clients achieve extraordinary results and sustain them over time, with weekly updates and monthly in-depth reviews on top of a distinctive "unlimited support" delivery model.

Our story starts in 2009, when our founder Fabrizio Fantini, while jointly pursuing his Maths PhD and Harvard MBA, discovered new algorithms that could outperform even the most complex and expensive commercial pricing systems.

On top of analytical excellence, we deliver a distinctive business model: value creation crucially also depends on the people side of the equation, as our founder learnt in his 10 years at McKinsey, consulting for global CEOs. Therefore, our algorithms build on human intuition, instead of aiming to replace it.

And so, our unique Evo Pricing approach was born.

Better management decisions, every day. Powered by artificial intelligence software, developed in partnership with the very best academics globally, building a new man/machine alliance.

Today we have 2 offices (London, Turin) and 120 man-years experience between engineers, data scientists, academics and business experts, who all share a common goal: relevant business decisions, driven by data and CEO-quality insights.

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Further reading:

1. http://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-age-of-analytics-competing-in-a-data-driven-world
2. http://www.hbs.edu/faculty/Publication%20Files/kris%20Analytics%20for%20an%20Online%20Retailer_6ef5f3e6-48e7-4923-a2d4-607d3a3d943c.pdf
3. https://hbr.org/2016/05/where-predictive-analytics-is-having-the-biggest-impact