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The big data revolution is well underway in the cosmetics industry

Maximize the sensory perception of a perfume, better targeted sampling campaigns, optimize a cosmetic formula, better understand customer behaviours... In a few years, the scoop of big data has expanded considerably. Retailers, brands, manufacturers : the entire perfume-cosmetic sector is concerned ! Yet the field of opportunities offered by big data processing still remains to be discovered.

Data analysis can help to maximize the sensory perception of a fragrance and to optimize the formulation. Photo : © scyther5 / shutterstock.com

Will it soon be possible to enhance, with the help of computers, the perfumer's expertise ? Assist his nose to consistently design successful fragrances ? In theory, the principle is simple : use huge databases (of raw materials, sensory perceptions, consumer preferences) and combine them, using powerful algorithms. Yet who could seriously imagine that the creator of the next Chanel No. 5 – or, in another area, that the author of the next Guernica – could be an algorithm ? We must always be prepared for surprises with Google, who already creates paintings – sold up to 8,000 dollars – with the help of intelligent machines, but then, replacing artists by statisticians is another story...

Nevertheless, massive data revolution is already well underway and the perfume-cosmetic sector is not lagging behind. « *The scope of application of big data is very vast, from banking to perfumery and it can address such matters as fraud risk or business growth, like for example the appeal to products,* » explained Patrick Zerbib, a zettafox co-founders, a start-up specialized in knowledge extraction from

large amounts of data using machine learning technologies.

From predictive to prescriptive analysis

With a background in management consulting, Patrick Zerbib is convinced that big data is ripe « *to move from being predictive to prescriptive.* » The aim being to respond precisely to the strategic issues of companies.

The analysis of massive databases has long been used for descriptive purposes (in national statistics, for example). With advances in IT and the over-abundance of data retrieved from new technologies, companies are increasingly seeking to predict consumer behaviour. And once reality has been well described and future scenarios anticipated, it is then very tempting to want to take action.

Patrick Zerbib, co-founder of zettafox, a start-up specialized in knowledge extraction from large amounts of data

« *Beyond prediction, the prescriptive dimension of big data is all the more interesting that the implementation of tracks identified with predictive analysis can concretely be materialized,* » emphasised Patrick Zerbib. His method consists in collecting large amounts of characterizing data, to best identify all the elements likely to influence consumer behaviour. « *We therefore never limit our analysis to our customers' internal data, we always integrate external data.* »

Maximize sensory results

zettafox also conducted analyses in the perfume sector to maximize the sensory perception of a fragrance. « *For example, to maximize the clean smell effect delivered by the fragrance in a soap or a detergent or to optimize the technical impact of a general public fragrance. Our role is complementary to the one of 'noses' and their subjectivity, by bringing statistical objectivity.* »

For this, zettafox relies in particular on the data collected by fragrance houses during the consumer tests they have been consistently conducting for years. In such cases, we are far from the huge amount of data, usually associated with big data, we refer to it more as Smart Data – high value data but in small quantities. Algorithms must therefore be able to compensate for the relatively small amount of available data, which includes on top of it, a very large number of variables. « *Our algorithms will select variables in order to set up combinations, formulation scenarios, likely to maximize the desired sensory experience,* » detailed Patrick Zerbib. Scenarios that can also be tested.

Optimize formulas

The algorithms developed by zettafox have also been used to optimize fragrance formulas. « *The aim in particular, is to compact the formula by reducing the number*

of ingredients used while maintaining the same impact. » Algorithms can target combinations that maximize the olfactory aim and remove ingredients that reduce or have no olfactory impact. With these scenarios we can then work on finding the most effective formulas from an economic point of view, the most cost effective or the easiest to implement.

« *In the case of perfume formulas, the additional challenge is that we work blindly,* » added Patrick Zerbib. « *The composition of formulas is kept secret, which means ingredients are coded, we don't know their names. It is the customer who then decodes our results.* »

In theory data mining can be used in an unlimited number of areas. For instance, zettafox has applied its techniques to sampling distribution or to the transformation rate in duty free stores. One can very well imagine using specific algorithms to maximize the impact of a packaging, the texture or the sensory accuracy to a product. Provided the necessary data is available ! But when companies specialized in this area are called upon it is often because companies have already started collecting data and – overwhelmed by the flows – they need to structure them.

Arranging and processing all this amount of data obviously represents the bulk of the task. Especially since the very principle of big data is to integrate data, which at first seems totally unrelated. While, on the one hand, most companies and brands do not have the storage infrastructure nor, a fortiori, the appropriate processing technologies, they can still get help. On the other hand, companies must learn to increase their contacts with customers to collect as much data as possible. For manufacturers, the challenge is clearly not to leave this knowledge in the hands of distributors alone, who will not share it.

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