Redesigning the future of beauty with data

“The digital context creates an increasing demand for product customization. To respond to this demand and to innovate, we have deployed new tailor-made digital platforms for L’Oréal researchers, with Talend at the heart of it all, facilitating the management of more than 50 million data per day.”

Philippe Benivay, IS Experimental Data Intelligence - L’Oréal R&I IT team

Product safety, greater personalization thanks to social networks, air pollution or an aging population – the fields of research for the global beauty industry seem limitless. Cosmetics experts must innovate faster and faster, in line with the desires and needs of clients, who are always in search of new products that respect their bodies and the environment.

With more than 500 patents filed each year, 7 billion products manufactured worldwide and 36 international brands, L’Oréal is the world’s leading cosmetics group. L’Oréal is present on the luxury cosmetic market and offers consumer products as well as professional products.

For more than a century, L’Oréal has devoted itself to a single profession, beauty. Beauty is a science, and innovation is essential. Only strong research can create cosmetic products capable of generating real performance.

This conviction is reflected in the central role of its Research & Innovation (R&I) division—which employs 4,000 people worldwide—to envision and create the products of the future by drawing inspiration from beauty rituals around the world.

Capitalizing on all research knowledge in a central database

Each year, several thousand formulas are developed by the R&I teams at L’Oréal. Innovation has always been fueled by an ongoing dialog between science and marketing.

To put new products onto the market while rigorously and scientifically demonstrating their safety and efficacy, R&I must first be able to compile all data related to the physico-chemical characterization and definition of formulas and raw materials (laboratory structure data), and must take into account all information concerning the performance of the products as perceived by consumers from every continent in real conditions and in real time.
“Today, we only have two ways to stay above the fray. We must offer our customers products of impeccable quality, the famous "supra quality," and on the other hand, we must be increasingly innovative," explains Philippe Benivay, IS Experimental Data Intelligence – L’Oréal. Our challenge is capitalizing on all research knowledge in a central database.”

To meet this challenge, the cosmetics specialist has deployed a governed data lake to collect, protect and share research data, from product innovation to consumer assessment data.

“We launched a Big Data Platform program hosted on Cloudera and on Microsoft. With Talend, we are consuming 50 million pieces of data a day and that data is available in real time,” Smahine Hachem, Head of Data Intelligence – Project Sknow+ – at L’Oréal, explains. Next, L’Oréal applies learning algorithms using application program interfaces (API).

“Our digital acquisition platform captures very heterogeneous and sometimes raw data sources, such as robotic measurement data. To better understand subjects such as the microbiome (microorganisms living inside the epidermis and on its surface), or the exposome (the effect of pollution on the skin), we are also led to seek out and integrate more and more external data: IPSOS/Nilsen, scientific publications and research from universities or companies, open data, contextual weather data or pollution indexes,” Philippe Benivay emphasizes.

According to Smahine Hachem, the data being processed is “super sensitive” because it concerns raw materials and formulas. The nature of the data led to the selection of a private cloud infrastructure three years ago. “The new General Data Protection Regulation (GDPR) legislation regarding data privacy requires us to guarantee maximum security for our data,” he adds.

Why Talend?

“We appreciated Talend’s ability to connect to all types of databases, such as ElasticSearch or HBase. Another interesting point is the possibility of putting a Talend project on the collaborative developers platform, GitHub,” Philippe Benivay explains.

“Finally, what made the difference was the ability to integrate intelligent algorithms into integration flows in the form of APIs,” Philippe Benivay summarizes.

“Using an algorithm to enter intelligence data directly into the integration flows makes it possible to consolidate and prepare the data to facilitate our researchers’ analysis and to help them reach their conclusions, based on reliable data,” he continues.

Accelerating the design of new products

The first operational use case was developed for the Financial Department on the economic management of research, and on Portfolio Management.

“Each time we release a formula as part of a project requested by marketing, there is an associated development cost, the cost of the formula itself but also the cost of the overall approval and qualification tests. The evaluation of this cost calls on many departments and expertise, which generates a lot of activity at the global level,” Philippe Benivay comments.

New dashboards, powered by Talend, aim to better manage all of the key performance indicators (KPI) of activities related to research and the associated cost.

Since the construction of the data lake, the use cases have multiplied and to respond to them, L’Oréal is able to deploy on-demand data marts according to business needs, to facilitate the design of new products.
When we first start developing a product, we do it in response to a marketing need or a consumer request, and our labs go to work on creating the product. Julie Blanc, Senior Head of the Color Formula Laboratory, explains: “We have a catalog of millions of formulas, which is why data is so crucial for us. When the lab gets a marketing brief, the chemists start by developing the color shades. Thanks to our FastColor data mart, which logs 100 years of product development history, they can find the closest tone and using their expertise, adjust the colors to respond as closely as possible to the marketing brief.”

Each formula must have its own security file. Therefore, it is necessary to evaluate all of the raw materials that go into the composition of each formula.

“We intervene very early on in the development of new molecules, to support the researcher,” Delphine Blanchet, Toxicologist, continues.

“The idea of the OpenSafety data mart is to give toxicologists and safety assessors independent and rapid access to quality data so that they can make the right decision,” Mehdi Ez-Zoubir, Head of Lab Advanced Research, adds.

The developed products are then submitted to the assessment teams. Chloé Deghilage, Head of Digital Hair Care, France, explains this in detail: “We have the instrumental evaluation, the expert evaluation where aestheticians or hairdressers test the product and finally, we have the consumer evaluation.”

“We decided to create DigitExpert to collect all of the product evaluation data by our business experts. The evaluation summary is sent much faster to the laboratory: we have gone from two days to one hour, and the laboratory can therefore reformulate the products very quickly,” Chloé Deghilage explains.

During the evaluation tests, L’Oréal acquires millions of images. For Julien Pierre, Instrumental Evaluation Engineer, “with the ImageBank data mart, we go from a several-day delay to instant results when it comes to processing and handling images and videos related to the tests.”

“Our vision is to use this database platform to provide all our divisions with services and tools that they can still barely even imagine today. The transformation is phenomenal!” Philippe Benivay proudly concludes.

“Talend and our private IaaS environment Microsoft Azure helps us transform ourselves into a valuable vector service capable of combining all Research and Innovation data for the best of cosmetic innovation in terms of quality, efficiency and safety.”

Philippe Benivay, IS Experimental Data Intelligence - L’Oréal R&I IT team