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L'ORÉAL: THE BEAUTY OF SUPPLY CHAIN DIGITALIZATION

Researcher Dr Richard Markoff and Professor Ralf W. Seifert prepared this case as a basis for class discussion rather than to illustrate either effective or ineffective handling of a business situation.

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L'Oréal, the world leader in beauty products, began to rethink its vision for the industry. The world was on the cusp of a digital future full of possibilities. This meant that L'Oréal – known for its consumer-pleasing beauty products and owner of some the world's most iconic brands – had to think about innovation in a different way. In addition to providing the best products, it had to continuously adapt to the market needs.

Through a combination of goal setting, training and communication, L'Oréal's digital transformation began, first with efforts in marketing, sales and consumer outreach, but supply chain quickly moved to a prominent role in helping address questions about how digitalization would affect its products and consumer expectations.

Starting with CEO Jean-Paul Agon's vision, the company would find itself on a journey that would challenge its culture, its approach and even its value proposition.

Along the way, the supply chain would become a force for bringing together the different functions of a large, complex organization to identify and implement new business models in the digital age that would cut to the heart of the company's operations.

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COMPANY BACKGROUND

L'Oréal was founded in 1909 by the French chemist Eugène Schueller, who formulated the first hair dyes that were manufactured and sold to Parisian hairdressers. It went on to become the world's largest beauty company, and one of the largest consumer goods companies in the world. Ranked number 375 on the *Forbes Fortune 500* list,[1] the Paris-based company earned over €28 billion in revenues in 2020.[2]

L'Oréal products covered the entire range of beauty technologies, including haircare, fragrance, skincare, makeup and hair color. The company offered these technologies through 36 major brands (*see **Exhibit 1***). The brands were organized into four operating divisions: Consumer Goods, Luxe, Active Cosmetics and Professional Products. These operating divisions were broadly distinguished by the distribution channels they served, as the company's products were available in several distribution channels, including the mass market, drugstores, spas, salons, department stores, travel retail, specialty stores, branded retail and e-commerce – its fastest growing channel. In 2020, 27% of L'Oréal's sales were generated through e-commerce.

The company operated in 150 countries in all regions of the world, employing almost 90,000 people. L'Oréal's strong tradition of innovation was supported by robust research resources that yielded hundreds of patents each year, including 497 in 2020.[3]

An extensive global supply chain operation supported the company's activities. Operations at L'Oréal were comprised of Manufacturing, Distribution, Customer Care, Quality, Sourcing, Product Development, Package Design and Environment, Health & Safety and Security.

With a preference for managing its own production, L'Oréal had a global footprint of 40 factories (*see **Exhibit 2***) that manufactured over 6 billion units/year. The factories were organized by both technology specialization and proximity to markets. The company had 149 distribution centers (*see **Exhibit 3***) servicing the various distribution channels. The distribution network was a blend of internal and outsourced sites, that delivered both from factories to markets and markets to customers.

The nature of the beauty market brought a dimension of complexity to L'Oréal's operations. The company portfolio included approximately 70,000 stock keeping units (SKUs). The catalogue turnover was high, with a 20% catalogue churn each year. Looking at the broader network, L'Oréal had over 50,000 suppliers upstream. Downstream, the company had over 500,000 delivery points and shipped two orders every second.

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CREATING A DIGITAL ENTERPRISE

Digitalization as a business vision

The vision of the role of digital capabilities at L'Oréal began back in 2010, when CEO Jean-Paul Agon declared that 2010 was "The Year of The Digital."[4] He encouraged the different functions to begin exploring digital transformations. Powered more by his vision than by an explicit mission, functions such as sales and marketing in different countries undertook a rapidly growing number of organic initiatives with entrepreneurial zeal.

In 2014, Lubomira Rochet joined L'Oréal as the company's first Chief Digital Officer. With experience at Microsoft and as a digital transformation strategy advisor, Lubomira began building a structure and framework around Jean-Paul Agon's vision.

Lubomira established three clear objectives for L'Oréal's digital transformation under the banner 20/50/100: 20% of L'Oréal's sales should be through e-commerce, 50% of all interactions with consumers should be personalized and 100% of the company's brands should engage with consumers through social media.

This vision was met with some skepticism. It was thought at the time that before making a purchase decision, cosmetics consumers – particularly in the luxe channel –needed to interact with the product through a mix of handling the package, testers and exchanges with beauty assistants. To imagine half of all sales occurring through e-commerce was to propose a radical rethinking of the way the company understood the market.

In response to these hesitations, Lubomira set up a new, separate organization, staffed in large part by people from outside L'Oréal, who were digital natives without preconceptions. This structure was highly verticalized and existed outside the usual company reporting lines, with an emphasis primarily on sales and marketing capabilities.

Externally, L'Oréal partnered with well-known incubators and accelerators to position the company as a leader in identifying and fostering beauty start-ups (*see **Exhibit 4***), as well as the achievement of continued milestones and tech acquisitions such as ModiFace, a Canadian artificial intelligence (AI) startup specialized in beauty (*see **Exhibit 5***). The 20/50/100% goals were well on their way, with over 27% of sales done through e-commerce in 2020[5] and 80% of interactions with consumers occurring online.[6]

Creation of *Operations 4.0*

In 2016, L'Oréal created the position of Chief Operations Digital Officer, placing this responsibility with Stéphane Lannuzel. The role, as he described it:

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> *To understand and explore new technologies can change how we manufacture and distribute our products, while maintaining a coherence with our digital transformation efforts at a company-wide level.*

In order to foster this coherence with a broader L'Oréal digital strategy, the position had a solid-line reporting relationship with Barbara Lavernos, EVP Operations and Lubomira, using a matrix organization approach frequently seen at L'Oréal.

As opposed to the structure implemented by Lubomira, Stéphane and Barbara opted to create a "light" Operations organization tasked with fostering digital innovation within the operational teams in the various functions and regions.

Stéphane called the program *Operations 4.0*, and identified five broad themes to provide structure and goals to dispersed efforts. The themes were purposefully framed in terms of capabilities and desired outcomes rather than specific technologies:

1. Lower product development time from 18 months to 6 months.
2. Develop products that interact with the consumer.
3. Foster manufacturing and distribution agility to respond to ever-increasing demand volatility.
4. Develop personalized products.
5. Leverage data science to improve the supply chain.

This approach encouraged the operational teams to look first at their processes and identify opportunities, rather than starting with a technology and looking for use cases. One successful example could be found in the first theme of lowering product development time. The product development teams recognized that iterations of product mockups between suppliers, packaging engineers and marketing were both cumbersome and time consuming. This led to the internalization of 3D printing for fast product prototyping, resulting in 14,000 prototypes being created using 3D printing in 2017, with a turnaround time of 24 hours.[7] The practice was extended to using additive manufacturing for industrial production tests, even before the supplier had begun the production of packaging materials.

As an example of the link to the business requirements enabled by both the five-point framework and dual reporting structure, L'Oréal began developing the use of serialized QR codes on certain products. This met marketing's request to find ways to interact with individual consumers to deliver information and promotions, which improved operations' capability in traceability and anti-diversion tracking and its transparency toward consumers. Per Stéphane:

> *All our efforts were very much aligned with the requests, expectations and desires of the brand marketing at a global and local level.*

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To move from objectives to action, Stéphane avoided setting up elaborate programs with timelines and expansive governance structures. The approach was to be very agile and concrete, identifying factories or distribution centers interested and ready to experiment and providing resources to them. As Stéphane explained:

> *We looked for partners, both internal and external – people who were ready to try, to test, even to fail, along with suppliers who were ready to work with us. Our goal was not perfection; it was a minimum viable product (MVP). Once we could prove that a new technology worked and created value, the dynamic nature of the company took the deployment and scale from there.*

In addition to looking for motivated partners, the positioning of the initiatives was explicitly not to use *Operations 4.0* as a vector to help sites improve on their fundamentals; it was to introduce new capabilities. This had the effect of gravitating the program toward high-performing sites and teams.

Despite the emphasis on MVPs, the Operations 4.0 team ensured, prior to any undertaking, that the technology and its use case were capable of scaling company wide.

The birth of *Beauty Tech*

Led by Jean-Paul Agon, the company's vision of cosmetics in 10 years was not only "topical" beauty products that a consumer applied, but also services, such as diagnostics, the consumer experience and personalization. Invariably, the company saw technology and IT as the key avenues to deliver these services. According to Stéphane:

> *Jean-Paul Agon consulted with the giants of the tech industry such as Google, Microsoft, IBM and others. The question to each was, "How do you see the role of technology in the beauty industry?"*

The resulting realization was that IT would not be able to meet the moment with its current structure. Set within the finance function at L'Oréal, IT was very risk-averse, avoided the spotlight, and it squarely focused on cost optimization.

For IT to rise to the occasion and play a key role in the company's vision, a change was needed. As a consequence, IT was moved from Finance and placed under the Operations function (led by Barbara), where Operations 4.0 had already shown that teams had the ability to undertake a digital transformation. As a result, Barbara's title was changed to EVP Technologies and Operations.

The next step in L'Oréal's digital voyage was the evolution of the existing programs, both in the business and in Operations, led by Stéphane. Hence, Beauty Tech was born with the goal of bringing resonance to the transition from products to both products and

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services, and to bring IT into this transformation by bridging IT with the business, including Operations, Marketing and Sales.

Beauty Tech was not limited to consumer-facing services and experiences but also to internal capabilities. Building a digital culture with the company would be critical to the success of Beauty Tech. Per Stéphane:

> *My deep conviction is that we cannot ask of our teams to develop cutting edge services of tomorrow if the digital tools we give them are the tools of yesterday … people need to breathe tech air to develop tech solutions.*

True to its mission of transforming beauty into an interaction with the consumer with services as well as products, Beauty Tech delivered a range of new capabilities (in part through acquisitions) such as AI-enabled virtual testers for makeup and hair color, shade finder diagnostic tools and tele-consultations *(see **Exhibit 6**)*.

Of the many initiatives enabled by Beauty Tech, two examples offered an understanding of the capabilities prioritized by L'Oréal in service of its vision of a future of tech-enabled agility and beauty as a service proposition.

Demand Sensing – and so much more

A complexifying market

L'Oréal undertook an effort to rethink the way it identified and quantified demand for its products.

The ability of L'Oréal to successfully anticipate and plan demand was key to its ability to respond to changing market trends. Always a challenge in an industry built on evolving tastes and fashions, anticipating demand was only getting more challenging. Omnichannel, the idea that consumers could interact with a brand and make purchase decisions in many ways – both online and offline – was a complexity driver in sizing demand streams. The continuing innovations in personalizing products multiplied the levels of change that had to be considered when developing demand plans. Even with a robust Sales and Operations (S&OP) process that aligned Sales, Marketing and Finance with Supply Chain, simply using purely historical data and classic statistical techniques was not enough.

It was in this context that L'Oréal launched the *Demand Sensing* initiative, under the Beauty Tech umbrella.

Thanks to an ambitious earlier initiative, led by Yves Gouret, currently Vice President S&OP of the group, the company already had a global, end-to-end planning system that compiled demand plans in each market, calculated and consolidated market supply needs, defined factory production plans and even did shop floor scheduling all under one tool.

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The L'Oréal S&OP process even extended to integration with suppliers, through a pioneering digital initiative to use a Platform as a Service (PaaS) to share packaging component and raw material requirements digitally with the company's huge vendor base.[8] This early supply chain digitalization effort helped show the importance of integrating external data and leveraging digital tools to increase transparency and agility in the supply chain.

The objective of Demand Sensing was to use a cloud platform to integrate daily order portfolios in distribution (commonly called sell-in) and actual consumer demand (sell out), as well as sales on e-commerce and in branded retail stores. The company then imagined deploying machine learning to automate the demand planning calculations.

Data as a value driver

The scope of the data inputs needed and the granularity in terms of products, categories, time scales and network actors was vast (*see **Exhibit 7***), but the anticipated benefits were correspondingly ambitious: an improvement of 5–10% in demand planning accuracy, and 50% less manual interventions in the demand planning process, in a context where demand planning was becoming increasingly complex and volatile.

The key was the data platform, as Yves explained:

> *The supply chain, and its tools, at first were transactional and moved from node to node. Then we moved to planning systems to provide visibility and the ability to make decisions, and to be the source of data for analytics. Now with the complex scope of the network, flows and products, the starting point is really the consolidation of data, mostly from outside our internal supply chain. Only then can we have an effective, digital S&OP.*

The external sources of this data spanned all the local operational functions of the company – Marketing for media plans and launch market intelligence, Sales for customer sell-in plans and promotional plans and Finance for coherence with the financial objectives. Per Yves:

> *A part of the initial business case was about optimizing service and headcount, but over time we came to see Demand Sensing as about value-added planning and as a driver of good data for the benefit of all functions. Having powerful tools and algorithms needs clean, exploitable data.*

L'Oréal already benefited from company-wide data management tools for product-level codes and attributes and media spending plans. These earlier efforts to harmonize and centralize internal data were key success factors to Demand Sensing.

Using all of this data would allow L'Oréal to fully leverage the complete end-to-end governance of its supply chain and governance, since changes in demand detected in a

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market would quickly propagate all the way to stock deployment decisions, or the sequencing decisions in a production line.

In keeping with the spirit of Operations 4.0 and Beauty Tech, several proofs-of-concept were done with the right internal partners, which led to the selection of a vendor and to a pilot with NYX, a popular makeup brand in Europe that demonstrated the potential.

Beginning in 2021, L'Oréal started running a deployment plan using an agile sprints approach. Recognizing that success would depend on the ability of many different functions to collaborate and embrace the new tools and exploit their potential, an outside change management consultant team was integrated into the deployment approach from the outset.

Yves explained that acceptance of the change was key:

> *If the results of the Demand Sensing process are not embraced, and general managers change the demand plans out of a lack of confidence in the algorithms, we will have spent tens of millions of euros for nothing.*

One future ambition for Demand Sensing was to integrate and leverage social media engagement into the machine learning algorithms. While an important input, usage in demand planning was currently manual and ad-hoc.

Personalization

L'Oréal introduced many digital innovations in the space of personalization and increasing the proximity of its interactions with the consumer.

The Lancôme brand introduced the Teint Particulier foundation concept in 2018. Using ModiFace's analytics technology, consumers could have their skin tones analyzed at the beauty counter, capture their preferences and have a foundation blended right on the spot to match their needs, with 72,000 different combinations possible[9] (*see* ***Exhibit 8***).

The concept moved to the mass retail space with the launch of Perso under the L'Oréal brand (*see* ***Exhibit 9***). Perso, a streamlined version of Teint Particulier, took the approach even further. Consumers could use their phones to perform skin analyses, and the device could blend not only foundations, but also skincare products and liquid lipsticks.

Teint Particulier and Perso had become the industry showcase for the potential of digital technology integrating marketing, product research and supply chain into providing beauty as a service.

The next step along the road of personalization was the concept L'Oréal was calling My Little Factory, where the personalized product could be made in an industrial setting,

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accompanied by personalized packaging at speeds of over one unit produced per second.[10]

Personalization was a key part of the Beauty Tech vision as Stéphane explained:

> *Personalization addresses one of the fundamental questions of the consumer. When you are standing in front of a store shelf, real or virtual, which one should you choose? Either you can try to steer them toward the closest product for them in your offering, or you can produce just the right product for them on demand.*

Forging ahead

The success of L'Oréal's supply chain transformation had not gone unrecognized. Gartner, the supply chain advisory firm, provided an annual ranking of the top supply chains in the world, in their estimation. In 2012, L'Oréal was ranked 71st in the world, according to Gartner. In 2020, L'Oréal cemented its place in the global supply chain ranking by finishing in the top 10 for the first time.[11]

L'Oréal continued its approach of retooling its governance and organization to foster digital innovation. In 2021, Barbara moved from her role as EVP Technologies and Operations to EVP of Research and Innovation.[12] Research and innovation was considered a pillar of the company, with investments of about 3% of sales and hundreds of patents every year.

However, in announcing this move the company also moved IT to Research and Innovation, renaming it Research, Innovation and Technologies. The motivation, per Stéphane:

> *Technology it as the same level as research and Innovation at L'Oréal. One can even say they are the active ingredients of the future.*

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Exhibit 1: Major L'Oréal brands

Source: Company information

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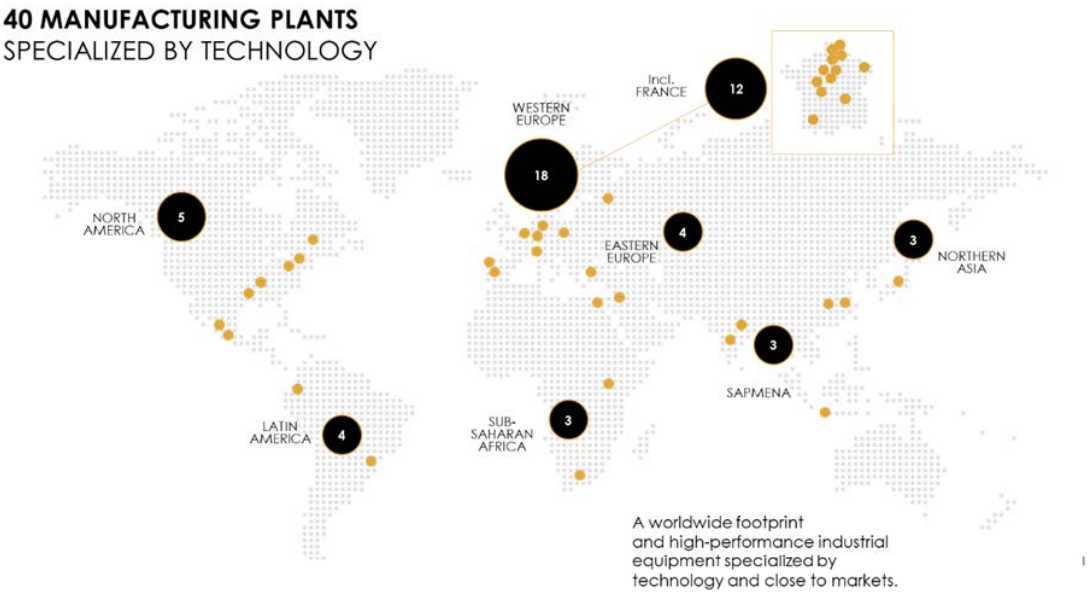
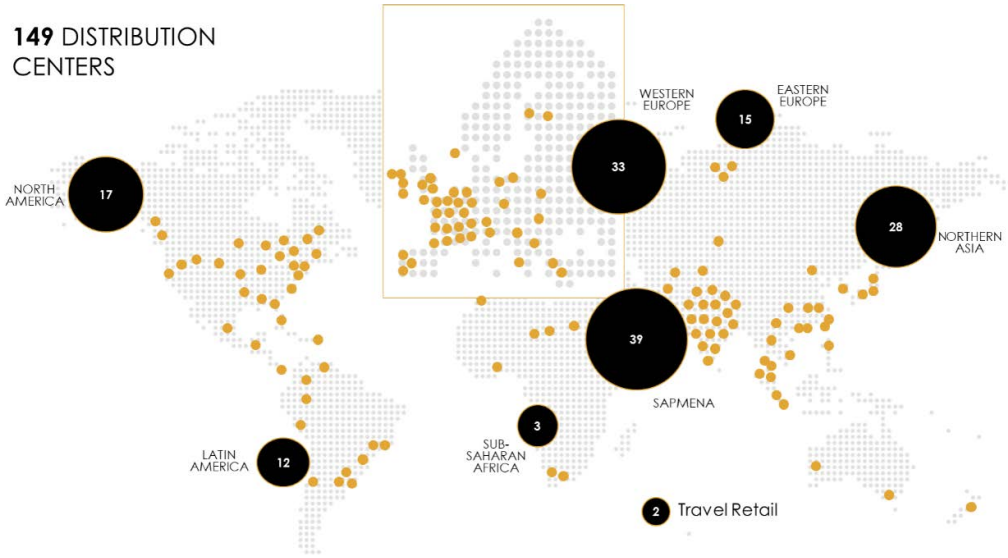
Exhibit 2: L'Oréal manufacturing footprint



Source: Company information

Exhibit 3: L'Oréal's distribution footprint



Source: Company information

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Exhibit 4: L'Oréal tech capital collaborations

Source: Company information

Exhibit 5: L'Oréal digital journey

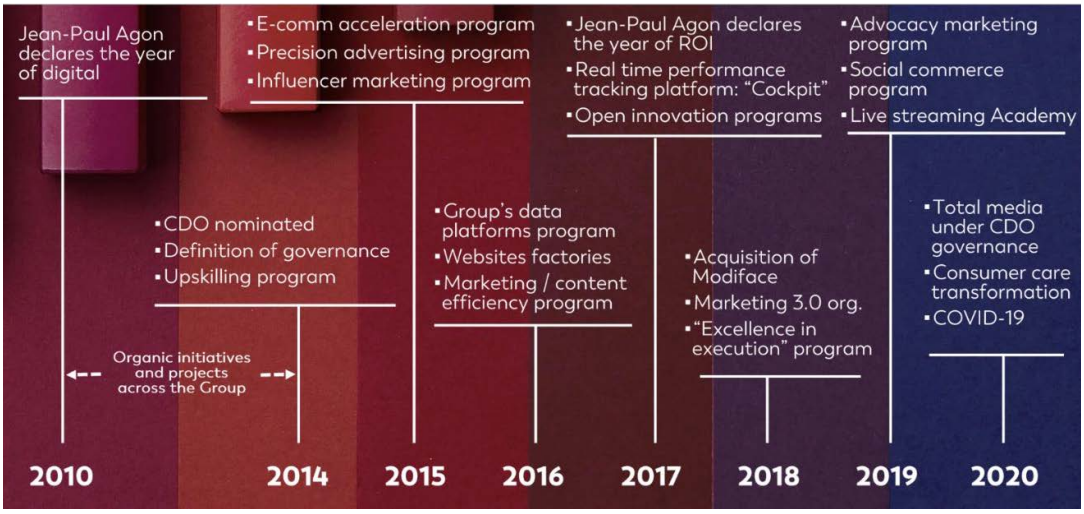

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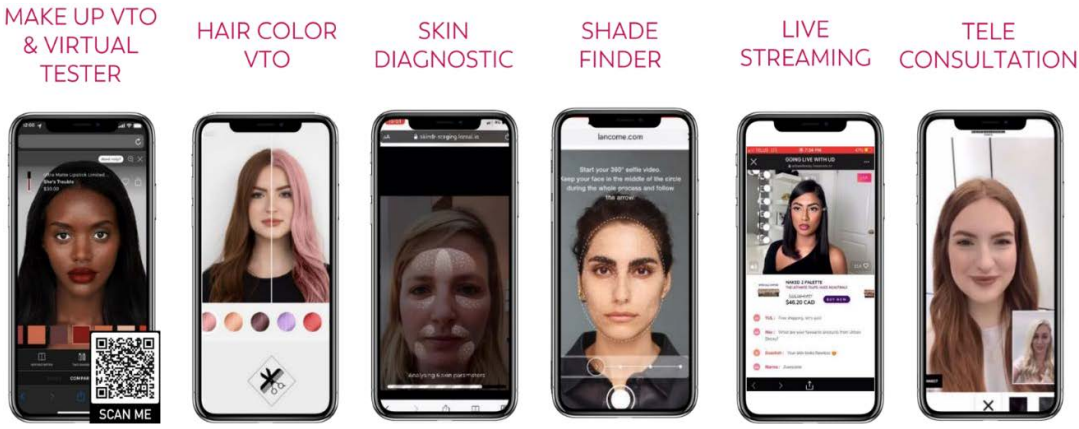
Exhibit 6: Beauty Tech services examples



Source: Company information

Exhibit 7: Demand Sensing scope

Inputs	Granularity	Automation	Lifecycle	Basics
Drivers & Data Sell-in Sell-out Stock-In-Trade Promo plan Media plan Launch attributes Sales activities Special events Weather ...	**Product** From macro level (axe, brand...) to finer level (EAN)	**Sell-in forecasts**	**Baseline** Including cannibalisation	**Stability** Interfaces with stability focus
	Network From national forecast to channel / customers / distrib centers	**Sell-out forecasts**	**Promo**	**User experience**
	Horizon From M+1 to M+12 And M+18 for budgetary process Weekly split	**Reporting** New dataviz with user experience in mind	**Launches**	**Agility** New brands and channel shift
		Valorization (CA)	**End of Life & Long tale**	**Explainability**
				Scalability To other countries, divisions...

Source: Company information

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Exhibit 8: Le Teint Particulier

Source: Company information

Exhibit 9: Perso from L'Oréal

Source: Company information

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