

Cosmetics and Fragrance Marketing and Management Master's Degree Program

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Capstone 2013 White Paper **DIGITAL ANALYTICS**

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Future of Big Data and Beauty

Today, there are already pharmaceutical companies approved to manufacture pills which are able to track ingestion time, heart rate, temperature, and activity. In fact, in just the first half of last year, venture capital firms invested \$700 million in businesses developing wearable, edible, and implanted sensors (Kahn, 2013). Big Data is projected to be worth \$300 billion annually to the health care industry alone. It has become one of the leading topics in business today, and there are now more connected devices in the U.S. than there are people and by 2020, there will be 31 billion devices used by the 4 billion people connected to the Internet (Badcock, 2013, Figure 1). This explosion of devices has been termed "The Internet of Things" (Tyler, 2006, Figure 2).

The Internet of Things

In order to understand the Internet of Things, one must comprehend the true size and meaning of Big Data.

Size of Big Data: In 2012, the total amount of data created was enough to fill a stack of DVDs that could reach the moon and back. In 2013, the average person will process more data in a single day than a person in the 1500s did in an entire lifetime. In 2020, the amount of data the world's population generates will be 57 times the amount of sand on all of the beaches in the world (Tyler, 2006).

Meaning of Big Data: Big Data is defined on three dimensions: Velocity, Volume, and Variety (Kaushik, 2013). Data is generated faster than ever before and is so big that it has outgrown today's server technologies. These factors, along with data's increasing amounts of structured and unstructured formats, ulti-

mately represent value. There is a reason that many "quantrepreneurs" say that Big Data is the new Oil (Kahn, 2013). By applying technology to data, businesses are expected to quickly derive insights to improve their bottom line and outpace the competition.

Beauty Product Launch 2020

To understand what Big Data means for the beauty industry, one can examine the potential impact through the Product Launch cycle of 2020. By 2020, Big Data will have an impact on each stage of the product development process. Data will bring value to beauty companies enabling cost savings, speed to market, and greater return on investments (Figure 5). The below addresses six specific ways Big Data will affect beauty innovation:

Data-Centric Focus Groups: Product experience is based on a range of cues that are not always conscious. However, we know the medical industry is using ingestible sensors to track patient's usage of medications. In the future, sensors are predicted to go beyond what people can verbally express and track what they physically do with the beauty product. Sensors will be molded into product packaging to track actual consumer usage behavior as companies develop and validate product concepts (Holmes, 2012). These sensors will allow brand marketers to understand where and how consumers are using products, as well as how much product and how often. For example, in a recent survey consumers claimed that they apply five strokes of mascara to each eye. But when counted during actual usage observation, it was closer to 50 ("Big Data issue," 2013).

Biology-Led Innovations: Biological factors affect a significant part of the way each human ages. All human beings carry genes that control these factors, but what differs is exactly which variants of them each person has. Today, the industry looks at skin health when assessing aging. In the future, sensors built into beauty devices will go deeper and capture biological information to understand



Figure 1: How Big Is Big Data



Figure 2: The Internet of Things

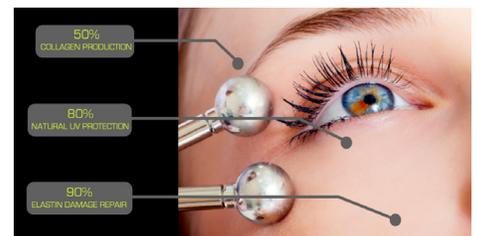


Figure 3: Sensor Intelligence

specific aging needs of consumers. For each consumer, a brand can understand how he or she makes and retains collagen, how skin is protected, and how quickly it repairs from UV damage. After receiving the data from the sensors, the biological information will be put into a digital database pre-loaded with information about active ingredients and their effectiveness with these biological variations ("Delivering on-demand," 2012). Recommendations directly related to each individual's skin care requirements will determine which existing products will be the most effective or even allow the brand to create a specific product for that consumer ("How Big Data," Figure 3).

Data-Driven Innovation Choices

Delivering this innovation successfully is critical for high performing companies. However, only 8% of prestige beauty retail sales were from true innovations or newness in the marketplace (Ferber, 2013). By 2020 there will be new technologies that will allow brands to quickly aggregate Big Data across several macro factors including environment, natural resources, search analytics, consumer ratings and reviews, and consumer sentiment analysis. This information will enable companies to create virtual trending scenarios of the future, helping to identify gaps within product offerings ("Big Data issue," 2013). For example, in a virtual trending scenario, there is a prediction that employment rates will rise for women, despite a downturn in the economy. Social media sentiment reveals that working women are more stressed and have less time to dedicate to beauty rituals. They are choosing nail accessories to treat themselves during this poor economy. Search analytics show that women are looking to update their look more often. Sales trends indicate strong growth predictions through 2025 in the nail category, outpacing total beauty, and product sensors have populated data of nail polish usage revealing women are beginning to change their nail look two to three times per week. By gaining these insights a nail company could identify an opportunity to create nail polish that updates instantly with a UV wand.

Data Stock Options: Big Data will also affect the future supply chain. Today, over \$800 billion in sales are lost annually due to inventory distribution challenges like out-of-stocks. For retailers, out-of-stocks lead to dissatisfied shoppers and for brands a lost sale to competition. Overstocks lead to heavy discounting or returns which not only negatively impact the brand profit but may also lead to diminished brand equity. In 2020, digital technologies will allow retailers and manufacturers to break down silos that exist in inventory management and provide full visibility across channels. Brands will be able to collaborate with retailers to ensure the right stock is available in the right place at the right time. This will enable real-time visibility, better planning, improved customer service levels, and, most importantly, shopper satisfaction (Lohr, 2011).

Sensor Intelligence: Data will improve executional elements as well. Adjacent industries are using radio-frequency electromagnetic fields, also known as RFID, to transfer data for the purposes of automatically identifying and tracking objects. Today, it is used to monitor the distribution of pharmaceuticals, assess

food quality and temperature, and identify adverse reactions for hospital patients through implanted microchips. In 2020 there will be new ways to leverage this technology and integrate it with GPS and advanced data analytics. This will provide the manufacturer with real time information about the consumer, and, most importantly, where and how products are used (Gulbahace, 2010). For example, during a typical fragrance launch a beauty brand can spend an estimated 6% of projected retail sales on sampling. But the company is not always certain of the return it is getting on that investment. In 2020, this integrated tracking system will give businesses a way to capture data on where product was sampled, who received the sample, and if they enjoyed it enough to purchase.

This technology will also improve consumer experience. According to NPD, by 2015, one in six people will be over 65 years old, and 14% more people will reach 100 years of age. As a result, the U.S. anti-aging market is projected to skyrocket to \$144 billion a year.

In the future, brands will leverage algorithms so consumers can receive specific recommendations to prevent or reduce aging (Grace, 2012). These algorithms will be based on three elements:

- 1) Intrinsic biometrics that detect skin health, moisture, collagen, and elastin levels.
- 2) Extrinsic measurements that capture pollution, UVA and UVB rays, and climate conditions.
- 3) Behavioral data that tracks behaviors that affect aging like stress, exercise, and sleep.

Once the technology captures this information, it will export a consumer's profile of skin health and suggest hyper-personalized product and behavior recommendations. It will then calculate an aging index score and project the consumers' future aging profile based on the three elements. With continuous data processing and regular input, the platform will empower the consumer with hyper-personalized recommendations to minimize the effects of aging.

From product innovation all the way to consumer relationship management, the future of Big Data and beauty looks quite promising.

Beauty & Data Today

While 2020 holds groundbreaking possibilities, Big Data can affect the beauty industry right now. Today, 93% of beauty organizations do not have a data-dedicated function (Meerman Scott, 2009). Data is often generated and disseminated within the sales and finance teams, instead of cross-pollinating



Figure 4: Data-Centric Organization

across the company. To solve for this, companies should create data-centric beauty organizations. In this new data-centric organization, data is at the core. It feeds into and connects all elements of the company through a newly created function of data strategy. This new group receives data from all company sources including supply, finance, and sales. Data is analyzed and strategies are implemented across the company to affect everything from product development to execution (Figures 4, 5).

While the new data-focused organization will bring analytics across the company, finding data experts to lead these functions will be challenging. There are currently 40 universities in the U.S. with data science programs, and we predict that this will be the most popular major by 2020. However, at the same time, there will be a shortage of 200K data scientists in the workforce. Today, companies like American Express are buying smaller analytics companies to acquire talent in this area. The beauty industry needs to start recruiting, acquiring, and developing data scientists now ("Global powers of retailing," 2010).

Many companies have a large amount of data, however only 12% of marketing experts claim to have access to actionable data (Jones, 2012). In order to be effective, brands need to know what data to focus on, and what to push aside. They must start with the business objectives and eliminate irrelevant data to ensure that Big Data can go to work generating the desired results. For example, in 2010, a Singapore taxi company was looking to expand its customer base and increase taxi bookings. The company invested \$8 million in Big Data, ramping up its booking system and tracking its fleet of taxis through billions of data points including GPS, weather patterns, consumer usage, and traffic trends. In two years, the company tripled its revenue, increasing taxi bookings by 251% (O'Connor 2013).

Privacy is also a concern. Over 90% of internet users are worried about their privacy, and it is the top reason why non-users still avoid the internet. The current patchwork of privacy laws fails to provide comprehensive protection, which causes confusion, distrust,

and skepticism. When it comes to preserving privacy, brands must invite consumers to share personal information in exchange for some type of value-add. Then, when speaking with them, brands must only use information which consumers have knowingly shared in order to build a loyal and trusting relationship (Homes, 2010).

Beyond privacy, it is difficult to know exactly who your target consumer is. You need to go deeper to understand them, as inaccurate personalization could lead to missed opportunities. For example, when the credit agencies undervalued the probability of failure in the U.S. housing markets in the mid-2000s, they based their assumptions on data pulled from housing statistics during the boom years. It was a recipe for egregiously wrong predictions, as there were many observations but no variance to show how the housing system would function under different conditions (David, 2012). This mistake demonstrates the importance of testing. You must ensure that you are constantly testing with a control group to capture real time learnings and evolve your targeting.

Big Data is changing the beauty world as we know it. It is estimated to be worth \$300 billion a year to the health care industry alone, and the impact on the beauty industry is expected to be double (Heussner, 2010). Big Data will increase operating margins by 60% in the retail sector, and will save over \$150 billion in government spending through added efficiencies. The beauty industry must act today to capture the value that Big Data and associated analytics represent. If brands do not act on data now, they may not be ready in 2020 ("Big Data issue," 2013) (see Figure 5).

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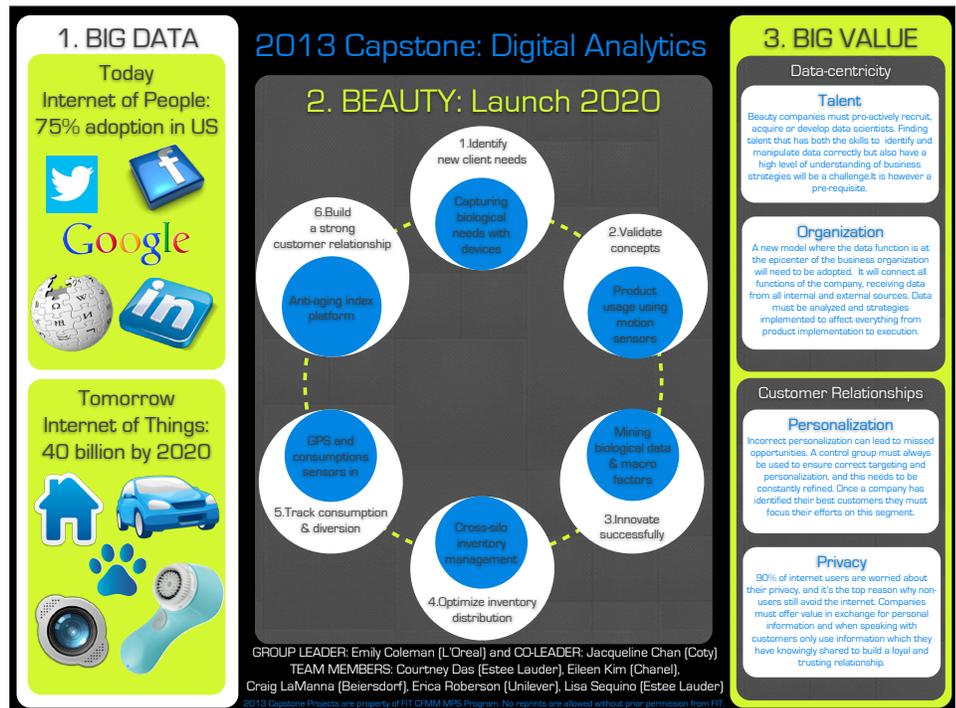


Figure 5: Beauty Launch 2020

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