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The Thomas Kay Woolen Mill: A Look into the Past with a View to the Future?

Designed by AI:

The Impact of Big Data, Artificial Intelligence, and Machine Learning on Apparel

By Craig Crawford

In a post-pandemic world where the previous year's sales data is not indicative of normal trading, are advances in data analytics, algorithms, computer vision, and machine learning capable of keeping retail relevant and prosperous? Have they really changed the industry? Well yes, and no.

Big Data = Big Mess?

According to IBM, from the calendar years 0-2013, humans generated 10% of the world's data. But from 2013 on, every two years, we generate 90% of the world's data. That means every day, we create 2.5 quintillion bytes of data. How do we make sense of this? Enter Artificial Intelligence (AI) and Machine Learning (ML).

AI—the field of computer science dedicated to solving cognitive problems such as problem solving and pattern recognition usually associated with human intelligence—allows vast amounts of data to be computed in periods of time impossible to be performed by humans.

ML—derived from the discipline of AI—is a collection of algorithms that can learn from and make predictions based on recorded data. The accuracy of a ML model depends on the quality and quantity of historical data.

Operational Efficiencies

Administrative routine business functions are easier to convert to automated processing with AI and ML provided that large amounts of enterprise data are involved.

With over 50,000 product lines and more than 1,500 new products introduced weekly to 3 million customers in more than 160 countries, e-commerce pure-player ASOS has enough data to drive and benefit from Intelligent Process Automation (IPA) .

Through the deployment of inStream, an IPA platform created by software provider Celaton, only accurate and complete information enters ASOS's financial systems, resulting in quicker service times and improved supplier relationships. The platform streamlines the processing of electronic and paper invoices by reading and extracting key data, also checking purchase orders for accuracy, currency conversion, and validation of supplier details. Any invoices that do not conform to business requirements are returned to the supplier with clear justification for resubmission and processing.

How Much is That Doggy in the Windows?

Dynamic pricing isn't a new concept—consumers are well aware that the travel and hospitality industries hike prices during peak periods of demand. With the introduction of AI, retailers can change prices in minutes and be more receptive to trends, the weather, and even what consumers are actually willing to pay, allowing brands to respond rapidly to both market changes and consumer behaviors.

Inditex is one of the world's largest fashion retailers, selling eight brands—Zara, Pull & Bear, Massimo Dutti, Bershka, Stradivarius. Oysho, Zara Home, and Uterque—in more than 200 markets through its online platforms and brick and mortar stores. AI and ML algorithms drive markdown strategies as well as improve demand forecasting. Additionally, trend analytics using computer vision ML technology powered by data-driven fashion trend forecasting firm Heuritech, reveal current fashion demands to facilitate "just-in-time" manufacturing.
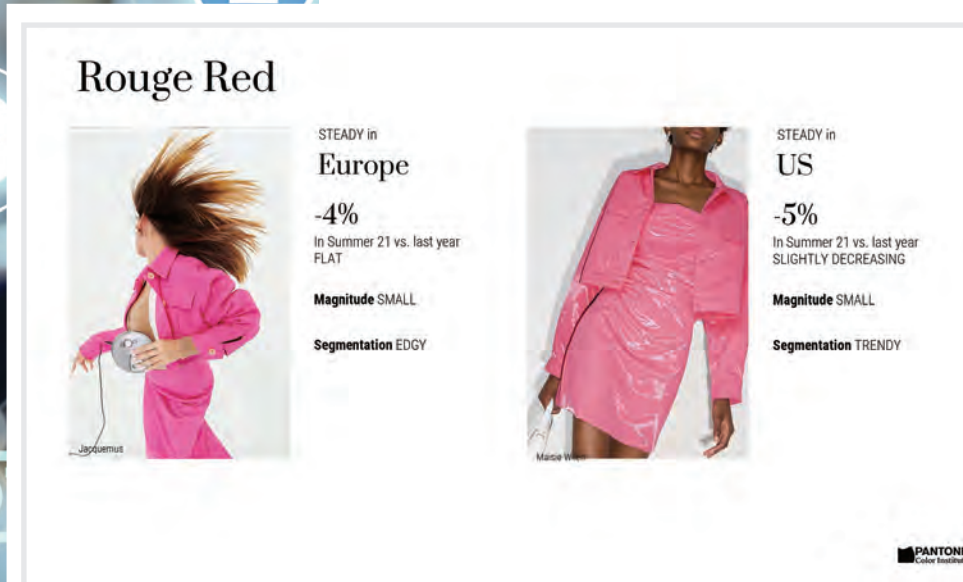
Pantone and Heuritech Fall 2020 Color Predictions for Shades of Rouge Red.

A Picture is Worth a Thousand Words

Computer vision now routinely outperforms humans at tasks such as object and face recognition. Computer vision can inform us about color, pattern, shape, construction details, even seasonality.

To capture the power of product details in social media images, Heuritech uses AI and ML to analyze millions of social media images every day to help brands understand consumers, trends, and the competition. Predictive analytics on trends and stock levels boost sales, reduce overstock, and increase sell-through.

Heuritech's "data based" trend forecasting helped the brand Rue21 identify which trends should be included in their Spring 2021 womenswear collection, and which should be avoided.

Visual search tools, such as those provided by Visenze, power the "Search by Image" functionality at brands Uniqlo and La Redoute, allowing them to achieve twice the product discovery rate. Consumers simply drop a photo of what they are looking for into the brands' product search function and matching product is displayed.

In partnership with Pantone Europe, Heuritech launched the womenswear Fall 2020 color trends prediction report with five tiers—Micro, Small, Medium, Big, and Massive—for three customer segmentations—Edgy, Trendy, and Mainstream. The report also ranked colors into six opportunities: Fashion Bet—high magnitude trend with growing dynamics; Bold Bet—less visible trend with growing dynamics;

Safe Bet—high magnitude trend with stable dynamics; Stable—low magnitude trend; Last Call—high magnitude trend with decreasing dynamics that still have business potential; Mark Down—"one shot" trend that won't be carried over. All are aimed at helping brands give consumers what they want.

Data Without Interpretation is Not Enough

"Detecting what's happening is different than forecasting demand based on current demand and buying habits," explains Jessica Graves, founder and Chief Data Officer of Seflueria, a data science consultancy empowering retailers and brands with decision support technology.

"If everyone has the same information about what's happening in the market, and makes the same decision on the same data, then the market will keep shifting into the same predictable thing," she explains.

"You're not measuring anything, but instead you are self-replicating. It's different to detect what's happening outside of the mainstream. That's the interesting thing—using the same tool—an ML algorithm—but looking at what could influence or emerge," she says.

Zara Meets Netflix

"Our proprietary algorithms tell us what's trending for our customer," explains Ramin Ahmari, founder Finesse, a brand that produces fashion product targeted at Gen Z consumers. With a background in financial technology and a master's in computer science from Stanford, Ahmari set out to disrupt the

ML algorithms not taught to recognize style hemlines and borders on Acne's clothing image archives resulted in curved openings at the bottom front of jackets and fronts.

traditional fashion value chain with data and ML tech by stealth in 2019. Initial product offerings sold out twice—$30,000—in five hours, with more than 3,000 people on the waitlist. Earlier this year, the brand's official launch has garnered much press and acclaim for its lack of dependency on traditional creatives.

"We distill the essence of what we see," he explains. By interpreting data from what Ahmari refers to as the digital catwalk—social media, influencers, popular culture, micro trends, and sub-cultures—the brand provides product direction to a team of product engineers who then create collections digitally (until pre-production samples). Ahmari says lead times have been reduced from five months to 25 days—with no creatives providing trend, color, silhouette, or trend research.

"Gen Z doesn't know themselves," he explains. "Our attention span is that of TikTok—mere seconds. It's impossible for a team of people to keep up with that. I don't want to take away from the creatives, but for us something is hot one second and irrelevant the next." Finesse's algorithms are all the brand needs to drive product, he says.

"Of course, our team of ML engineers are always fine tuning the algorithms," he explains. "We are continuously developing our personas."

But Can AI Design?

Six years ago, Leon A. Gatys, Alexander S. Ecker, and Matthias Bethge, from the University of Tubingen Germany, took the first steps toward recognizing artistic style and cloning it from one image to another. Using ML, they transferred Vincent Van Gogh's *Starry Night*, Edvard Munch's *The Scream,* and other artists' "learned styles" onto photographs.

But style transfer does not create art. It merely learns it and layers it onto existing imagery.

Acne Studios, in collaboration with artist Robbie Barrat, explored the possibilities of using AI with its Men's Fall/Winter 2020 collection. Barrat's ML algorithm was fed thousands of looks from the Acne archives but was programmed not to learn the "correct rules." As a result, the output inspired unconventional designs.

2018 Balenciaga + Robbie Barrat collaboration with "untrained ML" resulted in fused bags with trousers because the algorithm confused people holding bags with bags being connected to models' shins.

OpenDress Bespoke AI sewing patterns based on individual body topology.

Initially, Acne Creative Director Jonny Johansson expected to just copy the algorithm's suggestions; however, the designs didn't solve the problem of selecting fabrics and cuts, so his team had to translate the ML output via traditional methods.

Prior to the Acne collaboration, Barrat created a collection of "untrained" AI designs for Balenciaga in 2018 as creative inspiration.

Can Algorithms Engineer Product?

While the technology is still nascent, yes, algorithms can engineer textile products. OpenDress uses algorithms to create patterns for garments directly from 3D body scans taken on mobile devices. "We measure the circumference of the scanned person in a number of ways and then create a referencing model," explains Verena Ziegler, co-founder and CEO OpenDress.

"We are now on our fourth iteration of this technology," she explains. "We use natural principles of how entities work together and allow the system to compute this in a way beyond traditional pattern making and sizing."

To maintain a brand's aesthetic, humans can dictate necessary seam lines, she explains, and still allow the algorithm to engineer the rest of the garment.

The Evolving Role of Creatives

"Brands think that they push the trends, and I think that is naive," explains Jelle Stienstra, digital strategy director for pttrns.ai, a data science company that uses deep learning to understand consumer behaviors, visual recognition, and prediction at scale. Leveraging multiple sources of data, pttrns.ai provides clients with holistic views of consumers and helps them match product and experiences in a hyper-personalized way.

"We can use visual recognition, data, and ideologies to capture color patterns, moods, and behaviors," he explains. "A Spotify playlist is as important to understanding a consumer as is their social feed."

"But it's just data, and we need someone who curates the data—defines the silhouette, the color," he explains. "A brand wants to express something about that brand. The curator controls what color schemes work or the main outlines of the silhouette. I don't think it can be an algorithm yet, simply because algorithms are programmed by technologists. And we can't trust that technologists are telling us what to wear."

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