Siloed data. Unstructured data. Lack of connectivity. Lost opportunity. With all the data being generated and collected, internally and on the Web, machine learning can address the challenge of connecting the dots, drawing insights, and making better decisions.

Retailers and brands have an opportunity to leverage the myriad of available data to make better product design and development decisions, whether the data is maintained in internal (often disconnected) systems or external unstructured data on the Web and in social media. Artificial intelligence and machine learning (ML) can take all that data and extract specific elements that are meaningful to your brand and your sales, and present it in dashboard format to easily extract insights.

Here are two use cases that demonstrate the power of blending these insights with your instincts to make truly informed decisions.

**Use Case 1: Detect Brand, Product, and Consumer Trends**
The Web contains a massive amount of data. Perform an image search of your favorite brand, celebrity, or fashion maven and you are rewarded with on-trend styles and inspirational new looks. Every day there is something new. This content is what your customers are liking, pinning, and sharing on social media and it represents emerging sales opportunity for retailers and brands.

What if current trends found on-line could be harnessed and synthesized to help predict future trends? ML can help find patterns in data to identify data sets that have relative importance to your brand. For example, ML can indicate a high correlation between a specific celebrity and fashion expert and your sales, meaning that elements of what they wear and talk about closely correlates to style elements that are popular and selling in your stores and on-line.

Leveraging the ML capability of PTC’s ThingWorx solution, a trends dashboard can be created to provide trend inspiration. The dashboard allows product, design, and merchant teams to identify specific style elements to be used in a future trend forecast. For example, a dress merchant or product leader wants a forecast of what dress elements will be trending in nine months. They indicate the following example data into the dashboard:

1. Category (e.g. dresses)
2. Demographic segment (e.g. age ranges 19-27 and 28-27)
3. Attribute (e.g. surface design)
4. Time horizon (e.g. nine months)
5. Brands, celebrities, and fashion experts (e.g. Diane Von Furstenberg, Vera Wang, Kate Middleton, and Vanity Fair)

ML can calculate and display the correlation between the selected inputs and your sales. Based on the above example, the technology compares images from the selected celebrities and brands from nine months ago with similar surface designs to styles my brand is selling right now to determine relative importance. Those inputs with high relative importance will then be used to take a web scrape to find images of their current styles that are predicted to be popular in my stores in nine months. These images can be presented in a Pinterest-like dashboard to be used as inspiration for designers and product developers.

Based on the trends presented, the dashboard can also access internal system data to drill down for more specific sales history on specific trends. For example, if the dashboard presents prints/patterns as an emerging trend, historical “solids vs. prints/patterns” can be displayed to see how well prints and patterns performed in the past.
and how big the predicted trend is likely to be.

In addition, historical sales can be broken down by demographics to provide information on which age groups are more likely to purchase prints and patterns, allowing design teams to design for those specific age groups, and regional distribution of print and pattern sales so that design and development teams can pick climate and color appropriate fabrics and materials (in addition, planning teams can allocate units accordingly). ML can provide specific details for product design and development teams to make better decisions early in the process, condensing development cycle time and getting hot products to market faster.

Use Case 2: Mine Product Reviews and Social Media Content to Understand Returns

Product returns is a major challenge for retail, footwear and apparel companies. With increased on-line purchases, where customers cannot try on product before buying, returns will continue to climb. Important insights exist in the product feedback customers provide on-line, in stores and call centers, and on social media. The challenge is to draw learnings out of customer sentiment and loop that knowledge back into the product development cycle.

The ML technology supported by PTC’s ThingWorx solution uses natural language processing to identify common phrases found on the web, from call center data, and on social media regarding your brand and products. Common phrases can be categorized by the product team as positive, negative, or neutral, and ML can aggregate and prioritize the top positive and negative phrases. Weighting can be specified to place a higher relative importance on specific inputs, for example customers who actually purchased the product vs. those indicating a blind opinion. The top phrases could yield insights into product issues such as a material, fit or manufacturing.
ML can assist further by presenting product lifecycle management (PLM) data for visibility into a product’s development process. For example, in trying to understand a product’s high return rate, ML can present a dashboard providing visibility into the product’s sourcing details such as the sample iteration history, and factory information. The dashboard may show a product’s high number of sample rounds with reasons for sample rejection (e.g. fit and construction issues), and factory information such as details regarding the relatively low number of units assigned to this factory in the past, lead time issues and on-time delivery problems. Armed with this specific information, product teams can make decisions to avoid costly mistakes earlier in the process and improve with every iteration.

Think Forward. Act Now.

If your business goals include understanding and better meeting your customers’ needs and wants, now is the time to take the next step to turn social content into data. Empower product developers to make better decisions in real time with insights provided by machine learning, reducing costs and returns. Use ThingWorx Analytics to blend instinct with facts, what you hear with what you know and invest in the future.

Accelerate innovation results in a digital world. Think forward. Act now.

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