Product data generation and management with Vue.ai's Automated Product Tagging
– An Impact Study

Vue.ai®

The Direct-To-Consumer Era

Direct-to-consumer e-commerce sales are projected to reach $17.75 billion in 2020—up by 24.3% from 2019.[1]

The story of the D2C industry is the story of e-commerce today. An industry that saw its genesis in the internet and its growth in a rapidly digitizing world.

The rise of D2C brands can be mapped to two related movements:

- The increasing number of younger people across the world for whom shopping has become synonymous with online channels.

87.3 million people ages 14 and older in the US will buy on a DTC platform this year, up 10.3 percent year over year.[1]

- The increasing number of social media channels that function as customer acquisition channels and the first touch point for an experiential retail journey.

61% of all D2C brands will tell you that social media is their top acquisition channel.[2]

The D2C era that began in the latter half of the last decade is likely to gather steam in a post-Covid world. This is the era where the shopper comes first, brand loyalty is highly prized and not easily granted, and how the shopper sees, connects, and purchases from the brand all matter.

Direct-to-consumer is also—at a time when the world is actively going online—the most effective and efficient means of meeting shoppers on the platforms where they shop.

1.   Direct to consumer ecommerce sales emarketer report - AListDaily
2.   The State of D2C marketing in 2019 - Yotpo

The Story of Experiential Retail

E-commerce success for brands revolves around how effective they are in bringing the offline shopping experience to online shoppers.

Experiential shopping will remain one of the key features that will be carried over from the last decade, and from the era of offline shopping. Crafting stories about the product, conveying the value of the product to the shopper in a way that captures shopper attention for the long term is critical to retaining shoppers.

Every story has a beginning. The beginning for experiential e-commerce starts with product data. The brands that are successful and have managed to set themselves apart in a crowded marketplace have two things going for them:

- They have crafted a story for themselves—about the brand and its value.
- They have understood the value of these narratives and learned to identify how fundamental units like the quality of their product content can impact brand loyalty and ultimately a shoppers lifetime value for the brand.

"A lot of [Lifetime Value] just comes down to experience. When brands are trying to understand how LTV is going to change, as the times change, it will all boil down to the initial experience a company undergoes and distributes, and how much they can maintain those relationships over time." - *Web Smith, Founder 2PM*

The Customer

The customer is part of a European luxury fashion group. They have over 5,000 points of sale worldwide and over 400 mono brand stores with stores in the US.

The customer represents ~60% of the total revenue of the parent company. The direct e-commerce channel was one of the driver of the brand's growth with an increase of 24.3%.

The brand implemented Vue.ai's automated product tagging solution.

Key Takeaways:

- Improved product data quality, with AI-generated, detailed, fashion tags
- Reduced time to review product content
- Improved the accuracy of product attributes in their catalog by 15%

The Challenge

The customers product related information was being **manually annotated and uploaded into the system**.

This kind of data is often created by teams of on-site employees or outsourced to ecommerce annotation services that ingest attributes associated with each product.

Product data created for catalogs eventually feed into multiple third party sites, marketplaces and syndicators, in addition to the brand's website and database. These sources use this information to make these products more discoverable and shoppable.

This manual-entry data gives way to several kinds of inaccuracies to seep in. As a result, the brand found it hard to develop a scalable process to create and push out content to multiple channels.

And the customer was not alone.

73% of businesses expressed concerns on standardization for their data, let alone fixing the actual data itself.[1]

This constant struggle of prioritizing between producing standardized data and standardizing already generated data often leads to **analysis-paralysis** for most teams and businesses.

1.   Product Information Management: Business and Technology Trends - Ventana Research

21% of incomplete online transactions were as a result of incomplete content, **14%** due to incorrect content.[1]

1.   **98% of shoppers deterred by incomplete content in apps and websites - BizReport**

Problem: Inconsistencies in product information

Manually entered meta tags

CATEGORY: **DRESS**

NECK: **HALTER**

COLOR: **PURPLE**

PATTERN: **SOLID**

LENGTH: **THIGH**

The image details a product with typical manual data entry tags. We note that the neck is attributed incorrectly and the product is missing detailed product attributes.

The customer had two distinct types of images uploaded. They were either well shot professional images or product sketches. Both sets were in need of visual tagging to serve different functions in their business.

It was necessary for the brand to integrate with a solution that provided the flexibility of not only identifying product attribute across categories but also identifying the products from diverse image types.

Need: Automate tagging process for visual attributes of product images in the catalog

The Vue.ai solution

AI-generated meta tags

CATEGORY: **DRESS**

NECK: **SQUARE**

Erroneous information correctly tagged

COLOR: **PURPLE, OPAL, MINSK**

Highly-specific tags generated

PATTERN: **SOLID**

SLEEVE: **SLEEVELESS**

LENGTH: **THIGH**

FIT: **A-LINE**

Missing attributes added
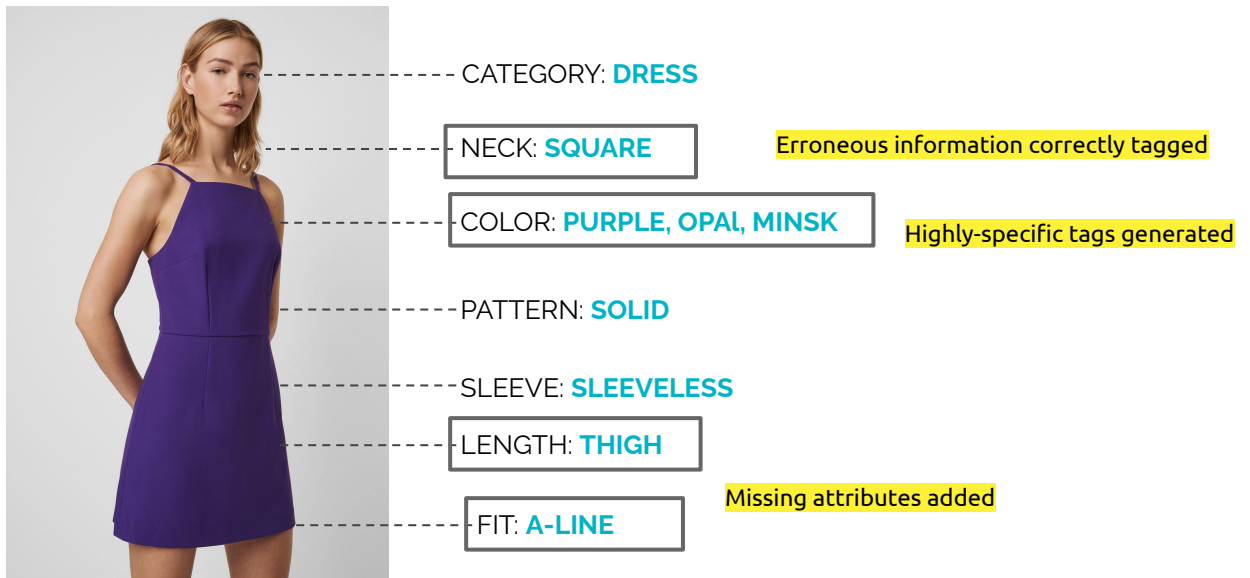
The VueTag powered tagged output shows the reconciliations made by the AI generated tags. The previously wrongly tagged output has now been rectified. In addition to missing attributes added, more specific and detailed tags have also been added.

VueTag generates tags with standardized information- reconciling and generating content in the process. Product data is generated with a combination of computer vision and NLP techniques-- the resulting tags being reviewed by teams.

Moreover, VueTag was able to map on to customer-specific taxonomy and train highly specific, custom tags for their business. These attributes were able to distinguish deeper into subcategories, addressing nuances most seeked by their target audience.

# Problem: Poor accuracy of attributed product tags
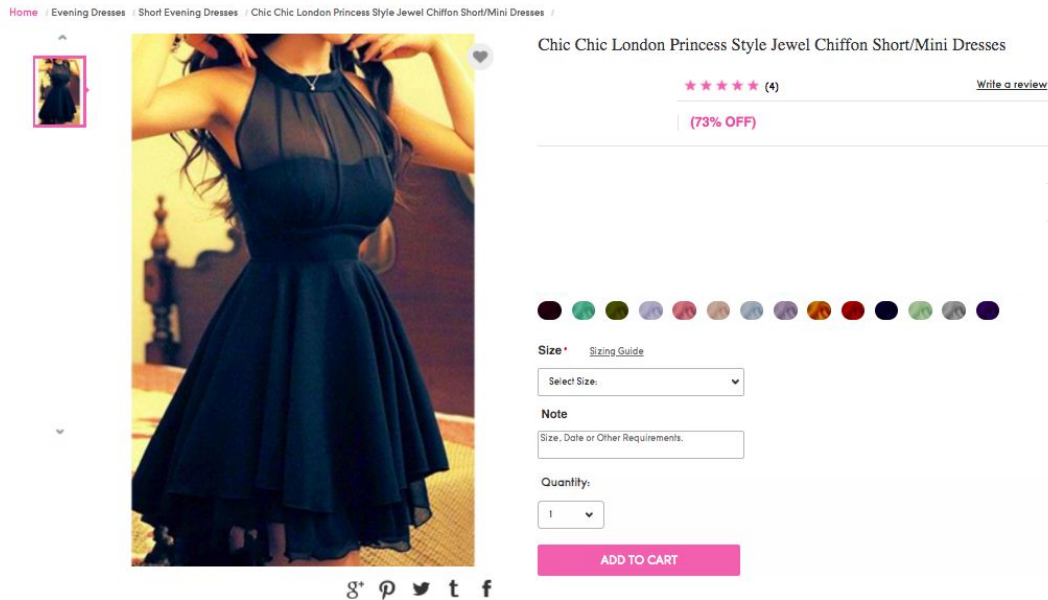
Inaccurate product tags, result of inaccurate attribution feed into various channels, often working its way into product pages. In the image, you can observe that the product title is not optimized for product discovery on search. Moreover, the tags used as keywords in this page is insufficient in addition to being inaccurate.

In case of many product tag annotation services and tools in the market, poor confidence or accuracy scores of attested tags is often a blocker to efficient systems and faster go-to-market.

For solutions automated or semi-automated for this purpose, constantly improving accuracy on predicted outputs is statutory for better operations.

Need: Iterative improvement towards higher accuracy of predicted tags for a given product catalog

The Vue.ai solution
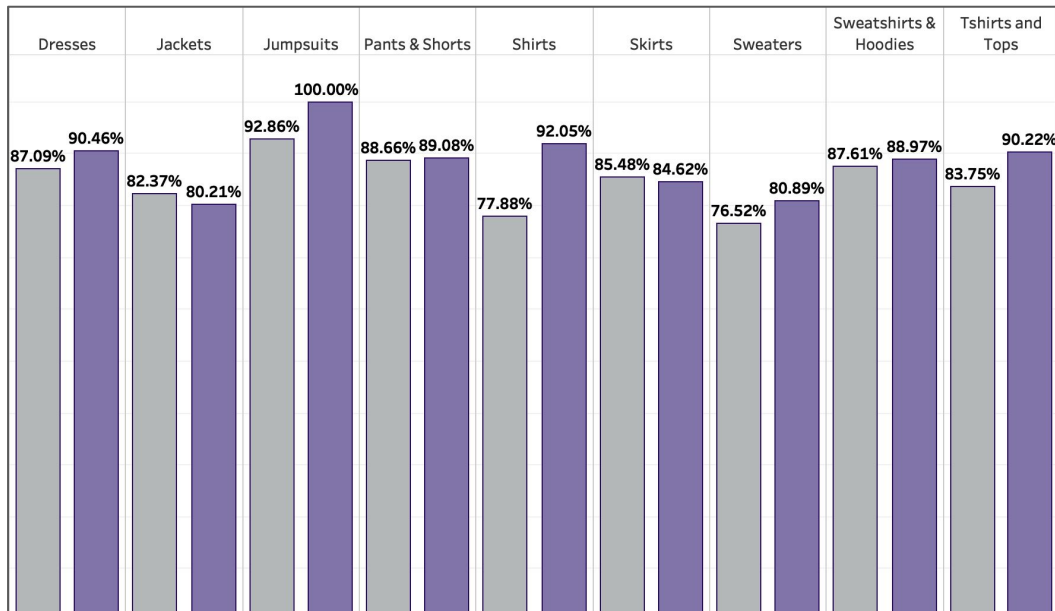
The graph illustrates average accuracy under each category of apparel for the first catalog upload (in gray) over its succeeding catalog upload(in purple).

Predictions for visual tags improve with iteration of batches and catalogs. In the graph, we observe that in the category "Shirt", we observed 100% accuracy between just two consecutive catalog uploads, with a 7.68% improvement in accuracy in that iteration alone.

In terms of improvement in predicting attributes across apparel categories, we observed a 8.5% uplift in overall accuracy between consecutive catalog upload and review.

VueTag RE-TRAINS networks with user feedback received from reviewing predicted tags. Post retraining - the customer observed a 15% uplift in the overall accuracy over two consecutive uploads that month:

With each round of feedback, networks deployed improved at detecting nuances of the attributes identified for sharper, consistent outputs. Eventually, networks would attain sufficient accuracy i.e, as much as human vision accuracy, and surpass human prediction, with the help of non-visual cues collected with the uploaded product images.

# **Problem:** Reduce Manual Quality Assessment (QA)

QA teams often have to review itemized product content one- by- one, while manually comparing it with any available additional information in the form metadata- a process that is unscalable for most businesses.

Manual data synchronization and quality assurance is a long drawn, time consuming but highly essential part of the data generation process.

In case of oversight, this error essentially propagates from the original content source, to their website, aggregator platforms they are associated and other third party platforms— losing out on sale and chances of the brand's products being discovered by their shopper.

Need: Process automation to improve manual verification of product content

The Vue.ai solution
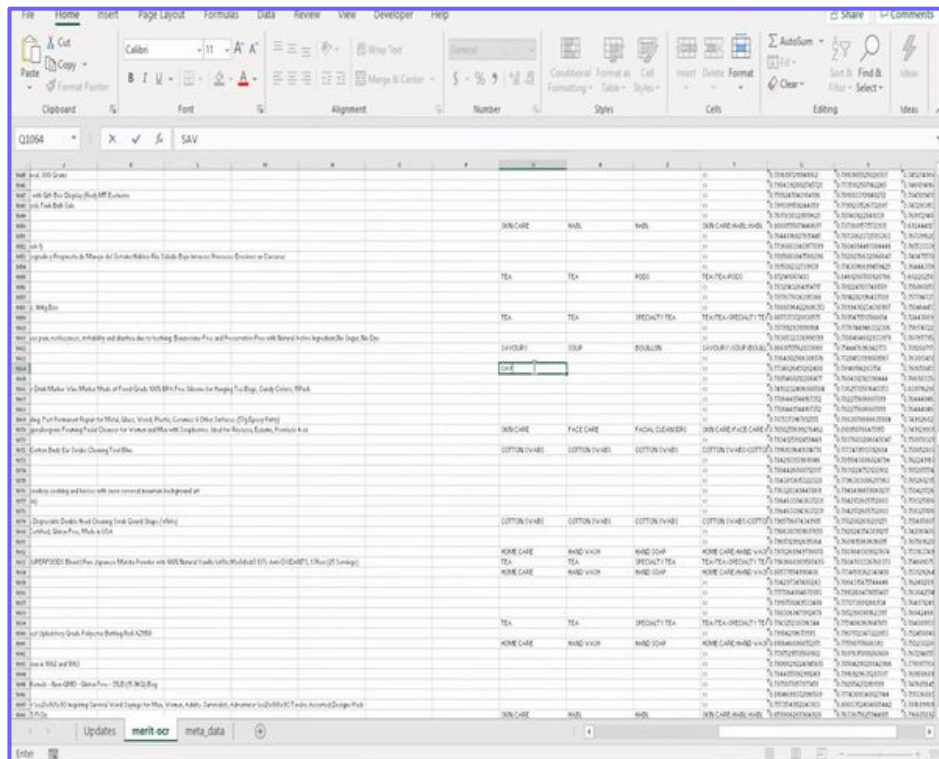
In the <u>gif</u> above, the user from the client's team is required to perform manual data entry for a couple of product attributes. On obtaining critical mass required to automate QA for the rest of the gaps in the given catalog, VueTag notifies the user to allow it to carry out the process of adding supplementary data entries for the rest of the products in the catalog.

The need for automating processes that simplify the process of filling in and correcting discrepancies needs to be repeatable and scalable to a point that requires minimal manual intervention- key for marketplaces. With QA, algorithms improved, improving accuracy over iterations of feedback. The algorithms also identified confidence cut-off beyond which margin of error was acceptable, reducing the need to QA.

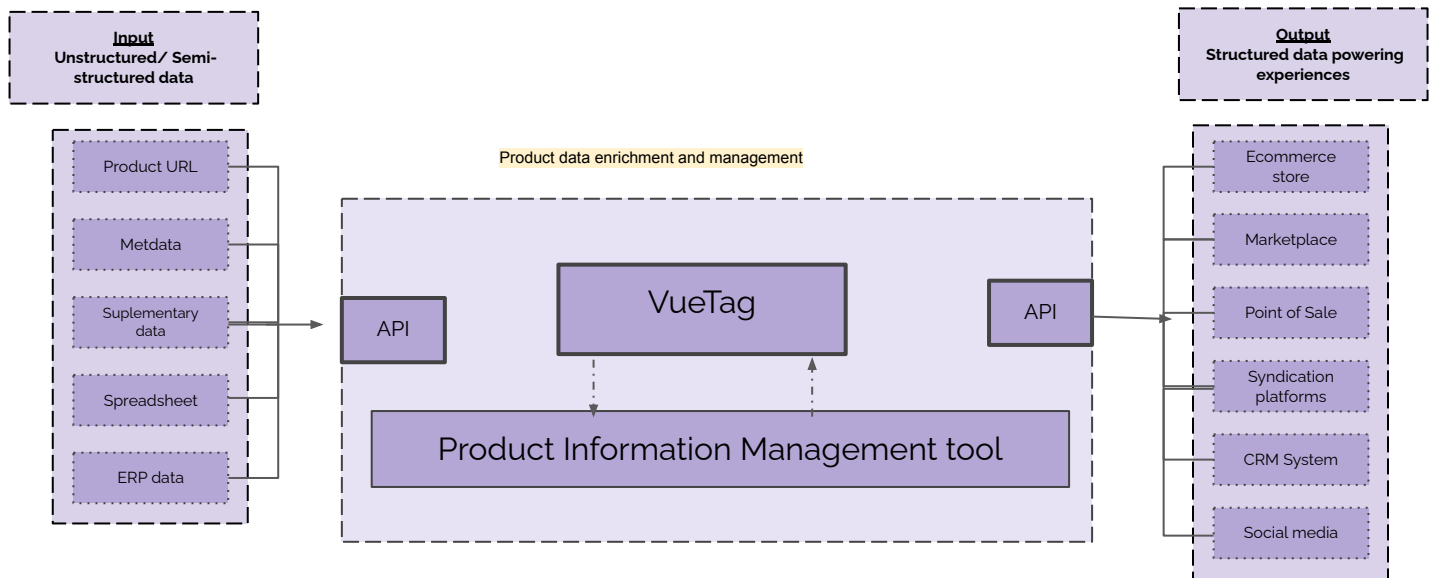# **Problem:** Integration with existing data management tools
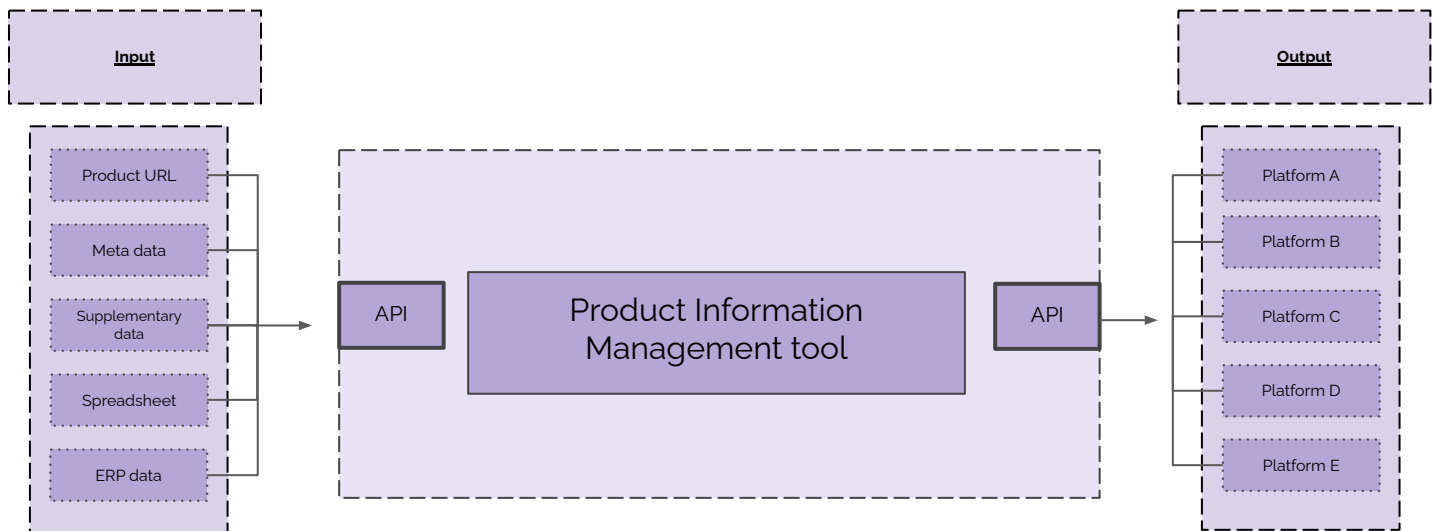
A typical Product Information Management Tool.

With complex platforming in position, businesses often have trouble with data migration and data management. Since brands often sell via multiple retailing platforms, the content and format required for each retailer would be different.

However, brands, aggregators, and sellers all have their own Product Information Management (PIM) systems which format data differently. Conventional data companies offer only limited help in formatting the data again leaving significant gaps. This results in missing product information and duplicated listings. As a result, Automating aspects of the product enrichment process with a reliable solution can make or break the stream of product content chain.

Need: Support for existing Product Information Management System with enriched product content.

The Vue.ai solution

Input
Unstructured/ Semi-structured data

- Product URL
- Metdata
- Suplementary data
- Spreadsheet
- ERP data

Product data enrichment and management

API

VueTag

API

Product Information Management tool

Output
Structured data powering experiences

- Ecommerce store
- Marketplace
- Point of Sale
- Syndication platforms
- CRM System
- Social media

VueTag enriches product data that is typical inputs into a Product Information Management (PIM) tool. This in turn helps PIM tools enable better data distribution and management with standardized product data.

Product data needs enrichment and standardizing before being delivered to the website, with standardization playing a major role in reinforcing brand identity. As a result, ensuring that PIM tools have updated product content on a regular basis, becomes a critical business priority.

VueTag supported the brand's existing PIM tool platform via API integration. With enhanced data generated by VueTag now feeding into the PIM, teams monitoring the process were now spending less time in manual data synchronization. This helped with better syndication, and pushing data out to channels, partners and platforms. Inturn, the specificity of these tags helped improve product discovery on search.

Vue.ai's Automated Product Tagging solution

With VueTag, reduce upfront data cleaning work that businesses often need to leverage, and gain deeper insights from structured and unstructured data. Granularity of tags predicted range from categories, and subcategories to 250+ attributes and tags including ones that indicate color, style and occasion among others.
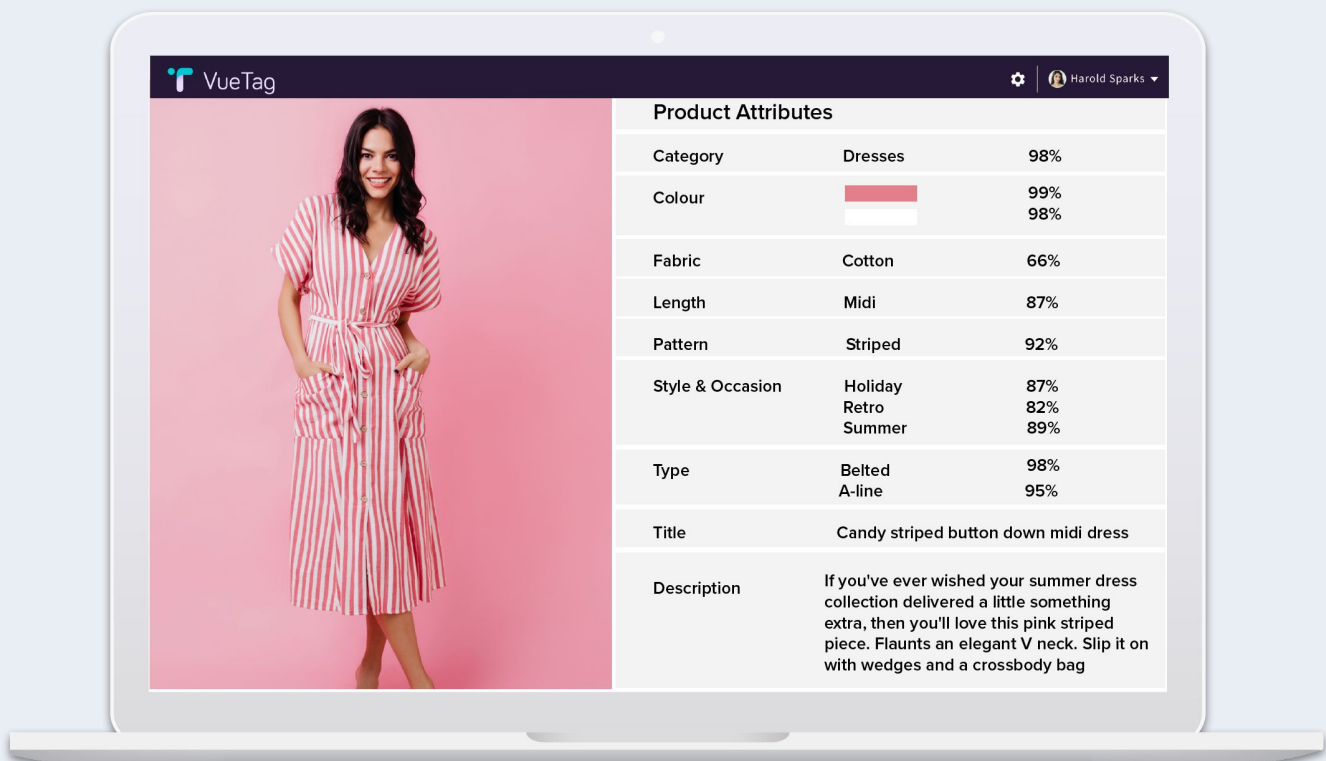
You can review these highly-specific predicted tags against their predictions' confidence score and ground truth, to send feedback back to VueTag, that in turn improves accuracy of the prediction over iterations of uploads.

As a result, you observe primary effects such as:

- Decrease in time to market products as a result of faster product digitization.
- Decrease in time taken to manually review and synchronize product data.
- Enhanced search and detailed filters for better product discovery as a result of the depth of meta tags.

PRODUCT IMAGE & DETAILS - - - - - - → - - - - - - STANDARDIZED ATTRIBUTES

The Floral Dress

Product Title

Product Specification

Size, Fit & SKU information

Material & Care instruction

Details

This dress is as cute as it looks and is beyond perfect for spring and summer! It is light-weight and se **Product Description** urple, red, pink and gray floral print, cute front pockets and gathered waist.

ADD TO CART

In case of product data that is consumed by both shoppers and the brand's teams, a large part of parsing structured and unstructured data into standardized attributes and in turn, promotional content such as product information on an item's PDP page, requires a combination of techniques for extraction and prediction, i.e. generation of the product content mainly:

1. Data generated using NLP techniques
   - Attributes extracted are from unstructured text and metadata.
2. Data generated using Computer Vision methods
   - Attributes predicted are purely derived from product images.
3. Data gaps Filled by predictions from historic data
   - Machine-assisted quality checks to reconcile data generated using Computer Vision and NLP.

Benefits

Automated Product Tagging helps in standardizing the fundamentals of a business' operation- The Product Data. With better product data, retailers can unify product information across channels, and make informed decisions.

Product Catalog enriched with highly specific fashion tags

Automate/ heavily machine-assist product annotation and digitization process

Easy vendor onboarding and third party data ingestion

Increased engagement as a result of improved site search

Enriched metadata that enables higher SEO ranking for your products

VueTag Powered by **Image Recognition** to enrich **product catalogs** by extracting **product attributes** with minimal **manual intervention**

Vue.ai®

Intelligent Retail Automation

Process Automation & AI solutions for the Retail Industry

Vue.ai is an end-to-end retail automation platform that is redesigning the future of retail with Artificial Intelligence. Using Image Recognition and Data Science - we extract catalog data, analyze it with user behavior and help your marketing, product and cataloging teams get actionable insights that improve customer experiences, drive conversions and reduce costs. We help you digitally map your products' DNA to create one-of-a-kind retail experiences for your customers and translate product information into the language that your teams can understand and make business decisions with.

Making Retail Teams AI-Ready

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