



SUCCESS STORY HIGH TECH

MACHINE LEARNING SOLUTION HELPS PRINTING COMPANY SAVE MILLIONS IN SHIPPING COSTS

Automated processes and unsupervised learning algorithms optimize packing and distribution

Over the last decade, Apexon has had an ongoing relationship with a large printing and distribution company. The customer produces and mails catalogs, retail inserts, magazines and books for its clients, an undertaking that sees more than six billion physical items shipped every year.

Distribution and logistics have long been a focus for digital transformation, even more so when you consider the volume of physical mail, marketing collateral and commercial material that is sent out every day. And while bulk mail is the result, distributing printed B2C assets is often impacted by how much they cost to ship.

As part of its commitment to lower overall postage costs, the company encourages its customers to join a co-operative mail program. This program is a key part of the process, allowing the company to combine participating customer orders in one batch and distribute them more efficiently across the delivery ecosystem.

However, the sheer volume of physical products often meant that shipping costs exceeded printing costs. In addition, the batches of printed material had a staggering number of postal configurations, all of which increased both the number of hours spent in assembling the batches themselves and the varying shipping costs associated with timely distribution. discount coupons at the point of purchase.



Prints and distributes 6 billion catalogs and magazines annually



ML saved \$6.2 million in operational costs



Delivered solution won industry award for AI excellence

Faced with this challenge, the company tasked Apexon with developing a solution that could not only reduce the total shipping costs but also optimize the batched materials into workable configurations for distribution. Apexon's solution to the problem was to introduce data and analytics into the mix, with an internal team leveraging machine learning to solve the demonstrated pain points.

Thanks to the 10-year involvement with this company, the delivered solution has already been beneficial. By using artificial intelligence and machine learning to solve the configuration and batching problems, the client will be able to save around \$6.2 million every year, while an optimized configuration can be identified in less than 90 minutes.

In addition, the innovative use of AI/ML in a real-world problem saw Apexon receive an Artificial Intelligence Excellence Award from the Business Intelligence Group.

THE RESULTS

KEY OUTCOMES



DEMONSTRATED COST SAVINGS

AI/ML integration will save the company around \$6.2 million in operational costs



OPTIMIZED CONFIGURATION PROCESS

Optimal material batch size and configuration for distribution identified in 90 minutes or less



CO-OPERATIVE MAIL PROGRAM

Maximized savings through ML will allow company to offer competitive fees and increase customer satisfaction



EFFICIENT GROWTH PROCESS

Efficient process = new customers and increased growth opportunities. Automation alleviates distribution delays and batch mis-configuration

OUR METHODOLOGY

THE DIGITAL LIFECYCLE

Apexon works with companies across the digital lifecycle.



GO DIGITAL

LAUNCH & EXPERIMENT



BE DIGITAL

AUTOMATE & ACCELERATE



EVOLVE DIGITAL

BE INTELLIGENT & AUTONOMOUS

Enable digital adoption in a quick, and agile manner



Build digital infrastructure and foundation for enterprises to scale



Leverage data engineering to make strategic decisions and get digital right every time

Data & Analytics was the platform for a custom machine learning program designed to find not only the choke points in the process – in this case, equipment configuration and material batching – but also enhance the distribution and logistics requirements of those materials.

Automated processes via machine learning algorithms were a critical part of the cost savings achieved and the optimization of the logistics costs. By saving the customer more than \$6 million every year, these savings can be applied to internal programs directed to the customer's customer.

Integrated unsupervised learning algorithms to find patterns in the data. This allowed the customer to understand where cost savings could be achieved, and customer satisfaction increased.

THE CHALLENGE

REDUCE SHIPPING COSTS, INCREASE OPERATIONAL EFFICIENCY IN BATCH CONFIGURATION

Commercial mail delivery is often offered to companies at reduced rates by third parties such as the U.S. Postal Service or specialized vendors. However, those costs can quickly mount up when the number of items being batched and dispatched run into the thousands per consignment.

In the case of the printing and distribution company, the shipping costs not only formed a large part of the operational expenses, but also exceeded the total printing costs of a project. As part of its cooperative mailing program, the company worked with a third-party vendor to deliver the printed materials to customers, a partnership that relied on the discounts that said vendor could provide for presorted bulk mail.

The Problem

These printed materials ended up being a variety of sizes and batch configurations. This meant that the company had to continually set its onsite packaging equipment to create the bundles required for the vendor. In addition, the number of potential configurations made it almost impossible to come up with the optimal batch in not only a timely fashion but also one that could take advantage of the discounted rates.

Apexon's brief was therefore simple; find a way to shrink the number of possible configurations down to a smaller, workable set of optimal ones and select the best configuration from this smaller set, considering both equipment and timing constraints.

THE SOLUTION

INTEGRATION OF MACHINE LEARNING INTO CONFIGURATION AND DISTRIBUTION

The data and analytics team determined that a custom machine learning solution was the best way to achieve desired outcomes.

Data being generated by the batching process would follow certain patterns. The key element was to find those patterns and apply them to the optimization metrics required. In this case, the team used unsupervised learning algorithms to find and group unusual patterns – for example, the constant equipment configurations and the batched material cost requirements.

Unsupervised learning

Unsupervised learning is the ideal way to integrate an automated process into logistics as it relies on methods that do not have “labeled” data. In other words, it looks for patterns that do not rely on human input. The algorithms can then group items such as equipment configuration that generate cost savings for distribution and apply that to the items to be batched.

This approach allowed the client to configure the packaging equipment to group batches of printed material for third party distribution. The algorithms work in tandem, feeding each other with outputs that optimize the solution and look for ways to improve it beyond the original brief.

For example, there were two types of algorithms working together – one genetic (simulating natural selection) and one hierarchical clustering algorithm with structural constraints (introduced to group the printed material into the most optimal for mail carrier routes). This tag teaming of algorithms thereby allowed the company to optimize equipment configuration and cost savings in one single process.

Partnership Platforms/Software



PROBLEM + CHALLENGE = SOLUTION

As distribution and logistics becomes ever more digitalized, companies that can optimize machine learning capabilities to reduce the time spent batching physical products will be a vital part of the ecosystem.

The solution for this printing and distribution company was designed to maximize the opportunities that automated processes can offer, with the optimized configuration time reduced to less than 90 minutes.

THAT LEADS TO TWO DEFINED RESULTS:



The time spent on equipment configuration and material batching is more attuned to the requirements of the customer.



The operational cost savings generated by machine learning and/or automated processes means that the company can offer its customers competitive pricing for those that join its cooperative mail program and, importantly, increase customer satisfaction via a more efficient distribution strategy.



Apexon is a pure-play digital engineering services firm focused on helping companies accelerate their digital initiatives from strategy and planning through execution. We leverage deep technical expertise, Agile methodologies and data-driven intelligence to modernize systems of engagement and simplify human/tech interaction.

We deliver custom solutions that meet customers' technology needs wherever they are in their digital lifecycle. Backed by Goldman Sachs and Everstone Capital, Apexon works with both large enterprises and emerging innovators — putting digital to work to enable new products and business models, engage with customers in new ways, and create sustainable competitive differentiation.

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