

Enhancing the In-Store Retail Experience

Trusted Analytics Platform
Internet of Things
Retail



Levi's tests an innovative solution that combines Internet of Things technology with advanced analytics based on the Trusted Analytics Platform

Since making the first pair of blue jeans in 1873, Levi Strauss & Co. has grown to become one of the world's largest apparel companies and a global leader in jeans. Today, Levi's continuously strives to improve the in-store experience by making sure customers and salespeople can find the products they need, when they need them. Working with Intel data scientists, the company launched a proof of concept to explore ways the Trusted Analytics Platform (TAP) can help salespeople quickly find misplaced items in a store so they can ensure those items are on the shelves, in the right spots, and ready for customers.

Challenges

- **Improve the in-store experience.** Help ensure customers can easily find the products they want and avoid missing sales due to misplaced items.
- **Build a foundation for generating customer insights.** Identify ways to better understand customer preferences based on in-store behaviors.

Solution

- **Proof of concept based on the Trusted Analytics Platform.** Intel team members designed and implemented a proof of concept with a solution incorporating radio-frequency identification (RFID) tags, in-store sensors, a gateway system, and cloud-based analytics built on TAP—an extensible open-source platform initially developed by Intel.

Technology Results

- **Efficient data management.** The gateway system uses analytics to help reduce the data traffic sent to the cloud for more detailed analysis.
- **Fewer misplaced items.** Using data collected by sensors, TAP algorithms help determine whether a clothing item is misplaced in a store. Business rules determine when to notify salespeople.

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Senior Vice President, Americas,
Levi Strauss & Co.

Business Value

- **Greater customer satisfaction.** Levi's can enhance customer satisfaction and improve the in-store experience with better inventory accuracy and visibility. Helps deliver superior customer service.
- **Fewer missed sales.** Levi's can avoid lost sales opportunities when customers are unable to find what they need.
- **Enhanced efficiency.** Analytics insights can reduce the time and effort to find misplaced items. Store managers can also use insights to optimize their sales personnel resources.
- **Improved inventory accuracy.** Stores can more accurately quantify stock levels, which will help them request the right amount of replacement products and avoid out-of-stock situations.

Striving to Deliver a Better Customer Experience

At Levi's, delivering a strong in-store experience is a top priority. "Consumers today can shop in more ways than ever before," says Noah Treshnell, Senior Vice President, Americas, Levi Strauss & Co. "When our customers choose to come to physical stores, we want to make sure they experience all the benefits of in-store shopping. They should be able to try on a new pair of jeans before they take them home, check out new styles, and experiment with combinations of clothes—all things that might be more difficult when shopping online."

Unfortunately, misplaced items can present challenges to that strong experience. "Over the course of a day, customers occasionally place items in the wrong spot in the store—after deciding against a pair of jeans, a customer might inadvertently leave

the jeans next to the shirts," says Treshnell. "We need ways to help our salespeople quickly find misplaced items, so they can put those items back where they belong and we can avoid losing sales."

Locating misplaced items is particularly important for apparel retailers. Unlike other types of retail businesses, apparel retailers often keep only a few of each unique product type—or SKU—in the store. The business might have 50 pairs of each type of jeans in the store but only two or three of each size. "It's critical that every item is accounted for," says Treshnell.

Finding Misplaced Items with the Trusted Analytics Platform

Levi's turned to Intel to explore new ways to address the challenges of misplaced items. Intel data scientists recommended implementing a solution that combines Internet of Things technology with advanced analytics to help determine when items are no longer in their correct places. Together, Levi's and Intel launched a proof of concept in Levi's flagship store.

Levi's team members equipped clothing items with small, inexpensive RFID tags provided by Intel. The Intel team installed antenna sensors in the ceiling of the store that enable continuous, real-time monitoring of the location of the RFID tags. A gateway system located in the store collects data from the sensors and then sends a smaller set of data to the cloud for detailed analysis.

The gateway system conducts some basic data analysis to reduce the amount of data transmitted over the network to the cloud. Instead of sending the thousands of pings per second recorded by the sensors, the gateway system reduces that number to approximately 25 per second. It sends only data coming from the

sensors nearest to each item and data that indicates changes in location.

The cloud-based environment uses algorithms included with the Trusted Analytics Platform (TAP)—an extensible open source platform initially developed by Intel. The Intel data scientists integrated the TAP algorithms together in a way that enables Levi's team members to discover whether items are misplaced.

The algorithms use data collected overnight (when products are stationary) to determine the correct locations for groups of items, such as jackets, belts, or a particular jeans style. During store hours, as sensors monitor the location of items, the algorithms determine whether an item is located in the correct location for its group. If a pair of jeans is on the proper shelf, or within arm's reach of that shelf, no action is required from a salesperson. But if that pair of jeans is misplaced or left in a fitting room, the algorithm could generate an alert on a mobile app that an action should be taken.

The algorithms can incorporate business rules to determine which action is taken and when. For example, a store might decide that moving a shirt back to its proper rack can wait until the end of the day, whereas moving the last pair of jeans in a particular size is an immediate priority.

Increasing Customer Satisfaction and Avoiding Missed Sales

Deploying this solution in production could help Levi's increase customer satisfaction. "We want to make sure customers can find a particular size or style right away," says Treshnell. "If we help salespeople identify misplaced items quickly and return them to the right location, we can provide a much better overall shopping experience. Customers will no longer be frustrated since they'll be able to easily find the styles and sizes they're looking for."

Providing that experience will benefit Levi's as well. "Making sure items are in the right place will help us avoid the missed sales that can result when customers cannot find what they're looking for," says Treshnell.

Enhancing In-Store Efficiency

The insights gleaned from the solution can also help enhance the efficiency of store operations. For example, analytics insights can reduce the time it takes for salespeople to find misplaced items. "If a salesperson knows that a pair of jeans has been mistakenly placed near the jackets, he or she can find those jeans fast," says Treshnell.

Managers might also determine that items are more likely to be misplaced during certain hours or days. As a result, managers might decide to assign salespeople to finding and reshelving misplaced items during those times. "The more information we have about the ebb and flow of business in our stores, the better we can optimize our personnel resources," says Treshnell.

Building a Foundation for Additional Use Cases

Though this proof of concept focused on misplaced items, the same solution could be used to assist retailers in a variety of additional ways. For example, the Internet of Things technologies could help stores improve the accuracy of store inventory. "When customers can't find what they want on the sales floor, they might ask salespeople for assistance," says Treshnell. "By improving the accuracy of our inventory system, we can help our salespeople provide the right answer, right away. They can immediately find an item or offer an opportunity to order it."

Using Internet of Things technologies in conjunction with TAP algorithms could also help managers and

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salespeople better control front- and back-stock replenishment. Salespeople could receive alerts when it's time to replenish jeans on a store shelf using stock from a back room. As a result, stock will be more readily available and visible to customers.

In the future, stores could use this solution to help generate new customer insights—similar to those that have been available through online transactions. “We could determine which combinations of items customers are trying on in the store, and which combinations are

most frequently purchased together,” says Treshnell. “Understanding these and other customer behaviors can help us optimize marketing, promotions, and display decisions. Overall, we can deliver a strong, targeted experience in our physical stores, just as we do online.”

Learn More

To learn more about the Trusted Analytics Platform, visit www.trustedanalytics.org.

Lessons Learned

In many cases, organizations can draw on existing TAP algorithms to quickly deploy a solution that combines Internet of Things technologies with advanced analytics. Collaborating with experienced data scientists, such as the Intel team members working on the Levi's proof of concept, can help organizations tailor analytics to specific business use cases and maximize the value of TAP.



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