Fashion Retail Planning: Build Your 2022 Roadmap to Omni-Channel Excellence

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About the eBook

Dear reader,

In 2021, fashion retailers had to tackle many great challenges between the ongoing effects of the pandemic, supply chain shortages and consumers' rising expectations around omni-channel experiences.

But with every challenge comes an opportunity.

Omni-channel retailing is becoming the gold standard for success. I believe in 2022 and beyond, it will be paramount for retailers to explore new ways to deliver the omni-channel promise and embrace an end-to-end approach to their planning strategy and execution.

Predicting and optimizing every aspect of customer demand and matching it with the inventory at the right place will become necessary to remain relevant and resilient.

As we look ahead to 2022, we created this eBook to help fashion retail industry leaders understand the key dynamics that will impact their planning strategies and provide actionable insights to help them plan and build their roadmap for the next year.

Here you will find the success stories of high-performing fashion retailers. You will discover how they have accelerated their demand forecasting, allocation, replenishment, and markdown capabilities, reaping substantial rewards along the way. As a result, today not only do they enjoy gross profit improvement, lost sales reduction, and better forecasts, but they also solve their omni-channel challenges.

As we move beyond the crisis mode of the pandemic - into a new paradigm where innovation, AI and advanced analytics have become the foundation for growth and success, we invite you to a profit-optimized omni-future.

Like a new moon landing, we're pushing the boundaries for what's possible in inventory planning in the retail industry, and with this eBook, we welcome you to our journey.

Prof. Gurhan Kok
Founder & CEO of Invent Analytics

Article

01

3 Major Challenges for Omni-Channel Retail Inventory Planning

For many years, the single-channel brick-and-mortar retail model meant that supply chain processes were fairly straightforward. Occasionally, things might go slightly wrong, such as a store being out of stock of the shoes your customer wanted in her/his size. In that case, generally the retailer would lose the sale.

In the omni-channel retail world, things are much more complicated. Today when a customer buys shoes online, their order can be fulfilled from a central warehouse, a dedicated fulfillment center or a local store that caters exclusively to online shopping. The customer may want the shoes to be delivered to their home or office. They can also choose to send them as a gift to another address or collect from their preferred store.

Now, it is vital to give customers what they want, when they want it and where they want it. Yet this level of customer centricity is placing huge pressure on retailers, as they have to ensure their supply chains can deliver the promises they make.

Here are 3 of the main challenges retailers face in adapting their inventory planning processes to win in this new omni-channel world.

1 Accurately forecasting omni-demand

Identifying and forecasting omni-channel demand is no easy task. Hundreds of factors determine the inventory needed for each store or warehouse. Some events have predictable timings and can be planned in advance, such as Christmas or Black Friday. But some other events are more difficult to predict.

For instance, fear of Covid-19-related lockdowns prompted panic bulk-buying of supermarket staples, such as pasta and toilet paper. When a celebrity appears (at a live event or on Instagram) wearing a particular coat, dress or nail polish, the item can sell out in-store and online within a few hours. In an increasingly data-driven online world, customers receive product recommendations based on anything from their previous purchasing patterns to local weather forecasts.

On the other hand, more retailers realizing that predicting physical store sales is no longer enough. They need to consider the effect of inventory transactions such as BOPIS (Buy Online Pick-Up In Store) or home delivery from store. While considering these, they should also pay attention to the timing gap between the sales order and fulfillment order.

2 Serial returners

When customers buy online, they are much more likely to return items. According to recent Barclaycard research, around 30% of online shoppers deliberately over-purchase and subsequently return unwanted items. Another 19% also admitted to ordering multiple versions of the same item (in different sizes or colors), so they could make their mind up when they're delivered. Therefore, it's important to consider an increasing return ratio as a critical factor in forecasting and inventory planning both at stores and DCs.

3 Defining and accounting for lost sales

The way retailers define lost sales in an omni-channel environment continues to evolve and has many implications. In the old world of retail, unavailability was calculated as lost sales by taking into account factors such as the day of the week and substitute goods.

Today, if a customer wants to buy a new pair of shoes, but their favorite footwear store has run out of the size, they still can place the order from an "Endless Aisle" to be delivered to their home. However, depending on the delivery time, the lost sales probability changes. So, how should this situation be interpreted and taken into consideration for managing inventory and replenishment decisions?

Rethinking the role of the stores to improve omnichannel fulfillment performance helps retailers to use their inventory more efficiently and reduce lost sales. It also helps to deliver more convenient shopping experiences. A global footwear retailer from Europe is a great example of that. The retailer uses iPads at the stores to help its customers explore the company's full assortment. With the iPads, customers can place orders online for the desired products at the stores. As a result, iPad orders lead to a purchase in about 30% of the events in which a size was missing. It also contributes about 5% of the store sales.

As another example, an online order that's fulfilled from a local store may not be packaged with the necessary care and attention. According to a study, just one poor customer experience is likely to push 89% of customers to start doing business with a competitor. What is even worse is that dissatisfied customers are likely to tell their bad experience to others and which can eventually cause a low Net Promoter Score of the retailer. So, how should this Net Promoter Score taken into consideration in inventory planning and supply chain decisions?

All these scenarios, and the extensive customer-centricity that drives them, pose significant inventory planning challenges for retailers. Yet, defining the impact of multiple events, determining how they will affect future demand, ensuring efficient omni-channel planning are essential to delivering on customer experience promises and supply chain efficiency.

Inventory optimization takes the center stage

To meet these expectations of the omni-customers, retailers need to leverage innovative technologies, create new planning and fulfillment methods to enable convenient, predictive, and cost-effective deliveries to their customers, and ensure inventory planning is profit optimal. Embracing and implementing AI-powered inventory optimization solution such as Invent Analytics' Omni Plan, is at the heart of this new world supply chain operations.

An AI-powered, omni-channel replenishment solution will help retailers to assess and predict customer demand and integrate omni-channel fulfillment with store and DC inventory management. Through continuous learning, AI can also enable proactive, flexible and optimal inventory planning in response to evolving demand patterns at an individual store or DC level.

As the world starts to recover from the Covid-19 crisis, the retail industry will need to evolve and become even more customer-centric. That means inventory optimization will take center stage. It is no longer simply an enabler; it is a key business process that will determine who will (and who won't) build a competitive advantage through a differentiated retail customer experience.

Prof. Gurhan Kok
Founder & CEO, Invent Analytics

Article

02

Do You Have the "Demand Forecasting" Capabilities to Meet Your Omni-Customers' Demand?

There has been a revolution in retail. It's been driven as much by consumers embracing technology as it has by innovative business models. In fact, many retailers have failed to keep up with customers' changing shopping habits and are still struggling to develop and use accurate demand forecasting for inventory planning.

In short, your customers have become omni-channel shoppers and they now expect you to deliver an omni-channel experience at every touch point, online and in-store. If you can't provide the right inventory your customers want at a place and time that suits them, you will lose the sale. That means you need to be able to predict the most efficient way of getting your inventory to your customers when they demand it.

All forecasting systems on the market look at historical buying patterns, sometimes going back three or more years. Many will take account of environmental and social factors, such as weather, holidays or the day after payday. This became the classical method – but it is wedded to the view of the physical store as a standalone entity, where physical sales happen in real time, not part of a dynamic ecosystem shaped by changing consumer preferences.

Hours or days can now separate the purchase point from the moment when the actual inventory item transfers from the retailer to the consumer. That physical delivery location is also increasingly distinct from the sale point (say online) and fulfilment point (a warehouse or store). On top of that, handling customers' returns add another level of complexity for retailers. Today, stores handle multiple returns from their own in-store sales and from other purchase points.

Omni-demand forecasting is smarter

As a result of these changes in consumer behavior, demand forecasting must take a multi-dimensional, approach that doesn't just account for logistics and efficiency. It must also understand and predict your customers' preferences for trying, buying, receiving, and returning goods. That requires a more granular analysis combined with probabilistic forecasting techniques to maximize sales and improve inventory turns.

There are now a few forecasting systems using AI models and machine learning to predict consumer demand. However, even these can rarely handle the complex data structures required for omni-channel demand forecasting and inventory planning. Invent Analytics adds 3 further levels of sophistication to standard AI-based forecasting to create more accurate forecasts and plans: the first is demand probability, the second is that all important omni-channel element and the third is returns forecasting.

Forecasting at SKU-fulfillment time and zip-code level for each fulfillment preference:

1 Omni-channel fulfillment forecasting

It takes account of all transactions such as whether consumers prefer the BOPIS (Buy Online, Pick Up in Store) option and whether the order is fulfilled by a central warehouse or stores acting as hubs. It also looks at delivery times and calculates how much next-day delivery demand might come from the district around the store. This can help you reduce lost sales by maximizing availability and fulfillment options.

2 Probabilistic Forecasting

It doesn't provide just a single quantity figure. Instead, it calculates the probability of all possible inventory transactions and potential quantities. This can help you reduce lost sales, inventory holding, and fulfillment costs.

3 Return forecasting is now vital to reducing inventory holding costs.

The return ratio for ecommerce sales has shot up in recent years from around 3% to 20%, as people now buy multiple versions of the same product to try out at home. They then return what they don't want to a central warehouse or, as is increasingly the case, to their nearest store. Demand forecasts and inventory plans must factor in these returns, in the typical 30-day return window.

Ozgur Karabulut
Head of Solutions, Partner,
Invent Analytics

Article

03

How to Forecast Demand Accurately for the Next Season: The Billion-Dollar Fashion Retail Question

Pre-season planning is one of the most complicated problems in forecasting. Every year, fashion retailers face the challenge of accurately predicting future demand for the next season.

What will be the baseline demand for a new item that will be introduced to the market six months from now on?

This is a billion-dollar question.

Fashion retailers need to recognize and accept that uncertainty is a fact of life in demand forecasting. The first step for retailers to handle this is by segmenting products using advanced prescriptive and predictive analytics such as clustering algorithms to segment products and defining a supply chain strategy for each segment.

When planning for items with high forecast error, there is very little information available on what will be prevailing fashion in the future.

Forecasting for basic items such as a white t-shirt is relatively easier than fashion items, as forecasts can be based on the sales history of similar items.

But consider forecasting for a new fashion item such as a floral printed neon dress. That's when things get more complicated.

Fashion items have short life cycles, long lead times, and no historical data to draw upon. Rapidly changing customer preferences, new competition, macro influences, and 'see now buy now' trends make it incredibly hard to predict demand accurately in the long run. That's why judging how many units a fashion retailer will need to order from the supplier becomes more like guesswork.

Guess wrong, and you will either run out of inventory -which is a deal-breaker for many consumers, or stock too much inventory that will need to be marked down later.

To our knowledge, there isn't 'one right way' to accurately forecast demand for new items in fashion. But these days, data is plentiful and there are different approaches that retailers apply.

Here are 6 commonly used methods.

1 Relying on designers, buyers, and merchandisers' opinion

Despite all the developments in AI-based demand forecasting, many fashion retailers still use a gut-based approach and trust their buyers, merchandisers, and designers to make pre-season forecasts.

Merchandisers read the market, buyers pay visits to production and design houses, and designers use their personal observations of what people will buy. In this method, long-term forecasts are limited by intuitions. This is more of an art and creativity-based method rather than an accurate science-based approach.

Besides, every designer or buyer can work on a narrow segment of the merchandise. For example, one can be working on the scarfs, whereas the other can be working on the crop tops. Therefore, using this method alone, fashion retailers can't foresee the effects such as cannibalization or product substitution accurately.

2 Finding similar items in the past and projecting from there

Fashion retailers might have similar products that are close enough to make comparisons. Think of a retailer who wants to forecast demand for a 'never-out-of-stock product' like a black dress for the next season.

Typically, the retailer has access to the historical data of existing or previously sold black dresses for the past few years. Looking at previous years' data can help in forecasting demand at sufficient levels for existing black dresses. But they can't be 100% efficient in predicting demand for a new item. Because of the fast-changing nature of the fashion industry, it's quite impossible to fulfill the demand of tomorrow's consumers if forecasts are based solely on yesterday's data of similar products.

3 Working with a trend forecasting agency

Unlike other retail industries, fashion is heavily trend-driven. Fashion retailers can work together with data-driven trend forecasting companies that offer predictive analytics on upcoming trends and products.

Using trend forecasting to predict fashion direction and analyzing social media and fashion week trends can be helpful in better demand planning. However, this method is more likely to work for short-term forecasting, as trends can change seemly overnight. And the question remains: is this data applicable and reliable for forecasting items that will be in the market 6 months or a year from now?

4 Using product attribute and image processing data

As fashion retailers don't have detailed information about the actual products for the next season, they try to take advantage of image processing and attribution data to find similar items.

They use these items' features, design attributes (such as patterns, color, fabric, materials, and so on) also visual similarities. And generate long-term forecasts using machine learning models.

5 Getting customers' insights on upcoming fashion trends

Today retailers meet their customers through various channels, survey them to understand their preferences better, and use the input to identify the trends they're likely to follow in the upcoming season. They then use this data for the next season planning.

It's always good to use customers' opinions, analyze where they are getting inspired and use this data to predict trends. This was an efficient method in the pre-AI and analytics revolution era. Today future demand cannot be modelled purely based on customer preferences and predictions alone.

6 Combining all the methods into one holistic approach

Next season forecasting has long been an art form, but with the growth of AI-powered advanced prescriptive, predictive, diagnostic and descriptive analytics, it now becomes more of a science. Although forecasting continues to be a complex task with a track record of high error percentages, one thing is clear: Fashion retailers need to continuously look for new ways and methods and become more efficient and agile in how they forecast demand for the next season.

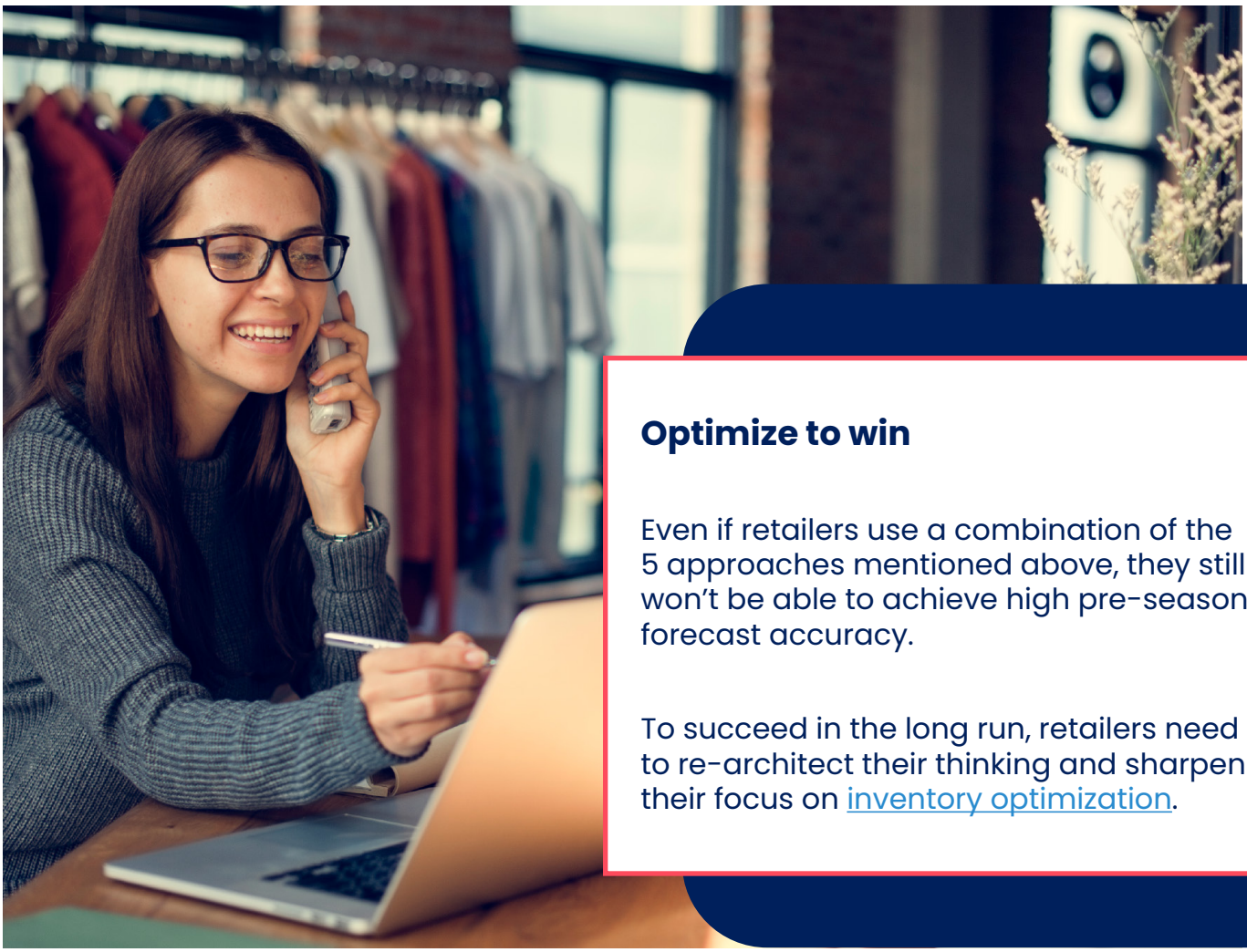
Better pre-season forecasting, better planning

At Invent Analytics, we believe efficient pre-season planning is the first step towards becoming a profit-optimized business. Because it leads the way to better decision-making, planning and execution. Instead of using a stand-alone method or choosing between analytics vs. human, we recommend fashion retailers to use a combination of these 5 approaches.

To make efficient pre-season planning and generate more accurate forecasts, companies need to use all relevant insights and leverage AI and smart analytics capabilities to the fullest. They need to adjust their supply chain strategies, review demand bi-weekly and update their production plans accordingly.

Instead of committing to a specific product 6 months, 9 months or a year before the next season, they should focus on becoming more agile and responsive. By producing semi-finished items in small batches until they get better market signals and tailoring their supply chain strategies accordingly is a strategy that works for successful global fashion retailer

Koray Parkin
Inventory Solutions Director, Invent Analytics



Optimize to win

Even if retailers use a combination of the 5 approaches mentioned above, they still won't be able to achieve high pre-season forecast accuracy.

To succeed in the long run, retailers need to re-architect their thinking and sharpen their focus on inventory optimization.

Article

04

Omni-Channel and Retail KPIs: The Good, the Bad and the Future

To gain marketplace advantage, many retailers have adopted an omni-channel strategy in a bid to both make shopping easier for customers as well as fulfilling demand more quickly and conveniently.

The strategy entails broadening sales channels, unifying the customer experience across channels, and harnessing the supply chain to deliver product through multiple paths and locations. To fully realize marketplace advantage, retailer omni-channel skills must evolve:

1. From **transactional competency** (systems and processes deliver what is expected).
2. To **economically sound** (can the platform be measured & managed profitably).
3. To **competitively leverageable** (does the capability deliver competitive advantage).

After an initial flurry of activity, many retailers have attained stage 1 (transactional competency). They can deliver an omni-channel sales experience to the customer and have enabled their supply chain to deliver product in a multitude of ways. But many are struggling on stage 2, making the platform economically sound, which is a requirement to attain stage 3 (competitive leverage).

Let's examine some of the challenges in moving from stage 1 (transactional competency) to stage 2 (economic soundness).

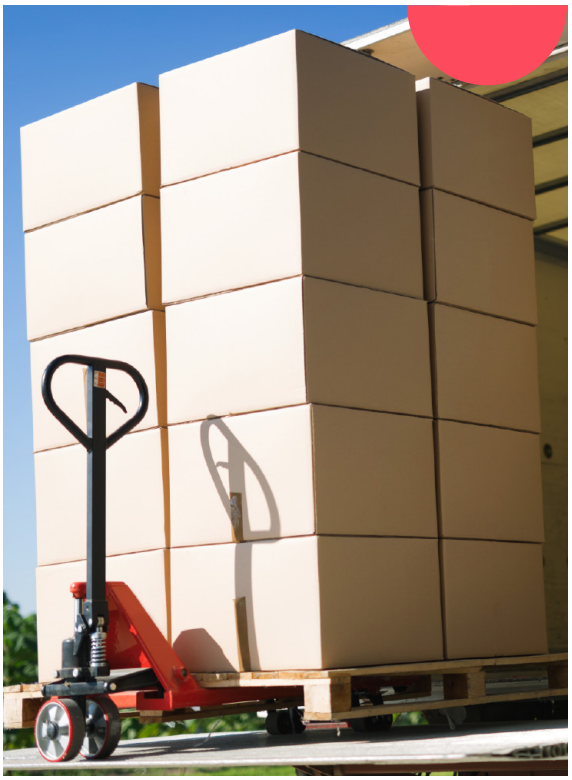
First, let's talk about the nature of the change. To use an analogy, the communications industry made a similar change 40 years ago. Prior, telecommunications were point-to-point (PTP) needing a single circuit to send data or complete a call. In the late 1970's another approach came into being. It was the internet protocol (IP) and it worked in an entirely different way. It packetized communication information and dynamically routed the packets through different paths reassembling them at the end. As a result, the transport mechanism changed from point-to-point to a network infrastructure.

How is this change in telecommunications like the change to omni-channel retailing?

In the traditional model, we pretty much had a linear, point-to-point distribution system. Product flowed from a manufacturer to a DC then to a store where a customer went to purchase it. Essentially a series of nodes. And measurement and management of that linear flow devolved into measuring and managing each node in the chain. And it was easy to link system/chain performance to that of the nodes.

In the move to omni-channel retail, we've moved from linear flows to a network fulfillment model. The fact that product can flow from many places to many places means that we have enhanced our ability to serve the customer with our existing inventory. That was the philosophical underpinning of omni-channel (on the supply chain side) that was most attractive - making tighter inventory seem bigger by putting it into motion and leveraging it more broadly.

The problem facing many retailers today is that those capabilities do not come for free. Essentially, meeting the economically sound challenge means being able to holistically measure and manage the NETWORK not just the nodes in the network. And that is proving to be difficult for many retailers.



So, what do KPI's have to do with it? For many retailers KPI's define both how they measure and how they manage the business. People are trained to track KPI's and, when they fall out of range, take corrective action. The fact that many KPI's can be localized has enabled the distribution of management responsibilities to both specific business units as well as functional areas.

With the arrival of basic omni-channel capabilities, we need to ask whether our historical KPI's provide with the perspectives to effectively manage the supply chain. How well our KPI's help us manage an omni-channel supply chain depend on two key questions:

1. Are our KPI's **complete**?
2. Can our KPI's be expressed in a **common metric**?

Completeness

What do we mean by "completeness?" A complete set of KPIs address ALL drivers of total performance. A complete set of KPIs measures all factors that impact the financial performance of a retailer.

Relative to a specific business decision, we don't always need to address every factor that drives financial performance. Many are fixed costs that aren't directly affected by the decision. But we do need to address ALL costs that are impacted by the decision if we want to completely understand the ramifications of our decisions (and plans that support those decisions).

Historically, for inventory purposes, retailers focused on two key KPIs representing customer service (e.g. in-stock, service level…) and financial efficiency (turn, sell-through…). Certainly, other factors are required for "completeness" such as labor cost and transportation but, for most retailers, these are "fixed" costs and not directly linked to unitary inventory decisions. As a result, retailers generally manage those costs as system costs separate from the inventory decision and focused on customer service and inventory efficiency as they two key KPI's to manage their inventory levels.

How has omni-channel impacted the requirement of "completeness?" One of the key tactics of omni-channel is inventory "fromanywhere-to-anywhere" which essentially makes inventory very mobile – at a cost. Unlike the traditional brick-and-mortar transportation cost (DC to Store, for example) which was managed as a fixed, system cost, the omni-channel "from-anywhere-to-anywhere" logistics cost is at the item level and is a variable transactional cost.

So, to be complete, we need to explicitly account for that transportation cost. And we need to do so both in our planning (where & when to place inventory) and fulfillment (where to pull inventory from to service a sale) decisions.

Common Metric

Once we have identified a complete set of KPI's that address all of the impacts of our inventory decision, the next challenge is how we measure them. Here's where traditional KPI's, even for traditional brick-and-mortar retail, come up short. Let's consider the two key KPIs that retailers have traditionally used to measure inventory:

1. Inventory fulfillment of customer demand.

This can be expressed in several ways: in-stock, service level, demand fulfillment. All are designed to measure how well the inventory is serving the customer.

2. Inventory financial efficiency.

For long-life replenishment products, this is often defined as inventory turn. For shorter-life items, a sell-through percentage is often used to measure inventory efficiency. Both measures are designed to express how well the inventory is performing financially.

In looking at these two metrics, one immediately notes there is no easy way to trade-off between the two KPI's. A retailer cannot easily answer the question "if I raise turn from 3 to 3.5, what happens to in-stock?" Not only is it difficult to answer this question, the two concepts don't even share a common measurement regime.

Omni-channel compounds this problem in many ways. First, by putting inventory into motion at a transactional/granular level, omni-shipping costs is an added factor that must be considered. And that factor needs a seat at the KPI table. Second, how do we now measure the customer service for a level of inventory at a location if our fulfillment model says we can satisfy demand with "inventory from-anywhere-to-anywhere?"

So, let's recap what our KPI's have become in this omni-world. There is a KPI for customer service that is a %. There is a KPI for inventory financial efficiency (turn) and that is a number. And, finally, there is a KPI for omni-logistics cost and that is in $'s. If we can't easily answer the "If I raise turn from 3 to 3.5" question, the questions omni-channel raises are even more difficult to solve without some significant changes.

So, how have retailers balanced KPI's in the past? Basically, through a combination of trial-and-error and the development of an empirical memory of what worked and didn't. While there are many sophisticated tools that retailers have used, at their root, the tools asked to retailer to answer the question "What service level should we target?" and that answer was based on past experience and retailer knowledge.

The Future

The problem facing retailers today, and into the future, is that the approach of the past is too slow, too cumbersome, and too imprecise for the complexity that omni-channel creates. No longer can they make in-market changes to measure their impact and develop an experience base to drive their policies.

The omni-supply chain problem is more complex to analyze, measure and manage. In addition to traditional customer service and inventory productivity challenges, many retailers now face omni-logistics costs in the 1000s of basis points (in the order of 10% of sales or more). With "from-anywhere-to-anywhere" as a fulfillment framework, the analytical challenge is daunting. Altogether, it's not your parents supply chain.

So, how can retailers solve this problem and move to a better future? I'd propose these key steps:

1 Strategy

- Move quickly focusing on improving decision quality as they impact financial performance
- Leverage existing transactional systems to reduce risk and shorten development time
- Be willing to reconceive the roles of people and systems

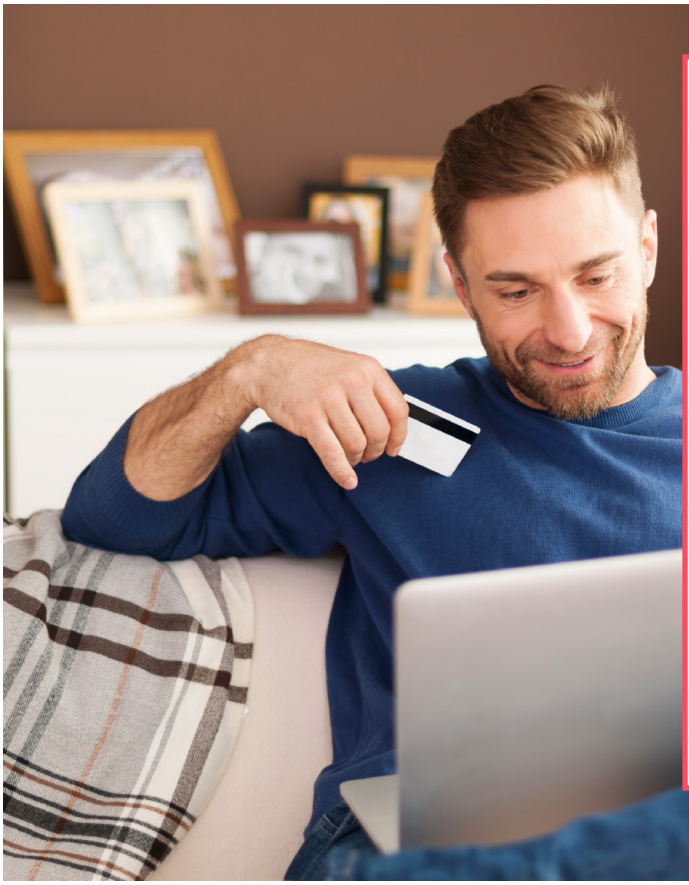
2 Analytics

- Understand ALL factors that impact costs and be sure to incorporate their measures into reporting, models, and decisions
- Convert these factors to a common measurement regime – specifically economic measures. Use an economic measure of customer service (e.g., lost margin dollars), use an economic measure of inventory efficiency (e.g., inventory holding cost), and variable fulfilment costs to convert all KPIs into economic terms
- With financially expressed KPIs, leverage advanced analytics and optimization approaches to enable measuring and modeling total system costs. Use that cost model to economically optimize TOTAL costs and drive improved profitability.

3 Systems

- Move to a layered architecture segregating transactional activities from decision activities
- Implement strong change control for core transactional systems. Focus on bullet-proof reliability
- Focus on speed and flexibility for decision systems. Ensure that they can quickly respond to changing business models and requirements.

Jiri Nechleba
Board Member, Invent Analytics



By adopting a profit framework, where:

Omni Profit = Expected Sales - Lost Margin - Cost of Inventory (average or leftover) - Fulfillment costs

Retailers not only create a measurable omni-channel framework but put into place a financial infrastructure that will flexibly guide them in quickly evolving their supply chain and create an **economically sound** omni-channel driven business.

Those that do are also more likely to gain **competitive advantage** as they move forward.

Case Study 01

Iconic Fashion Retailer, Mavi, Achieves 9.6% Revenue Growth with Invent Analytics

With a presence in 33 countries including, the USA, Canada, Germany, Russia, Australia, and Turkey, Mavi is among the leading premium denim brands. To increase availability, have flexible allocation management and efficient inventory visibility, Mavi needed superior inventory and markdown optimization capabilities. The retailer also aimed to increase gross margin and sell-through.

To achieve its mission, Mavi turned to Invent Analytics, a global provider of AI-powered retail supply chain solutions dedicated to the retail industry.

Mavi rolled out Invent Analytics' AI-powered inventory optimization solutions, including Allocation Optimization, Replenishment Optimization, Transfer Optimization, and Markdown Optimization. As a result, leading fashion retailer has maximized profitability, increased availability, and reduced lost sales with better inventory planning and markdown optimization.

9.6%
Revenue growth

10.6%
Gross margin growth

"With Invent Analytics, we have achieved remarkable business results. Invent Analytics delivers speed to value, understands our operational constraints, and uniquely tailors their inventory optimization solutions to meet our needs.

Sinan Sefai
Chief Sourcing & Supply Chain Officer, Mavi

The challenge: increasing inventory optimization efficiency

Founded in 1991 and selling its products through approximately 4,500 sales points, including 439 stores, Mavi is recognized as one of the highly successful global lifestyle brands. As a leading premium denim company, Mavi runs an omnichannel model. It offers its products through a directly operated retail network with stores located in major international fashion centers, department stores, and online retailers, including Bloomingdale's, Nordstrom, Simons, Amazon, Zappos.com, Zalando.com, and David Jones.

To keep the customer experience at a high level with an increasing store and product count, Mavi needed much more agile and fast decision-making systems. Invent Analytics supported these decisions with maximum profitability, minimum time spend and more reliable conclusions.

Choosing Invent Analytics' Inventory Optimization Solutions

Mavi had the vision of offering new products to their customers without compromising accurate inventory management. With that, the company aimed to strengthen its brand loyalty, gain new customers, and increase sales.

To bring their ambitious goals to life, Mavi needed a new set of solutions with:

Deeper Analytics:
User-friendly systems to drill down to data flexibly and improve decision making,

New Dimensions:
AI-based advanced analytics for better inventory optimization,

Autonomous Systems with the Advanced Reporting Capabilities:
To avoid man-hour spent looking into historical data and focus on exception management.

Following extensive market analysis and assessment cycle to select a partner for this project, Invent Analytics was chosen as the best option, aligning to Mavi's goals.

> **Invent Analytics provides tailor-fit solutions to retailers' problems. Its fashion-retail industry-specific expertise and dedicated data analytics team are some of the other reasons behind our decision to partner with Invent Analytics."**

Sinan Sefai
Chief Sourcing & Supply Chain Officer, Mavi

Fast implementation, fast results

Mavi implemented Invent Analytics' AI-powered Allocation Optimization, Replenishment Optimization, Markdown Optimization, and Transfer Optimization solutions.

Invent Analytics delivered speed to value and did a fast implementation where data transition was handled carefully. There was an enormous data load during the initial implementation. And after going live, Mavi revised their internal infrastructure and data warehouse four times. Invent Analytics successfully adapted to the changes, including the data transition process for SAP implementation. During all the revisions, Invent Analytics' systems worked flawlessly.

KEY BENEFITS

Granularity: Forecasting on a size level, product attribute-based forecasts
Increased Forecast Accuracy: Bias & MAPE
Scenario Planning: Maximizing Gross Margin or Sell Through

The Impact

Profit-optimizing allocation and replenishment

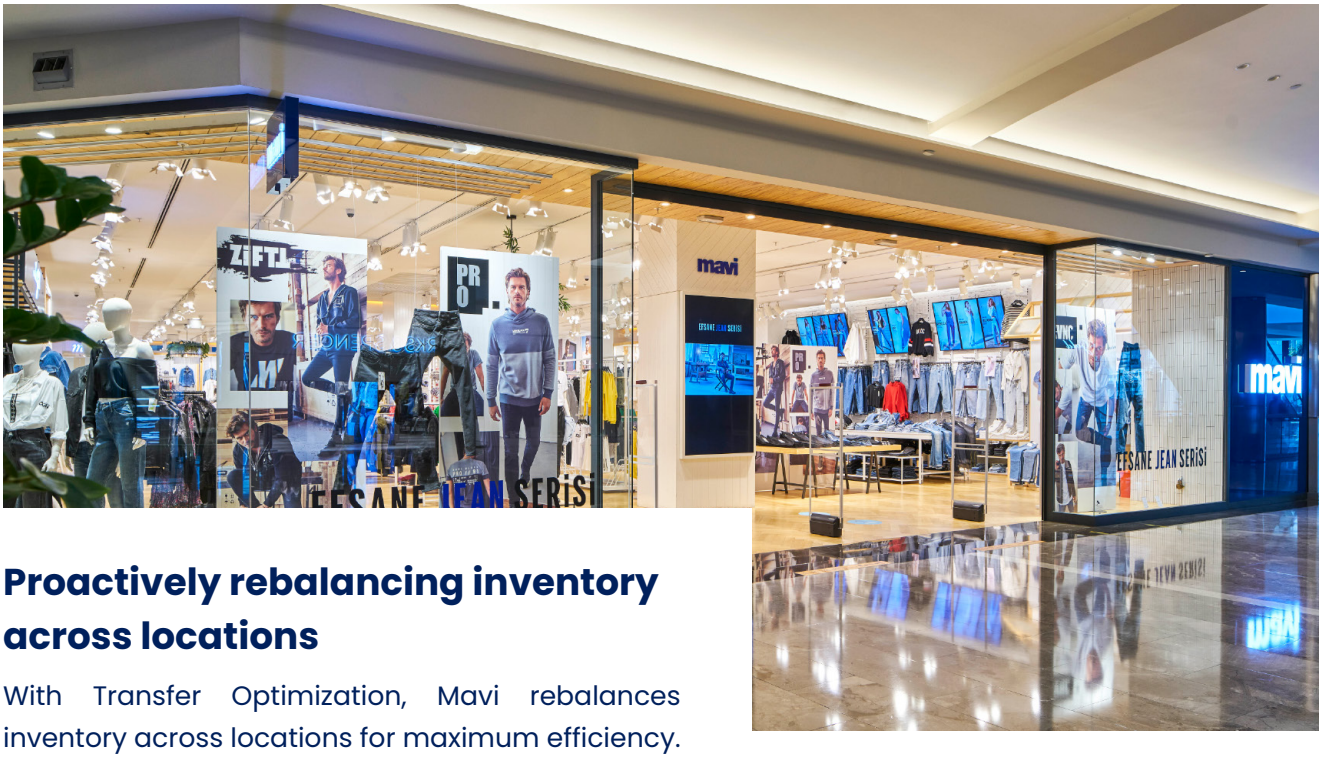
Mavi was quick to see the benefits of the solutions. Using Replenishment Optimization Solution, Mavi upgraded its inventory decisions from a judgment-driven, KPI-measured process to a financial optimization-driven and measured process.

Through automatic decision-making, the system now creates replenishment orders at the size breakdown. It takes into account various parameters, including sales history, lost sales, stock amount, and future events (such as special days, local events and markdowns) for each option.

Invent Analytics provides quarterly post-mortem product distribution and suggestions on which stores to increase the number of options from which product and price group and where to decrease, considering the sales, ST, GMROI, store type, MD, ITR, and store capacity.

Thanks to Allocation Optimization solution, specific size assortment and quantity for every single store are provided depending on their KPI performances and product attributes during the initial allocation.

As a result of the sophisticated allocation and replenishment systems, Mavi successfully optimizes inventory, achieves higher availability all while minimizing cost.



Proactively rebalancing inventory across locations

With Transfer Optimization, Mavi rebalances inventory across locations for maximum efficiency. The retailer makes optimized transfer decisions for more than 2000 options and 325 stores and improves sales for non-moving options.

"Invent Analytics' Transfer Optimization helps us dynamically manage the inventory imbalance between the stores. As a result, we can now sell products with higher turnover, higher GMROI, and lower markdowns and lower logistics costs." says Sinan Sefai of Mavi.

KEY INNOVATION

Pre-allocation / Flow-through: As pre-allocated shipments from vendors arrive at the DC's of the retailer, new product forecasts at the store-size level are revised using the most recent sales data of products with similar attributes.

This way, products flow to the stores fast without entering the DC, preventing the formation of backlogs at the DC's, and allocations are reoptimized to better match customer demand at the store-size level.

Increasing availability and reducing lost sales

Mavi treats lost sales as missed opportunities for higher growth in the following season.

The retailer uses Invent Analytics' out-of-stock item lost sales analysis as an input in the pre-season planning phase. Mavi tracks lost sales by each category and sends ten lost sales by each category weekly to category and planning teams

KEY RESULTS

Margin and Revenue Growth
With Invent Analytics, Mavi has achieved striking results and increased its revenue growth by 9.6% and gross margin growth by 10,6%.

The future with Invent Analytics

Mavi has ambitious goals for the future.

"We value our partnership with Invent Analytics a lot. For us, it's much more than a client/vendor relationship. We are partners working together to push boundaries in retail operations today and tomorrow."

Sinan Sefai,
Chief Sourcing and Supply Chain Officer, Mavi

The iconic retailer plans to implement omni-channel analytics, assortment planning and optimization in partnership with Invent Analytics.

BOYNER

Case Study

02

A Leading Multi-Brand Department Store, Boyner, Increases Sales by 4.8% Using Invent Analytics' Inventory Optimization Solutions

Invent Analytics helped Boyner, a leading department store retailer transform its business with Omni-Store Replenishment and Omni-Transfer Optimization solutions. Invent Analytics empowered the retailer to increase in-stock availability and sell-through, reduce out-of-stocks, and ultimately boost sales.

Boyner is a large department store chain serving its customers with large multi-brand department stores in various retailing concepts. Boyner's department stores houses hundreds of brands and various product lines. The range of products Boyner offers - including its own labels - range from cutting-edge fashion, jewellery, accessories, and cosmetics to home decoration.

Captured

4.8%

incremental sales with Transfer Optimization

At a Glance

Invent Analytics helped Boyner, a leading department store retailer transform its business with Omni-Store Replenishment and Omni-Transfer Optimization solutions. Invent Analytics empowered the retailer to increase in-stock availability and sell-through, reduce out-of-stocks, and ultimately boost sales.

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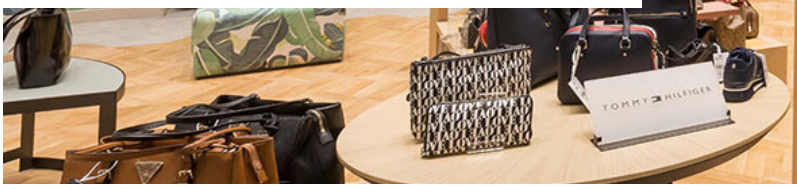
"In the customer-centric future, the requirements for better inventory management, flexibility, and adaptability will increase. For us, the strong support and innovation from Invent Analytics plays a critical role in maintaining our competitive edge in a rapidly shifting environment. By focusing our efforts to create measurable financial impact, Invent Analytics walks with us on the path of delivering significant value today and tomorrow."

Eren Camurdan,
General Manager, Boyner

The goal of improving inventory optimization capabilities

Boyner had the goal to maximize inventory turns and availability with profit-optimized inventory decisions. To bring this goal to life, Boyner needed to improve its ability forecast Store-SKU level demand more accurately and replenish in a profit-optimal manner.

On the other hand, due to working with hundreds of global brands and having a multi-brand operating model, Boyner has different unique constraints to its business dynamics. For example, long-horizon buy plans, long lead times for repeat orders, large store capacities require Boyner to have high initial allocation quantities. Thus, Boyner also wanted to increase its inventory productivity by rebalancing the inventory across locations with Store Transfer Optimization. The company wanted to be highly proactive and optimize store transfers to prevent overstocks, lost sales, and unnecessary markdowns. These goals were the key driver in the company's decision to move to more analytics driven inventory planning processes and implement more sophisticated replenishment and transfer optimization technologies.



Why did Boyner select Invent Analytics?

AI and advanced analytics capabilities I Tailor-fit Solutions I Continuous Support

To maintain the company's position as a leading department store retailer and better meet its customers' demands for product availability, Boyner decided to leverage the power of AI and analytics to enhance its inventory management capabilities. For this transformational inventory optimization project, the retailer selected Invent Analytics based on its technological expertise and advanced scientific know-how in retail industry.

"We wanted to work with a solution provider that can add value by bringing advanced capabilities," explains Eren Camurdan, General Manager at Boyner, *"Invent Analytics was the only company that provided tailor-fit solution that would adapt to our changing business needs. Their deep analytics capabilities and the collaborative approach to delivering value hold the key to fulfill our expectations to the fullest."*

How Invent Analytics helped Boyner to take dynamic inventory optimization the next level

One key element of Boyner's customer-centric approach was to make sure that their customers are able to find products that they would like to purchase and have the right sizes are available. As such, Boyner first deployed Invent Analytics' Omni-Replenishment Solution and fully automated its processes for all the stores. The robust solution helped Boyner positioning inventory smartly and reduce overall lost sales.

"Before Invent Analytics, our old transfer planning system wasn't effectively rebalancing inventory across locations for maximum efficiency. Our goal was to make better decisions on moving products from underperforming locations to other locations where demand is higher."

Arda Sirin,
Supply Chain & Merchandising Planning Director,
Boyner

The Results

Invent Analytics delivered new capabilities for Boyner in 4 key areas in just 4 months.

1 Enhanced replenishment capabilities

"Invent Analytics dramatically simplified a very complex process for us. Today, replenishment is just an email that we receive every morning from Invent Analytics." says, Arda Sirin, *"The solution empowered us to increase inventory turns and improve in-store availability in a very short time."*

2 Faster transfer decisions and minimized lost sales

Before the rollout of Omni-Transfer Optimization, it would take Boyner a couple of days to make the transfer decisions. By creating an optimum transfer plan using a profit-maximizing optimization model, Invent Analytics enabled the retailer to make the transfers within an hour. Accurate transfer orders helped Boyner to consolidate the right inventory at the right stores. It minimized lost sales and markdown losses by reducing broken assortment and creating efficiency by transferring inventory from stores approaching season-end to stores that are still in high-season.

3 Store-to-store transfers based on the probability of sales at Store-SKU-week level

With Invent Analytics, Boyner was able to address the costly problem of transferring inventory between stores and increased profitability.

Today the comprehensive Omni-Transfer Optimization Solution creating a profit-maximizing transfer plan identifies transfer pairs with the highest revenue impact and lowest transfer costs. By moving products from underperforming stores to locations where the same product sells faster, Boyner achieves maximum sales uplift with minimum logistics and operational cost.

4 Store-to-store transfers based on the probability of sales at Store-SKU-week level

Redesigned and streamlined transfer optimization has contributed a 4.8% increase in Boyner's sales. Arda Sirin, Boyner says, *"With, Invent Analytics' Omni-Transfer Optimization Solution, we've seen a significant increase in turnover. Invent Analytics helped us reach beyond optimizing KPIs and boost our financial performance."*

Providing continuous support every day

Throughout this transformational project, Invent Analytics team understood the challenges Boyner faced and applied proven methodologies and advanced capabilities in inventory optimization for Boyner. Working hand-in-hand with the leading retailer to accurately understand its changing needs, Invent Analytics continuously support Boyner and tailor-fits its solutions to take their business one step forward.

"In the customer-centric future, the requirements for better inventory management, flexibility, and adaptability will increase. For us, the strong support and innovation from Invent Analytics plays a critical role in maintaining our competitive edge in a rapidly shifting environment." says, Eren Camurdan, Boyner, *"By focusing our efforts to create measurable financial impact, Invent Analytics walks with us on the path of delivering significant value today and tomorrow."*

Case Study

03

A Major Apparel Retailer Improves Its Revenue by 2.4% and Lowers Markdown Loss by 2% with Markdown Optimization

Invent Analytics helped a leading apparel retailer in Europe increase its revenue, lower markdown loss, and achieve higher sell-through. Using Invent Analytics' AI-powered Markdown Optimization Solution, the retailer the retailer optimized its products' markdown path through the season and directly improved its margin.

The retailer serves its customers with 400 stores in +20 countries. The range of products the retailer offers include high-quality fashion for the whole family, footwear, to accessories. To excel at markdown strategies and achieve profit optimization throughout the season, the retailer turned to Invent Analytics, a global provider of AI-powered inventory and price optimization solutions dedicated to retail industry.

Revenue increase
6.9%
in markdown period

Revenue increase
2.4%
in total season

Lower
2%
markdown loss

+30x
Return on investment

Optimized product level markdown timing and depth

Accurate end-of-season forecasts and visibility

"Invent Analytics' tailor-fit solution leveraging full capabilities of AI and advanced analytics allowed us to optimize our markdowns and achieve maximum profitability throughout the season."

Head of Merchandising,
Leading Apparel Retailer

Why did the apparel retailer choose Invent Analytics?

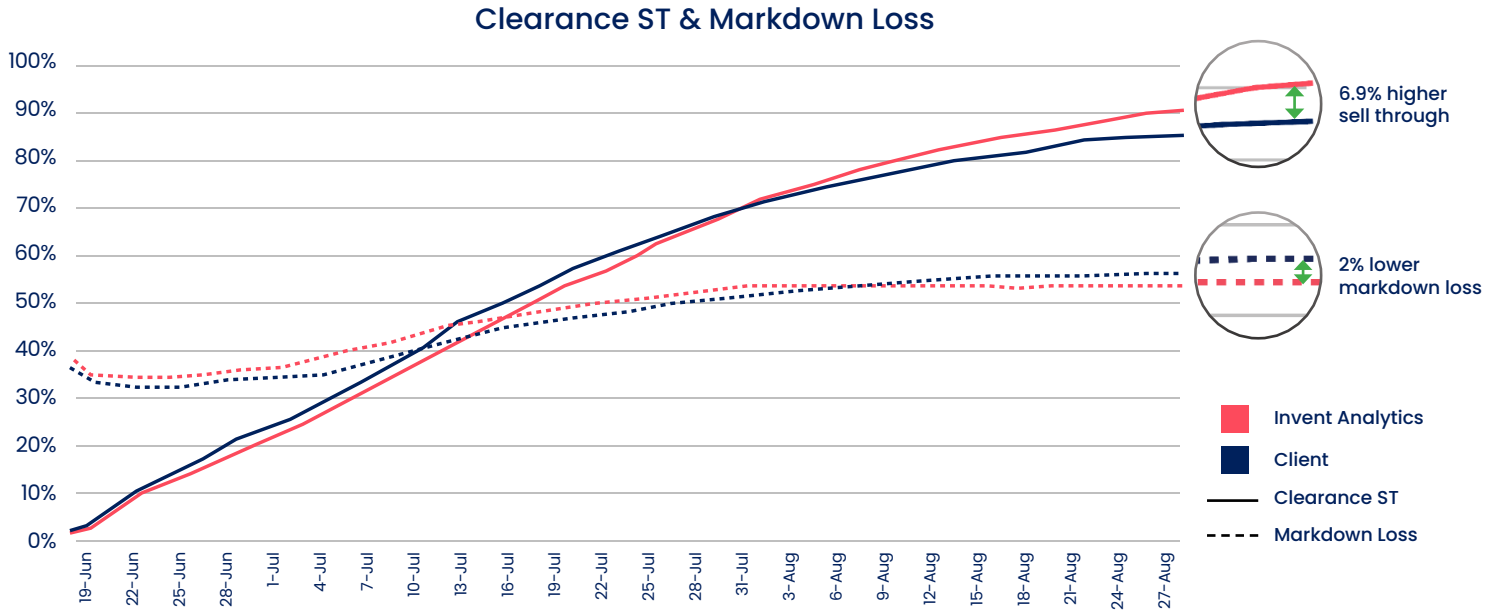
Invent Analytics' customer; a leading European retailer, wanted to accelerate its margin growth by optimizing markdowns throughout the product cycle. Following extensive market analysis, Invent Analytics was chosen as the best option, aligning to the retailer's ambitious goals. Invent Analytics' proven fashion-retail industry-specific approach, and expertise were the other reasons behind this leading retailer's decision.

The Solution

Accelerating margin growth with optimal markdown timing and depth

During a 3-month period, Invent Analytics proved the benefits of its profit-optimal markdown solution with pre-go-live simulations and rigorous A/B testing. As a part of the A/B test, Invent Analytics and the retailer shared the categories and markets in a cross-matrix format to establish identical sets.

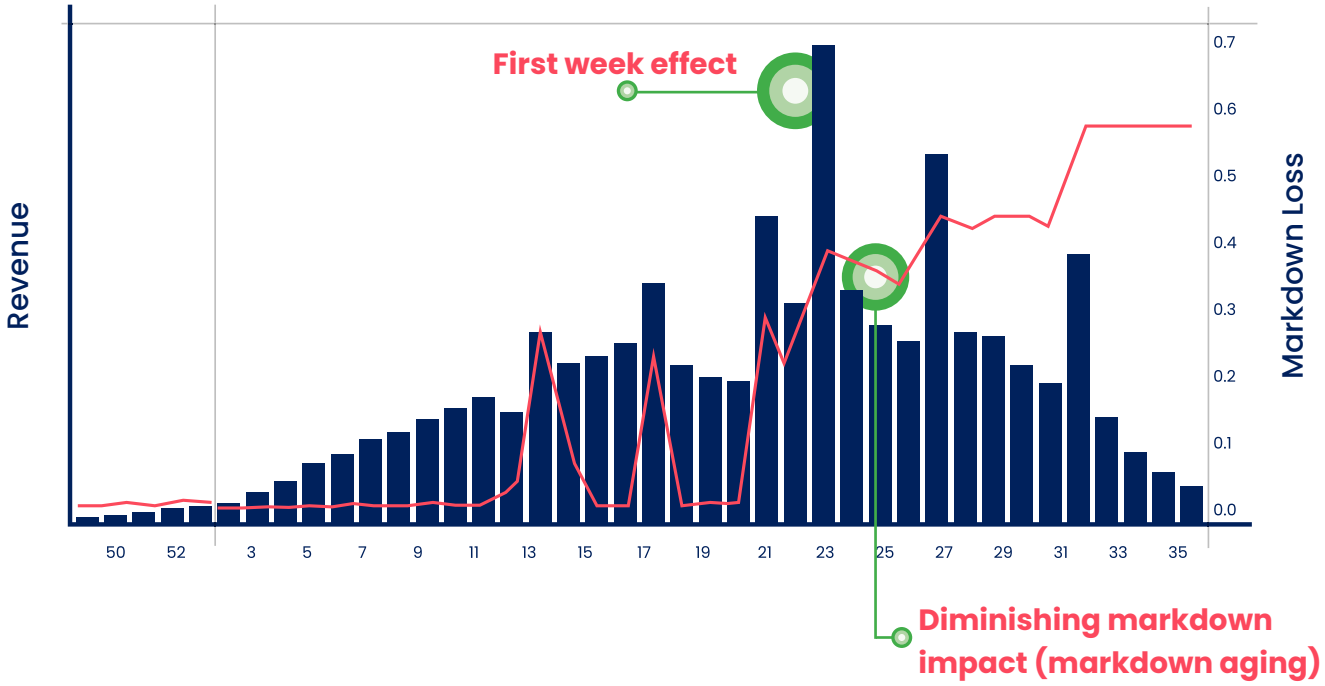
A/B Testing	Category Set 1	Category Set 2
Country 1	Client	invent ANALYTICS
Country 2	invent ANALYTICS	Client



During this period, Invent Analytics Markdown Optimization achieved 6.9% higher sell-through with 2% lower markdown loss.

Following that, the company implemented Markdown Optimization solution. Invent Analytics delivered speed to value and allowed the retailer to take advantage of option-level, machine learning-based markdown decisions.

Invent Analytics applied customized algorithms to meet different demand patterns and operating models of its customer. For instance, a “clearance strategy” was used for several product categories at the end of the season, which had a high “first markdown week” effect when markdown started. The customized algorithms that take into account the diminishing markdown impact also known as the “aging effect” enabled the retailer to increase their sell-through in the following weeks, until the subsequent markdown increase.



For some specific categories “markdown and clear as you go strategy” was applied for the products that didn’t perform well after the initial sales period, so that retailer could start markdowns and continue to the end of the season.

The Impact

Accurate forecasts at all price levels

With Markdown optimization, today the retailer maximizes its overall profit by optimizing its markdown strategy for each item over its lifetime. The solution using markdown-specific forecasting also accurately predicts seasonal demand for the retailer's new products with a limited history.

KEY INNOVATION

Attribute-based Forecasting

Markdown Optimization estimates price elasticity uniquely for each product and the cannibalization impact on similar options by using product attributes.

Invent Analytics' forecasting model based on the statistical analytics of factors such as price elasticity, seasonality, special days, broken assortment impact provides the optimum frequency, depth, and timing for us. Thanks to Invent Analytics, we now can find the answers to important questions such as:

- **What is the optimal markdown path for each and every SKU over its lifetime?**
- **When should each product be discounted based on the sell-through and inventory levels?**

Director Merchandise Planning & Controlling,
Leading Apparel Retailer

Key Results

Increased revenue. Increased sell-through.

Increased margin.

Implementing Invent Analytics' Markdown Optimization solution helped this major retailer successfully optimize its markdowns and **increase clearance revenue by 6.9%** and **overall revenue by 2.4%.** Today, Invent Analytics empowers the apparel retailer to successfully manage its markdowns and accelerate its margin growth in Europe. replenishment from around 5000 suppliers.

About Invent Analytics

Invent Analytics' Omni-AI **delivers significant financial improvement** by empowering retailers to **profit-optimize** their supply chain. It orchestrates a retailer's entire supply chain **by unifying network planning, inventory and price optimization, and fulfillment in one framework.**

Invent Analytics puts your **omni-customers at the heart of its tailor-fit solutions**. It **proves the financial benefits** with pre-go-live simulations and rigorous **A/B testing.** Invent Analytics' over 30 clients have experienced a **2-6% increase in profitability.**

Invent Analytics' Omni-AI SaaS solutions are:

- Omni-Network Design
- Omni-Plan Suite
  - Omni-Demand Forecasting
  - Omni-Store and DC Replenishment Optimization
  - Omni-Allocation Optimization
  - Omni-Transfer Optimization
  - Markdown Optimization
  - Assortment Optimization
  - Dynamic and Competitive Price Optimization
- Omni-Fulfillment

Invent Analytics has been selected as the **Top Supply Chain Technology Company by Retail Industry Leaders Association (RILA)** and **won the 2020 Innovation Awards for Supply Chain.**

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