



# LEVERAGING ADVANCED VALIDATION TECHNIQUES FOR RETAIL SIZE OPTIMIZATION

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## Introduction

In today's highly volatile business environment, retailers that want to remain profitable must be able to predict customer demand and ensure availability of the right products in the right store at the right time. This is a challenging task when merchandise such as apparel and footwear are offered in a range of sizes. To maximize revenue and profitability, retailers need a strategy that allows them to sell goods at full price while reducing markdowns.



## How does size optimization help retailers

Size optimization transforms historical sales and inventory data into size-demand intelligence. This enables smart buying and allocation at the size level to match customer needs at each store. The size profile optimization (SPO) application provides optimized size curves for products at the store level. SPO uses past sales history to deliver the right sizes to the right stores and reduces the imbalance between consumer demand and inventory.

By leveraging a combination of back-end data crunching technologies and front-end size profiling tools, SPO enables allocators, buying coordinators and buyers to leverage sales and inventory data and create precise style/color size scales for each store. This degree of specificity can help buyers and allocators create size profiles that recover lost sales, improve the size balance across the retail chain and launch new products and categories based on previous successes.

## Key challenges in size optimization

Retailers find it challenging to procure and maintain the right mix of merchandise in the right size at the right store. The store-specific size profile plays an important role in helping retailers make assortment and allocation decisions. As the competition evolves, new challenges arise and retailers need suitable approaches to counter these challenges.

## Ability to understand consumer demand

Customer demand varies across stores. Understanding the size level demand at each store for different products is critical

to meeting each unique customer demand. This requirement can be accurately captured and analyzed through granular data that represents size profiles for every store/product.

## Historical performance is not true customer demand

As size profiling is based mainly on sales history, a cleansed history is necessary to generate an accurate size profile. Typically, historical data comprises of profitable sales, lost sales and markdowns. To get relevant size profiling data, it becomes necessary to filter out inventory data related to stock-outs, markdowns, margins, etc., from the consolidated data. This ensures that the right data set is used to design better analytical models and prevent biases arising from extreme data points.

## Analyze and process large volume of data

Gathering information at the granular level of store and size can generate large data volumes that are difficult to handle and analyze. Retailers may find it challenging to derive impactful business decisions from such large data sets.

## Key influencers in size optimization: Predicting customer decisions

Consumers are always looking for specific merchandise; say for instance, a shoe that has the name of a basketball legend. In case the store does not have this particular product, they should be able to offer the customer a suitable alternative through smart product grouping. Size profile optimization can help retailers predict similar products and position them appropriately within the store.





## Region-specific demand for products

Certain products have high customer demand in specific regions. Size profile optimization can analyze historical data to ensure adequate stock of high demand products in these stores.

## Reducing imbalance between consumer demand and inventory

Customer demand for merchandise depends on factors such as holiday seasons, upcoming special events such as a marathon, etc.

Size optimization can predict the type of merchandise that needs to be in stock during these seasons. This ensures that the inventory is never out-of-stock for such products.

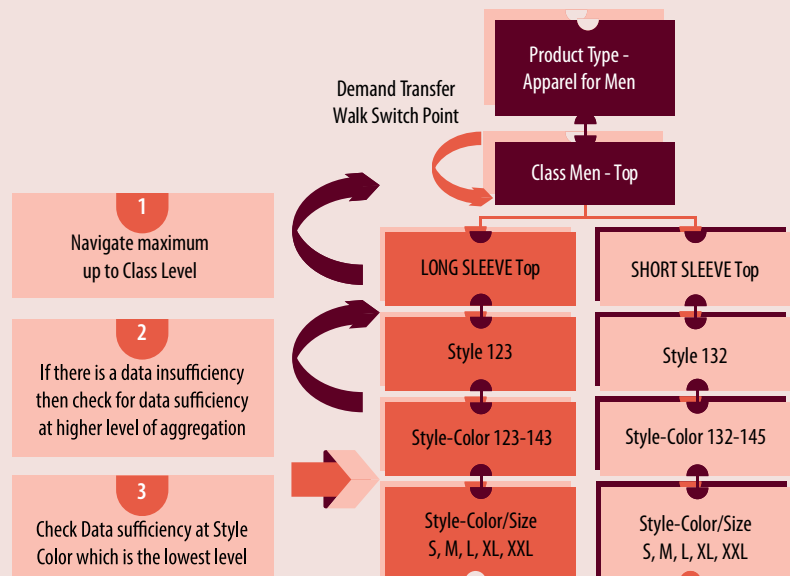
## Recovering lost sales

On the other hand, owing to inaccurate or excessive merchandise allocation, some stores are forced to conduct clearance sales at the end of a season to reduce their inventory. SPO can assist retailers in allocating accurate size profiles, thereby ensuring only the required inventory is stocked to meet existing business demand.



## Allocate new products/new stores based on similar products/stores

Size profile optimization goes beyond allocating size profiles based on historical sales and inventory data. Retail merchandising mandates that the allocation of a new article to any store is profitable to the company. The SPO engine can map a new article to similar existing articles and create profiles based on these. Similarly, SPO can map a new store to similar existing stores and create relevant profiles.



## Why validation is critical for size optimization?

Previously, retailers were unaware of the importance of size optimization. They would randomly determine an average size profile and apply it across all stores and, occasionally, across geographic locations. Retailers lacked the right approach to leverage the large amount of historical data readily available. This often resulted in early season stock-outs in some stores and markdowns for the same merchandise in other stores. Additionally, retailers struggled to make intelligent data-driven decisions owing to the lack of automated approaches and techniques to validate data quality and integrity issues.

## Validation strategy

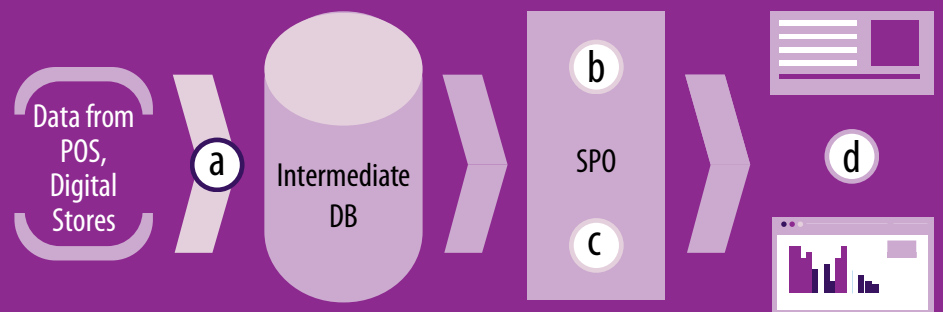
Validation involves processing a large amount of data from various sources according to the format specified by the size profile engine. A validation strategy can help retailers meet customer demand by accurately projecting each store's future sales and inventory needs. It can support the business goals of the retailer, i.e., reduce markdowns, increase full price sales and drive higher revenue.

Besides validation, size profiling also includes functional and performance testing.

## Functional testing

Functional testing is performed to ensure that size profiling is done according to business expectations. There are four key ways to conduct functional testing:

1. Validate pre-load data
2. Analyze data in SPO
3. Validate of the size profile engine based on business rules
4. Validate business intelligence reports



## Validation of pre-load data

Data from various sources such as point-of-sale (POS) terminal, digital stores, etc., are loaded into the database. The raw data can exist in any form (flat file or XML).

To verify that the right data is fed into the database, different validation techniques can be used. These include:

- Comparing data received from different

input source systems through XML/flat file format with data available in the intermediate database

- Ensuring that data is loaded according to business rules defined in the system
- Ensuring the data loaded from the source to intermediate databases is according to the mapping sheet specified in the requirement

## Analysis of data in spo

Retail merchants possess large amounts of historical data accumulated over several years that can be fed into the size profile engine for profile generation.

Testing teams should ensure that the correct data and possible scenarios are sampled and transferred to the size engine.

## Validation of the size profile engine based on business rules

Once data is fed into the size profile engine, it needs to be processed according to business rules specified within the system.

Business rules are set to analyze the accuracy of size profiling. The size profile engine can analyze and process data using these validation techniques:

- In cases where the business rule should exclude stock-out data and sales data having a margin filter greater than 10% for a particular set of merchandise, the validation team verifies that the size profile engine has not considered such data for profile generation
- The validation team has to ensure that relevant data is used to determine the appropriate profile for the introduction of a new article/ store. Often, the data

used may be incorrect owing to non-availability of relevant data for the new article/ store

To execute high-level validation for business rules, the following validation techniques can be used by validation teams:

- Compare data on new products with data on existing/similar products to verify that a similar size profile is generated
- Ensure that the correct sample of data is selected for verifying all the business rules
- Monitor and verify that size profiles are generated for every size of a particular style/color of a product
- Ensure that the total size profile generated for a particular style/color of an article is 100%

## Validation of reports

Once the size profiles are generated, business users can compare the profiles for different products and allocate them based on analytical reports drawn using business intelligence report-generation mechanisms.

Analytical reports are generated based on the business rule set. The testing team validates the accuracy of the report data with data from the data warehouse and verifies the usefulness of information displayed to the business.

The reports generated by the size profile engine provide the following key details:

- Allocation by store – How many articles of a particular size have been allocated to a particular store
- Allocation percentage at various levels such as class, style, style-color, concept, etc
- Effectiveness of size profile – Business can measure the effectiveness of size profiles in improving allocation to stores

## Non-functional testing

Any size profile optimization project involves processing a large volume of structured data. Performance testing ensures that size profile engines perform optimally and that size profiles are generated within the stipulated time limits to support business needs. For best results, the test environment for performance testing should be similar to the product environment. Further, if the performance service level agreement (SLA) is not met, then the advantages of size profile optimization are lost. Performance can be monitored by different tools that are available in the market. The typical performance testing check-points are:

- Ensure data movement in each stage is completed according to the SLA
- Monitor system performance on maximum data load





## Conclusion

Size profile optimization helps retailers effectively stock the right sizes in stores based on various parameters, thereby enabling them to maximize profit, reduce markdowns and recover lost sales.

Historical sales and inventory data is analyzed and transformed to drive critical business decisions. Here, data quality and data analysis play a vital role. By leveraging the right validation strategy with appropriate validation techniques, retailers can ensure that all possible business scenarios are considered and accurate data is chosen for size optimization decisions.

## References

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