WHITE PAPER



# FIGHTING RETAIL SHRINKAGE THROUGH INTELLIGENT ANALYSIS AND VALIDATION

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**Abstract**

While striving to achieve greater profitability in a landscape characterized by aggressive competition, retailers keep racking up losses due to retail shrinkage. In this white paper we take a look at the various sources of retail shrinkage and discuss the benefits of establishing effective validation for loss prevention systems. The paper also reveals how loss prevention Quality Assurance (QA) solutions can reduce retail shrinkage. We also outline how the right testing approach and techniques can help avoid loss.

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In their effort to stay ahead of competition, retailers are employing innovative measures to minimize operational costs so that they can increase their profitability. Today's retail dynamics are impacted by a volatile global economic environment and diminished consumer spending. These issues are pushing retailers to evaluate various techniques they use to reduce losses that adversely affect the bottom line.

Retail shrinkage or shrink is the fraction of inventory that is lost in the supply chain from the manufacturing unit to the point of sale (PoS). Analysis of enterprise information, collected throughout the supply chain and stored in data warehouses, along with historical transaction data is used to identify and qualify loss data. However, the success of loss prevention techniques depends on the quality of data used for deriving these analytical reports. To ensure the quality of data, retailers need to develop benchmarks for each relevant business parameter, which can help them identify inventory loss and flag anomalies in their operations. These threshold levels must be managed centrally with business rules developed specifically to provide systematic alerts for corrective action.

A proper validation of the loss prevention system along with an effective approach for their business intelligence solutions , enables retailers to obtain a holistic view of their enterprise data and make smart decisions to fight retail shrinkage.

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## What causes retail shrinkage?

Inventory shrinkage can be attributed to several sources such as shoplifting, employee theft, vendor fraud, administrative errors, and other unknown reasons. According to the National Retail Security Survey Report 20111 the five major sources of retail shrinkage in order of frequency are:

- Employee theft (44.2%)
- Shoplifting and organized retail crimes (35.8%)
- Administrative errors (12.1%)
- Unknown reasons (5.3%)
- Vendor fraud (4.9%)

Total retail shrinkage amounts to $35.28 billion in the United States alone.

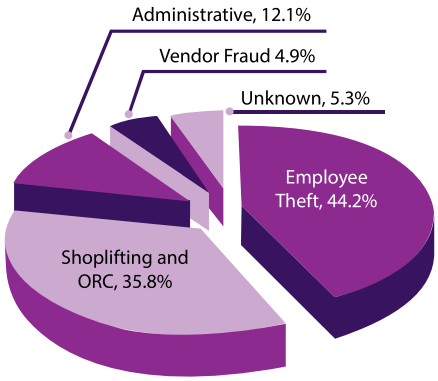


*Table 1 – Sources of retail shrinkage*

To understand the nature of inventory loss better, let us examine the various causes of retail shrinkage in detail.

### Employee Theft

Employee theft continues to be the most significant source of retail shrinkage in the US. Among the various retailer categories, convenience stores or truck stops suffer the most from employee theft.1 This involves 'sweethearting' where a cashier unofficially gives away products to family or friends for free using fake scan or offers discounts. Cashiers can also slide items into the cart without scanning it at the PoS system. Other instances of employee theft are: voiding items from sale, reducing the price without authority, under-ringing (selling products at a lower price while collecting the full amount), no ringing, ringing fraudulent return, and using staff discounts inappropriately.

Conventional theft detection mechanisms include electronic surveillance, audits, and review of till receipts followed by investigation.

### Shoplifting and Organized Retail Crime (ORC)

Shoplifting and ORC is the second largest source of shrinkage in the US. Craft and hobby stores, accessories and men's and women's apparel are the top three retail categories worst hit by retail shrinkage.1The trails of organized retail crime can be found supporting terrorism and money laundering. This problem warrants immediate attention and a focused approach. Most retailers use electronic surveillance and automated alert mechanisms to deter shoplifters. Advanced electronic surveillance systems offer analytical capabilities that work with captured video footage to proactively alert loss prevention (LP) executives in real time.

### Administrative Errors

Pricing mistakes like incorrect mark-ups and mark-downs can lead to large losses, especially over time. This area has seen some improvement from the previous years. Three segments which recorded the highest retail shrinkage due to administrative errors are jewelry and watches, home center, garden, and household furnishings.[1]

### Vendor Fraud

Vendors can steal merchandise in the course of the supply chain, either during buying or fulfillment. They contribute the least to the total volume of retail shrinkage. Fraud prevention strategies include delivery audits while receiving merchandise at the warehouse or when the customer receives the merchandise in case of direct fulfillment.

Other sources of shrinkage are not related to store inventory. These include cash losses, check losses and credit card losses. Return and refund fraud also contributes to retail shrinkage. In most such cases, the shrinkage does not leave a clear audit trail. Hence the LP management is required to deduce the root cause of shrinkage.



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## Leveraging business analytics for loss prevention

Loss prevention is always a moving target. The key is to stay on top of the changing LP requirements and be able to respond to them faster than the time the contributing factors take to adapt to the circumstances – be it shrinkage or salvage.

The key objective of a business analytics (BA) program is to empower business owners, the finance team and LP management to take timely informed decisions. The overall success of this program depends on the strategies adopted for data warehousing and analytics, the quality of the underlying data used for analytics and the granularity of the data.

While retail shrinkage affects all types of retailers, certain categories are affected at a disproportionally higher rate. The strategies each retailer needs to adopt depend on and vary primarily with the business model, line of business, sources of retail shrinkage, and major contributors to the loss. Usually, the BA strategy for loss prevention can be classified at a high level into two distinct areas – operational and strategic.

### Operational LP Analytics

Operational LP analytics aims at identifying the retail shrinkage and its sources for shorter periods. This provides near real-time view of the shrink and salvage. The method aids the LP management to identify shrink quickly, thereby providing them the ability to respond faster to the situation and prevent further loss. LP data average out over longer periods; hence for the method to be effective, the identification must be as close to real time as possible.

Not all categories and items are treated equally in loss prevention methodology. Products such as shaving items, clothing accessories, cheese, meat, perfumes, etc., fall into a high-risk category. Departments like cosmetics are more prone to retail shrinkage than fresh produce.

Operational analytics report at the category level, providing the ability to drill down to sub-categories and even to shrinkage at the level of stock keeping unit (SKU). Comparative reports with other sub-categories or averages enable the prevention strategy to be devised at the department level or SKU level. For example, when a new range of perfumes is introduced in a store, operational analytics can provide a view of the retail shrinkage for this range, or for a product within the range, for a specific time period, compared with other products in the range. Operational analytics reports can provide the average shrink for that department or sub-category or even industry averages. This enables the department managers to act quickly and prevent loss.

Another dimension of operational LP analytics is based on the source of shrinkage. Retail shrinkage can take place right at the aisle where shoplifters sweep out or at the till where an employee or a member abuses a discount or in a vendor's unit where fraudulent transactions are conducted. Horizontal analytics offers a different perspective to loss prevention thereby enabling the adoption of more comprehensive and efficient strategies. For example, reports on void transactions at the cashier level, price exceptions at the tills, reports at the return tills at cashier or member level, reports against the inventory booked and bill of landing (BOL) for a vendor, etc., work both as a deterrent to malicious activity as well as an enabler for shrink identification.

In operational analytics, reduced time to market is the key factor. It is critical to work out ways to cut short the requirement-to-validation cycle. It is observed that the entities involved in the sources and strategies of theft adapt quickly to the new security measures, identifying ways to break the current system . The ability of IT to respond to this continuously elevating challenge in relatively shorter windows, determines the success of this program and the ability to stay ahead of the miscreants.

### Strategic LP Analytics

Strategic analytics help evaluate the effectiveness of the LP program as a whole. These reports provide executive snapshots into retail shrinkage data with drill-down capabilities. The objective is to empower executive management to make informed decisions that influence the corporate loss prevention strategy, return on investment (ROI), LP budget allocation and formulation of corporate policies.

Some examples of the types of reports obtained through strategic LP analytics are: trend analysis and comparative analysis comparing various time periods such as year-on-year (YoY) shrinkage for a department, comparing the same quarter, store YOY, region YOY, etc., types and locations of warehouses (mall or strip), merchandise-specific classification (such as life-time return), data comparisons before and after changing the LP strategy and more.

Strategic analytics enhances the effectiveness of the overall LP strategy against industry averages, and helps steer the course at the executive management level. Validation for loss prevention system plays a vital role in ensuring quality and reliability of data, and accurate reporting.

The level of analytics required in a specific retail setup is determined by several factors that are in play such as the line of business, corporate policies, etc. Further considerations for analytics can be cultural diversity in the operating markets and the climate and economies in which retailers operate.

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## Validation for loss prevention system

Developing a comprehensive loss prevention analytics validation strategy early in the development cycle is critical to the execution of a successful loss prevention program. The validation strategy is defined based on the corporate loss prevention strategy, the data warehouse design, key performance indicators (KPIs), and the business intelligence reports identified for loss prevention.

The analytical methods used for loss prevention need to be qualified and validated. The key process indicators, as part of the analytical methods, are identified and the exact business rules to be validated are defined. The key process indicators included in the test strategy must be examined to establish threshold values based on historical and real-time data for operational and strategic reporting.

Validation for loss prevention system helps the retailer not only to address their current issues but also predict any issues that may arise in the future. Therefore, decision-making must be open to adopting different validation techniques for operational and strategic loss prevention analytics.

### Strategic LP Analytics and Validation

The major strategic challenge in creating a permanent loss prevention analytical platform is the uncertainty involved in the retail industry. Retailers continue to improve their LP program to remain competitive and protect their brand. However, this implies that until the LP analytical platform is implemented and the Business Intelligence (BI) reports and KPIs are in place, the retailer is unable to confirm the accuracy of the analytical data to help the company meet its long-term profit and growth plans.

Strategic validation for loss prevention system must focus on the following factors:

- Integration of BI with loss prevention techniques
- Design of a scalable Enterprise Data Warehouse (EDW) and Supply Chain Integration

### Operational LP Analytics and Validation

The constrained global economy has led to reduced operating budgets. Retailers are today seeking immediate business benefits from monitoring and analyzing loss prevention data. The focus is on tapping into the large amount of high-quality cross-functional operational data and uncovering suspicious activities. This helps retailers discover problems pertaining to fraud or retail shrinkage and extract actionable insights.

The operational validation for loss prevention systems needs to focus on the following factors:

- Reduced time to market for the implementation of LP program through automated validation
- Continuous integration validation of incremental features in the LP program through reusable regression suites

Retailers across the world are using BI to strengthen their loss prevention systems. Let us see how a pharmacy chain in North America used loss prevention QA solutions to fight retail shrinkage.



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## Case study

### Implementing Integrated EDW and BI Reporting for Effective Loss Prevention

**Customer**: A leading pharmacy chain in North America decided to replace the existing semi-automated loss prevention system with an integrated EDW and BI reporting solution to enhance their LP data analysis and reporting capabilities. The end-user group was the loss prevention finance department.

**Business Context**: The existing system was based on fragmented data sources and relied on multiple satellite databases or flat files with multiple hops/layers. This involved significant manual intervention and effort in data extraction, cleansing, transformation, and report generation. The inventory of reports was extremely large and redundant. It provided merely different views of the same data, and lacked drill-down and drill-across capabilities. The existing system failed to track action items on the basis of data reported.

Analysis of the 'as-is' state of the system revealed the opportunity to consolidate the existing inventory of reports to one-third of the current size. This would allow the company to reduce the maintenance costs for the existing reports and business process refactoring.

The new system needed to be based on a platform with EDW as the back-end and Oracle Business Intelligence Enterprise Edition (OBIEE) as the front-end. The future-state solution envisaged robust analytics and reporting to increase data visibility and support enterprise level BI goals for loss prevention.

**Loss Prevention QA Solution**: The loss prevention QA strategy was defined considering the nature of the project and in-line with the overall loss prevention strategy for the customer. The QA team was engaged in stages ranging from requirements and design validation to data source consolidation and retirement strategy definition. This helped identify the high risk areas and build a risk-based test approach with optimal time to market.

An automated test approach was adopted for data warehouse (DW) testing using proprietary in-house solution accelerators for Extract Transform and Load (ETL) testing which greatly reduced the regression test effort. This was the key differentiator for ensuring test coverage and reducing the time to market. Data quality testing, system scalability and failure recovery testing were performed to ensure that the DW solution was sufficiently robust to accommodate future enhancements as well.

BI report testing was conducted based on the KPIs/threshold identified for the loss prevention strategy. The QA strategy called for automated testing using an in-house open source-based tool that reduced the execution time for test cycles and formed the foundation for the regression pack. This enabled the regression for future releases to be conducted in comparatively smaller timeframes.

Enforcement of role-based access to data and data restriction by user on a need-to-know basis were ensured by security testing.

Overall, the loss prevention QA solution enhanced the test coverage to almost 100%. This enabled early detection of loss and ability to prevent it, thereby saving an additional $1.5 million every year. The annual maintenance and support costs were reduced by $60,000.



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## Conclusion

In the current market scenario the ability to optimize profitability by reclaiming leaked revenue allows retailers a greater opportunity to enhance profits. Today the ability to reduce retail shrinkage is more critical than ever. However, the 'one-size-fits-all' strategy does not work in loss prevention. Loss prevention programs need to be tailored to address the challenges of the retail category or department based on the impact and sources of loss. The ability to predict retail shrinkage proactively, identify it and react as soon as anomalies surface is the key determining factor for the success of the loss prevention program. IT, the key enabler for this business objective, plays a central role in empowering business with innovative solutions and reduced time to market. Automation, innovation and re-use are the three pillars to achieve effective loss prevention.

## End notes

1 National Retail Security Report 2011 by Richard C Hollinger and Amanda Adams

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