

Using Market Basket Analysis to Increase Sales and Heighten Marketing Effectiveness

→ Type of Project:

Data Warehouse Design and MicroStrategy Report Development

→ Technologies:

MicroStrategy, Oracle, Oracle Retail Data Warehouse and Oracle Retail Merchandising System

→ Team Size:

3 InfoCeptions, 2 Customer Associates

→ Our Roles:

Project Management, Data Warehouse Design, MicroStrategy Development and Quality Assurance

→ Users:

Marketing Managers, Merchandizers, Store Planners



Executive Summary:

We worked with our customer, a leading arts and crafts retailer, to build a market basket analysis solution using their MicroStrategy BI platform. With their new solution, our customer was able to increase the effectiveness of their marketing campaigns and optimize the layout of their stores to increase sales & profitability across their company.

Business Challenge

The Retail industry is a highly fragmented one facing significant challenges. Change is continuous as tastes, fashions and customer preferences sway with the times. Retailers need many tools at their disposal to understand and cater to their customers' changing purchasing behaviours and preferences. One of these tools is Market Basket Analysis. This technique helps retailers identify which items a customer is more (or less) likely to buy, given a previous purchase or a contemplated purchase (such as an online shopping basket). This technique is also known as Affinity Analysis.

Market Basket Analysis enables planners, merchandisers and product teams to:

- Make crucial decisions regarding promotions, displays, product placements, store segmentation, customer segmentation and target messaging
- Identify cross sell and up sell propositions
- Understand how purchases of products correlate with others
- Understand correlations of product baskets over time
- Create promotions that leverage correlations

Key KPIs used for market basket analysis include:

Baskets – The count of baskets is the number of transactions in which related attributes appear together

Confidence – Confidence (in the context of market basket analysis) is a measure of how much more likely it is that B is purchased when A has been purchased. For example if the confidence value of apples (the consequent) with the purchase of oranges (the antecedent) is 70%, then there is 70% chance

that apples will be sold in a customer transaction that includes oranges. A consequent is an attribute, the purchase of which is dependent on the purchase of an antecedent. An antecedent is the attribute that is the first one chosen or purchased.

Support – This is the measure of how often an item or a collection of items (called the Itemset) occur together in a transaction. It is measured as the ratio of transactions that contains an itemset to the total transactions. For example, if there are 10 transactions on a particular day, out of which 7 transactions contained oranges then the support value for oranges is 70% (7/10).

We helped our customer, a leading arts and crafts retailer, with over 100 stores, implement a market basket analysis project using their MicroStrategy BI platform. During the course of a strategic assessment with our customer, we had identified

market basket analysis as a key project that would enable them to gain more value from their MicroStrategy investment. The benefits our customer expected to achieve from this project:

- Greater marketing effectiveness
- More effective store layouts and merchandising
- A deeper understanding of market basket sizes (number of items, value, correlations)
- Tracking of key performance indicators including number of baskets, \$ spent per basket and profit per basket

Our customer had been performing market basket analysis at the department level in an ad-hoc manner by directly querying the database. However they had not taken the time to automate the process and to use the power of the MicroStrategy platform for more robust market basket analysis that could be shared widely across the company.

How We Helped

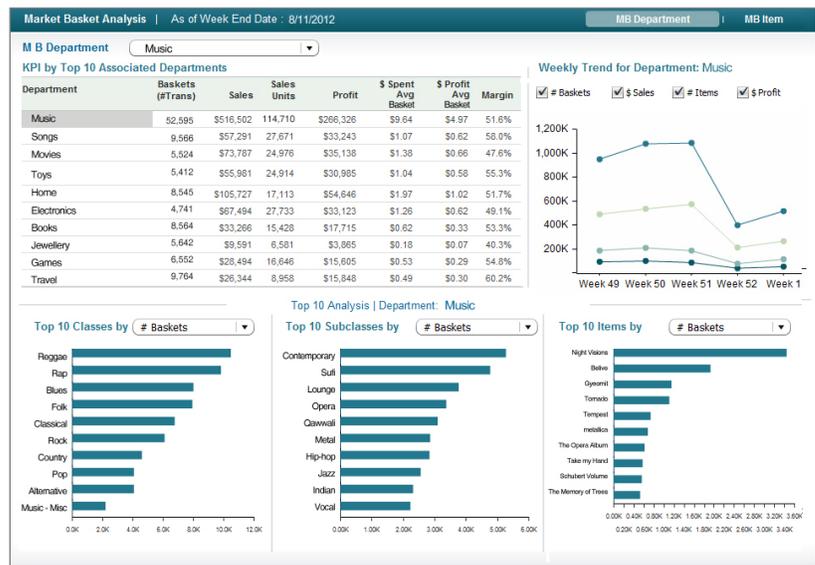
Overall, we were responsible for modeling the data in our customer's Oracle RDW system and for creating a core set of reports for market basket analysis. Specifically, we worked on:

Creating a Technical Architecture for Market Basket Analysis

Our customer did not have the necessary warehouse architecture in place to support market basket analysis. We used their transaction level data as a foundation to build a new data model that supported this analysis. Our work included creating the ETL processes for the initial and incremental data loads and the database design necessary to support the various hierarchies. The new tables and views created supported market basket analysis at the week, store and item levels.

Market Basket Analysis for Top Selling Items in an Advertisement

This report provides the top selling items that were included in an Ad and the products they had an affinity to. In one use case, our customer used this



report to analyze top selling items for a promotional campaign. The reports enabled end users to perform KPI analysis of the associated items that correlated with items being promoted.

Market Basket Analysis for Top Selling items by Department

This report provides the top selling items by department and the products they had an affinity to. This report enables end users to perform KPI analysis of associated items which were sold along with the top selling items in a department.

Ad-hoc Market Basket Analysis

Reports were built to allow end users to select the item, category, class, sub-class, or any other

attribute in the product dimension and conduct market basket analysis for a week of data. Users were able to choose any item for which they wanted to perform KPI analysis.

Market Basket Analysis with Time-over-Time comparison

This report enables users to conduct time-over-time comparisons at the week and higher levels in the time dimension. In these reports, end users are able to select any attribute to conduct market basket analysis for any time period

High ROI BI Delivered

This project, delivered cost-effectively with our Global delivery model, provided our customer with a highly scalable, reliable and flexible new system with the following benefits:

➔ Heightened marketing effectiveness – our customer was able to better identify advertisements that were profitable based not only on the products in the ad, but also on products with a high affinity. In addition, our customer was able to better judge the overall effectiveness of marketing campaigns, resulting in a 5% decrease in the company's marketing budget

➔ More effective store design – The KPIs like #Baskets, Average Spent per Basket and Average Profit per Basket helped the users to track Product Affinity for their Top Selling Items. This

analysis allowed the users to effectively plan their store layouts and rack arrangements which resulted an increase in Quarterly Sales of the Top Selling Items by 10%.

➔ A scalable BI architecture to support market basket and other analysis – our design and deployment of a new warehouse for this project allowed users to perform market basket analysis. We also used several database optimization techniques to improve report performance.

➔ About InfoCepts

Since 2004, InfoCepts has delivered on the promise of Business Intelligence. Our consulting capabilities and process oriented approach, with world class governance frameworks have delivered high quality solutions to our customers. Our technology

specific methodologies and global delivery model provides exceptional ROI for our customers. Our services include high quality Mobile Apps, award winning Dashboards and end-to-end business intelligence development and support using a host of technologies.

