Consumer demand patterns in brick and mortar stores often result from local factors that are not always available as structured dataset features. For example, the presence of a school near a store can affect one subset of products (e.g., products that children prefer), while a local product's promotion by a nearby competitor can affect another subset of products (e.g., complementary or competing products).

Accordingly, a store can share demand patterns related to specific subsets of products with specific stores that are affected by similar hidden factors, even if these stores are different in size, format or region and do not necessarily belong to the same stores' segment.

Trying to explain such complex demand behavior is extremely time consuming and practically impossible when many of these external and internal factors are hidden and dynamic. At the same time, with the right technology, the actual demand patterns that are reflected in point-of-sales data can be extracted and used to trigger granular and actionable recommendations.

CB4's technology is based on proprietary data-compression algorithms that can automatically capture the local demand patterns at each store, regardless of their affecting factors. Detected patterns are not bound by assumptions on how stores are segmented or clustered, or how various internal and external factors affect the demand behavior locally.

CB4's algorithms automatically detect similar demand patterns among products and stores, regardless of whether those products were purchased together by the same customer ('basket analysis') in specific stores. The algorithms automatically identify the related 'fuzzy-clustered' patterns and define an exact sales benchmark for target products at each store. It then generates recommendations based on anomalies and unmet opportunities that are detected for specific products in specific stores.

Algorithm Highlights

Applies advanced data enrichment and preprocessing methods for effortless automated handling of persistent databases.

Automatically generates and adaptively refines the analytic models without requiring data scientists to consistently update and validate the models

Data-agnostic, parameter-free algorithms that do not assume a conventional time-series model nor simplified auto-correlated processes.

Machine learning & AI algorithms that are not regression-based and can discover highly non-linear, conditional and state-dependent patterns.

Generates in-depth and accurate insights and recommendations at unparalleled speed and precision.

Unique modeling at the finest granular level enables a dynamic data drill-down to more detailed levels and a scalable, decentralized approach.

Realize Operational Opportunities

CB4	Other Technologies
ANALYSIS GRANULARITY	
Granular analysis applies to products in stores, generating recommendations at a SKU-in-store level	Conventional statistical analysis often applies to aggregated data, e.g., category / brand / chain
INSIGHTS	
Descriptive and *self-explanatory*, presented in natural language	Often a Black Box solution, difficult to interpret
DATA SET	
Only *4 weeks* of history required for analysis	Usually 24–36 months of history required for analysis
DATA TYPE	
Only sales data is needed, other data, such as inventory promotion and pricing can be easily integrated	External data required, relying on time consuming IT projects. Also often require sensors/HW installation at stores
MODEL	
Automated machine learning and AI models with no need for continuous maintenance or upkeep	Continuous investment and maintenance by data science and analysts
DIMENSIONALITY	
Multiple SKUs that can be analyzed in *parallel*	Often one dimensional – each SKU is analyzed on its own