Section 1: Week 3: Smart Restaurant Proposal

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Smart Restaurant Proposal

The Black Bean started life as a simple ‘mom-and-pop restaurant,’ but has since rapidly grown to over one hundred locations. Now the business faces challenges ensuring the consistently high-quality experience customers know and love. As mitigation, the organization wants to deploy technology that provides business intelligence across the end-to-end lifecycle starting at the supply chain, continuing into each restaurant location, and finally presenting a personalizing mobile and social media presence.

# Current State of the organization

One of the critical challenges for Black Bean comes from its inability to continue scaling existing processes. When the business only needed to manage a handful of sites performing inventory management manually with local spreadsheets was sufficient. As the organization grew, its ability to report on the state became more distorted. The latency between sales information arriving at head-quarters causes incorrectly placed products to spoil in one location and be unavailable in another. Similarly, as a small group of franchises, the marketing team understood the identity of their customers. Now that the business spans numerous locations, they face challenges connecting with the highly diverse communities.

Black Bean’s IT department has addresses aspects of these challenges through point-of-sale solutions. These initial systems have standardized reporting templates that managers can manually populate. However, these semi-structured documents are still open to interpretation and can misrepresent the state of an individual site. The organization also has investments in distribution and supply chain processes that could emit telemetry. They also benefit from a positive work culture where employees are willing to embrace technology, assuming its beneficial and not overly complicated.

# Determine functionality and missing capabilities

There are three distinct pillars that Black Bean wants insights into, specifically the supply chain, restaurant efficiency, and customer experience. These insights need to answer questions around the compliance and performance of the business units and enable the leadership team to address dynamic market conditions.

## Supply Chain Monitoring

The company specializes in desserts made from highly perishable ingredients. With the ability to monitor the various distribution centers’ environmental controls, such as humidity and temperature, product life can be extended and reduce waste. Integration of the point-of-sale (PoS) would ensure that products are routing to the ideal regions. As these efficiencies materialize, the forecasting error will reduce inventory in storage without risking shortages.

## Restaurant Efficiency

If the eatery does not have enough wait staff, then the customer might choose a competitor instead. Having enough staff is subjective, given the variability in skill levels between tasks. There are several other key performance indicators (KPI), such trends in table reservations, that management can monitor to validate efficient order-flow.

## Customer Experience

Customer Relationship Management (CRM) has converged with social media and created a firehose of user-generated content (UGC). Now organizations need new techniques for topic extraction and sentiment analysis across the unstructured text. Traditional loyalty programs are ineffective because they focus on existing customers, despite the majority are new users. These issues require pivoting to marketing strategies that align the business personality with the target audience.

# What kinds of tooling would you recommend

The business intelligence solution needs to consume heterogeneous unstructured data sources and present role-based perspectives into operations. These data sources will originate across the business pillars as IoT sensors, mobile app interactions, point-of-sale data, hierarchical inventory caches, advertising impressions, customer and employee feedback, and internal streams. Different aspects of these feeds will be relevant to customers, material suppliers, the wait staff, leadership, marketing, and sales teams.

The format and mechanism for providing this information to the different audiences require specialization. For instance, identifying too many apples is cached in a regional warehouse should trigger a local advertising campaign to customers for apple pies, and in parallel, notify the local farmers to delay further shipments. The signal to the customer might occur through a mobile push notification, versus the farmer receives an email — meanwhile, the leadership team overseas these communications through a desktop web portal.

Making sense of these micro-optimizations is difficult for humans, due to the depth of information to parse. Systems need to detect these ‘too many apples’ scenarios that will happen with sufficient lead-time to make an actionable decision. These situations require machine learning models that can assess big data sets to surface these hidden rewards. Artificial intelligence is becoming democratized through Machine Learning as a Service (MLaaS) technologies, such as Microsoft Cognitive Services and Amazon SageMaker. These tools lower the cost and complexity to allow businesses of any size to reap value.

Software as a Service (SaaS) providers even provides out of the box solutions for smart restaurants. These tools focus on order-flow, inventory management, aggregating customer feedback, and employee performance and review features.

# Research and Evaluate Solutions