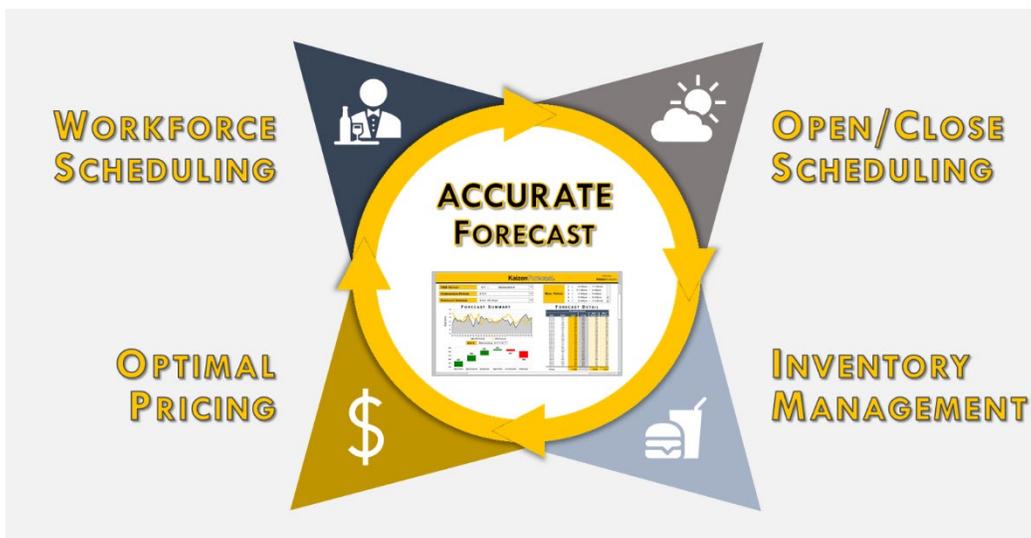


4 METHODS TO BOOST YOUR F&B OPERATION'S PROFITS USING ADVANCED ANALYTICS

Leading operators using advanced analytics to deliver significant margin increases.

As the Food & Beverage (F&B) industry continues to grow in competition and complexity, continually increasing profits can be a challenge. Leading F&B operators have responded with advanced analytics that are built on accurate forecasts of guest demand and powered by machine learning. From a data foundation consisting of reliable demand forecasts, these innovators have created and captured real business value by leveraging analytics for a variety of tough decisions, including outlet open/close, menu item pricing, staff scheduling, and inventory management. Though running your business with advanced analytical models can appear to be daunting and light years away – especially those who've been making judgement-based decisions for years – Kaizen Analytix has helped F&B operators rapidly deliver practical analytics solutions which generate more revenue, reduce costs, and boost margins. It all starts with an accurate demand forecast!



DEMAND FORECASTING

Acknowledging that no two business problems are identical in nature, the structure and objective of one's application must be clearly identified. As demand forecasts frequently involve deploying statistical regression models, the first step is to determine their dependent and independent variables. In doing so, it is important to remain cognizant of the data that is accessible or reasonably obtainable.

The dependent variable should be defined based on the measure that provides the most insight into the F&B outlet's performance. For example, a table-service operator may be interested in cover counts, while someone in the counter-service business may prefer to predict the number of transactions or individual menu items.



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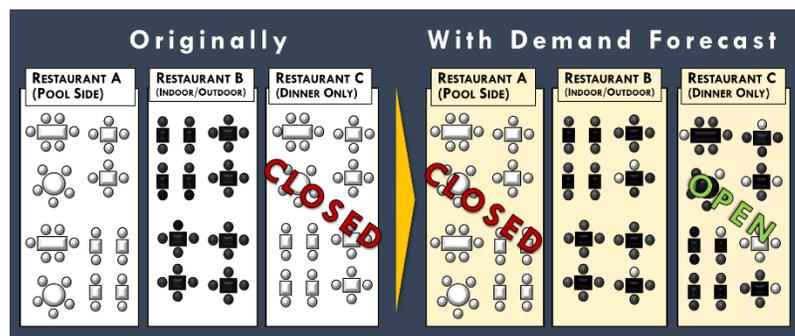
While seasonality often lies at the heart of a successful demand forecast, the independent variables—or elements that drive business—can greatly differ across use cases. In hospitality settings, such as hotels, resorts, casinos, and cruise ships, F&B demand is primarily driven by occupancy and demographics. However, standalone restaurants may be most-heavily influenced by external factors, such as weather and local events both of which are included in Kaizen's **KaizenDataLabs™** database.

With the fundamental structure defined, successful forecast execution depends on effective data preparation and modelling techniques. Aggregation, outlier removal, data transformation, collinearity analysis, stepwise selection methods ensure proper leveraging of the data. To finally produce the best-possible results, various forecasting methods, such as regression and exponential smoothing, can be evaluated for accuracy and fit.

1. OUTLET OPEN/CLOSE SCHEDULING

Prescriptive open/close scheduling of your outlets is a simple way for a demand forecast to generate immediate ROI. Let's say you are a destination beach resort with 3 restaurants on property – 1 casual pool side restaurant, 2 family style restaurants (one with half indoor/half outdoor seating and one that is only open for dinner). When it rains during

the typical lunch rush, the pool side restaurant is deserted, the family style restaurant with indoor/outdoor seating is packed, and the dinner only restaurant remains unused. Without factoring weather into your restaurant open/close scheduling, the pool side restaurant is over staffed, the indoor/outdoor restaurant is struggling to keep up with demand, and there is a lost opportunity for additional profit at the dinner only family style restaurant. Instead, when the forecast shows rain, your demand forecast model would recommend closing the pool side restaurant to save on operation and staffing costs, upping the staff at the indoor/outdoor restaurant and opening the dinner only restaurant to account for the increased demand. Through the model's recommendations, your destination beach resort will likely see an increase in profit – and higher guest satisfaction score due to shorter wait times and better overall service from your staff.



2. OPTIMAL MENU ITEM PRICING

With an analytics foundation set by a reliable demand forecast, F&B operators can capture hidden profits by optimizing the prices of all menu items. By measuring the *price elasticity of demand* across the segmentation variables, one can quantitatively project the effect on demand, revenues, and profits that would result from changes in menu prices. Take a steakhouse, for example, that sells its signature porterhouse for a premium and its hamburger for a moderate price. Upon modeling *price response functions* for these items, the historical data indicates that the primarily affluent customer segment exhibits inelastic behavior when considering the porterhouse. Alternatively, a more frugal segment demonstrates



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elastic behavior as they tend towards the affordability of the hamburger. In other words, incremental price changes will have a stronger effect on demand for the burger than the steak. So, if we model the objective function to maximize contribution margin, our optimizer might recommend increasing the price of the porterhouse and decreasing that of the burger. At these new prices, our steakhouse would expect to sell a few less porterhouses and many more hamburgers.



While this approach to price optimization will maximize profits, it could usher further consequences that may be undesired by management. In our example, the concept strategist may be concerned that an inverted “steak-to-burger” ratio could cause customers to associate the restaurant with burger joints—thus sacrificing its identity as a fine-dining steakhouse. Rather than simply optimizing for financial objectives, we can incorporate business-specific constraints to avert such circumstances. To prevent this inadvertent concept change, an enhanced model constrains our “steak-to-burger” ratio to ensure that the final pricing scheme promotes sales of more porterhouses than hamburgers. Thus, by foregoing a small portion of our maximum profit opportunity, we can incorporate constraints to align the models with business strategy and ultimately realize significant uplift over the current pricing scheme.

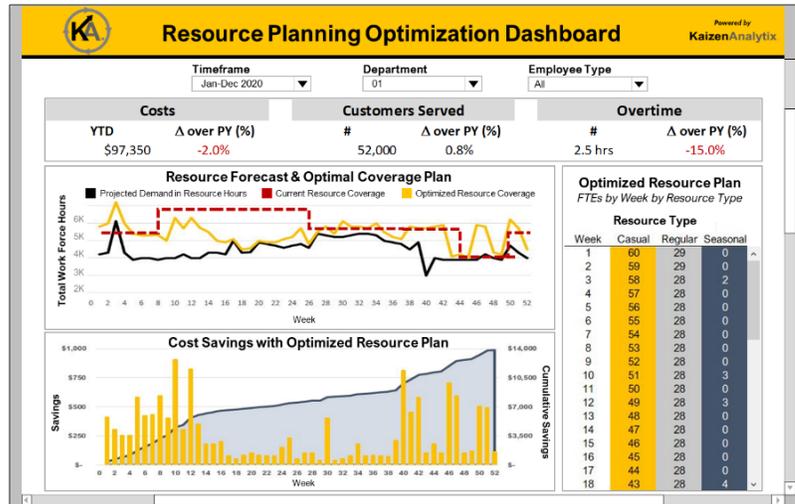
3. WORKFORCE SCHEDULING

One of the most challenging and dynamic decisions that F&B operators must address is staffing the front of house (FOH) and back of house (BOH) at levels that simultaneously satisfy demand and keep labor costs low. While many restaurant managers simply devise their plans on the basis of experience and instinct, mathematical optimization models can bring certainty to the decision-making process. Although the analytical and numerical computations may be complex, the fundamental components are simple. To arrive at the best solution possible, we build an *objective function*, identify our *decision variables*, and *constrain* the possibilities in accordance with business rules or practices.



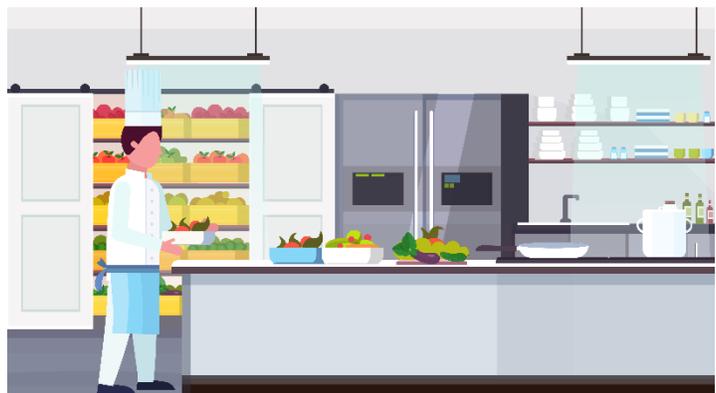
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In the workforce scheduling example of our restaurant, the objective function aims to minimize total labor cost. Our decision variables include the demand levels, direct labor standards by job function, labor hours by job function, and consumer sentiment. By integrating our demand forecast, measuring standards with time studies, constraining labor in accordance with agreements, and constraining consumer sentiment above a certain threshold, we can optimize the solution. Upon execution, the model will quantify exactly when and how many employees in FOH and BOH job function are required to achieve the goal. Thus, by modelling workforce scheduling with mathematical optimization, we can prescribe a solution that minimizes labor costs without sacrificing the ability to meet customer demand with quality service.



4. INVENTORY MANAGEMENT

In the F&B industry, failure to effectively manage stock levels can burden inventory costs, increase waste, and cause items to sell out while in high demand. In a business with thin margins, restaurant operators cannot afford to lose profit as a result of poor inventory management. Success in this area requires a few fundamental responsibilities to be meticulously performed and continually maintained. Knowing exactly what's on hand, at any given time, is the crux of *inventory tracking*, which should be supported by a POS system and validated with manual cycle counts. Beyond just knowing current stock quantities, *shelf life* and *turn rates* must be monitored to determine how long the inventory will last. With on-hand inventory under control, your itemized *demand forecast* will inform replenishment requirements for purchasing. Because the forecast considers all variables that influence demand for each menu item, it can accurately estimate how many units will be sold on a given day or meal period. Leveraging a more accurate demand forecast for inventory decisions will promote lean operations that keep obsolescence and inventory costs low while preventing stock-outs of high velocity inventory.



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CONCLUSION

Food & Beverage operations are ripe for data-driven insights that increase revenues, decrease costs, and improve the bottom line. With an accurate demand forecast forming your rock-solid analytics foundation, you can almost immediately capture quantifiable benefits across multiple functional areas within your operation. Beginning with a guest demand forecast, we recently delivered 2%+ profit uplift at a destination resort through prescriptive F&B outlet open/close recommendations for their 10+ restaurants. While many restaurants operate with some degree of nuance, our analytical models can be configured to ensure successful deployment in any environment. Kaizen Analytix is here to help you build the multi-faceted analytics platform that suits your needs. Contact us to discuss how our analytics acumen, industry expertise, and **KaizenDataLabs™** external data can grow your F&B operation.

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