Executive Summary

The past decade has been tough for airlines, due to a wide array of macro-economic factors, socio-political uncertainties, increased cost of operations, a stagnating and in some cases even declining market and tremendous increase in competition. In light of these challenges, airlines need to continuously reinvent themselves and stay connected with customers, increase returns on every dollar spent and build a loyal customer base.

This paper provides insights into ways advanced analytics can be leveraged by airlines to address these challenges by improving their customer centricity. It looks at customer behavior in the airlines industry from three aspects. We start with the hypothesis that any numeric customer index that captures the value of the customer to the airline needs to reflect the heterogeneity of customer behavior. This can be best achieved by using a multi-dimensional customer index, or what we call the Customer Composite Vector (CCV).

Secondly, a numeric customer index (single aggregated score or multi-dimensional vector) is not only a way of understanding customer behavior, but it also has the potential to be used by airlines as a lever to shape and drive customer behavior in a manner that increases customer yield and profitability.

Last, but not least, looking at the customer through the lens of CCV will allow airlines to treat customers differently by leveraging their heterogeneity and allowing for connections at an individual level. This, we believe, will increase customer loyalty and overall brand equity over time. We also offer a vision of the technology infrastructure required to make CCV a reality, including custom in-house deployments or delivered as hosted, managed application services.

Advanced Analytics: A Competitive Lever

With overall airline industry margins at less than 3% in 2010,¹ the industry continues to lag in shareholder value creation by not matching traditional cost of capital measures. While conventional levers such as increasing operational efficiency and monitoring KPIs and metrics are still important, they are not sufficient for creating a competitive edge. Studies show that while fuel cost instability and revenue management are among the top challenges for airlines, it is customer loyalty and retention that are viewed by almost all airlines as the lever with the most potential positive impact on their business.²

That’s where advanced analytics can play a crucial role. Analytics can help uncover elusive trends and patterns and unearth uncommon insights across all areas of the airlines business.
Advanced analytics can enable airlines to gain an increased understanding of customer behavior patterns, identify a cost-optimized way to serve them, enhance opportunities for revenue generation and build strong brand perception/loyalty among existing and potential customers.

This and more can be accomplished by leveraging proven statistical and scientific methods. These methods can significantly improve the quality of decisions by reducing “gut-feel” decision-making and increasing scenario-based decision-making that is fortified with data-derived foresight. In today’s hyper-competitive marketplace, advanced analytics can be the crucial element in identifying ways for airlines to differentiate themselves with customers and ensure continuous business improvement on an ongoing basis.

Airlines are obsessed with new customer acquisition. However, they also realize the importance of retaining and generating more revenue from existing customers while enriching their experience and thereby increasing customer loyalty and stickiness. They have worked hard to understand customer behavior, with varying degrees of success. The key question is how airlines can move beyond merely understanding customer behavior. Our fundamental hypothesis is that satisfying customer demand is not sufficient; rather, airlines need to shape and drive existing customer behavior in a manner that maximizes returns and keeps them one step ahead of both the customer and the competition.

Creating a single customer score is valuable; however, it also has its limitations, as the heterogeneity of customer behavior is lost when it is aggregated under a single score. Limits of Traditional Customer Scoring

At most airlines, customer data is generated by different sources and is manifested in different shapes and sizes. Some examples include ticketing data (e.g., owned and online travel agency Web sites, intermediaries, agents, etc.), frequent flyer data (e.g., owned, alliance or third-party), marketing data (e.g., partner information) and call center data. Many have attempted in several ways to understand the profitability (i.e., cost-to-serve) or to link non-travel revenue with other customer data; however, they have not found any direct mechanism to compute it.

In an attempt to use disparate customer information, they end up creating multiple versions of customer databases, each specific for each requirement. In some cases, airlines have hundreds of different customer databases, each built for analyzing customer data in a different way. While many airlines have consolidated customer data from disparate sources under a common customer database or data warehouse, they have not yet been very successful in utilizing the insights this data reveals in a cohesive manner.

Most airlines currently have one view of the customer through their customer loyalty database, and they use frequent flyer data to differentiate customer profiles—which may not be an accurate reflection of their lifetime value or profit contribution. Some have even gone a step further and used customer data to assign a score to customers, indicating the relative value or importance of individual customers. Creating a single customer score is valuable; however, it also has its limitations, as the heterogeneity of customer behavior is lost when it is aggregated under a single score.

Sometimes, customer scores are used to quantify the value of the customer from a lifetime perspective. Such a value does not provide insight into the customer’s behavior at any particular time, and it does not provide any insight on how to change the customer’s current behavior to the airline’s advantage. A single customer score or lifetime value does not provide any indication of how airlines can connect better with the customer, ultimately resulting in increased yield and spend. More specifically, it does not help airlines to assess how different offers may have a different impact on different customers.

Customer Composite Vector: A Multi-Dimensional Customer View

An alternative to an aggregated customer score is a Customer Composite Vector, or CCV, which can form the foundation for generating customer-specific actionable insights. By definition, CCV is a multi-dimensional customer value along a set of behavioral dimensions or vectors. The definition of vectors will differ from industry to industry
and even within the airlines industry from airline to airline. For example, airlines could define the CCV along the vectors of travel frequency, travel spend per trip, non-travel spend, trip profitability, cost-to-serve, passenger type, peer influence and/or competitive consideration set (see Figure 1).

While the definition of vectors can be customized, the concept of the heterogeneity of CCV, which is its biggest asset, remains constant. CCV is a set of numerical values defined along different vectors. For each customer, each vector is represented by a single numerical value, which is arrived at using pre-defined vector rules. For example, the value for a vector such as “frequency of travel” can be arrived at by using the appropriate vector conversion rule, which converts the number of trips a customer takes per month on average into a numeric vector value according to the vector rules (e.g., one trip per month = 2, three trips per month = 7, five trips per month = 15).

The idea behind such a conversion is three-fold: The first is to ensure that the “non-linearity” of a vector is appropriately captured. For instance, while three trips per month is more valuable than one trip per month, five trips per month is significantly more valuable than three trips per month. The second objective of the conversion is to ensure a vector can be defined as a combination of two or more parameters. For example, if an airline wants to define a single vector comprising both the “frequency of travel” as well as “spend per trip,” then appropriate conversion rules will allow numeric computation of one vector value from two different parameters. Lastly, if at any time an airline wants to combine two or more vectors to arrive at a single value, again, in that case, these conversion rules can aid in the numeric computation of one value across vectors.

Apart from a numeric value, vectors may also have non-numeric or qualitative attributes, which provide descriptive details of the vector value. For instance the “passenger type” vector, which will have a calculated numeric value, may also have a qualitative attribute describing whether the person is primarily a business or a casual traveler, mostly travels alone or prefers to travel with family, is a long-haul traveler or typically goes on short trips, etc (see Figure 2, next page).

Similarly, a “competition consideration set” vector may provide the list of the top two or three competition airlines with which the passenger typically flies or is an active member of their
CCV allows airlines to target customers with the vector that is most important and relevant for them, as well as the one where they may have a higher propensity to act.

Data timeliness: CCV also ensures the “timeliness” of the customer data. The CCV value for each customer gets recalculated at every customer event. This ensures that the airline is always looking at the most current, or recent, value of the CCV when using it for analysis. For example, when the marketing department wants to run a campaign, it can use the most relevant CCV vectors for segmentation and be sure that these CCV vector values reflect the most recent customer behavior.

Perceived value to the customer: Various customers ascribe different values to products and services. CCV allows airlines to target customers with the vector that is most important and relevant for them, as well as the one where they may have a higher propensity to act. For instance, studies show that frequent flyers perceive some attributes of a loyalty program as more important than others. However, in most cases, there is a substantial gap between what customers want and what they get. According to the research, bridging this “want-get” divide can lead to up to a four-fold increase in the percent of customers who will be willing to fly the airline more. Not only this, but if airlines offer products and services that customers value more highly, then the cost of these promotions will be also be less.

The basic hypothesis here is that the higher the perceived value of a particular product, service or experience by a particular customer, the lower the incentive required to drive the behavior. This perceived benefit by the customer can be captured as a CCV “strength,” which indicates the relative importance of that vector for that particular customer. For example, a customer may travel three to five times per month, but that may be the highest level the customer has the potential to achieve; therefore, the strength of the trip frequency vector will be ranked lower than other vectors. On the other hand, the number of trips, perhaps due to flying with another airline, and should be provided with offers and communication, incentivizing him to return to his previous level of travel with the airline. The second customer is increasing her travel, suggesting that offers related to increasing spend per trip may be more impactful.
strength of other vectors, such as the value of an extra baggage allowance or services such as free wireless access at the airport, may have more of a bearing on the customer’s future behavior, and hence, it will be ranked higher than the trip frequency vector.

The strength of a vector can be calculated in a couple of ways. The easiest is at the customer segment level, where customer segmentation can provide an indication of what types of services are valued by which segments, which can provide a segment-level strength value for each vector. This segment-level strength value can be assigned to all the customers in that segment.

The more accurate way is to calculate the vector strength at an individual customer level. This can be achieved by examining the specific set of services and offers used and accepted by the customer from the variety of offers provided as part of recent promotions. In some cases, a direct customer survey can also provide additional insights into which vectors are valued more by the customer. The combination of the vector value and strength is the best way for airlines to target their customers and ensure the best return on investment (ROI).

**Vector progression:** Another big advantage of the CCV is vector “progression.” Vector progression exposes the historical and future path for each vector. This concept allows the airline to not only know the current value for each CCV vector but also how the customer has progressed along each vector over time – and the potential for his progression in the future. This capability is crucial when building scenarios and performing econometric modeling for campaigns directed at moving the customer up the value chain. The net advantage of this capability is that it allows the airline to predict whether or not the customer will move up the value chain (i.e., increase the vector value), what the cost will be and with what probability.

**Benefits of CCV Analytics**

Using such CCV-based analytics, airlines can improve the effectiveness of a marketing campaign. For example, say an airline wants to drive traffic in a particular sector, so it decides to offer bonus frequent flyer miles to customers. Using the combination of vector values and vector strength for each customer likely to fly on that sector, the airline can identify the initial customer set. Then, using the progression pattern of vector values, the airline can then perform an econometric modeling of what kind of bonus mile incentive is required to increase the probability of each customer flying that particular route. It can use this information to create a personalized offer for each customer, with specific bonus miles that are most likely to drive the customer’s behavior.

Moreover, for customers who are likely to fly on that route anyway, offering bonus miles may not result in additional traffic, and hence, airlines can significantly improve the campaign ROI by making the offer only to those who are not likely to fly without this incentive. Such a CCV-based approach is likely to be more effective, as it can transform mass generic campaigns into highly personalized ones, with higher campaign success rates and significantly higher campaign ROI.

Over time, the evolution of customer behavior across different vectors can be analyzed to provide an even deeper understanding of the airline’s relationship with its customers.

Over time, the evolution of customer behavior across different vectors can be analyzed to provide an even deeper understanding of the airline’s relationship with its customers. Analysis can also be conducted to identify which vector progression paths lead to greater customer loyalty and improved customer yield over time. This insight can provide inputs to the types of offers, promotions and campaigns that need to be designed to drive customer behavior in the desired direction. Analysis of how the different vectors of CCV progress over time can provide much more meaningful insights about how to reduce attrition and address low-yield customers. Additionally, potential red flags can be raised much sooner, as the propensity to lose a customer will be highlighted much sooner.

The definition, conversion rates, aging process, strength and natural progression path for each of the CCV vectors vary from airline to airline, depending upon their specific needs. Defining the vectors and identifying the optimal number of vectors is a crucial foundation step. Creating too many vectors can make analysis difficult and decision-making, hazy. On the other hand, creating too few vectors will compromise the heterogeneity of customer behavior. While defining vectors, it is important to combine only those parameters under a single vector...
that have natural and statistical affinity among themselves. Vector definitions and associated rules should be defined only after thorough due diligence and impact analysis.

**Application of CCV: Driving Behavior**

Airline operators spend millions of dollars on promotions and campaigns to attract customers. They acquire new customers who often enroll in their frequent flyer loyalty programs, allowing them to collect more data and provide better offers and communication. While engaging customers in loyalty programs is important, the greater benefit comes from tracking customer behavior on an ongoing basis.

Setting the initial value of the customer’s CCV vector values is the essential first step in this process. The new customer may be slotted into an existing customer segment, and his CCV vector value counter would be set by extrapolating behavior from other customer behavior patterns. The initial assignment of the CCV dimensional values becomes the starting point of the airline-customer relationship and should then be subsequently used over the customer’s lifetime to continuously change the CCV vector values, depending upon different customer journey and lifecycle events.

Throughout the customer lifecycle, a variety of events occur, which feed into the CCV and enrich the understanding of the customer. This then improves the ability of airlines to use that information and respond meaningfully. Every customer trip, nature/class of travel, non-travel related purchase, cancellation/postponement, call center interaction of an individual customer, customer preference and so on enrich the CCV. Even non-events like not flying enough can provide inputs to the CCV. Also, information such as rival airline frequent flyer programs of which the customer is a member can help in understanding the airline consideration set for that customer. Studies show that while 9 in 10 of business travelers belong to at least one frequent flyer program, more than three in five belong to three or more such frequent flyer programs.

Thus, in theory, all else being equal, the optimal pricing strategy is not to be the cheapest among all airlines but to be the most attractive in the customer’s consideration set. Similarly, a customer with two active frequent flyer programs will have significantly different response behavior compared with the customer with five or six different active loyalty programs. For instance, even the most cost-conscious budget traveler will be willing to pay a slight premium to travel on an airline in which she is a member of the frequent flyer program in order to accrue additional miles and rewards. And so, the campaigns and promotions that will drive the customer’s behavior need to differ depending upon the competition consideration set, which, again, the CCV can help decide.

**Learning from Retailers**

Airlines can also learn from retailer loyalty programs, especially when it comes to creating customized promotions at an individual level. While most airlines only conduct mass market campaigns that are not based on individual customer behavior, leading retailers have carried out targeted and highly individualized promotions for years based on their customer data and loyalty programs. Airlines should consider emulating the way retailers analyze in-store and online spend behavior and attempt to increase the customer’s total spend. Retailers do this by performing a market basket analysis and delivering targeted promotions, increasingly in real time and in context (i.e., where they are searching for or comparing products).

For instance, a leading UK retailer uses individual customer market baskets to classify the customer into one of over 20 lifestyle segments. It then uses that segmentation to not only understand the customer but also influence her behavior based on customized offers and promotions. Similarly, customers’ flying patterns can be analyzed to determine when they are likely to fly, how often they fly, which sectors they fly, etc. All this information can potentially be used by airlines in tailoring their relationship with customers.

For instance, three in four of all U.S. air passengers choose the airline they fly most often...
because of the airports they fly from; more than two in three cite convenient schedules. This means that based on the most frequent sectors, airports or flight times preferred by the customer, airlines can offer promotions specific to those particular sectors, airports or flight times. Offering sector-, airport- or even schedule-specific incentives and promotions will be more effective compared with a generic mass-market offer. Such promotions may also be used to level out occupancy and utilization across different sectors and across different times of day.

Airlines also have an advantage over retailers in that they know in advance (i.e., as soon as the customer books his/her ticket) where customers are going and when. Retailers would turn that knowledge into a pot of gold by targeting the customer with a variety of up-sell/cross-sell offers.

The ability to predict customer reason and probability of defection is crucial for airlines in trying to retain their existing pool of loyal and profitable customers. CCV-based analytics can provide red flags at appropriate stages (event-based or pattern-based). For example, an unusual dip in travel frequency can be flagged as a potential case of customer defection and marked for further investigation. From there, proactive measures can be taken to retain and recapture the customer.

For instance, if a dip in travel frequency points toward a change in a customer’s preference for a different airline, CCV-based vectors can provide insight into what is important to the customer and create an incentive that will increase the probability of gaining the customer back.

Conventional wisdom suggests it is less costly to retain a customer than to acquire a new one. However, this is possible only if the airline knows the specific customer’s behavior, preferences, propensity and reasons to defect, etc. For example, a small incentive like a simple upgrade voucher for the customer’s next flight may not only help retain the customer but also prove to be the crucial event that can potentially cement the airline/customer relationship for a very long time. Knowing when to offer and whom to offer what kind of incentive and promotion is where CCV-based analytics can help airlines improve the effectiveness of their retention efforts.

Learning from Financial Services Providers

Some leading financial product providers in the e-commerce space conduct “test and learn” experiments, where they try to identify the nature and timing of promotions that can have the most influence on customer behavior across various customer segments. By identifying whom to give what kind of incentive and when, they are able to drive customer payment behavior toward financial products that are more suitable and arrest possible attrition, as well as those that are more profitable for the company. Airline operators can adopt a similar model, whereby they create micro-promotions based on experiments at an individual customer level and use the results to guide customer behavior.

The ability to understand the impact of loyalty status promotions, campaigns and offers on the decisions made by customers when selecting the preferred airline is crucial to ensuring the right amount of money to spend on the kinds of promotions that elicit the required customer behavior. For some customers, on-time arrival may be more important than price. And if the airline is able to identify those customers and design a promotion exclusively on timely arrival rather than focusing on low prices, then this offer will not only attract more such customers and improve the customer yield, but it will also prove to be a clutter-breaker in the competitive marketplace.

For example, airlines can guarantee an on-time arrival (by promoting actual arrival time within plus or minus 30 minutes of the scheduled arrival time) or promise to reimburse the customer in some form (i.e., an in-kind cash-back offer). This will be similar to the 30-minute guarantee or money-back promotion used by pizza chains. This approach could be hugely popular among a particular segment of customers, say business travelers or late-evening flyers, where flights have a higher propensity for delay.
A one-size-fits-all approach does not work in most industries, and the airline business is no exception. It is important to treat different customers differently and understand the differences among categories such as business traveler vs. casual traveler, frequent flyer vs. occasional traveler, single traveler vs. travelers with family, long-haul traveler vs. short-hop travelers, etc. Each of these customer segments has its own characteristics, with significant implications for airlines.

For instance, a study shows that more than one in two business passengers may be willing to pay $10 more for services such as priority airport security screening to reduce waiting time at the airport. The vector of time or convenience is more important to a certain set of passengers, and they are willing to pay extra for it. This indicates an opportunity for the airlines to charge extra for such services from such business passengers.

Similarly, there might be differences in other categories of passengers, such as the long-haul traveler vs. a short-hop traveler. A long-haul/multi-leg traveler may value access to special lounges more than anything else, which will ease transit significantly. Providing that additional feature at the time of booking, even at an extra cost, may not only increase the yield but also do wonders for the long-term loyalty of the customer. Similarly, for a traveler with family, providing discounted vouchers for a restaurant at the airport might be the most valued promotion.

Personalization Counts

Again, CCV-based analytics can help identify the right audience for this offer, calculate the cost of such a promise and compute the returns on such promotions. The econometric modeling of such promotions is crucial to ensure that the incremental revenue/profit over a period of time more than offsets the cost of risks undertaken and, hence, the overall cost of such promotions.
According to one industry survey, more than one in two customers prefer the aisle, while more than two in five favor the window. For either customer type, the booking system can use previous flight history to offer a guaranteed aisle/window seat for a small fee.

The crucial aspect in creating these customer-centric services and offers is the use of CCV-based advanced analytics to identify the right set of customers for the right set of promotions and incentives. Airlines can predict the impact by using ROI analysis and econometric modeling to optimally decide the level of incentive and, then, can apply actual response data to improve their analytical accuracy and effectiveness over time.

**Ancillary Revenue Opportunities**

Industry estimates suggest that ancillary revenues currently account for approximately 7% of global airlines’ top line, a figure that is expected to almost double by 2015. Co-branded credit cards are the quickest and most popular way for airlines to add ancillary revenue. Many frequent flyer loyalty programs are also combined with the loyalty programs of car rentals or hotel chains. However, this opportunity for ancillary revenue generation can be increased many-fold if airlines are able to understand individual customer preferences and behavior and provide personalized promotions. Here are some examples:

**Airport-based revenues:** Going beyond the revenue generated through the loyalty card partnerships with car rental agencies, hotels and credit card companies, tremendous opportunity exists to engage with customers while they are at the airport or by charging for services that are valued most by them. Customers at the airport are increasingly viewed as a captive audience. Many customers spend as much time at the airport as they spend in flight. The boom in the airport-based retail and hospitality industry is a big opportunity for airline operators to better connect with customers.

CCV-based analytics can help airlines decipher customer behavior and preferences, and that can help them design co-branded promotions in partnership with retail and hospitality stores in airports. While some operators are already doing this, it is mostly conducted at a mass-market level rather than at an individual customer level.

For instance, a mass-market promotion in which all frequent flyers get, say, 5% off at a particular store or restaurant will be far less effective than a targeted promotion in which a customer gets 10% off on a store or restaurant that she is more likely to visit. The key difference is that an individualized promotion means the preferred store will differ from customer to customer, and hence, the promotion response rate and the ancillary revenue will be significantly higher for the same amount of campaign spend.

**Optional travel products/services:** CCV-based advanced analytics can provide insights into likely customer behavior, product preference and preference of retail and hospitality stores, both inside and outside of the airport. This, in turn, can be leveraged for a more targeted promotion with a much higher conversion rate.

Micro-campaigns can be analyzed along different CCV vectors, and their progression over time can be mined for ROI. The results can be used to continuously refine and optimize campaigns to achieve ancillary revenue targets. According to research, almost one in two U.S. online airline passengers have paid a travel fee in the past 12 months for at least one optional travel product or service. According to another study, more than two in three travelers booked at least one additional service at the time of booking their last trip, with services ranging from insurance, to meeting facilities, to restaurant reservations, to other travel services. This shows that a tremendous opportunity exists to increase ancillary revenue, provided that airlines can understand who needs what at the individual customer level.

**Airline/airport partnerships:** With the evolving concept of smart airports, and with a growing number of users opting for a mobile Web experience, airlines can enhance the customer experience by partnering with airports to provide enhanced services throughout the journey. With the flight data, services such as discounted stays at an airport hotel in case of flight delay or valet services for travelers in case of a late-night flight will help provide a better customer experience.

**In-flight opportunities:** Similar to the enhanced customer experience and ancillary revenue...
opportunity at airports is the opportunity of the in-flight time spent by the customer. While this is still an evolving space, a greater understanding of customer behavior can be leveraged to enrich the customer’s in-flight experience, which can not only augment ancillary revenue and increase profits per trip but also be a way for the airline to differentiate itself.

For example, in 2010, Virgin America launched the first ever digital shopping platform on seat-back video screens. Korean Air will roll out the world’s first flying duty-free store onboard its first A380 by the end of 2011. With technology making such services possible, the key is to identify whom to offer what kind of service at what price point.

Thus, providing Internet access to business passengers through an in-flight wireless facility may be a very simple and effective way of not only increasing revenue potential but also increasing customer loyalty in a hyper-competitive market. For instance, Delta offers a 24-hour pass for unlimited Internet access. CCV-driven analytical insights can help airline operators design and run such additional products and services and make offers to customers who value them most and have a higher propensity to accept them.

**Online/social media opportunities:** Studies show that almost two in three bookings today are conducted online through airline Web sites and that customers are increasingly using comparison/aggregation Web sites for comparing fares and making bookings. Online and peer review sites are also becoming an increasingly important vector in the customer’s decision-making process. Holiday and casual travelers increasingly rely on Web buzz, including the formal and informal feedback from third-party and social media sites, as well as independent blogs.

Social media sentiment is becoming an important aspect, and hence it is crucial for airline operators to be proactive in the online space through effective use of advanced analytics. While the ability to listen and analyze the sentiment of online chatter is crucial, it is becoming increasingly important to ensure social media attitude is managed like any other brand attribute. Thus, the ability to shape key opinion leaders’ views in the social media space is crucial.

Advanced digital and social media analytics can go a long way in augmenting airlines’ overall marketing strategy to manage brand perception. In fact many retailers, consumer goods manufacturers and automobile companies are already doing this very effectively, and airlines would be wise to apply lessons learned from their digital marketing strategies. CCV can help analyze the impact of social media interactions and drive airlines’ digital marketing and social media strategies. Airlines need to analyze the impact of such social media behavior and try and understand the drivers for customers choosing a particular airline over others.

Malaysian Airlines, for example, has launched an application (MHbuddy) on Facebook that allows users to book and check in for a flight while sharing their trip details with their social network. While the digital world is in hyperactive mode, it is also important for airlines to differentiate and segment digitally-savvy customers from digitally-challenged ones. An airline’s digital marketing strategy should primarily serve digitally-savvy customers, and CCV vectors can enable it to make this distinction. Knowing which customer is impacted how much by digital media and the most effective way to reach him can help airlines make optimal use of their marketing dollars, especially digital marketing spend.

**Peer influence:** CCV-based analytics can also enable airlines’ assessment of the impact of peer influence on a customer and the ability of customers to influence others who span their direct or indirect influence. Network analysis of customers and their connections can help analyze their impact on peers (family members/friends/office colleagues, etc.) and see which vectors have a higher correlation and identify a greater influence. CCV vectors can help connect this very important linkage among the peer group, which can be used effectively in designing referral campaigns to help airlines reach the customers they want to attract through the network of customers they already have.

While ancillary revenue opportunities are immense, it is important for airlines to ensure that customers are not inundated with numerous frivolous offers and are instead offered only a few

An airline’s digital marketing strategy should primarily serve digitally-savvy customers, and CCV vectors can enable it to make this distinction.
targeted and personalized offers pertaining to services that are valuable to them.

High-end analytics such as a CCV model can dramatically help airlines understand individual customer behavior and create personalized offers and promotions. In a recent survey,93% of respondents felt that loyalty programs were not serving loyal customers but were primarily a marketing tool. CCV-based analytics can enable airlines to leverage data embedded in these loyalty cards to do exactly what they were originally intended for, to get closer to customers and increase their loyalty.

Analytics as a Key Lever for Cost Rationalization

The global economic downturn was particularly hard on airlines because of their higher fixed cost structure. Per International Air Transport Association (IATA) estimates, the airline industry is set for a 40% decline in combined profits in 2011, falling from $15.1 billion in 2010 to $9.1 billion in 2011. Though revenue is set to grow 5.8% to $598 billion, profit margins will fall by almost half to 1.5%. Thus, a lean and mean operation is the new industry mantra, and hence it is important for airlines to rationalize all costs, including the expense of serving customers.

However, a cookie-cutter approach of slashing costs, especially on customer-facing services, can have disastrous long-term impacts on customer loyalty, revenue and brand equity. That makes it important to be prudent in understanding the impact of cost rationalizing measures on customer behavior.

CCV-based analytics can help airlines identify the right ways to rationalize costs in a proactive manner with minimal customer impact. CCV can allow rationalization of cost as a continuum across multiple vectors rather than a toggle decision. For example, the first move for airlines is to examine ways of driving customer behavior in a manner where cost of service can be reduced without compromising customer service, such as moving customers toward using self-service kiosks, online and mobile check-in facilities. While most airlines have these capabilities, much more can be done to drive customers toward desired actions, especially on a case-by-case basis.

Analytics can help identify the right customer segments with a higher propensity to change and also illuminate the appropriate level of incentive, such as bonus frequent flyer miles for driving specific customer behavior that supports cost rationalization initiatives.

Airlines can apply analytics to such data to generate the optimal balance of fare and frequent flyer miles. Analytics can also help in changing the incentive lever, such as which rewards should be offered, how rich they should be or when they should be offered. For example, it might make more sense to target very busy airports when providing a bigger incentive like more bonus miles for lower-cost online or kiosk check-in during peak hours/seasons than providing it at all times or uniformly at all airports.

Another focal point could be around services such as in-flight meals and cost of extra baggage. For example, buying in-flight meals or extra baggage in advance, through online services, or at the time of booking at a cost significantly lower than the rack rate, could not only improve the yield per customer, but also reduce operational costs.

Again, CCV-based analytics can enable airlines to identify when to offer what promotion to whom to drive the maximum change and have the biggest cost impact. This will also allow airlines to identify the economics (quantitative), as well as the perceived benefit (qualitative) of such services, thus reducing cost of operations by converting no-fee services perceived as less important into paid services.

Bring CCV Alive: Implementation Ideas

To implement CCV-based analytics, airlines need three essential components. First is the “CCV Engine,” which is at the heart of the solution and calculates the CCV value for each customer on an ongoing basis, based on different customer journey events. The number and definition of different customer vectors is a crucial consideration and needs to be decided after careful deliberation.

The CCV Engine identifies customer preferences and the products and services most valued based on different vector values. The engine analyzes customer behavior patterns and identifies probable customer preferences, along different CCV vectors. This analysis is then used to identify those dimensions that can be leveraged by airlines in driving customer behavior by optimizing incremental revenue and the cost of serving the cus-
customer, including the cost of incentives and assessing probability of acceptance. CCV vector values are calculated in an offline manner on a periodic (weekly or monthly) basis and on-demand for all customers.

CCV is an independent engine that can provide customer vector values for any given customer to any system or program within the airline’s IT landscape. From a technical perspective, the CCV Engine is developed using a set of advanced statistical and mathematical techniques and algorithms. The engine is specific to each airline and must be built based on specific customer data and core intellectual property. Once developed and matured, the CCV Engine can be operated like a black box, with minimal maintenance overhead. However, persistent change in the business environment may necessitate continuous fine-tuning of the algorithms and logic inside the CCV Engine from time to time.

The second component required to implement a CCV-based solution is a set of “CCV Business Applications” that can be leveraged by different business groups and functions within each airline’s business group to optimize their day-to-day decisions using CCV-based analytics. These could be across the business value chain, such as marketing, promotions and campaigns, pricing and revenue management, ancillary revenue opportunities, partnerships with other loyalty programs, etc.

CCV Business Applications could range from a set of simple business rules, to complex algorithms specific to a business function. And since these are pure business applications, they should be fairly flexible to changing market dynamics. CCV Business Applications can be developed specific to an airline or could be delivered as hosted, managed services. These business applications can even be consumed in the evolving software-as-a-service (SaaS) model, which reduces the cost of investment required to deploy and leverage their benefits.

The third component required to implement CCV-based solutions is “CCV Analytical Services.” Initially, this is required for building the CCV Engine and different CCV Business Applications. Subsequently, these services are required to ensure that customer data and related inputs computed by the CCV Engine and CCV Business Applications are optimally applied to different business scenarios and ongoing decision-making exercises. CCV analytics can also be delivered as a business or knowledge process outsourcing (BPO/KPO) service, in which clients entrust a third-party specialist to identify and make customer-specific recommendations offers.

From a technical perspective, the CCV Engine is developed using a set of advanced statistical and mathematical techniques and algorithms.

CCV: Approaching Take-off
It is a continuous quest for airlines operators to increase customer yield in these economically challenging, highly competitive times. Advanced analytics is the most under-utilized lever today and has significant potential to aid and optimize decision-making at all levels. Analyzing customers along different CCV vectors can improve airlines’ understanding of customer behavior patterns and enable them to offer services, promotions and campaigns that are customized for individual customers. This, in turn, will have a higher probability of driving customer behavior in the desired direction that will increase the customer trip yield and profitability and ultimately increase customer stickiness and loyalty, which is the industry’s Holy Grail.

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Footnotes


About the Author
Siddhartha Tomar is a Director in Cognizant’s Enterprise Analytics Practice and is the global leader of analytics for multiple industries, including travel, hospitality, manufacturing, logistics, energy and utilities. Siddhartha can be reached at Siddhartha.Tomar@cognizant.com.

About the Cognizant Enterprise Analytics Practice (EAP)
With over 900 consultants, Cognizant’s Enterprise Analytics Practice (EAP) is partnering with clients across the globe by providing business-specific and enterprise-wide analytical services. EAP uses advanced statistical, mathematical and econometric models, combined with deep domain knowledge to provide predictive and descriptive analytic solutions to drive fact-based enterprise decisions. Cognizant EAP’s philosophy is to extend the classical hindsight analysis by providing uncommon business insights and predictive foresights in a manner that brings analytics to the masses in a highly accessible manner. For more information on how EAP can help your organization in gaining analytical insights and foresights, contact analytics@cognizant.com.

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