Predictive thinking

How travel managers should be using predictive analytics

CWT Solutions Group

Predictive Analytics: Intelligent data modeling used to accurately understand future behavior and events.

It's being used by e-commerce companies like Amazon to ship items in anticipation of customer purchases, and suggest items based on the buying activity of shoppers 'like you'. Google's AI division is using deep learning tools to develop models to predict everything from the second-half results of basketball games, to clinical outcomes – and even mortality. It's already being used for direct marketing, by banking and financial institutions, and in healthcare. We can make educated predictions with more certainty than ever before.

But how valuable is this tool to those in the travel industry?

When it comes to predicting trip-specific price changes at a macro level, such as the evolution of demand and fares on set routes over time, there is real value for travel managers.

At a micro level, we can dig even deeper. We can use predictive to develop personalized itineraries for travelers, or forecast price hikes that could impact their future travel.

It's time to look seriously at how predictive analysis could impact how travel managers use data to manage their budget, find savings and achieve return on investment (ROI).

We have been working with trusted partners, including one client who is a leader in the technology space, to model what it could look like if you were able to harness predictive tools when planning your travel program.

Executive summary

CWT Solutions Group, CWT's consulting division, has built an advanced data model that sifts through more than 85 indicators and metrics. This includes large historic travel data sets as well as public data on commodity prices, macro-economic indicators, weather, and holidays. Those data are analyzed to identify patterns and correlations, generating robust predictions for a company's future spend, specifically number of trips and cost per trip.

In today's environment managing travel programs should not be just about monitoring and taking corrective actions. Predictions enable all stakeholders in the business travel industry to better anticipate and to act proactively.

This paper illustrates concretely how predictive analytics can reveal new savings opportunities on many fronts:

- **With travelers** – you can enforce advanced booking for trips to destinations expected to see high occupancy or load factor, ensure availability and best rates, provide insights about the best time to travel to a destination (seasonality throughout the year, avoiding peak periods), or communicate about new suppliers where best terms are anticipated. The result: better traveler compliance.

- **With suppliers** – you can proactively manage your supplier programs by adding challengers when you identify load factor or occupancy constraints. In response to the predicted evolution of your spend areas, you may widen negotiated booking classes and room types, renegotiate specific discounts or rates, review contractual targets, or adjust online tool settings.

- **With internal business stakeholders** – you can act as an internal consultant to support business unit (BU) leaders when they need better insights on travel trends and travel budget planning, and educate BU leaders on who will be most impacted by specific availability or rate increase challenges.

Chapter 1

Developing a predictive model to solve a problem

The big challenge: Managing the cost of travel

Managing the cost of travel remains one of the top priorities for travel managers.

One clear way predictive analytics can be used to improve travel managers' work is by better understanding travel spend to allocate budgets and better manage costs.

How can I optimize my travel program?

- By identifying ahead of time which routes are most susceptible to cost increases.
- By identifying what could drive that cost increase.
- By defining actions to change behavior or outcomes in response to future insights.

To do this, we need to develop a specific, tailored model that examines a specific area of interest.

First, we need to define what we want to forecast. Then, we need to find out what factors to look at to develop the right predictive model.

Number of trips x cost of trips = travel spend

What do we want to predict?

We can apply predictive analytics modeling to examine the cost of travel or the travel spend, by breaking them down to two elements:

1. We can predict the number of trips that will occur in a period of time.

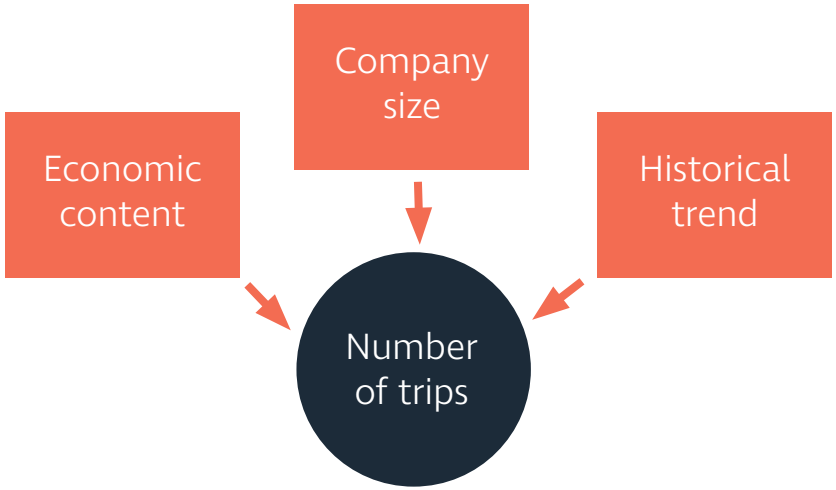
2. We can predict the cost of each trip.

How do we make this prediction?

To make this prediction, we need to adopt a top to bottom approach:

1. First we predict the yearly travel volume, taking into account both historical trends and external factors. Here, we are leveraging the entire CWT transactional database from the last 4 years, and taking into account more than 85 macroeconomic KPIs plus commodity prices such as GDP, inflation, food price, fuel price, and more.

2. Next, we predict the quarterly, monthly, or weekly breakdown for the year ahead by using the corresponding breakdown from past years. This lets us account for calendar holidays and seasonality within a company.



Methodology

Q: How can you predict the number of trips and the cost per trip in the next week, month, quarter or year?

A: *CWT Solutions Group*, CWT's consulting division, has built advanced data modeling capabilities that sift through large historic travel data sets, as well as public data on commodity prices, macro-economic indicators, weather, and holidays. This data is analyzed to identify patterns and correlations in order to generate robust predictions for a company's future spend, specifically number of trips and cost per trip. Our data science team is constantly improving the algorithm over time, to ensure our predictions are as accurate as possible.

Q: What does that mean for me and my program? (Why should I care?)

A: By applying this advanced data modeling to a company's specific travel questions, you can make robust predictions about how this activity will impact your future travel program. This will especially help you take proactive measures and actions on your travel policy and supplier program.

Chapter 2

Applying the predictive model to a specific route

Testing the model

Now that we've looked at the methodology used to predict number of trips and cost of trip, let's apply the model to a specific route to see what we can discover.

By testing the model: comparing the results of the predictive model to actual outcomes, we can see just how accurate the model can be in projecting future developments in one specific area.

Chosen route:

London Heathrow (LHR) to John F. Kennedy International Airport (JFK), return

Q: Why test this specific route?

A: Transatlantic routes carry the largest number of business passengers globally.

Q: Why does this matter?

A: Our results show there is considerable value in looking at high-volume business travel routes.

These routes have also been subject to fierce competition, which makes them subject to change over time. The three main joint ventures in the industry are structured around the biggest American and European legacy airlines. Increasingly, secondary airlines aggressively compete on prices, and push to multiply their capacity, especially in US cities, driving competition in the primary hubs of the biggest airports in the US.

Test 1: Number of trips

Route: London Heathrow (LHR) to John F. Kennedy International Airport (JFK), return

We applied predictive analytics tools to project the number of trips during a period from January to June 2018. Once that period had passed, we compared our results to the actual trip figures.

Why you care:

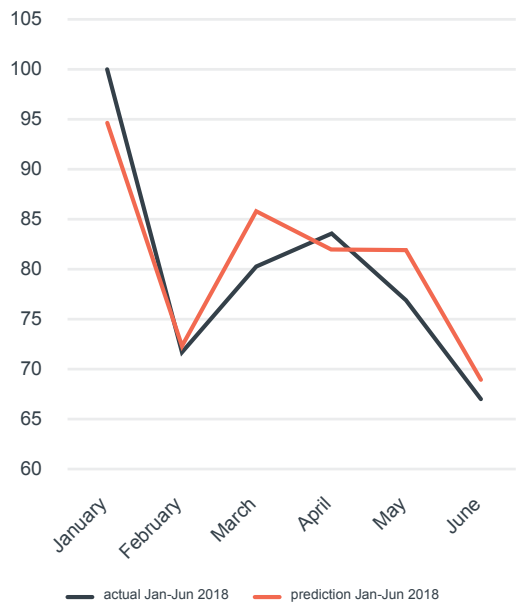
You can see that both of our predictions show a very small margin of error between the actual and projected numbers during this 6 month period; around 2%.

Takeaway:

What would you do with a 98% accurate forecast of the number of future trips?

Comparison of predicted vs. actual number of trips Jan-Jun 2018 on route LHR to JFK, business class

On an index basis with 'actual number of trips January 2018' = 100



Comparison of predicted vs. actual number of trips Jan-Jun 2018 on route JFK to LHR, business class

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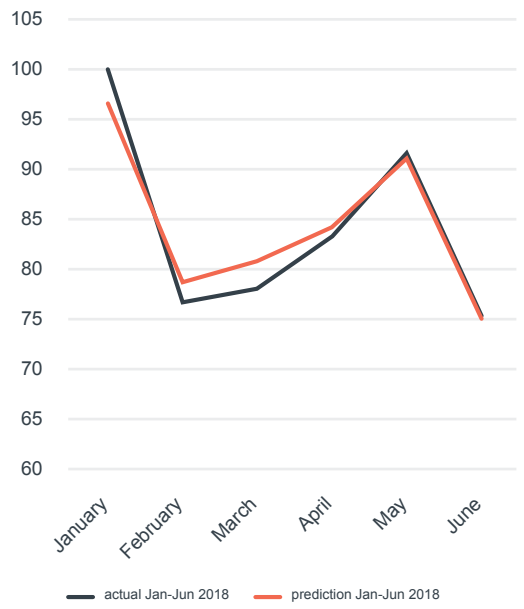


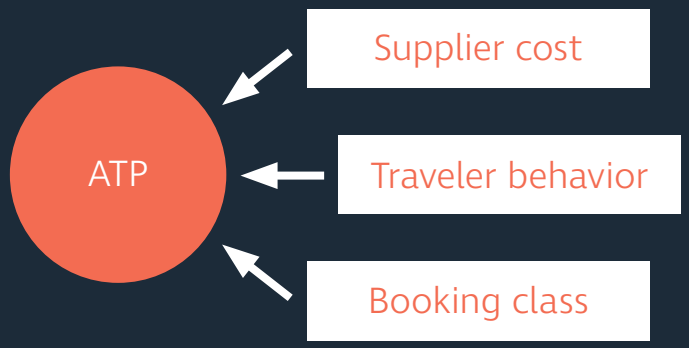
What determines the cost of a trip?

Q: What factors impact the average cost of a ticket?

A: The average ticket price in a given market is driven by several factors: suppliers (airlines, hotels), traveler behavior, and class of travel (flight cabin, hotel room type).

Q: What factors impact the supplier cost?

A: Supplier cost is impacted by the price of commodities and the rate of occupancy.



Test 2: Cost of trip (average ticket price)

Route: London Heathrow (LHR) to John F. Kennedy International Airport (JFK), return

We applied predictive analytics tools to project average ticket prices, with a comparison of actual variations observed from January to June 2018.

Why you care:

As for test 1, you can see that both of our predictions show a very small margin of error between the actual and projected numbers during this 6 months period; around 2%.

Takeaway

- Do you forecast ticket costs across your high-volume routes?
- What value could you gain from accurate projections of your average ticket prices?
- What would you gain from accessing to these kinds of predictions?

Read our 3 key use cases in chapter 4 to answer to these questions.

Comparison of predicted vs. actual average ticket price Jan-Jun 2018 on route JFK to LHR, business class

On an index basis with 'actual average ticket price January 2018' = 100

Comparison of predicted vs. actual average ticket price Jan-Jun 2018 on route LHR to JFK, business class

On an index basis with 'actual average ticket price January 2018' = 100

Chapter 3

Applying the predictive model to 2019

2019 projections

Now that we've looked at predictive modeling of the past year and know our figures were roughly within a 2% margin of error, we can look ahead and apply this model to the future.

Let's now look at what you should expect for H1 2019 (first half of the year) on flights to and from JFK and LHR.

Q: What's going on?

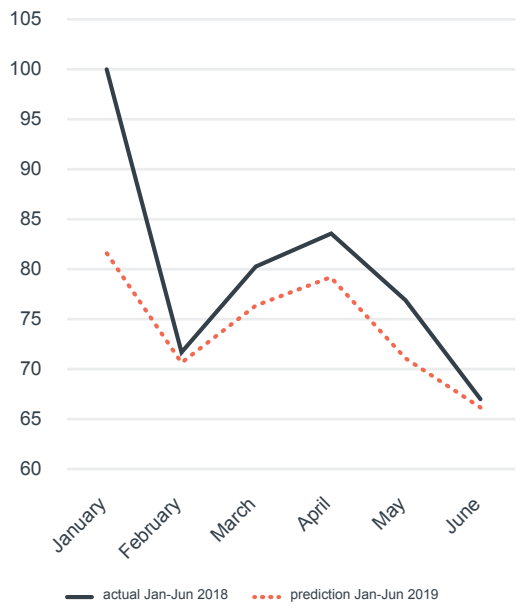
A: Using the same market and methodology as we did in the previous examples – for January-June 2018 – we are now going to look at the period from January-June 2019.

Prediction 1: Number of trips during Jan-Jun 2019

Route: London Heathrow (LHR) to John F. Kennedy International Airport (JFK), return

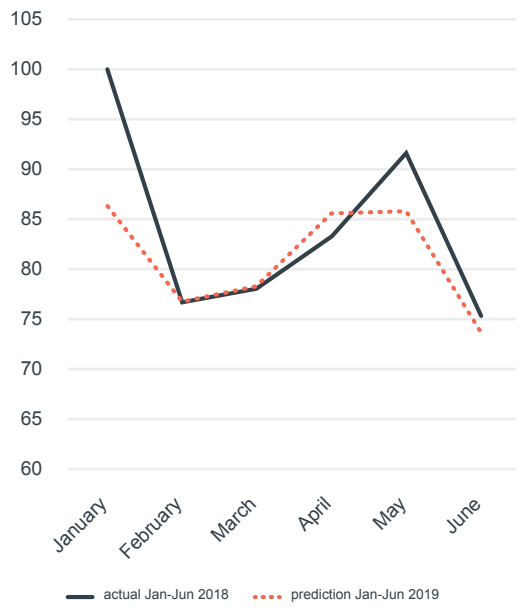
Comparison of predicted vs. actual number of trips Jan-Jun 2019 vs. 2018 LHR to JFK, business class

On an index basis with 'actual number of trips January 2018' = 100



Comparison of predicted vs. actual number of trips Jan-Jun 2019 vs. 2018 JFK to LHR, business class

On an index basis with 'actual number of trips January 2018' = 100



Insights: predictions for H1 2019

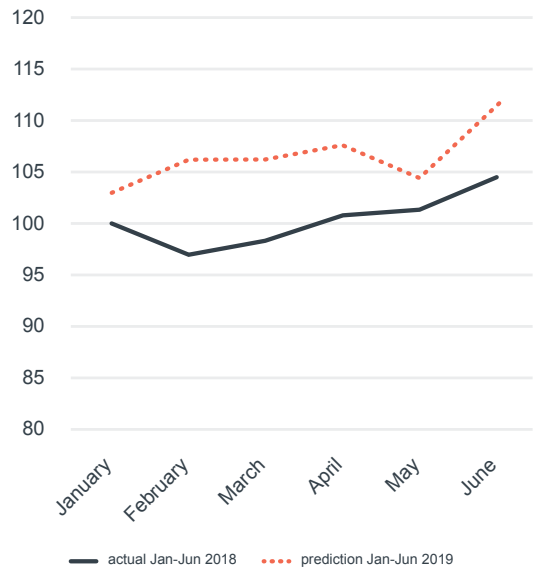
- Both routes (JKF to LHR and LHR to JFK) are expected to have decreased demand compared to the beginning of 2018.
- This finding aligns with trend of slowing demand seen in Q2 2018.
- 2019 shows signs of returning to a more stable pattern of demand.

Prediction 2: Average ticket price during Jan-Jun 2019

Route: London Heathrow (LHR) to John F. Kennedy International Airport (JFK), return

Comparison of predicted vs. actual average ticket price Jan-Jun 2019 vs. 2018 on route JFK to LHR, business class

On an index basis with 'actual average ticket price January 2018' = 100



Comparison of predicted vs. actual average ticket price Jan-Jun 2019 vs. 2018 on route LHR to JFK, business class

On an index basis with 'actual average ticket price January 2018' = 100

Insights: predictions for H1 2019

Trips from the US

- On trips from the US (JFK), the average ticket price (ATP) is expected to increase by 5,8% year-over-year, continuing the trend seen since mid-2017.
- The US will remain a competitive market with a strong, dynamic and growing economy.
- We predict increasing ATPs, combined with a decreasing number of trips (as shown above).
- The above observations are leading to a slight spend increase on this route.

Trips from the UK

- On trips from the UK, the ATP is expected to decrease by 2.6% year-over-year, continuing the trend seen since mid-2018.
- The economic situation in the UK is more complicated as Brexit approaches: more uncertainty; decreasing value of the pound against US Dollar; more cost control and frozen investments from companies in the UK.
- Decreasing ATPs combined with decreasing number of trips results in significant decrease in total spend on this route.

3 key use cases

3-ways predictive analytics can transform your travel program

You have now traveled through the entire predictive journey. From developing a predictive model, to testing, to applying the model (to a high-traffic route: JFK-LHR), to looking ahead to 2019 to see what insights can be uncovered.

Now it's time to put these insights into practice.

What would it look like if you applied tailored predictive modeling to your travel program? How could you protect your program from supplier price surges, uncover new savings in your program, and react to market changes by proactively changing traveler behavior?

Read on to find out.

A. With your travelers

Your challenges:

- To anticipate travel factors that might result either in non-compliant traveler behavior such as booking above caps, booking outside your TMC, or by selecting a supplier for which costs are predicted to increase.
- To anticipate peaks in traveler demand which result in increased average room rates and ticket prices on identified routes/cities and suppliers.

Why:

- To control costs, by sourcing additional rate types or discounts on the main suppliers, or adding more suppliers to the travel program.
- To ensure your caps and bookings tools are matching the forecasted market conditions.
- To help your travelers select the right suppliers or rate types according to the predicted trends.

Your actions:

- Communicate with defined traveler groups to let them know about price increases: avoid non-compliance and encourage them to take actions to remain within the travel policy rules.
- Recommend the use of an alternative supplier or suggest they postpone the trip to other dates if they have flexibility in their travel plans.
  - *Looking at our example of expected ticket price increases from JFK to LHR in early 2019, you could for example recommend to your travelers who have some flexibility to search for flights on Tuesdays rather than Sundays and Mondays (peak days for departures) or travel on a different month. They could also look for alternative suppliers to legacy airlines on the same route, or to consider flights from alternative airports in the NYC area (LaGuardia, Newark) or in London (Gatwick, London City).*
- Blacklist suppliers expected to have fares increase, or with forecasted limited availabilities.
- Pro-actively adjust caps, upwards or downwards in order to drive your travelers towards suppliers not subject to rate increase.

B. When working with internal stakeholders

(directors, management, business leaders, finance teams)

Your challenge:

- Ensure that the company's business units are aware of the predicted travel trends which may impact their bottom lines.

Why:

- To support the business unit leaders with budget planning, and with intelligence on future travel costs.

Your actions:

- Armed with data-driven predictions, you can support internal business stakeholders to help them plan their travel budget and ensure they take relevant actions on the travel budget, especially if a destination where the company has business projects is being impacted.
- Predictive analytics lets you become an internal consultant to support business unit (BU) leaders when they need better insights on travel trends.
  - *Looking at our route examples, the predicted reversal of spending levels (increasing for JFK-LHR, decreasing for LHR-JFK) means that different messaging should be used for BU leaders with US-based teams traveling to the UK, compared to BU leaders with UK-based teams traveling to the US.*
  - *For example, UK leaders with a high volume of people traveling to the US should manage their travel budget by assigning more financial resources to areas where costs are set to increase.*
- Determine optimal location for team meetings. In our example, if you have teams in London and New York, it is more cost efficient to have the UK staff traveling to the US.

C. With suppliers and the procurement team

Your challenge:

- To get visibility on volumes and spend for more proactive sourcing and ongoing supplier contract management.

Why:

- To anticipate your evolving needs: to be proactive when negotiating rates, and to understand market trends that are likely to occur (rate increases, capacity constraints…).

Your actions:

- Leverage predictive analytics to adapt your negotiation strategy before, during and after agreements renewals.
- Optimize your supplier program, by managing the number of suppliers (adding more suppliers, adding more fares, classes, rate types, or ancillary / amenities) and focusing on the areas expected to increase.
- Adapt your negotiations targets and caps.
- Review your contractual goals (volume, market shares) set by the suppliers, and monitor that your negotiated classes or rate types are available.
- Ensure your online booking tool is matching your negotiation strategy, and predictive analytics outcomes.
  - *Which concrete actions could be considered based on our example routes, with your suppliers?*

    From LHR to JFK, with total spend expected to significantly decrease, achieving revenue-based targets on the route could be more challenging. If your main airline's contracts include this type of goal on this route, your procurement team could be recommended to request a switch to a market share goal, so as not to be impacted by volume evolutions out of your control.

    From JFK to LHR, ticket prices are expected to increase significantly meaning increased usage of higher booking classes in airlines' inventories. Suppliers' contracts covering this route should be checked to ensure these booking classes are correctly covered by discounts and are available to travelers. If required, a review of these discounts can be requested as number of tickets in these classes may increase compared to last year's volumes, which were used as the baseline for your contract's discounts.

1 real world example

Predictive analytics in action

How we helped a global technology company protect their travel budgets from a pricing surge at their top supplier hotel.

Who:

A leading global technology company with a key workforce based in Western Europe.

What we did:

CWT Solutions Group, CWT's consulting division, has built advanced data modeling capabilities that sift through the client's historic travel data sets, as well as 85 macroeconomics KPIs and commodity prices such as GDP, inflation, food price, fuel price, and more. This data is analyzed to identify patterns and correlations in order to generate robust predictions for a company's future spend, specifically number of trips and cost per trip.

High level findings:

Using predictive modeling capabilities, we projected a flat market evolution quarter over quarter in London for the average room rate. However, the client's top supplier is forecasted to increase its fares, while the supplier's challengers are expected to decrease theirs.

Risks:

In predicting specific evolutions with regards to chains and independent suppliers, we identified a financial increase for our client, representing more than 300,000 USD.

Why it matters:

The city of London represents for the client more than 1.5 million USD spend for the quarter. We projected with high probability that its top supplier would be triggering large price increases due to availability constraints.

Conversely, we projected positive outcomes for two alternative suppliers, which both represent an equivalent choice for travelers (equivalent types of rooms, location, and negotiated rates). Our projection shows a 1% and 5% decrease in average room rates quarter over quarter for the 2 alternative suppliers.

Recommended actions:

- After identifying the above trends, we provided recommendations to protect the organization from being impacted by the rates increase on its top supplier.
- With the right communication actions such as targeted messages to travelers, and online booking tool display modification, the organization was recommended to redirect its travelers to the 2 alternative properties, reducing the number of bookings at its top supplier and the underlying cost increase.
- We helped the client to identify 150,000 USD of savings, by shifting a significant portion of bookings to the 2 alternative suppliers.

Key Takeaways

This paper has introduced you to the fundamentals and possibilities of predictive analytics.

You have seen:

- How a specific predictive model can be built to examine a travel program key performance indicators.
- The degree of accuracy we can reach by applying a predictive model to a specific area (eg. the US to UK air route).
- What outcomes this model could uncover for H1 of 2019.
- How predictive consulting can uncover new travel program savings opportunities with your travelers, with internal business stakeholders, and with suppliers.
- How predictive modeling uncovered a 300,000 USD risk in London for a client with a quarterly spend of more than 1.5 million USD in the city.

Applying predictive analytics to business travel can yield significant opportunities for travel managers.

Predictive analytics is already being used in multiple markets. Tapping into its potential in business travel is the next step.

If you want to dive deeper into this topic, please contact *CWT Solutions Group*.

Authors and contributors

About *CWT Solutions Group*:

CWT Solutions Group is the consultancy arm of CWT, the leading digital travel management company. The division helps deliver travel procurement efficiencies through innovations in supplier sourcing, data intelligence, traveler management and mobility.

Research and analysis:

Data modeling by Gheorge Lungu, Manager, Data and Analytics, with support and input by Christophe Renard, *CWT Solutions Group* Vice President, Cedric Barbesier, Director, Products & Digital Sales and Romain Brun, Global Sales Strategy Manager.

Editorial:

Editorial and strategy by Bianca Healey, Jo Geneen, and Benedicte Darrieu.

Graphic design:

Tom Hedges and Matteo Zanre.

CWT Solutions Group