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Defining the future of travel through intelligence

Turning big data into meaningful insights

A discussion paper from Amadeus Travel Intelligence

Foreword

Today's age of experimentation requires all of us to act fast

There is much talk of disruption in the travel sector.

New entrants are disrupting all facets of the travel industry. New traveller expectations of the service experience are challenging all of us to continually improve how we operate. New sources of data and information are challenging each travel brand to innovate in terms of how travel is sold, how travellers are serviced and how disruption is managed.

Over the last ten years, we have seen two important trends. Firstly, the exponential rise of data and information on everything from traveller behaviour, spending patterns, weather events, systems efficiency and much more. Secondly, the increasing scale of computing power and storage capability, which is able to assimilate, process and work with multiple and complex data sources to generate insights and action.

This is exciting and unprecedented. It is exciting because the potential for innovation, disruption, and new ideas is limited only by our imagination. It is exciting because instead of strategising for months on end, we can instigate testing of new ideas quickly, and roll them out at scale within a shorter timeframe than ever before. It is exciting because the future that so many of us have talked about for years is closer than we think, and in many cases it is here today.

More than ever we live in an age of experimentation.

Companies that succeed will be those that embrace this new age. But in addition, those that succeed will also be those that ensure that their systems and processes allow for the rapid generation of insights, as well as the rapid deployment of the actions needed to capitalise on those insights.

The key to unlocking the potential of today is identifying the quick wins across the business to ensure incremental and impactful changes, as well as an open mind about what is possible in the future.

This paper explores what can be done today, and how best to think about the future.

Pascal Clement
Head of Travel Intelligence
Amadeus IT Group


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Tid Time
Destination Destination
Flyg nr. Flight no.
Incheck. Check-in
Bagdrop Bag drop
Anmärkning Remark
Gate Gate
1235 Bergen SK899 Automat 71-90
1250 Helsinki SK708 Automat 71-90
1305 Frankfurt LH803 SK3613 Automat 71-90
1305 Madrid 123605 AY5637 37-39 37-39
1310 St Petersburg SK732 FU4732 Automat 71-90
1320 Oslo DY813 Automat 10-20
1325 New York JFK DL203 01-06 01-06
1330 Copenhagen SK1423 LH6173 Automat 71-90
1330 Helsinki DY4285 Automat 10-20
1340 Luxembourg LG5782 43-44 43-44
1350 Malaga SK1583 Automat 71-90
1350 Oslo SK455 A33308 Automat 71-90
1350 Istanbul SAW PC846 10-20 10-20
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Section 1: A new age of intelligence and insight

Big data and advances in computing power have transformed the world's biggest industries: from retail, to healthcare, to banking. Harnessing data, processing it effectively, and deriving unique insight from this information is no longer the preserve of Silicon Valley companies or established technology giants - it's the strategy of choice for those organisations, large and small, who want to secure competitive differentiation and seek out new revenue opportunities.

Unlike ten years ago, all successful companies are in the business of information and technology. As one airline executive once said, *"we're in the business of IT, we just also happen to fly planes."*

It is 'information' which is the common root of disruption across many diverse industries. Amazon is often cited as being the single biggest disruptor of the retail sector, which is arguably the case. However, according to Deloitte, it isn't just the fact that Amazon brought online shopping to the masses, it is the second generation of insights in terms of understanding the customer experience, making shopper's lives easier, reducing tension points that make the traditional retail sector vulnerable to disruption. We have seen this replicated across the music industry, with the advent of iTunes, Spotify and Deezer, all of which use information to personalise, tailor and target content effectively.

In all of these cases, information and insight has resulted in a move from a linear, transactional model to a multi-faceted, personalised and holistic relationship between brand and consumer.

The disruptive impact of this type of actionable insight is making waves across all parts of the travel industry. In 2013, Amadeus commissioned a report, *At the Big Data Crossroads*, written by Professor Thomas Davenport, a world-renowned expert in data and analytics, to examine what the advent of big data and predictive analytics meant for the travel industry. In the paper, he identified the potential benefits and challenges for travel providers, and outlined a number of recommendations for travel companies seeking to maximise the big data opportunity. At that time, only a few 'early adopters' were driving the use of analytics in travel.

Three years later, the landscape is already very different. Travel companies face new and diverse challenges: as well as contending with their traditional competitors, emergent rivals such as sharing economy brands are disrupting the status quo. As consumers become used to an 'Amazon Recommendations' experience across other industries (we need only think of Netflix, LinkedIn, or grocery delivery services), their expectations of the travel experience increase. This, in turn, means there is an ever-greater need for travel companies to employ sophisticated personalisation techniques and intelligent merchandising.

As Hervé Couturier, Executive Vice President of R&D at Amadeus, comments, *"There's an appetite amongst consumers to go beyond simply booking travel at the lowest price. What we are seeing now is a growing demand for personalisation and content enrichment."*

The deepening of The Experience Economy means that people are looking for travel brands to enrich their lives.

The Amadeus and Future Foundation report, Future Traveller Tribes 2030, articulated: "[In 2030], for millions, basic material needs will be well-catered for. And so the search for the exceptional grows: tastier and more varied cuisine, more elegant fashions, richer expectations for one's children and, naturally, more travel. The Experience Economy is particularly vibrant when travel exploits are endlessly traded on social networks."

The future travel brand isn't therefore just about moving people from A to B, unveiling new destinations, or organising trips. Instead it is about a thoroughly progressive, completely 360 degree view of the traveller and everything that goes into creating special, unique, memorable experiences.

And this information and data needs to be gathered and deployed throughout the customer experience from the moment they are inspired to travel, to the time they return home from their trip.

As Francisco Pérez-Lozao Rüter, Senior Vice President, New Businesses at Amadeus comments, *"At every moment in the traveller's journey, from the time they make an air booking or search for a train timetable online, to their hotel check in, their actions create data. This data, picked up from hundreds of points across the travel ecosystem, presents a valuable opportunity for travel companies to provide better-individualised services to the traveller and improve his or her experience."*

Achieving such insight will increasingly involve not only this travel data, but also external data such as weather, geographical, social, media consumption and spend data. When companies are able to integrate and act upon both their own data and that of third parties, they will be equipped to develop breakthrough products, services and models.

In the past, this data acquisition and integration, coupled with limited computing power, posed the biggest hurdle to fully realising the potential of analytics. This is no longer the case: not only do travel providers have unprecedented volumes of data to work with, but computing power is also increasing exponentially. Today, travel companies are truly in a position to unlock the benefits of analytics and automation.

"As market dynamics in the travel industry evolve with unprecedented rapidity and new competitive threats emerge, responsiveness to your environment becomes the key to success and growth. Companies that embrace a culture of collaboration, combined with a flexible and agile technology environment, will be rewarded," explains Pascal Clement, Head of Travel Intelligence at Amadeus.

Travel Intelligence: a definition

Travel Intelligence refers to next-generation business intelligence solutions and services, designed primarily for the travel industry. Such solutions transform raw travel data into meaningful information to facilitate strategic, tactical and operational decisions.

As the travel industry has grown and deals with more complex data, the challenge of making sense of data has grown exponentially; new technologies and the abundance of digital data offer exciting opportunities for those who want to take either an incremental or radical approach to Travel Intelligence.

Amadeus Travel Intelligence helps our customers leverage advances in technology and analytics in order to transform the increasing amount of raw travel data into actionable insights and stand out from the competition.

Innovation through experimentation

The rapid change in the travel industry can be unnerving, but the travel brands who will succeed in this environment will be those who harness data and analytics for operational and customer experience transformation - optimising what they do today, while looking boldly to the future.

It won't be enough to assume future success by continuing with the products, services and patterns that have been effective so far. A changing environment requires new products, services and collaboration opportunities across the industry that meet the new expectations of travellers – and surpass what's on offer from the rest of the market. Innovation requires travel companies to imagine ways to do things differently, or indeed, to do new things altogether.

We are entering an 'age of experimentation', where the travel companies that will succeed will be those who embrace and test new ideas and take an analytics-enabled approach to innovation. They will work on many different approaches and ideas at any given time, in order to find those that will help transform their business.

One pioneer of this approach within the travel industry is the travel search site KAYAK. KAYAK makes extensive use of randomised testing in its website decisions—known as "A/B testing". As early as 2013, between 30% and 50% of users were participating in some type of test every day. Such testing is the only way to establish cause-and-effect relationships behind which features of the site lead to better results.

Experimentation isn't only about developing the 'next big thing'; some ideas won't work, and to be truly innovative, companies will need to accept the possibility of some failures. The priority, however, must be in taking the insights from that failure, and innovating again – as quickly as possible. It's not the failure rate that will count, but the speed of developing and prototyping new ideas. That's why we will start to see the 'Platform-as-a-Service' model play an increasing role, with companies looking for the flexibility that a 'toolkit' of technologies offers them.

Data and 'machine learning' will drive many of the innovations that emerge over the next few years. As Hervé Couturier explains: *"We don't teach the machine, and we don't give it rules. We feed the machine data, and we let it discover the pattern, with the computing power facilitating the work. This is the move from rules-based learning to pattern-based learning, which allows for a much higher ratio of confidence in output."*

The combination of big data and machine learning will allow travel providers to create completely new products and services. For example, if a traveller is watching a film on a plane, and they like the landscape featured within this, they could instantly discover the location where the film was shot through a single touch of the screen – and what's more, they could be presented with additional information such as weather forecasts, and the opportunity to book travel to that destination. This is the convergence of entertainment, media and travel into a single offer – enabled by data and analytics.

Another example of the kind of innovation Travel Intelligence can underpin is at the travel planning stage. Imagine that multiple colleagues within a company are included on an email chain about a particular project, and someone suggests a face-to-face catch-up meeting. An application built on top of the email programme could combine data about each individual's availability with location, travel duration, and price, to suggest the best possible venue for the meeting.

In fact, in the future, we'll see this kind of automated, data-enabled recommendation embedded within other apps; not only email, but even messaging apps, with consumers booking and buying travel, products and services in the same way they make their social plans.

"The illusion that we understand the past fosters overconfidence in our ability to predict the future."

— Daniel Kahneman, *Thinking, Fast and Slow*

Platform-as-a-Service

'Software-as-a-Service' and 'Infrastructure-as-a-Service' are well-established models within the technology industry, and have freed companies from the costs and complexity of building and maintaining their own IT software and infrastructure.

In a 'Platform-as-a-Service' (PaaS) model, the technology partner provides the platform, including necessary tools and capabilities, so that the customer can build their own applications. Ultimately, a highly automated and flexible PaaS will allow companies to identify and adopt new opportunities - quickly.

Big Data has pushed us into an 'age of experimentation'. At Amadeus, we are providing customers with the tools and solutions needed to thrive in today's market and to prepare for tomorrow. Our vision to empower our customers with data is to use a Platform-as-a-Service model offering a complete kit of components that free businesses to build what they need quickly.

Section 2:
The opportunity for airlines

Unlocking operational efficiency and achieving true customer centricity

Airlines are at the forefront of pioneering projects that employ data and analytics to address their perennial business challenges.

Ultimately, these challenges relate to two central priorities: increasing **operational efficiency** and improving **customer centricity**. In a competitive marketplace, successful operational efficiency and customer centricity strategies will allow the airline to stand out, enjoy greater customer loyalty and increased revenues.

The strategies that airlines must devise to address each of these two areas differ: operational efficiency calls for optimisation, whereas customer centricity calls for innovation. Whether the airline chooses to focus on optimisation, customer centricity, or to tackle both at once, Travel Intelligence has a pivotal role to play in delivering both 'quick wins' and strategic, long-term transformation.

Optimising operations

Optimisation requires airlines to find ways to do what they do today – but do it better, faster and cheaper. For airlines seeking to optimise, technology can support initiatives that will - virtually overnight – create tangible business benefit. Qantas, for example, has embraced big data, analytics and automation to transform its operational approach to disruption, with enormous success.

As Francisco Pérez-Lozao Rüter, Senior Vice President, New Businesses at Amadeus, explains: "*One of the clearest 'quick wins' that analytics can create for travel companies is in operations. For example, flight operations, gate allocation, disruption management and sequence planners - all of this is needed when there's a storm, a mechanical issue or air traffic congestion. Data and analytics will help the airline react in the most efficient way, understand what created or caused the delay, and take action to prevent it in future.*"

Qantas and Amadeus Schedule Recovery

More than 600 million passengers worldwide were affected by disruption in 2014. Operational recovery from disruption is complex, as the airline must balance costs, customer service, and constraints such as staffing. The volume of information and the decision-making required can be overwhelming, and it is very difficult for manual decision-making to take in the full operational and traveller picture.

In order to help airlines overcome disruption, Amadeus Travel Intelligence developed Schedule Recovery, a recommendation engine that helps airlines react quickly and efficiently to minimise the disruption to their operations caused by events such as bad weather or air traffic control congestion. Amadeus Schedule Recovery uses data analytics to help the airline swiftly identify the most critical issues, and act upon them.

This solution helps airlines make rapid choices such as whether to delay or cancel flights, swap aircraft, or reassign landing slots. Schedule Recovery reduces manual effort and improves the quality of decisions while closely controlling the strain on the airline operating costs and minimising the overall impact on passengers.

The solution was developed in partnership with its launch customer, Qantas Airways, which has been using Schedule Recovery to improve operational efficiencies when dealing with disruptions.

Qantas has seen remarkable benefits since implementing the solution: on an average day, Amadeus Schedule Recovery: Airport Resource Tracker is able to remove 300 minutes of flight delays from the initial slot allocation by Air Traffic Control, thus **reducing by 60% the number of flights that would have been reported as being late** due to Air Traffic Control.

Paul Fraser, Head of Operations, Qantas, comments, *"Improving our operations with Schedule Recovery has been enormously successful from a competitive point of view for us, which translates into market share and dollars."*

Travel Intelligence can not only automate responses to operational issues, as in Schedule Recovery, but can even take on a predictive role, to alert any potential issues and allow the airline to proactively contact customers or make contingency plans.

This is one of the ambitions Qantas has for its own use of analytics. As Paul Fraser, Head of Operations, Qantas, explains, *"Within the Qantas Operations Centre, we want better predictive analysis on what's going to happen each day. Today, if there's an operational problem, then we react to this. We'd like to get to a predictive position, where we are using predictive analytics to look at probabilities around forecast conditions, our fleet, customer load and so on. Then, route by route, day by day, we will build up a picture of what we expect to happen, so we've got more accurate operational targets to work towards.*

"If we see there's an expected weather event in Sydney – rather than wait for it and react, we can go to our customers the night before. Then they can decide whether to, say, delay their meeting or take their chances. They are taking control of that choice, with analytics putting the decision back in the customer's hands."

In this scenario, analytics not only helps the airline better manage its operations, but also empowers it to be more customer-centric, giving its customers greater control and choice.

Another example of how analytics can be effectively deployed for optimisation is in the area of merchandising.

"We can easily see how analytics can optimise the upsell of ancillaries today, with business rules and automation pushing more relevant and timely offers to the customer at the shopping and booking stage. In the future, however, analytics will also empower airlines to completely re-imagine the shopping experience. Other players in the industry, such as hotels, travel insurance providers, car hire companies, could partner with airlines and offer the traveller the opportunity to bid for a packaged trip at a certain price. The catch is, they don't necessarily know all of the details. As they want to know more, they will need to increase their bid to reveal further details– the carrier, the hotel facilities etc." says Hervé Couturier.

There are clear commercial benefits to be gained from analytics-driven optimisation, such as reduced operational costs, smarter and faster processes, and freed capacity to focus on the areas of greatest value.

Customer centricity

Whilst optimisation of operations and existing processes supports airlines to become more customer-centric, to deliver a truly personalised travel experience, airlines will need to harness data and act upon the insights identified by analytics to innovate around the traveller experience. Real-time and automated responsiveness to evolving traveller needs are key to increased customer satisfaction and brand loyalty.

"Big data and Travel Intelligence offer airlines the opportunity to customise each traveller's experience so that it reflects the needs, preferences and expectations of that traveller," says Pascal Clement.

For example, Hipmunk's 'Agony' feature sorts flight searches based on the combination of price, flight duration, and number of stops. This provides the customer with the information to decide whether a flight meets their unique needs. Such a feature could evolve to incorporate a wider range of variables, based on the traveller's unique attributes.

Taken a step further, airlines will also be able to proactively offer solutions to meet traveller needs. For example, what if you could choose to allow an airline to recognise your interest in music festivals because you have posted on a social network that you plan to attend Sonar in Barcelona or Glastonbury? Thanks to integration with this third party data, the airline could then automate a decision to offer you a 'Music Festival' bundle of services. This could include a promotional fare, with outsized luggage allowance for your tent and transport to the venue from the airport.

To be able to customise the individual traveller's experience at their option, airlines must first achieve greater insight into the individual traveller. Claudio Velez, Executive Director, Planning, Avianca Brasil explains, *"We have visibility of our customers in multiple phases across the customer journey and the challenge is to bring all this different data together to analyse it and provide a single, full view of the customer."* This data will come from touchpoints as wide-ranging as the airline's loyalty programme database, airport security systems, and the traveller's social media profile.

Once an airline has this level of insight into the traveller, they can provide a much more proactive and personalised service. This is an ambition for Qantas, as Paul Fraser details, *"Our goal is not just to improve the customer experience from the point that they arrive at the airport, but to know our customers and provide them with mobile solutions 24/7. How can we best understand customer segmentation? How can we proactively offer solutions with choice, so that the decision is always with the customer?"*

Fraser offers a vivid example of this personalised service: *"The changes you will be able to make might seem quite simple but will have a big impact. For example, you might have a frequent flyer who, when offered a drink on board, always asks for sparkling water. You have enough information here to identify a pattern and to automate this exchange. Instead of asking the traveller what they want – when you already know the answer - the flight attendant just walks over and gives them a sparkling water. If you can know your customers in this way, better than your competitors, that will drive real market share shift."*

By achieving a more complete picture of the traveller, airlines will not only be able to improve the traveller experience and secure greater loyalty, but they will also reap the financial benefits of improved customer centricity. Tailored offers to the customer and a better service experience should increase propensity to purchase - which will, in turn, translate into revenues. The airline will also be able to identify new customer segments, and start to merchandise tailored offers accordingly. *"Growth segments lie beyond the loyalty programme, which is the customer segment we have the most data and insight on at present. Data analytics will seamlessly seek incremental business outside of the loyalty database,"* says Qantas' Paul Fraser.

Transforming the customer experience: Avianca Brasil and Amadeus Performance Insight

Avianca Brasil is working with Amadeus Travel Intelligence to achieve a strategic organisational goal: to secure greater insight into its customers, in order to improve the customer experience.

Claudio Velez, Executive Director, Planning, Avianca Brasil explains: *"Information about customers can empower us to better market to and serve each individual customer - this has been established by other industries. It is an opportunity to generate incremental ancillary revenue and establish loyalty from our customers."*

Avianca Brasil's ambitions extend beyond understanding the structured data they have about customers' interactions with the airline – they want to be able to make greater sense of their customers' experience in their own words.

"We want to analyse unstructured data such as social media data. Customers are telling us their perceptions, experiences, and requests every moment through social media, contact centres and surveys – our task is to make sense of this and use it to inform the strategies we develop."

Avianca Brasil is using Amadeus Performance Insight to achieve greater insight into the vast data it possesses. Performance Insight is Amadeus' next generation Business Intelligence suite, offering airlines a fast, cost-effective and complete platform that gives them access into critical data insights to further monitor their business performance and make more informed decisions. Its cloud-based open architecture means that it can integrate multiple data feeds, and it is scalable and flexible to the needs of airlines, with no limit on the amount of data it can handle.

"So far, we've focused on centralising information, such as data on sales, operations, inventory, DCS, interline, reservations and fares. With the enhanced visualisation of our data, our analysts are more likely to identify patterns and outliers, allowing quick action to grow revenues and increase profitability," says Claudio Velez.

Claudio Velez believes the most powerful application of analytics and data will be to enhance the customer experience, from beginning to end.

"There is so much customer data out there detailing shopping and buying behaviour, check-in and baggage history, in-flight service preferences, airport movement, and customer service interactions. The challenge is to build a complete view of our individual customers with this data and personalise their experience accordingly."

Conclusion

In a big data, machine-learning world, almost anything is possible – if not today, then certainly tomorrow, constrained only by good data governance mechanisms. The last five years have seen an explosion of digital data. On one hand, this can be unnerving, but on the other, it provides the raw material for real innovation – for businesses specifically, and the travel industry generally.

At such a time of great change and disruption, it is important to hold on to three fundamental principles that will allow us to navigate the future.

Firstly, travel brands much encourage an openness and willingness to experiment with new ways of working, new approaches to old problems, and entirely new ideas and paradigms.

Secondly, acting with confidence, without becoming attached to 'always getting it right'. The new world will require increased experimentation and a boldness to pursue new ideas, even in the knowledge that some will fail, in order to find the breakthrough, disruptive ideas that will define the future travel experience.

Finally, technology alone isn't enough. While investing in the systems and tools that will enable increased agility is imperative, organisations must also be prepared to achieve cultural change through fostering curiosity.

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