

# BIG DATA:

## CURRENT AND COMING IMPACT ON TRAVEL AND TRAVEL MANAGEMENT



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### WHAT CAN BIG DATA DO FOR YOU?

Like many industry sectors and professions, travel and travel management are working to move past the buzz and hype of the ‘Big Data’ headlines to assess the potential challenges, impact and benefits it could have on this space. Many are excited by the ability to combine and mine data left behind from searches, mobile, payment transactions, sensors, tweets and social media, global positioning system and more to find the useful nuggets. While suppliers seek ways to use the new technology trend to boost revenues, enhance service or reduce expenses, travel managers want to know how it might solve some of their challenges.

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The machines of modern life—web searches, automated kiosks, mobile phones, global positioning systems, tracking systems, sensors, electronic payment, social networks, etc.—are generating massive volumes of data. Technologists and scientists have developed new ways to capture, store, search, share, analyze and visualize the mountains of data exhaust in what is called “Big Data.” The World Economic Forum in early 2013 declared data a new economic asset. Some companies argue that the ability to capture and mine the data is a new competitive weapon.

This BTN Group white paper, sponsored by TRX, will explore how big data is starting to be used in the travel sector, what is likely to come, and what travel managers need to know to take advantage of some of the advancements.

#### WHAT IS BIG DATA?

Infographics and hyperbole about big data most often refer to the massive amounts of data generated today by the digitization of web searches, radio-frequency tracking devices, mobile, email, shopping, debit and credit card use, social media

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and even sensors in everything from airplanes and automobiles to appliances, healthcare devices and weather stations.

“Every day, we create 2.5 quintillion bytes of data — so much that 90 percent of the data in the world today has been created in the last two years alone,” according to an IBM briefing. Instead of kilobytes, megabytes and gigabytes, this class of data requires much larger terms of terabytes, petabytes and zettabytes.

registered for a recent BTN Group webinar, sponsored by TRX, on this topic, 34 percent said their companies had just started to talk about ways to use big data. But 14 percent indicated that their companies had not only embraced the concept, but expected the travel department to do the same.

To manage the mountains of new data has necessitated development of new breeds of data processing technology, expertise and talent. Consulting firms now rank Big Data providers, a market estimated at \$11 billion in 2012 and forecast to grow to nearly \$50 billion by 2017, according to technology community Wikibon. In a 2011 report, McKinsey Global Institute projected that the United States will need 140,000 to 190,000 workers with “deep analytical expertise,” and more than 1.5 million data-literate managers to manage the deluge.

To clarify how big data is different, IBM said such data typically has four attributes, the four Vs of:

- **VOLUME**  
Terabytes to petabytes of data
- **VARIETY**  
Data in many forms, structured, unstructured, text and multimedia
- **VELOCITY**  
Analysis of streaming data to enable decisions within fractions of a second
- **VERCITY**  
Managing the reliability and predictability of inherently imprecise data types

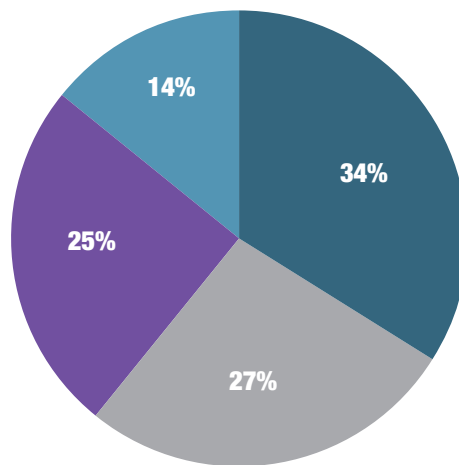
“To add a dimension in corporate travel, I would add an additional ‘V’ of value,” said TRX senior vice president of business intelligence and consulting Tom Tulloch. “It’s exciting to sit on these vast sets of data, but unless you’re working with someone who understands the underlying formats and can enhance the data sets into actionable information, it really is useless. You need to be working with tools to mine data, match it, map it so it better tells a story to help you manage your travel business.”

“Equally valuable today is the ability to add unstructured data,” added Advito managing director April Bridgeman, who also serves as senior vice president of BCD Travel. “Where there is significant value today is in the ability to bring in data

### BUYER BIG DATA PROJECT STATUS

Regarding big data, has your company...

- Started to talk about ways to use
- Embraced it, now expect travel to
- Do not know
- Begun to better mine data



Source: BTN Group/TRX Big Data webinar registrations of 360 travel managers/buyers, April 2013

Each browser, web search, smart phone, tablet, gaming system, Internet service provider and sensor is generating data. Each user choice, along with all options presented, is tracked. And every financial transaction includes reams of data behind the money exchange. But only recently have technologists started to consider the ramifications of using it.

In travel, every online booking search, booking, payment and transaction along the way ends up in one or more databases. Corporations already receive reams of data about their business travel from online booking systems, travel management companies, payment systems, suppliers and expense systems. But the process to garner more data from social media, reviews or interaction on the road to combine with external sources has just begun.

Of more than 360 travel managers/buyers who

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points that lie outside our traditional card, expense and travel transaction data. That might be data derived from travelers' activities while they are on the road, data to help with travel risk management" or insights gleaned from social media to provide "sentiment analysis" for insight on why a traveler chose a specific supplier.

### PREDICTIVE ANALYTICS

One of the biggest benefits expected to emerge from effectively mining volumes of data is in the area of predictive analytics. By analyzing historical data of traveler choices, location, preferred airlines, status and other factors, travel management companies or online booking tools could drastically improve travel options offered.

"With online booking tools and even agent today, you're often given many, many choices," said Microsoft senior travel manager of strategy and technology Eric Bailey. "There's actually quite a bit of predictive information we can put into a search" to improve the results and speed the process for the traveler, he added.

The first and early impacts of predictive analytics, added Bridgeman, will be in the shopping and booking experience. "Many of the online booking tools are actively investing in the ability to drive much more personalization to present more relevant choices."

Instead of dozens of flight options, including those that arrive an hour after a meeting in a given destination, a traveler could be presented only with the one or two options that would allow them to arrive on time, comply with travel policy, preferred vendor needs and business objectives, added Bailey.

"If you allowed someone to look into your email, a system might be able to" forecast, based on message content a need to travel to a specific destination to meet a client and automatically present flight options, Bailey said. "I think we'll see a lot more of the predictive analytics that could make it so your choices might be one or two clicks instead of a full booking process."

Companies are already using predictive analytics concepts to solve business problems today, said Tulloch. "We recently helped a company that spends over \$1 billion a year on travel identify and solve a duty of care need," he said. The company needed to identify all of its employees who had

who traveled outside their countries of origin for extended periods of time and risked tax consequences. To solve the client's problem, TRX also had to devise a means to communicate the facts and risks to not only each traveler, but his/her manager, Tulloch said.

### IMPROVING REVENUE, OPERATIONS

Airlines also are investing in the technology to "improve their operations, particularly around disruption management," Bridgeman added. Hotel chains are likewise using big data to improve their revenue management operations and better predict supply and demand trends. Airlines and hotels are using the latest in predictive analytics to determine where to introduce new aircraft or build new hotels, Tulloch said.

Three companies using a "combination of structured and unstructured data" today to improve customer conversions, revenues or the shopping experience, Bridgeman said, are nor1, Deem and Intercontinental Hotels Group.

Providing upsell solutions to the hotel industry, nor1 "uses mountains of data to target in a refined way individuals who have already booked to upgrade their room and overall hotel experience." Deem is using a "relevance engine based on past

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**"Use as many data sources as you can. The more data sources you can add to the picture, the more complete the puzzle looks."**

*— Tom Tulloch, TRX Senior Vice President, Business Intelligence and Consulting*

behaviors of a traveler and others" with similar behaviors. The booking tool uses "sentiment analysis to understand more about the hotels they offer to match and individual's preferences with hotel attributes," she added. The machine mining of reviews is designed to allow Deem to be able to recommend not just a hotel with a fitness center, "but a great fitness center," know that a hotel pool

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is open and that rooms are “new and refreshed, not old and stale,” she added.

“IHG uses information from their 71 million loyalty program members. They actually defined 12 customer segments based on 4,000 attributes about a customer and used that information to create relevant campaigns. One campaign targeted at a segment that stayed over on weekends had a 35 percent conversion rate improvement over a similar campaign the year before. Those are three examples of ways that companies are using Big Data to improve conversion, drive greater rates of purchase and improve the relationships between their products and customers.”

### OPTIMIZING EXISTING DATA

While the prospects of capturing and analyzing new data sources are intriguing, experts question whether corporations and their travel managers are maximizing use of the data they already receive today.

To get the most complete picture of travel today, Tulloch advised companies to “use as many sources of data as you can. The more data sources you add to the picture, the more complete the puzzle looks.” Some rely only on TMC data, which “obviously is a very rich data source. But unless you have 100 percent compliance with your TMC, you might not be getting 100 percent of the picture.”

Corporate card data is valuable for hotel spend, particularly with efolio programs that deliver line-item details of hotel expenditures. “But when you combine these data sets together and you’re able to match and map the data back to corporate hierarchies, you have a much deeper analytical representation of who’s spending the dollars, where they’re spending them and with whom. Once you tie all these data sets together, you have a single source of truth for your company.”

Bridgeman noted that an executive for a Dublin-based company echoed a similar sentiment with plans to “help airlines merge all the unstructured and structured data” to improve revenues and operations. But company executives quickly realized that “a lot of airlines were still struggling to use the data they already had. I think that’s probably true in corporate travel management too,” she added. “How do we make sure we’re doing the most with

all the data we already have available to us and gain additional insight. There is a gap between the use of big data and we’re not using it to the extent that we could or applying it” to solve problems.

Microsoft’s Bailey said it’s not only combining data sources but getting it into the hands of those who need it at the right time. Often using advanced version of its own tools, the company has developed various tools to do just that. A traveler tracking system maps travelers by flight, city, location and country, Bailey said. “It’s really about slicing and dicing data to make it more effective. “The exact location of the individual is the next step in traveler tracking. With mobile phones, that technology is really here today and I’m pretty sure that will be expanding.”

Using an advanced version of Excel, the Microsoft travel team has poured more than 1.6 million travel records from the past three years into a database to track cost per mile by city, carrier, advanced booking or not, class of service and more. The reporting is available to about 450 stakeholders, most in finance for various business units.

“I’ve met with hundreds of stakeholders internally, usually all in finance who love numbers. They want to know how to dig down one level deeper,” Bailey said. So the reporting was designed to allow them to drill down as deep as they want, even to the individual level, of historical data. As they developed the traveler tracking and other databases, Bailey said, his team and providers made sure they raised no data privacy concerns.

### DATA PRIVACY CONCERNS

Data on individuals that qualifies as personally identifiable information is obviously a concern for many global companies that must ensure compliance to various data privacy laws. And the concept of combining data sets could raise concerns.

“When you shop for someone who will be a steward of your data, whether an expense engine, credit card company or third-party provider, do your homework,” Tulloch advised. “Make sure they are PCI compliant, Safe Harbor-certified and that they encrypt any data they work with. As long as you check the boxes there, you are usually OK.”

Advito’s Bridgeman added, “When we start

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talking about data outside our comfort zone, it's important to establish early and regular communications with your legal and information security teams.”

### WHAT'S NEXT

While there are some early examples of how big data might transform travel and travel management, experts said they soon expected the data mining to enhance the overall experience for travelers and perhaps force companies to rethink the concept of travel policies.

Marrying profile data with travel itineraries, a company could “leverage data to enhance the traveler experience,” Tulloch said. For example, technology could be programmed to send a vegan traveling to a specific destination for 10 days a list of the top vegan restaurants in that destination.

Used correctly, predictive analytics, according to Bailey, could provide a traveler with such a rich traveler experience, with advance notice of all flight delays, recommendations for nearby restaurants frequented by coworkers and even notification of coworkers nearby that one might want to rideshare with “that everyone will book within a

system because they would hate not doing it.”

Done correctly, predictive analytics, Bridgeman said, might even offer up options that would surpass those in a travel policy. “With company goals in mind, traveler preferences,” and recommendations, a system could offer “not just the cheapest, best option, but the best possible deal. There’s a real opportunity for us to completely rethink the role of what a policy means and what it might look like,” she added.

### NEXT STEPS

As a beginning or next step to rethink how you use your data today and the potential for Big Data initiatives, experts recommended that companies:

- Start looking at your data. Put it in a pivot table.
- Start with something simple to prove how data analysis could be used to solve a business problem. That will give you the backing internally to do more.
- Use the data you already have as much as you possibly can. Then look toward what to do next.
- List the problems you are trying to solve. What questions need answering? What trends do you need to explore further?

### ABOUT TRX

TRX, Inc. is a global leader in data, software and solutions, primarily in the travel industry. TRX solutions help the world’s top travel agencies, governments and corporations save money and increase efficiency. TRX technology adds visibility and value to travel programs through data intelligence, process automation, outsourcing, and a host of related software and mobile solutions. For more information on TRX products and services, visit [www.trx.com](http://www.trx.com) or call 404.929.6100.

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