

Making big data digestible

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Chapter 7 showed that making retail decisions, such as the size of your product assortment, is worth doing in a substantiated, research-driven manner. Tools for retail data analysis are continually becoming more advanced. In Chapter 8 I provided an overview of best practices followed by retailers such as Tesco to better connect with shopper needs through loyalty card programmes. In this chapter I look into one of the most advanced approaches: big data analysis.

At the start of my career, research company Nielsen provided me with printed market reports. Although the reports only showed basic indicators such as numeric distribution and unit sales with a reporting frequency of two months, I thought it was a lot of data. The same reports are now available on a weekly basis, integrated with many more dimensions and the electronic format allows users to slice and report the data as they wish. The amount of data available to decision makers has grown exponentially: apart from scanning data they use loyalty cards, consumer panels, industry reports, store data, ad hoc research and social media. There is no doubt about it: the reports on my table in the mid 1990s were peanuts compared to big data 20 years later.

What is big data?

Morrisons was using it when it tracked shopping carts for its store layout optimization; Procter & Gamble (P&G) was using it when it set up Vocalpoint, a domestic management website. They carried out experiments to better understand the shopper, which resulted in large amounts of data. Yet even larger amounts of data now flow from online: interactions on social media such as Facebook and Twitter, Google searches and online shopping. The term big data is used for:

- Data that comes in large amounts. It is not relevant to describe what large is and how many terabytes you are talking about, because big data increases every minute. For example:
 - In 2007 six hours of video material were uploaded every minute on YouTube. In 2012 it was 60 hours; now this number is over 100 hours per minute.¹
 - Twitter processes one billion tweets per week.
 - Walmart handles 200 million transactions per week.²
- Data that is unstructured. Organizations collect data from many sources and in many forms, including video, audio, numbers and reports. Unstructured data is not completely new as such: in the past there was also unstructured data, but retailers were not able to analyse it. What is new is that the shapes and sources of data grow in numbers. We can now start to analyse the 80 per cent of data that organizations hold in unstructured formats.
- Data that comes in fast, immediately and at different intervals. Gone are the times when we waited for a monthly meeting to discuss the sales numbers or to look into the bimonthly audit tables from Nielsen. Sales reports can be delivered in real time. Insights from loyalty card analysis are completed within a few hours or days.
- Data that is complex. The data includes so many variables that it is impossible to see relationships among them without profound statistical analysis. It has become difficult for organizations to judge who needs which part of data.

So, big data is so large, so complex and unstructured that normal database management systems cannot store or analyse it. Shoppers may receive too much information; managers struggle as well. When the printer Johannes Gutenberg lived in the 15th century, for example, people could claim to be able to read all books that had ever been printed in their own language. Nowadays the amount of information is too large. Research by Neuman, Park and Panek shows that US citizens are offered 884 times more media content than minutes they have available for consumption.³ Retailers need to develop systems and processes to convert these large amounts of unstructured data into insights of shopping behaviour:

- In 2003, a team of Accenture researchers showed what it could do with large sets of transaction data of a US retailer.⁴ They built a model they could use to forecast which products each shopper would

buy during a shopping trip. An application of such information is that the shopper's smartphone or hand-scanner shows at the beginning of the trip a list of groceries the shopper is likely to need. During the shopping trip the shopper only receives suggestions if the product sits in the aisle that they visit. The study shows that supermarkets can increase revenue by 11 per cent by reminding shoppers of products that they would have otherwise forgotten. Getting to the bottom of the data and finding the deeper-lying causal relationships are essential to understand the shopper. (As a side note, one of the researchers, Rayid Ghani, was later hired by Barack Obama as chief scientist to shape the project Dream Catcher – data-digging into the dreams that people had shared told Obama's campaign team which arguments they had to use in each neighbourhood and in swing states. Big data was a major factor in Barack Obama's re-election as president of the United States in 2012.)

- Electronics retailer BestBuy changed its stores after data analysis showed that 7 per cent of its shoppers brought in 43 per cent of the revenue.
- Walmart is always careful to have sufficient stock of batteries and torches when the hurricane season starts. Deeper analysis showed that shoppers buy a certain set of other products, such as cereal bars, that are easy and nutritious when the hurricane prevents shoppers from visiting a store for some length of time.

Drivers of big data in retail

A good plan starts with information. It has become less expensive to obtain and store information, and new technology allows retailers to use the information in a quicker and more user-friendly fashion. Enterprise resource planning (ERP) systems connect data from different functional areas, such as marketing and logistics. Better business intelligence software unlocks the insights. The retail sector is in an excellent position to benefit from the big data trend. The logistical channel is equipped with sensors that generate a continuous stream of data on incoming and outgoing products. A grocery retailer receives many customers per day resulting in many more details on the transaction, such as type of product, moment of shopping and method of payment. Some retailers, such as mail order companies, have always had a deep interest in knowing everything about their shoppers. They have become one of the first to see the benefits of big data along with the banking

sector, credit card companies, telecom operators and insurance companies. The internet and social networks such as Facebook and Twitter have caused a revolution by making information about shoppers widely available to companies. They enable shoppers to change from passive buyers into vocal activists. This requires retailers not just to offer information or track behaviour but to respond as well. Shoppers review and discuss all companies and brands on blogs and other digital platforms, regardless of whether they sell cosmetics, cleaning products, fresh food and so on. With the help of smartphones, shoppers can tell the retailer what they think of the store and its assortment. Retailers and suppliers can read on Twitter just what shoppers think of their advertising campaigns, and can use this to adjust them. It is not just their regular business activities and ongoing marketing programmes that form the big data: retailers can set up experiments that make data come in every second. Here are two examples:

- In two Morrisons stores in the UK, shopping trolleys were tracked with the help of radio-frequency identification (RFID). This delivered a lot of information such as search times, shopping paths and conversation rates. By comparing stores and conducting small experiments Morrisons could optimize its store layout. For example, moving a category might create a longer shopping path, or mean less time is needed to find a particular product in the category, or that more categories end up in the shopping trolley.
- At the Shopper Insights in Action conference in 2012, Metro Romania showed how it continuously adjusted the location of categories based on video recordings. For example, it discovered that it is more important to place related categories together (for example powdered milk with coffee) as a traffic builder than to give categories prominent visibility at the beginning or end of an aisle. From the experiments Metro concluded that the highest total sales are generated when it places leading brands such as Coca-Cola at foot level on promotional gondola ends.

Although suppliers have fewer opportunities for direct interactions with all end consumers, and receive masses of data, they may seek their own ways to generate big data programmes. For example, P&G set up the website Vocalpoint. With suggestions about travelling with children, cooking and money, P&G stimulates discussions among more than 500,000 users. This gives P&G new perspectives on its target group and especially its most loyal fans. At the site P&G investigates how it can improve the messages of its advertising campaigns. Next it offers its readers samples, discount coupons

and quizzes. P&G measures the effects of its campaigns by looking at how widely the product news was shared, and through the redemption rates of discount coupons for the next purchase.

Opening new ways to make the shopper happier

Big data can be applied in so many ways that companies may underestimate its speed and impact. Technology enables retailers to influence purchase decisions at any moment of the transaction. When I visited my local gardening centre I was positively surprised when an employee informed me, after a quick glance at a hand terminal, about the remaining stock and order time of parasols. The US gaming store Gamestop has checkout software that shows the most recent transactions when shoppers pay. This enables employees to remind the shopper of videos or games for family members. Pricing is usually the key concern of retailers and is one of the main factors that can quickly make the shopper experience less positive. For example, blogs are full of shoppers who complain about travel websites that offer the same plane ticket for a higher price the second time the journey is searched for online. It is difficult for shoppers to notice when an online retailer like Amazon.com applies personalized pricing. Bricks-and-mortar stores such as Kroger can do so with the help of personalized coupons but it will be difficult to accept, for example, if grocers charged shoppers more during busy hours of the week.

Big data offers opportunities to get to know the shopper better and optimize the product offering. In fact, it is possible to convert the collected information into a product itself. When shoppers place reviews on the retailer site, they add to the service experience of other shoppers. The new technology and big data let shoppers co-create: individual shoppers participate in the developing and production phases, and decide together what a product should look like. Car manufacturer BMW asked shoppers to help build the car of the future at BMW's online co-creation lab. Retailers could similarly ask for help developing new services.

With all its possible applications and benefits big data requires a strong marketing vision and a strategic approach to market research and information technology (IT). However, the required investments are significant and will be more difficult in times of financial crisis and moderate economic climate. Fortunately, several studies show that big data leads to better decision making and higher returns on investment:

- In 2011 Brynjolfsson, Hitt and Kim demonstrated that companies that use data and business analytics are 5–6 per cent more productive and have a higher market value.⁵ They introduced the term ‘data-driven decision making’ (DDD) to describe the technique of applying data to create new products, and for decision making throughout the organization.
- According to an estimate by McKinsey in 2011 the collection and application of big data result in an annual productivity increase of from 0.5 to 1 per cent.⁶
- The value of the investment in IT and data analysis software is also evident when a company succeeds in transforming data into a service for other organizations. Think of Tesco leveraging its ownership of dunnhumby to sell shopper data, analytical methodologies and other consultancy services.

According to a survey by McKinsey in 2012, for 23 per cent of companies in the United States big data is one of their top three priorities.⁷ Yet even if the trade marketing or research department has support from top management and has been allocated the necessary budget, it is difficult to know where to start digging into the data. The early adopters of big data show that retailers and trade marketers get to grips with big data by using a step-by-step approach and lots of experiments:

- Capital One is a credit card company that is not one of the most well-known to shoppers, but it is often seen as the founding father of experiments with big data.⁸ Capital One has segmented its shoppers and offers each segment a different view of the website, each with its own prices. Imagine that the regular grocery down the street asked for the same bottle of beer at 4,000 different prices. Still, that is what Capital One achieves in the financial services market.
- Amazon followed in the tracks of Capital One. It continually plays with the design of the website and offers information to selected shoppers. Next Amazon compares their behaviour with that of shoppers who are seeing the ‘old’ website. Amazon compares what people buy and how they buy, for example at the moment of purchase. In this manner they conduct some 200 experiments per day. Often Amazon knows after a couple of hours what works best for them. Experimentation has become second nature to Amazon.
- Anderson and Simester shared a success story from the US grocery sector in the *Harvard Business Review*.⁹ The supermarket segmented

its stores in six clusters and started playing with the pricing of promotions. It learnt that it could increase its profitability by 10 per cent if it matched national brand promotions with moderate discounts on private-label products as compared to not discounting the items at all. In order to protect sales of its profitable private label the grocer decided to match a 'Buy one, get one for 50% off' promotion on a national brand with the same offer on the private label, and compared the outcome to a 'Buy one, get one for 50% off' promotion on a national brand matched with a straight discount on the private label.

Experimentation as second nature in fast-moving consumer goods

Most people would agree that big data is important when it comes to gaining a better understanding of the shopper. However, if the organization has a lower budget and fewer data experts than P&G, Morrisons, Amazon, Tesco or Walmart, big data might seem too much of a challenge. I think that starting with experiments is the way forward. However, there are freelance consulting services available; one is Kaggle.com, and organizations should not be afraid to take advantage of them. Data scientists are eager to collaborate in exchange for prizes and a declaration of honour. The more successful solutions these data scientists provide, the higher their ranking among their colleagues from around the world.

In addition to starting with lots of experiments, I think we can be more creative in the ways in which retailers and trade marketers collect information. For self-service restaurants there are soft drinks dispensers that pass on information about buying behaviour over the internet in real time. First of all, this allows the retailer to decide whether the technical defect requires a service visit from a technician. The data also provides insights into flavour preferences, time of consumption and other shopping elements. Another great source for shopping behaviour comes from customer responses, complaints and returns. An organization uses the information, of course, to solve the issue. However, the data can be a great driver for innovations if it is aggregated, integrated in the data management system, analysed and made accessible to the brand team.