



ROTTERDAM SCHOOL OF MANAGEMENT, ERASMUS UNIVERSITY

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Enriching the customer experience with big data

By *Evelien van der Hurk*

Public transport operators have recently gained access to a wealth of information about their customers with digital records from journey-planner apps and smart travel cards piecing together a comprehensive understanding of individual and general travelling habits. New research uses this big data to create personalised travel options during train service disruption. How can other industries adopt the same idea to stay competitive in the Age of the Customer?

Imagine you must take two trains to get from Schiphol airport to Den Helder. You arrive at the connecting station of Sloterdijk and pull your collar up against the sub-zero temperature wind that is typical of a Dutch winter. A familiar announcement comes over the public address system: due to infrastructure problems your planned Intercity train has been cancelled. You need a new travel plan.

It's not enough to simply know when the next train departs. You need to know if you will be competing with other people for a seat, or even for standing room. You need to know if you are facing the very real possibility of not being able to get on the train at all.

Are there other train routes? Shuttle bus alternatives? Will there even be room for your child's pram or your folding bike? You are pressured to make this decision quickly, because while you are contemplating all these choices, time is ticking away, trains and buses on alternative routes are departing, and your delay is increasing.

Although my model focuses specifically on train service disruptions, proposing alternative routes and trains to the delayed train passenger, the underlying idea is to offer all buyers the highly targeted, customised information that they need to make decisions, improving their own experience and avoiding bottlenecks and backlogs in the purchase and consumption process.

The application of this idea extends far beyond public transport.



The age of the customer

Supply chains are increasingly shaped by individual buyers. Online reviews offer opinions from a buyer's peers about a product or service; social media is taking over from traditional helplines and customer service desks and has the added effect of bringing customer feedback into the public domain to be read or heard by others; apps and other real-time services create an expectation that information will be available to the buyer at every step of the purchase process.

In many ways public transport has lagged behind when it comes to using big data to streamline and personalise the customer experience. One of the biggest reasons for this was a simple lack of access to information. Public transport systems traditionally used paper tickets paid for in cash (and often multiple tickets for different modes of public transport) that are intrinsically anonymous.

Now that smart travel cards and travel-planning apps are a mainstay of the public transport experience, operators have the opportunity to gather data and analyse trends, at last being able to develop strategies to effectively support a travellers' journeys when disruptions occur.

Thanks to the progressive approach of Netherlands Rail (NS) and their enthusiasm for collaboration and innovation, I was able to develop a mathematical model that does exactly that. However, beyond the scope of my model are a range of possibilities for all kinds of suppliers and providers to "speak" directly to individual customers

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Meaningful alternatives

When a supply chain is disrupted we often assume that the customer wants to move as quickly as possible through the process. In this case, when a train is cancelled, we assume that every passenger just wants to get home even if it means standing shoulder-to-shoulder with their fellow passengers on an overcrowded train. But what if this were not the case? What if a great number of people would prefer to remain – not necessarily on the platform but somewhere nearby – delaying the next leg of their journey until the trains were less crowded?

Imagine a scenario in which an operator knows that a significant proportion of travellers at a particular time of day are parents with young children. If that operator has developed partnerships with local services and facilities, a cancelled train may be an opportunity to turn an inconvenienced customer into a loyal one. For example, if a nearby indoor playground offers a free coffee to any parent delayed by a train cancellation, how many parents would choose to be "bumped" from their intended train in the same way passengers vol-

unteer to be bumped from their flight, freeing up space for other passengers? The win-win situation to all parties is clear as operators reduce crowding and bottlenecks, local services increase their own customer base and – most importantly – the traveller has full control over their travel decisions and a pleasant way to pass the time.

Building on the idea of partnerships (and catering to those passengers who cannot wait), a scenario in which a cancelled train triggered an automatic alert to ride-sharing networks like BlaBlaCar or to local taxi services would offer passengers an extra travel alternative, one that can be used almost immediately while still avoiding bottlenecks on other trains.

Similarly, although train service operators contract with local bus companies to provide shuttle alternatives to cancelled trains, the amount of time needed to arrange extra buses and drivers is prohibitive. Effective use of big data in this scenario could provide a passenger with a clear journey plan using already-scheduled buses, reducing or even eliminating wait times for specially arranged services. ▶

Enriching the customer experience with big data *(continued)*

By **Evelien van der Hurk**

Obstacles to using big data

With so much information available, effective harvesting is crucial. Although the focus of many companies is on storing lots of data, the potential applications of big data are severely diminished if data is gathered and stored inconsistently. These inconsistencies often only show up during analysis. For example, in the analysis of data from NS we found that the asynchronicity of clocks in different data sets caused many problems and we had to discard a significant amount of data. Imagine, for example, some-

one arriving before any train on any route arrives according to the timetable, as the check-in and out times are not synchronized with the registered train-driving times.

Synchronisation of the clocks in all data sets would significantly increase the value of the data itself – but once the system is in place, correcting this is usually far from easy. Therefore it is important that companies focus not only on storing data but also on storing it in such a way that it is consistent with other (existing) systems – and also consistent over time.

company's servers. I could also store this information myself locally on my phone and use an app to help me find my favourite products on sale – or maybe even propose alternatives if my preferred product is unavailable. Third parties could even develop this app. The convenient shopping experience, and possible discounts, may still attract me to shop at Albert Heijn – creating a win-win situation without having to share all my information.

Using information to streamline and personalise the customer experience will become more important as mobility and interconnectedness increases. When large services like NS are heavily investing in streamlining their customers' experiences it can only become more interesting to see where they go next. ■

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Consumer concerns about privacy are also significant. While there is no requirement to track individuals in order to improve service (anonymous data follows patterns of behaviour, not names and addresses), big data can sometimes be akin to Big Brother in a customer's mind. To allay these concerns, it becomes even more important for companies to use data to support a customer, and not only for their own benefit.

Right now, a company collects data and we hope that they use it wisely. In the future a customer can easily be the custodian of their own data while benefiting from the applications it offers. For example, when shopping at supermarket Albert Heijn there is no need for my grocery list to be on the

This article is based on Evelien van der Hurk's PhD thesis *Passengers, Information and Disruption*, which can be downloaded at [WEB http://repub.eur.nl/pub/78275](http://repub.eur.nl/pub/78275)

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RSM Discovery videos

Watch a video of Evelien van den Hurk explaining the practical insights and applications offered by her research at [WEB http://rsm.nl/rsmdiscovery23/](http://rsm.nl/rsmdiscovery23/)

