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Big Data to spur more efficient, more reliable public transport

By Harry van Huyssteen

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South Africa is battling some unique challenges in the field of public transport: the legacies of historical urban planning programmes, complex inter-relationships of formal and informal travel systems, fragmented and disconnected bus, train and taxi networks, and a section of the population stubbornly insistent on using private cars.

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Overcoming these challenges is proving to be a slow and painstaking journey, but it's one that could certainly be accelerated by smartly applying technology. Big Data, in particular, has the potential to ease the transit flows for millions of daily commuters, and unlock huge economic value.

In fact, there are four key areas in which Big Data can be applied to SA's public transport:

• **Planning urban commuter networks:** geolocation technology can reveal essential information on where people are, where they're going, how long it is taking them, and so on. With this information at your fingertips, it's possible to plan public transit systems that match customer needs. Detailed information reveals insights at a very granular level – like the number of train carriages required at certain times of the day – to ensure the optimal allocation of resources.

• **Predictive analytics/maintenance:** sensors embedded in physical equipment stream data back to a central hub, giving authorities insights into key metrics such as commuter volumes at certain times of the day, or average waiting times. On physical equipment, maintenance-oriented sensors give us an early warning of when components are likely to malfunction, improving uptime and reducing the chances that commuters are left stranded.

• **Responding to events:** Data-gathering becomes highly useful when responding to accidents or incidents. Alerts can be automatically dispatched to police and emergency services, who can speed up the process of clearing the incident and get traffic moving once again. Alternative routes can be suggested to travellers via mobile alerts, or digital signage, for instance.

• **Personalised service:** Though public transport has traditionally been a not-for-profit service rather than a revenue-generating endeavor, tailored digital marketing is an opportunity for operators to grow new revenue streams. As Big Data enables a sharper understanding of one's customers, information alerts can be targeted at only those who would need to know about a specific issue (rather than bulk SMSes to a broad database of commuters).

For South Africa, the opportunities we find in each of these four areas may not exactly follow the case studies and examples from other parts of the world. But there are certainly some 'quick wins' that could be achieved. Imagine, for example, a taxi system that uses basic sensors, linked to an SMS platform, to keep commuters updated.

Getting to the first level of Big Data maturity

For the time being, we need to get to this 'first level' of Big Data maturity: simply surfacing information and presenting it to those who need to know. In the taxi example, this could result in fewer people arriving late for work each day - one of the most basic, most persistent problems with our informal transport networks.

In a similar way, rail and bus operators could begin their journey with sensor technology and Big Data analysis for just those most pressing issues - the components that fail most often, or those that take the longest to fix and cause the most disruption to customers.

With some of these basics 'in play', we could then turn our attention to the higher-level issues that Big Data could solve, such as pulling together schedules and real-time data from various public transport operators – buses, taxis, trains, ride sharing, carpooling, and more – to present commuters with an integrated view of transit networks.

As businesses, we've certainly bought into the benefits of Big Data, for understanding our customers' needs and tailoring our offerings. But in the realm of public transport, we've been slower to see the potential for Big Data in improving the daily commute for millions of South Africans. With the decades-long flock of people from rural to urban centres continuing, and congestion levels in major metros reaching epic proportions, the reality is that we have to swiftly and decisively start finding solutions.

Big Data is central to finding strategies that work, to address our unique transport challenges.

ABOUT HARRY VAN HUYSSTEEN

Harry van Huyssteen has a diverse background with experience in training, in senior management, strategic business development and management consulting. His experience spans the private and public sectors mainly in education, broadcasting, IT management, health and transport. He started the Transport Forum almost 11 years ago as a business development initiative for the state-owned arivia.kom. This initiative soon became an asset for networking and content provision in the South African transport sector: www.transportsig.com

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