INRIX

Population Analytics: A New Opportunity for Mobile Operators

Few new mobile-based technologies have the potential to change the way that organisations think about their customers and stakeholders as population analytics. Information about how whole populations flow from one point to another is emerging as a new and powerful tool for strengthening communities, building smarter cities and creating better customer relationships. But to take full advantage of its potential, mobile operators must embrace partnership opportunities sooner rather than later.

It is quite hard to get lost in the modern world. Today, nearly everyone who wants one can have a mobile map in their pocket telling them exactly where they are – a fact being put to good use by many different sorts of organisations building businesses on location-based models. Such models, built principally using established GPS data sources, can provide vital information about immediate locality – where a person or a vehicle is, and what places or resources might be close by. To date, though, far less attention has been paid to the whole population flow picture of how, where and why large numbers of anonymous crowds of people are moving.

As this paper will show, there are many good reasons for having this information. Detailed knowledge about origins and routes, in particular, can help organisations of many kinds gain new kinds of insight into their customers and constituents that are very hard to obtain in other ways. Such knowledge is the foundation of a new technology innovation called population analytics, which

### POPULATION ANALYTICS BENEFITS AT A GLANCE

Many different sorts of organisations can benefit from the unique ability of population analytics to deliver new insights.

» Mobile Operators

For mobile operators, population flow technology represents an opportunity to deliver a whole new raft of services to both existing customers and completely new ones. In conjunction with the INRIX analytics platform, operators can distil real information and insight from their own unique and vast collections of data – a potentially significant new revenue source, and a valuable addition to their services portfolio beyond

promises to revolutionise everything from road planning and event management to retail strategies and financial forecasting.

Population analytics is still in its youth, but it is generating considerable excitement as the potential of its applications and their very substantial associated revenues become clear. The use cases are almost limitless, and organisations in almost every industry sector will benefit significantly from it over time. In the short term, though, it is mobile operators who have an especially critical role to play in building its foundations. They stand to benefit in a wide variety of ways, everywhere from additional revenue streams, entry into new vertical sectors and the provision value-added services for enterprise customers. But to succeed, they need to partner with organisations with the data skills and assets to complement their own; organisations such as INRIX, whose experience in managing and integrating data from multiple sources at scale give them a significant head start.
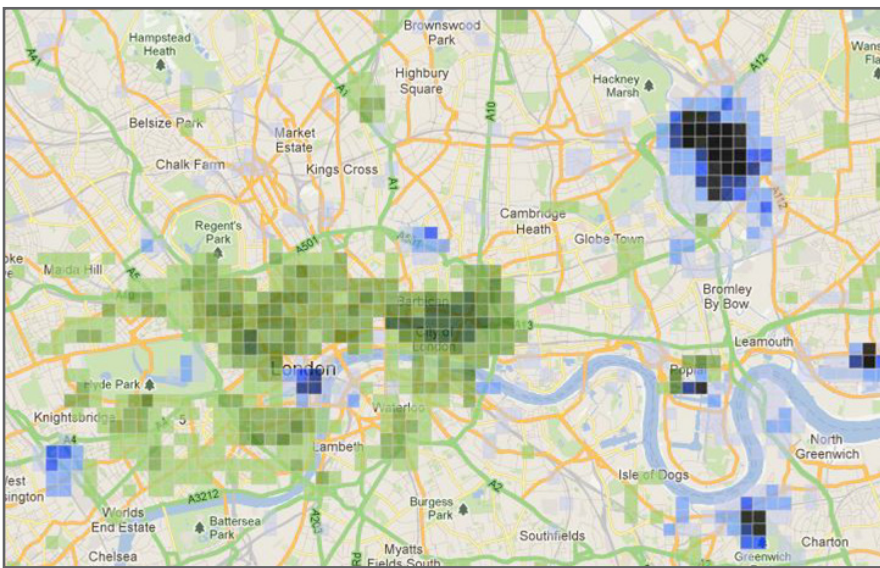
» Population analytics in context

Population analytics is a data-driven analytical technique for answering questions about large groups of people - as its name suggests, whole populations rather than individuals. Its power comes from its ability to understand not just where anonymous groups of people are at a given time, but where they've been, how they got there and where they may be going next. Knowing where people start their journeys to a major sporting event, for example, can help local authorities plan and manage every aspect of the relevant travel and transport arrangements with much greater precision than is currently possible. Similarly, a retailer who knows what percentage of customers live in a particular postcode has a much clearer view of its real customer demographics, and can modify its strategy accordingly. Today, users as diverse as large retailers, event planners, civil engineers, surveyors and investors can leverage population analytics to answer difficult

the reach of the over-the-top technology players.

» Public Sector

For public sector organisations, origin analysis and population flow gives planners a new way to visualise real-world urban problems and create working solutions based on actual data; not just in road and transport planning but across social strata too.

» Consultancy Firms

For consultancy firms, mobile data analysis offers the potential for a new kind of competitive advantage for themselves and their clients; genuinely new approaches to big-business problems that cannot be addressed with more conventional technology.

» Large Business

For large businesses, population flow offers a new way to look at old issues; in particular, how to gain far greater understanding of customer behaviour, and use that understanding to maximise revenue and minimise costs.

questions about their business that are hard or impossible to answer using conventional data-collection methods.

Gathering the data about moving people and populations has to date been costly, time-consuming work. Roadside data collection, for example, historically mandated for road planning purposes in the UK, is highly dependent on data from human-conducted roadside interviews – a fact which limits the potential scale of the data and dramatically magnifies the cost of collecting it. Similarly, roadside cameras are expensive to install and maintain, and are subject to failure in adverse weather conditions. Commercial ventures face similar challenges; the costs of conducting research on a big enough scale to obtain useful data, among individuals often reluctant to be stopped and interviewed, are hard to justify for even the largest organisations.

» The mobile advantage

By contrast, data from mobile networks is always readily available from a very large and evenly distributed number of sources – the handsets that nearly everyone now routinely carries, an asset unique to mobile operators that cannot be replicated by other market players. That asset brings several advantages in the big data analytics market, not least its scale; the sheer volume of mobile data means that sample sizes correlate statistically with real-world population volumes, for example, ensuring that models can deliver meaningful results. Putting that data to use, though, is non-trivial. One specific barrier to using data from mobile operators for population analytics and population flow analysis is the sheer technical difficulty involved in processing and aggregating such enormous quantities of information – more than 1.5 billion real-time data points a day in the UK alone. Managing volume, though, is just one aspect of the processing task; maintaining anonymity of the data at every stage is critical too.

Perhaps the biggest barrier to mobile operators building their own population analytics platforms is accuracy. While they have tremendous reach, the intricacies of mobile technology make it very hard for them to resolve to the level of detail needed to build really accurate models of dynamic populations. But what if they overlaid the mobile data with other more accurate sources of location information, such as GPS? In the right hands, that combination of mobile data and GPS data becomes something much more than the sum of its parts – a true foundation for population analytics, and a catalyst for a significant new wave of innovation across a multitude of sectors.

INRIX is at the forefront of that wave. Thanks to its expertise in processing huge volumes of traffic data from multiple sources, INRIX is an ideal partner for mobile operators looking to exploit the potential of population analytics. It is one of a tiny number of companies able to manage and process real-time data at national scales, regardless of its source; it has several patented algorithms that improve the accuracy of locating handsets in mobile networks, in addition to its own traffic intelligence services based on multiple data sources such as GPS as well as fixed sensors such as automatic number plate recognition and induction loops. And critically, it has many years' experience in working directly with mobile operators, which it is already helping to understand the real power of data analytics.

» Partner benefits

In the UK, INRIX uses its mobile operator partner's aggregated and anonymised data to provide insights to customers; in return, the operator gains an additional revenue stream. For mobile operators that are yet to benefit from population analytics, partnering with INRIX would negate the need to invest in large, costly and time consuming technology infrastructure – a key consideration for mobile operators as they seek to take advantage of the increasingly clear benefits of location insight platforms such as INRIX Population Analytics.

Partnership with INRIX, and the greater data accuracy that generates, is enabling mobile operators to build new revenue streams across a wide variety of industries and sectors - not just in their core existing markets, but in many new markets too. Some examples of how INRIX population analytics can be used in real-world revenue-generating environments:

Some of the questions that mobile operators can help their customers answer:

- Smart city planning. How do I improve traffic and transport flow around my city? City planners can determine how many people enter and leave the city, and where they came from and return to; critical data for making good decisions about everything from building new roads to implementing new bus routes and implementing effective park-and-ride schemes.

- Retail insight and marketing. Who are my customers, and how can I reach them more effectively? Shops, malls, cinemas and event venues can use information about where anonymous customers travelled from to visit their site and when; what their true catchment area is, what the demographics of that area are. At the same time, they can plan very focused postcode-based marketing campaigns and test their efficacy with much greater accuracy.

- Site location. Where's the best place to put a new store, or build a new sports/entertainment venue? Armed with the right information, organisations can find optimal locations for customer destinations based on real population flow data.

- Venue management. How do people get to and from our venue? What's the fastest and safest way to evacuate in an emergency? Venue owners and safety professionals can determine where people start their journeys, how they get there and what they need to do to get people out safely.

- Investment planning. Which companies in my portfolio were busiest over key trading periods? Investors can see exactly how busy specific retail and commercial sites are during critical trading periods such as Christmas, and what sort of people visited them; thus helping them to make informed investment decisions based on likely profitability.

Many projects utilising ideas like these are already underway. Origin and flow data has shown great promise for smart city planning in particular, thanks to its ability to measure events at an extremely detailed level; how many vehicles pass through a particular area over a specific time period, for example, or total volumes and origins of traffic along streets and across transport networks over the course of a day. During the London 2012 Olympics, for example, INRIX worked with Transport for London (TfL) to analyse real-time population flow across the capital and around key events, assisting TfL to make better-informed transport planning decisions.

The use of mobile data also has important applications for local and highway authorities, who are already using it to plan road network changes and measure travel time with great precision. Examples of INRIX 's work in this area include a travel time measurement system used by Connect Plus to manage one of the busiest motorways in Europe, the M25 London Orbital; providing essential data for the M25 Junction 30 Congestion Relief Scheme Study undertaken by Jacobs UK Ltd on behalf of the UK Highways Agency; and a venture in partnership with Mouchel and Transport for Greater Manchester to build a multi-modal picture of travel across a wide area. Many other examples exist: INRIX's Incidents platform, for example, which provides detailed information and insight around major disruptive incidents (public

transport strikes resulting in more traffic on roads, for instance). Monitoring such incidents is clearly vital to public sector organisations, but to date understanding such data using conventional qualitative methods has been difficult; population analytics makes it highly accessible.

Public sector applications like these illustrate just one aspect of the power of population analytics. As the examples above show, however, much of the untapped potential exists elsewhere, particularly in the retail and financial industries, where the subtleties afforded by this kind of data analysis may turn out to have particular benefits. In the retail world, for example, the ability to accurately predict the times and places at which customers from more affluent neighbourhoods go shopping may have a dramatic effect on everything from opening times (with all that entails, from staffing levels to energy usage) to marketing campaigns and stock control strategies. Similarly, information about the journeys that people take may have great significance for advertisers, who can make decisions about exactly which billboards to buy space on based on precise volumes and demographics of passers-by, rather than on perceived value of the site itself. All of these examples create opportunities for new revenue streams and newly profitable business relationships.

It is early days for population analytics, but the message about it is already clear; its potential is limited only by the imagination of its users. And increasingly, it is the mobile operator community, in partnership with INRIX that will be helping to stimulate that imagination.

» About INRIX

INRIX is one of the fastest growing big data technology companies in the world. The company leverages big data analytics to reduce the individual, economic and environmental toll of traffic congestion. Through cutting-edge data intelligence and predictive traffic technologies, INRIX helps leading automakers, fleets, governments and news organizations make it easier for drivers to navigate their world. Our vision is simple – to solve traffic, empower drivers, inform planning and enhance commerce.

Whether through an in-car or smartphone navigation application, a local newscast or our INRIX Traffic app, our up-to-the-minute traffic information and other driver services reach more than 150 million drivers to help them save time, fuel and frustration. INRIX delivers traffic and driving-related insight, as well as sophisticated analytical tools and services across six industries covering nearly 4 million miles of road in 37 countries.

To talk to INRIX about how you can benefit from population analytics, please contact:

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