

## Realising the potential of big data analytics

The potential of insights from big data analytics to inform current decision making and future service (re-)design initiatives has barely been touched upon. But problems loom with organisational capacities to handle big data and do data analytics work. Nevertheless, pioneers are pressing ahead and getting some support. Perhaps the challenge here is not one of building business cases and managerial decision making, rather it is one of leadership's strategic vision and principle, and willingness to grasp the nettle.

### Introduction

Computing and online processes generate a lot of data. The Internet of Things, with its huge numbers of smart devices and sensors, all generating even more data, is compounding the rate of data accumulation. Anecdotally, the rate of increase of data mountains today could be likened to Moore's Law – it's doubling every 18-24 months!

### Big data

But these data mountains – so-called 'Big Data' – can be seen as an opportunity and not a problem if one sees them as resources to be exploited. 'Data is the new oil', is another metaphor widely used to illustrate the nature and scale of the commercial opportunity. There's obvious potential in the public services sectors too, but it has a lower profile and different incentives than the market projections of £trillions to be had.

### Exploiting big data

There are several basic means of exploiting a given kind of data resource. The simplest is to just use the new data 'as is', to inform evidence-based policy and management decision-making. A more sophisticated approach is to turn data into 'information', either through analysis or synthesis by selectively combining one kind of data with another. These processes that turn data into useful information are essentially what 'data science' and 'big data analytics' are all about.

### Big data in public service

The notion of gathering and analysing data to inform decision making is certainly not new. Data observatories such as those for the [south west](#) and [Birmingham](#), founded by regional development agencies, have been around for many years. What is new is the sheer volume of data available and new tools to help store, process and analyse it.

And new fields generate new job specialisms for those with the appropriate skills and capabilities, such as 'data scientist', 'data engineer', 'analytics manager' and 'data visualisation specialist'. This in turn naturally creates new business function groups inside organisations, providing 'data analytics' or 'business intelligence'. When the new activity becomes significant enough in importance and impact, it can become a full blown 'Office of Data Analytics', for example.

### Mayor's office of data analytics

We featured the City of New York Mayor's Office of Data Analytics (MODA) in a previous Insight briefing in 2015 '[Big data: What does it mean to 'do' it?](#)' MODA's work included predictions about which city premises had the greatest fire risk, for example, which was used by the city's fire services for preventative interventions.

There is as yet no equivalent to a MODA here in the UK, but similar themes are emerging. The creation of new regional mayoralities in England could be an opportunity to establish new organisations that do new things in new ways. And local authorities that lead the way in digital services provision and service redesign are, almost inevitably, getting into big data projects and practices.

### **ODAs in the UK – it won't be easy**

Socitm and Nesta have recently discussed the idea of Nesta and partners conducting some 'city data pilot' exercises in the UK as part of a new [Nesta 'Local Datavores' programme](#). The pilots could look at the practicalities (people, processes and technologies required, for example) and the potential business cases for establishing MODA-like, data analytics business functions for individual UK local authorities or indeed regional groups.

However, some of the challenges are as big as the opportunities here. The House of Commons Select Committee on Science and Technology observed in 'The big data dilemma' (emphasis added):

*"The UK is a world leader in big data research across disciplines and our Tech sector, especially in London, dramatically outperforms the rest of the economy on growth and productivity indicators. By identifying big data as one of the Eight Great Technologies, and investing significant financing in large scale data infrastructure, the Government has signalled that realising the full potential of big data is a priority. However, investing in capital infrastructure projects alone will not deliver this. **Urgent action on the digital skills crisis, overcoming public distrust over data sharing, further progress on 'open data' and greater clarity over prospective data protection legislative changes are essential** if the UK is to set the pace on big data."*

They go on:

*"The digital skills gap is approaching crisis levels... This risks UK business being unable to grow the big data sector at the pace it should. In the meantime, this skills gap is forecast to grow exponentially as big data reaches further into the economy. The evidence we received on the digital skills crisis was so concerning that we have launched a further inquiry specifically into this issue..."*

In a Nesta briefing in July 2015, 'Analytic Britain: Securing the right skills for the data-driven economy' (emphasis added):

*"However, the data-driven companies we have surveyed are struggling to find suitable talent. Two-thirds ... who tried to recruit analysts in the previous 12 months struggled to fill at least one vacancy. A recent employers survey by the Tech Partnership shows that big data analytics is the tech occupation with the biggest skills gaps. While data may be part of the answer to the UK's productivity gap with other countries, it appears that barriers to accessing analytical talent are preventing businesses from fully harnessing its potential.*

***"By and large, the problem is finding people with the right mix of skills: the data scientists who combine technical skills, analytical and industry knowledge, and the business sense and soft skills to turn data into value for employers are very hard to find – so much so that some people refer to them as 'unicorns'."***

It may be the case that a shortage of people with the right skills will be even worse for local public sector employers, severely limiting their ability to build the necessary business capabilities in-house and engage in 'pilots' with such as Nesta to build a business case.

On the other hand, with such a shortage there is great commercial opportunity for outsourced service providers with in-depth business development resources to offer varieties of 'analytics as a service'. Atos, IBM and Oracle appear on the first page of web search results. Others offer sophisticated DIY analytics tools, such as [tableau.com's 'Analytics anyone can use'](#).

Of course, out-sourcing will compound the usual fundamental issues around data/information ownership, security and governance. The pragmatic alternative is to (re-)train existing employees, which has two consequences that may be detrimental. First, their new skills will be very marketable and if they leave they take valuable sector knowledge and experience with them. Second, if they stay to do this new work, then their previous work will not get done any more, assuming there's no recruitment to backfill or automation instead. So a gain in one area of in-house work could be a significant loss to another.

There is a significant problem looming here if in fact it has not arrived already. We plan to delve into this shortly under the umbrella of an IT Trends deep dive survey on **'digital skills and organisational capabilities building'**. Please respond positively to the invitation to participate when it arrives.

### ODAs in the UK – but it would be worth it

Notwithstanding the stresses of funding and rates of change in local public services in the UK at the moment, the benefits of better-informed decision making just have to be had if they are on the table. The alternative is coping with poorer decision-making than would have otherwise been the case.

Business cases are conventionally made through attention to Value for Money comprising the economy with which resources are acquired and used, the efficiency of conversion of inputs to outputs and the effectiveness of those outputs in contributing to desired outcomes. In this way of thinking, calculating the VfM benefits to outcomes only *comes after* there is good data and information to inform the calculations. The resulting business case for something that is truly new and innovative is immediately very vulnerable to a fatal challenge from a higher level on the grounds of ‘unproven’ benefits being promised.

The only way to break out of a cycle of despair like this is to either prove the benefits from somewhere else – in which case the new proposal isn’t truly innovative or new, except perhaps only locally now – or to elevate the task of making the case up to that higher level itself – to the leadership level, in fact.

### A leadership requirement here?

The Nesta pilots, and others elsewhere, may provide tangible proof of ODA benefits in due course. We’ll watch for the outcomes with interest. But that means there’s no way forward via the managerial decision-making route in the meantime.

And it may be that the pilots will fail to prove benefits! There is no guarantee that they will be well selected and successfully executed. And even if one pilot fails, that is no preclusion of another’s success. So, requiring a search for ex-ante proof of innovation benefits is, arguably, a kind of a hunt for a chimera.

The other option of elevating the making of the case is the key one here, at least to facilitate action in the short term, pending ‘proofs’ arriving. This is an opportunity for the decision to be made on high-level, strategic direction grounds via *leadership*, rather than on lower-level, *managerial* VfM grounds. An organisation’s leadership can simply decide that an ODA or something similar *will* be established as part of their *vision* for the future and in line with the *guiding principles* they want to run their business by – e.g. ‘being data driven where appropriate’. Leadership decision making to support *vision* and *principles* isn’t about VfM alone.

Pragmatically, at any given point in time, few leaderships will be both confident enough and able to act first and justify second rather than vice versa. So it is the case that proofs of benefits are very much worth having for many most of the time. Socitm therefore very much welcomes and encourages any efforts by organisations such as Nesta to push this along. Similarly, we would urge Socitm members to participate when the opportunity arises.

### What’s going on already?

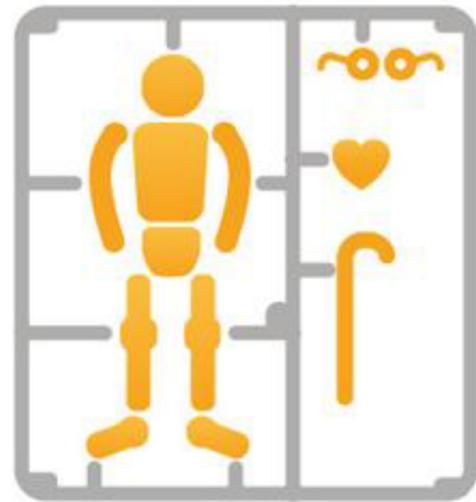
We highlight below some examples of early days big data initiatives across the Socitm community.

It’s important to note that collaborations and partnerships almost always play a big part in this, for it’s surely certain that nobody has all the data that could be brought to bear.

This is especially apparent when one takes a person/user/customer holistic view, as opposed to a view from within one’s own organisational silo. The example of ‘Bob from Leeds’ cited by Leeds’ Chief Digital Officer, Dylan Roberts, really makes this plain. Services organisations that gather, share and analyse what they know about Bob and his needs are obviously better placed to coordinate their actions and make better decisions for Bob’s benefit. Eliminating poor coordination, duplication even, should mean that better helping Bob in this way is overall less costly too.



Bob as seen by his friends and family



Bob as seen by the healthcare system

**Leeds Data Mill** (leedsdatamill.org) is owned and managed by Leeds City Council. It's a city-wide platform, not just made by and for the council's purposes: 17 different organisations are publishing a range of open data/information; it's an engagement tool, with regular innovation labs; and they hope to kick-start a new generation of data-driven cities and businesses. For example, council services, other service organisations (e.g. health sector) and Leeds' entrepreneurial digital community are looking at real and current challenges such as: 'How can we make Leeds the best city to grow old in?' The Mill is facilitating exploration of the complex relationships between the city's diverse services and businesses, providing more and deeper insights into the workings of the city than ever before.

**The London Borough of Camden** is pursuing a data-driven transformation programme. Cllr. Theo Blackwell [recently presented at the Socitm Spring Conference on the topic](#), as part of the authority's strategic response to increasing demand and reducing budgets. Its 'data journey' has been all about unlocking data from legacy systems and making it available to the people who need it to improve public services. Camden has made a major investment in a programme of business intelligence dashboards development and currently has 32 live out of a planned total of more than 70. A new platform, Open Data Camden, will give residents direct access to data to use as they see fit. There's more in the same vein from Blackwell [in a presentation at a Nesta facilitated workshop in March](#).

**Nesta** identified [four kinds of leading-edge examples of local government data usage](#) and cited recent or current UK or international examples of each area, as we illustrate:

Machine learning prediction tools	City Optimisation	Open Data	Local economic growth and business development
<p><b>New York MODA</b> - fire prediction, rat infestations  <b>Chicago 'Data Science for Social Good'</b> - reducing adverse birth outcomes  <b>Auckland</b> - children at risk of abuse  <b>Predictive policing</b></p>	<p><b>Seoul Metropolitan Government</b> - Night-bus route optimisation  <b>Singapore</b> - Intelligent Transport System  <b>Santander</b> - City-wide sensing</p>	<p><b>Greater London Authority</b> - Data Stores  <b>Leeds</b> - Data Mill  <b>Trafford</b> - Innovation and Intelligence Lab  <b>Open Data Challenge Series</b></p>	<p><b>New York</b> - NYC Business Atlas and Digital NYC  <b>Montreal</b> - open public procurement data</p>

## Some other open data and data mill-like initiatives

Typical features of all these initiatives are:

- a focus on outcomes and transforming services
- exposing and publishing open data
- drawing on capacity and capabilities in their communities and other organisations, including universities.

And specific initiatives include:

- [Open Data Bristol](#)
- [Cambridgeshire Insight](#)
- [Camden](#)
- [Greater London Authority London DataStore](#)
- [Leeds Data Mill](#)
- [Manchester and \(open.manchester.gov.uk\)](#)
- [Open Data Institute Nodes network](#)
- [Sunderland](#)
- [Surrey](#)
- [Trafford Innovation and Intelligence Lab](#)
- [Transport for London](#)



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**Socitm Insight Programme**

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