Government is in the enviable position of having lots of data about its citizens. But the current culture, systems and processes make it difficult to unlock the insight held within that data to better understand citizens, improve services and drive efficiency. With the technology available – and affordable – to take advantage of big data, there are no excuses for the public sector to keep this valuable asset locked-up and underused.

The public sector has something private sector companies would love to have: huge amounts of data on the UK public. Government departments and agencies have been collecting information about citizens for decades and, with more services going online, that asset is only going to grow.

But big data on its own is of little value; it’s what you’re able to do with it that counts. For the public sector, that means being able to integrate data from across departments to give a joined-up view of citizens, operations and services. It means using big data analytics to understand which data is important, and transform it into insight for better decision-making, increased efficiency, faster innovation and improved services.

Of course, big data is not just a question of volume. It’s about variety; comprising a mixture of traditional, structured data, as well as unstructured files such as social media, unstructured forms and emails. And it’s about velocity; the unprecedented, constant pace at which it’s arriving.

Unfortunately, out-dated legacy systems and limited analytics capabilities mean the public sector struggles to unlock the value of its data; it’s data-rich but insight-poor. It has all the unnecessary problems of big data – high costs, poor data quality, and disparate data sources and formats – but none of the tantalising benefits.

The good news is that changes in technology have made cheaper storage and processing, and easy-to-use analytics tools, affordable and accessible to everyone. Driving the most value out of data is no longer the remit of IT or policy makers, but something managers and frontline staff can do on a daily basis.

In this paper we expose the five myths preventing the public sector embracing big data, and highlight the five key reasons it must overcome these barriers and unlock the value of information as soon as possible.

With better use of big data, governments have a significant opportunity to boost their efficiency and value for money they offer citizens.

McKinsey Global Institute

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1 Big data: The next frontier for innovation, competition and productivity, McKinsey Global Institute, May 2011
5 myths around big data analytics

The concept of big data is nothing new, but there are a number of out-dated perceptions that prevent government from making the leap from 'lots of data' to the big data dream.

**Myth #1: Big data management and analytics are expensive**

In the past, storing, managing and analysing big data could be prohibitively expensive for cash-strapped governments. But technology has developed; open source software such as Hadoop makes it possible for departments to cost-efficiently store, process and analyse all their data, including unstructured files.

**Myth #2: Big data analytics take time and specialist skills**

Visual analytics, drag-and-drop dashboards, and apps for mobile devices mean everyone can explore big data to reveal insights and patterns that were previously hidden. Users with no analytical training can use predictive analytics to understand the impact of decisions, or the steps needed to achieve desired outcomes.

**Myth #3: Public data cannot be shared**

This is ‘data fear’ rather than a legal barrier. The value of data increases when it is shared; for example, anonymised HMRC data on incomes could help the NHS build a clearer picture about cancer risk, or the police understand crime patterns. By educating the public about the benefits, and building secure data sharing platforms, government could overcome this ‘data fear’ to achieve true reform.

**Myth #4: Public sector workers are too busy to collect data**

Collecting and publishing data need not be a job in itself. Government must review its processes to ensure collection is automated where possible, and made available in a meaningful way that is useable by frontline staff. For example, The Office for National Statistics conducts surveys to collect its data. Yet, by fully embracing the use of existing administrative data, it could save time and money, remove the need for sampling, and deliver more up-to-date insight, faster.

**Myth #5: Public sector has a robust decision-making culture**

In the past, the public and press accepted the public sector’s limited ability to provide hard data to support decisions and demonstrate success. But, in the digital age, people know the data and technology are available to make evidence-based decisions that stand up to scrutiny. As an awareness of the power of big data grows, the public sector needs to develop a culture of transparency, providing data-led evidence around spending, services and policy.

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2 The Data Dividend, Demos, March 2012
5 reasons to embrace big data analytics

Despite the wealth of information it holds, the public sector cannot see the bigger picture. Citizens appear as fragmented sets of needs, rather than complete individuals, and it is difficult to get the bigger picture of operations to make effective, fact-based decisions.

By integrating all the appropriate data and using big data analytics, government can get a 360-degree view of citizens, society and operations. But to tackle a problem such as obesity, the Department for Education, Social Services, Government Payment Services, HMRC Cycle to Work and the Department for Culture Media and Sport, as well as local government, need to be involved to optimise the overall spend and tailor programmes to different socio-demographic regions that respond better to certain approaches or intervention. Government could

1. Improve resource allocation
A joined-up approach would enable the public sector to understand more about citizens and the factors driving demand for public services, so managers can plan resources more tightly. For example, using SAS, the London Fire Brigade (LBF) combines its own historical incident data with a range of external sources - such as the census - to produce fire risk maps, which inform budget allocation and enable LFB to target limited fire fighting and preventative resources to the buildings and people most at risk.

2. Increase efficiency and productivity
Big data analytics enables organisations to identify and address operational weaknesses, streamline services, and focus on the areas that will deliver the best results. For example, one pharmaceutical company uses SAS to consolidate and harmonise data from more 12,000 clinical trials, and quickly and cost-efficiently meet stringent regulatory demands. This approach also provides a rich resource for added value analytics, such as clinical trial simulations that could save it tens of millions of dollars.

3. Improve forecasting and planning
Predictive analytics give organisations an accurate view of the future demand for services, and how decisions made today will affect that demand, to make evidence-based decisions about spending. Forecasts are based on the most up-to-date information, so services can be delivered that reflect the population as it is today, not what it looked like two years ago.

For example, the Department for Work and Pensions (DWP) combine internal and external data to create simulations of what will happen - or could happen - in the future. It relies on this insight to forecast pensioner incomes and shortfalls, and plan benefit expenditure fairly and accurately.

4. Prevent waste and increase revenues
Traditional approaches to combating fraud, error and debt (FED) are ring fenced into siloes by government department, and often depend on expensive investigations to recover money owed. But a joined-up approach to big data would enable a cross-government view of FED, and the use of analytics to predict and prevent it happening before money is lost.

HMRC uses a platform called CONNET to integrate more than 26 data sources and identify potential tax fraud and criminal networks, before money is paid out, while processing valid claims faster. The pilot systems increased tax yield by 58 percent, a return on investment of 30:1.

5. Target services and communications more effectively
Once the public sector has a 360-degree understanding of citizens’ needs, it can segment them to ensure the right services are delivered to the right people, at the right time. They can identify the best channels to communicate with certain groups of citizens, much of which can be automated. This will not only save money on communications, but will also increase the uptake of services when they are most needed, reducing cost further down the line.

This is ‘customer intelligence’ approach has been used in the private sector for years. For example, insurer Swinton created a single view of its customers using data from across all its channels and products. This enables it to be more sophisticated in how it segments customers, and run more effective marketing campaigns with minimal intervention across email, SMS and telesales.
SAS: unlocking big data

SAS has been helping governments across the world operate more efficiently and effectively for more than 35 years. Our capabilities fit with existing IT infrastructures, including Hadoop’s cost-effective storage and processing power, to enable the public sector to:

- **Integrate data and ensure data quality**: cleanse disparate data sources, remove inaccuracies and duplication, and standardise based on common values.
- **Analyse large volumes and varieties of data**: access high-performance analytics to answer questions in seconds.
- **Share data securely**: with individual level log-ins and appropriate levels of access as required, e.g. analysts could access the full data in anonymised form, while caseworkers would access the full file, but only those they need.
- **Ask complex questions**: use a combination of leading data analytics tools to identify patterns, build ‘what-if’ scenarios and make evidence-based decisions.
- **Democratise analytics**: easy-to-use visual analytics tools put insight into more civil servants’ hands.
- **Automate**: have insight delivered to where it’s needed, fast.

SAS’ big data analytics give frontline decision makers the power to improve the quality of public services and improve outcomes for citizens - with less resource and greater efficiency. With SAS the public sector can:

- **Understand citizens’ needs today**: create an up-to-date single view of citizens to deliver the right services, to the right people, at the right time.
- **Accurately forecast future needs**: know how your community will change and plan accordingly.
- **Test the impact of proposed initiatives**: create fact-based ‘what-if’ scenarios to inform decision-making.
- **Plan effective interventions**: identify and support citizens before they become a burden on resources.
- **Predict and prevent waste**: create a single view of citizens across departments to prevent fraud, error and debt.
- **Communicate more effectively**: use customer insight and automated communications to encourage timely payment or discourage opportunistic fraud.
- **Foster a culture of excellence**: measure performance and improve outcomes.

Forrester rates SAS as a leader for big data analytics solutions

SAS proves an analytics powerhouse. With an unwavering focus on data analytics since 1976, SAS offers a broad set of tools for predictive analytics, an architecture that supports multiple platforms, in-database analytics, and significant market presence. SAS is a Leader in this evaluation because it scored well in all categories. Its Enterprise Miner tool is easy to learn and can run analysis in-database or on distributed clusters to handle big data.


To find out more about how SAS can help the public sector unlock the value of big data, contact the SAS UK public sector team on 01628 486933 or visit www.sas.com/uk/public_sector.