



# Using Big Data to Support a New Government

Research survey report

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# Executive Summary

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An election year is a key time for those making decisions about public services, as an incoming government plans and implements new policies. In 2015 we also know that spending cuts are planned by all parties, but after years of budget squeezes, radical service redesign is now the only way to find more efficiencies and savings. All of this makes big data more important than ever: policy makers must make the most of the huge volumes of data now available to them if they are to make the best decisions quickly, giving public services the best chance of securing policy outcomes and value for money.

Research carried out by SAS UK, the leader in business analytics software and services, and Civil Service World (CSW) shows that public servants understand the importance of data and proper analysis, and senior managers seem to be among the most supportive and positive about the use of data. Respondents also generally agreed that their organisation has clear ways to measure success, and almost half believe their organisation is able to use data and analysis to spot problems before they arise.

However, respondents also indicated that they do not always have sufficient information to make good decisions in their work; and over half believed that future strategy in their organisation is not always evidence-based. This could be explained by perceived challenges revealed by the research, including poor data quality; a lack of human capacity in departments; delays in receiving information; and difficulties in sharing information.

Wise investment in data management and analytics software can address many of these challenges but leaders will need to do more to attract the right skills and share data across organisational boundaries if they are to realise the full value of big data in this crucial pre- and post-election period.



## Introduction

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### Creating impact for a new government

In mid-May 2015, a new set of ministers will take their places around the Cabinet table at Number 10 Downing Street. Whichever party - or parties - these men and women represent, they will be keen to make an impact as they start their term in office: reviewing existing policies and implementing their own plans as quickly as possible.

These ministers will also be examining their budgets closely in preparation for a new Spending Review. All the main parties have indicated they will cut public spending which, after five years of unprecedented budget cuts, will present a challenge for many organisations. Most have already found the obvious efficiency savings: more radical redesigns will now be needed.

### Harnessing the power of big data

Yet even radical changes may not be effective unless ministers and the civil servants supporting them have good evidence on which to make decisions, and meaningful ways to monitor the success of the changes. In a 2013 report, MPs on the Public Accounts Committee (PAC) criticised the 2010 Spending Review for focusing on short-term cuts and failing to take a holistic view of spending across government, noting that a lack of information on costs, or accurate benchmarks for services, made it hard to assess cost effectiveness of different proposals.

The public sector has been using big data for many years: most organisations understand the importance of it and many are doing good work to mine the masses of data now produced by their services. But now is the year in which the whole public sector must embrace big data: if policy makers can harness its power, the wealth of data held by the public sector will help them to make the best decisions quickly, giving public services the best chance of securing policy outcomes and value for money.

In order to support public sector employees as they move into this crucial year of change, SAS UK, the leader in business analytics software and services, partnered with

### What is big data?

Big data describes the huge growth and availability of data, both structured and unstructured. This data is high volume, can be gathered quickly, and comes from a large variety of sources from financial transactions to online communications.

Civil Service World (CSW) to research public sector attitudes to big data, and discover the main challenges which could prevent organisations from making the most of this valuable asset.

### Methodology

An online survey was sent to CSW's database of public sector workers across the country; it was open for two weeks at the start of 2015. The survey received 1,114 responses; just over two thirds (67%) of which were from central government employees.

Throughout this analysis the term 'senior managers' refers to respondents in the senior civil service and Grades 6 and 7, or the equivalent grades in other parts of the public sector.

### Informed decision making

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When it comes to public servants' attitudes to big data and analytics, the SAS-CSW research revealed some encouraging findings. Among all respondents, 62% agree or strongly agree that their organisation welcomes the use of data to inform decision making - this rises to 80% among senior managers. In fact senior managers appear to be some of the greatest proponents for better use of information: just 21% of all respondents cited a lack of support from senior management as a challenge to gathering information, while senior managers are more likely to agree that better use of data can help their organisation spot challenges, or that more transparency will improve policy making (see Fig1).



Fig. 1: Proportion of respondents who agreed or strongly agreed with the following statements:

Statement	All Respondents	Senior managers
Greater transparency about what my department is doing is useful for departmental policy making.	79%	85%
My organisation welcomes the use of data to inform decision making.	62%	80%
Data gathering and analysis allows us to spot problems before they arise, rather than solving them after.	43%	48%
Data gathering and analysis allows us to effectively benchmark policies and actions.	47%	51%
Greater transparency about what my organisation is doing is useful for government policy making.	78%	85%

Yet there are some areas of concern: less than half of those surveyed said that future strategy decisions are generally evidence-based: 44% of all respondents and just 38% of senior managers. There are many reasons why strategies may not be evidence-based despite a general support for using data to inform policy- and decision-making. Political concerns and public pressures will also play a part as senior managers set out their plans, as will a lack of access to data.

### More effective ways to insight

As more and more services become digital, information is gathered more quickly and in a greater variety of ways than ever before. Yet when asked if they have sufficient information to make decisions, 42% said they did not and a further 22% don't know. Clearly the public sector needs to find more effective ways to turn the information it is gathering into meaningful insight which can be shared with decision makers across organisations.

## Thinking ahead

### Measuring success

Once decisions are made, it is of course important to evaluate their success, and here again there were relatively positive attitudinal findings: 62% said that their organisation measures success with clear indicators. Given the constant focus on public spending, however, it is interesting to note that cost effectiveness was the least popular answer when respondents were asked to indicate which measures their teams use to judge success: just 26% chose this answer. The most popular answers were customer measures; reduction in errors; and compliance measures (see Fig 2).

Fig 2: Within your team, how do you measure success?

Shorter delivery times	34.92%
Reduction in errors	45.24%
Impact indications	27.65%
Productivity metrics	34.29%
Reduction in cost	26.66%
Customer measures (internal or external)	53.05%
Compliance measure	36.36%
None of the above	9.07%
Other, please specify	14.00%

Senior managers have a slightly different focus: they are significantly more likely to view impact indicators as an important measure of success: 45% chose this answer, compared to 28% of all respondents. Here, big data can really come into its own: it is notoriously hard to measure the impact of many public services since the factors which affect success are so varied and variable. Good analytics systems can take large amounts of data from many sources and in many formats - structured or otherwise - to measure impacts more effectively.

Analytics can also support the public sector to reduce errors and improve compliance scores even during a time of reform by allowing organisations to forecast how changes will affect certain services or demand. Just under half of respondents (42%) agreed or strongly agreed that data gathering and analysis allows their organisation to spot problems before they arise rather than responding to them afterwards. There is already widespread use of this forward-looking analysis to monitor current services.

## More to achieve using proactive analytics

However, when respondents were asked in a free-text section to cite examples where data had been used effectively to inform policy, it was striking that many respondents gave examples which were reactive. There is still more which public sector organisations could do to use proactive analytics to design services which are more efficient and effective.

## Challenges to using big data

The research revealed three main obstacles which public servants believe could prevent organisations from making best use of big data in the year ahead:

- Data quality - capacity to analyse data
- Lack of collaboration around data
- Delays in accessing data.

When asked about the challenges to using data, the most popular answers focused on quality - 59% say data is not standardised; 46% say collection is inaccurate, and senior managers were more likely to view these as key challenges. While these challenges undoubtedly need to be addressed in order to improve, for example, the use of management information across government, they are not insurmountable hurdles for services wanting to use data effectively in 2015. Data management and integration tools can overcome many of the challenges of data quality, while analytics software can make use of data without rigid standardisation: even unstructured data from social media can be turned into useful evidence for service planning (see Case Study 1).

### CASE STUDY 1:

#### Using big data to prevent sickness

Respondents were asked to give examples where data have been used effectively to inform policies or actions in their organisations: over 100 did so, with answers ranging from reducing staff sickness absence to comparing past sales and international market data to prioritise work on defence exports.

One response illustrated the potential of big data: using high volumes, unstructured data from social media site Twitter to improve public health. In 2013, a team from the Food Standards Agency (FSA) began comparing data from Twitter with confirmed lab reports of norovirus in the winter of 2012-13. Researchers found that not only did certain keywords - such as winter bug or sickness bug - correspond to a spike in cases, but other key terms - such as retch and upset stomach - could be used to predict spikes. In some cases a spike in keywords occurred up to four weeks before confirmed lab reports of the virus were available.

The survey respondent noted that not only is the FSA now regularly harvesting data from Twitter but having established that predication using social media is effective, the agency is now developing interventions to reduce the incidence of norovirus when a peak is predicted. So the next time you are feeling unwell and you share it with your friends on Twitter you could, in fact, be doing a very useful public service.

Another commonly cited challenge was a lack of human capacity to analyse data: a problem also indicated by ambivalent responses to a question on skills and training. Asked how strongly they agreed that "we are adequately skilled/trained to analyse large data sets for our work", 38% agreed or strongly agreed, while 30% disagreed or strongly disagreed. This is a problem across the private and public sector and needs to be addressed at school and higher education level. Data science is becoming an integral part of everyday business life and it is important that the skills are not only nurtured throughout school and higher education years, but that organisations have plans in place to further nurture and retain these skills.

There is a certain amount that good software can do to help this: speeding up the time it takes to clean and analyse data, for example. But there will still be a need for skilled people who understand how to use different data sets and know how to ask the right questions to inform policy. Attracting people with those skills is a key challenge for government. The election year may again provide a crucial opportunity, as skilled analysts could be tempted into public sector work by the chance to influence policy making at such a crucial point in the political cycle.

Departments may also find that big data will help them to maximise the manpower they do have as they build the skills needed for the future. The Army, for example, invested in data quality and analytics solutions to help make the most of the information it holds on personnel to enable them to be confident to make the right decisions, using the evidence required (see Case Study 2).

### Sharing data is crucial

Respondents also noted the challenge of using data outside of the silos in which it is gathered. Sharing data across organisations will be crucial if spending decisions are to take into account impacts across government and avoid the criticisms levied by MPs at the 2010 spending review. Likewise analysis based on a wide range of data will greatly increase the chances of successful service redesign. Yet only 24% of respondents agreed or strongly agreed with the statement that “we are able to cross-reference our data with that of other departments.” This is further emphasised by findings around obtaining data from other teams and organisation: while 72% can get data from others within their department, 46% said they cannot get data - or can only get with difficulty - from other government departments; and 53% said they cannot get data - or only with difficulty - from other parts of the public sector.

Finally, there is the challenge of timeliness - which is particularly pertinent in 2015 as public service organisations move quickly to brief a new administration and then implement or adapt to new policies. Of the survey respondents, 85% said delays in obtaining data frequently or sometimes affect their work.

## CASE STUDY 2:

### Using big data to improve workforce planning

As well as improving services, big data helps public sector organisations increase their own efficiency, as the Army found when it invested in software to analyse and more efficiently allocate manpower and resources.

The Army retains a complex system with up to 200 trades supported, from infantry to signaller and from engineer to plant operator mechanic. With multiple sources of big data about its personnel, such as skills and capabilities, efficient data handling is crucial to making the right manpower decisions.

To make the most of this data, the Army uses analytics and reporting software from SAS, as well as data quality solutions which correct input errors and de-duplicate data sets. The insights revealed by these systems have allowed the Army to realign (and avoid wastage) of expenditure totalling £770m.

A team of SAS experts work on-site with the Army’s HR team, supporting re-organisation and on-going manpower allocation programmes. Simon Dennis at SAS UK, said: “SAS gives the British Army a much greater insight into vast volumes of information held within their systems. By sufficiently aligning and simplifying the data, the British Army now has the power to make better-informed decisions about manpower planning, driving efficiencies and new opportunities for innovation”.

In a free text section, respondents were asked to indicate the longest time they had to wait for data: the most common answers indicate that many people are waiting between one week and two months for data. Several indicated it can take up to six months for data requests to be fulfilled. Investment in capacity, both in terms of software and skills, will be vital if organisations are to keep up with demands for data in the busy first years of a new government.

## Conclusion

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### Crucial next steps

The next 18 months will be a crucial time for civil servants as they prepare to brief an incoming government; support new ministers to make best decisions possible around policy and service delivery; and implement new policies while finding yet more savings. If all of this is to be accomplished while protecting - even improving services - organisations need to use data wisely.

Simply put, efficiency gains and cost savings will not be achieved without analytics being at the heart of decisions.

The good news is that most public servants - especially the senior managers - already understand the value of insights offered by big data to shape and monitor services. They are already using data to shape their policies; they value transparency and see the benefit of using analytics to spot and tackle problems before they arise. Wise investment in data management and analytic capabilities can overcome concerns around data quality; it can also help to improve an organisation's capacity to use and analyse data. But this must be accompanied by a concerted effort to build skills, and a more positive attitude towards sharing data across government.

If leaders across the public sector really believe in the value of data - as it seems they do - they must ensure that the potential of big data is not constrained by organisational boundaries or skills shortages. The public sector is generating a wealth of data: now is the time to make the most of that data to shape policies and services in the next five years - and beyond.

### About Civil Service World

Civil Service World (CSW) exists to help civil service leaders and managers understand their working environments and achieve more in their jobs.

Providing authoritative, high-quality journalism to the civil service and national politicians, CSW is the only independent professional print publication available to every senior civil servant in the UK

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### About SAS

SAS, is the leader in business analytics and is the powerful secret behind successful public and private sector initiatives across the globe.

Uniquely, SAS offers a modular approach - whether it is data management, business intelligence, data visualisation or big data analytics - and we focus on many types of projects such as fraud and error, tax collection optimisation, citizen intelligence, manpower planning, borders and intelligent policing. Our UK public sector customers include HMRC, DWP, NHS, MoD as well as London Fire Brigade, police and universities.

For further information on how analytics can improve decisions across the public sector visit: [sas.com/uk/public\\_sector](https://sas.com/uk/public_sector) or call the SAS Public Sector team on 01628 486933.