Big Data and
standards market research

January 2016

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Contents

About this report

In late 2015, the British Standards Institution (BSI) engaged Circle Research to undertake market research to determine what new best practice was needed in Big Data. The report summarizes the research results and other findings about Big Data, which will shed new light on the Big Data market for all stakeholders. BSI will be taking the findings of this report forward and welcomes your thoughts on the topics discussed below.

Introduction – planning for the Big Data future

Big Data represents a very substantial and fast-growing opportunity. The Centre for Economic and Business Research (CEBR) estimates that Big Data will benefit the UK economy to the tune of **£216 billion** by 2017 and result in the **creation of 58,000 new jobs**[1]. In order to truly reap the sizeable predicted benefits of Big Data **best practice must be established and shared**, with standards playing a key role.

> *'Big Data is one of those sexy terms that will possibly disappear as quickly as it arrived.'*
>
> Government interviewee

While Big Data is perhaps not an entirely new concept, it is certainly a hot topic of the modern, digital era. However, it is an evolving concept, and any standards created must take into account that what is classed as 'Big Data' today is likely to change rapidly over the next few years (and may even cease to be called 'Big Data'). **Standards must therefore look beyond the 'here and now' of how Big Data is currently being used and instead seek to establish frameworks for dealing with data sets that represent a significant logistical challenge**.

BSI wants to take a lead on Big Data standards. By engaging the market, collaboratively developing standards content and promoting best practice, it aims to provide businesses with the help they need in order to flourish. To support this journey, BSI partnered with B2B research consultants, Circle Research, to explore the Big Data **opportunities and challenges facing businesses**, and to understand where standards could help to play a pivotal role in driving business success and market growth.

In September 2015, Circle Research conducted interviews with 27 leading Big Data experts, industry professionals and government representatives to inform the debate. BSI will be using this report as the basis for the development of new standards in Big Data.

1. The power of Big Data to revolutionize business models

The true power of Big Data does not lie in gradual improvements in efficiency, but rather in changing the approach of entire organizations to become **data-driven**.

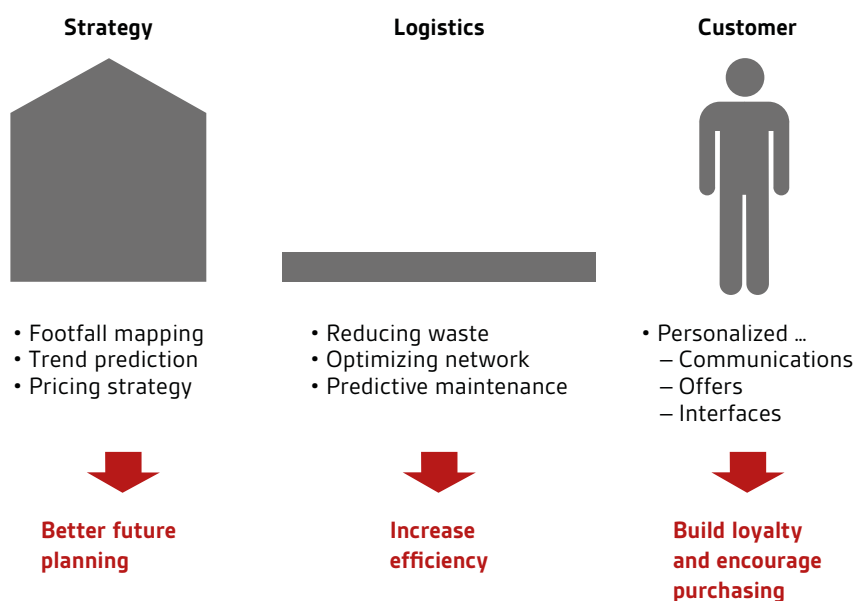Data-driven approaches can revolutionize internal strategy and future planning, through optimizing efficiencies in logistics, to delivering a truly personalized experience to the customer.

> *'Companies need to change their entire culture. Big Data should be central to all organizational strategy.'*
>
> Philip Treleaven, UCL

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1   http://www.sas.com/en_us/insights/articles/big-data/big-data-big-value-huge-opportunity.html

Figure 1 – Examples of business opportunities in Big Data

Strategy	Logistics	Customer

• Footfall mapping	• Reducing waste	• Personalized ...
• Trend prediction	• Optimizing network	– Communications
• Pricing strategy	• Predictive maintenance	– Offers
		– Interfaces

Better future planning	**Increase efficiency**	**Build loyalty and encourage purchasing**

'We invest for the long term in assets such as pipes in the ground, reservoirs and treatment works that cost a lot of money. The smarter we become at making those investments and operating those assets, the better. If we can mine Big Data to understand what kinds of pipe work best in what kinds of soil, or what kinds of motor work best in what kinds of situation, then we can invest more wisely in our assets in the future. That means we can deliver great service and value for our customers.'

John Skelton, Severn Trent

'The advantage to the customer of Big Data should be a better level of service. From more accurate weather forecasts for your holiday, to a bank that can give a far better-tuned product offering, the customer should receive a more personalized and useful service.'

Financial Services interviewee

The data used to inform these revolutions typically arise from four sources:

- More 'traditional' sources including **financial transaction data** and **personal profiling information on customers**
- Newer, rapidly growing sources including **Machine to Machine** (M2M)/Internet of Things (IoT) communications and **social media scrapes**

Whatever the source of the data, the true key lies in being able to **combine different data sources to form a single holistic picture**.

'What's happening is that as the Internet of Things grows, more and more information is being communicated online all the time. We will no longer be analysing data from a pre-existing database. Instead there will be live streams of data coming from a whole bunch of different things. From wearable heart rate monitors to smart home appliances, clothing, etc.; everything is starting to talk to everything else and this is very interesting for Big Data opportunities.'
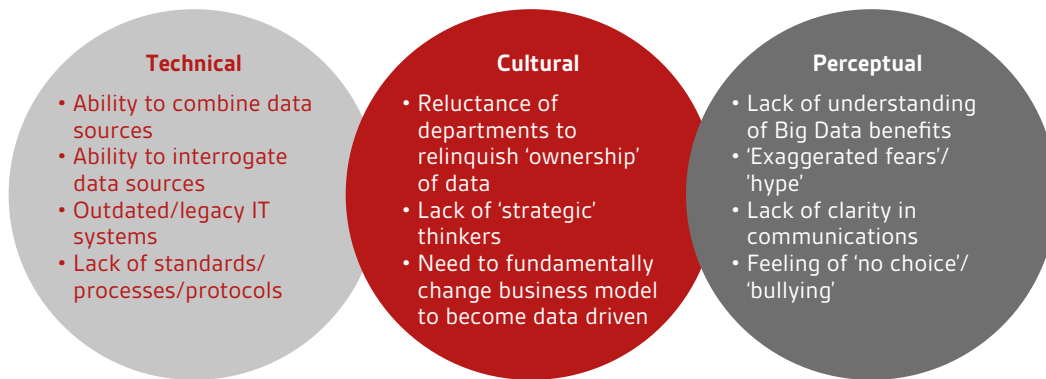
Academic interviewee

2. Technical, cultural and perceptual challenges

With such strong potential opportunities available from using Big Data, it is vital that businesses in the UK recognize and overcome any hurdles that may otherwise prevent them from capitalizing on these opportunities.

Prominent challenges arise in three different forms: **technical, cultural and perceptual**.

Figure 2 – Prevalent challenges to Big Data adoption

Technical
- Ability to combine data sources
- Ability to interrogate data sources
- Outdated/legacy IT systems
- Lack of standards/ processes/protocols

Cultural
- Reluctance of departments to relinquish 'ownership' of data
- Lack of 'strategic' thinkers
- Need to fundamentally change business model to become data driven

Perceptual
- Lack of understanding of Big Data benefits
- 'Exaggerated fears'/ 'hype'
- Lack of clarity in communications
- Feeling of 'no choice'/ 'bullying'

2.1. Technical challenges

At the heart of many organizations are **decades-old IT systems**. Often cumbersome, disjointed and inflexible, these IT systems present a very tangible barrier to growth in Big Data usage.

'I think all banks already know their systems are decrepit. They can barely recognize who a customer is when looking to sell them insurance. It should be very simple, but their current systems are often not able to do that.'

Jem Eskenazi, EBRD

This is particularly a challenge when it comes to creating single, holistic data sources, as **migrating data** from one system to another is far from straightforward. For many organizations, investment in Big Data will need to be accompanied by **investment in IT systems** and will almost certainly involve usage of cloud technology.

2.2. Cultural challenges

A **lack of strategic leadership** on Big Data is a serious challenge for many organizations. Without a strategic imperative at the highest level within businesses to **ask the right questions**, little will be truly achieved.

> *'One of the biggest challenges is that there currently aren't enough strategic people who are even beginning to ask the sorts of questions that Big Data might be able to help with.'*
>
> Retail interviewee

Businesses must adopt a different attitude towards data; rather than seeing data sources as pieces of property that are owned by individual functions within the business, they must instead consider **data as a single and unifying company resource**.

> *'Typically each senior manager is given responsibility for a portion of data. They consider it to be their sole property. Big Data is going to start bringing data together for everybody to use. That sharing style is a very different cultural style. The whole thinking process changes when you become data-centric.'*
>
> Mandy Chessell, IBM

This requires cooperation and collaboration between all functions within the organization – something that isn't always easy but is vital for becoming a data-driven organization.

> *'There are four types of company:*
>
> 1. ***Don't collect any data*** *and haven't got a clue about customers. A lot of companies still fall here.*
> 2. ***Collect data but you don't do anything with it****. Most of the Government is probably in that category.*
> 3. ***Collect data and do some analytics****. Companies like M&S and Waitrose would be good examples.*
> 4. *Finally,* ***build the whole company ethos around a bid to become data-driven****. There are very, very few of these. Google, Amazon and Facebook would be the classic examples.'*
>
> Philip Treleaven, UCL

2.3. Perceptual challenges

Whilst some data is 'un-sensitive' – few people for example would be concerned about what is done with data regarding rainfall in London – much of the data involved in Big Data analytics includes at least an element of sensitive and often personal information. As such, **customers and the public are vital stakeholders** in Big Data initiatives.

It is a cliché that as humans we are scared of things we don't understand; however, it is also often true – not least when it comes to Big Data. As a result, in many cases, the **public harbours serious concerns about Big Data usage**.

What data are you collecting from me? How is it being used? Who is it being shared with? Will I be contacted or harassed as a result?

> *'I think **people can sometimes be too scared of new things**. To give you one example, a common view is that Google abuses people's personal data. As far as I can tell though, Google is actually using the data to offer me a better service and for free!'*
>
> Jem Eskenazi, EBRD

A public perception has developed over recent months and years that threatens the very heart of Big Data: the use of Big Data is too often seen as being '**obscure**', providing the user with '**little or no choice**' and clouded behind '**misleading**' communications.

Restoring public trust will be paramount for the future success of Big Data initiatives.

> *'The most significant challenge is **seeking and gaining the trust of the public** that the NHS health and social care system is worthy to be trusted with their data.'*
>
> Healthcare interviewee

# 3. Opportunities for standards to support growth

Given the growth prospects of Big Data, coupled with a current lack of best practice and a series of prevalent challenges, it appears both logical and inevitable that new **guidance is needed**. BSI views that the correct form for this guidance is standards **created in consultation with businesses for the purpose of supporting businesses**.

> *'**If we don't accelerate standards, governments will end up introducing more legislation**. When you do that there's less consultation and you always have unintended effects. You can stifle innovation; you can prevent products and services from being offered; you continuously have negative publicity. **We need standards**.'*
>
> Ruy Pinto, Inmarsat

During the research, six topic areas were identified where the creation of Big Data standards could provide significant benefits to businesses:

Figure 3 – Potential Big Data standards

Signposting

Metadata

Terms and conditions

Consumer power

Communications

'How to' guide
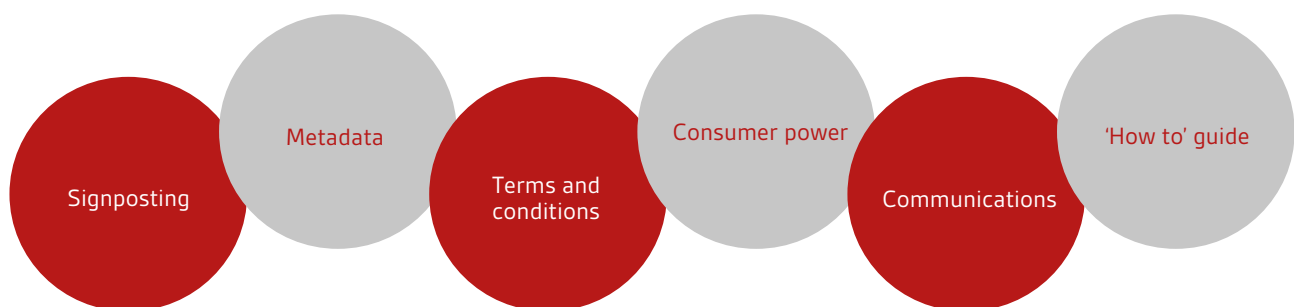
3.1. Signposting standard

The challenge/opportunity: From product specification to management systems, the wider world of standards and best practice is already very well established with **over 35,000 standards available from BSI**.

Whilst very few of these are Big Data specific, many – such as standards to do with **IT systems and data security policies** – have elements that are relevant to Big Data. However, businesses embarking on a Big Data initiative may not be aware of what is currently covered by existing standards or where to look for this information.

How a standard could help: Pool existing content into a single standard that **collates all relevant standards information**, or acts as a 'signposting' service to direct businesses to pre-existing relevant information.

3.2. Metadata standard

The challenge/opportunity: Analysis of data has historically focused on the 'primary information' (e.g. the product being bought) and discarded much of the accompanying metadata (time stamp, geographical location, what other products were viewed, etc.). However, in the world of Big Data, metadata is increasingly the **main emphasis of analytics**.

> *Q. Where are standards needed?*
>
> *'Metadata! **A lot of analytics is actually done on metadata**. When you upload your photo to somewhere like Flickr, they're analysing where you are, how rich you are from the type of camera, how often you travel. They know a huge amount about you just from that single photograph that you uploaded to a free site. That's one aspect. The other aspect is about **structure, quality, time limits, completeness**, all that sort of thing that at the moment we have recommended practices for but no standards.'*
>
> Mandy Chessell, IBM

Currently, many organizations **struggle to capture and store metadata in a usable and consistent format** and there is a **lack of guidance** available on 'rules' for using metadata, such as how to ensure its quality and how long it should be stored for.

> *'One of the things that standards might at some point do is provide the **technological solutions to prevent people from doing things they shouldn't be doing**. Data tagging of metadata, for example.'*
>
> Technology sector interviewee

How a standard could help: Define **best practice for collecting and storing metadata**, including how to ensure quality and completeness, together with guidelines for how long to keep different forms of metadata.

3.3. Terms and conditions standard

The challenge/opportunity: Building public trust is vitally important, yet, **terms and conditions are often confusing, ambiguous and too 'wordy'**. As a result, they are often ignored. Furthermore, a very wide variety of terms and conditions are often included with a single tick-box option that is compulsory for anyone who wants to use the service. This can lead to users feeling **upset, angry or even tricked**.

*'Trust is a big issue. Having **more trust in how data is used might help encourage greater [sharing of data]** … Companies today say "blah, blah, blah, here's the terms and conditions" — reading them is a very manual process and they're different every time. Having **standards about how things should be described would help**. At the moment there's not much clarity and it's hard for any progress to be made.'*

Academic interviewee

From a consumer perspective there is a strong desire to make terms and conditions more **'user friendly'**. From a business perspective, it is believed that an organization that has very clear and easy to understand terms and conditions will be at a **competitive advantage** with higher customer satisfaction and willingness to share data.

*'In some cases you're meant to tick a box if you want anonymity and in others you're meant to leave it blank! We need **clarity of the way the message is communicated to the consumer** about what is being done with their data.'*

Jem Eskenazi, EBRD

How a standard could help: Provide best practice for ensuring that terms and conditions are **simple to understand** and optimize informed consent.

3.4. Consumer power standard

The challenge/opportunity: Personal data is the property of the consumer. However, as a consumer it can sometimes feel all too easy to **lose control of your data**. Many believe consumers should have much greater control over their data and choice as to how it is used, including specifying to a very granular detail what data may or may not be used for different purposes. You can read more about this idea in the Citizens Advice paper[2] on personal data empowerment.

*'The main thing to remember is that the **data is owned by the individual** and that should be the starting point for any standard.'*

Justin Guttman, Citizens Advice

*'There could be a standard by which the **consumer decides who can use what when it comes to their data**. The consumer fully controls what information is shared and used for Big Data analytics even when it comes to information contained within the same transaction: here is what I'm willing to give you, here is what I'm not willing to give you. So far users have absolutely no control on that, companies do. This is something I've been reading about for at least the last 10 years, a user managing their own destiny, but to be honest **we're nowhere near it yet**.'*

Jem Eskenazi, EBRD

How a standard could help: If standards are the appropriate mechanism to deal with this topic, standards could define how to ensure that consumers can retain full and informed control of their data.

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2   https://www.citizensadvice.org.uk/about-us/policy/policy-research-topics/consumer-policy-research/personal-data-empowerment-time-for-a-fairer-deal/

3.5. Big Data communications standard

The challenge/opportunity: Over the past few years there have been numerous instances of Big Data initiatives failing to take off due to public resistance. Many Big Data experts and industry professionals believe that much of the problem lies in a **failure to adequately explain the potential benefits available to society from the use of Big Data** analytics.

> *'There's room for improvement when it comes to **engagement activities**. Previous studies have found that, when explained to them, most patients are happy for their data to be used. But it can take about half an hour of explaining the benefits to reach this conclusion. This suggests either it is a **too complicated message** or we haven't got our key messages sufficiently well-defined and targeted yet.'*
>
> Healthcare interviewee

How a standard could help: Define best practice for **how Big Data initiatives should be explained and communicated** so that the positive case for Big Data can be presented to consumers in a clear and unambiguous manner.

> *'Channel 4 has done a very good job of collecting demographic information about all the people who register to use their on demand services. A big part of the promise they make to viewers is you can give us this data and **you can trust us with it because we're not going to sell it on or pass it on to anybody else**.'*
>
> Media interviewee

> *'We need to raise our game and **explain the benefits** that data collection processing can bring to users and communities.'*
>
> Ruy Pinto, Inmarsat

3.6. 'How to' guide to Big Data standard

The challenge/opportunity: Simply thinking about doing something with Big Data can be scary: *How do you even begin? Who do you need to involve? What questions should you be asking? What do you need to budget for? How do you set up safety nets and checks?*

For a business starting out on their Big Data journey, a helping hand could be invaluable.

> *'**Only a small percentage of businesses "get" Big Data** at the moment. You're looking at maybe five per cent who get it. These have been thinking about it for two or three years but the rest – the majority – are far away. Many businesses are going through eye-opening stages at the moment.'*
>
> Mandy Chessell, IBM

How a standard could help: Define **'how to' guidance** for any business thinking about embarking on a Big Data initiative.

> *'To do Big Data properly you need to sit down with business line managers and work out what kind of data you're looking at, what the data means and how this could be interpreted and integrated into business. It's very complex. Having a **checklist would be good**. Things like what devices you're acquiring the information from and how you're integrating this into the business area. Are you doing models and interpretation as well? A standard that helps you **build a business case for using Big Data or a template** would be good.'*
>
> Peter Brackman, Thames Water

4. Conclusion

In summary, there is great potential for standards to help advance business success and market growth in Big Data, particularly in three areas:

- Best practice for ensuring quality in, and responsible use of, **metadata**
- Best practice guidance for how to **communicate Big Data activities**
- A **'how to' guide** for any business considering embarking on a Big Data initiative

There will be other areas that will also arise in debate that warrant standardization.

From the beginning of 2016, BSI will be working with all the relevant stakeholders in Big Data to take these ideas forward. **If you have any ideas, or to express an interest in being involved in the development of standards for Big Data, please contact Tim McGarr at Tim.McGarr@BSIGroup.com.**

BSI Group

BSI (British Standards Institution) is the business standards company that equips businesses with the necessary solutions to turn standards of best practice into habits of excellence. Formed in 1901, BSI was the world's first National Standards Body and a founding member of the International Organization for Standardization (ISO). Over a century later, it continues to facilitate business improvement across the globe by helping its clients drive performance, manage risk and grow sustainably through the adoption of international management systems standards, many of which BSI originated. Renowned for its marks of excellence, including the consumer recognized BSI Kitemark™, BSI's influence spans multiple sectors including aerospace, construction, energy, engineering, finance, healthcare, IT and retail. With over 70,000 clients in 150 countries, BSI is an organization whose standards inspire excellence across the globe.

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Circle Research

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For more information visit: **circle-research.com** or contact **graeme.cade@circle-research.com**.

BSI Group
389 Chiswick High Road
London W4 4AL
United Kingdom

T: +44 (0) 20 8996 7750
E. research@bsigroup.com
bsigroup.com

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