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Big Data For Small Business

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- Use big data to make better decisions
- Transform your business model
- Understand the technology
- How to turn data into insights

Bernard Marr
Founder and CEO, Advanced Performance Institute

Big Data for Small Business

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by Bernard Marr

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***Big Data for Small Business* For Dummies®**

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Introduction

Almost everything we do now leaves a digital trace. If you bought this book online, you left a trail of digital crumbs in your wake, from browsing the online retailer's website, to the transaction itself. Even if you walked into a physical bookstore and paid with cash, there's still likely to be a digital trail of your activities, including CCTV (closed-circuit television) footage and location data from your own phone.

These digital traces can be summed up in one phrase: big data. *Big data* refers to the ability to collect and analyse the vast amounts of data now being generated in the world. This ability to harness the ever-expanding amounts of data is completely transforming our ability to understand the world and everything within it – from healthcare and science to how entire cities and countries are run. And, of course, it's transforming the way we do business.

Some business owners and managers dismiss big data as being only for big-budget corporations. I think this is a huge mistake. Of course it's true that some companies have eye-watering budgets for big data analytics, but most simply don't. In fact, I work with plenty of small- and medium-sized businesses that successfully harness the power of data without spending a fortune.

The key is to start with a clear strategy. This allows you to focus solely on the data that's right for you – the data that will help you achieve your long-term business goals. Having a clear strategy helps you cut through the hype and noise surrounding big data and get straight to how it can realistically help you improve the way you do business. That's why I wrote *Big Data for Small Business For Dummies*: to help SMEs (small and medium enterprises) use big data in a practical and strategic way.

Whether you're planning a one-off data project or want to incorporate data into your ongoing business operations, this book can help you understand what big data is, how you can apply it to your business, how to create your own big data strategy and get underway and how to build a culture that emphasises data-based decision making and continuous improvement.

About This Book

Think of this book as a no-nonsense tour guide to help you on your big data journey. There are lots of inspirational examples of how other businesses are already using data, but the focus remains on practical tips to get you using data in *your* business. As well as examples and tips, the book is packed with step-by-step guidelines and lists designed to help you get the most out of big data. All the information is designed to be accessible and easy to understand. And where I have to resort to technical jargon, I give clear definitions. Sidebars (the grey boxes) contain nice-to-know but not essential information, so you can easily skip over them if you like.

The book is designed as a resource that you can dip in and out of and return to time and time again. As such, you don't need to read it from cover to cover (although, if you want to, go ahead!). It's designed to be read in whatever order works best for you.

Finally, if you decide to visit a website listed in the book then you just need to copy the URL (uniform resource locator) exactly as it appears in the book. This is true even if the address falls between two lines or two pages – no extra characters (such as hyphens) were inserted.

Foolish Assumptions

Every author has a target audience in mind when he writes. For this book, I assume that you're the owner of a small/medium business or a manager in such a business. I assume that you've heard a little about big data already – perhaps what a powerful tool it can be for businesses – and you want to know more. I don't assume you have any prior technical knowledge whatsoever. Crucially, whether you're a business owner or manager, I assume that you want to improve the way you do business and you're in a position to make strategic decisions . . . and then act upon them.

If you would like to supplement this book with more technical information, you might like to check out *Big Data For Dummies* by Judith Hurwitz, Alan Nugent, Fern Halper and Marcia Kaufman, published by Wiley.

Icons Used in This Book

When I see a huge wall of text, I start to switch off. So in this book I use a number of icons to break the text up, and to make it easier and more enjoyable to read. The icons also help you spot key information quickly.

These indicate expert advice or suggestions to help your big data journey go more smoothly. They help you save time, energy or money and are based on my experiences working with other businesses.

This icon flags critical material that you should store away in your memory for later use. But don't worry – they're usually very short.

As the name suggests, this icon flags potential pitfalls that you need to avoid as you start using big data.

Where I've had to use data-related jargon (for example, if it's a key industry term that you need to know), I highlight it using this icon.

I believe real-life examples bring information to life and I included tons of examples throughout the book that show how other businesses are already using big data. Some of these are small-scale data projects, others are much larger, and some are just plain weird and wonderful! But all are designed to demonstrate the exciting potential of big data and give you a few practical ideas for your own business.

Beyond the Book

In addition to the material in the print or e-book you're reading right now, this product also comes with some access-anywhere goodies on the Web.

Check out the free Cheat Sheet at `www.dummies.com/cheatsheet/bigdataforsmallbusiness` for some helpful key information and checklists. It's designed as a quick-check reference for some crucial big data information, including a handy list of key terminology.

There are also some useful bonus articles and an additional Part of Tens chapter available on the website. Head to `www.dummies.com/extras/bigdataforsmallbusiness` to access these.

You may also like to check out the website of the Advanced Performance Institute, which I founded and head up. There you'll find many relevant case studies, white papers and reading material on big data: `www.ap-institute.com`. I also write regularly for *Forbes* magazine on all things big data and

you can find my articles at www.forbes.com/sites/bernardmarr. My LinkedIn page also contains a wealth of articles and posts on big data: www.linkedin.com/in/bernardmarr.

Where to Go from Here

The short answer is: It's up to you. You don't have to start at Chapter 1 and work your way through the book in a linear way – but you can if you want to.

If you're completely new to big data, I recommend you start with the Chapters in Part I for an explanation of what big data is and the main ways it can be used in business. Otherwise, simply use the table of contents to find what you're most interested in and jump straight to that section. If you want to start by finding out exactly how to create a big data strategy, turn to Chapter 10. If you're interested more in big data skills and competencies, start with Chapter 8. Wherever you go from here, you'll find a wealth of information and tips to help you start using big data in your business.

Part I

Getting Started with Big Data Basics

web extras

For Dummies can help you get started with lots of subjects. Go to www.dummies.com to find out more and do more with *For Dummies*.

In this part . . .

- Understand what big data is and why you need to know about it.
- Find out the key characteristics that define big data.
- See why there's so much hype around big data right now – and why all the fuss is justified.
- Check out key big data uses for small businesses.

Chapter 1

Introducing Big Data for Small Businesses

In This Chapter

- Understanding what big data is and why it's so important
- Taking a peek at the different types of data
- Putting big data to work in your business

Big data has been making big headlines over the last couple of years, but it's much more than just a buzz phrase or the latest business fad. The phenomenon is very real and is producing concrete benefits in so many different areas – from business to medical research to national security.

The basic idea behind big data is that everything you do is increasingly leaving a digital trace (or data), which you (and others) can use and analyse. *Big data* therefore refers to that data being collected and the ability to make use of it.

In this chapter, I look at how this phenomenon is transforming the way you do business. I also look at what sorts of data are available these days and introduce my step-by-step processes for using big data in business.

Personally, I don't love the term *big data* because I think it places far too much emphasis on the sheer volume of data, when, as I talk about in this chapter, what you do with the data is much more important than how much of it you have. I have a feeling the term will gradually disappear and what's now called *big data* will, in the future, just be known as *data*.

Why Big Data Matters to Every Business, Big and Small

Given all the hype around big data, it's no surprise that market researchers Gartner found in 2014 that 73 per cent of businesses have already invested in a big data plan or are planning to do so in the next few years.

The online behemoths that have come to dominate business in the Internet age – Google, Facebook, Amazon, you know the ones – all base their business models on big data. It's by collecting and analysing huge amounts of information from us that they're able to determine precisely what we want. The data also enables them to sell advertising services capable of precisely targeting their clients' preferred demographics.

But big data isn't just for giant corporations, it matters to every company – no matter how small or traditional. To cater for this huge demand, many companies have sprung up to offer services to other businesses, enabling them to launch big data initiatives of their own.

I've found that the term *big data* can scare some business owners off, especially the *big* part. Some think it doesn't apply to their small business – or that it'll be prohibitively expensive to use. The truth is, in the current business age, if you want to grow, you need to start using data strategically. And yes, some companies have massive big data budgets. Most companies, however, are working with much smaller budgets but are still able to use data to gather insights that help their business grow.

Entering a world filled with data

Of course, data collection itself isn't new. But technological advances like chip and sensor technology, the Internet, cloud computing and the ability to store and analyse data have changed the quantity of data you can collect.

Activities that have been a part of everyday life for decades – shopping, listening to music, taking pictures, talking on the phone – increasingly happen wholly or in part in the digital realm and therefore leave a trail of data.

And the amount of data being generated every day is staggering. For example, users of Facebook upload around one billion pieces of content to the social network site every day. In industry, machinery and vehicles are fitted with sensors and trackers that record their every move, and whenever you call a call centre, an audio recording of your conversation is made and stored in a huge digital database.

Big data statistics to blow your mind

The following statistics give you a flavour of the sheer volume of data being generated in today's world:

- Every two days we create as much information as we did from the beginning of time until 2003.
- Over 90 per cent of all the data in the world was created in the past two years.
- It's expected that by 2020 the amount of digital information in existence will grow from 3.2 zettabytes today to 40 zettabytes. (A zettabyte is a unit of data measurement roughly equal to one million terabytes; a terabyte is one trillion bytes.)
- Every minute we send 204 million emails, generate 1.8 million Facebook likes, send 278 thousand Tweets and upload 200 thousand photos to Facebook.
- Google alone processes on average over 40 thousand search queries per second, making it over 3.5 billion in a single day.
- Around 100 hours of video are uploaded to YouTube every minute and it would take you around 15 years to watch every video uploaded by users in one day.
- 570 new websites spring into existence every minute of every day.
- This year, there will be over 1.2 billion smartphones in the world (which are stuffed full of sensors and data collection features), and the growth is predicted to continue.
- The boom of the Internet of Things will mean that the amount of devices that connect to the Internet will rise from about 13 billion today to 50 billion by 2020.
- 1.9 million IT jobs will be created in the US alone by 2015 to carry out big data projects. Each of those will be supported by three new jobs created outside of IT – meaning a total of 6 million new jobs thanks to big data.

Understanding the infinite ways to use big data

Eventually, every aspect of your lives will be affected by big data. However, there are some areas where big data is already making a real difference today – in business and in other areas. Let's look at the main areas where big data is most widely used right now.

- **Understanding and targeting customers:** This is one of the most common uses of big data today. Here, big data is used to better understand customers and their behaviours and preferences.
- **Understanding and optimising business processes:** Big data is also increasingly used to optimise a wider range of business processes, including stock control, supply chain and delivery routes and HR processes.

- **Optimising personal quantification and performance:** Individuals can now benefit from the data generated from wearable devices such as smart watches and smart bracelets – data like calorie consumption, activity levels and sleep patterns.
- **Improving healthcare and public health:** The computing power of big data analytics enables scientists to decode entire DNA strings in minutes and allows them to find new cures and better understand and predict disease patterns. What's more, big data analytics allow researchers to monitor and predict the developments of epidemics and disease outbreaks by integrating data from medical records with social media analytics.
- **Improving sports performance:** Most elite sports have now embraced big data analytics. Video analytics track the performance of every player in a football game, and sensor technology in sports equipment such as golf clubs allows you to get feedback (via your smartphone) on your game and how to improve it.
- **Improving science and research:** Science and research is currently being transformed by big data. Experiments with the Large Hadron Collider, for example, generate huge amounts of data. The CERN (European Organization for Nuclear Research) data centre has 65,000 processors to analyse its 30 petabytes (a petabyte is one quadrillion bytes) of data.
- **Optimising machine and device performance:** Big data analytics help machines and devices become smarter and more autonomous. For example, big data tools are used to operate Google's self-driving car.
- **Improving security and law enforcement:** I'm sure you're aware of the revelations that the National Security Agency (NSA) in the US uses big data analytics to foil terrorist plots (and maybe spy on us!). Others use big data techniques to detect and prevent cyber attacks and police forces use big data tools to catch criminals.
- **Improving and optimising cities and countries:** Big data is used to improve many aspects of where we live. For example, it allows cities to optimise traffic flows based on real-time traffic information as well as social media and weather data.
- **Optimising financial trading:** High-Frequency Trading (HFT) is an area where big data finds a lot of use today by using big data algorithms to make trading decisions.

Using big data in small businesses

Big data might seem like it's something that only big business can make use of. When people first hear that massive volumes of information are being used to fight terrorism, cure cancer or predict the spread of Ebola, it sounds expensive, difficult and time-consuming. But that doesn't have to be the case.

Huge datasets on everything from demographics to weather and consumer spending habits are freely available online for small businesses to use. Plus, the basic tools to make sense of the data are also free and becoming increasingly simple for anyone to use. For example, if you're using Google's AdWords to track what your customers are searching for online, you're engaging in big data analysis, even if you don't know it.

In many ways, big data is much better suited to small businesses than to big corporations – smaller companies tend to be more agile and able to act on the insights that data provides in a more timely fashion. In the end, even the most impressive data set and the most potent insights are worthless if you don't act on them.

Plenty of small businesses are already using big data to better understand and target customers. Retailers can predict what products will sell, car insurance companies can understand how well their customers actually drive and detect potential fraud and takeaway companies can tailor their services to meet local customer preferences and demand. Social media has become a particularly valuable source of data for understanding customers, trends and markets.

Big data can also help improve business processes. Retailers are able to optimise their stock levels based on what's trending on social media, what people are searching for on the web or even weather forecasts. Supply chains can be optimised so that delivery drivers use less gas and reach customers faster. And you can use data to understand and improve staff engagement or improve your hiring process.

There's more detail on the many big data uses in Chapter 3 – and there are examples dotted throughout the book. Just look out for the Example icon.

Too often I see big data analysis being done in an infrequent, unstructured or ad hoc way (and that's in businesses of all sizes). You really need an underlying strategy in order to get the most out of big data, and there's more on that in Chapter 10. Without an underlying strategy, you may stumble across the odd valuable insight, but with proper planning and preparation, those insights are more frequent and more useful.

Understanding Big Data in More Detail

The first thing to understand is that data in itself isn't a new business phenomenon. Business data is as old as, well, business itself. Just think of sales and financial ledgers or, in more recent history, customer databases. It's specifically *big* data that's the new phenomenon. But, as I mention at the start of the chapter, big data isn't just about how *big* it is. In fact, volume is just one of the key defining factors of big data.

In practice, some of the data you use in your business may not exactly qualify as big data (as defined by the four Vs I explain in the next section), and that's fine. If the best data for you isn't strictly big data, don't lose any sleep over it. So long as you're using data in a strategic way to meet your goals and grow your business, that's all that really matters – not what it's called.

Breaking big data down into four Vs

To understand big data, and what separates it from normal data, you need to understand four main factors, which all handily start with a V. It's these Vs that define what's really special about big data, why it's different to regular data and why it's so transformative for businesses. You can find more information on the Vs in Chapter 2.

The four Vs are:

- **Volume** refers to the vast amounts of data generated every second.
- **Velocity** refers to the speed at which new data is generated and the speed at which data moves around.
- **Variety** refers to the different types of data you can now use.
- **Veracity** refers to the trustworthiness of the data.

I'd include a fifth V that's perhaps more important than all the others: value. It's all well and good collecting vast volumes of data or accessing a wide variety of data, but if you can't turn that data into value (which in the case of business means *growth*) then it's useless.

Why big data is so big right now

I think there are three main reasons why big data is in the news so much these days:

- Big data has incredibly powerful predictive capabilities.
- Big data helps you make much smarter decisions.
- Big data challenges traditional notions of causality.

I look at each of these reasons in Chapter 2.

Another exciting aspect of big data is that it's only going to get bigger and more widely used. As the tools to collect and analyse data become less and less expensive and more and more accessible, we'll develop more and more uses for it – everything from smart yoga mats (no, really) to better healthcare tools and a more effective police force.