'Straightforward, engaging and entirely practical – Bernard Marr provides a comprehensive toolkit to rigorously analyse all aspects of your business.'

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Praise for *Key Business Analytics*

'Why was this book not written earlier? Key Business Analytics *is an excellent compendium of the analysis tools you really need, explained in a way that is practical and rigorous.'*

ROBERT SHAW, HONORARY PROFESSOR OF MARKETING ANALYTICS, CASS BUSINESS SCHOOL

'Many business and technology leaders are aware of the opportunities advanced analytics can bring to their businesses but struggle to define how exactly value is going to be generated. Bernard Marr has produced a book that fills a substantial gap in the analytics literature. He gives, with great detail, insights as to how virtually any business can benefit from modern analytics. This book must be a reference to practitioners and managers, as well as technologists.'

DR AHMED KHAMASSI, GLOBAL HEAD OF INSIGHTS, WIPRO DIGITAL

'This book demystifies analytics and provides a practical guide for any business professional. Bernard makes it clear which methods and processes are applicable to a wide range of business needs.'

RICH CLAYTON, VICE PRESIDENT, BUSINESS ANALYTICS, ORACLE

'This book is a must-have for anyone trying to navigate the data analytics landscape. Thoughtfully organised and full of practical, real-life cases, this handy reference will help you cut through the big data hype and understand the many ways that analytics can benefit your business. Whether you are new to analytics or a big data guru, this book should be on your desk.'

SCOTT ETKIN, WRITER, JOURNALIST AND EDITOR, DATA INFORMED

'While early adopters are busy implementing business analytics solutions, a majority of business leaders are just beginning their analytics focus and need a jargon-free reference guide. Bernard Marr's book is this guide. He provides readers with a non-technical, high-level overview of seven critical areas of analytics. He defines terminology, types of analytics and business areas that can quickly see benefit from analytics. Each area is practical and guides managers towards quick ways to get up to speed and join the conversation. I highly recommend this book for managers feeling excluded from today's business analytics conversation.'

GRETA ROBERTS, CEO, TALENT ANALYTICS, CORP.

potentially lifesaving. These simulations then provide additional information that can help doctors make the right decisions.

Google's Science Fair grand prize was actually won by an American teenager who used neural networks to create an app that can accurately diagnose breast cancer in biopsy tissue 99 per cent of the time. With no medical training Brittaney Wenger created the app using a vast amount of different data points, and the neural network is able to learn and detect patterns that can't be detected by the human eye. For years doctors have found it incredibly difficult to diagnose breast cancer based on a biopsy but Wenger's program is set to change breast cancer diagnosis forever.[1]

Tips and traps

Neural network analysis is a complex analytics methodology that normally requires the input from experts in neural network analysis as well as the use of specialist software.

Further reading and references

To find out more about neural network analysis see for example:

- http://mitpress.mit.edu/books/mathematical-methods-neural-network-analysis-and-design
- http://www.wisegeek.com/what-is-neural-network-analysis.htm
- http://metalab.uniten.edu.my/~chensd/courses/Neural%20Network%20in%20MATLAB.pdf
- http://www.statsoft.com/Textbook/Neural-Networks
- http://www.ijcsit.com/docs/Volume%205/vol5issue01/ijcsit20140501140.pdf

[1]BBC Two *Horizon*, 'Monitor Me' narrated by Dr Kevin Fong (2013)

Meta-analytics – literature analysis

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What is it?

Meta-analysis is the term that describes the synthesis of previous studies in an area in the hope of identifying patterns, trends or interesting relationships among the pre-existing literature and study results.

Meta-analysis is essentially the study of previous studies. For example, a meta-analysis of lung cancer would synthetise all the studies ever conducted on lung cancer into one meta-study. Often these meta-studies can provide a fuller, richer picture of the research area.

When do I use it?

You don't always have to conduct your own analysis to benefit from the analysis. If what you want to find out has been the topic of a number of studies then you can collate all the previous information into one meta study so that you can obtain the insights without conducting any of the original analysis yourself.

So long as the analysis is in the public domain or relatively easy to access this approach can be considerably cheaper than running your own analysis.

What business questions is it helping me to answer?

Meta-analytics can help you to answer:

- What are the trends in market X?
- How is customer behaviour likely to change over the coming years?
- What will be the role of mobile computing in our industry?
- What factors are most important for staff engagement?

How do I use it?

Conceptually a meta-analysis is a statistical approach that combines data from multiple sources to provide a broader, richer and potentially more accurate insight into the area being studied. If several existing studies disagree then meta-analysis can highlight these differences and determine the statistical likelihood of which findings are likely to be more accurate.

This can then allow you to generalise into a larger population so that you have a better and more accurate idea of what will happen in that larger population. Meta-analysis becomes more precise and accurate the more data is used, which can therefore yield more insights and they can be tested.

Practical example

Meta-analysis could be particularly useful if you were looking to enter into a new market or geographic territory. If you don't already operate in that market or territory then you may be tempted to make assumptions about buying behaviour and the suitability of your products or services to that market.

If however there have already been some studies conducted on this new market or territory – even if they are focused around different products or services – you could collate these studies and seek to identify patterns of behaviour that could influence your decision making and minimise the risk.

Tips and traps

The better the individual studies the better the meta-analysis. Sourcing and validating studies to include is therefore important but can be time-consuming. In addition if the studies have been badly designed then they can skew results. Only use robust studies that have been methodically designed.

The traps include bias that exists within each study – bias that you may or may not be aware of.

Further reading and references

To read more about meta-analytics see for example:

- Borenstein, M., Higgins, J.P.T. and Rothstein, H.R. (2009) *Introduction to Meta-Analysis*, 1st edition, Hoboken, NJ: Wiley
- Schmidt, F.L. and Hunter, J.Q. (2014) *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings*, 3rd edition, London: SAGE Publications
- Cooper, H.M. (2009) *Research Synthesis and Meta-Analysis: A Step-by-Step Approach*, 4th edition, London: SAGE Publications
- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2121629/
- http://www.analytics20.org/meta-analytics/

[PART TWO]

Analytics input tools or data collection methods

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Quantitative surveys

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What is it?

A quantitative survey seeks to 'quantify' something from a numerical or statistical point of view. It may be used to quantify the size of a market or market share, or it may be used to quantify opinion.

Quantitative surveys are characterised by their structure. They pose specific closed questions and then provide a selection of answers that the respondent must choose from. The respondent is not allowed to elaborate but instead must select the answer that is correct or most correct for them.

The standardised approach and structured answers make quantitative surveys easier to complete and interpret. If you need to classify features, count them, and then construct a statistical model to explain what you observed then you probably need to collect quantitative data collected automatically via operations, or through a well-designed survey.

Why does it matter?

It matters because quantitative survey data allows you to build up a clearer picture of how a random sample of a target population or audience behaves or what they think about a particular topic. The findings can then be projected out to the whole target audience to generalise opinion and measure the incidence of various views or opinions within the survey. This type of analysis can also be helpful in finding out more about particular sub-groups to understand more about what they want, like or dislike about your offering.

Plus if you initiate quantitative surveys on a regular basis to the same group of people then you can monitor changes to behaviour or opinion over time. This is especially useful if you maintain at least some of the same questions so you can make accurate comparisons.