

# Creating Value with Big Data Analytics

Peter Verhoef, Edwin Kooge & Natasha Walk

14 September, 2016



# Introduction: Edwin Kooge



**Edwin Kooge**

**(1968)**

*Passion for  
pragmatic high  
impact with  
Analytics*

- ▶ Marketing at the Rijksuniversiteit Groningen, 1986 – 1992
- ▶ Working since 1992 in the field of Database Analysis, Customer/Marketing Intelligence
- ▶ Co-founder of Mlcompany, a Dutch Marketing Intelligence consultancy, (45 FTE's, founded in 2006) and sold his share in 2013
- ▶ Co-founder of MetrixLab Big Data Analytics since 2014.  
Mission statement: helping our clients to integrate survey, social media & CRM data for value creation
- ▶ Co-Author of the book 'Creating Value with Big Data Analytics', 2016

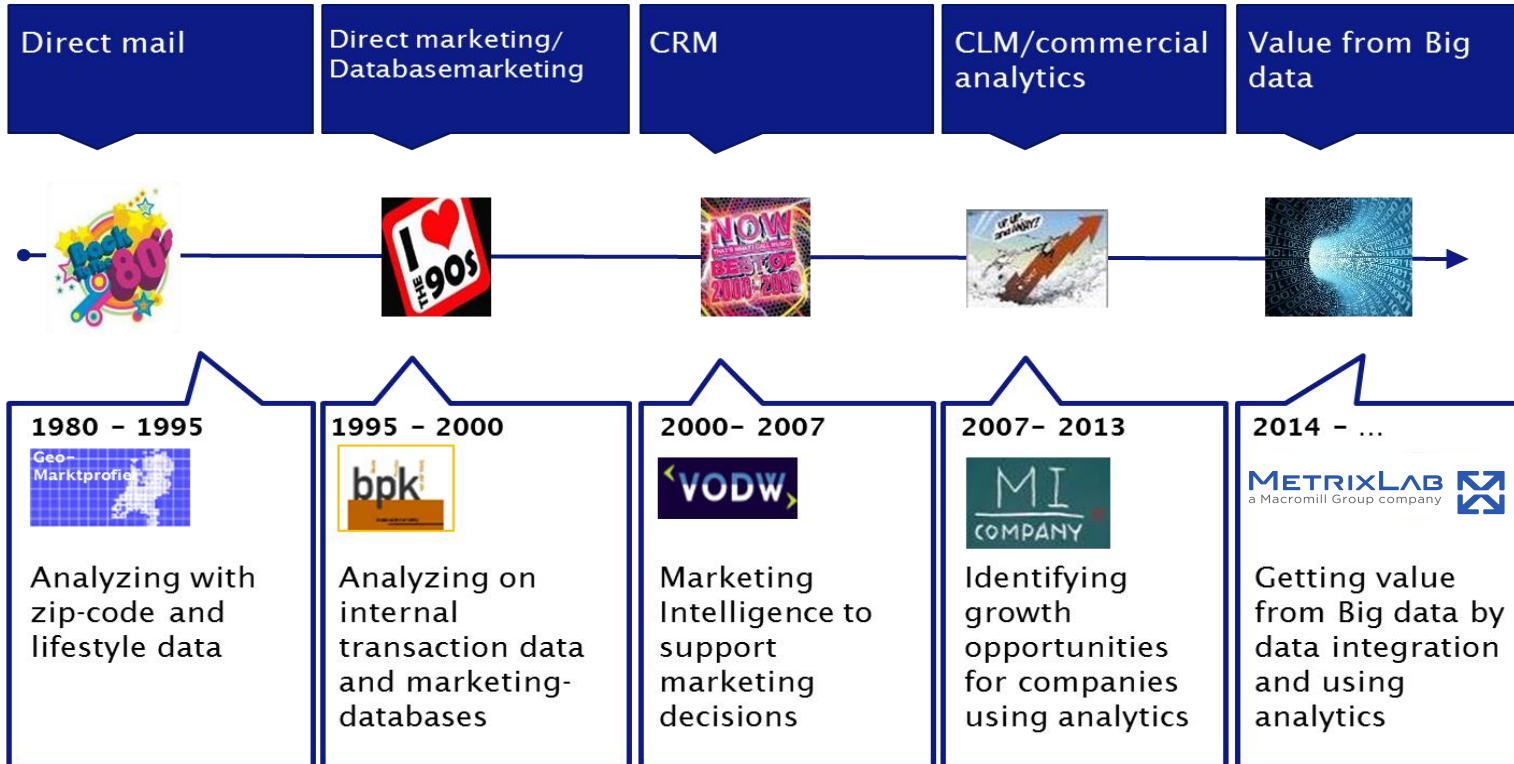
# Metrixlab Macromill

Een wereldwijde speler!

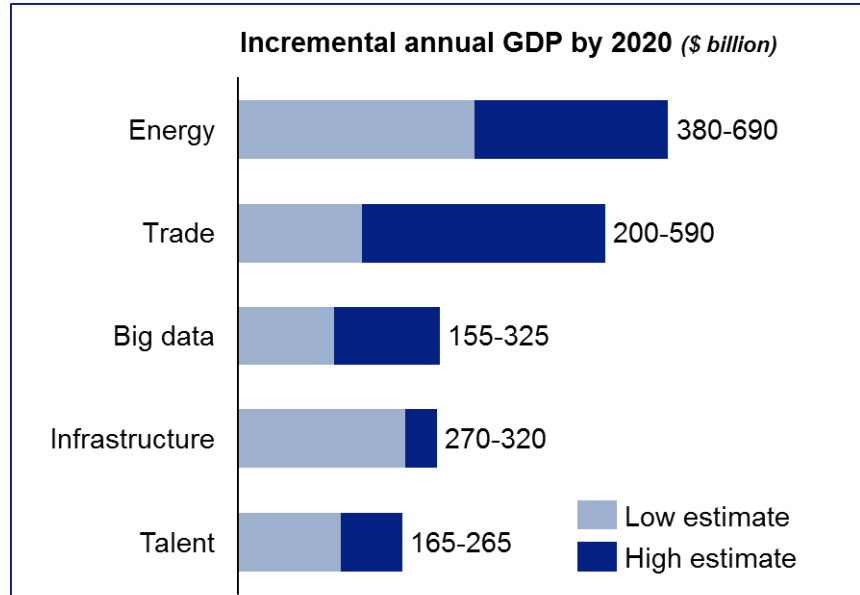
27 kantoren en meer dan 1.500 medewerkers!



# My journey through the decades.....

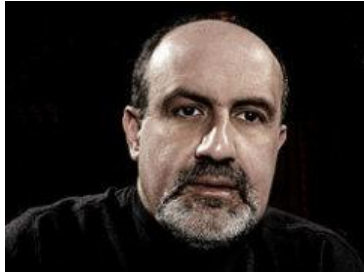


# Big Data Major Development for Business



(ADAPTED FROM: MCKINSEY GLOBAL INSTITUTE, 2013)

# Big data just another management Fad



Nassim Nicholas Taleb

“Big Data is Bullshit”

*Financieel Dagblad 7/10/2013*

## Is big data just a fad?



Written by  
Bernard Marr

Published  
Thursday 19 March 2015

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Latest Articles

From time to time, you still come across someone with the opinion that Big Data is nothing more than a fad, which will be forgotten about soon enough.

You might not expect to hear this from me, but they're actually right. Well – half right, at least!

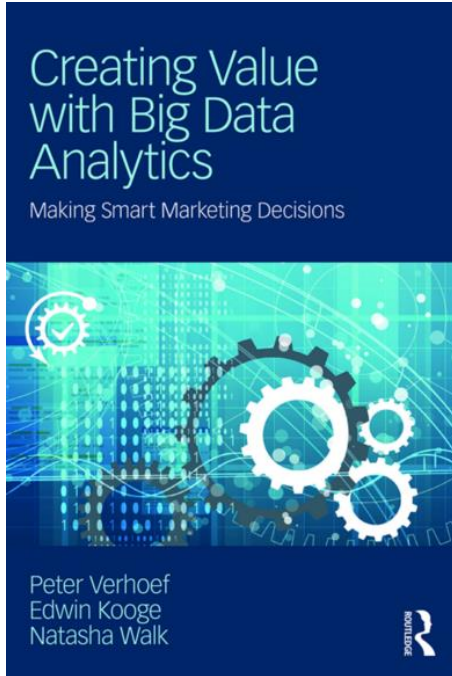
As I've written before, I'm not actually a fan of the term “Big Data”, which puts overemphasis on the importance of size. Anyone who's been reading my articles for a while will know that I'm firmly of the opinion that what you do with your data, is far more important than how big it is.

And I am sure as more people realize this – as working with extremely large datasets increasingly becomes the norm, rather than something new and exciting – the term “Big Data” may indeed fall out of use.



**BIG** data  
is geen **BIG**  
bang!

# Our book on Big Data Analytics....



*'This is a timely and thought-provoking book that should be on a must-read list of anyone interested in Big Data.'*  
**Sunil Gupta**, Edward W. Carter Professor of Business,  
Harvard Business School, USA

*Creating Value with Big Data Analytics offers a uniquely comprehensive and well-grounded examination of one of the most critically important topics in marketing today. With a strong customer focus, it provides rich, practical guidelines, frameworks and insights on how big data can truly create value for a firm.'*  
**Kevin Lane Keller**, Tuck School of Business, Dartmouth College, USA

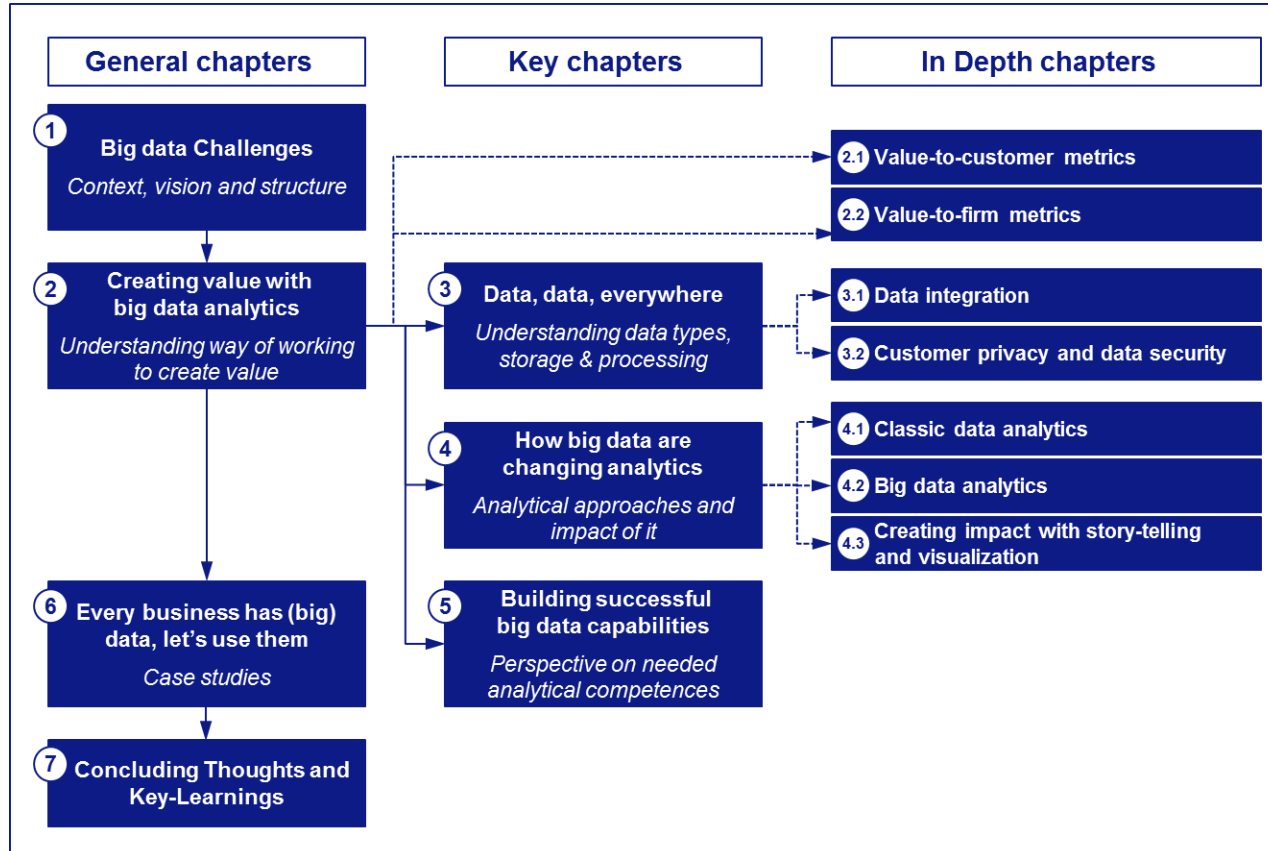
*'Big Data is the next frontier in marketing. This comprehensive, yet eminently readable book by Verhoef, Kooge and Walk is an invaluable guide and a must-read for any marketer seriously interested in using Big Data to create firm value.'*  
**Jan-Benedict E.M. Steenkamp**, Massey Distinguished Professor of Marketing, Marketing Area Chair & Executive Director AiMark, Kenan-Flagler Business School, UNC-Chapel Hill

*'This book goes beyond the hype, to provide a more thorough and realistic analysis of how Big Data can be deployed successfully in companies; successful in the sense of creating value both for the customer as well as the company, as well as what the pre-requisites are to do so. This book is not about the hype, nor about the analytics, it is about what really matters: how to create value. It is also illustrated with a broad range of inspiring company cases.'*  
**Hans Zijlstra**, Customer Insight Director,  
Air France KLM

*'This is one of the most compelling publications on the challenges and opportunities of data analytics. It paints not only a theoretical framework, but also navigates marketing professionals on organizational change and development of skills and capabilities for success. A must read to unlock the full potential of data-driven and fact based marketing.'*  
**Harry Dekker**, Media Director,  
Unilever Benelux



# Book Structure





# What's the typical business reaction on Big Data?

*'We have tons of data, but why is it taking so much time to create the right insights when we need them'*

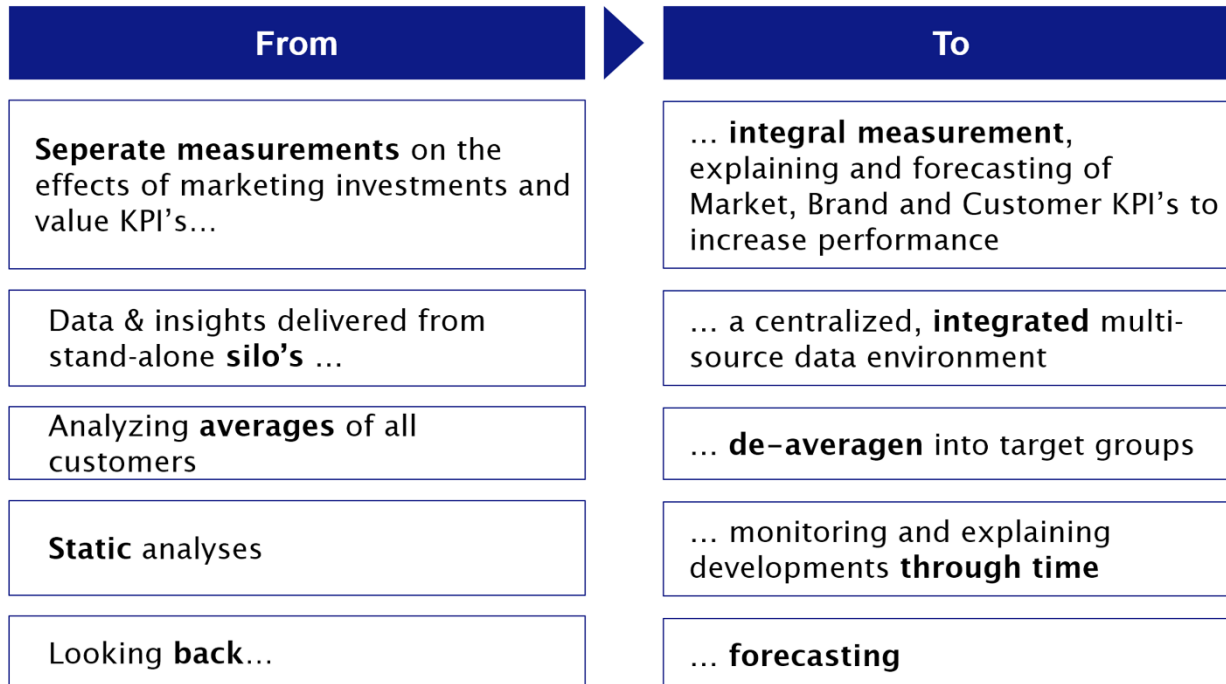
*'Why do we have to gather our crucial marketing insights from so many different departments within the organization?'*



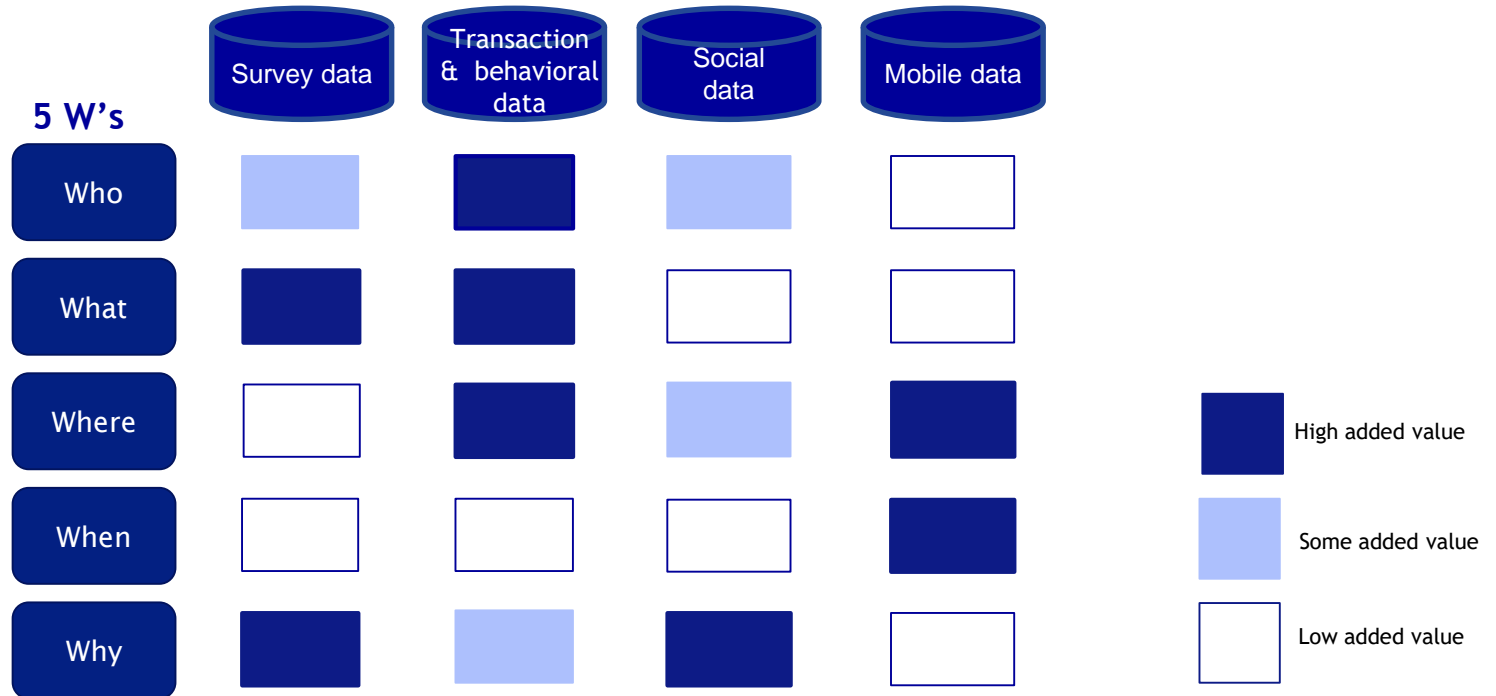
*'We are overloaded with reports and overviews, but they don't give us input on how to improve our business performance'*

*'Although I now understand what has happened, please tell me also how to act''*

# The necessary transition for value creation from Big Data

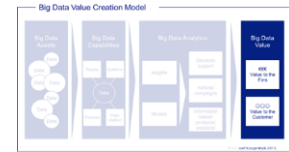


# Merging data streams in a customer centric organization



# The model for value creation with Big Data





# Introduction Value to the Customer and Value to the Firm

## Target group

## Value component

**Shareholders**

Value To the Firm  
V2F

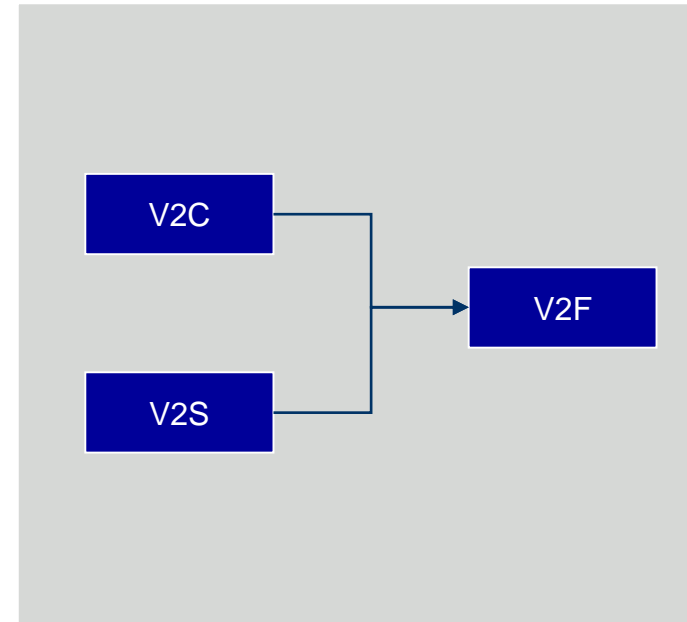
**Customers**

Value To the Customer  
V2C

**Society**

Value To the Society  
V2S

## V2C en V2S result in V2F



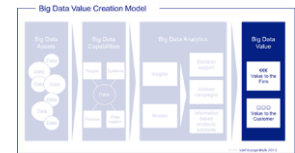
# Value to the Customer versus Value to the Firm





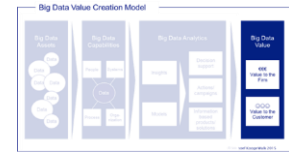
# Different levels of Value to Customer and Value to Firm measurement

	Value to Customer	Value to Firm
Market		
Brand		
Customer		









# Examples of how to measure V2C and V2F

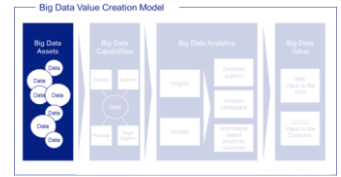
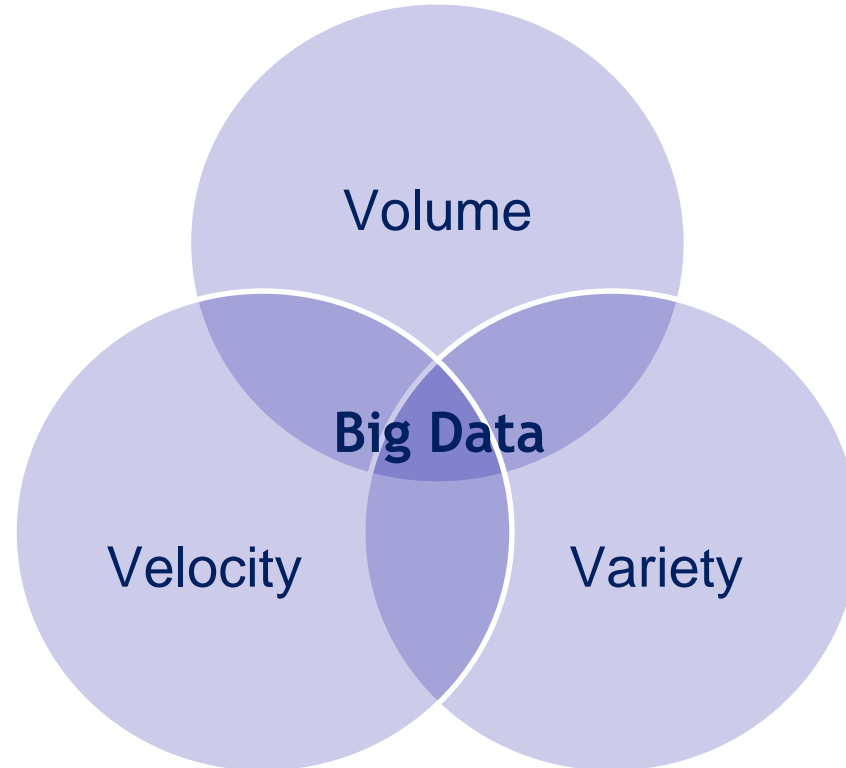
	Value-to-Customer 😊😊😊	Value-to-Firm €€€
Market/ category	<ul style="list-style-type: none"> <li>• Product awareness</li> <li>• Product attractiveness</li> <li>• Product uniqueness</li> </ul>	<ul style="list-style-type: none"> <li>• Market volume/size</li> <li>• Market growth</li> <li>• Number of competitors</li> <li>• Market concentration</li> <li>• Trial rate</li> <li>• Repeat volume</li> </ul>
Brand	<ul style="list-style-type: none"> <li>• Brand/advertising awareness</li> <li>• Brand association</li> <li>• Brand consideration</li> <li>• Brand preference</li> <li>• Brand linking</li> <li>• Brand likes/comments</li> </ul>	<ul style="list-style-type: none"> <li>• Brand penetration</li> <li>• Brand sales</li> <li>• Brand/market share</li> <li>• Brand repurchase</li> <li>• Brand Equity</li> </ul>
Customer	<ul style="list-style-type: none"> <li>• Customer Satisfaction</li> <li>• Net Promotor Score (NPS)</li> <li>• Customer Effort Score</li> <li>• Reviews: volume &amp; valence</li> </ul>	<ul style="list-style-type: none"> <li>• Customer Lifetime Value (and components)</li> <li>• Customer Engagement Value</li> <li>• Path to Purchase</li> <li>• Marketing ROI</li> </ul>

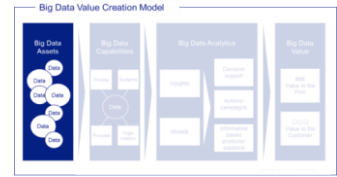


# Data sources for measuring value at the market, brand and customer level

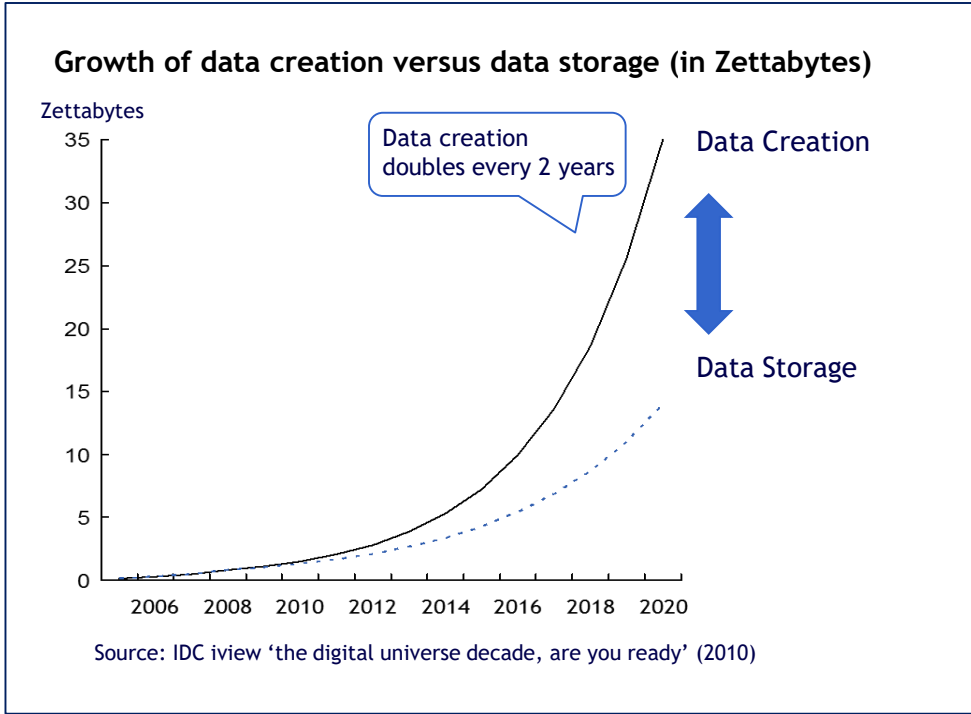
	Value-to-Customer ☺☺☺	Value-to-Firm €€€
Market/ category	 <p>Innovation research</p>	 <p>Market sizing, descriptions &amp; monitoring</p>
Brand	 <p>Brand tracking and Brand health studies Social listening data</p>	 <p>Sales data (like Nielsen or from CRM/ERP) brand equity research, Media spend etc.</p>
Customer	 <p>Customer satisfaction, Loyalty, Customer care data</p>	 <p>CRM/ERP, transactional data, customer contact data</p>

# 3 V's of Big Data



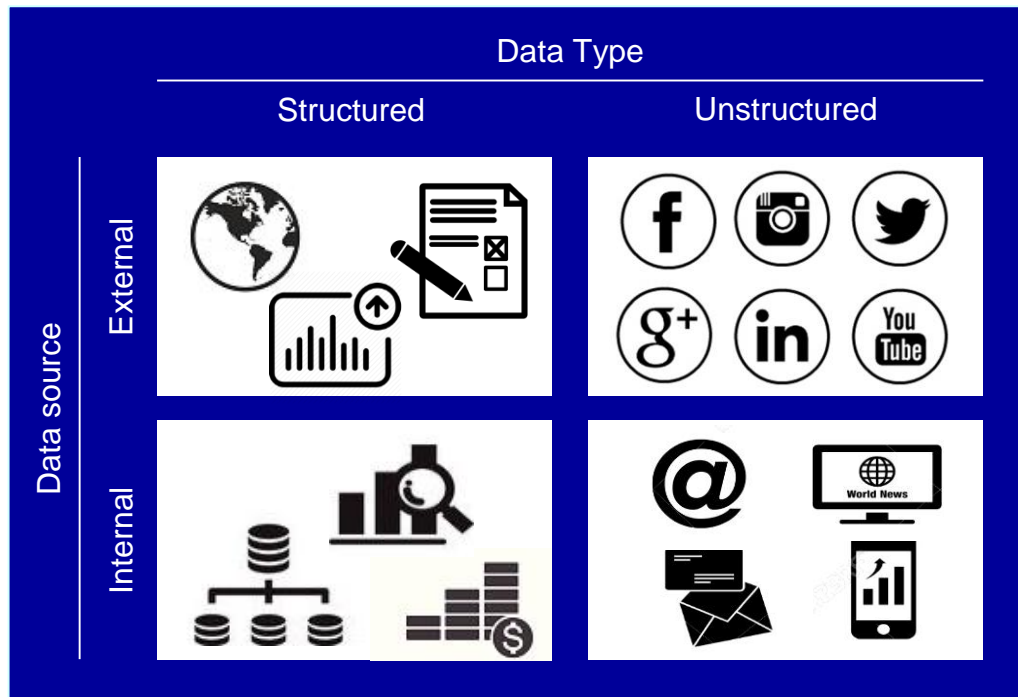
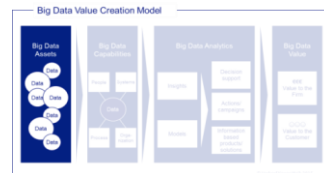


# Data creation is exploding!



- Digital is driving the exploding growth of data creation
- Mainly due to unstructured data from external and internal sources
- Data storage is not keeping up
- This will require a data strategy to assess the value of the data to be stored or not
- Analytics will be crucial for this assessment

# Dimensions of data



# Example of U.S. Government's open data



[DATA](#) [TOPICS](#) - [IMPACT](#) [APPLICATIONS](#) [DEVELOPERS](#) [CONTACT](#)

## The home of the U.S. Government's open data

Here you will find data, tools, and resources to conduct research, develop web and mobile applications, design data visualizations, and [more](#).

**GET STARTED**

SEARCH OVER **200,498 DATASETS**

*Federal Student Loan Program Data*



### BROWSE TOPICS



Agriculture



Business



Climate



Consumer



Ecosystems



Education



Energy



Finance



Health



Local  
Government



Manufacturing



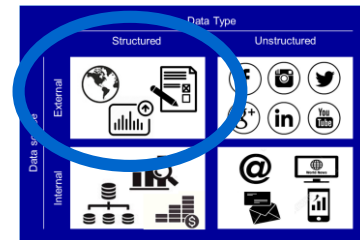
Ocean



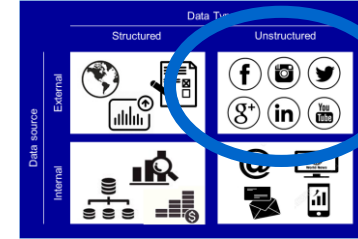
Public Safety



Science &  
Research



# Illustration of unstructured data versus structured data



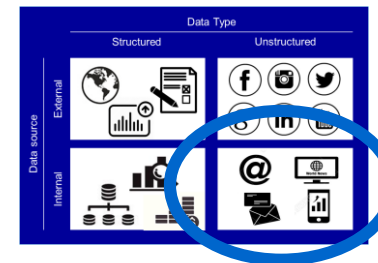
Nowadays, big data is such a hype that firms are investing in big data solutions and organizational units to analyse these data and learn from it. We observed that firms are now for instance hiring big data scientists. This occurs in all sectors of the economy including telecom, (online) retailing, and financial services. Firms have a strong believe that analysing big data can lead to a competitive advantage and can create new business opportunities.

However, at the same time experts are warning for too high expectations. Some thought leaders even consider big data as the next hype, which will mainly provide disappointing results . David Meer (2013) suggests that taking a historical perspective on prior data explosions shows specific patterns in the beliefs about the potential benefits. They specifically refer to the scanning revolution in the 80's of the last century and the CRM revolution in the late 90's of the last century as well (Verhoef & Langerak, 2002).

Word	Freq	Verb	Noun	Adj
analytic	57	no	no	yes
big	45	no	no	yes
brand	28	no	yes	no
create	23	yes	no	no
customer	98	no	yes	no
data	169	no	yes	no
example	30	no	yes	no
firms	82	no	yes	no
management	25	no	yes	no
marketing	93	no	yes	no
metrics	31	no	yes	no
model	36	no	yes	no
strategy	29	no	yes	no
value	101	no	yes	no



# Example of website visit data

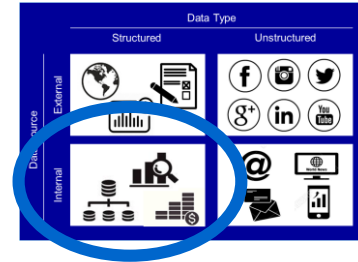
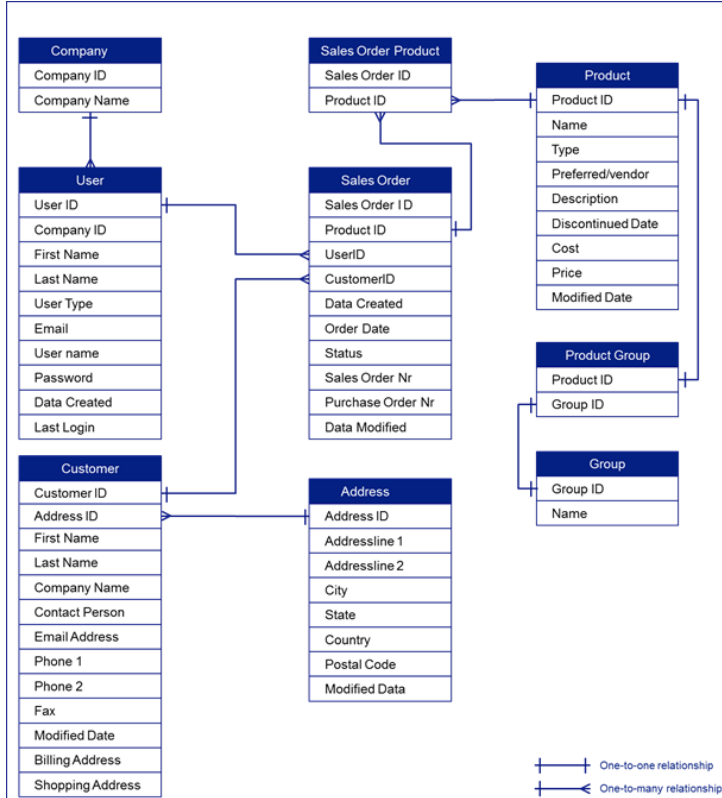


logdate	url	ip	city	state	country
2012-03-01	http://www.acme.com/	134.68.44.202	indianapolis	IN	usa
2012-03-01	http://www.acme.com/	99.66.177.241	dallas	TX	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	108.68.108.169	san bruno	CA	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	129.108.126.206	el paso	TX	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	132.3.61.68	montgomery	AL	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	146.201.162.233	tallahassee	FL	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	147.106.152.172	center valley	PA	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	151.151.109.14	rancho palos verdes	CA	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	163.151.2.10	bronx	NY	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	168.20.255.160	athens	GA	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	169.231.9.198	santa barbara	CA	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	170.185.214.19	bowling green	KY	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	174.109.188.135	durham	NC	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	174.29.4.39	denver	CO	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	216.201.66.246	idaho falls	ID	usa
2012-03-01	http://www.acme.com/SH55126545/VD55149415	24.14.74.99	concordville	TN	usa

Count per state



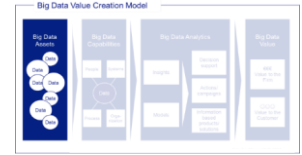
# Example of CRM data



Customer id	Customer name	Type of products purchased (product ID)	Transaction channel
1001	A. Johnson	80	Internet
2002	P. Van Hoof	07	Store
2004	George Hull	15	Direct Mail
2008	Barack Thomas	05	Store
3028	Ismael Buunk	20	Catalog

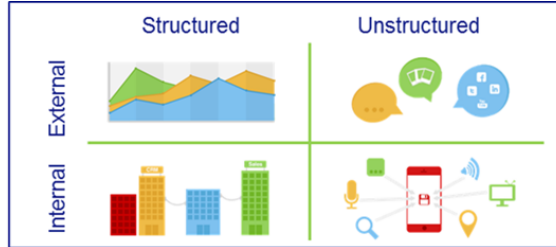
Product ID	Number of customers	Most frequently used transaction channel
80	80.000	Catalog
07	100.000	Store
15	15.125	Store
05	5.000	Internet
20	200.040	Store

# How to merge data streams?



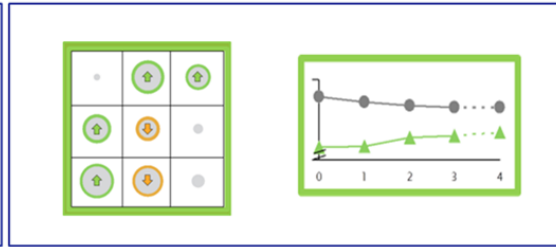
Technical

Integrating scattered & fragmented data



Analytical

Synchronizing the analytical perspective on segments & historical performance

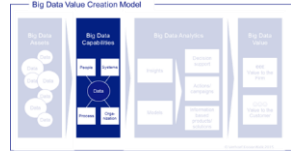


Business

Linking all Value to Customer and Value to Firm metrics to the P&L



# Building Analytical Competence



1

## People

to recruit, to develop and to maintain the right analytical talent

2

## Systems

platform & tools for an integrated data-ecosystem

3

## Process

creating a common business driven way of working & privacy/security proof

4

## Organization

taking the right place in the organization for the most impact

# Data Scientist: “the sexiest job on Earth”

Hal Varian (Google)

1 People	2 Systems
3 Process	4 Organization

*“A data scientist is: a hybrid of hacker, analyst, communicator and trusted advisor, and is also be able to code and have intellectually curiosity.”*

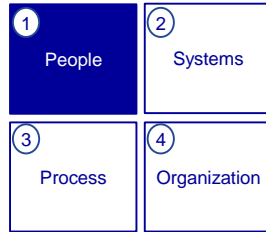
D.J. Patil (LinkedIn) & J. Hammerbacker (Facebook)



Anjul Bhambhri, VP of big data products at IBM, says:

*“A data scientist is somebody who is inquisitive, who can stare at data and spot trends. It's almost like a Renaissance individual who really wants to learn and bring change to an organization.”*

# Multi disciplinary skills of the modern Big Data scientist



## Analytical capabilities

- Excellent conceptual, analytical and numeric skills
- Statistical modelling & Experiment design
- Supervised learning: decision trees, logistic regression
- Unsupervised learning: clustering, dimensionality reduction

## Data & Tools

- Curious about data and sources
- Computer science fundamentals
- Statistical computing package e.g. R, Matlab, SAS, IBM (SPSS)
- Database tools like SQL and NoSQL
- MapReduce/Hadoop concepts



## Business sense

- Willingness to improve business performance
- Deep industry specific knowledge
- Organization sensitivity
- Leadership qualities
- Problem solver
- Engage with senior management

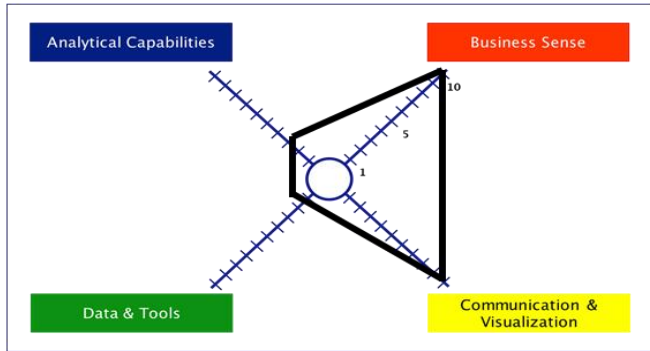
## Communication & Visualization

- Translate data-driven insights into decisions and actions
- Define and support your key-message
- Story telling skills
- Consistency and structure
- Visual art design

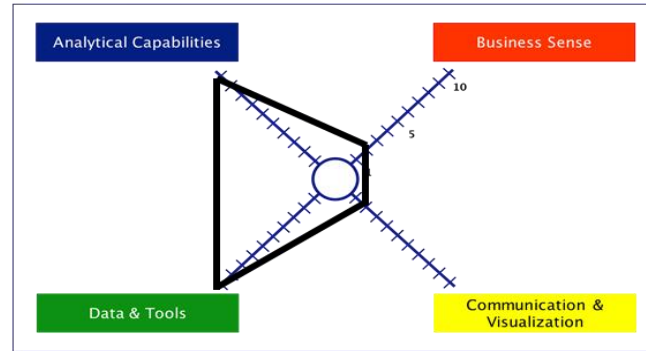
# Different profiles of the Big Data Scientist

① People	② Systems
③ Process	④ Organization

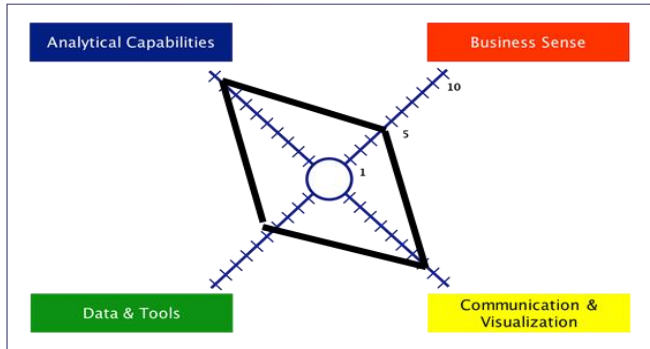
## The 'consultant'



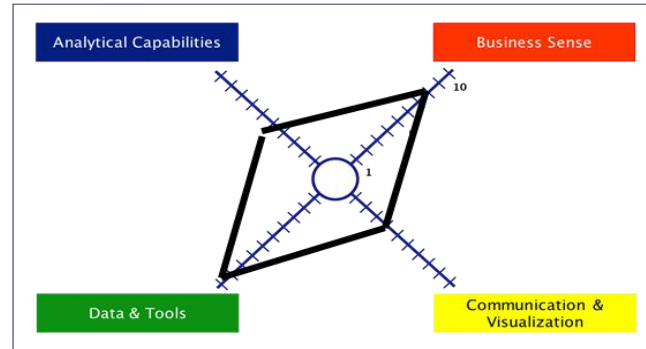
## The 'data-specialist'



## The 'data-analyst'

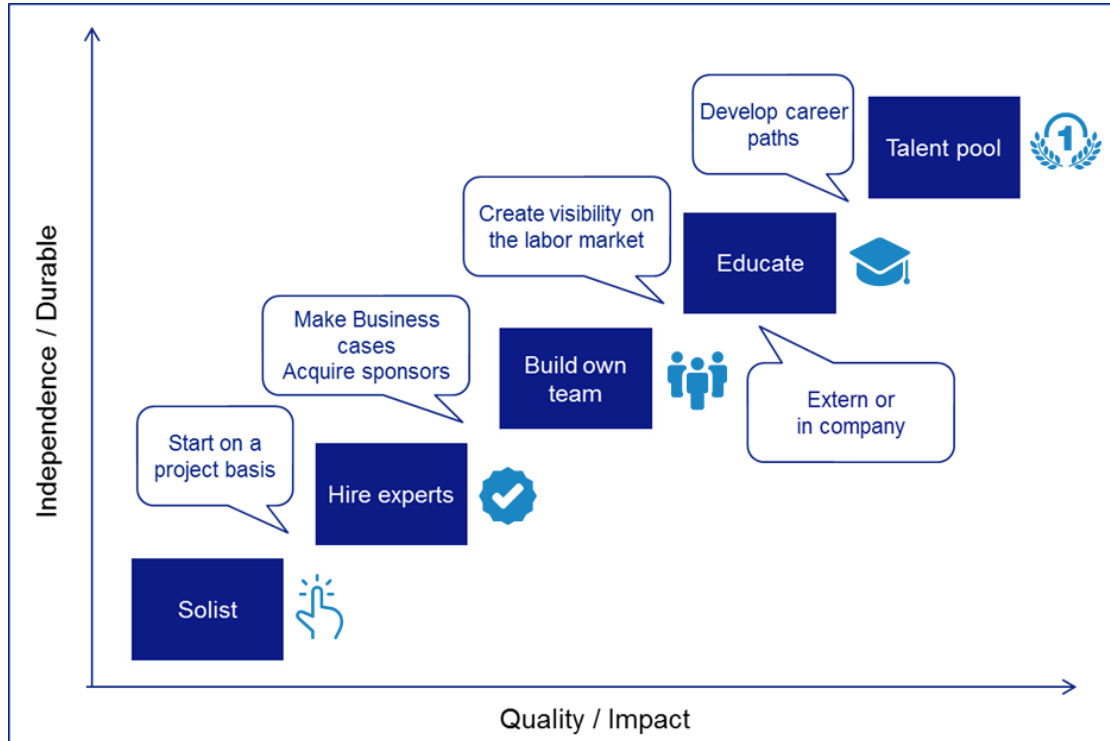


## The 'IT-professional'



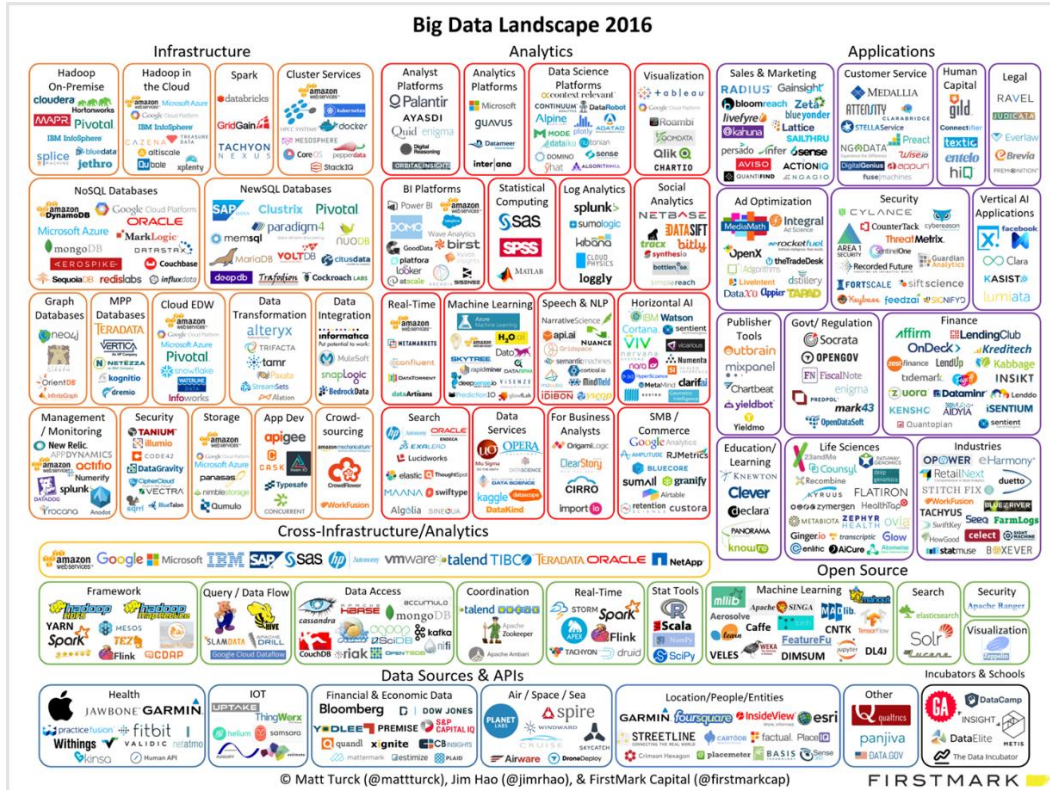
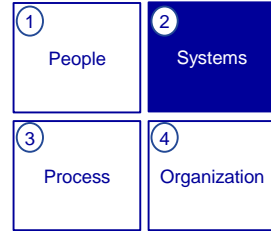
# How to create a top class Intelligence department?

1 People	2 Systems
3 Process	4 Organization

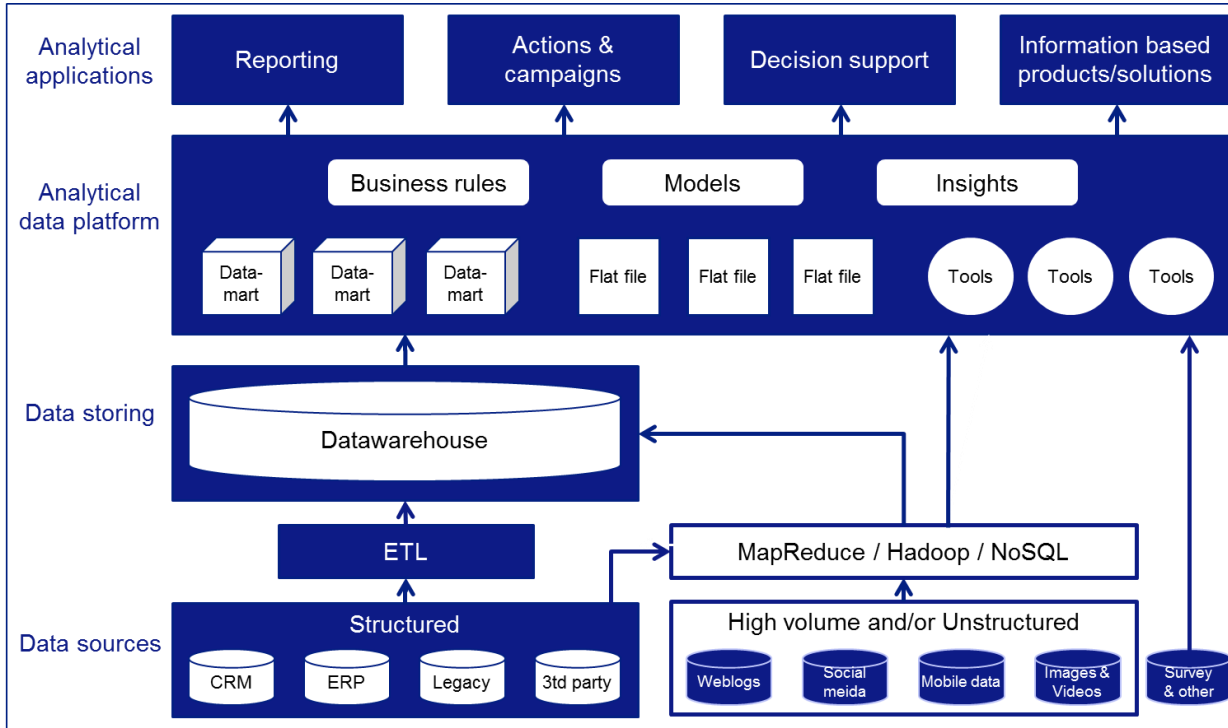
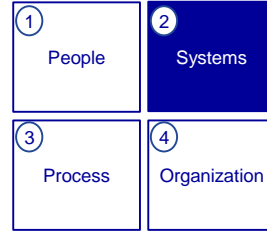




# The vendor landscape of tools and systems is dramatically scattered!

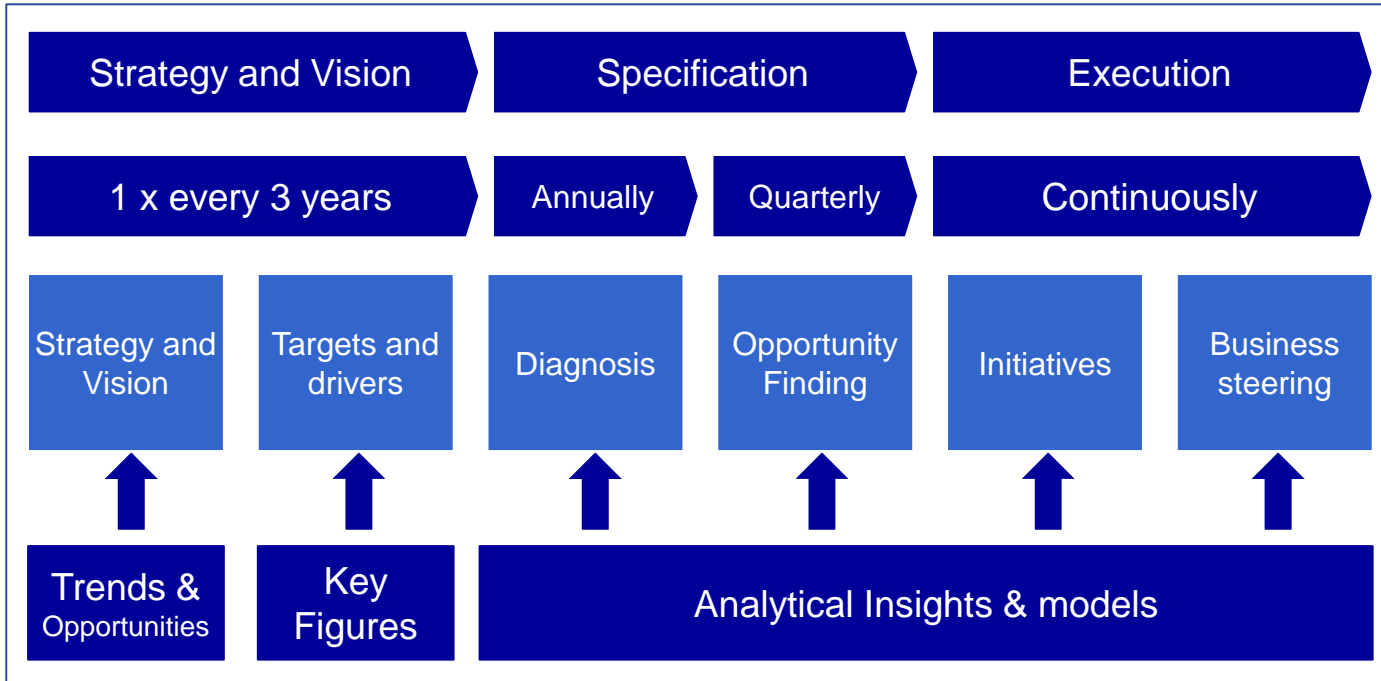


# Example of a Big Data infrastructure

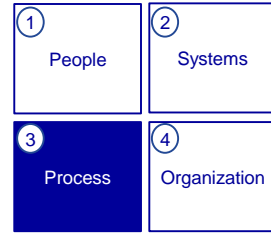


# Analytical roadmap: where analytics fits in the business cycle

① People	② Systems
③ Process	④ Organization

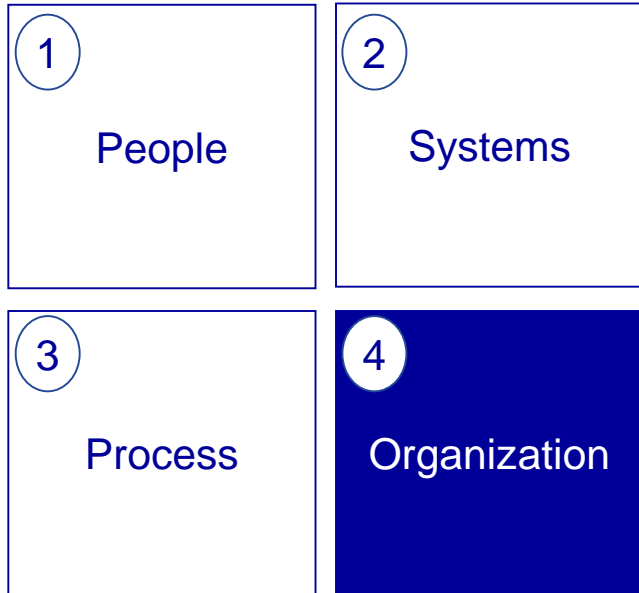
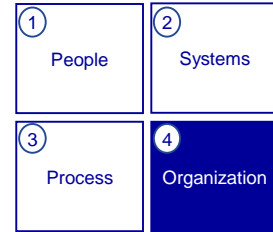


# There are four Analytical Strategies



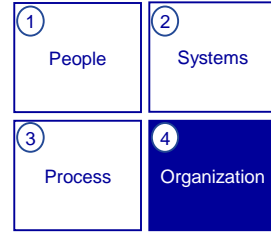
		Pre-defined Data	
		Yes	No
Framed problem	Yes	Problem solving	Data modelling
	No	Collateral catch	Data mining

# We observe three specific challenges

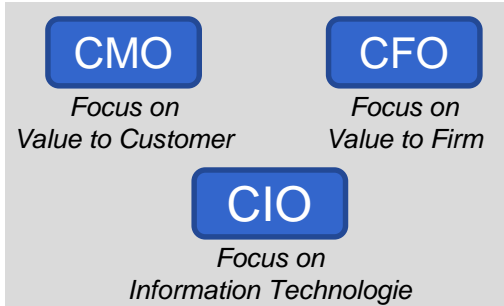


- Centralization or decentralization of the analytical function
- Cooperation with other departments/ functions
- Presence of a data-driven culture

# Establish a data-driven culture



Top management support



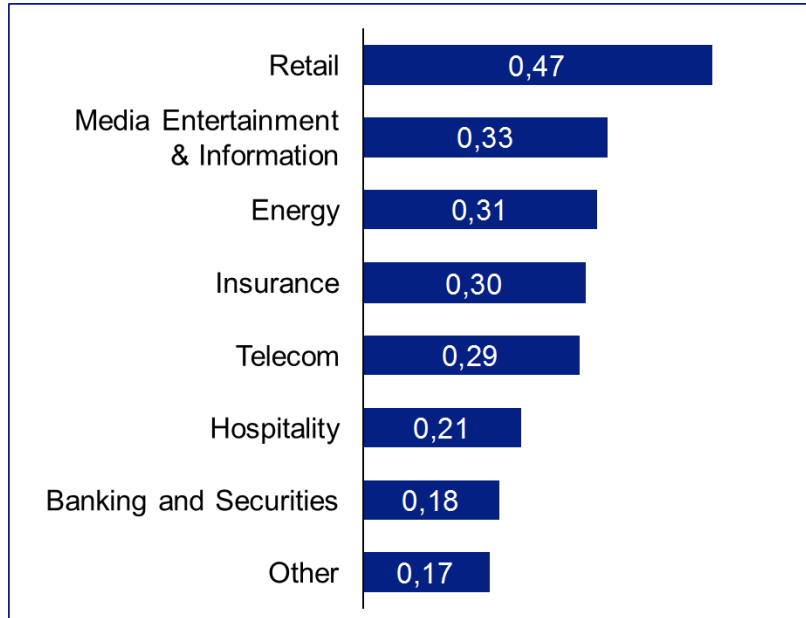
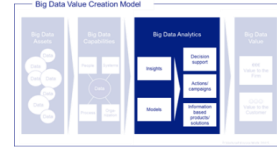
Intelligence function that build bridges on C-level



Necessary space for employees to innovate and to find their solutions



# Effect Analytics on Business Performance

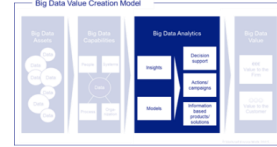


Source: Germann et al. (2014)

*All coefficients are greater than zero with a probability of more than .95*



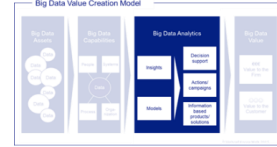
# How Big Data is changing analytics?



## Five Big Data Analytics Trends

1. From analyzing samples to analyzing to the full population
2. From significance to substantive and size effects
3. From ad-hoc data collection to continuous data collection
4. From ad hoc models to real time models
5. From single source to multi-source insights and models

# Overview of classic versus big data analytics



## Classics

- Reporting
- Profiling
- Migration analysis
- Segmentation
- Trend analysis & forecasting
- Product attribute analysis
- Predictive modeling

## Big Data

- Web analytics
- Customer Journey analysis
- Attribution modelling
- Dynamic targeting
- Big Data integrated models
- Social listening
- Social Network analysis

# The challenges of creating value with Big Data



