www.pwc.com

CSM-ACE 2013

Big Data Analytics:

Take it to the next level in building innovation, differentiation and growth

14 November 2013

pwc

About me

- Data analytics in the UK
- Forensic technology and data analytics in Malaysia
- Forensic investigations

Overview

- Industries now regularly collect and creates vast quantities of data
- Low level data and business information
- These huge data volumes (big data) can be harnessed to generate insight, otherwise companies run the risk of losing competitive advantage
- My key objectives in this short session are to:
  - Explain big data and why it's such a big deal
  - Discuss the opportunities in data analytics on big data
  - Discuss the potential challenges

Big data: what it is

Increasing data volumes means more potential insight – in ALL industry sectors

- ***Finance and retail*** (e.g. pricing and risk analytics)
- ***Utilities*** (e.g. smart usage analysis)
- ***Pharmaceuticals and health*** (e.g. smart patient monitoring and diagnosis)
- ***Supply chain and inventory*** (e.g. efficiency improvement through simulation modelling, stock management)
- ***Marketing and CRM*** (e.g. customer profiling and segmentation, customer acquisition and retention , customer value and profitability)
- ***Fraud investigation and prevention*** (e.g. insider fraud, bribery, corruption)

The Economist

Schumpeter

Building with big data

The data revolution is changing the landscape of business

May 26th 2011 | from the print edition

IN A short story called "On Exactitude in Science", Jorge Luis Borges described an empire in which cartographers became so obsessive that they produced a map as big as the empire itself. This was so cumbersome that future generations left it to disintegrate. ("[I]n the western deserts, tattered fragments of the map are still to be found, sheltering some occasional beast or beggar.")

As usual, the reality of the digital age is outpacing fiction. Last year people stored enough data to fill 60,000 Libraries of Congress. The world's 4 billion mobile-phone users (12% of whom own smartphones) have turned themselves into data-streams. YouTube claims to receive 24 hours of video every minute. Manufacturers have embedded 30m sensors into their products, converting mute bits of metal into data-emitting nodes in the internet of things. The number of smartphones is increasing by [illegible] and the number of sensors by 30%.

Big data analytics – consensus in the definition

Defined around the 3 "V's": Volumes, Velocity & Variety

Data Volumes

- Big data analytics deals with data volumes of 10's of Tb's to Pb's where traditional BI deals with Gb's to 10's of Tb's
- Volumes will be further driven by massive data growth in unstructured and externally, user generated data including text, speech and social media
- *"All data created from the beginning of time until 2003 is now being created every 2 days"*

Data feed Velocity

- High frequency of data generation & data delivery
- Data processing speeds to keep up with streaming data analysis and taking / recommending actions, in real time
- *"340 million tweets on Twitter and 250 million photos on Facebook added everyday"*

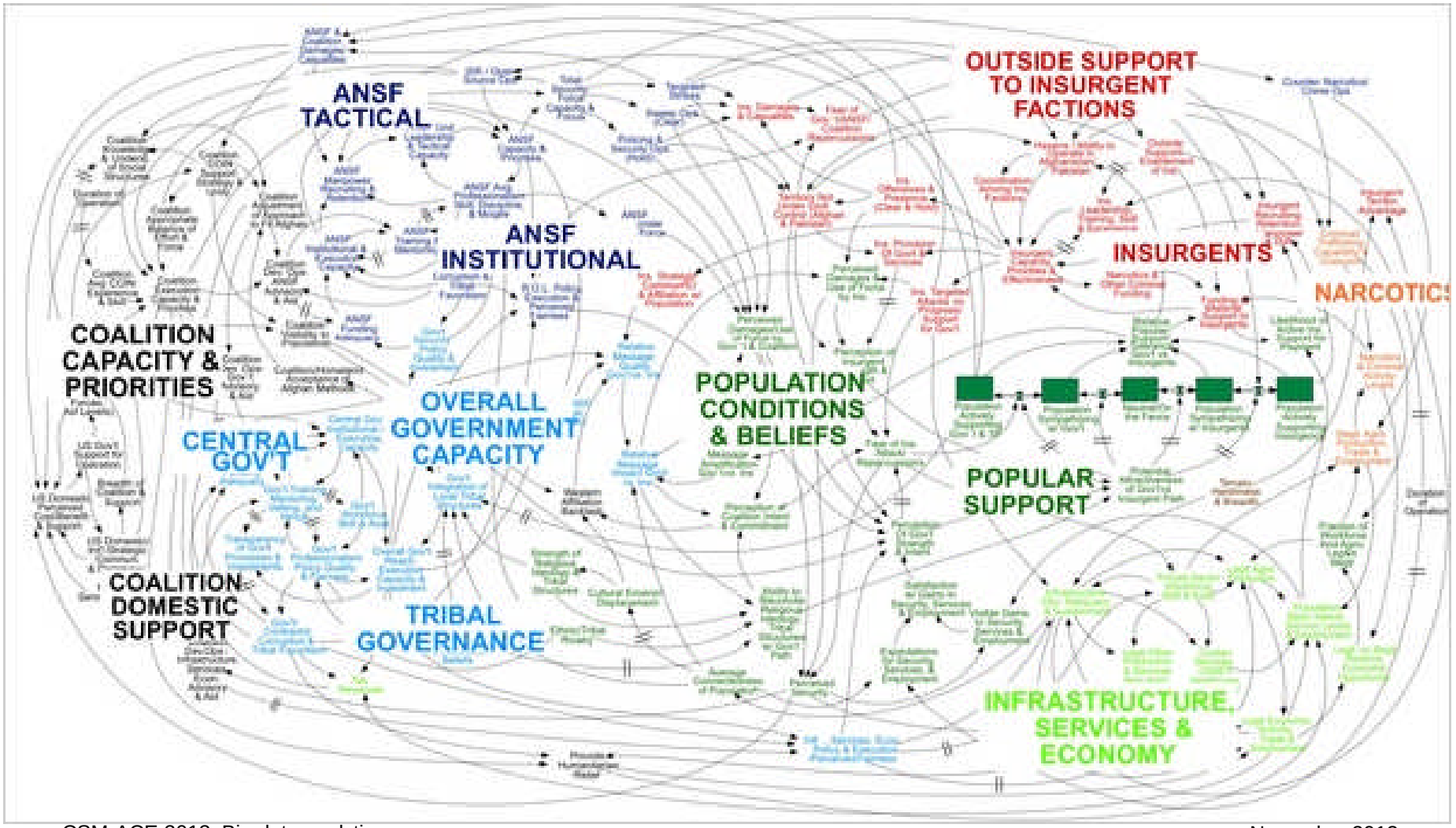
Data type Variety

- Structured (relational), semi structured & unstructured data
- In addition to internal structured data (transactions, operational), semi & unstructured data such as text, emails, logs, blogs, click streams, web / XML /RSS feeds, audio and video material, sensor data
- *"Only 5% of data is structured in a format suitable for traditional Business Intelligence"*

Big data analytics: why it's such a big deal

Five key drivers are changing the environment in which businesses operate today

Complexity – The world has become a jumble of interdependent stakeholders and variables



Knowledge Intensity – *Advancements in knowledge and technology have created multiple types of workers in today's economy*

Low Knowledge Intensity

Transformational Workers

- Lower skill, non-routine, jobs
- Typically involves physical activity, e.g. construction workers

Medium Knowledge Intensity

Transactional Workers

- Low to medium skilled jobs
- Routine jobs often done by people but capable of being automated
- E.g. Call centre employees or bank staff

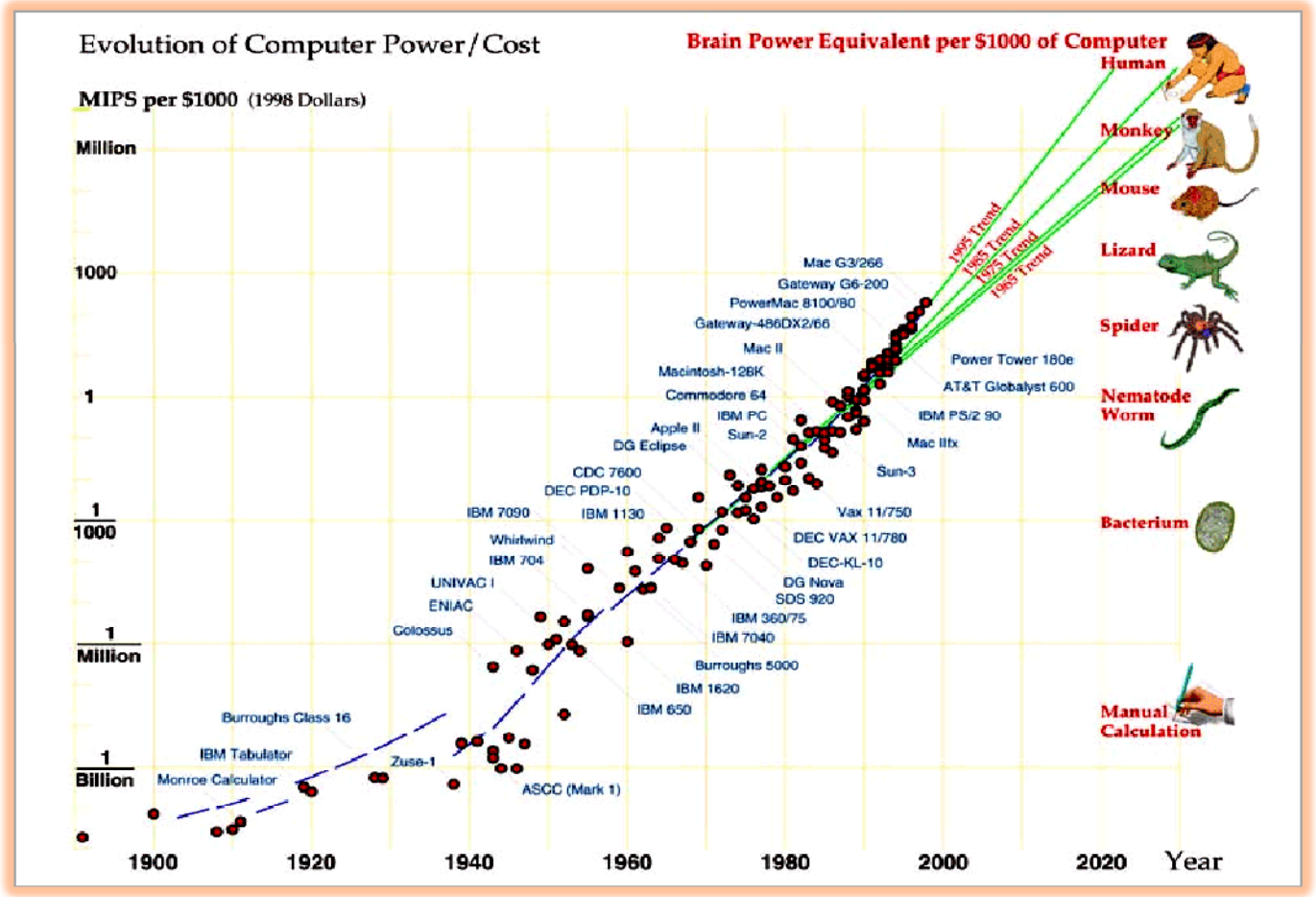
High Knowledge Intensity

Interactional Workers

- Relying on knowledge, expertise, and collaboration with others
- Difficult to automate
- E.g. Investment Banking, Lawyers

Digitisation – This year, the amount of traffic flowing over the Internet is expected to total 667 exabytes

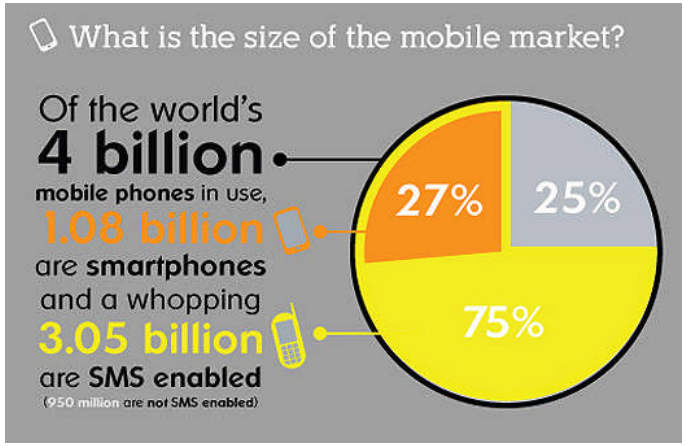
Digitisation– Rapid advances in information technology, processing power, robotics, and neuroscience are fundamentally altering how we will make decisions in the future

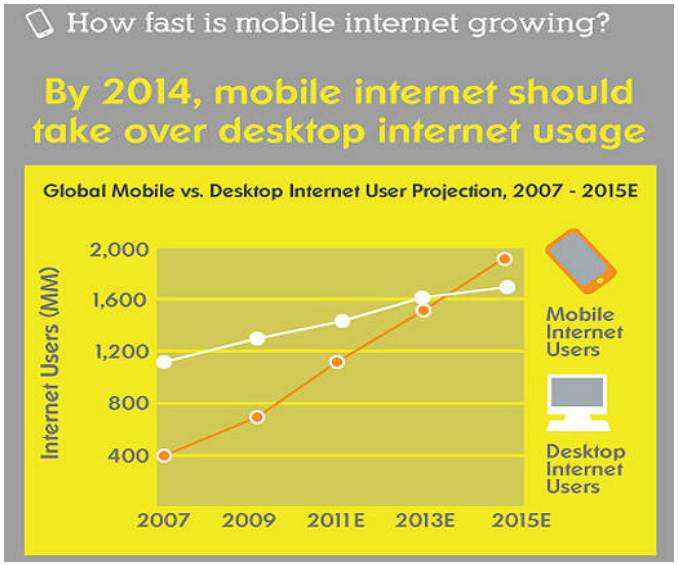


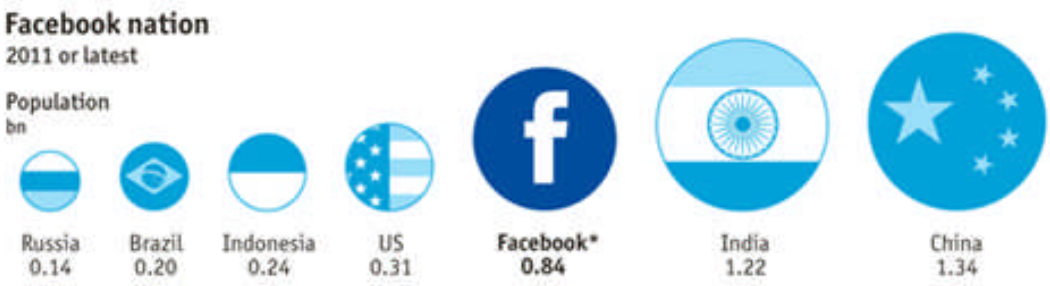
Source: The Singularity is Near, Ray Kurzweil

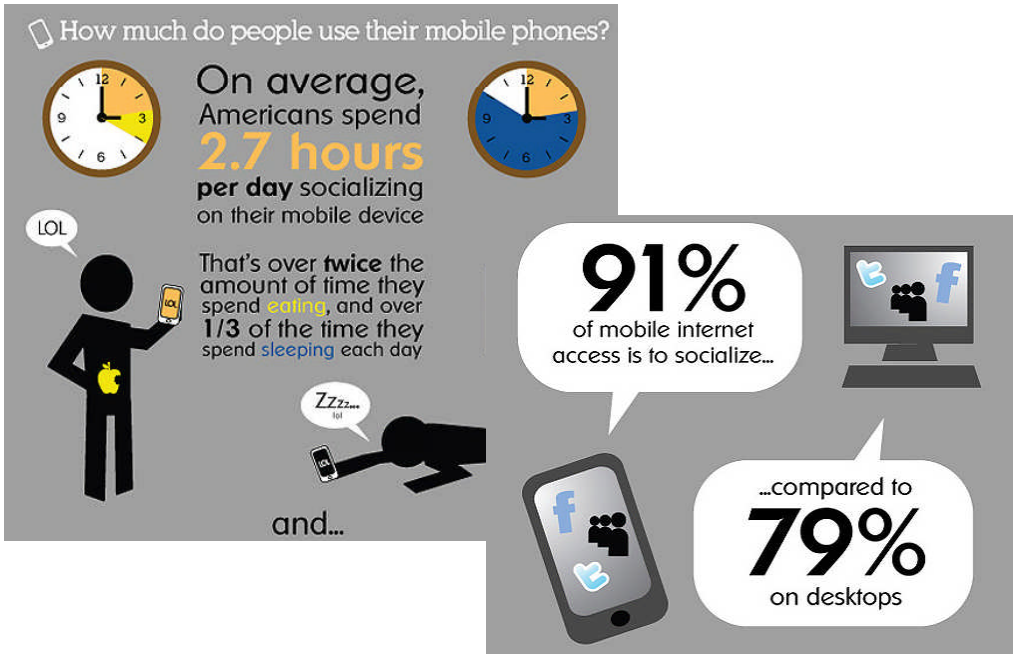
"An analysis of the history of technology shows that technological change is exponential, contrary to the common-sense "intuitive linear" view. So we won't experience 100 years of progress in the 21st century — it will be more like 20,000 years of progress (at today's rate)"- Ray Kurzweil

Networking – *Customers are using mobile devices and spending more time on social networking channels…*





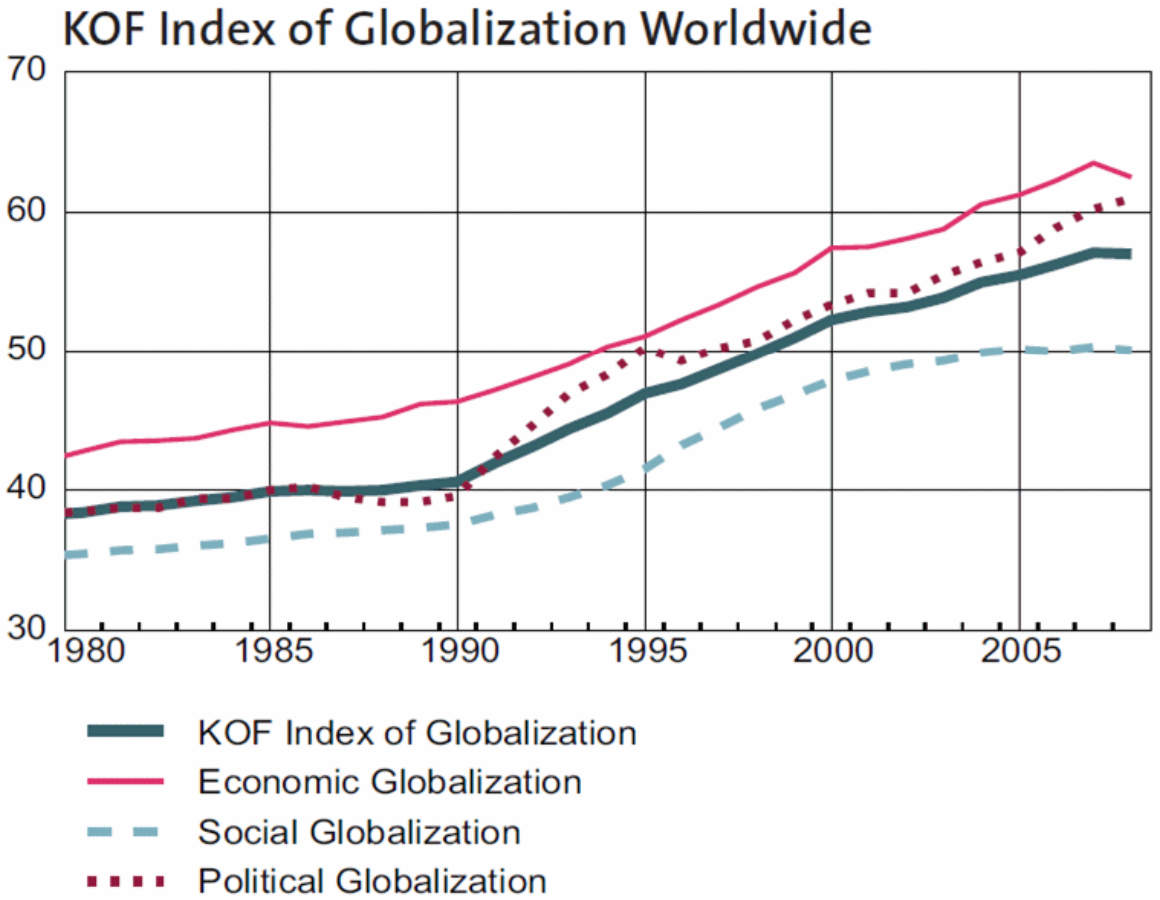




Source: http://www.digitalbuzzblog.com/2011-mobile-statistics-stats-facts-marketing-infographic/

Global Integration – Globalisation is forcing business integration

Globalisation Trend 1980-2009



- The overall KOF Globalization Index has increased by 48% from 1980 to 2008
- The index value reflects the degree of global integration economically, socially, and politically

Data analytics – why is it important?

1. Rapid increase in available data makes it a viable source of insight
   - In just four hours on "black Friday" 2012, Walmart in the USA handled 10 million cash register transactions – almost 5,000 items per second.
   - VISA processes more than 172,800,000 card transactions each day.
2. Data analytics techniques are being deployed across many different industries and for a range of purposes
   - "Companies are using [data analytics] tools to improve business efficiency, spot trends and opportunities, provide customers with more relevant products and services and, increasingly, to predict how people, or machines, will behave in the future."
     - Big data in the spotlight as never before, 26th June 2013, Financial Times (http://www.ft.com/cms/s/0/4ffdc998-d299-11e2-88ed-00144feab7de.html#axzz2XTCbWnRi)

Big data analytics: the opportunities

Framing the opportunity: Predicting outcomes and quantifying uncertainty

It's a rainy weekday and you have a flight to catch…
what are the chances that you will be able to hail a taxi?

The real answer is that it depends.

What can analytics do?

Analytics provides our clients with quantitative information on key drivers to properly frame the problem, measure the benefits and risks – and estimate the outcome.

With analytics we can better inform our clients and help them make better decisions.

Big data analytics: the words of warning

Big data: the challenges

- The technical challenges
- The hype
- Data privacy
- Cyber security issues
- How do we lock down and secure big data?

Thank you

Neil Meikle

Associate Director

Forensic Technology, PwC Malaysia

Tel: +60 3 2173 0488

Email: neil.meikle@my.pwc.com