The FOUR V's of Big Data

From traffic patterns and music downloads to web history and medical records, data is recorded, stored, and analyzed to enable the technology and services that the world relies on every day. But what exactly is big data, and how can these massive amounts of data be used?

As a leader in the sector, IBM data scientists break big data into four dimensions: **Volume, Velocity, Variety and Veracity**.

Depending on the industry and organization, big data encompasses information from multiple internal and external sources such as transactions, social media, enterprise content, sensors and mobile devices. Companies can leverage data to adapt their products and services to better meet customer needs, optimize operations and infrastructure, and find new sources of revenue.

By 2015
4.4 MILLION IT JOBS
will be created globally to support big data, with 1.9 million in the United States

Volume
SCALE OF DATA

40 ZETTABYTES
(43 TRILLION GIGABYTES)
of data will be created by 2020, an increase of 300 times from 2005

6 BILLION PEOPLE
have cell phones

WORLD POPULATION: 7 BILLION

It's estimated that
2.5 QUINTILLION BYTES
(2.3 TRILLION GIGABYTES)
of data are created each day

Most companies in the U.S. have at least
100 TERABYTES
(100,000 GIGABYTES)
of data stored

Velocity
ANALYSIS OF STREAMING DATA

The New York Stock Exchange captures
1 TB OF TRADE INFORMATION
during each trading session

By 2016, it is projected there will be
18.9 BILLION NETWORK CONNECTIONS
— almost 2.5 connections per person on earth

Modern cars have close to
100 SENSORS
that monitor items such as fuel level and tire pressure

Variety
DIFFERENT FORMS OF DATA

As of 2011, the global size of data in healthcare was estimated to be
150 EXABYTES
(161 BILLION GIGABYTES)

30 BILLION PIECES OF CONTENT
are shared on Facebook every month

By 2014, it's anticipated there will be
420 MILLION WEARABLE, WIRELESS HEALTH MONITORS

4 BILLION+ HOURS OF VIDEO
are watched on YouTube each month

400 MILLION TWEETS
are sent per day by about 200 million monthly active users

Veracity
UNCERTAINTY OF DATA

1 IN 3 BUSINESS LEADERS
don't trust the information they use to make decisions

27% OF RESPONDENTS
in one survey were unsure of how much of their data was inaccurate

Poor data quality costs the US economy around
$3.1 TRILLION A YEAR

Real World Use of BIG DATA

Kieran Hagan – Information Management Technical Manager
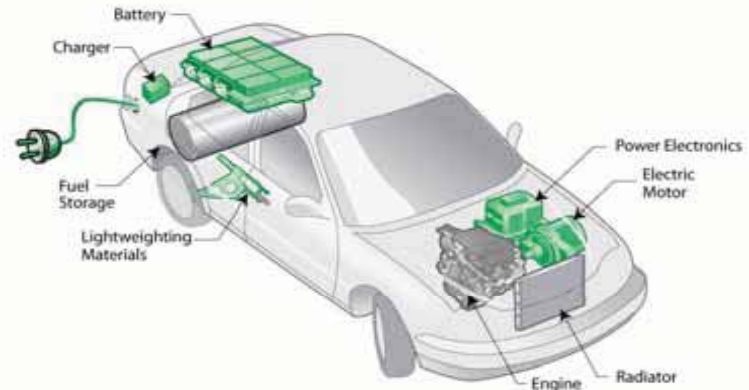**Tim Brown** – Information Management Technical Pre-Sales

@TimBrown_IBM

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The definition of "Big":

1) of considerable size or extent:

2) of considerable importance or seriousness:

3) *[predic.] informal*, often *ironic* generous:*'I'm inclined to take pity on you.' 'That's* **big of you***!'*

(Oxford online dictionary; http://oxforddictionaries.com/definition/english/big?q=big+)

Battery
Charger
Fuel Storage
Lightweighting Materials
Power Electronics
Electric Motor
Engine
Radiator

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Gaining Insight from your Information

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Resolving information management challenges outside traditional approaches to deliver **new business insight**

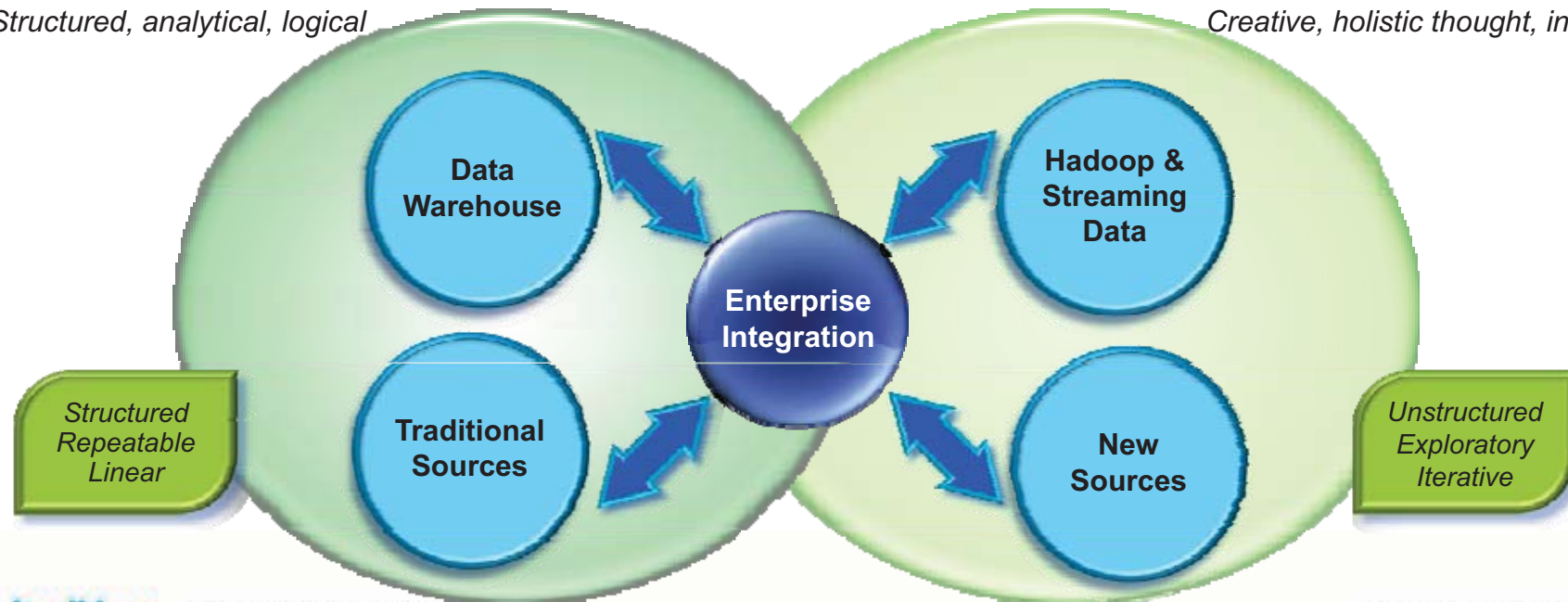# Analytics is expanding from enterprise data to big data

IBM

Traditional Approach
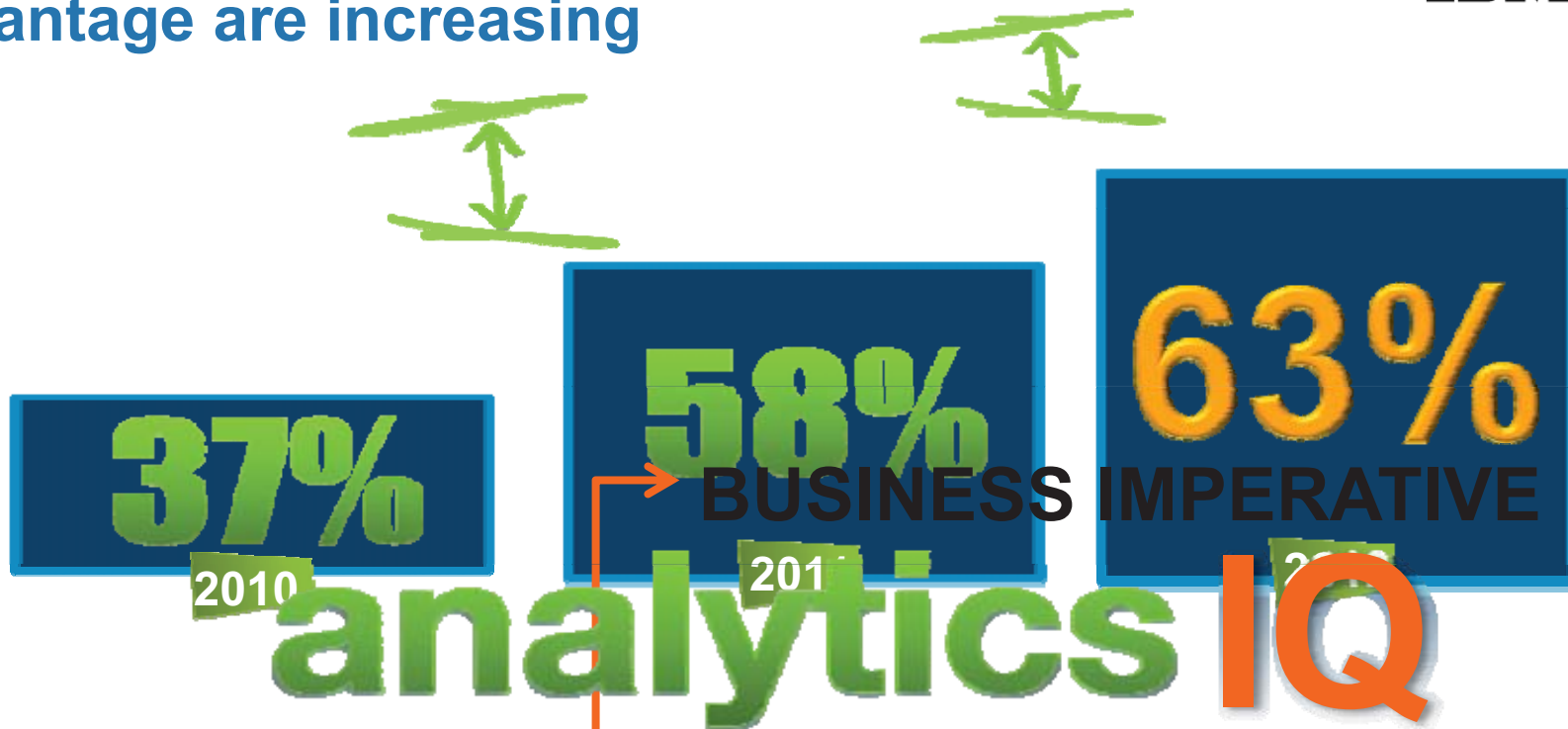*Structured, analytical, logical*

New Approach
Creative, holistic thought, intuition

Data Warehouse

Hadoop & Streaming Data

Enterprise Integration

Structured Repeatable Linear

Traditional Sources

New Sources

Unstructured Exploratory Iterative

Organisations who see analytics as a competitive advantage are increasing

IBM

37% 2010

58% 2011

63%

BUSINESS IMPERATIVE

analytics **IQ**

business initiative

Martha Payne

Automatic Temporal and Spatially Enriched Data

IBM

Teenager's Pink bomb tweet blows up

- In Perth, while travelling around the CBD, a person is captured by over 180 Cameras

- In Melbourne, a teenager texts "I'm ready with my Bomb. Time to blow up #RodLaverArena" during a concert and is intercepted by Police

- Star of 'Myth Busters' (Adam Savage) takes a photo of his car at his house using his smartphone and posts to his Twitter account

- This data is used for analyzing criminal activity and safety issues

Over 650,000 people now know where he lives….

- Spotted, report and stop a robber in Hyde Park, Sydney before the mugging had even finished.

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11

Big Data "Sense-making"

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5 Key Use Case Patterns

Big Data Exploration

Enhanced 360º View of the Customer
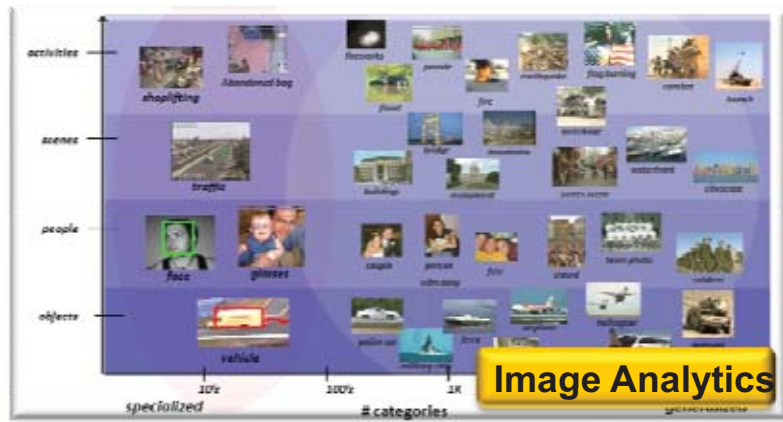
Security/Intelligence Extension

Operations Analysis
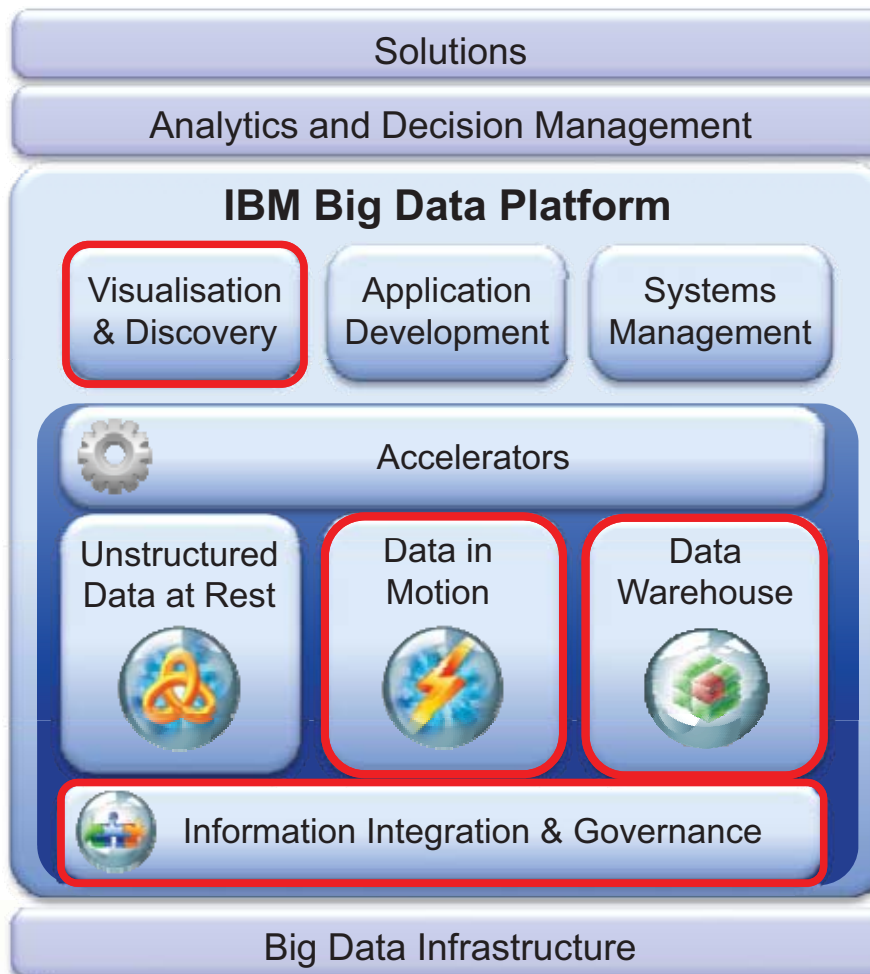
Data Warehouse Augmentation

Implementation Zone

Text Analytics

Image Analytics

Real Time Traffic Analytics

The IBM BIG DATA Platform

Solutions

Analytics and Decision Management

IBM Big Data Platform

| Visualisation & Discovery | Application Development | Systems Management |

Accelerators

| Unstructured Data at Rest | Data in Motion | Data Warehouse |

Information Integration & Governance

Big Data Infrastructure

IBM

The IBM BIG DATA Platform

Process any type of data: Structured, unstructured, in-motion, at-rest

Purpose-Built Engines: Designed to handle different requirements

Flexible Analytics: data-in-motion and data-at-rest

Solutions

Analytics and Decision Management

IBM Big Data Platform

Visualisation & Discovery	Application Development	Systems Management

Accelerators

Unstructured Data at Rest	Data in Motion	Data Warehouse

Information Integration & Governance

Big Data Infrastructure

Manage and Govern data within the ecosystem

Enterprise data integration

Grow and evolve on current infrastructure

IBM

Merging the Traditional and Big Data Approaches

Traditional Approach
Structured and Repeatable Analysis

Business Users

Determine what question to ask

IT

Structures the data to answer that question

Big Data Approach
Iterative and Exploratory Analysis

IT

Delivers a platform to enable creative discovery

Business Users
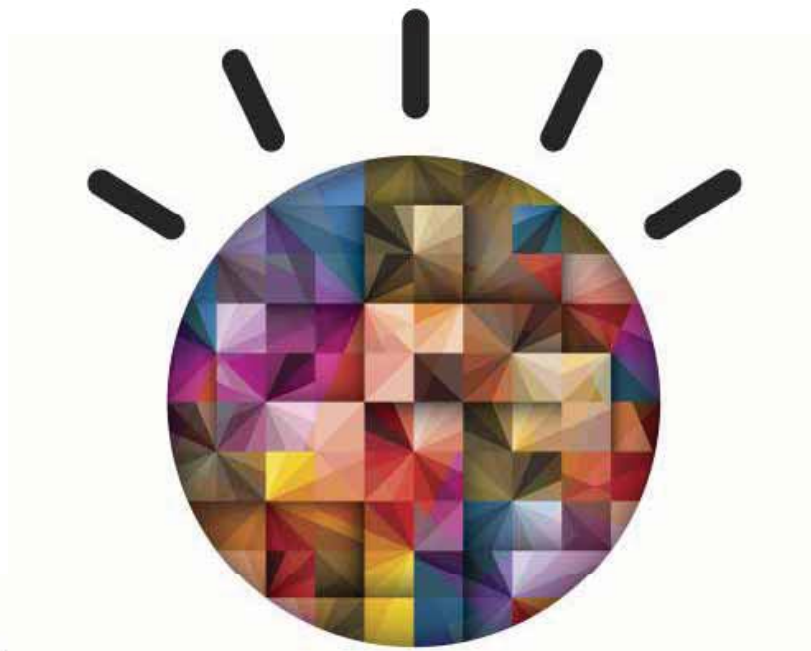
Explores what questions could be asked

Why Data Matters: The Age of Analytics

IBM provides a governable & accessible Big Data platform that delivers insight from data at-rest and in-motion

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For more information:
ibm.com/bigdata

#ibmbigdata

Thank you

Don't forget to check out the Demo Zone during the break
or talk to one of our experts at the Table Talk area.

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Reference Data Videos

Big Data Exploration

http://www.youtube.com/watch?v=AUVWhO87fuI

Security/Intelligence Extension

http://www.youtube.com/watch?v=j5U-IqpDQgk

360° View of the Customer

http://www.youtube.com/watch?v=M0GM8BlEXmo

Data Warehouse Augmentation

http://www.pnnl.gov/news/release.aspx?id=776

Operations Analysis

http://www.ibmbigdatahub.com/video/sprint-uses-analytics-innovate