IBM ®

Big Data & **Analytics**

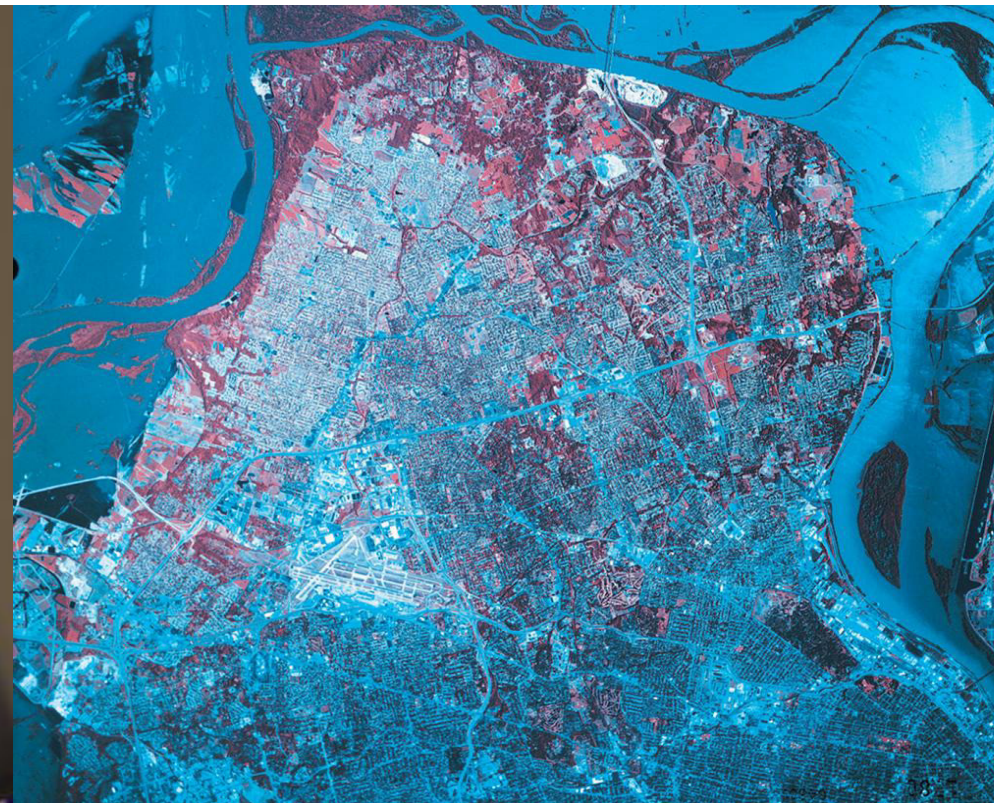# Transforming business with big data analytics

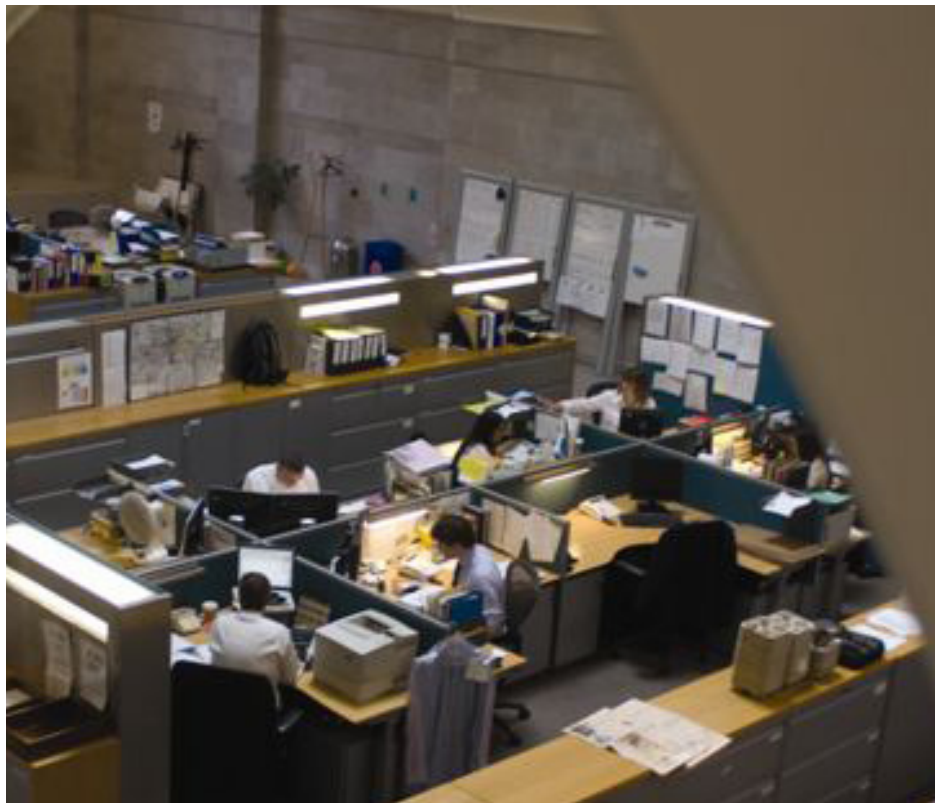Mike Kearney

October 2014
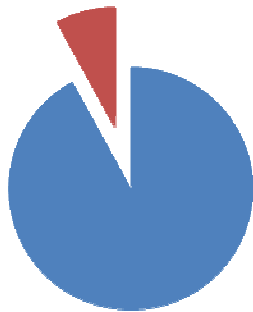
Inside focus or outside focus?

External focus requires management and analysis of external data

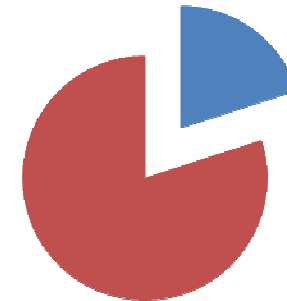Challenge: determine your organisation's current dependence on internal data, and consider whether increasing use of external data might deliver value

BusinessWeek

THE MAN WHO INVENTED
MANAGEMENT
Why Peter Drucker's
ideas still matter
BY JOHN A.BYRNE (P. 96)

"All the data we have so far focus inward. But **inside an enterprise** - indeed even inside the entire economic chain - **there are only costs**. The only profit center is a customer whose check hasn't bounced. But as regards **the outside** (customers, and, equally important, noncustomers; competitors and, equally important, noncompetitors; currencies; economies; and so on), **we have virtually no data**.

We can already discern and define the next task in developing an effective information system for top management: the collection and organization of **OUTSIDE**-focused information."

The Next Information Revolution, August 1998
Peter Drucker, 19 Nov. 1909 - 11 Nov. 2005

www.sjtech.com/Peter%20Drucker%20%20the%20Next%20Information%20Revolution.pdf

Agenda

- Some dimensions of a decision

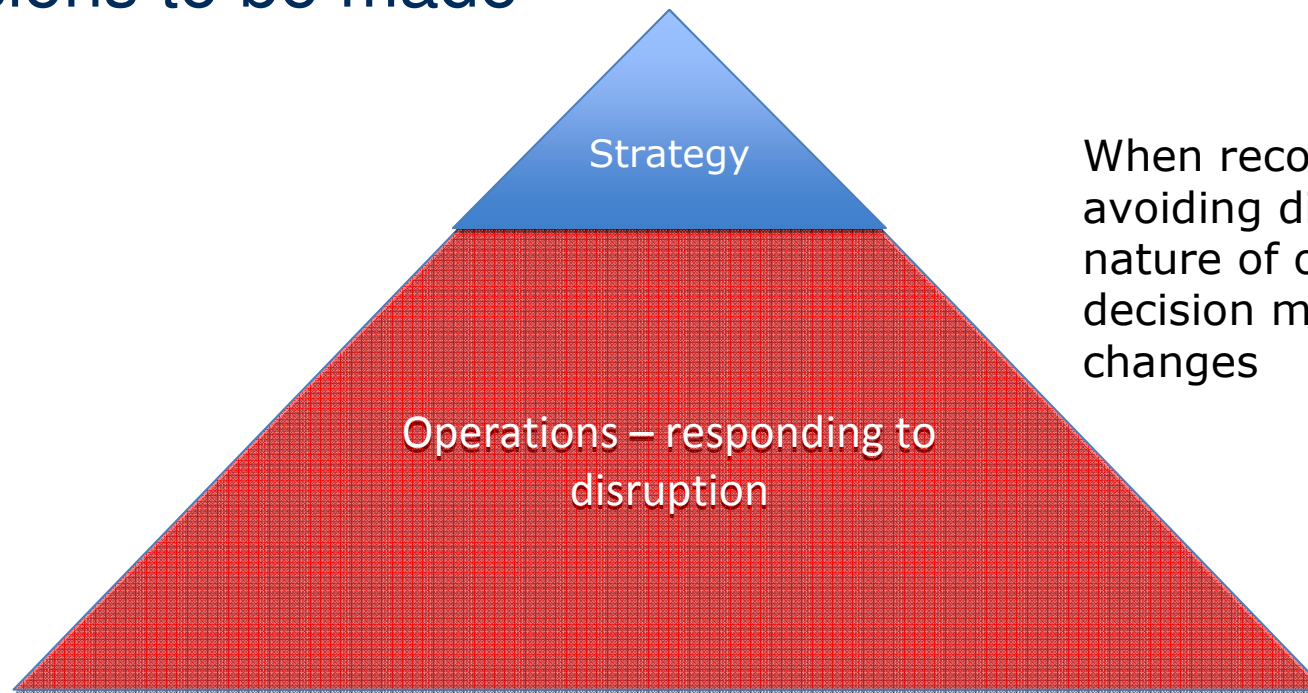- New decisions, new value - customer case studies

- Concluding remarks

The steady state organisation

Strategy

Operations

process of decision
making differs at
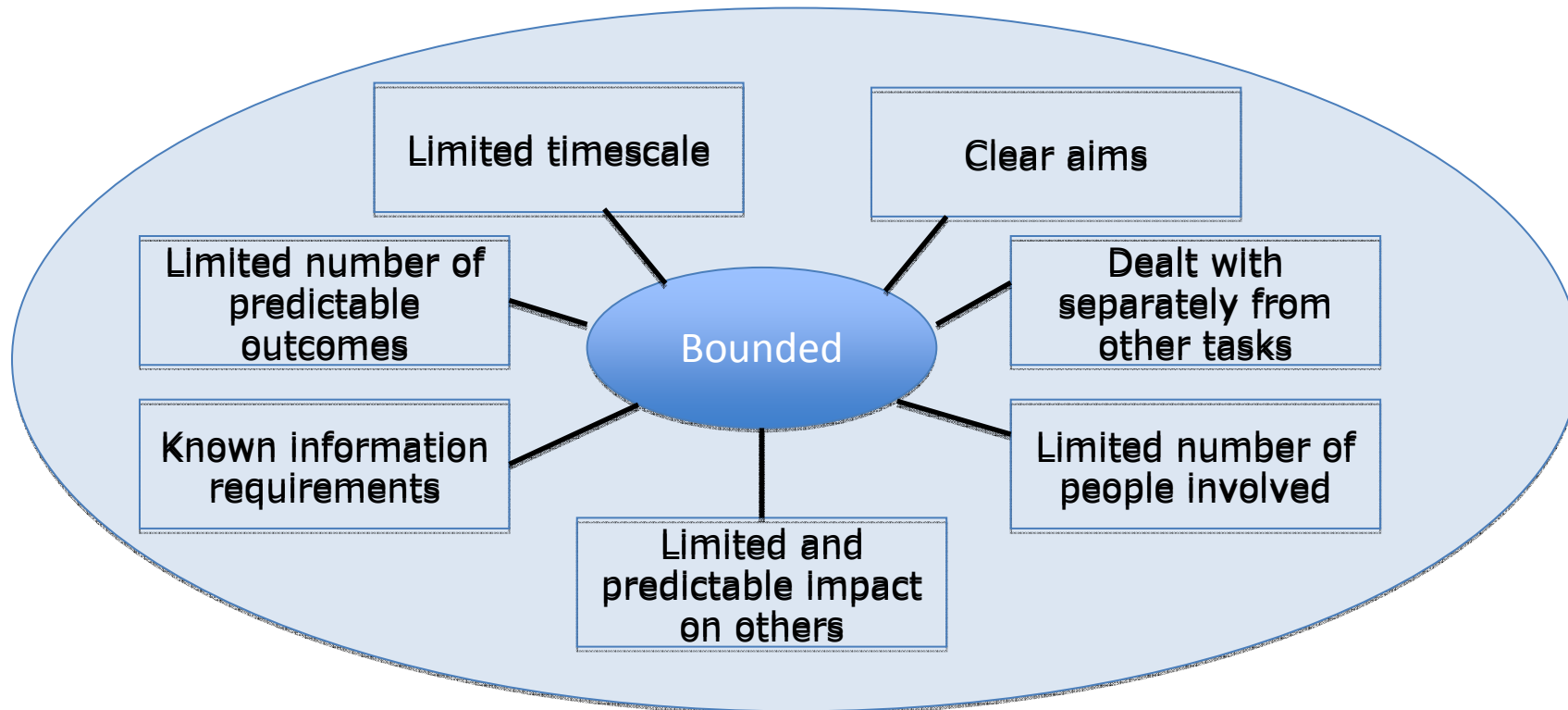different levels of an
organisation

Organisation recovering from disruption – different decisions to be made

Strategy

Operations – responding to disruption

When recovering or avoiding disruption the nature of operational decision making changes

Bounded decisions

Limited timescale

Clear aims

Limited number of predictable outcomes

Dealt with separately from other tasks

Bounded

Known information requirements

Limited number of people involved

Limited and predictable impact on others

Unbounded decisions

Tangled with other decisions

Uncertain but greater impact on others

Unpredictable outcomes

Unbounded

Unclear aims

Unknown information requirements

Uncertain timescale

Greater number of people involved

Source: OpenLearn at http://labspace.open.ac.uk/mod/resource/view.php?id=419620

Value of decision depends on role of decision makers
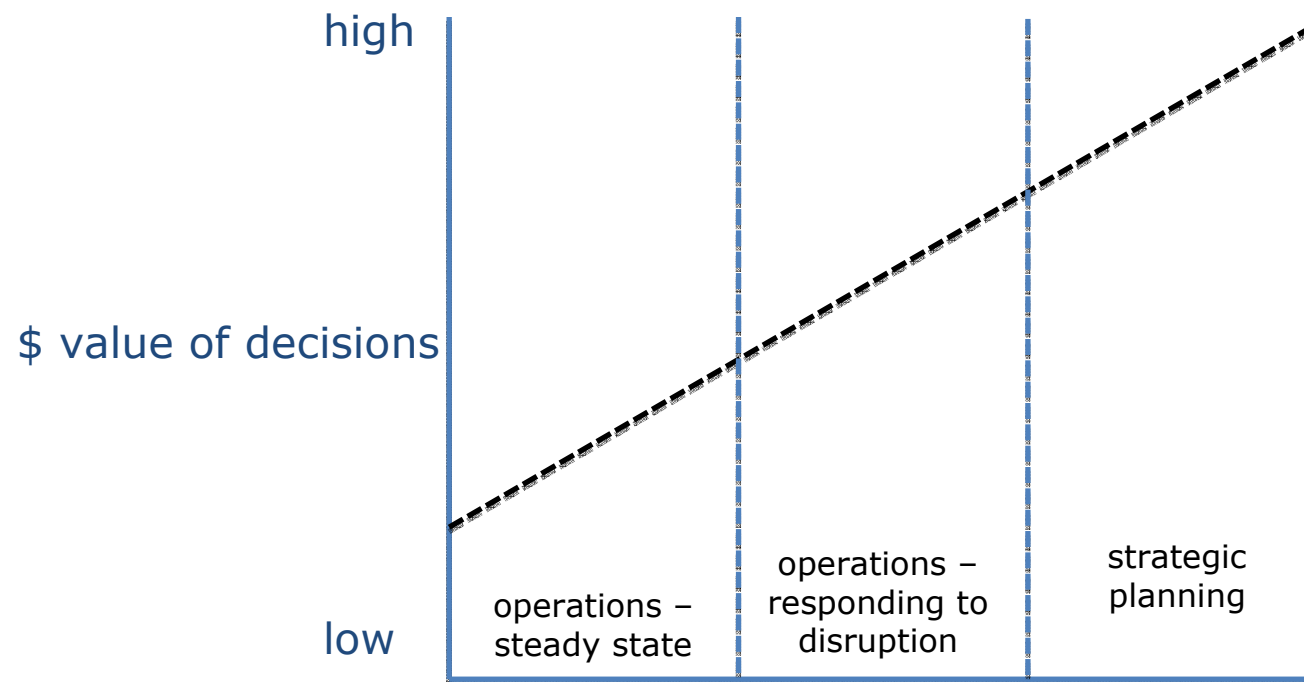
Volume of decisions depends on role of decision makers
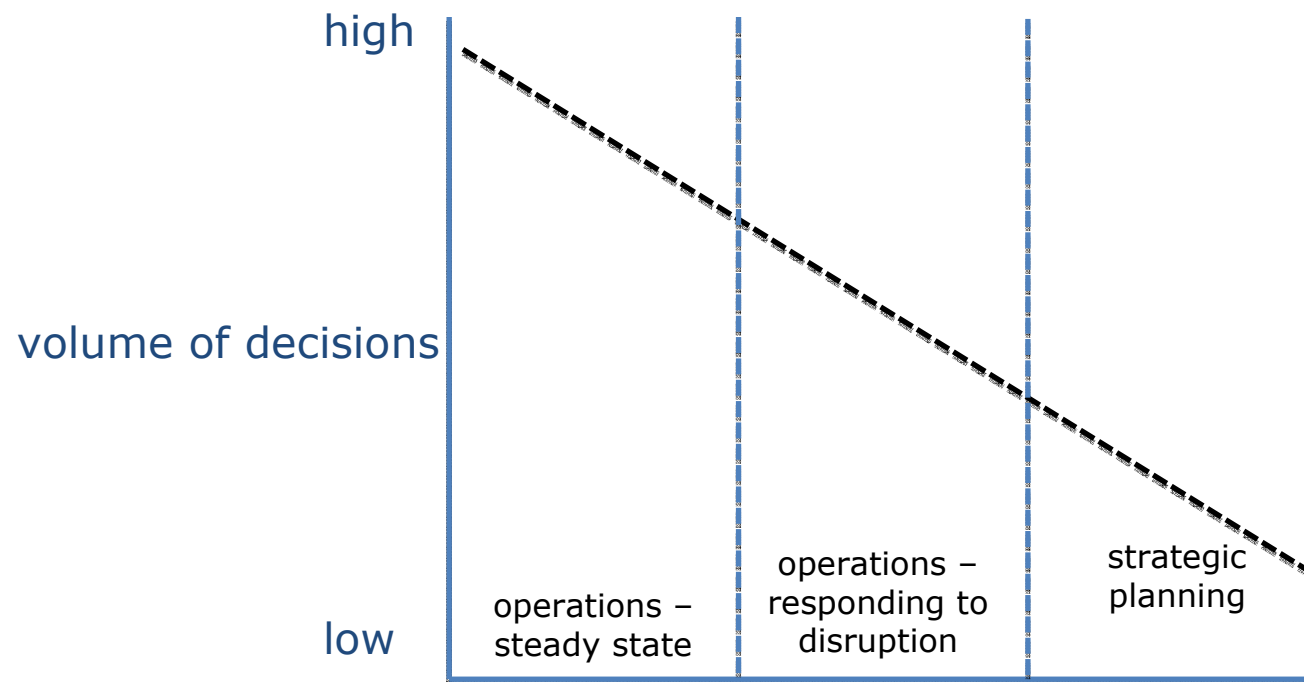
volume of decisions

high

low

operations –
steady state

operations –
responding to
disruption

strategic
planning

Agenda

- Some dimensions of a decision

- New decisions, new value - customer case studies
  - operational decisions: steady state
  - operational decisions: responding to disruption
  - strategic decisions

- Concluding remarks

Personalised digital marketing at Catalina Marketing

CONSUMERS IGNORE 98% OF WHAT THEY SEE WHILE SHOPPING

www.youtube.com/watch?v=M0t-Q8sVurQ&list=UU58XupIpHJ2YRzTQ86XQCqg

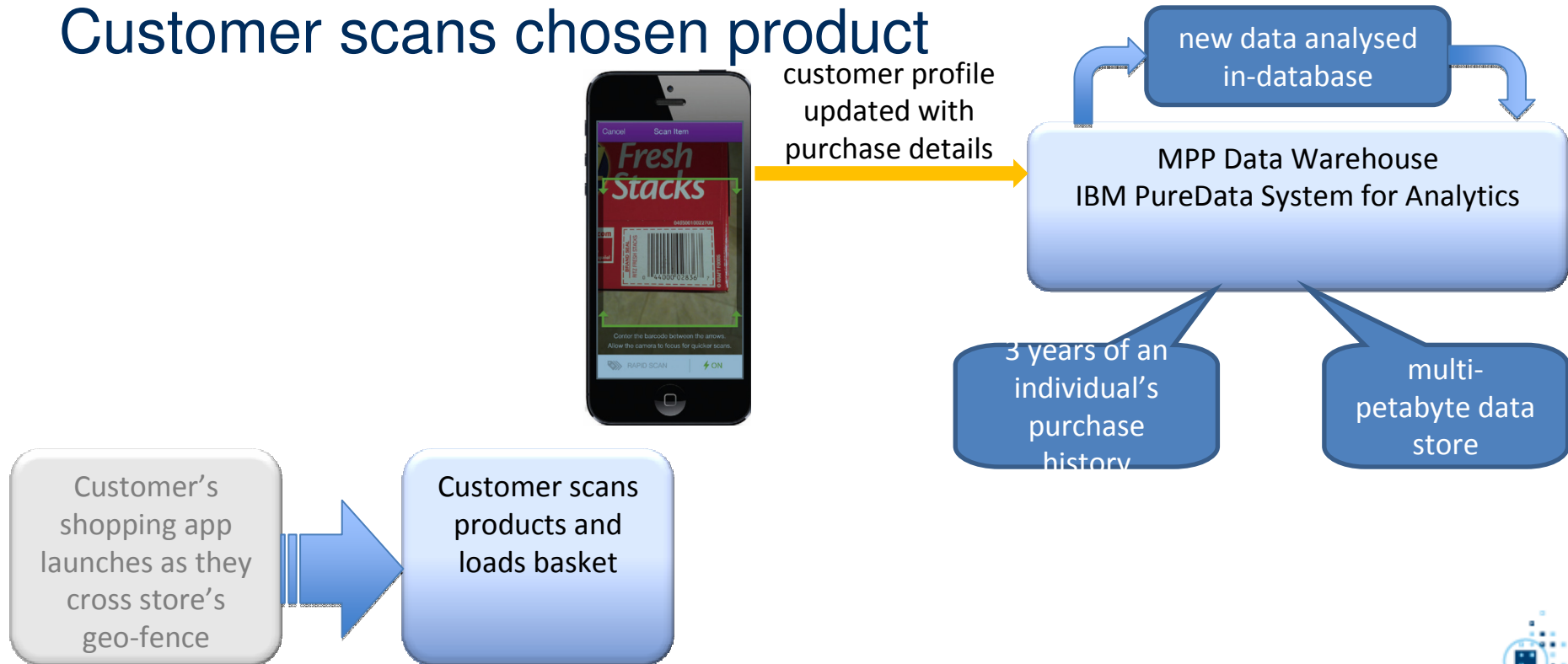# Shopping app launches automatically

Customer's shopping app launches as they cross store's geo-fence

Customer scans chosen product

IBM

new data analysed
in-database

customer profile
updated with
purchase details

MPP Data Warehouse
IBM PureData System for Analytics

3 years of an
individual's
purchase
history

multi-
petabyte data
store

Customer's
shopping app
launches as they
cross store's
geo-fence

Customer scans
products and
loads basket

Campaigns delivered to the point of decision

customer profile updated with purchase details

Save 75¢

on any TWO (2) EZ-Open cans
of StarKist Autentico Tuna

Limit 4

MPP Data Warehouse

offer sent to customer in real-time

increases spend per visit by up to 8%

4.6 million personalised offers per month

Customer's shopping app launches as they cross store's geo-fence

Customer scans products and loads basket

Catalina creates offers in real-time

Customers prefer self-checkout
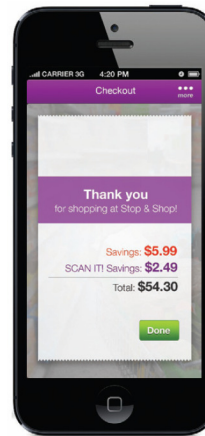
lowers front-end labour costs by 10-15%

| Customer's shopping app launches as they cross store's geo-fence | → | Customer scans products and loads basket | → | Catalina creates offers in real-time | → | Customer checks-out own basket and pays via app |
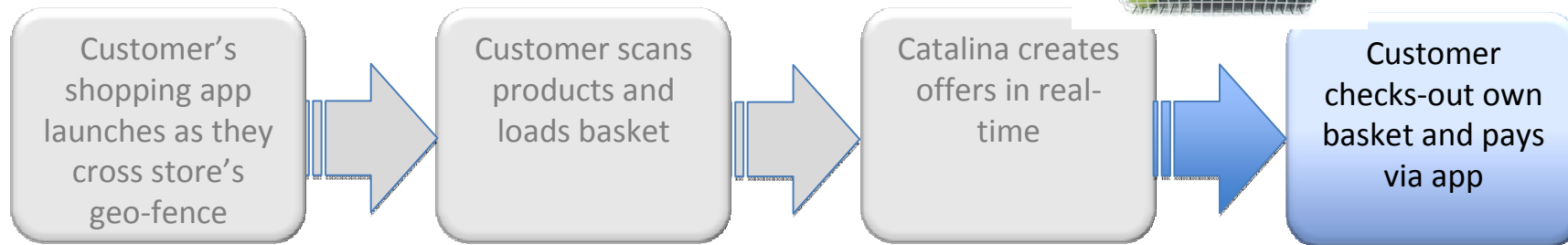
Transforming business at Catalina Marketing

IBM

no targeting

1% offer redemption rate

basic targeting e.g., offer dog food coupon to customer buying dog food

6-10% offer redemption rate

personalised coupon printing post-sale using predictive models to find latent correlations

25% offer redemption rate

personalised offer delivered to smart phone in aisle at point of product display

40-60% offer redemption rate
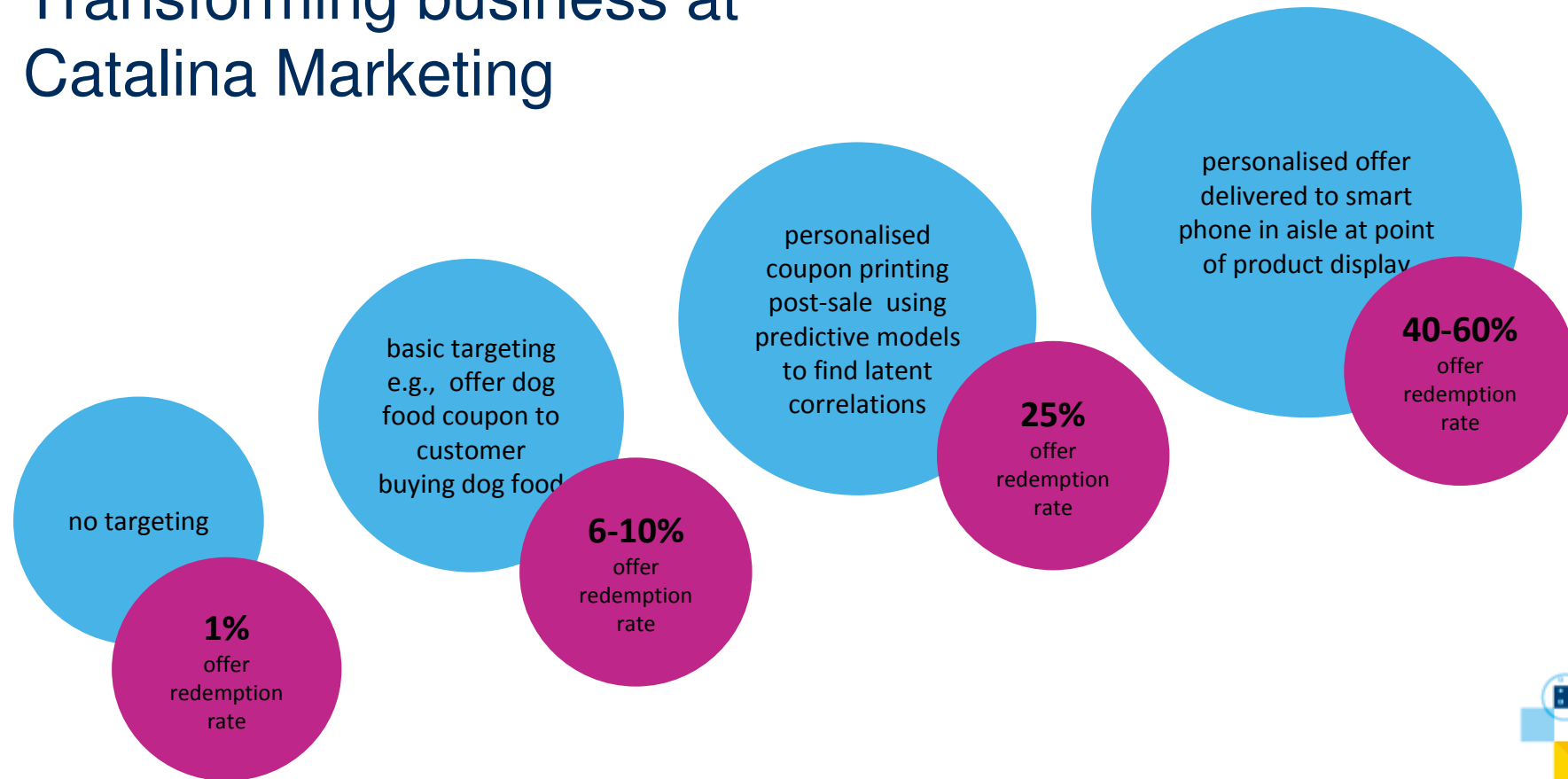
Operations - Steady State

Decision Profiling
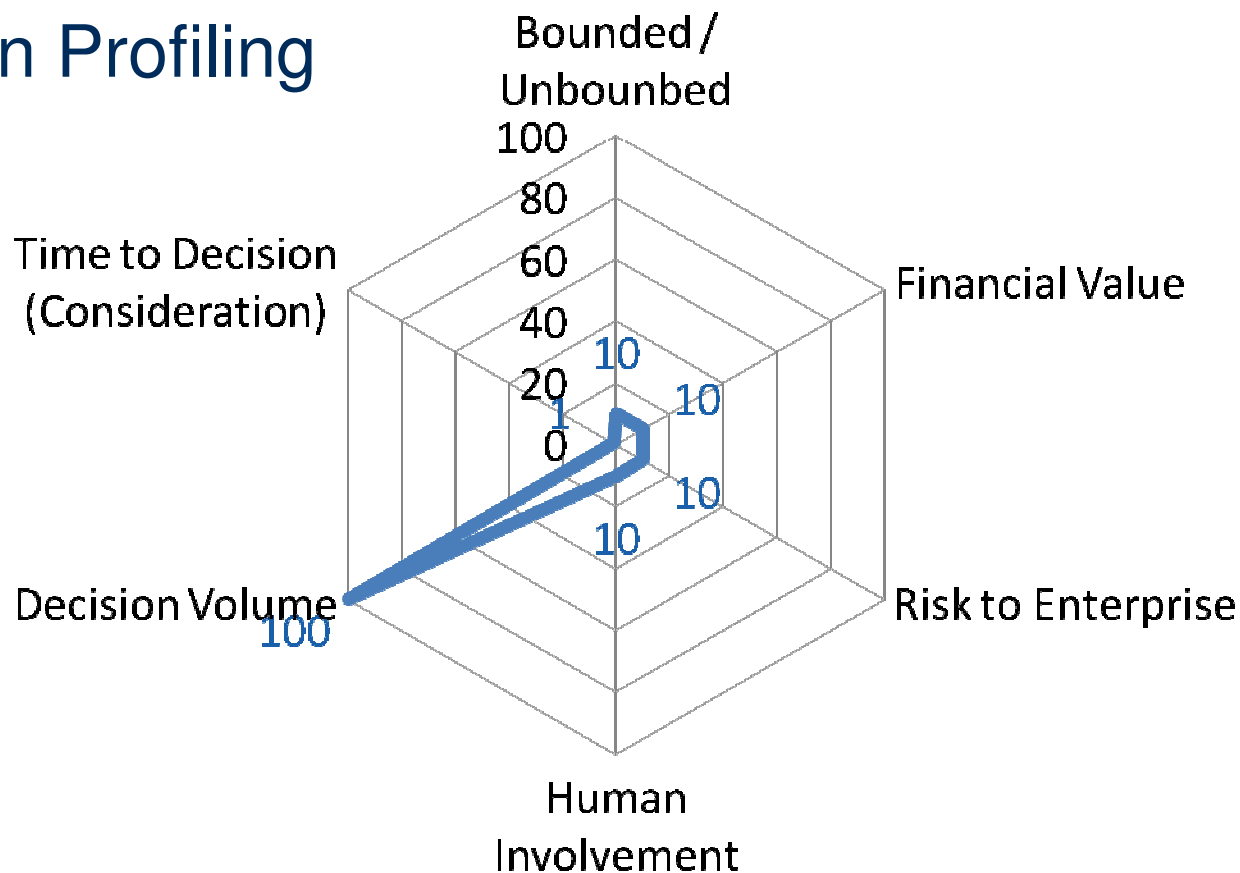
Steady state decision process: automated
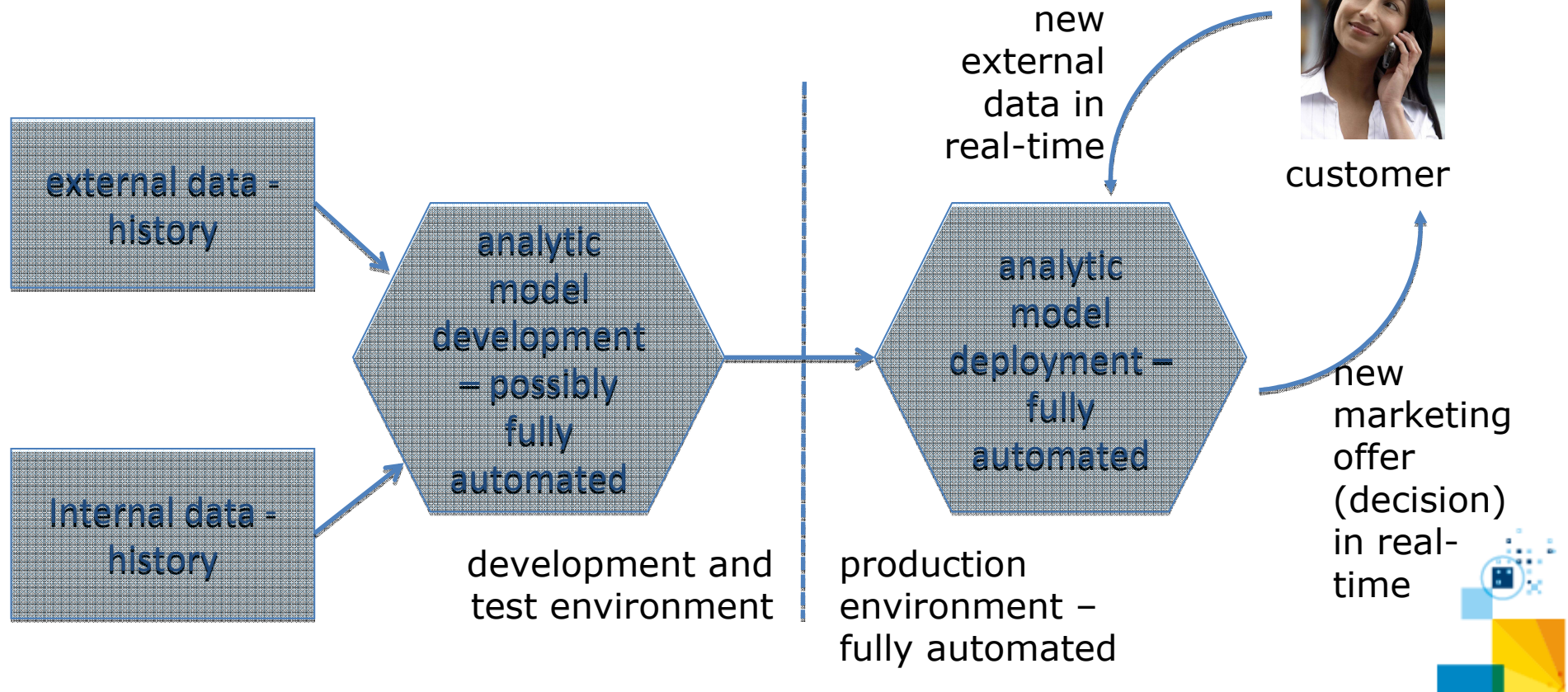
IBM

external data - history → analytic model development – possibly fully automated

Internal data - history → analytic model development – possibly fully automated

development and test environment

analytic model deployment – fully automated

production environment – fully automated

new external data in real-time → customer

new marketing offer (decision) in real-time

Agenda

- Some dimensions of a decision

- New decisions, new value - customer case studies
  - operational decisions
  - operational decisions: responding to disruption
  - strategic decisions

- Concluding remarks

Scale of disruption within US electricity grid

Year	Total number of outages	People affected
2008*	2,169	25.8 million
2009	2,840	13.5 million
2010	3,149	17.5 million
2011	3,071	41.8 million
2012	2,808	25.0 million
2013	3,236	14.0 million

Eaton Blackout Tracker, USA annual report 2013 www.eaton.com/blackouttracker

* partial year data

Towards a self-healing electricity distribution grid

"We can ingest 2.3 million data points relative to residential customers, we can merge and aggregate that data in real-time, and make a determination as to the extent of that outage, the type of equipment we need to resolve the outage, where our crews are relative to that outage, and understand from a situational-awareness perspective just how great an issue or potential issue we may have.

Ultimately we want to be able to recognise issues in our system before power outages occur and route around them.

We have reduced carbon emissions by 5,400 metric tonnes and lowered costs to consumers by $24 million."

Dr. Steven Pratt
Corporate Technology Officer, CenterPoint

youtube.com/watch?v=s7CzeSlIEfI&list=PL7FnN5oi7Ez8ldFg0FYaHWnm_CTa2e0jT

Operations - Steady State
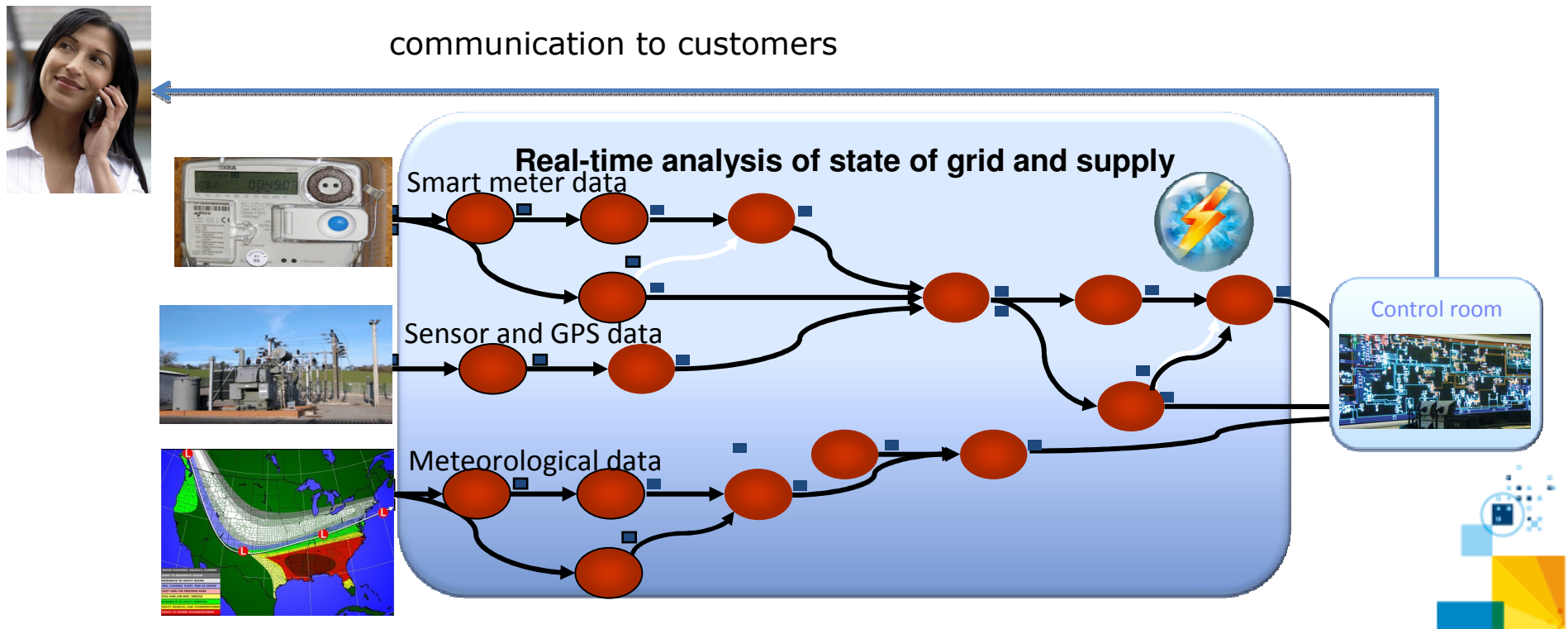
Operations - Responding to Disruption
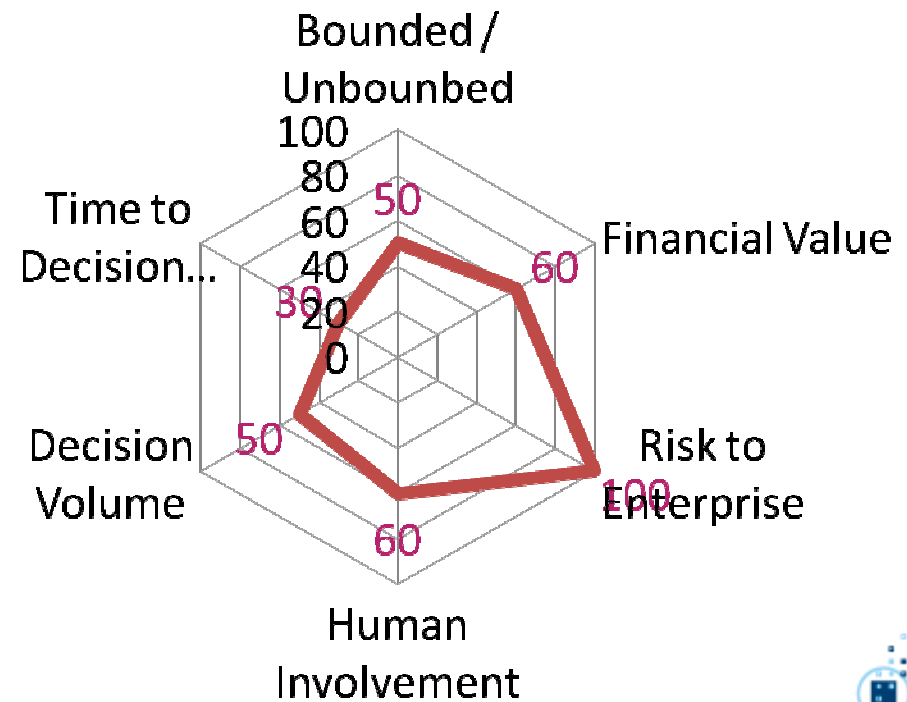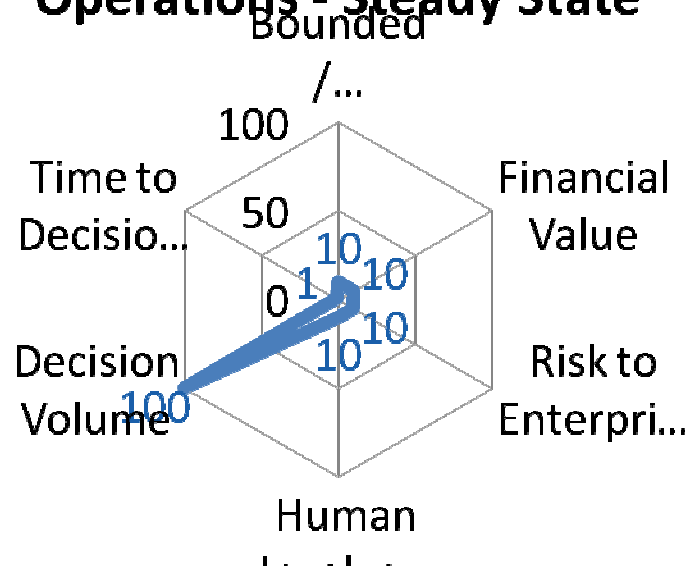
Responding to disruption decision process: real-time information and human operations

communication to customers

Real-time analysis of state of grid and supply

Smart meter data

Sensor and GPS data

Meteorological data

Control room

Agenda

- Some dimensions of a decision

- New decisions, new value - customer case studies
  - operational decisions
  - operational decisions: responding to disruption
  - strategic decisions

- Concluding remarks

Strategy

Derived from the Greek *strategos*, strategy deals with the planning and conduct of campaigns, the movement and disposition of forces, and the deception of the enemy.

www.princeton.edu/~achaney/tmve/wiki100k/docs/Military_strategy.html

"Three principles underlying strategy:

creating a unique and valuable market position,

making trade-offs by choosing "what not to do",

and creating "fit" by aligning company activities with one another to support the chosen strategy.

Professor Michael Porter, Bishop William Lawrence University Professor at The Institute for Strategy and Competitiveness at Harvard Business School

Impact of computing on strategic decisions

Peter Drucker, 19 Nov. 1909 - 11 Nov. 2005
The Next Information Revolution
published 24 August 1998

The computer would **revolutionize** the work of top management. It would have its greatest and earliest impacts on business policy, **business strategy**, and business decisions.

We could not have been more **wrong**.

Top executives have not used the new technology because it has not provided the information they need for *their own tasks*.

The more inside information top management gets, the more it will need to balance it with **outside information** - and that does not exist as yet

Within the next 10 to 15 years, developing this data is going to be the **next information frontier**.

Executives challenge data

When it comes to the balance of intuition and reason, the most revealing survey finding derives from the question: "When taking a decision, if the available data contradicted your gut feeling, what would you do?" By far the most popular response, with 57% of the sample, is "Reanalyse the data". This is followed by "Collect more data", chosen by 30%. Only 10% of respondents say they would "Take the course of action suggested by the data".

Decisive action: How businesses make decisions and how they could do it better
Economist Intelligence Unit
June 2014

CHART 2: When taking a decision, if the available data contradicted your gut feeling, what would you do?

- 3%
- 10%
- 30%
- 57%

■ Take the course of action suggested by the data
■ Collect more data
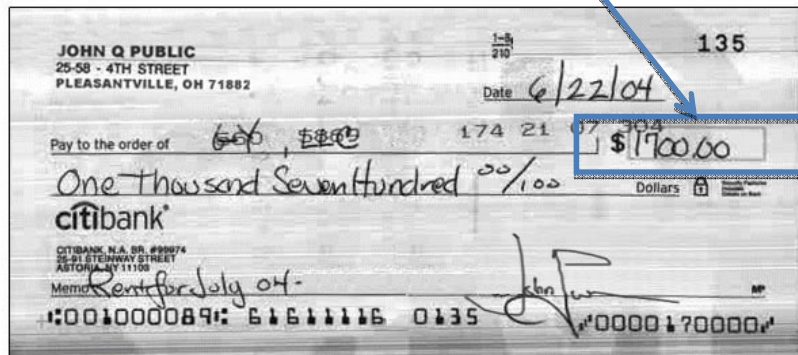■ Reanalyse the data
■ Ignore the data
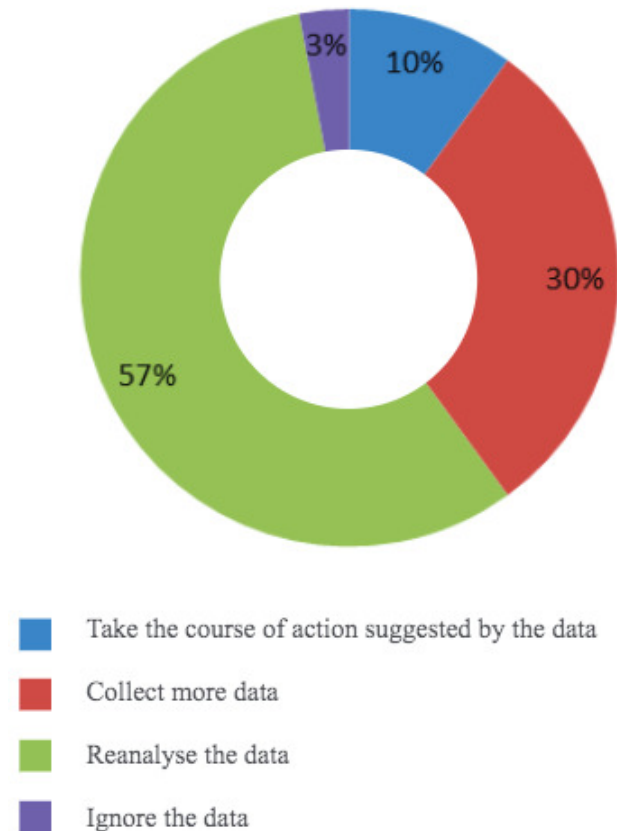
A global Bank

- Ten years of transactional history

- 30 petabytes of online data and more than 2 exabytes on-demand from tape

- Driving business value from this wealth of data to better:

  - Know your customer

  - Know your market

  - Know yourself

A transaction: internal focus on account balance
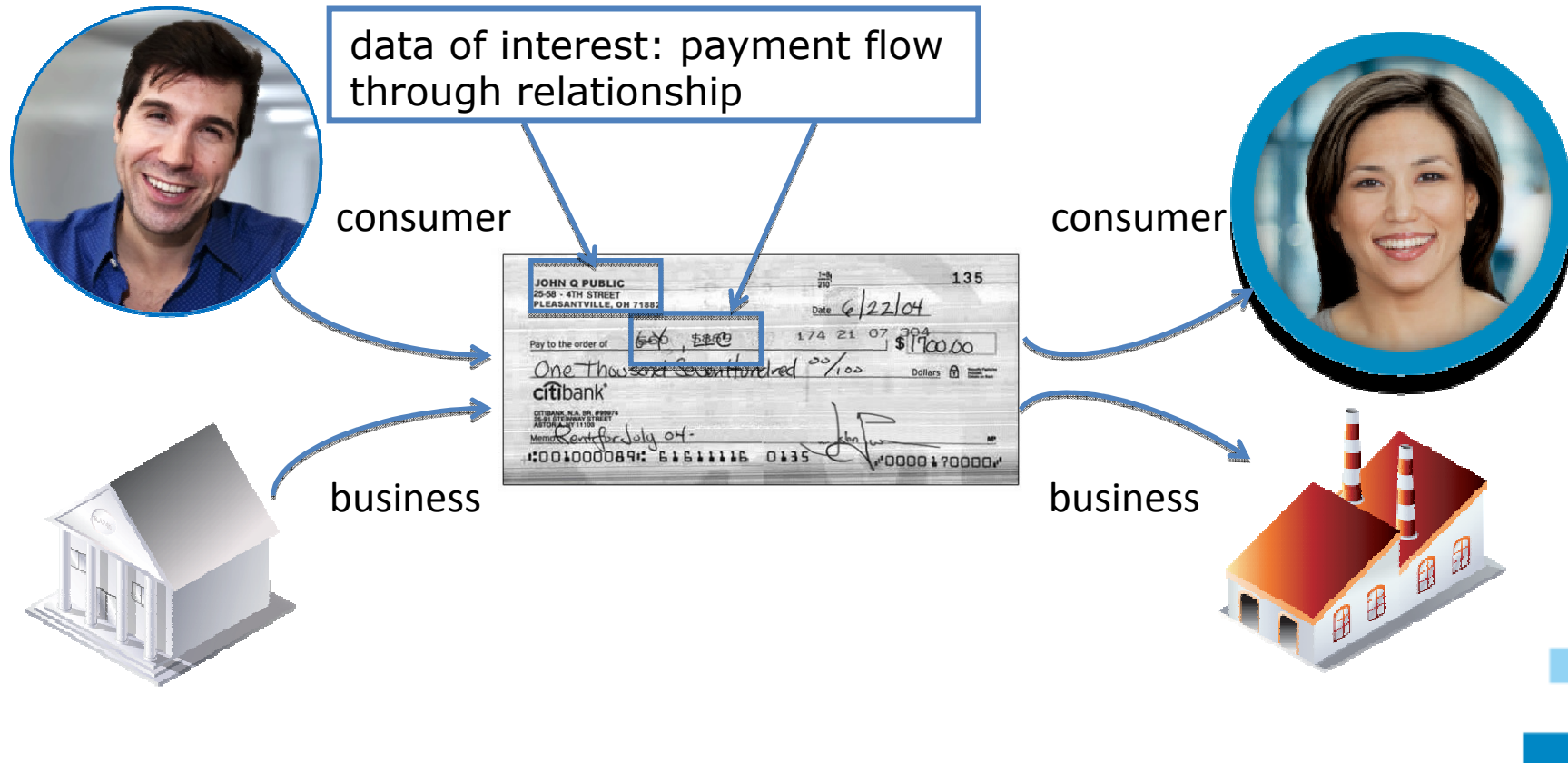
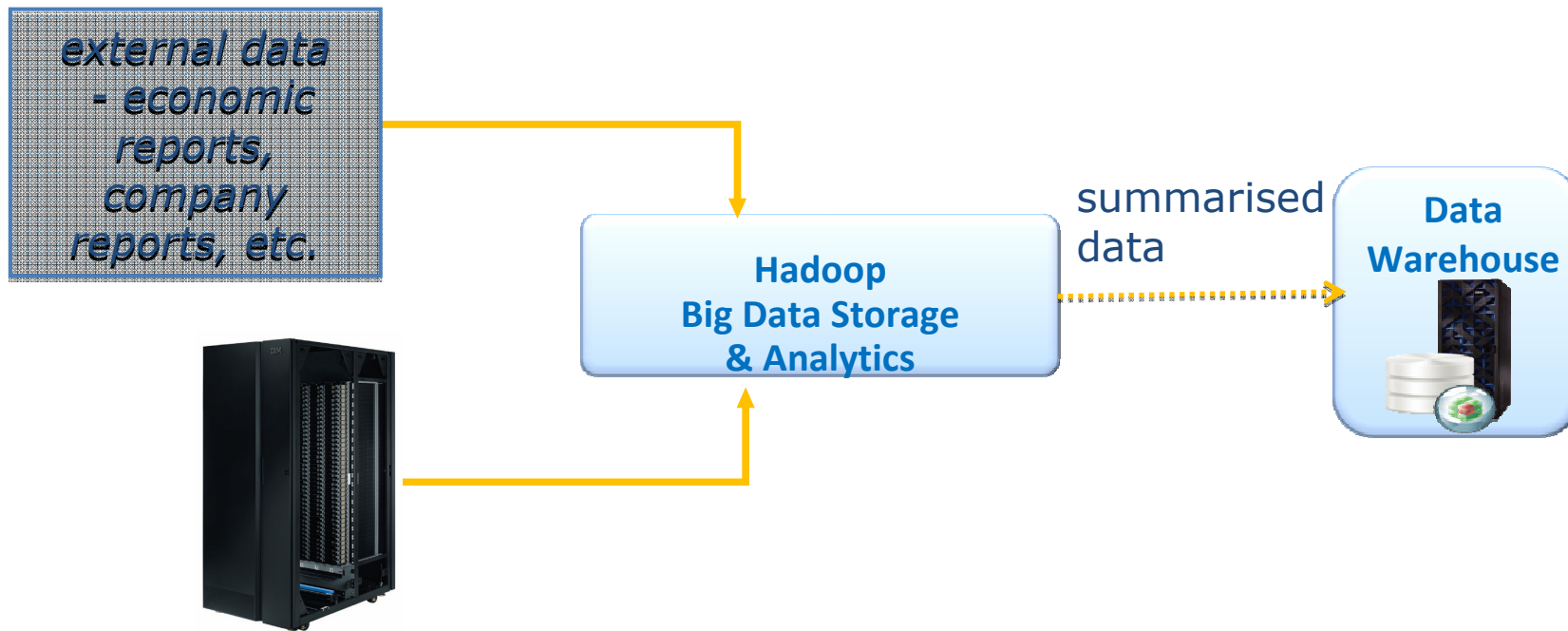data of interest: dollar value

Your Bank Balance Sheet

Opening Balance	$40,000
Transactions	-$1700
Closing Balance	$38,300

A transaction: external focus on payment flows

data of interest: payment flow through relationship

consumer

consumer

business

business

Bank's big data implementation
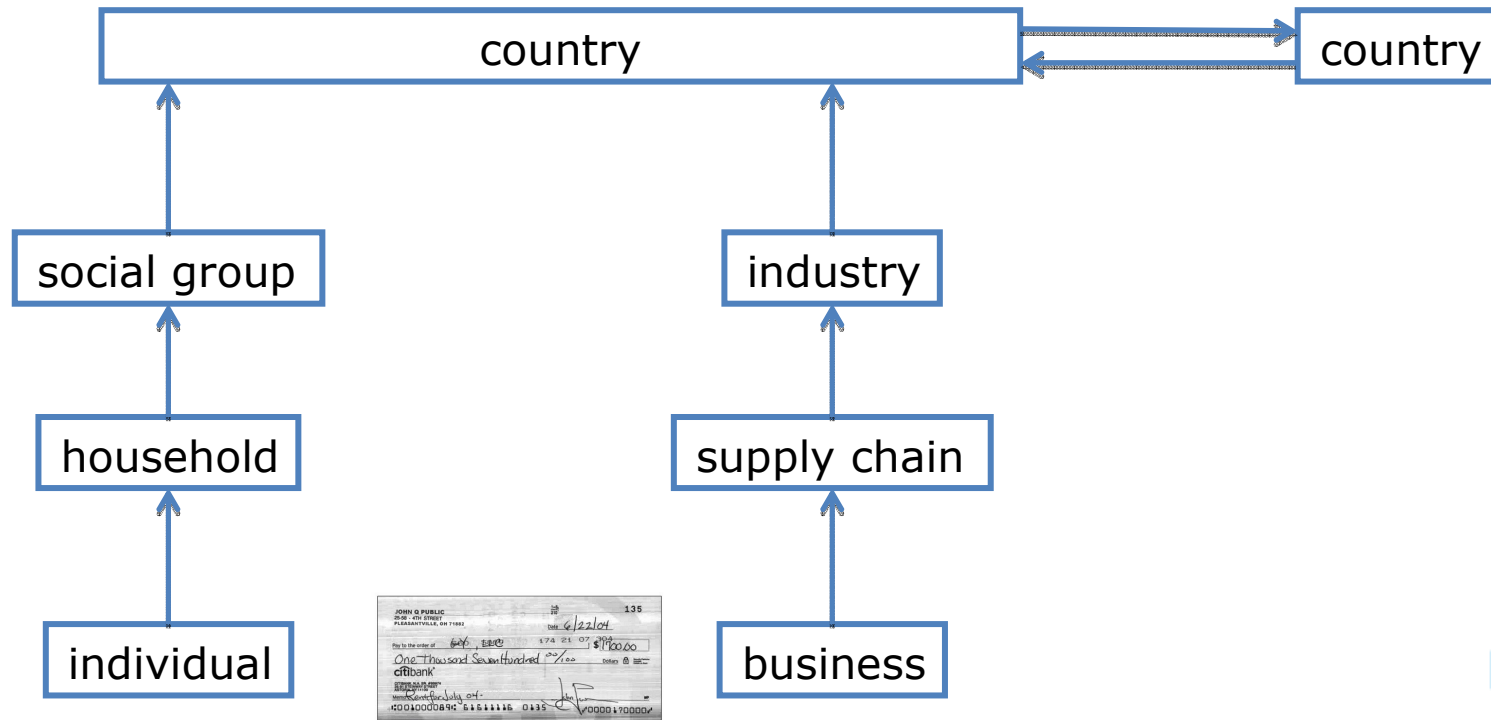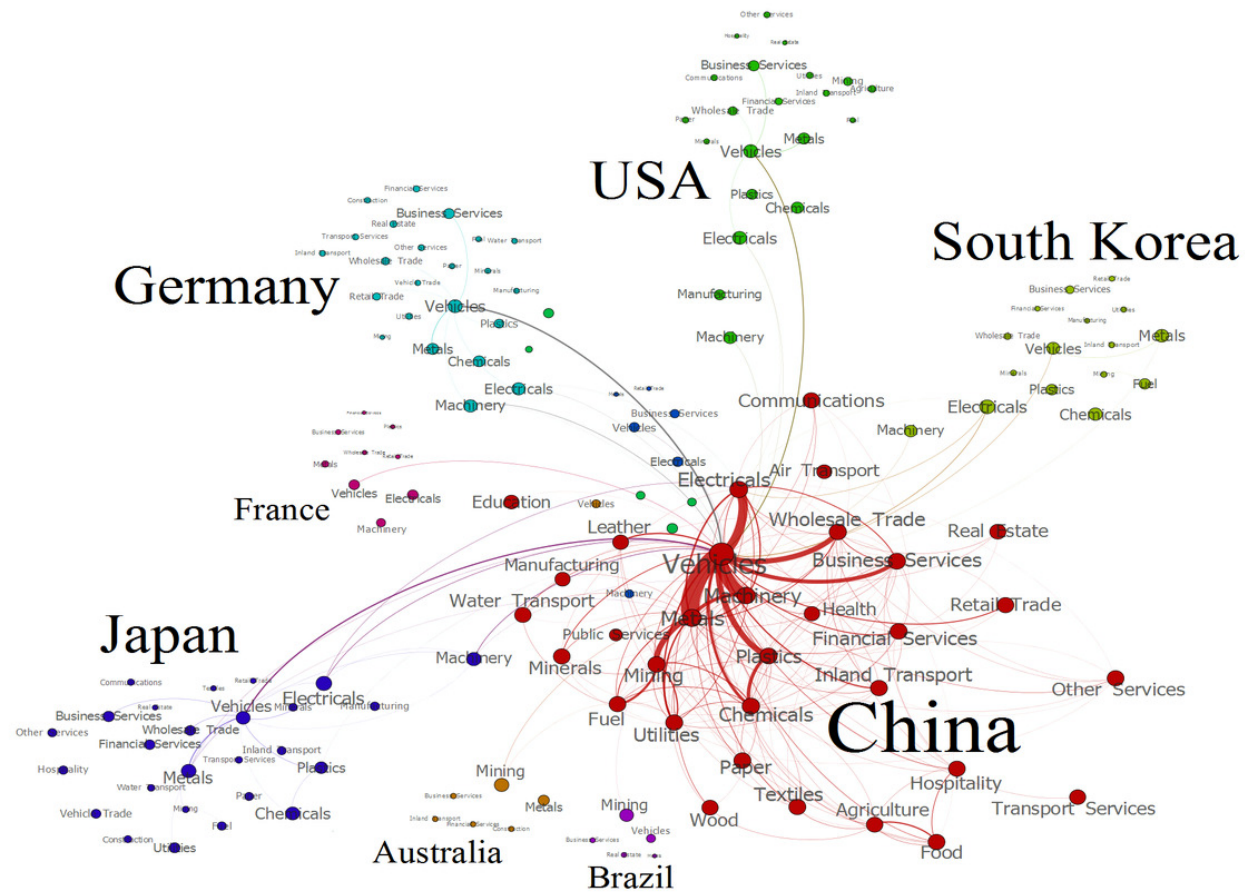
Power of aggregation: from transactions to macro-economics

Source: Data-Driven Economics by Rob Levy August 2014 at
http://aidcomplexity.blogs.casa.ucl.ac.uk/category/visualisation/

Data-driven strategy at a global bank

Eliud Polanco
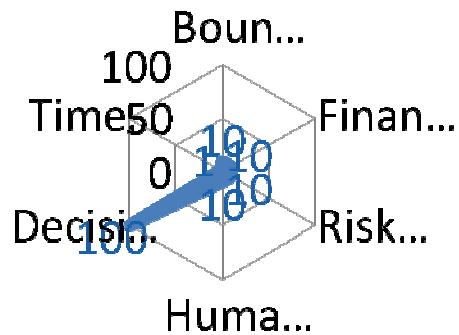Director of Data Innovation, Citi

*"What are the trade flows in and out of **countries**?*
*What **sectors** are driving flows in and out?*
*How do we create new models of **country risk**?*
*What markets should we be **investing** in?*
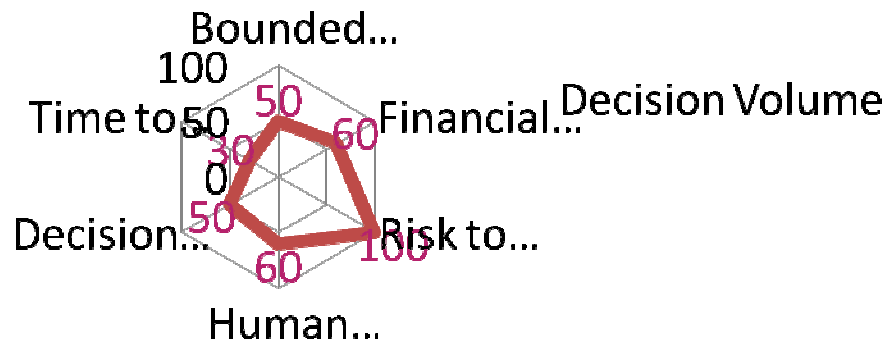*What market should we be **divesting** from?"*

youtube.com/watch?v=6wY6CkRncoY&list=PL0hKkrT8yJOl1a3Xrrqs8jfVFEslwLJqD&index=1
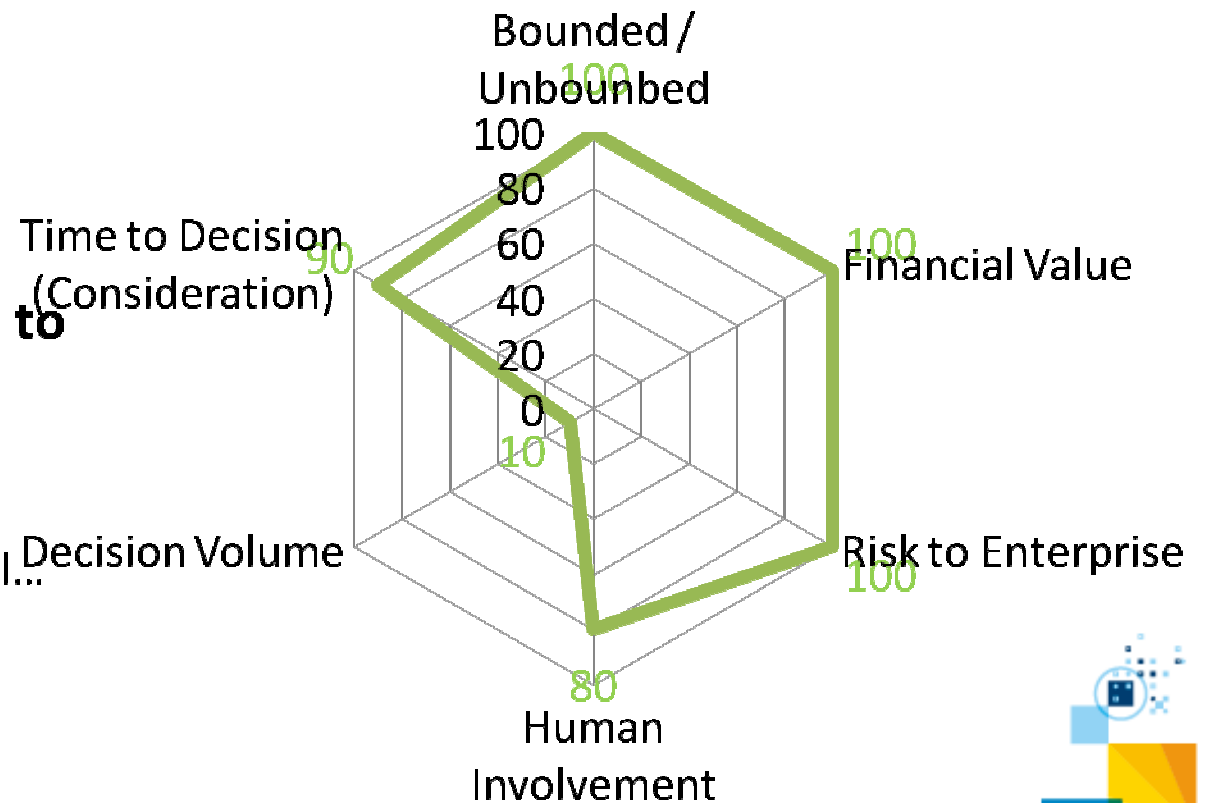Eliud's presentation starts 41 minutes in to video stream

Operations - Steady State

Radar chart axes: Boun…, Finan…, Risk…, Huma…, Decisin…, Time
Values: 100, 0, 50, 100, 10, 100, 100

Operations - Responding to Disruption

Radar chart axes: Bounded…, Financial…, Risk to…, Human…, Decision…, Time to
Values: 50, 60, 100, 60, 50, 30

Strategic Decisions

Radar chart axes:
- Bounded / Unbounded — 100
- Financial Value — 100
- Risk to Enterprise — 100
- Human Involvement — 80
- Decision Volume — 10
- Time to Decision (Consideration) — 90

Scale: 0, 20, 40, 60, 80, 100

IBM

Strategic decision process: data as evidence
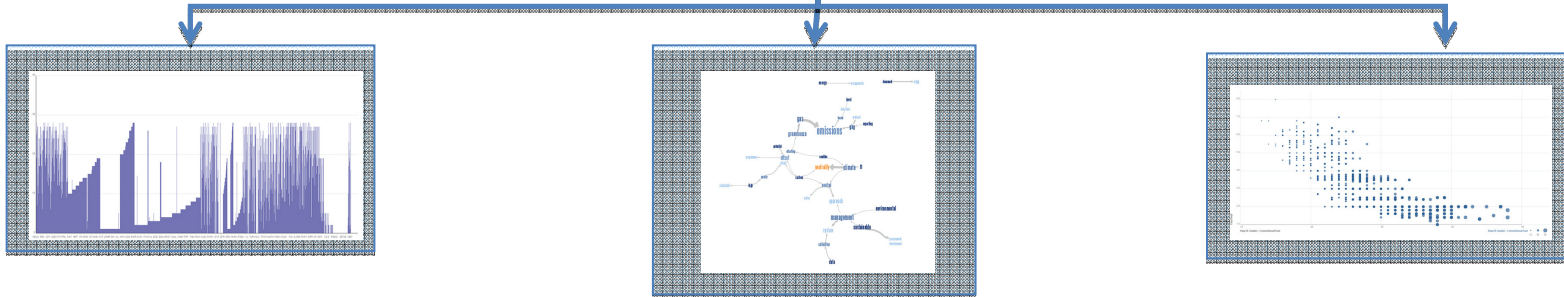
Concluding thoughts

- Adopting an external view and external data sources can be transformative

- Currently more evidence for transformative potential of big data at the operational level …..

- …… but greater gains may be available when external data drives strategic decisions

- Not all decisions are equal – consider how best to deliver analyses