New insights into customer behavior and value

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Agenda

- Technology, big data and disruption

- Data-enabled decision-making
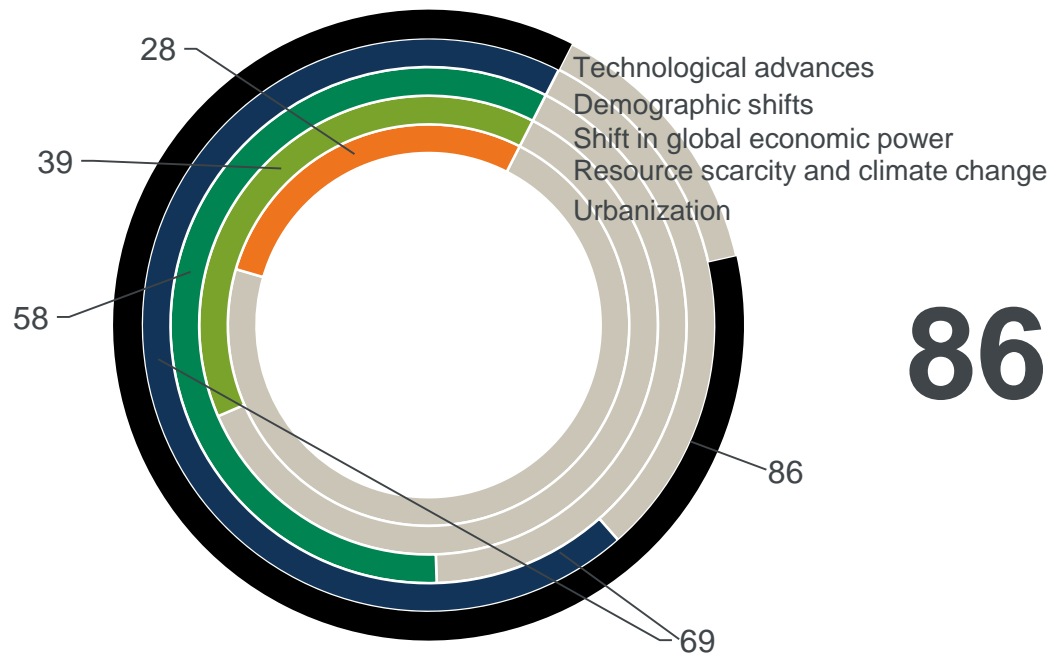
- Customer behaviour insights through analytics

Technology, Big Data and Disruption

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5 Forces Transforming Our World

Trends that will transform business in the next 5 years (%)

28
39
58
86
69

Technological advances
Demographic shifts
Shift in global economic power
Resource scarcity and climate change
Urbanization

86% of CEO's say 'Technological advances' will be the top driver transforming their business in the next five years.
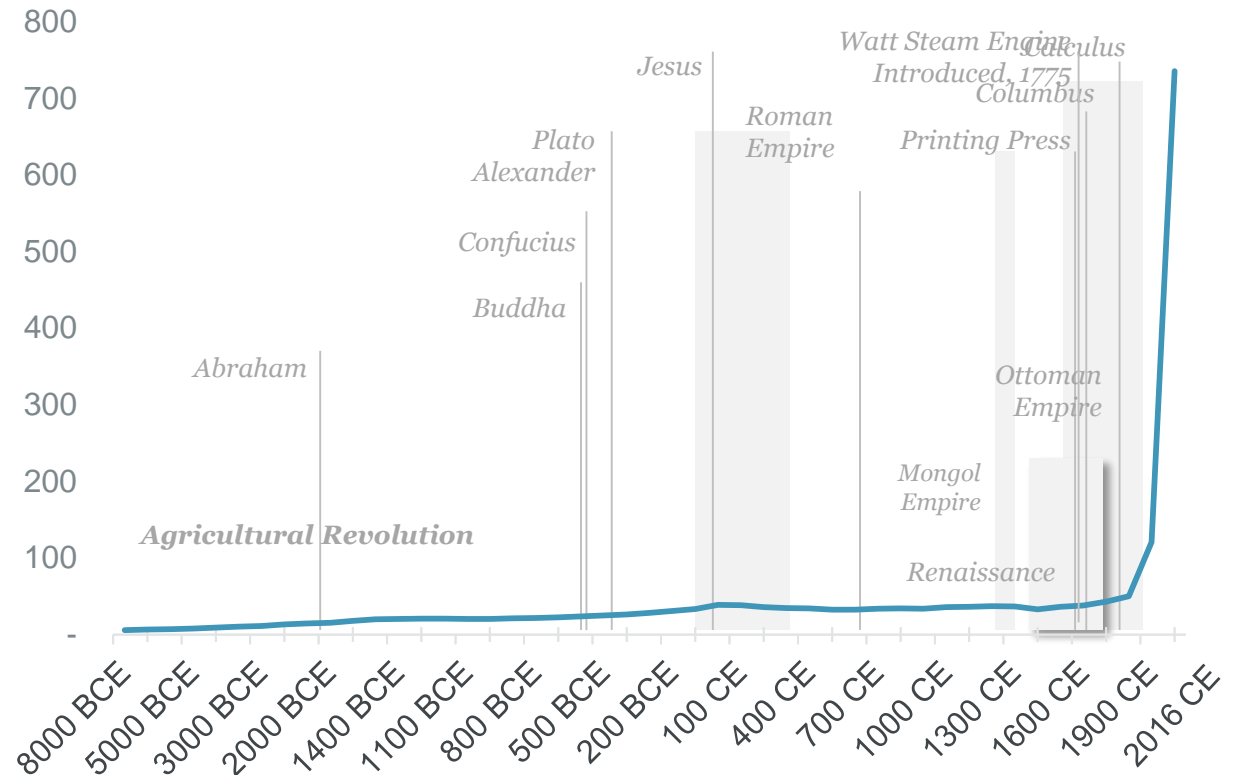
Source: PwC CEO Survey, 2014

Human Social Development

The First Machine Age (The Industrial Revolution)

The steam engine was "the biggest and fastest transformation in the entire history of the world"

- Ian Morris -

The Human Social Development Index

Source: Ian Morris,
Social Development, Stanford University

Are we in a Second Machine Age?

An Accelerating Pace of Change

"Computers and other digital advances are doing for mental power … what the steam engine did for muscle power"

- Andrew McAfee -
- Erik Brynjolfsson -

Acceleration Laws Apply to Analytics and Data

Moore's Law

Computing power doubles every 18 months

- Gordon Moore -
Co-Founder of Intel

Exponential impact on:
- Transistors / Chip
- Gigabytes per $
- Internet speed
- Energy efficiency
- Supercomputer Speed

The Impact of Moore's Law

ASCI Red

Introduced in 1996
Cost: US$55 million
Size: 100 Cabinets, 1,600 Sq. Ft.

1997: 1.8 teraflops of speed

Sony Playstation 3

Introduced in 2006
Cost: ~US$500
Size: 1/10th of a sq. meter

2006: 1.8 teraflops of speed

The Digitization of Everything

Digitization is transforming how people discover, engage, and transact with businesses and with each other

Analytics is evolving to drive and support

New sources of data

New analytics techniques
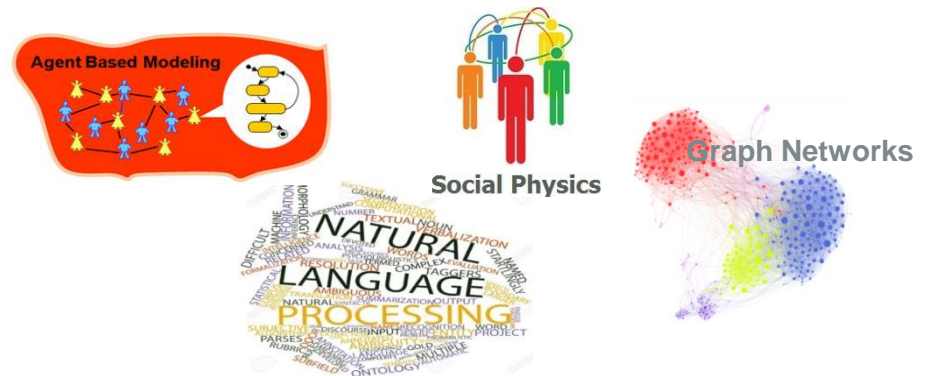
New emerging technologies

A word on AI…
Artificial Intelligence is a branch of computer science dealing with the simulation of intelligent behaviour in computers

Topic Areas within Artificial Intelligence (non-exhaustive)

Data-Enabled Decision Making

Spotlight: Customer and Marketing Analytics

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Applied data and analytics

What might happen next?

Predict

What happened and why?

Describe

What is the right answer for your clients business?

Optimise

Stage Two

Delivering:
- Change,
- Real-time intelligence,
- Assurance through Data and Analytics

Can you trust your data?

Trust

Is insight being delivered to the right people at the right time?

Empower

What value exists in your data?

Discover

How do our clients embed data analytics into their organisation?

Embed

Application: Customer and Marketing Analytics
The customer analytics framework

Acquire	Grow	Retain
New customers	My current customers into higher value	My most valuable customers

Customer Lifetime Value
Identify customers with the highest Lifetime Value

Digital and Experience Design
Design the right experience for the right customer

Campaign Optimization
Increase the effectiveness of campaigns

Channel Optimization
Select the right channels to effectively reach my current customers

Prospect Conversion Optimization	**Pricing and Profitability**	**Service Management**
Identify, prioritize prospects to increase conversion	Select the right pricing to optimize profitability	Minimize customer costs of servicing
Market Expansion	**Cross and Up-Selling**	**Churn and Win-Back**
Find new customers that bring highest Lifetime Value	Increase Lifetime Value through added and upgraded purchases	Minimize customer attrition and win-back lost customers
New Product Dev	**Product Portfolio Optimization**	**Loyalty Management**
Understand product ideas driven by customer need and wants	Ensure my portfolio is maximizing revenue across my customer base	Understand most effective ways to maintain loyalty

Analytics

Correlation Profiling	Cluster Analysis Prediction	Regression Segmentation	Conjoint Analysis	Data Aggregation	Behavioural Simulation	Machine Learning	Sentiment Analysis

Data Models

Demographics
Age, ethnicity, family lifecycle status, income, occupation, etc.

Macro-Economic
CPI, GDP, etc.

Social Media Data

Channel Performance
Client data – agent sales, store sales per square feet, etc.

Customer Lifestyles
Hobbies, pastimes, media preferences, etc.

Customer Usage & Preferences
Client data – purchase history, customer service history, etc.

Customer Servicing
Call center data, product issues/repairs/recalls

Life Events
Births, deaths, health, etc.

Application: Customer and Marketing Analytics
Customer Lifetime Value (CLV)

Value driven micro segments

Micro segments take into account product usage along with other behavioral characteristics to produce a clear understanding of how customers compare based on CLV.

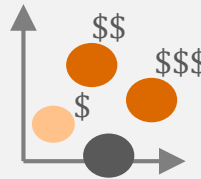**Gather PoS, CRM, and campaign data** → **Define patterns for each customer** → **Construct behavioural segmentation** → **Compute and validate CLV estimates**

Customer value paths

Predict changes in value over time per customer, and how this affects future product usage, segment affiliation, and ultimately loyalty and retention.

By forecasting changes in customer value over time, identify when to engage which customers to maximize the health of your portfolio.

Targeted customer interventions

Prioritize marketing spend and customer service efforts on those customers that signify the highest value at risk and greatest opportunity for gain (upsell and cross-sell).

Take the guesswork out of campaign and intervention strategies by prioritizing funds and resources on the highest value customers.

Application: Customer and Marketing Analytics
Churn Management

Life cycle of profit per customer

Profit

| Sales | Onboarding | Maturity | Proactive retention | Reactive retention |

1   *2*

Time

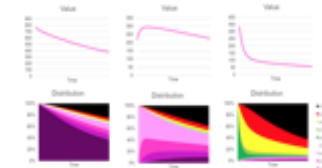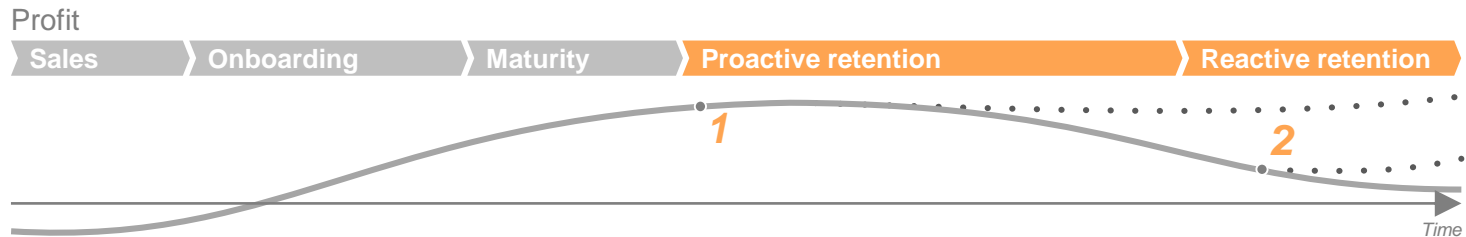|	**Proactive retention**	**Reactive retention**
Aim	• Interact with customers in advance to retain value *before* they discontinue a product or service • Create & sustain customer loyalty	• Interact with customers *after* they indicate their intention to discontinue a product or service • Create & sustain customer loyalty
Key process steps	• Predict churn risk for each customer per product or service • Implement campaigns and outreach programs to target high risk customers • Engage with channel representatives to implement customer interventions	• Established protocols for "customer save activities" • Train and incentivize customer service representatives • Monitor service channels and incorporate feedback as appropriate
Key enablers	• Customer data management • Predictive churn model • Value-at-risk segmentation • Integrated channel infrastructure and supporting tools • Quantitative and qualitative understanding of loyalty drivers	• Efficient processes for manage product or service terminations • Churning products past value and customer behaviour segmentation • Stand-alone infrastructure and supporting tools • Quantitative and qualitative understanding of loyalty drivers
Best practice principles	• Proactive churn management requires the engagement of the entire organization across each and every channel, *integrating processes, tools, and retention strategies* across departments	• Reactive churn management requires requires *effective communication* between individual channels to drive efficiency across individual retention strategies

Application: Customer and Marketing Analytics
Elastic pricing

Understanding individual expectations about the split between interest, commission and insurance is crucial.

	Bank's profit
Insurance premium	
Commission	
Interest rate margin	
Fixed or variable interbank offered rate	
Cost of capital, risk, acquisition	
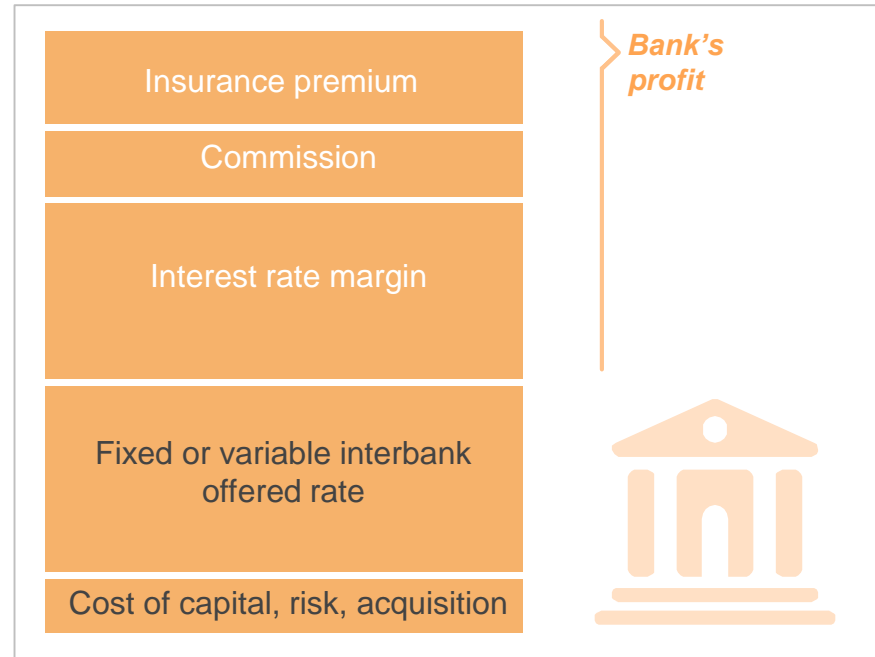
Why is it important?

Seniors might look at instalment value while younger people will compare interest rates

Customer behaviour insights through analytics

Case Study #1

Behavioural simulation to explore lapse behaviour in participating business

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Behavioural Simulation
Irrationality in the eye of the beholder

- **Understanding the customer requires knowledge of how behaviours change across the lifecycle.**

- **Customers do not fit neatly into demographic segments, such as age, income, and wealth.**

Life Events
- Getting married
- Buying a house
- Having a child
- Retiring

Choices
- Rational
- Behavioral
  - Mental accounting
  - Joint decision making
  - Financial literacy

Income Statement
- Salary
- Expenses
  - Nondiscretionary
  - Discretionary
  - Health costs

Balance Sheet
- Assets
  - Home
  - Financial assets
- Liabilities
  - Mortgage
  - Personal debt

Asset Cycle

Accountholder Life-Cycle Stages

| Dependents | Single and 'Rich' | Growing Family | Pre-Retiree | Retiree | New Generation |

Advice

Liability Creation

Asset Creation

Asset Creation

Asset Depletion

Asset Protection

Asset Transfer

Asset Preservation

Life Events

- Paying off student loans
- Starting a career
- Getting married

- Paying tuition bills
- Caring for parents
- Planning for retirement

- Buying a home
- Having or adopting children

- Withdrawal money for retirement
- Paying for health care
- Creating a legacy

Behavioural Simulation
Synthetic populations used to learn about the policyholder

Combining "deep and narrow" data with "shallow and broad" data at a household level enables us to understand complete consumer balance sheets.

Using various statistical techniques, internal data can be combined with external data to give a more complete view.

Narrow and Incomplete Datasets

Broad and Shallow Data

Synthetic Households

+

=

Household data
• Thousands of records
• Thousands of variables

Policyholder data
• Millions of policyholders
• 10's of variables

Advanced statistical techniques

Synthetic households
• Thousands of households
• Thousands of variables

Client account balances & product details	Detailed demographic information	
Basic demographic information	Complete household balance sheet	Full household dataset with realistic distributions both across and within households – representative of population
Rich transactional data	Rich behavioural and attitudinal data	

Behavioural Simulation
Sophisticated modelling to perform simulation

Artificial Intelligence
Cognitive thought through machines

+

Complex Systems
Emergent system behaviour from individual actions

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Computational Power
Rapid cycle-time for intensive calculations

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Agent Based Modeling

Sophisticated, computationally intensive modeling technique that relies upon a decentralized set of behavioural rules and studies emergent behaviours

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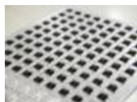
Classical Economics
Individual decision-making driven by self-interest and utility maximization

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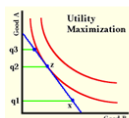
Psychology
Scientific study of mental functions and behaviours of individuals and groups

=

Behavioural Economics

Study of individual decision-making based on cognitive, heuristic, emotional and social factors

=

Behavioural Simulation
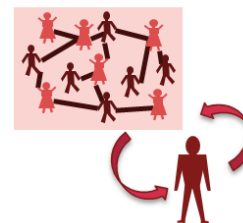
Simulation of how individuals really make decisions and their emergent group behaviours based on modeling individual behaviours as 'agents'. Choice made by individuals get reflected as 'market-level' emergent behaviours that are calibrated with actual and survey data

Behavioural Simulation
How is it done?
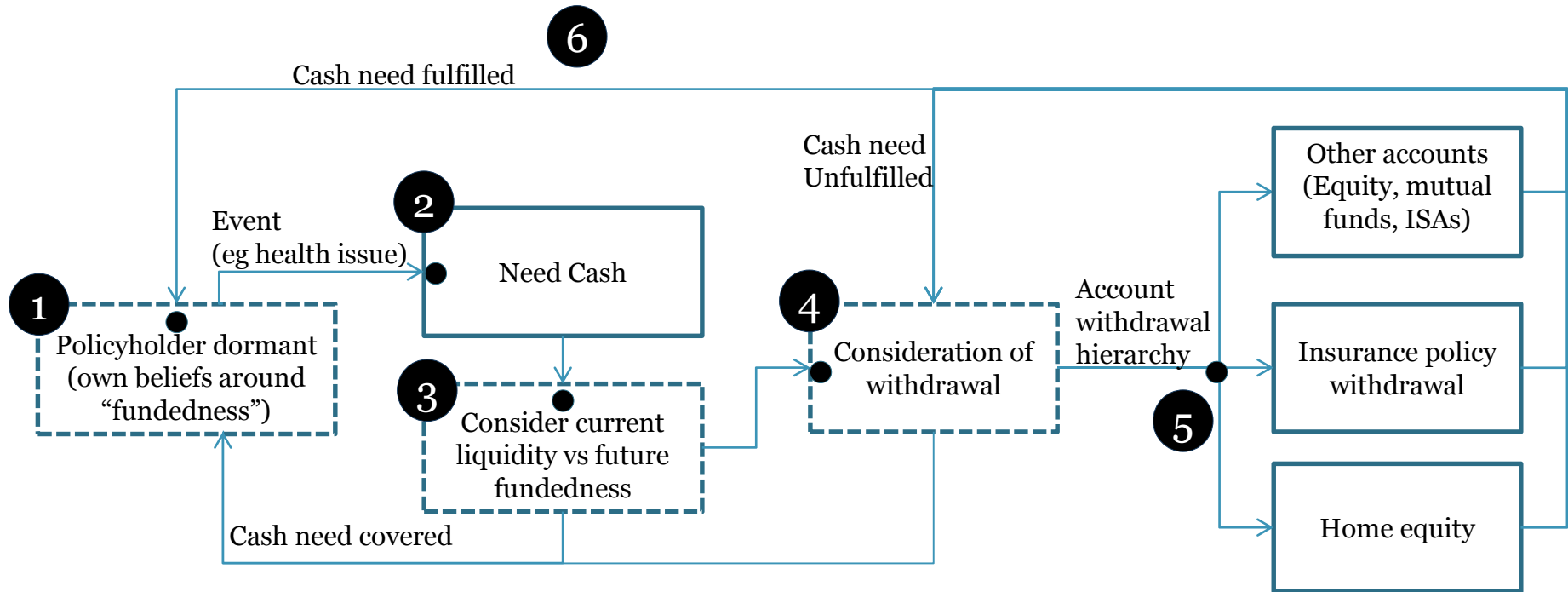
Customer behaviour insights through analytics

Case Study #2

Using branch geospatial analytics to capture market share across company's distribution network

Branch geospatial analytics (BGA)
Clustering like customers, markets, and branches

1. Customer Model

- Accounts and Transactions
- Channel preferences
- Priority and value segments
- Helix segments

- 5.6 million customers
- 20+ data zones
- 1205 attributes

Client data | PwC data | Other Market Data | Other Market Data

2. Markets Model

- Census stats
- Languages and behaviours
- Market rveys
- Employment data

- 2600 postcodes
- 5000+ attributes

Client data | PwC data | Other Market Data | Other Market Data

3. Branch Model

- Employees
- Performance
- Revenue
- Transactions

- ~800 branches
- 10+ data zones
- 1000+ attributes

Client Data | PwC Data | Other Market Data | Other Market Data

Each model progressively builds on the information contained in the previous model

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Branch geospatial analytics (BGA)
Mapping out different attributes

Outer suburb, multicultural suburbs and industrial zones — 6%
- High language diversity
- Large number of businesses (construction, transport and warehousing)

Newer, outer suburban neighbourhoods with younger Families — 21%
- High proportion of younger families
- Higher proportion of new homes
- Larger number of construction businesses
- Postcodes on M5-M9 borders have branches in their postcode

Regional, low socioeconomic areas with mature population — 18%
- Low population density
- Need to travel further for a branch than M2
- Older age demographic than M2

Higher socioeconomic inner-suburb neighbourhoods — 1%
- Highest proportion of young children
- Average proportion of adults (25-45)
- Convenient access to branches but not in their postcode

Remote areas with lower socioeconomic Value — 4%
- Largest household sizes
- Low business presence
- Low branch presence
- Significant mining employment population

Remote regions with average socioeconomic value — 4%
- Average household characteristics (Size and economic standing)
- Low number of businesses in the area

High density major cities with a large number of branches — 0.5%
- Highest proportion of working professionals
- High transaction activity

Lower socioeconomic remote regions — 19%
- High proportion of agricultural, fishing and forestry businesses
- Low population density

Higher socioeconomic regions in established inner suburbs — 13%
- High value homes
- Highest labour workforce participation with a high proportion of working professionals
- Postcodes on M9 border have branches in their postcode

Outer-suburbian renters and buyers in residential-growth areas — 3%
- High proportion of working age population
- High merchant terminal and ATM transactions (particularly shopping centres and petro)
- Significant use of credit card and lending products

Regional town centre with a high working population relative to residential — 11%
- High proportion of mature customers
- Convenient access to one branch nearby
- Lower language diversity

Map regions: M1, M2, M3, M4, M5, M6, M7, M9, M10, M11

Branch geospatial analytics (BGA)
Identifying "underweight" branches and uplift potential

B3 — Higher socio economic in established inner suburbs

B2 — Outer suburban with middle-aged saver customers

B4

Regional town centre

B6 — Suburban banking hubs

B5 — Servicing urban development

B1 — Broad based country bank

$3.3bn

Strategy to enter:

Products	Channels
Mortgages Offsets	• Branch • Specialists (Experienced)

Note: See Primary Pack (Underperforming Branches) for further detail

$2.8bn

Strategy to enter:

Products	Channels
Mortgages	• Branch • Specialists

Strategy to enter:

Products	Channels
Savings Lending	• Digital • Branch

$1.7bn

$1.2bn

$1.2bn

$1.1bn

Billions (y-axis: 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0)

■ ■ ■ ■ ■ ■ Indicates uplift to achieve average market share for comparable branches   ■ Existing in the market

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Questions   Comments

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