Building a Data Science Capability from Scratch

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The Insurance Industry

The Insurance Industry

Background - QBE Context

- QBE is one of the world's largest insurers, Australia's largest, Market cap of A$18.6B
- Founded in 1886, 130 years ago
- 17000 employees in 38 countries worldwide
- 4 regional entities spread across 4 continents

Background - QBE Context

QBE European Operations is a specialist commercial insurer and reinsurer

- UK and European commercial business, international speciality P&C business, multi-line global reinsurer
- One of the largest managing agents at Lloyd's

Diverse and flexible product range

- Products include the standard suite of property, casualty and motor through to the specialist financial lines, marine and energy covering large complex risks
- Customers range from local tradesman through to large construction companies

GWP of approximately £3bn

Heavily underwriting driven

Data

- Fairly small data sets
- Lots of detail on each risk
- Relatively unstructured

Challenge 1: Buy-in

Big data is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it…

Dan Ariely, Duke University

Creating the corporate ambition

- Look outside insurance and financial services
- Workshop with Execs
- Agree as a strategic priority with the Board
- Led by the business
- Articulate the ambition

Deliver $100m benefit over the next 5 years using data science and analytics.

Create a modern data led culture combining the best business expertise with the ‘Art of the Possible’ from data science.

What is data science?

- Data Science – Evolutionary step in analytics combining computer science, statistics, mathematics and machine learning to analyse large amounts of data and extract useful knowledge
- Machine learning - Algorithms that allow computers to recognize patterns based on empirical data, then make predictions on new inputs

- **Applications in everyday life**:
  - Netflix – Recommender systems
  - Siri and Shazam - Speech / music recognition
  - Google – Search engine results, auto-complete predictions, spam filtering

Why is data science important?

Already revolutionizing other industries by optimizing benefits and eliminating slower competitors:

1. **Hedge funds** – high frequency trading strategies account for an estimated $100B in managed assets

2. **Retail** – supermarket product layout, pricing, targeted marketing campaigns all driven by data and analytics

3. **Travel** – airline and hotel prices all optimized for day of week, time of day, proximity to travel date, etc.

4. **Insurance** – personal lines already heavily changed by analytics, price comparison websites

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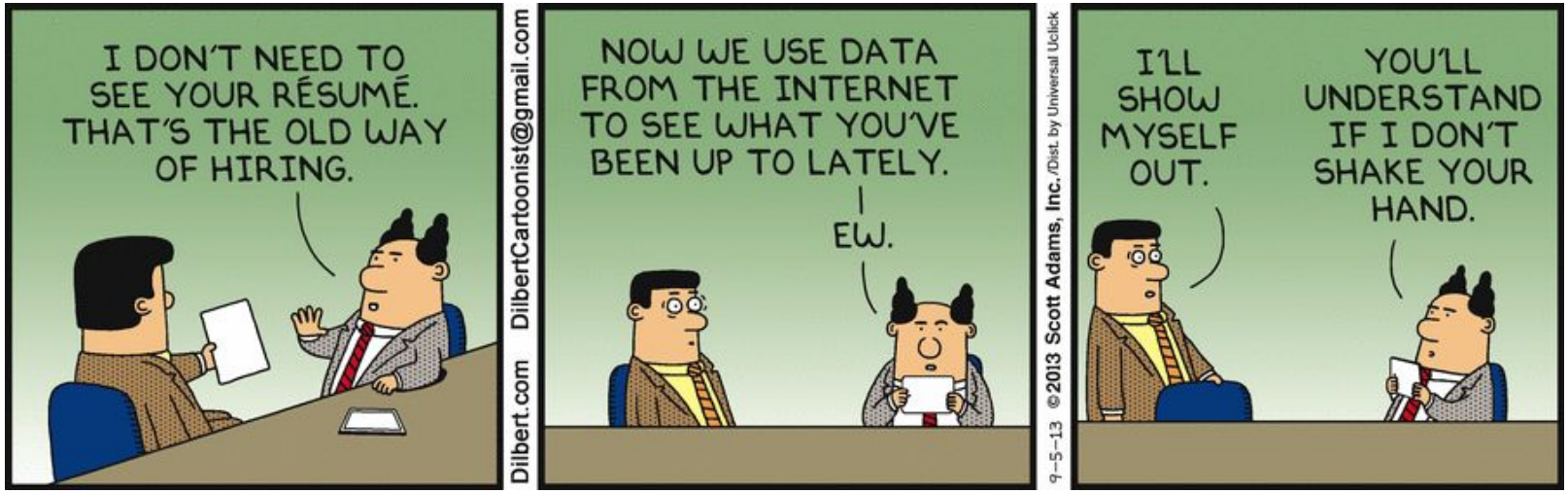
Challenge 2: Team



Building a data science capability

- **Bring in new talent**
  - Look outside insurance and financial services
  - Look for something different
    - to challenge the status quo
    - as a catalyst for cultural change
  - Ability to engage business as important as the technical

"We cannot solve problems by using the same kind of thinking we used when we created them".
Albert Einstein

- **Recruitment Challenges**
  - Huge demand for data scientists
  - Usual agencies not tuned in
  - Work the social media
  - Be clear what you want – data analyst, data architect, data engineer, data scientist, data artist(!)
  - Why join an insurer over 100 years old?
  - Create a compelling proposition (not just about the money)
  - Tackle the millennial issues
  - Sell!
  - Use outsourcing to accelerate

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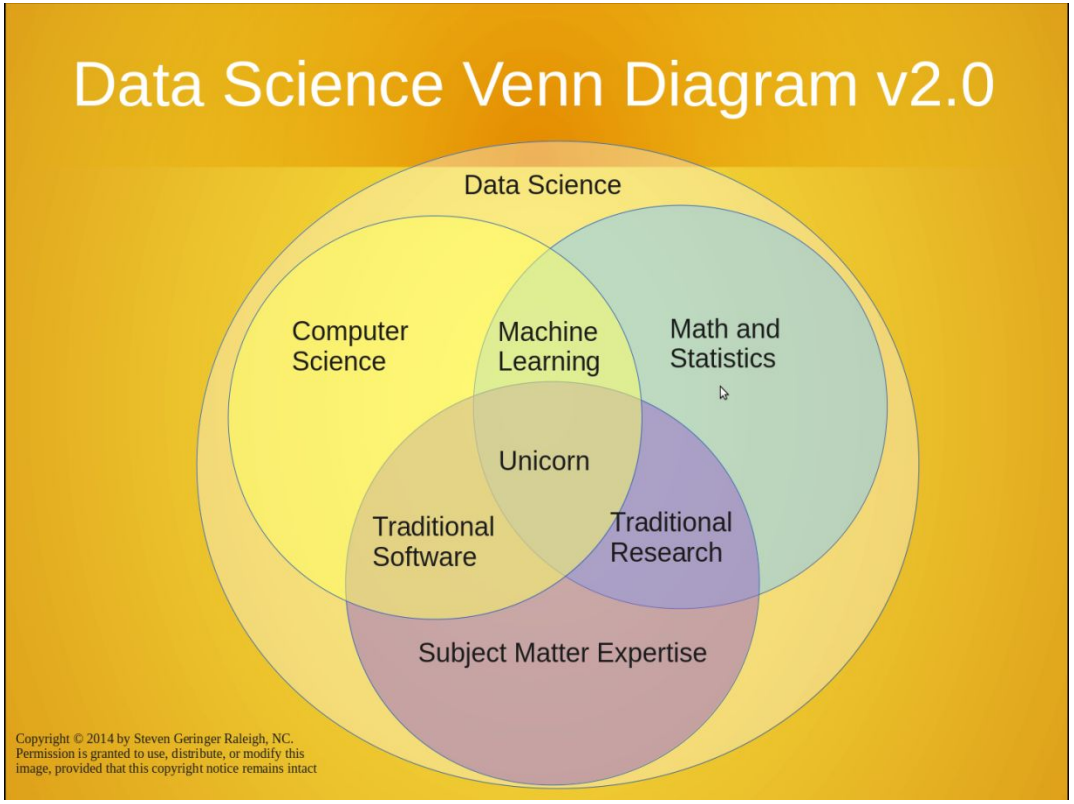
Hiring


Data Science Venn Diagram v2.0
Data Science
Computer Science
Machine Learning
Math and Statistics
Unicorn
Traditional Software
Traditional Research
Subject Matter Expertise
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What capabilities do we need?

Data Scientist
Data Engineer
Data Analyst

Business Analyst
Business Change Manager
Project Manager

IT
System Architects

Exec Sponsor
Business SMEs

Challenge 3: Prioritization

Potential applications for non-life insurer

A. Customer:

1. Customer Lifetime Value
2. Segmentation
3. Acquisition Strategy
4. Cross-sell / Up-Sell
5. Next Best Action
6. Retention, Renewal, Propensity to Lapse
7. Customer Experience
8. Call Centre Optimisation

B. Distribution:

1. Agent, Broker and Intermediary Performance
2. Producer analytics and segmentation
3. Sales Lead
4. Pipeline Forecasting
5. Producer Retention
6. Web Journey / Omni Channel Effectiveness
7. Channel Optimisation

C. Pricing:

1. Exposure/Policy Level Pricing
2. Segment of One
3. Real Time Price Optimisation
4. Pricing Elasticity
5. Competitive Pricing: Testing and Deconstruction

D. Underwriting/Product:

1. New Product Development
2. Portfolio Management
3. Underwriting Risk Selection
4. Product Analysis
5. Loss Control
6. Optimising Underwriting Cycle
7. Automated Rules Engine
8. Submission Optimization
9. Market and competitive research

E. Claims:

1. Claims Anti-Fraud
2. Claims Triage (2,0)**
3. Claims Life Cycle Management
4. Recovery & Subrogated Recovery
5. Claims Vendor and TPA Management
6. Claims Reserving
7. Claims Settlements / Best Offer
8. Claims Litigation Behaviour
9. Cat/Event Claims Monitoring
10. Single Touch Claims
11. Claims Adjudication / Liability Effectiveness
12. Claims Aggregation
13. Market and competitive research

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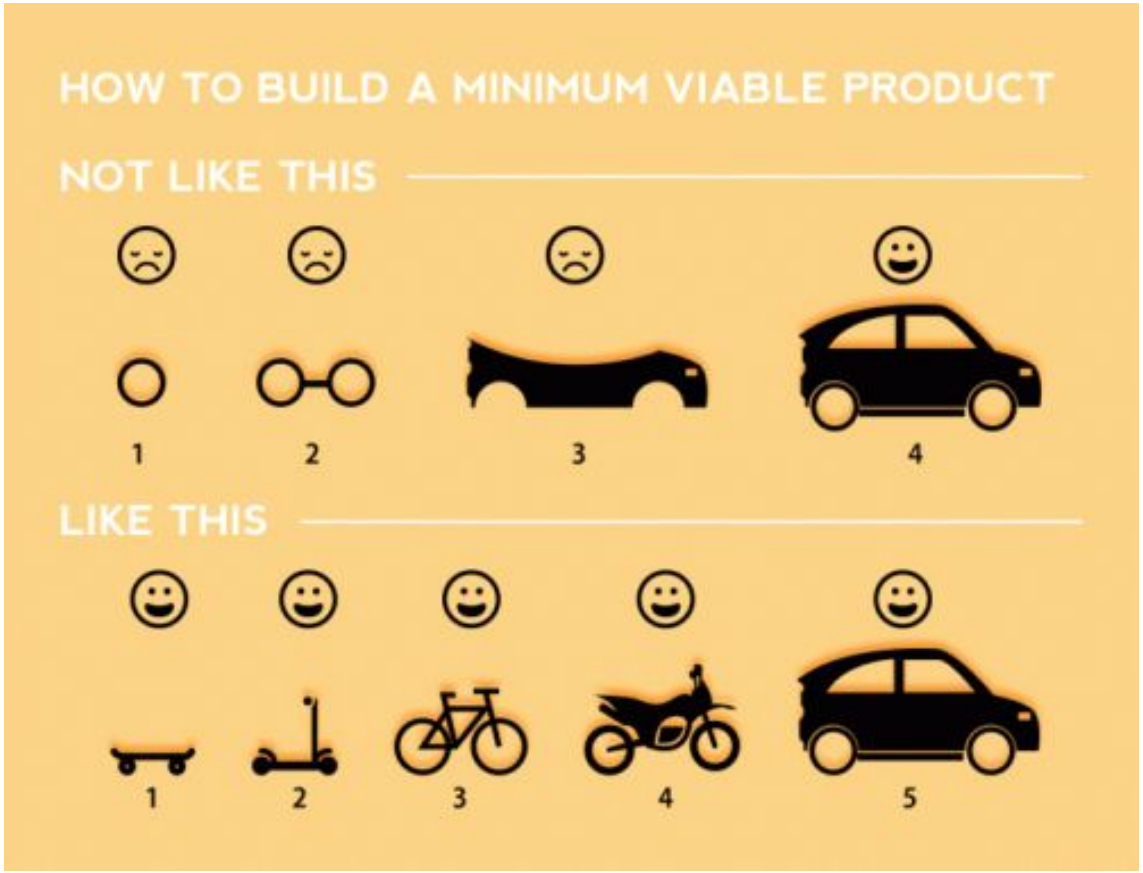
Prioritization principles

- Must generate real **benefits** (trackable)
- **Customer** perspective
- Clear ability to execute necessary **business change**
- **Data** – sufficient volume, quality and understood (data champion)
- Business **sponsorship**
- **Resource** availability (virtual team)
- **Reuse** and scalability

Challenge 4: Speed



Delivering value

- **Benefits**
- Prioritisation
- **What does deployment look like?**
- Planning

- Internal
- External
- Data Protection /Privacy
- Completeness
- Consistency
- Anomalies
- **Simple Analysis**
- Fail fast

- Model
- Algorithm
- Validate
- Diagnostics
- **Iterate**
- Fail fast
- **Open the black box**

- People
- Process
- Systems
- Application
- Reports
- Frequency
- Testing
- Pilots
- **Business Change**
- **Experimentation**

- Usage
- Benefits Tracking
- New data collection
- Feedback loop
- **Sell it!**

- Review
- Revalidate
- Test
- Refresh

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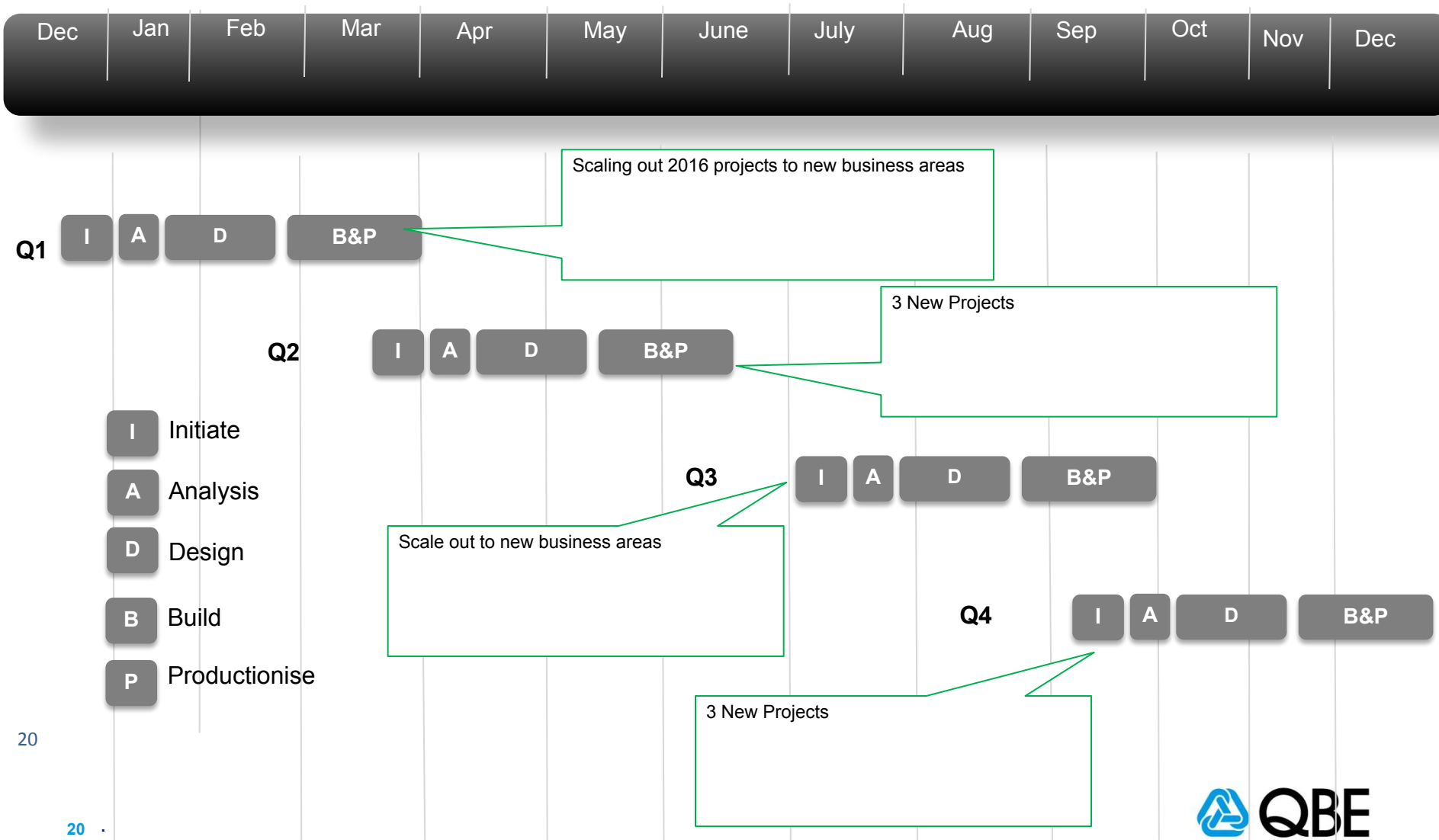
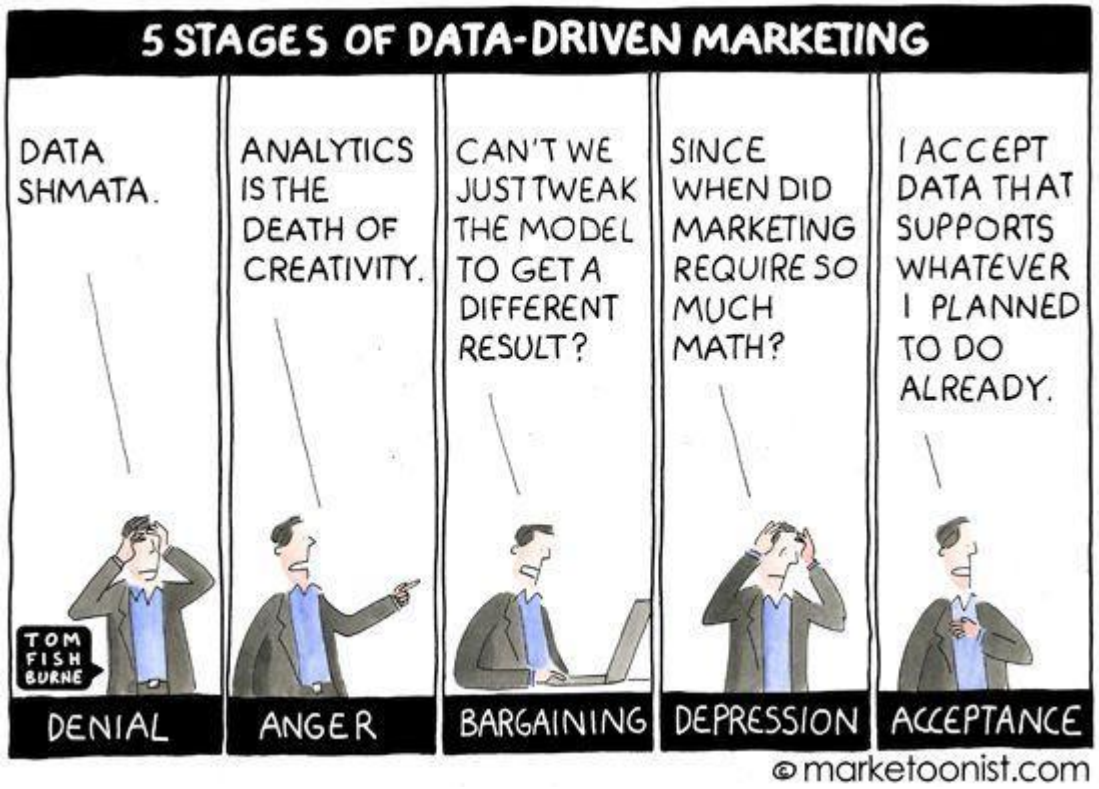
2017 High level plan



Challenge 5: Culture



Embracing the cultural shift to a data-driven company

- Recruiting from new generation, diversifying the gene pool
- Embedding new skills and ways of thinking within the business
- **Business led and owned**
- Role model new capabilities and approach
- Creation of Data Science and Analytics community
- Business engagement/awareness
- Involving everyone in new ideas and joining projects
- Sell the successes (bring it to life)
- Raising external image and profile (speaking at conferences)

Success factors (or lessons learned)

- **Executive Sponsorship**
- **Business Sponsor** (makes it happen on the ground)
- **Over-communicate** to all stakeholders
- **IT** – senior IT support to circumvent usual cycle times
- **Data** – early analysis for quality but also "predictiveness"
  – data SME
- **Opportunity** – upfront clarity on outcome (type of insights, benefits, deployment method…)
- **Business Change** – run parallel alongside data / modelling
  – is there an existing process to change?
- **Team** (virtual) – right people, available, aligned and accountable
- **Project Management** – Agile methodology

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Thank you

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We're hiring!