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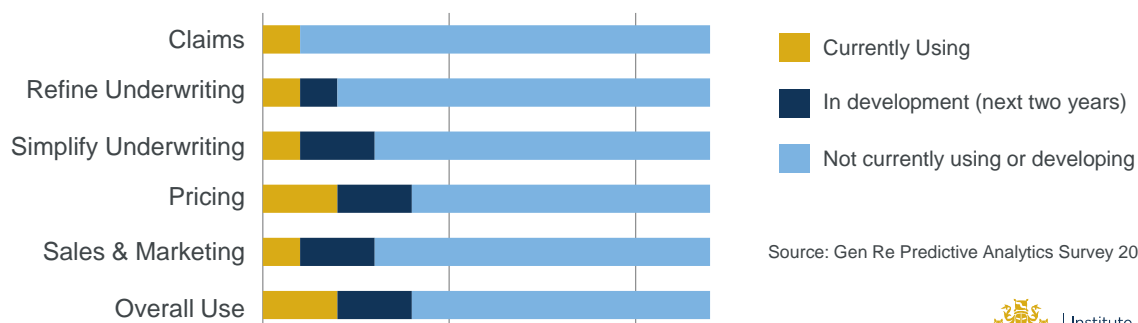
Using data analytics to revolutionise underwriting

Alastair Gerrard – Gen Re
Gwilym Morrison – Royal London

17 November 2017

Use of predictive analytics in life insurance

For which of these applications are you currently using or developing a use (next two years) for Predictive Analytics?

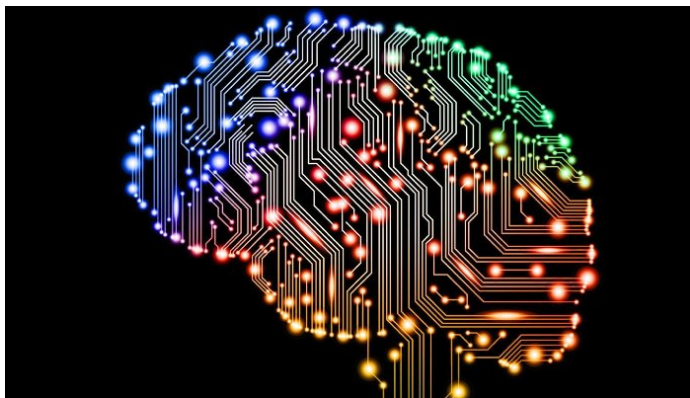


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Machine learning



Machine Learning is a sub-field of Computer Science that allows computers to learn from data without being explicitly programmed.



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Two traditions



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Methods compared

Linear regression & Generalised Linear Models	Machine Learning
Requires less computational power	Requires a lot of computational power
Easy to understand and explain	Tend to be “black boxes”
Tend to be limited to linear relationships	Can natively model non-linearity
Lends itself to smaller datasets	Usually requires a lot of data
Tend to give moderately accurate models	Can give very accurate models
Parametric: need to watch assumptions	Non-parametric: few/no assumptions



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Machine learning Google trends

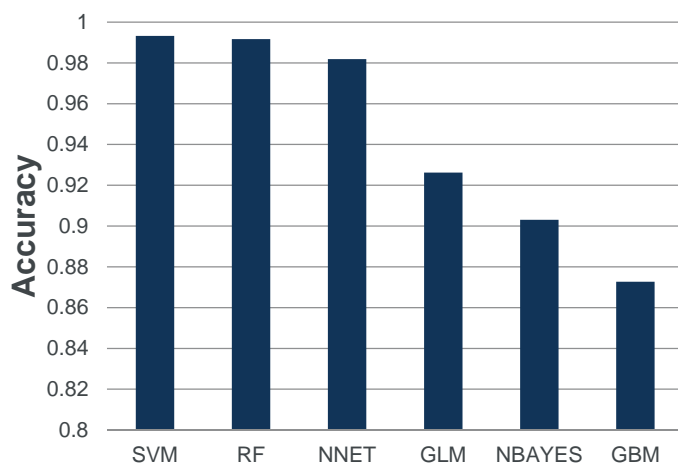


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Comparison of Learning Algorithm Performance



https://rpubs.com/m3cinc/Benchmarking_20_Machine_Learning_Models_Accuracy_and_Speed



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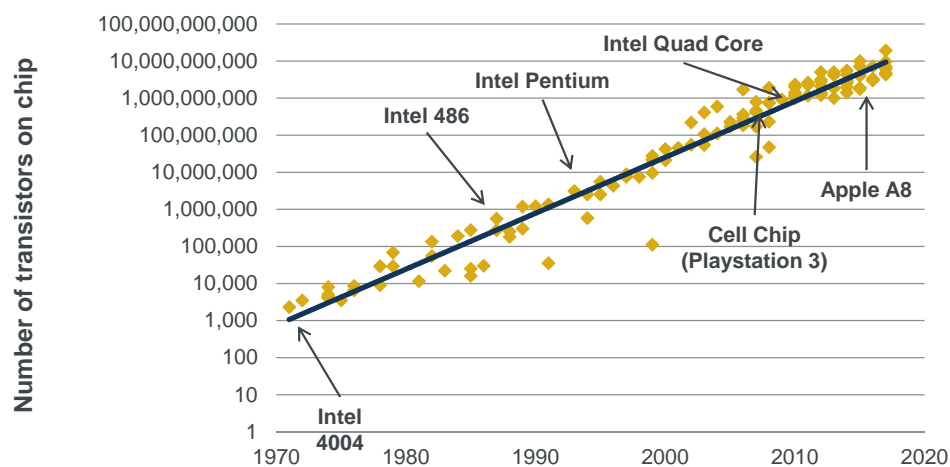
Gordon Moore



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Moore's Law



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Battle of the “supercomputers”

1996



2006



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The Second Half of the Chessboard

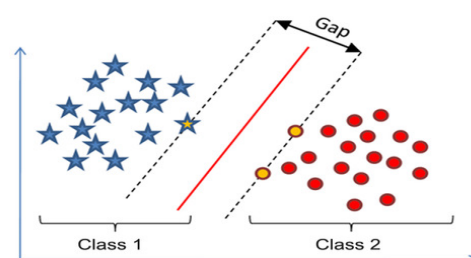


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Support Vector Machines



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Mortgage Market Trends



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Mortgage Broker Market Challenges



**Mortgage
Market
Review**



**Longer
advice
process**



**Mortgage
market
buoyancy**



**Increased
broker share
of market**



**Less time to
sell
protection**



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Insurance

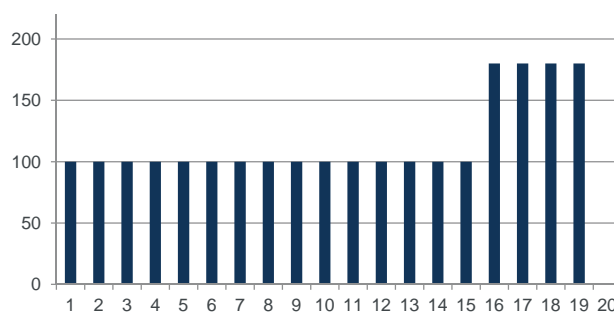
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Why Underwrite?

- Approach is historic mainly
 - Ask 40+ medical questions
 - Refer for further evidence
- >75% Standard
- 5% Decline
- 20% terms
 - Rate – EM / p.m.
- Costly process
 - UW resources, IT, Medical expenses

Traditional UW



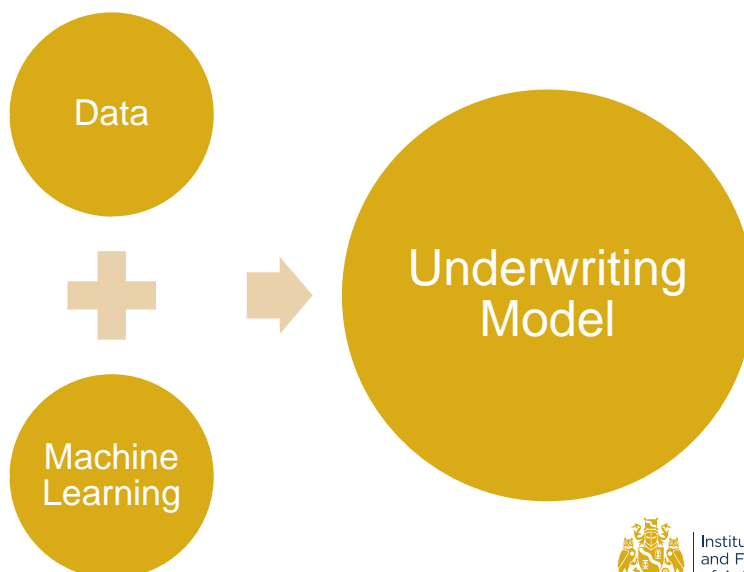
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Inputs to Model

- Data
 - Mortgage-related fields
 - Salary
 - Occupation
 - Age
 - etc



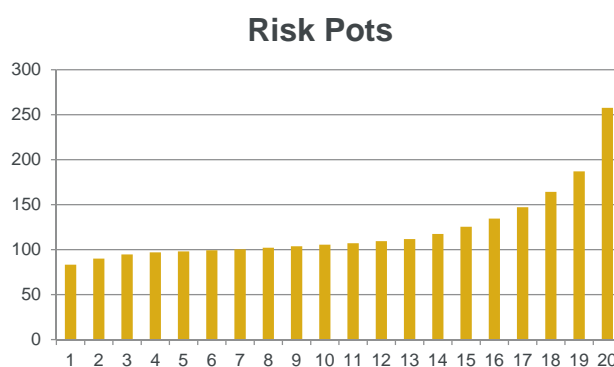
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The Model

- Divides the population into 20 equal vigintiles
- Higher differential the better



Note: Indicative Numbers



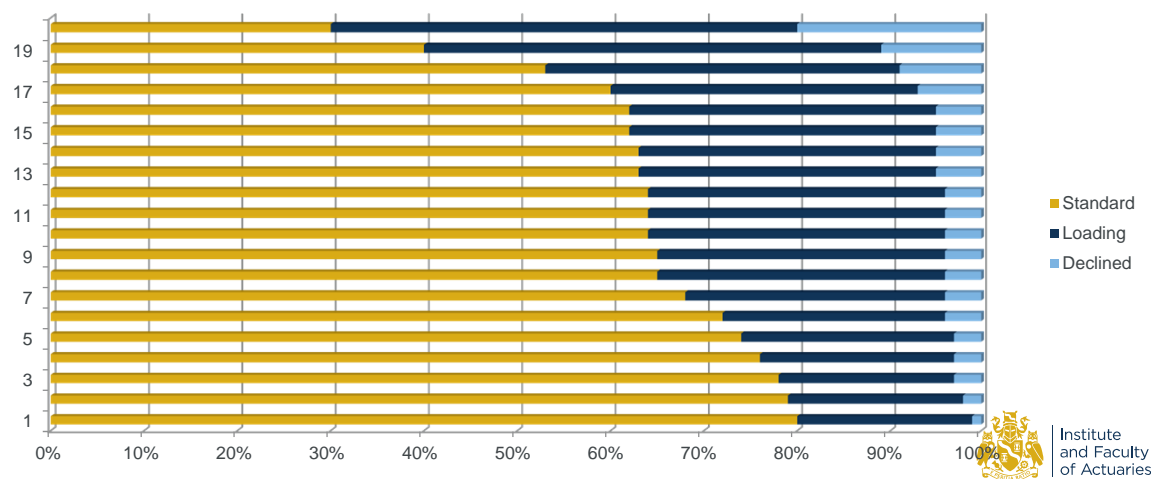
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Vigintiles by decision

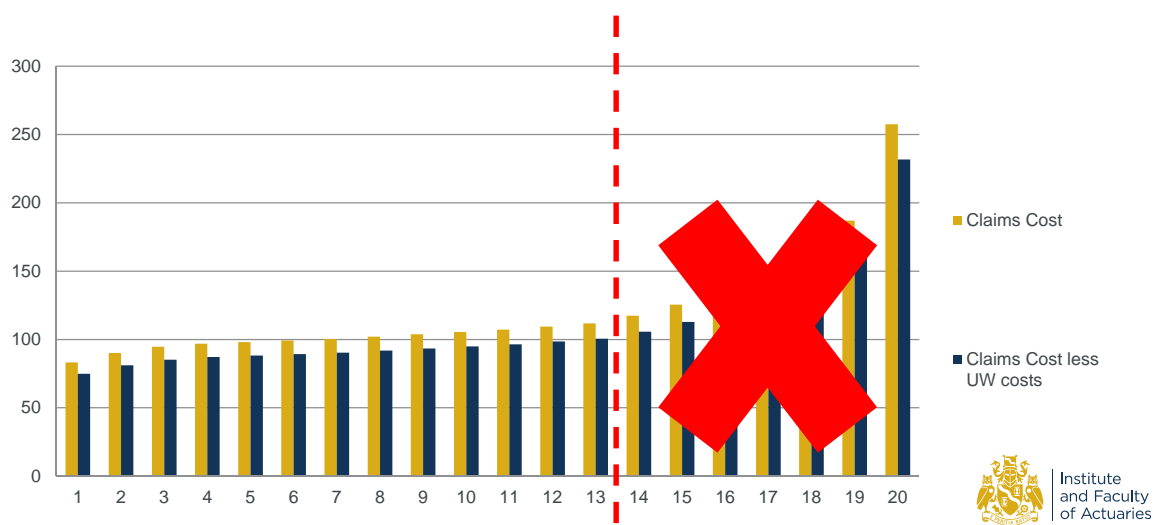
Note: Indicative Numbers



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The Model - viability



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What do we (RI) want to understand?

- Insurers can control
 - Underwriting costs
 - Commission paid
 - Application process
 - Broker behaviour?
- Reinsurers- can't!
- Can we control Behaviour of the applicant?
 - Anti-selection



What are we prepared to take?

- What trust do we have in the model?
- How do we test the outcome?
- Who are we willing to take on risk?
- At what price?
- What further controls?



What a model can't do

- Underwrite!



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MIRAS



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Small number of questions added

- Keep the number of qualifying applicants high
- Keep Price low
- Keep application procedure simple and quick
- Exclude Declines and Heavily Rated

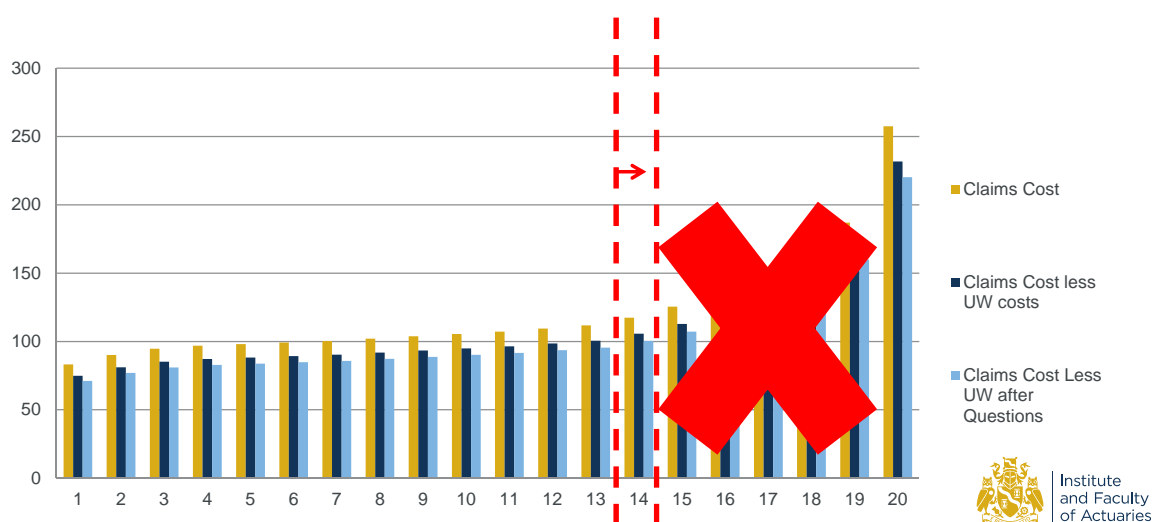


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The Model - Improved



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Anti-selection

- Applicant
 - Knows his own health
 - May know what the application process is elsewhere
- Broker
 - Definitely knows what the process is elsewhere



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Application Process as Risk Control

- Control of the sales force
 - If meet conditions for Streamlined product must offer this only
 - Don't want the broker picking and choosing cases
 - Belief is however that ease of application will convince broker
- Risk of Anti-selection if free choice between Whole of Market and Streamlined



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Next Generation Underwriting



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Streamlined mortgage protection proposition

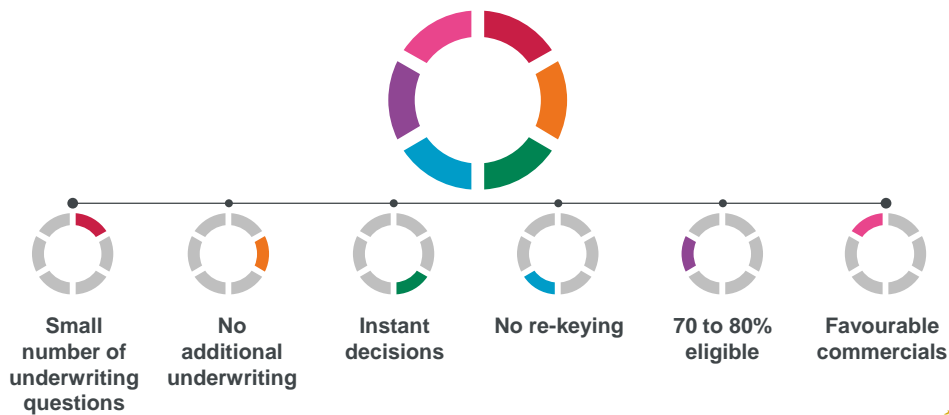


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Proposition key features



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Results

- Pilot stage so too early to say
 - Positive signs in the mix of business coming through
 - Further evidence being gathered to prove concept is solid
- Press/Broker reception overwhelmingly positive



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Trade Press Coverage



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Questions

Comments

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