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A.I. FIA – Exploring the Growing Role of Technology in the Actuarial World

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Technology Is Advancing Rapidly

- Advances in tech in just the last **5 years** have been **incredible**.
- Certain sectors embracing it. They are changing the game:
 - They use Data Engineers and Data Scientists.
 - They use Scalable Computing + Statistics to compete
 - They do it on Huge volumes of data
 - They do it in using new architectures, in Real Time
 - They do it with Open Source tools
 - They do it on the Cloud, and are agile even at scale.



And, they are incredibly successful RIGHT NOW.



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Are actuaries in Life keeping up?

- Others areas of insurance may be ahead of Life.
- I've been working on insure tech problems lately to:
 - automate Claims Handling
 - automate Underwriting
 - test Non-Linear pricing models
 - test using vast external datasets as a source of signals
 - scaling up complex calculations using cloud computing
 - building completely new technology platforms to handle volume of data
 - building chatbots and doing other complex NLP modelling.
- Does this sound familiar? Possibly.



Life Insurance is about to rapidly change.

- Life Actuaries had better take note...
- The game *is* changing

Insuring a life just got bundled with "Wellness Nudging"

It's a massive data collection exercise.

Needs Realtime
Needs Cloud
Needs Big Data
Needs Data Science

healthy living and rewards partners

Apple Watch with Vitality life insurance

To help you get active and earn rewards for doing so we're pleased to announce - Vitality Active Rewards with Apple Watch Series 2.

...it is unique to Vitality and partners...
...the next generation of...

Today

- Let's talk through
 - MegaTrends — Medium Term. Society. Technology.
 - Some Hypotheses — Life Insurance Predictions
 - Architecture patterns — Tech Patterns with Future Proofing.

Mega Trends

Medium Term.

Society

Technology

MegaTrends

1) Wearable technology



ICU technology



Everyone gets a wearable



Wearables



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MegaTrends

2) Internet of Things



Your household devices
were offline, dumb.



All devices go online.



IoT

Everything we interact with
is Online and monitors us.



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MegaTrends

3) Trusted Digital Identity



We managed your identity.
You proved who you were.



Trusted digital identity is ubiquitous



Trusted digital identities.
(Estonia is first of many to come)



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MegaTrends

4) BlockChain



Customer fills in questionnaire



Health data self managed



Customer gives you access to
their digital health wallet
in BlockChain



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MegaTrends

5) Healthy Populations live longer



Unpredictable
lifespans



People live **much** longer



Ageing Population

MegaTrends

6) Mature OpenSource is winning.



Desktop Tools



Enterprise Adopts Opensource



mature OpenSource now gold standard.

MegaTrends

7) Cloud Computing



Desktop Tools



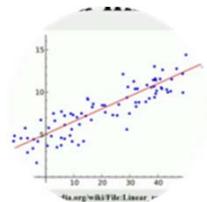
Cloud First



Cloud computing is easy choice for all compute

MegaTrends

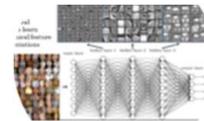
8) Deep Neural Nets take high ground.



dominant models
are challenged.
(GLMs etc)



Deep Neural Net Models Gain Wide Acceptance



Softer Computing in all areas
becomes accepted across Insurance
as performance proven

Life Insurance, Our Predictions

We predict some business changes based on the mega trends.
We explore technology implications.



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Prediction 1. Realtime Life Insurance

Wearables + Life Cover = "health nudges" based business models.

Implication:

- The amount of data you must collect/process **is immense**.
- You need this data to recommend timely health advice.
- You manage high volume streams of data to execute the models



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Prediction 1. Realtime Life Insurance

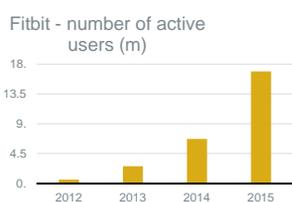
Customer Monitoring = Active Management of Portfolio and Reserving

Implication:

- Based on real time monitoring data,
 - we can adjust our portfolio wide reserves dynamically
 - we can adjust premiums for customers PAYG on wellness score
 - we can offer rewards and improve awareness
 - Do best estimate valuations change in real time ???

Prediction 1. Realtime Life Insurance

Is this really coming? We think so.

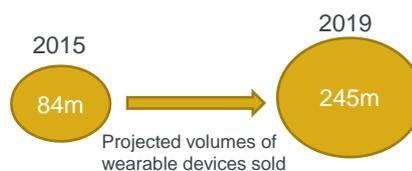


- 49% would be willing to wear 'smart clothes',
- 36% would wear 'smart skin patches or tattoos'
- 46% of Millennials believe that by 2025, their passports will contain specific places within countries visited



Fitbit data is now being used in COURT: Wearable technology is set to revolutionise personal injury and accident claims

- Law firms in England, America and Italy are using a Fitbit to show effects of an accident
- An air crash in the US, where passengers and other data about the plane
- Analytics from Wearables has helped service to compare the value of claims with the actual damage to determine the strength of a case
- Data will be used alongside other evidence, and evaluated by a doctor



Prediction 2. Customer Interaction

Health advice + Connectivity = Converged Customer Centric Relationship

- Millennials want personalised service. Advice is how we do it.
- Trust issues - we need to earn this trust.
 - It's missing now. Is this a Privacy blocker?
- Life Longevity Goals - We help you achieve them.
- Customer's achieving smaller goals (weight, activeness) help build that trust.
- Prediction to Mitigation outcomes - also build trust.



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Prediction 3. Partnership / Adjacencies

Personalised Risk Factors + Longevity Prediction = Partnership Model

- Measuring - Who distributes "things"? Who owns the data?
 - Insurers cannot be distributors
 - Need a partnership model
- Multiple drivers of longevity makes it even harder to go it alone!
- How do we build rich partnerships?
- Data sharing models? and or with individuals



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Prediction 4. Changing Actuary Skillsets

Changing Life Business + Big Data = New Actuarial Skills

- Actuaries today need to either retrain into big data engineering, or hire a team that includes big data engineers.
- Data management maturity across the board needs looking at. Data Protection, Governance and Controls.
- Regulation in a high velocity actuarial environment - unknown challenge!

Prediction 4. Changing Actuary Skillsets

Changing Life Business + Big Data = New Actuarial Skills

- Will there be “Actuarial Engineers” in the future?
- Perhaps in an **Actuarial Engineering Department**?
- Would we see it in life insurance companies?
 - When would we see this?
 - 5 years?
 - 2 years?
 - 1 year?

Prediction 5. Auto Underwriting

Wearables + BlockChain = Proactive Life Underwriting

- Speed to decision - meets millennial time expectations.
- Customers grant you access to their BlockChain digital health data wallet.
- i.e. No more forms to fill out.
- Multi sources of monitoring data, converged in BlockChain.
- Automated models do risk assessment and price discovery on read.
- Only outliers go to human review. 80/20 rule on underwriting.
- Chatbots and other novel interfaces are interface.



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Architecture Patterns

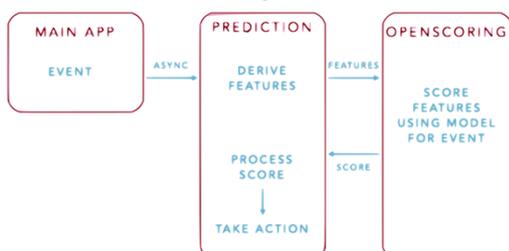
Tech Patterns with Future Proofing



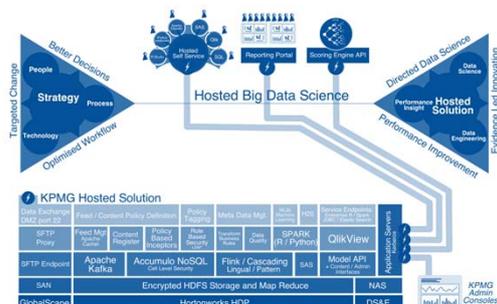
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Architectural Patterns

Feature Extraction and Scoring Framework



The high level “AirBnB architecture”
Very applicable for Wearables / Life use case.
Allows for high speed realtime interactions.



KPMG platforms
Executes the AirBnB Pattern +
hits enterprise needs.



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Conclusions

Technology Advances are Shaping the Life Business

- Life Business Models changing
 - Realtime Life Insurance
 - Customer Interaction
 - Partnership / Adjacencies
- Actuarial Roles Changing
 - Changing Actuary Skillsets
 - Actuarial Engineering
- Automated Underwriting
 - shared health data enabled
 - chat bot and other interfaces



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Thanks! Any Questions?

