



# Connected Insurance and Other Tech Trends

## LIMA 2021

09/11/2021  
Alexander Karvelas

Munich RE 





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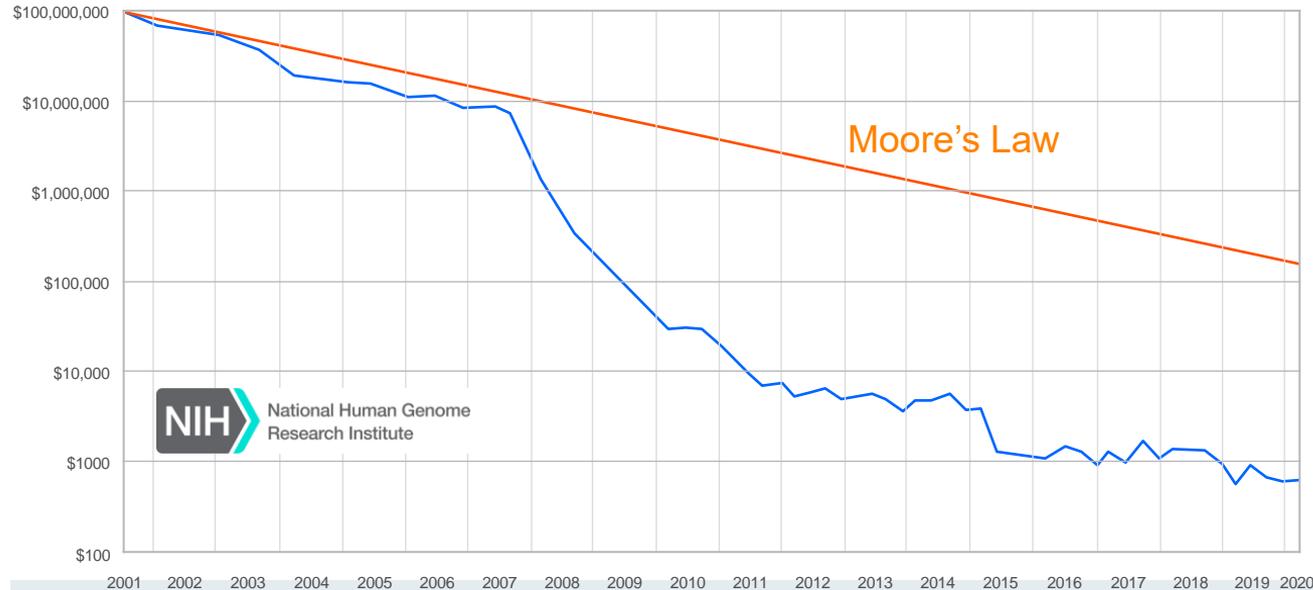
- 
1. Exponential Thinking
  2. Tech Trends
  3. Connected Insurance

# Exponential Thinking



# Moore's Law and The Human Genome Project – Exponential decay of DNA sequencing cost

## Cost per Human Genome



The Human Genome project started in 1990.

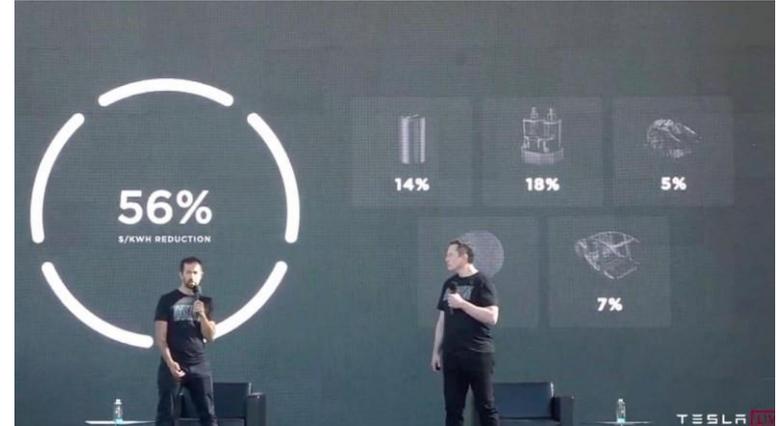
With the existing computing power at that time, it would have taken 1000 years to finish the project.

But it finished successfully after 13 years – 2 years ahead of plan.

# Wright's Law – The Learning/Experience Curve Effect has led to an exponential cost decay for SpaceX and Tesla



Credits: Elon Musk: Bloomberg / Kontributor / Getty Images



**-84%**

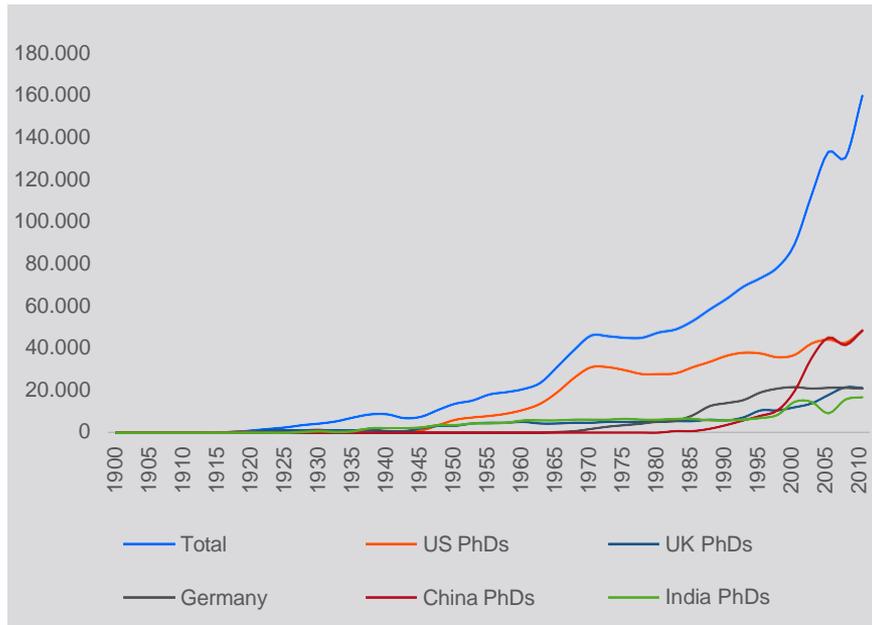
SpaceX has reduced the cost of a rocket launch from \$18,500 to less than \$3,000 per transport kg

**- 67%**

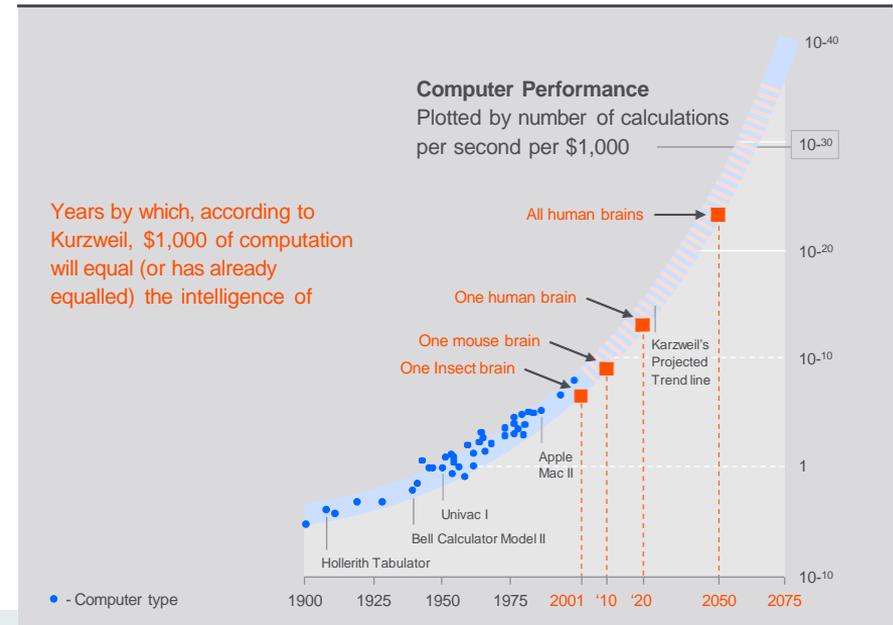
Tesla has reduced the cost/kWh from \$300 to ~\$100 which makes it compatible with combustion engines and has announced an additional 56% reduction

# # of smart people increases exponentially so that Kurzweil's Law Of Accelerating Returns might become reality

PHDs awarded annually worldwide



Computer Intelligence according to Kurzweil

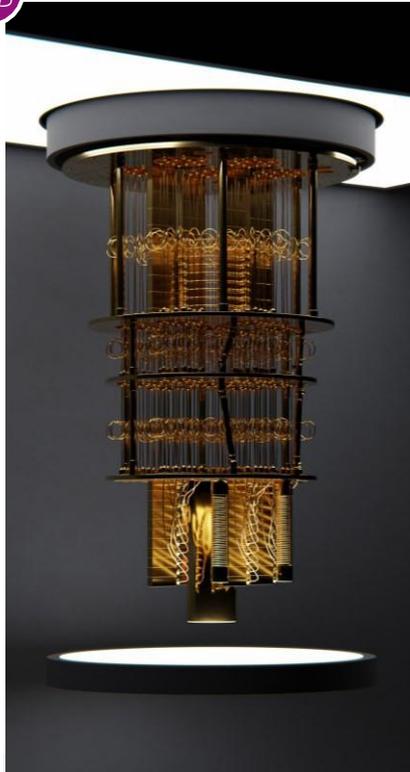


Left - Source: Frank Thelen – 10x DNA

Right - Image source: <http://www.americanprof.net/apn-ai/images/graphs/kurzweil-2.png>

# Tech Trends





Quantum Computer (Credit: DP / stock.adobe.com)

## What is it all about

- Quantum computing stands for unprecedented computing power.
- It could trigger a new wave of technological advancement over the next five to ten years.

## Impact on insurance processes

- Product design & Pricing
- Loss prevention
- Risk + Capital management

## Opportunities

- Train new machine learning models
- Improve drug development through analyzing an almost infinite number of molecule interactions in a second.
- Predict weather / climate / material development

## Risk

- Existing encryption standards will be broken easily
- Currently overhyped – limitations in scale and general purpose vs. niche use cases

Global race is ongoing to develop quantum computer and to find sweet spots of relevant use cases. Munich Quantum Center has been founded.



Humanoid Roboter (Credit: Peppi Robot, Tomasz / stock.adobe.com)

What is it all about

- Smart Automation in Manufacturing, Logistics and other industries
- Fire fighting; Search and rescue robots
- Disinfection robots in hospitals
- Inspection robots

Impact on insurance

- Product Design & Pricing
- Risk Prevention
- Claims

Opportunities

- Insure robot manufacturer
- Reduce future claims with inspections
- Replace hazardous working areas with robots

Risk

- Insurability of smart robots
- Impact on business interruption insurance



Robotic Hardware and Software has made great progress. Automation in Logistics is just in its infancy.

# Example Robotic Revolution – Alibaba and Amazon warehouses



Amazon Robotic Drive Unit in Fulfillment Center (Image Source: Amazon)

## eCommerce fulfillment center continuously optimize their robots

- Worldwide Christmas online shopping and Singles Day sales in China as well as Covid19 shopping mall closings have led to a huge spike in online sales
- Specialized robots know their location, content and bring goods to the dedicated human picker for a certain order
- They avoid any collisions with humans or other robots. And they know when they need to recharge their battery pack

Business interruption insurance:  
What is the loss amount if the robotic software gets hacked on one of the major shopping days?

# Space-based services for objects and equipment in earth's orbit



What is it all about

- Satellite deployment, on orbit inspection and repair
- Orbital refueling (Gas stations)
- Orbital object protection, waste collection and reuse

Impact on insurance processes

- Product Design & Pricing
- Risk Management
- Capital Partnership

Opportunities

- Rising need for insurance with the increasing commercialization of the in-space economy

Risk

- Orbit waste can damage objects and equipment
- Wide range of hard to insure potential issues (on the ground, during launch and flight, in orbit, during return)
- Fear of spying or governmental abuse of space tech.

Further growth of the space sector is expected through the efforts of private companies to commercialize this economy.

Image source: U.S. Bureau of Economic Analysis, "Exploring the Space Economy", <https://www.bea.gov/system/files/Space%20Economy%20Infographic-Full%20Infographic.png> (accessed 05/16, 2021).

## Exploring the Space Economy



**\$178 billion**  
in U.S. gross output\*

\*all data are from 2018

### What is the U.S. space economy?

The space economy consists of space-related goods and services, both public and private. This includes goods and services that:

- Are used in space, or directly support those used in space (*space vehicles, launch pads, space weapon systems, insurance*)
- Require direct input from space to function, or directly support those that do (*satellite telecommunications and broadcasting, GPS and Positioning, Navigation, and Timing equipment*)
- Are associated with studying space (*research and development, educational services, planetariums, observatories*)

These estimates are experimental statistics as we continue to refine our measurement of the U.S. space economy.

In private industry, the space economy supports **356,000** full- and part-time jobs

### How do we measure it?

One way: by measuring industries' space-related gross output, which is principally measured as an industry's sales or receipts.



Gross Output by Industry Group (Billions of Current Dollars)



BEA's research on the space economy, including measurement of space-related government employment, continues subject to the availability of data, resources, and funding. We ask for feedback on improvements to the preliminary statistics. Please email us by May 2021 at [SpaceEconomy@bea.gov](mailto:SpaceEconomy@bea.gov). Information about our methodology is on [bea.gov](http://bea.gov).

[www.bea.gov/data/special-topics/space-economy](http://www.bea.gov/data/special-topics/space-economy)



# The new language prediction model **GPT-3** can be applied to any language task...



DALL-e (Image source: openai)

What is it all about

- *Generative Pre-trained Transformer 3* can answer questions, summarize long texts, translate languages, take memos, and even create computer code
- Largest artificial neural network with over 175 billion parameters
- Outputs what it predicts as most useful for user

Impact on insurance

- Sales & Distribution, Underwriting
- Customer engagement & services
- Claims

Opportunities

- Analyze and optimize wordings
- Improve customer services
- Improve claims handling

Risk

- OpenAI as a product is a black box
- Answers are predictive

# BERT vs. GPT-3: Higher quantities of parameters result in qualitative leaps in capabilities 340m vs. 175.000m

OpenAI

Discovering and enacting the path to safe artificial general intelligence.

Our first-of-its-kind API can be applied to any language task, and currently serves millions of production requests each day.

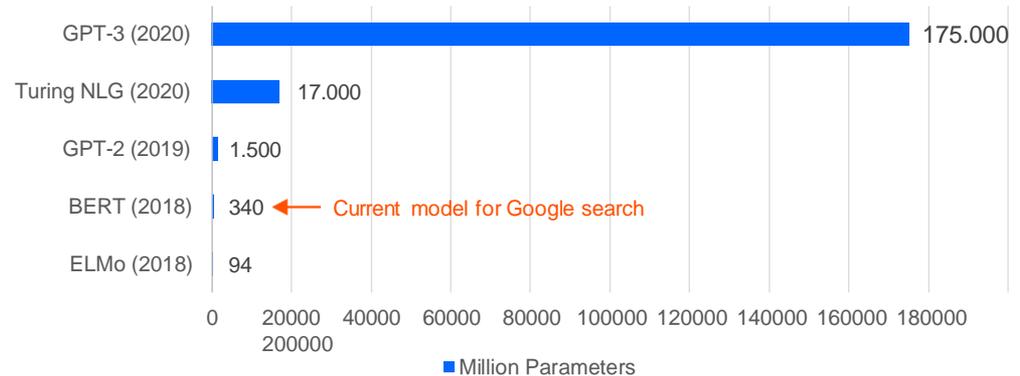
[EXPLORE API](#)

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## Why is it possible now

Higher quantities of parameters result in qualitative leaps in capabilities



SWITCH TRANSFORMERS: SCALING TO TRILLION PARAMETER MODELS WITH SIMPLE AND EFFICIENT SPARSITY  
JUN 11, 2021

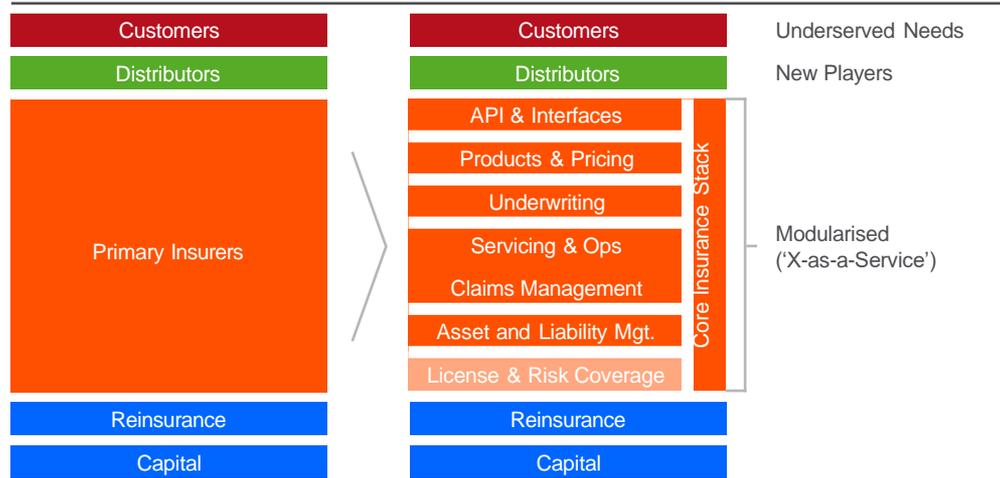
William Fedus  
Google Brain  
william.fedus@google.com

Bernadette Zhong  
Google Brain  
bernadette.zhong@google.com

Naman Shrivastava  
Google Brain  
nshrivastava@google.com

# Digital Insurance Eco-Systems are expected to grow by 10x in the next ten years – alone for Embedded Insurance

Rapid digitalization and modularization of the insurance industry stack



## From Monolith to modularized 'stack'

- Insurance value chain gets optimized on module level / micro-service
- Due to the huge number of emerging solutions and services insurers are invited to establish digital ecosystems with partners

Insurers need to evaluate where to collaborate with a trusted partner to allow for speed to market and to reduce operational expenses.

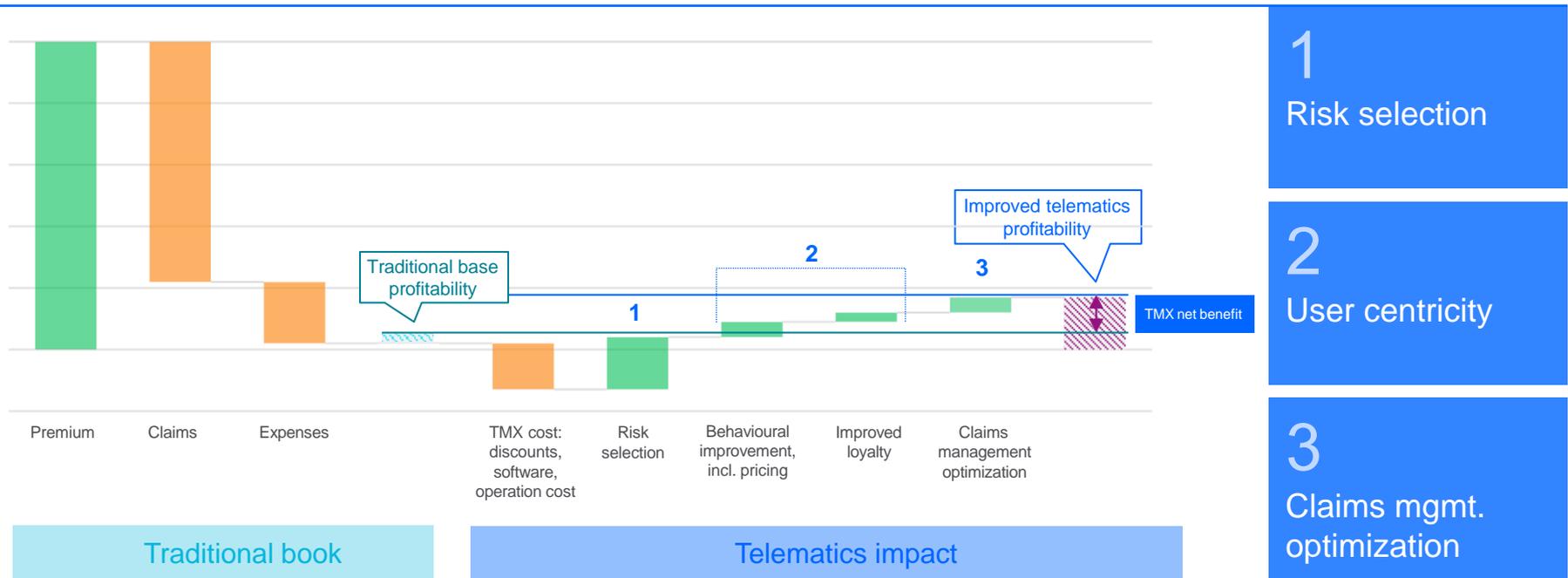
# Connected Insurance



# Telematics impacting three key business drivers

## Internal drivers to implement telematics

### Illustrative business case for telematics



# TMX attracts good risks and allows for risk-adequate pricing

## Assessment of driving behaviour



## Self-selection bias

- People who subjectively assess themselves as better drivers are more prone to sign up for a telematics policy

## Pricing

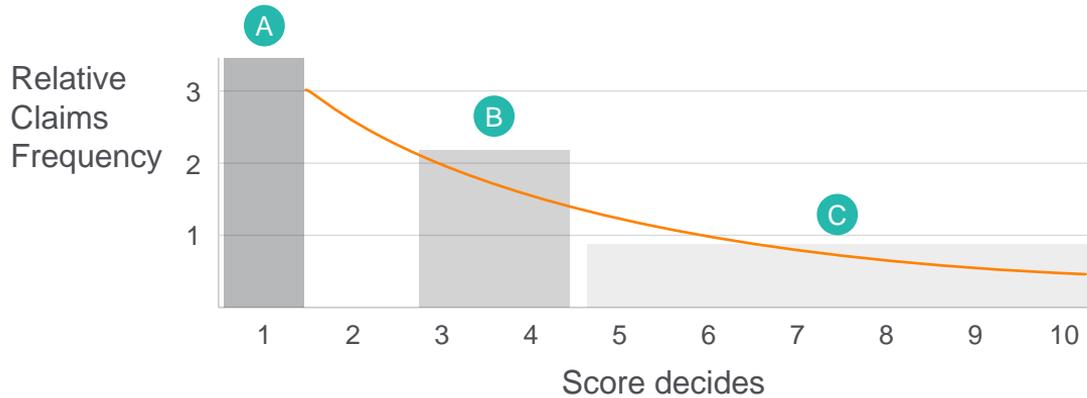
- Telematics pricing models when augmented with existing risk models more accurately predict risk and reduce overall portfolio volatility

## Avoidance of anti-selection

- Risk of not using telematics and being undercut by competitors who allows for more risk-accurate pricing

# Risk scoring can help inform approaches to driving improvement

## Overview of behavioural conditioning interventions approaches



- Behavioural intervention requires deep understanding of driver's behaviour and how to influence it
- Staged program that can drive improvement of risk
  - Autonomous in app feedback
  - Tailored emails
  - Rewards based incentives
  - Driver intervention and coaching (online or telephone)

A

### Highest crash probability

- In severe cases, drivers can be taken off coverage (subject to T&Cs) or manage renewal pricing
- Introduce driver intervention coaching

B

### Elevated risk profile

- Risk elevated relative to average book
- Combination of tailored emails, online driver videos, awareness notifications and rewards

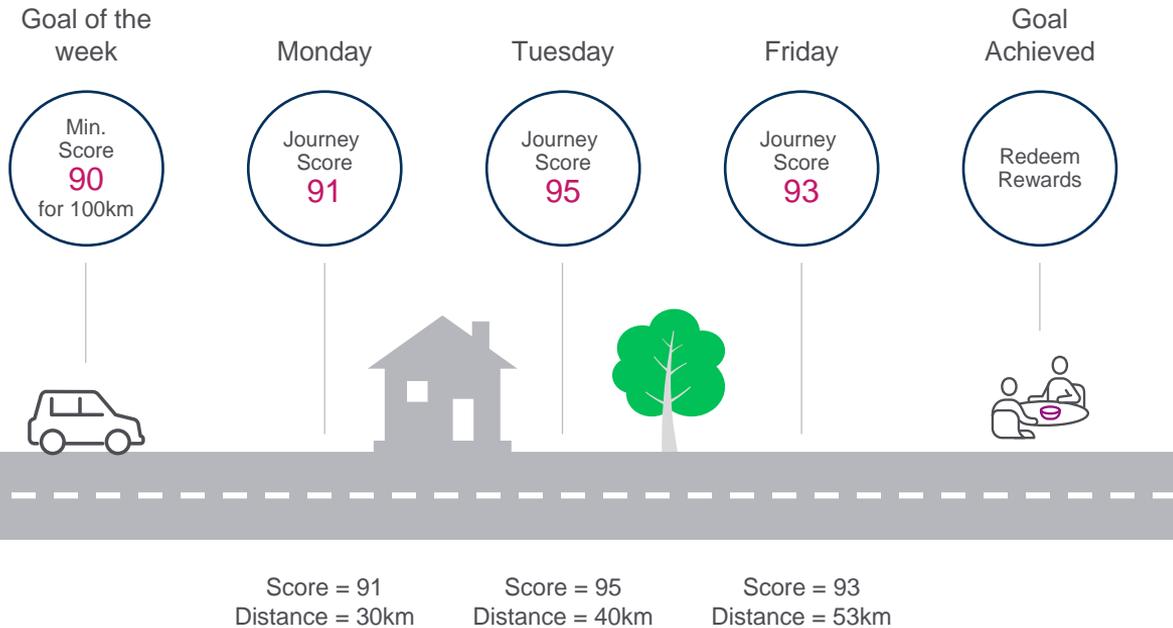
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### Standard risk profile

- In-app journey scores, rewards and positive driving reinforcement

# Improve loyalty and engagement by instant rewards for good driving

## Instant reward programme



- Direct customer access via app allows for continuous engagement with user
- Telematics enables more touchpoints than “typical” insurance interactions
- Rewards for good driving encourage sustained improvement of driver behavior
- Customer-centric vouchers are highly valued by users since they see a direct correlation between good driving and respective reward
- Upside: Deeper understanding of user's profile and higher brand engagement allow for targeted renewal strategy and cross- / upselling

# Usage of gift cards to instantly reward safe driving behaviour

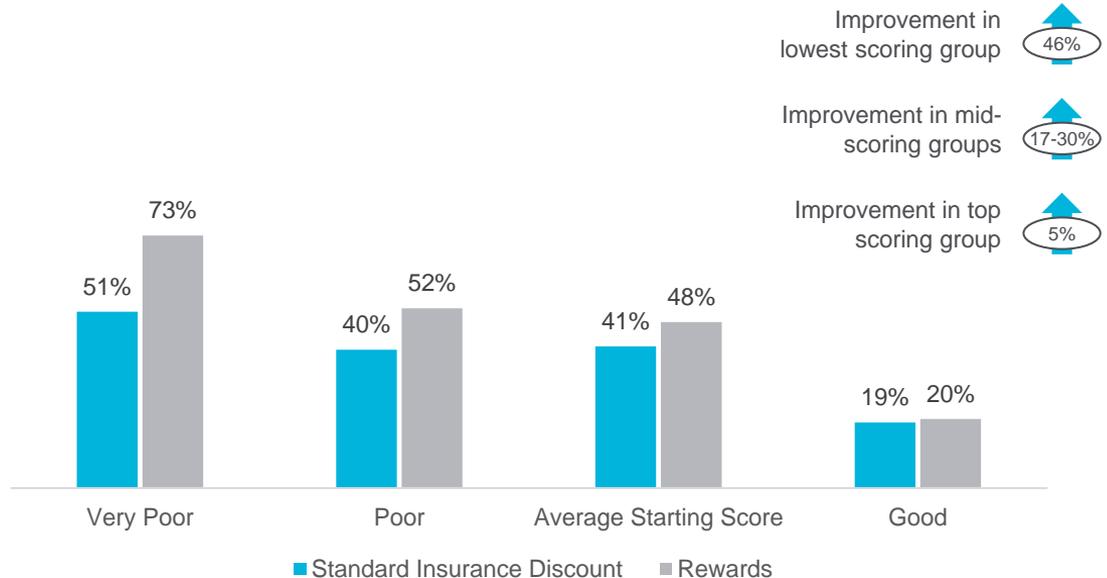
## Example rewards program

### Small denomination gift card awards for safe driving

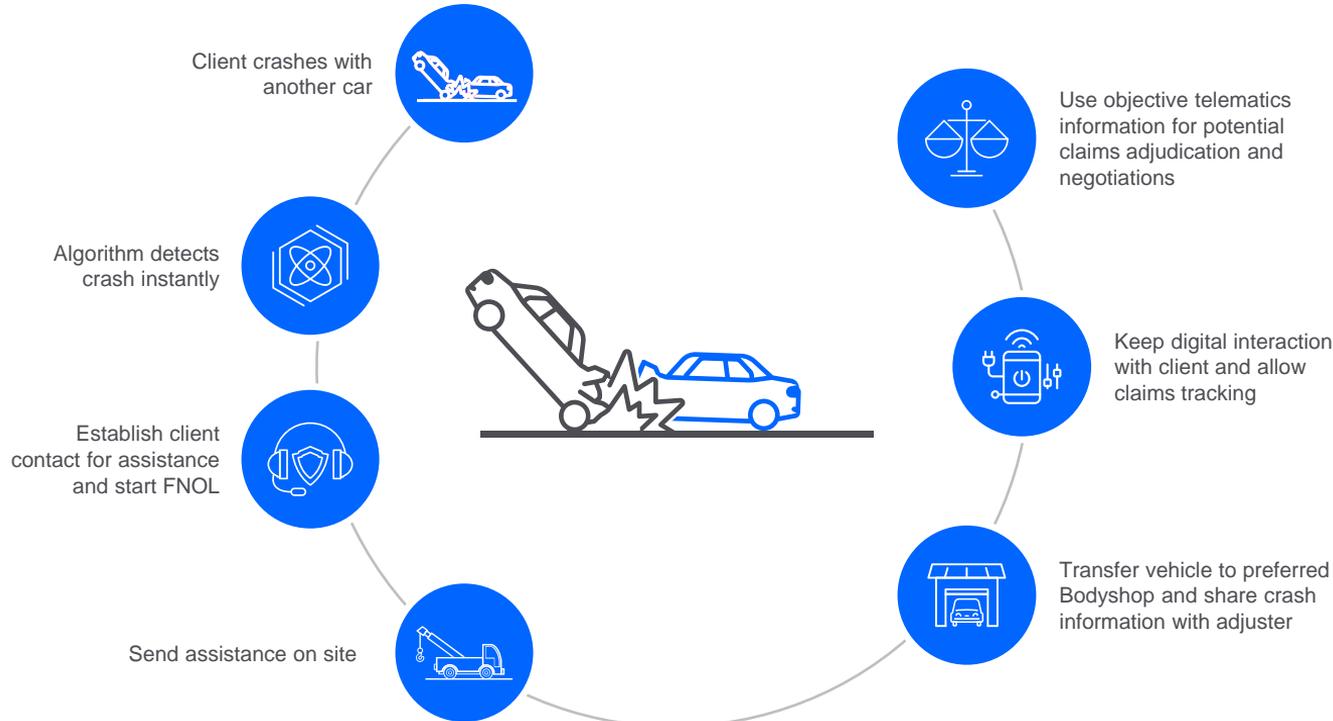


- Every driver should earn some points based upon their scores
- The better you drive, the more points/Dollars you'll be awarded
- Drivers making significant improvements should be rewarded
- Rewards should be easy to access within the app and quick to redeem

### Driver deciles based on safe driving score



# Telematics can lead to material reduction in cost of claims due to earlier identification and intervention



- Automated crash detection can improve FNOL accident reconstruction assistance
- Loss control and rapid claims payment can be facilitated
- Upside: Optimization of reserving and capital allocation through reduction of incurred but not yet reported (IBNYR) and possibility of proactive network steering

Fully customizable, dynamic and up-to-date platform allowing for deep portfolio insights

Comprehensive view on portfolio and operations to cater for stakeholders' needs



Available for  
live demo

### Monitoring and control



- Management view to monitor overall book
- Possibility to integrate claims and policy data
- E.g., development of sale volumes; estimated average discount, registration success

### Operational support



- Insights for day-to-day operations and steering
- E.g., Ability to identify users who have not registered within the agreed timeframe

### Deep dive insights



- Drill-downs for user/cohort specific details
- E.g., reports on driving behaviour & patterns to see when, how, for how long people are driving

# Your feedback matters



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Thank you!