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Professional Auditor Forum
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Governor – Research Committee Chair
IIA Indonesia

Enhancing and Protecting Organisation Value in Disruptive Innovation Era

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Agenda

1 Changing business landscape

2 Case study: Self-driving car

3 What can companies expect from Internal Auditors?

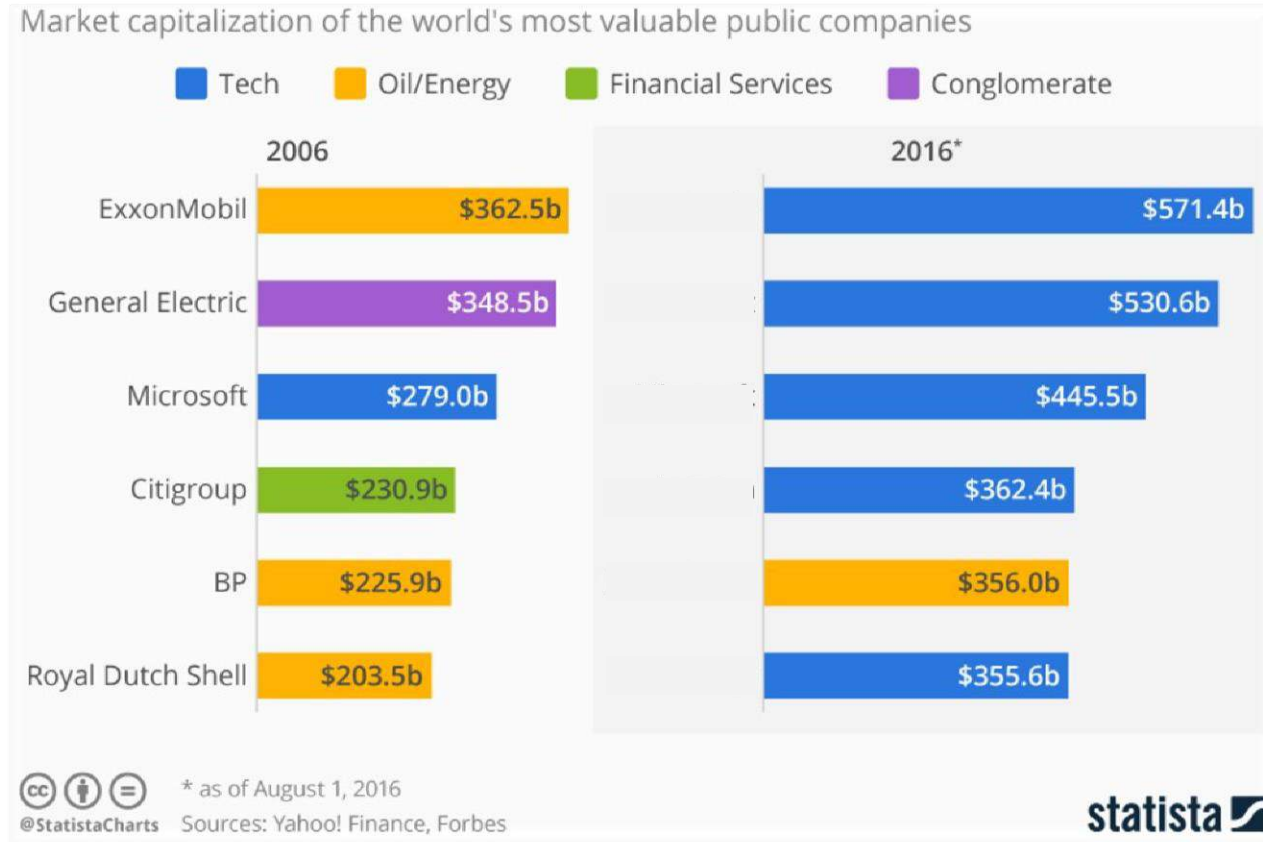The Institute of Internal Auditors Indonesia

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(1) *Changing business landscape*

Dramatic movements in 10 years

Market capitalization of the world's most valuable public companies

- Tech
- Oil/Energy
- Financial Services
- Conglomerate

	2006	2016*
ExxonMobil	$362.5b	$571.4b
General Electric	$348.5b	$530.6b
Microsoft	$279.0b	$445.5b
Citigroup	$230.9b	$362.4b
BP	$225.9b	$356.0b
Royal Dutch Shell	$203.5b	$355.6b

* as of August 1, 2016
@StatistaCharts Sources: Yahoo! Finance, Forbes

statista

Companies that were big players in 2006 had become smaller in 10 years time

'Data driven' companies are of leaders in disruptive innovation and have pushed the adoption of new business models to the markets

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Businesses vulnerable to disruption

Industries Ranked by Potential for Digital Disruption	
Technology Products & Services	#1
Media & Entertainment	#2
Retail	#3
Financial Services	#4
Telecommunications	#5
Education	#6
Hospitality & Travel	#7
CPG & Manufacturing	#8
Healthcare	#9
Utilities	#10
Oil & Gas	#11
Pharmaceuticals	#12

Source: Global Center for Digital Business Transformation, 2015

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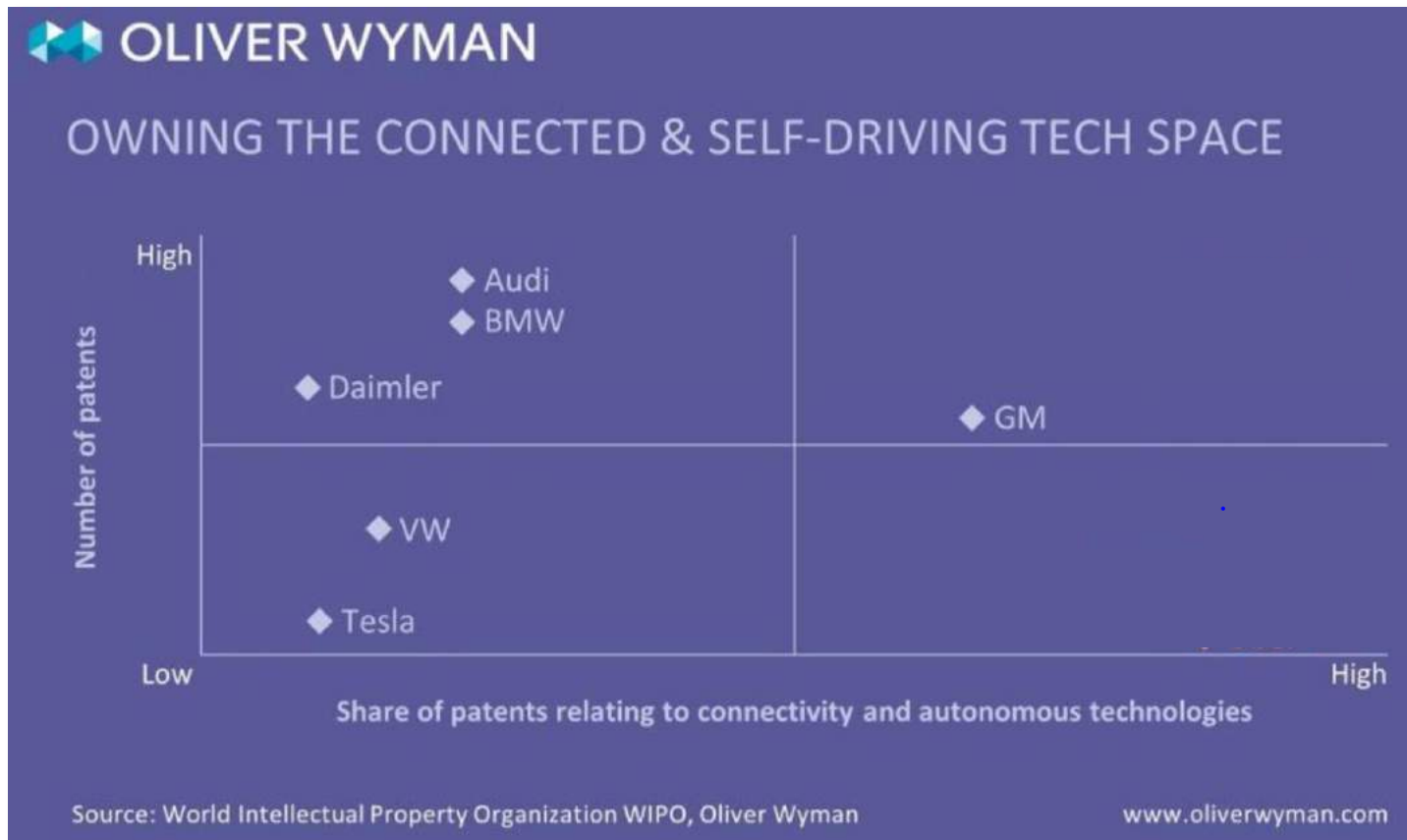
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② *Case study: Self-driving car*

Who are investing in self-driving car ?

Massive investment and innovation are being made by 'automakers' and non automotive companies.

OLIVER WYMAN

OWNING THE CONNECTED & SELF-DRIVING TECH SPACE

Source: World Intellectual Property Organization WIPO, Oliver Wyman

www.oliverwyman.com

Nissan begins public robo-taxi trials next year

In 2018, Nissan launches public trials of its new Easy Ride self-driving car taxi service.

www.cnet.com/roadshow/news/nissan-begins-public-robo-taxi-trials-next-year/

Four years ago, Nissan CEO Carlos Ghosn set an aggressive goal by saying the company would **produce self-driving cars by 2020**. In retrospect, Ghosn might have been underselling Nissan's technological chops, as it just announced public trials of robo-taxis to commence next year.

The self-driving taxi service is called Easy Ride, and the trials will be conducted in Yokohama, Japan.

Nissan is partnering with a company called DeNA, which operates online services for healthcare, gaming and automotive. The Nissan Leaf electric car, modified with self-driving technology, will deliver passengers in the testing area.

Self-driving car technology has been a hot topic for automakers and technology companies, as it promises to save lives by preventing accidents, and offer up a whole new service industry.

With the Easy Ride service, passengers will be able to summon a car using an app. Nissan says the app will not only let passengers set their destination, but it will also recommend restaurants and other businesses, and allow them to take a scenic route.

Nissan isn't alone in public trials for self-driving cars. Google's **Waymo began public trials in Arizona** this year, and GM's **Cruise Automation is planning on public trials** using the name Cruise Anywhere.

Participants in the Nissan test will have to sign up on the **Easy Ride website**, which runs from March 5-18 next year.

Sept 18, 2017 11:30 AM   BUSINESS & TECH

China En Route to Driverless-Car Road Testing

By An Limin and Fran Wang

Under draft regulations, driverless cars will have to clock up to 5,000 kilometers of test driving in closed environments before being let loose on China's roads. Photo: Visual China

(Beijing) – The government is considering giving the green light to driverless car companies to conduct tests on public roadways, a move that is expected to help ambitious Chinese firms pull ahead in autonomous driving.

BlackBerry Is Testing Driverless Cars (BBRY)

By Donna Fuscaldo | November 30, 2016 — 11:39 AM EST

You May Also Like: Looking for a quality broker? Read Investopedia's unbiased review of Charles Schwab.

Just weeks after announcing that it is getting out of making smartphones and on the heels of a deal with Ford Motor Co. (F), BlackBerry Ltd. (BBRY), through its ONX unit, is one of three companies approved to begin testing driverless cars on the roads of Ontario, Canada.

On the Road to Fully Self-Driving

WAYMO

When it comes to driving, experience is the best teacher. Waymo's fully self-driving technology has driven 3.5 million miles on real-world roads for over eight years and counting. In that time, we've built a comprehensive safety program to guide our testing and development of fully self-driving technology.

Waymo's first-of-its-kind Safety Report provides an overview of Waymo's processes for the safe testing and deployment of this technology, and the work we're doing to make it safe and easy to use.

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Self driving car in numbers
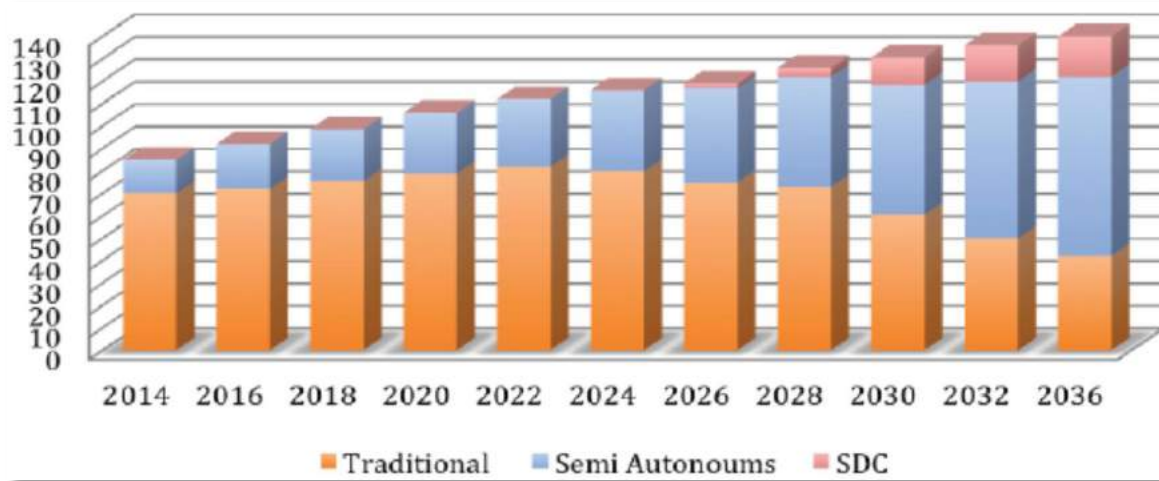
The number of total cars sold globally (in million units)

Source:
Applied Innovation Review,
1 June 2015

Market For Car Automakers

1. the fastest growing market for carmakers for next ten years.
2. expected to grow to $250B by 2030.
3. Charging anywhere from $3000 on mid-range to $7000 on luxury models for these features.
4. **50% of cars are projected to be autonomous by 2035.**

Market For Self-Driving Cars

1. projected to bring in an additional $80B in revenue by 2030.
2. **25% of cars will be self-driving by 2030**.
3. Google, is expected to capture 8% of the total car market by 2035.

Global Market For Cars

1. By 2030, the number of cars in use globally will exceed 2B.
2. **50% of the cars sold by 2030 will be either autonomous or self-driving cars.**
3. The number of autonomous and self-driving cars will grow by 15-17% in CAGR over the next ten years.

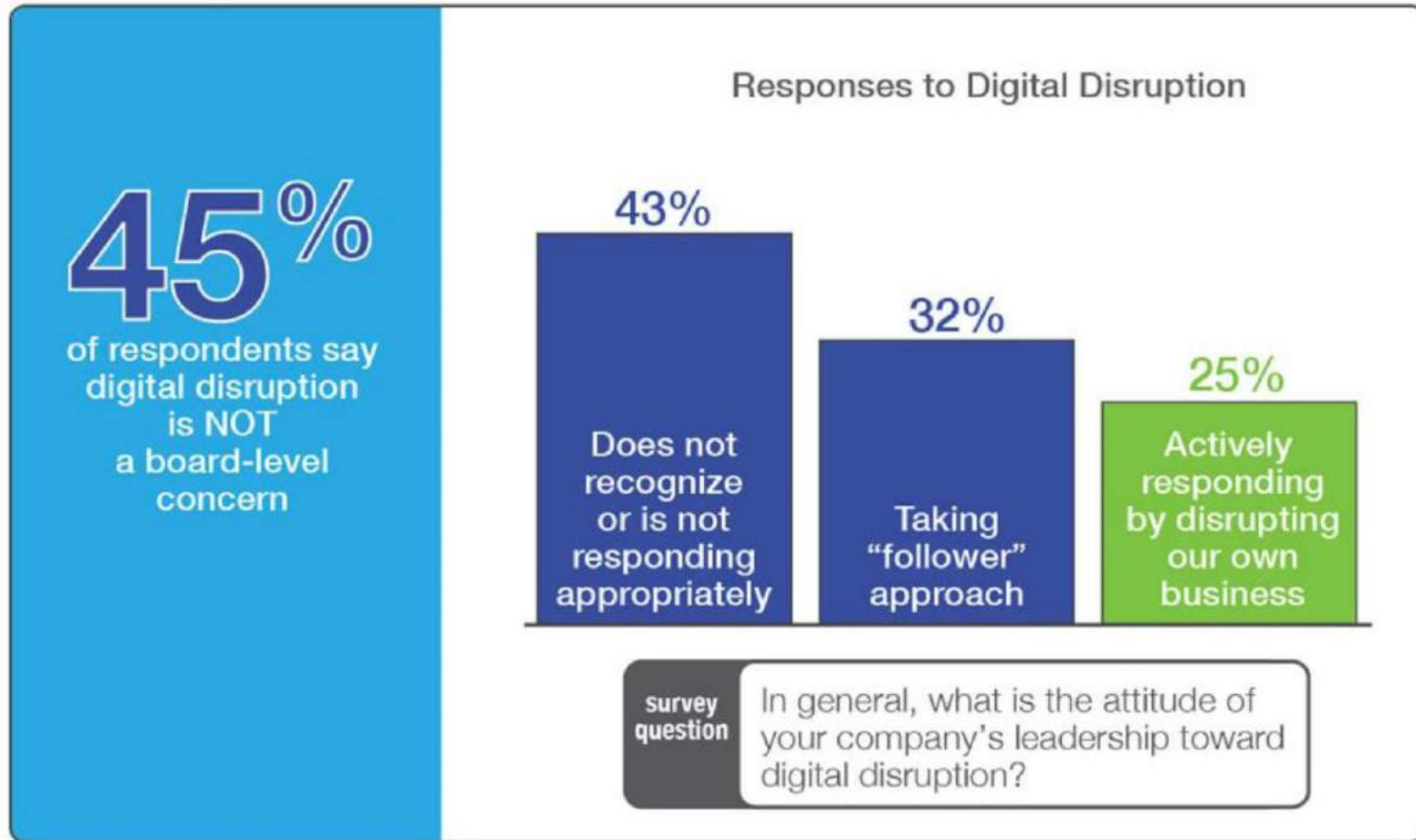|	
Utilization Cars are driven only 4% of the time (that's 8.4 trillion hours of idle time per year) (Morgan Stanley)	• Owned model to service / car sharing model • 250 million cars to only 2.5 million in the US alone through a transportation sharing mode (PwC)
Traffic accidents 90% are mainly caused by human (Various sources)	8 million traffic accidents to 1.1 million (PwC)
Fuel Reduced fuel consumption (Various sources)	9 billion gallons of gas to 190 million gallons – road congestion leads to wasted-fuel; eliminating this would lead to a savings of $158 billion (PwC)
Parking Parking comprises more than 30% of city traffic (Various sources)	Without parking lots and garages, more space would be available for city development, improving quality of life (Various sources)

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③ **What can companies expect from Internal Auditors ?**

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Responses to Digital Disruption

45% of respondents say digital disruption is NOT a board-level concern

43% Does not recognize or is not responding appropriately

32% Taking "follower" approach

25% Actively responding by disrupting our own business

survey question — In general, what is the attitude of your company's leadership toward digital disruption?

Source: Global Center for Digital Business Transformation, 2015

Catalytic roles

1. Bringing in a Chief Digital Officer (CDO) is often the first step.
2. Catalytic roles must be positioned correctly, with sufficient scope, influence and sponsorship.
3. Finding the right person for new roles:
   Chief Analytics Officers, Chief Growth Officer and Chief Customer Officer for driving growth, combining strategy, corporate development, investment, and operations.

Culture

You can't talk about digital without also mentioning its lifeblood — data.

1. Decisions that had previously been deferred to those with years of experience and "a feel for what the customer wants" are now being challenged with data.
2. Whoever has the data has the power to make strategic decisions.
3. Organizations that foster a culture of making data-based decisions will be in a stronger position to weather the changes ahead.

Commitment

Digital should be built into the core strategy, systems, and processes of an organization.

We see this in the recruitment of digital directors at the board level, which has risen steadily over recent years.

23% of the largest 300 companies in the world have at least one Digital Director.

Companies can't become a more digital company without the right people leading the charge.

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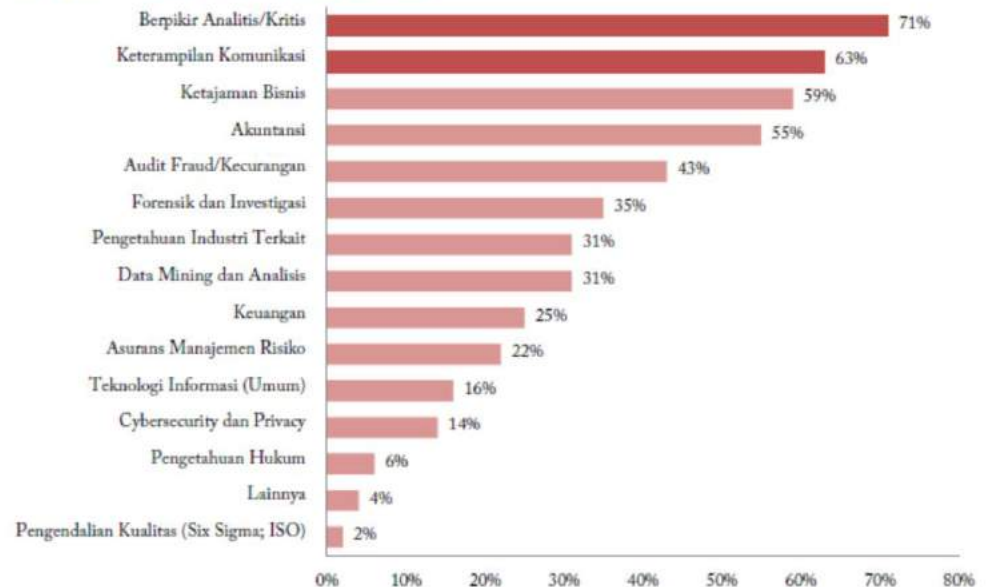
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2: Playing a role as trusted advisor

Advise management on the current and future competition as well as technology trends. This requires business acumen, critical thinking, general knowledge on IT advancement.

Lanskap Praktik Audit Internal di Indonesia, IIA Indonesia

Advise management on the risks on new innovation and how to overcome them. Equally important is the risks of not innovating.

Hacking Risk Is What Worries Americans Most About Driverless Cars

By **Sonali Basak**
October 3, 2017, 1:00 PM GMT+1

→ Majority polled don't expect autonomous cars for two decades

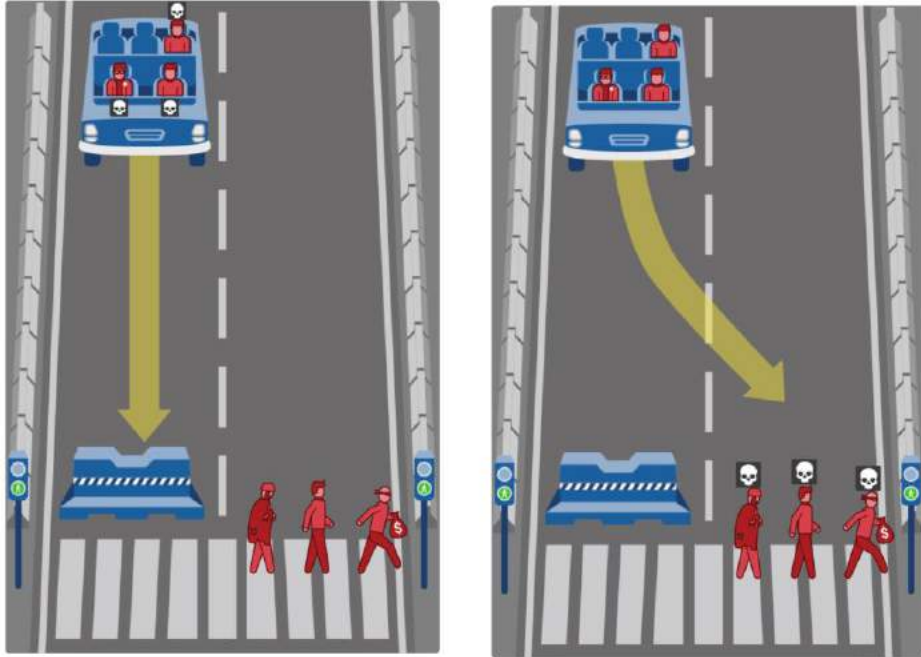→ The risk 'shifts from humans to machines,' AIG's Baugh says

IT TAKES VISION

Do you believe it will arrive soon?

believers vs nonbelievers

Remaining issue: ethical and robotic laws for Autonomous / Self-driving cars

What should the self-driving car do?

Source: Moral Machine - MIT

1. An automated vehicle should not collide with a pedestrian or cyclist.
2. An automated vehicle should not collide with another vehicle, except where avoiding such a collision would conflict with the First Law.
3. An automated vehicle should not collide with any other object in the environment, except where avoiding such a collision would conflict with the First or Second Law.

An automated vehicle must obey traffic laws, except where obeying such laws would conflict with the first three laws. Such an approach would enable the vehicles to break traffic laws in the interest of human life when presented with a dilemma situation, an allowance that would most likely be acceptable to society.
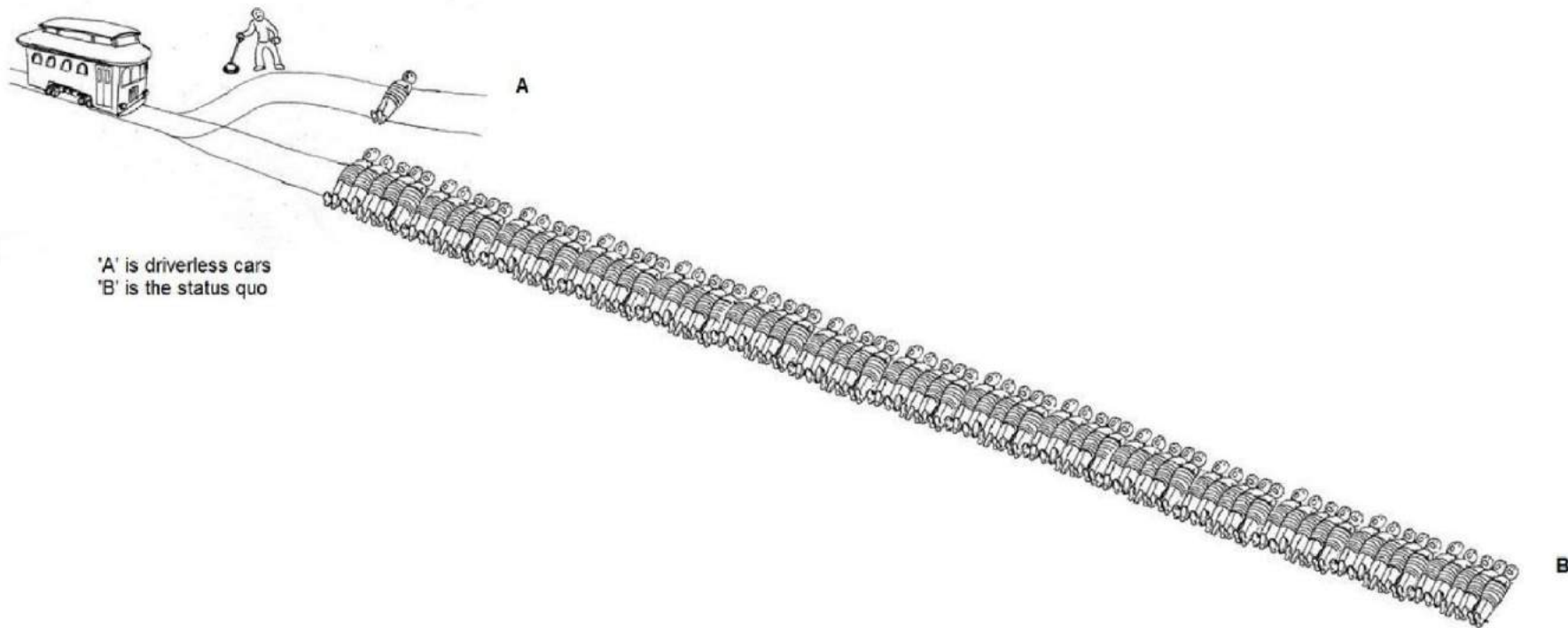Another point worth considering...the need to protect human life outweighs the priority given to human commands

The Real Trolley Problem

'A' is driverless cars
'B' is the status quo

Why being sceptical? The benefits are real!

Autonomous cars will generate huge economic benefits   U.S. market, non-exhaustive

- $488 billion — Total savings from accident avoidance
- $158 billion — Fuel savings
- $507 billion — Increased productivity from autonomous cars
- $11 billion — Fuel savings from avoiding congestion
- $138 billion — Increased productivity from congestion avoidance
- Autonomous cars total savings: **$1.3 trillion**
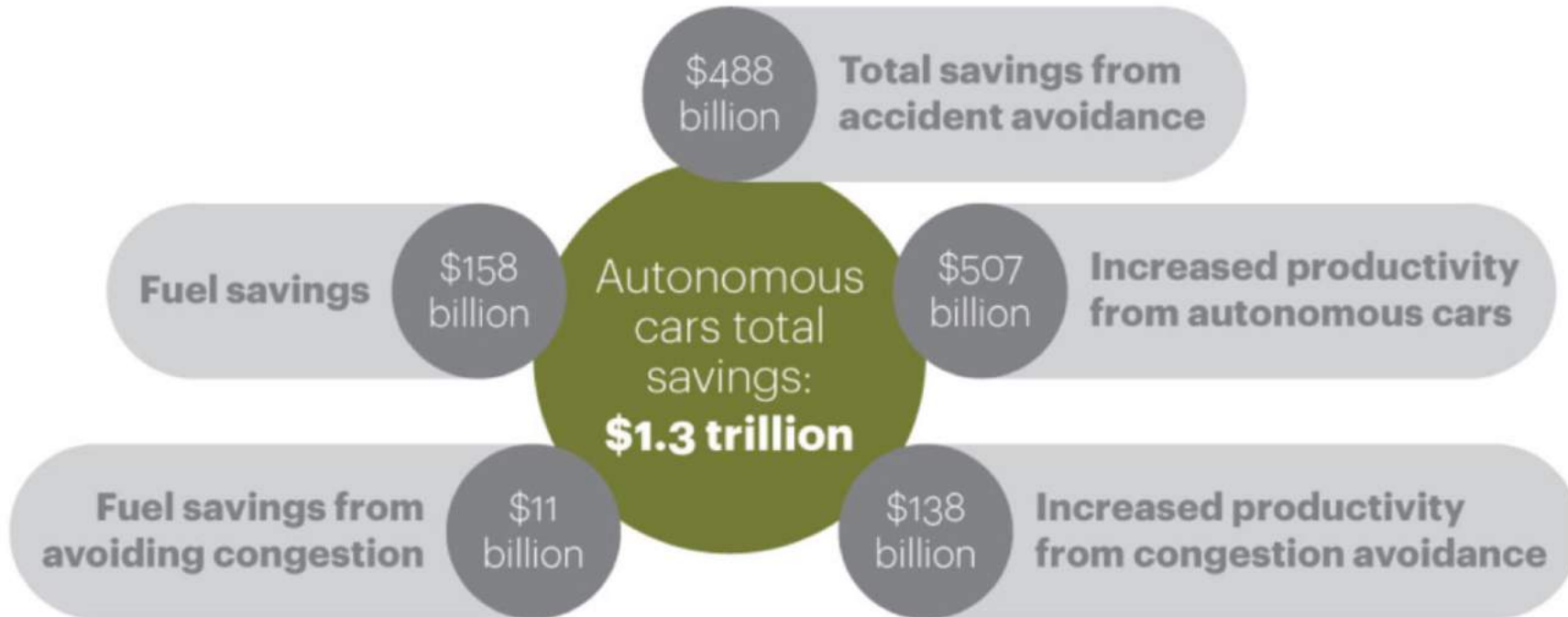
Source: Predictions for U.S. market, Morgan Stanley research, 2014

How many new cars may be fully autonomous by 2030?

New-vehicle market share of autonomous vehicles, %

High-disruption scenario
- Conditionally autonomous[1]
- Fully autonomous[2]

Low-disruption scenario
- Conditionally autonomous
- Fully autonomous

Commercial introduction by new tech players and premium OEMs[3]

Availability in popular consumer models

Technical/regulatory barriers delaying commercial-scale introduction

Gradual ramp-up of manufacturing capacity by tech players

Commercial introduction by mass-market leaders

Low perceived value or negative publicity following critical incidents, causing slow consumer uptake

Factors in disruption scenarios	High disruption	Low disruption
Regulatory challenges	Fast	Gradual
Safe, reliable technical solutions	Comprehensive	Incomplete
Consumer acceptance, willingness to pay	Enthusiastic	Limited

[1]Conditionally autonomous car: the driver may take occasional control.
[2]Fully autonomous car: the vehicle is in full control.
[3]Original-equipment manufacturers.

McKinsey&Company

"I think the hardware may be ready before society is ready."

Bill Ford, great-grandson of Henry Ford

Contribution of human error

Table 1. Driver-, Vehicle-, and Environment-Related Critical Reasons

Critical Reason Attributed to	Estimated	
	Number	Percentage* ± 95% conf. limits
Drivers	2,046,000	94% ±2.2%
Vehicles	44,000	2% ±0.7%
Environment	52,000	2% ±1.3%
Unknown Critical Reasons	47,000	2% ±1.4%
Total	2,189,000	100%

*Percentages are based on unrounded estimated frequencies
(Data Source: NMVCCS 2005–2007)

9 Out of 10 Crashes Are Due to Human Error

- Driver failed to look properly
- Driver failed to judge other drivers path / speed
- Driver careless, reckless or in a hurry
- Loss of control
- Poor turn or manoeuvre
- Pedestrian failed to look properly
- Slippery road (due to weather)
- Travelling too fast for conditions
- Sudden braking
- Following too close

Note: the percentages add up to more than 100% because an accident has more than one contributory cause.

Source: UK Department of Transport

AUTONOMOUS