



The Fourth Industrial Revolution and Financial Insurance: Focus on Case of Japan

A Reum Choi



INDEX

- 1. Definition of Fourth Industrial Revolution**
- 2. Policies Related to Fourth Industrial Revolution**
- 3. Fintech**
- 4. Insurtech**
- 5. Summary**

1. Definition of Forth Industrial Revolution

- What is Forth Industrial Revolution?

=> Rapid technological innovation centering on IoT, Big Data and AI, which is being labeled the “Fourth Industrial Revolution,” has the potential to significantly change our lifestyles and our societies.

- All business and information available to society in the “real world” can be freely controlled through digitized networks(IoT)
- Large volumes of data can be analyzed to create additional value(Big Data)
- Self-learning machines can analyze data and situations more rapidly and objectively than human beings. (Artificial intelligence: AI)
- Automation can be applied to more diversified and complicated tasks. (Robotics)

⇒ That which was previously impossible is now possible for society.

⇒ Hence the potential dramatic changes in industrial and employment structures.

1. Definition of Forth Industrial Revolution

- These technological breakthroughs includes the changes below:
 - Shift from mass production/uniform services to customized production/services based on individual needs (customized medical treatment, immediate custom-made clothing, educational service depending on individual understanding)
 - Free matching of society's unused potential assets with needs of individuals(Uber, Airbnb, etc.)
 - Support or replacement for human labor, recognition/learning capability(automated driving, manufacturing/management, delivery by drone)
 - Creation of new services, shift to after-market services for products and goods (from simple sales of equipment to added services of operation/security/insurance using sensor data), significant efficiency improvement throughout the entire supply chain with data sharing (integration of production equipment and logistics/delivery/payment systems)
 - Technology used in the revolution is common foundational technology for innovation across all industries, and allows for addressing new needs (genome editing technology × biodata=new drug discovery, new type of farm product, bioenergy, etc.)

2. Policies Related to Fourth Industrial Revolution

Title	Department	Main theme	Hold
Review Board of Information Resources in the Fourth Industrial Revolution	Intellectual Property Policy Office	Copyright, industrial property rights, and other intellectual property rights reviews on how to protect and utilize new information materials such as artificial intelligence and data	2016.10~
Future Investment Conference, A group for structural reform	Industrial Revitalization Division	Social implementation of technological innovation such as artificial intelligence, IoT, industrial structure reform, elimination of obstacles to realize technological innovation, etc.	2016.9.12~
Data Distribution Environmental Improvement Review - Data utilization in the AI and IoT era working Group - Open Data Working Group	Advanced Information Communication Network Society Strategy Headquarters (IT Strategy Division)	Improvement of smooth data distribution, utilization and utilization environment using IT including banks	2016.9.16~
Next-Generation Healthcare ICT Council	Health, Medical Strategy Promotion Division	Promotion of digitization, standardization of data in field of medical care · Improvement of data utilization such as medical care by private healthcare business	2015.1.21~
Industrial Structure Review New Industrial Structure Group Intelligence Committee Board of Trade Information	Ministry of Economy, Trade and Industry	Formation of data distribution market · Intellectual property policy	2015.9.17~
Distributed strategy working group	Commerce and Information Policy Bureau	· Reviewing new challenges using IoT · Summary of technology and structure for realizing distributed data distribution structure	2016.3.28~
A communications council Information communication policy conference IoT Policy Committee	Ministry of Internal Affairs and Communications	Review of data utilization promotion model for IoT / Big data era	2015.9.25~

source: Cabinet office, Government of Japan(2016)

2. Policies Related to Fourth Industrial Revolution

Title	Department	Main theme	Hold
Review on the fourth Industrial Revolution Intellectual Property System	Ministry of Economy, Trade and Industry, Economic and Industrial Policy Bureau, Industrial Science and Technology Policy and Environment Bureau, Japan Patent Office	<ul style="list-style-type: none"> · Responding to challenges in key areas of new industrial structure vision (automobile, robot, medical care, etc.) · Intellectual property system and operation plan to cope with increasing data and related technology using artificial intelligence and IoT · Support for patent · Strategic International Standardization 	2016.10~
Transversal System for the Fourth Industrial Revolution	Ministry of Economy, Trade and Industry, Economic and Industrial Policy Bureau	Characteristics of digital market · overseas institutional response trend and horizontal system (competition policy, data utilization, protection and intellectual property)	2016.1.15~
Meetings on artificial intelligence and human society	Cabinet office, Government of Japan Council for Science, Technology and Innovation	Review the relationship between artificial intelligence and human society for the future society where artificial intelligence advances from a broad perspective such as ethics, legal system, economy, and social influence.	2016.5.30~
Artificial Intelligence Technology Strategic Conference	Ministry of Internal Affairs and Communications, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Economy, Trade and Industry,	Artificial intelligence R & D goals and industrial roadmap planning	2016.4.18~
Comprehensive Science and Technology Innovation Conference	Cabinet office, Government of Japan Council for Science, Technology and Innovation	Create new value by linking systems to each other, strengthening the base technology (AI, etc.) while improving the database that is the foundation of new value service creation.	2015.1.13~
AI Network Society Promotion Conference	Ministry of Internal Affairs and Communications, Institute for Information and Communications Policy	Comprehensive review of social, economic, ethical and legal issues for promoting AI networking throughout society	2016.10.31~

source: Cabinet office, Government of Japan(2016)

2. Policies Related to Fourth Industrial Revolution

- **The latest Fourth Industrial Revolution policy**
- Growth Strategy 2017:
 - The key to break the secular stagnation and achieve mid-and-long-term growth is to realize “Society 5.0” that resolves various social challenges by incorporating the innovations of the fourth industrial revolution(e.g., IoT, big data, artificial intelligence (AI), robot, and sharing economy), which has recently been taking place rapidly, into every industry and social life.
 - ✓ Extension of healthy lifespan
 - ✓ Realization of mobility revolution
 - ✓ Creating of next-generation supply chains
 - ✓ Building and developing pleasant infrastructure and towns
 - ✓ FinTech

2. Policies Related to Fourth Industrial Revolution

- **The latest Fourth Industrial Revolution policy**
- New Economic Policy Package 2017:
 - Human resources development revolution
 - Supply system innovation
 - ✓ Supply system innovation of SMEs and small-scale entrepreneurs
 - ✓ Supply system innovation through improved profitability and investment promotion of corporations
 - ✓ Supply system innovation through societal implementation of Society 5.0 and disruptive innovation
 - Institutionalization of regulatory “sandbox”
 - Societal implementation of the Fourth Industrial Revolution and the system reforms in the areas experiencing sluggish productivity
 - Radical strengthening of the foundation for the innovation promotion
 - Infrastructure development for Society 5.0 etc.

2. Policies Related to Fourth Industrial Revolution

- **The latest Fourth Industrial Revolution policy**
- Growth Strategy 2018
 - The government has doubled down on the implementation of a variety of measures, including bolder tax policies, budget, and regulatory reforms. Various measures have also been proposed so as to raise the productivity of the entire Japanese economy toward the realization of "Society 5.0".
 - "Future Investment Strategy 2018" will expand the scope and timeframe of the growth strategies while steadily implementing various measures based on the considerations of the past half a year. Capitalizing on the technological innovations of the Fourth Industrial Revolution, past efforts will be reevaluated and new mechanisms introduced in order to fully realize "Society 5.0".

3. Fintech

- Social vision that Japan aim at

⇒ While safety and security of users are secured, FinTech corporations and financial institutions that use advanced technologies such as blockchain cooperate with each other through open API and provide services competitively to users one after another. Cashless settlement is pervasive.

- Directions of change

⇒ Realization of more convenient settlement, remittance and funding etc. through a small amount settlement, remittance and swift data-based credit review which will be all executed online.

⇒ Realization of efficient corporate back office and household finance through real-time visualization of corporate management, accounting and household finance.

3. Fintech

- Main Movement for FinTech
 - The bank's IT investment status
 - ✓ The advancement of the settlement business is closely related to the IT strategy of the financial group and the problem of the management strategy of the group as a whole.
 - Prepare a countermeasure by IT utilization in Japanese bankers
 - Responding to FinTech advance
 - ✓ Global movements are likely to change significantly
 - ✓ Changes in the structure and ecosystem of the financial industry(unbundling etc.)
 - ✓ Need to secure user protection and anti-fraud system stability
- ⇒ Securing of user protection, convenience of user, productivity improvement

3. Fintech

Case 1: The readjustment of laws related to virtual currency

- Japan has implemented law and system related to virtual currency since 2014.
- This background was caused by the bankruptcy of domestic virtual currency businessmen and international request.
- Due to the bankruptcy of the world's largest virtual currency exchange in 2014, it recognized the need for institutional devices to protect virtual currency users.
- The present condition of legal system in Japan
 - Introduction of registration system for exchanger between virtual currency and legal currency
 - Readjustment of the rules for the discretion of the money and virtual currency deposited by the user through the guarantee of user trust
 - Mandatory identification when opening an account
 - Non-taxation in consumption tax through tax revision in 2017

3. Fintech

Case 2: Draw a digitalization of check in blockchain technology

- In Singapore, Hitachi, Ltd. is affiliated with MUFG Bank in Tokyo and is simulated.
- In Japan, it is possible that a business with blockchain technology is affiliated with a bank and is simulated except to register industry type.

Source: Financial Services Agency(2017)

3. Fintech

Case 3: Robo-Advisor

- Robo-advisors or Robo-advisers are a class of financial adviser that provide financial advice or Investment management online with moderate to minimal human intervention.
- They provide digital financial advice based on mathematical rules or algorithms. These algorithms are executed by software and thus financial advice do not require a human advisor. The software utilizes its algorithms to automatically allocate, manage and optimize clients' assets.
- In America, business(business operator) that register in investment adviser develop business.
- In Japan, business(business operator) that register in Financial Instruments and Exchange Law develop business

3. Fintech

Case 4: P2P lending

- Peer-to-peer lending, also abbreviated as P2P lending, is the practice of lending money to individuals or businesses through online services that match lenders with borrowers.
- Since peer-to-peer lending companies offering these services generally operate online, they can run with lower overhead and provide the service more cheaply than traditional financial institutions.
- As a result, lenders can earn higher returns compared to savings and investment products offered by banks, while borrowers can borrow money at lower interest rates, even after the P2P lending company has taken a fee for providing the match-making platform and credit checking the borrower. There is the risk of the borrower defaulting on the loans taken out from peer-lending websites.
- In America, business that was registered in US Securities Laws and had a banking license develop business.
- In Japan, business that was registered in Financial Instruments and Exchange Law and Money Lending Business Act develop business(The business follows the regulations of the Money Lending Business Act and makes loans).

3. Fintech

Case 5: Transaction Lending

- Transaction-oriented lending focuses on one transaction with a customer, or many standardised and repetitive transactions with various customers.
- Transaction lending relies more on information that can easily be quantified, commonly referred to as 'hard' information. Lending decisions are therefore made after borrowers go through a formally structured application process where they are required to meet certain requirements such as providing specific financial information in order to qualify for a loan.
- A new financial service that uses big data, such as credit card payment information and bank account balances.
- In America, business that registered in US Securities Laws and had a banking license develop business
- In Japan, business that register in Money Lending Business Act develop business.

3. Fintech

Measures for FinTech in Japan

- In consideration of the balance between user protection and the need for regulation, the regulations are individually adjusted in the Act.
- Regarding Environmental Improvement
 - ✓ 1. Establish FinTech Support Desk
 - ① Clearness of legal interpretation
 - ② Providing guidance of the individual case.

=> Proactively analyze the impact of IT advances on the financial industry and drive financial innovation

3. Fintech

- Open API
 - In recent years, “open APIs,” which disclose methods for connecting with banking systems to other companies, have attracted increasing attention as a tool for enhancing financial services through collaboration with financial institutions and Fintech companies, etc.
 - In the Japanese banking industry, many banks have now begun considering the possibility of utilizing open APIs.
 - An API (Application Programming Interface) generally refers to connection specifications that enable functions and managed data of an application to be accessed and used by another application. APIs that allow access by other companies and such (hereafter referred to collectively as “third parties” or individually as a “third party”) are known as “open APIs.”

3. Fintech

- Increased Interest in Block Chain After 2017
 - Enable systems to operate at low cost
 - Other than finance, it can be used in areas such as system improvement, smart contract, etc.



NTTサービスエボリューション研究所

ブロックチェーンを活用したコンテンツ利用許諾管理に関する研究結果を公表



ソフトバンク

ブロックチェーン技術を活用してインターネット上で信頼性の高い取引を実現するプラットフォームの研究開発を実施



ガイアックス

CtoCのマッチングや取引を行うシェアリングサービスにおいて、ブロックチェーンを活用した本人確認サービスの実証実験を実施



LO3エナジー

ブロックチェーンを活用して、自家発電で余った電力を直接近隣の住民と売買する実証実験を実施。



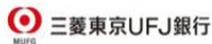
ブロックアイ

ブロックチェーンに登録された著作物について、著作権の証明書を発行するサービスを提供。



ファクトム

電子文書をブロックチェーンで管理することで、公証を実現するサービスを提供。



三菱東京UFJ銀行

「MUFGコイン」と名付けた独自の仮想通貨を開発



みずほフィナンシャルグループ

カレンシーポート、日本マイクロソフト等と協働し、シンジケートローン業務を対象とした実証実験を実施



デロイトトーマツ

メガバンク3行とともに、銀行間振込業務に焦点をあてたブロックチェーンの実証実験を実施



ストリーミウム

ビットコインを用いて、実際に視聴した分の料金のみを支払う、従量課金型動画配信サービスの試用版を提供。



エバーレジャー

宝石のダイヤモンドやその所有者、付随する保険、鑑定書などの情報をブロックチェーンで管理するサービスを提供。



ナユタ

ブロックチェーンを活用し、使用权を第三者の仲介なくして管理できる電源ソケットのプロトタイプを公開。

3. Fintech

- Direction of Fintech in Growth Strategy 2017
 - First, Japan will use this to tremendously improve the convenience of finance-related services for users and drastically improve the fund-raising capacity of companies as well as their productivity and earning capacity.
 - Second, Japan will address the enhancement of a common base aimed at creating value sources.
 - ✓ To start with,
 - ✓ Japan will establish “database (real data platform)”.
 - ✓ Japan will invest on human resources who would be able to respond to the fourth industrial revolution, as well as facilitate shift in labor force.
 - ✓ Japan will advance reforms on work styles to improve productivity and enhance creation of new values.

3. Fintech

- Direction of Fintech in Growth Strategy 2017
- Third, Japan will “try first” and shift to “shape policies based on demonstration”.
- Fourth, Japan will establish a metabolic system aimed at creating an industrial structure for the period of Society 5.0.
- Fifth, Japan will establish a system whereby local economies will be in a virtuous cycle.

4. Insurtech

- Innovative ICT Responses by Insurance Companies
 - Development and sales of medical insurance products (such as premium based on health age standard) by utilizing medical big data, health promotion services (healthcare service)
 - Automation of insurance business
 - Driving diagnostic service using drive recorder and pricing of car insurance
 - Introduction of speech recognition and summary technology of call center
 - Customer correspondence by humanoid robot

Source: 石橋 弘文(2017)

4. Insurtech

Case 1: Sompo Japan Nipponkoa Holdings

- The utilization of digital technology
 - Establish "SOMPO Digital Lab"
 - NIPPONKOA INSURANCE CO., LTD :
 - ✓ Utilization of cutting-edge technology
 - ✓ Aims to relax, safety, health for customers
- Key themes in digital utilization
 - Business efficiency in business units
 - Build a new customers touchpoint with digital technology
 - Marketing for digital native
 - Research and development of new business model

4. Insurtech

Case 1: Sompo Japan Nipponkoa Holdings

- Telematics insurance => discount a premium
- AI application of call center => efficiency of call center

=> It is realizing "improvement of customer management quality" and "business efficiency improvement" by utilizing new technologies such as AI (Artificial Intelligence) voice recognition technology at a call center that received inquiries from customers.

- * Telematics is a term that combines the words telecommunications and informatics to broadly describe the integrated use of communications and information technology to transmit, store and receive information from telecommunications devices to remote objects over a network.

4. Insurtech

Case 2: Telematics in Aioi Nissay Dowa Insurance Co., Ltd.

- The premium is discounted by analyzing the movement in the vehicle equipment.
- Analyze sudden braking, over-speed, etc. using a vehicle navigation
 - ⇒ Insurance premium discount reflection
 - ⇒ Expansion of safety operation service

Source: <http://www.sankeibiz.jp/business/news/>

4. Insurtech

Case 2: Telematics in Aioi Nissay Dowa Insurance Co., Ltd.

- Data Utilization
 - Create a data telematics system

 - Main task
 - Enhancement of data source utilization by each department
 - Advanced human resource training
 - Strengthen the partnership with professional talent with our European, U.S., and Asian subsidiaries
 - Collaborative research project of Linkage of Industry Academia
- ⇒ Drive greater utilization of our data
- ⇒ Contribute to the creation of new added value, relief, and the establishment of a safe society

Source: <https://www.aioinissaydowa.co.jp/corporate/service/telematics/>
Waseda university alliance lecture(2018)

4. Insurtech

- In respect to ICT in insurance
 - Improve business processes
 - Creating business processes
 - Web market data enhancement
 - A survey study on the IoT domain
- ⇒ Research on AI and technology, verification experiment
- ⇒ Open innovation

Source: Waseda university alliance lecture(2018)

5. Summary

- Japan is actively reflecting the Fourth Industrial Revolution, analyzing the challenges and strengths facing Japan, and establishing a fourth industrial revolution strategy for its own country.
- Companies are actively responding under the active support of the Japanese government.



Thank You !



Impact of Digitalization on the Insurance Industry

28 July 2018

Michio Kitahara
Executive Officer

Aioi Nissay Dowa Insurance Company Limited

1. About Aioi Nissay Dowa Insurance

INDIVIDUALITY

A distinctive company full of individuality

Growth Strategies

Community focused

**Regional
revitalization
project**

Build a mobility society

**Telematics
project**

**Create new
business model**

ICT project

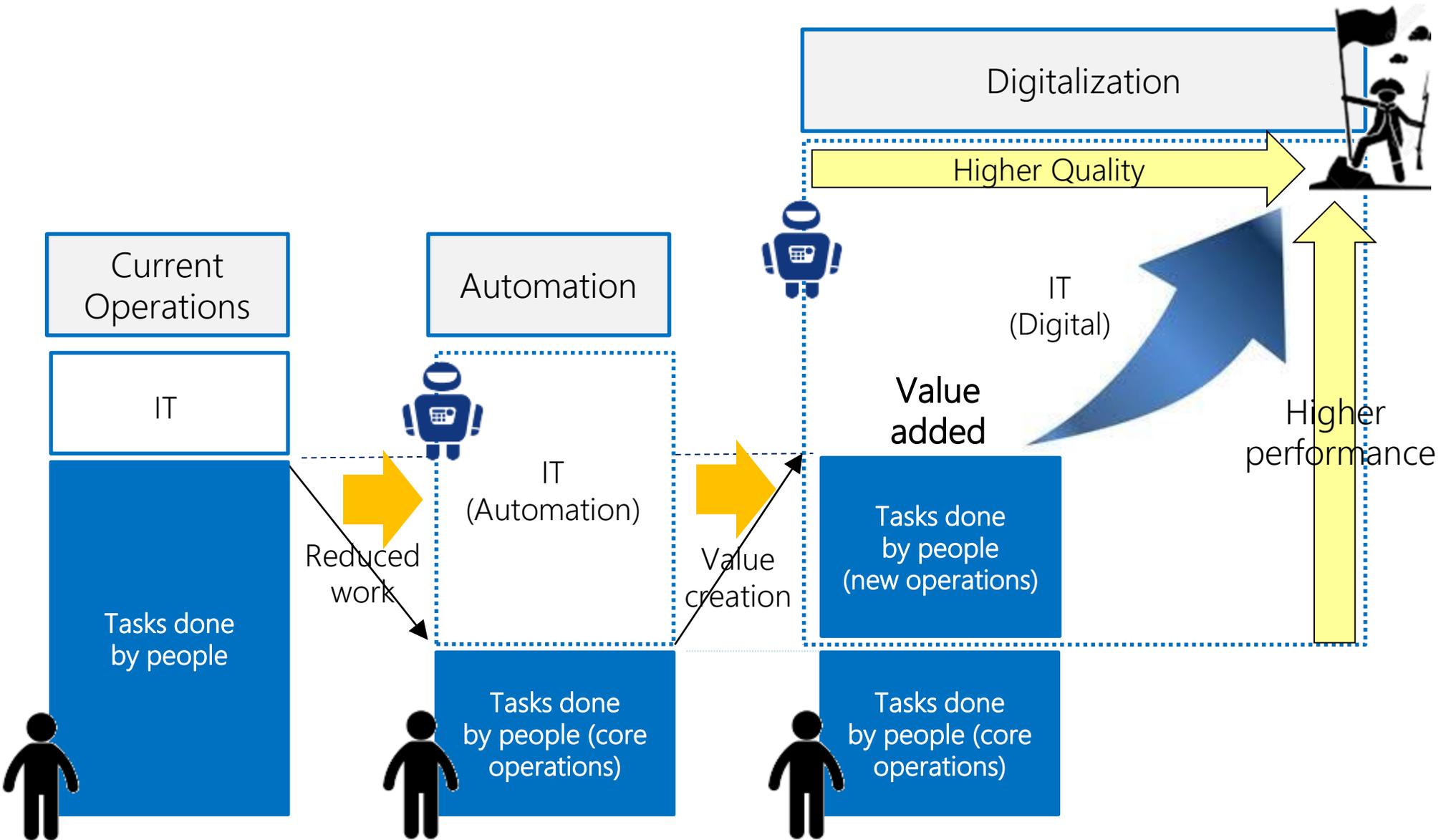
New risk project

Change business environment

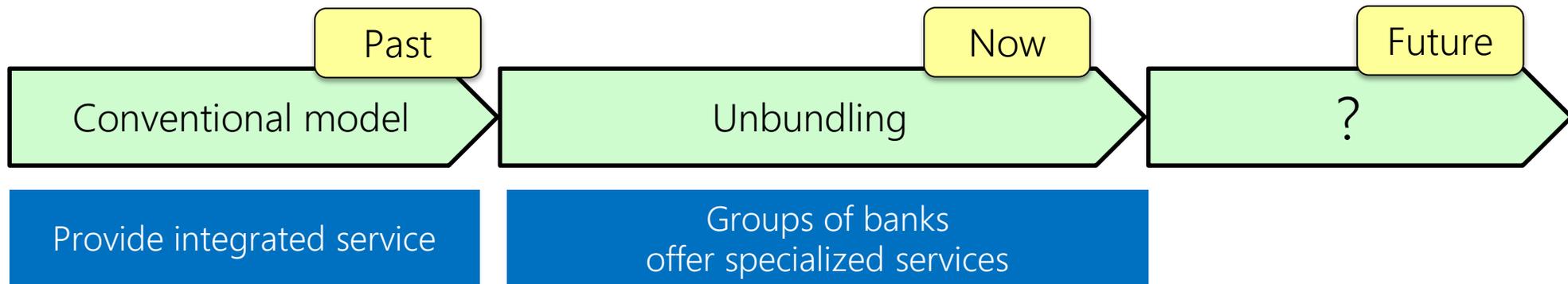
Corporate culture innovation project

2. Impact of Digitalization

(1) Impact of digitalization: What is 'digitalization'?



(2) Impact of digitalization on business (banks)



Bank

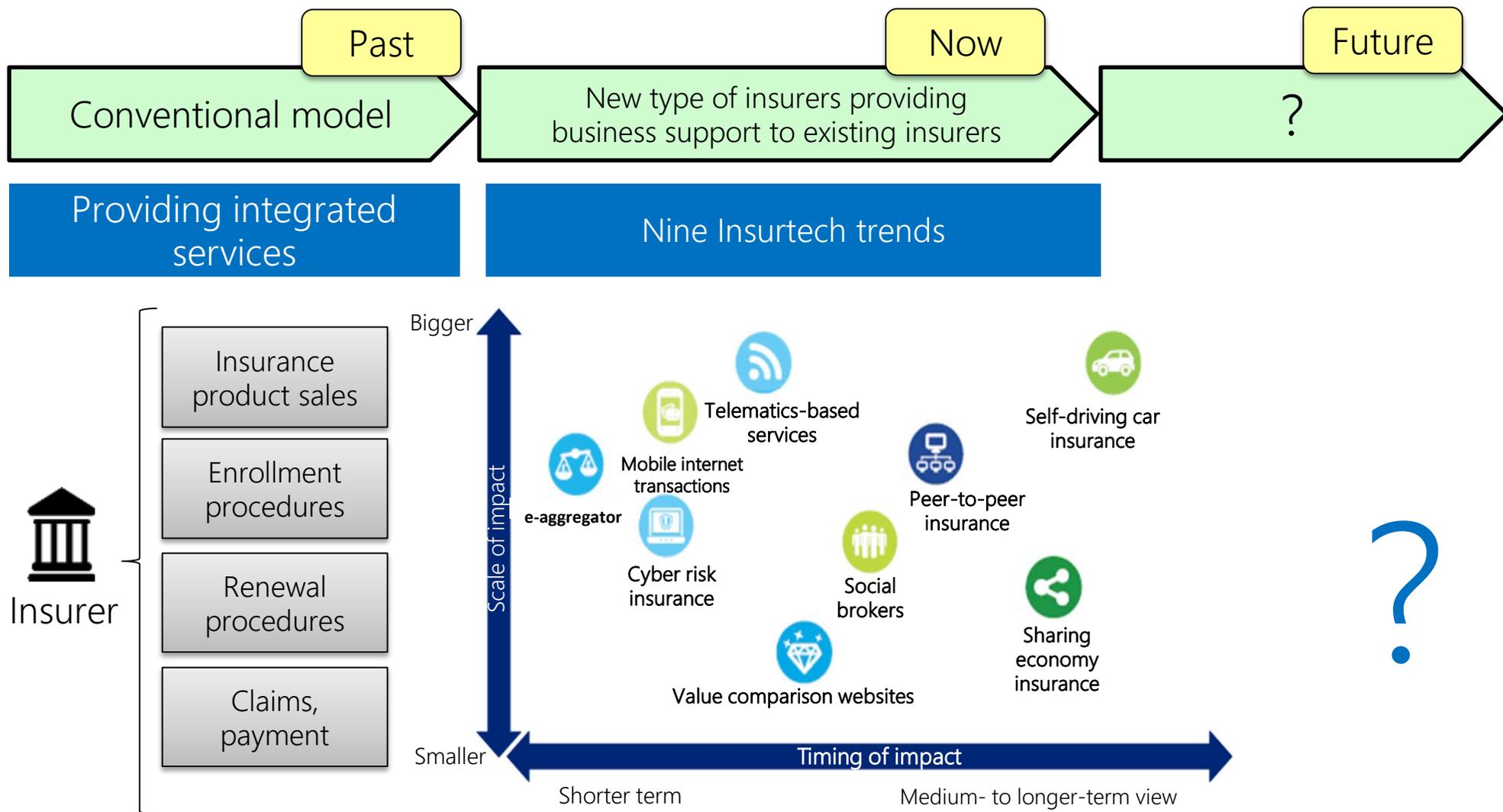
- Savings
- Settlement/re mittance
- Investment management

-
-
-



Source: *Insurance disrupted: General insurance in a connected world*, Deloitte, 27 July 2015.

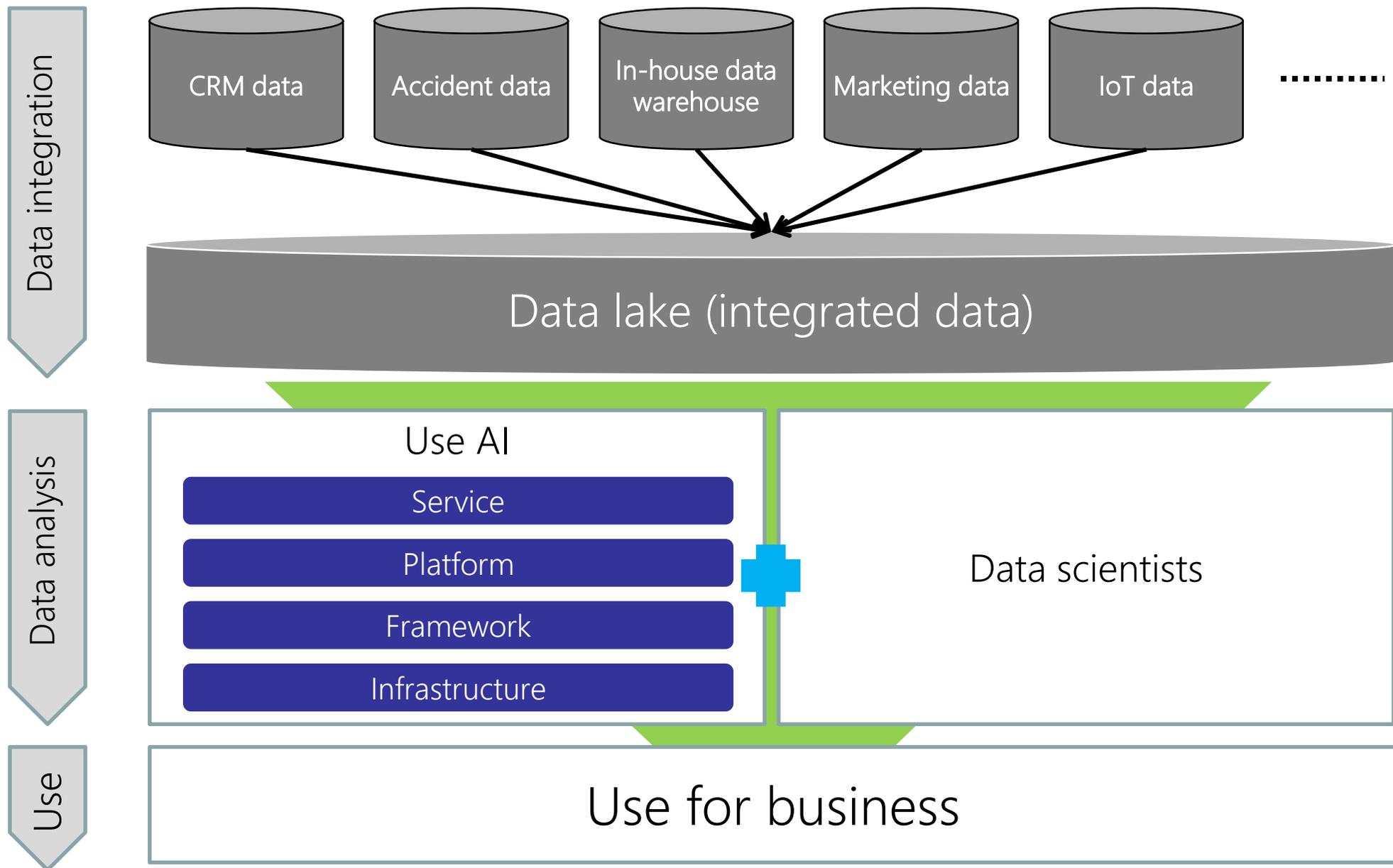
(3) Impact of digitalization on business (insurers)



Source: *Insurance disrupted: General insurance in a connected world*, Deloitte, 27 July 2015.

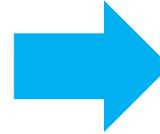
3. Responding to Digitalization

(1) Base establishment

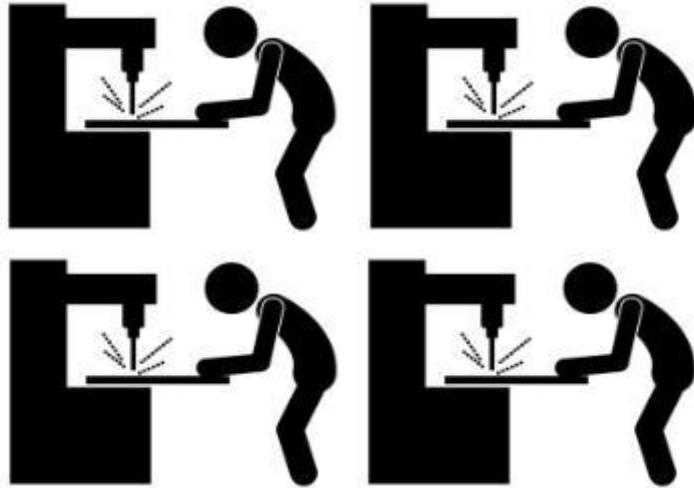


(2) Shifting existing operations to digital ones

Analog business processing
— low productivity



Business processing utilizing
technologies



Affordable technologies have lowered barriers to adoption

Need to review framework of current business operations



Find talented workers who can bolster operations centered on technologies

Put in place a system so that reduction of work volume can be assessed

(3) Innovation in Claim Payments — Document Search

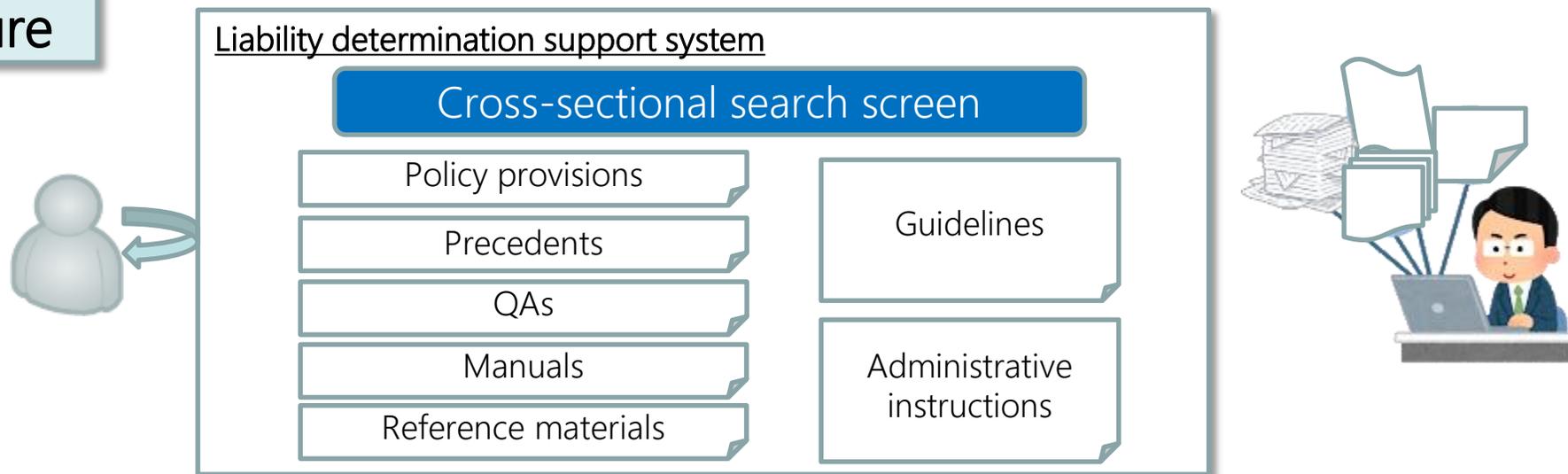
Establishing highly accurate system for searching documents

Diversified insurance products require insurers make judgment on complex cases while checking a mass of documents.

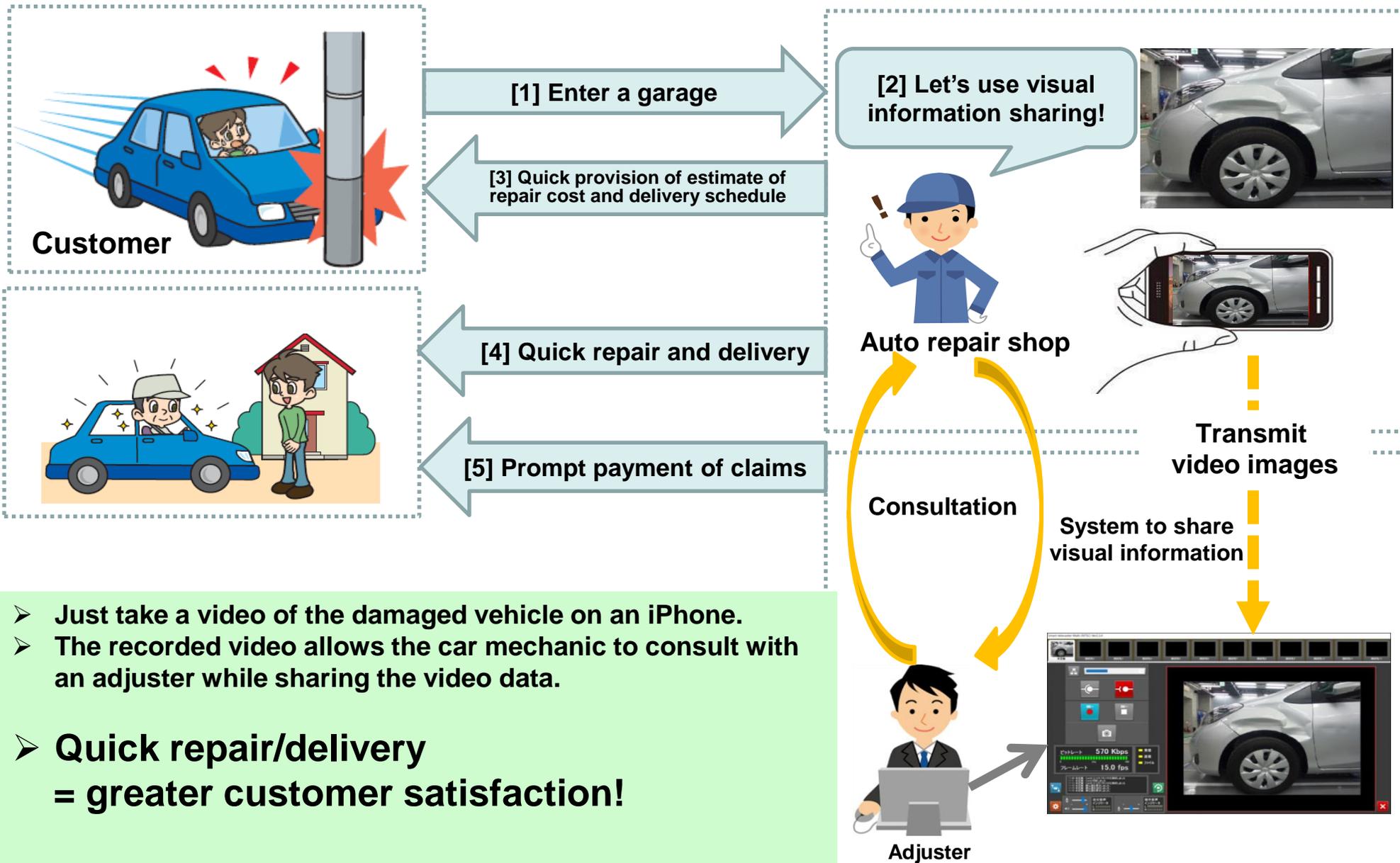
Now



Future



(4) Innovation in Claim Payments — Share Visual Information



Response to wide-area disasters

◆ Drones

Places difficult to conduct on-site inspections promptly:
areas affected by large-scale natural disaster/fire.



Use drones for
on-site inspections

Our loss adjuster-qualified employees
operate drones.



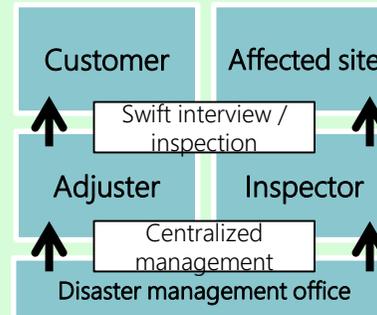
- Allows efficient/swift claims inspections
- Significantly reduces time to payment of claims

◆ Loss adjuster witnessed inspection system

Problems in a large-scale natural disaster/fire:
excess/lack of insurance inspectors and inefficient movement among
affected sites.



Support for efficient attendance/appointment through using map
information and management of inspectors' schedules



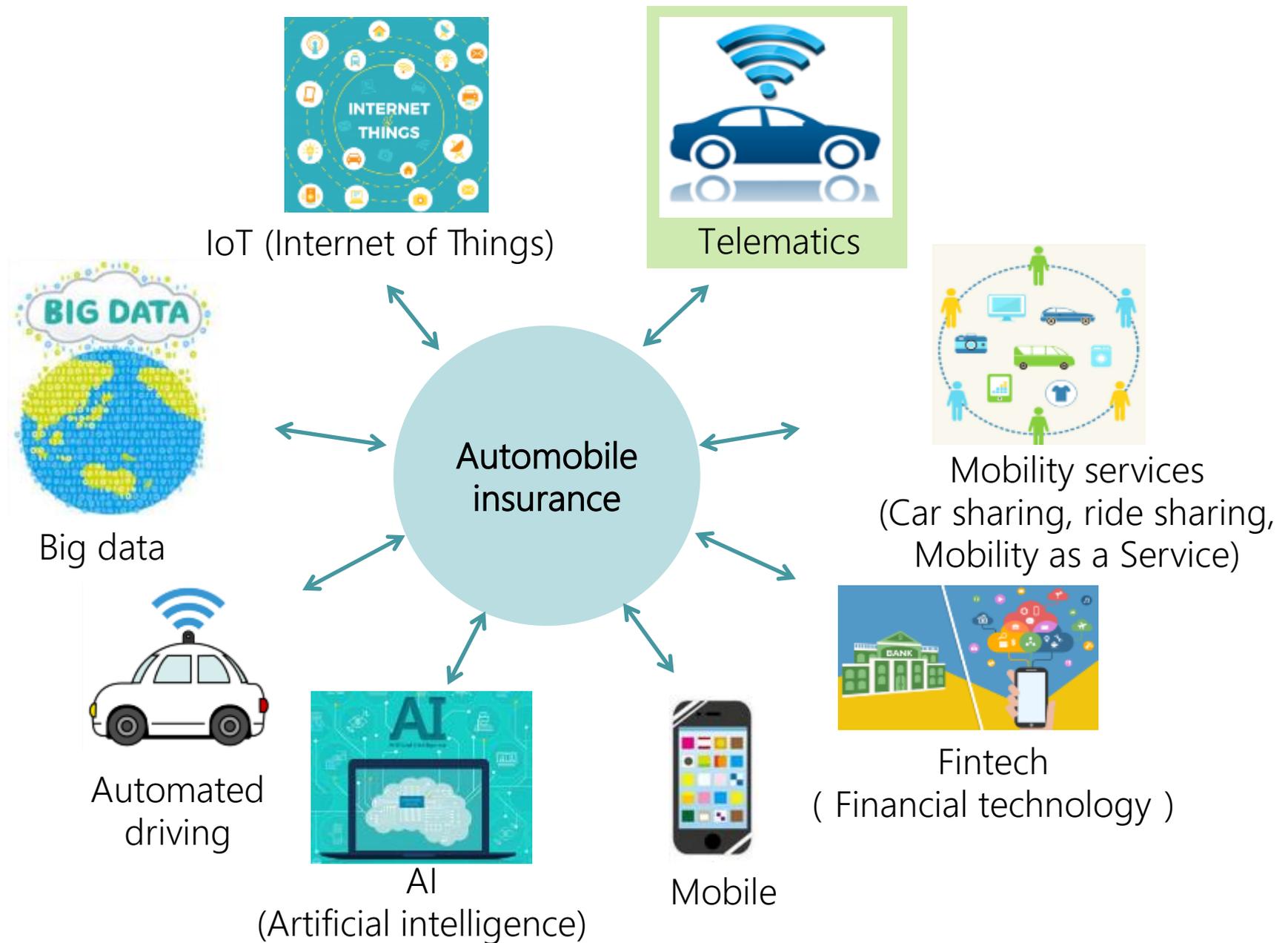
Use of map
information

Swift/efficient
responses

4. Insights from Telematics Automobile Insurance



(1) Factors that affect automobile insurance



(2) Telematics technology as the basis

- Telematics is a technology that forms the basis of *new mobility* and *automated driving*.
⇒ With telematics as a key strategy, we will expand our business inside/outside Japan.



Car sharing



Ride sharing



Automated driving



Connected technology
(Telematics)

(3) Telematics services



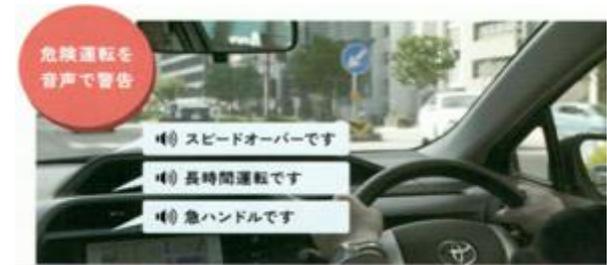
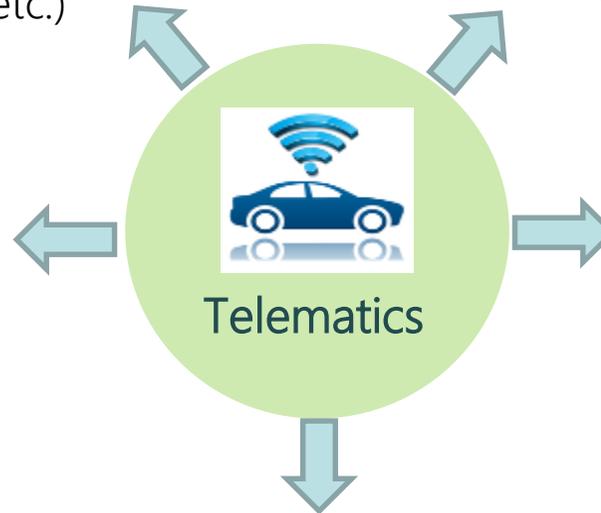
Provision of information together with in-vehicle navigation system
(Information on traffic jams, weather at the destination, etc.)



Helping elderly drivers drive safely
(Alarms to prevent driving wrong way on a highway, notifying exiting a geo-fence etc.)



Safe driving diagnostic system



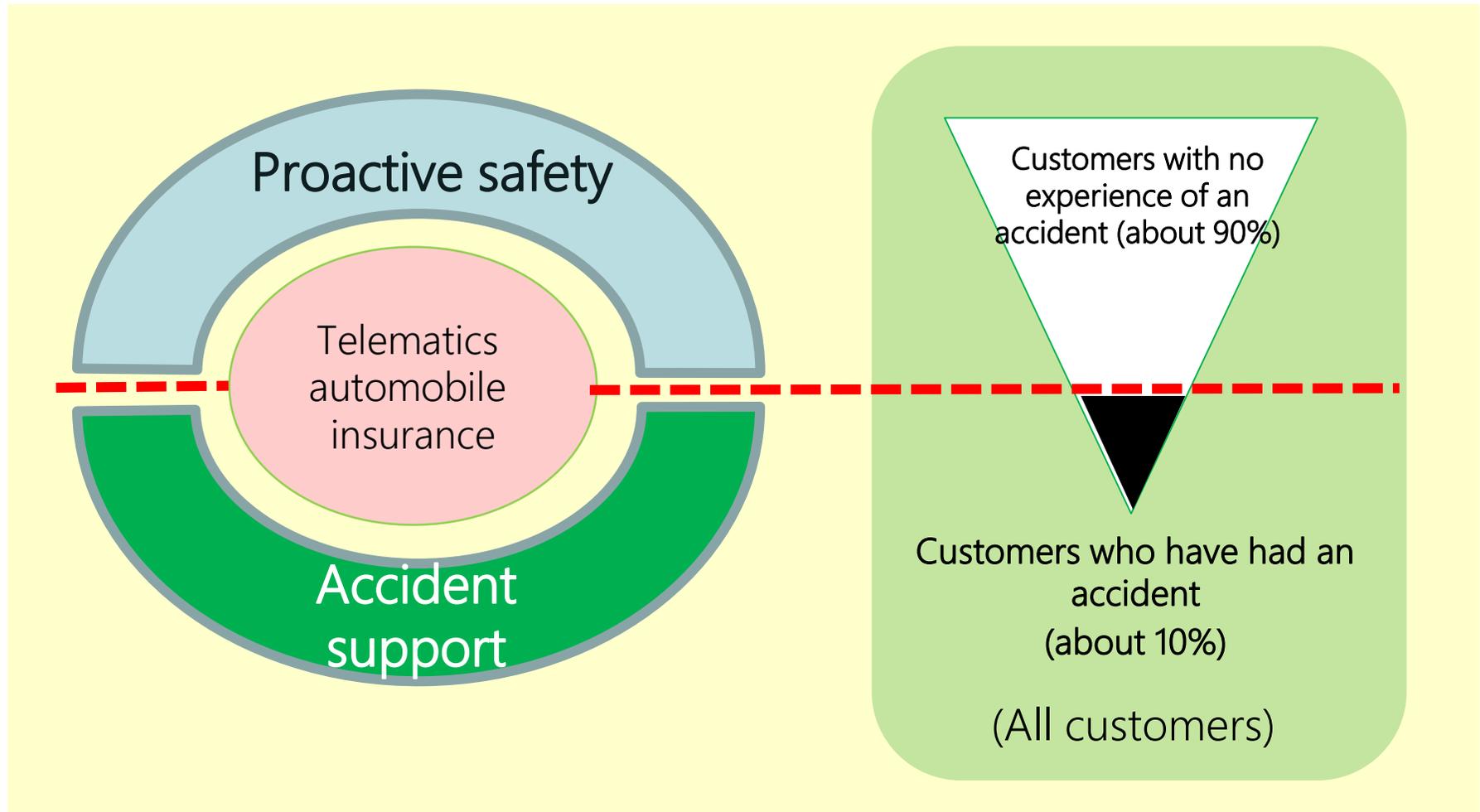
Alerting driver's attention to his/her dangerous driving



Outbound call in the event of an accident

(4) Ensure security/safety through telematics insurance

- Telematics provides more security/safety from the aspects of both proactive safety and support in the event of an accident.



(5) Our initiatives (UK) - ITB Limited

- Acquired the UK's largest telematics insurer, Box Innovation Group Limited (BIG), as of 31 March 2015.
- ITB (established in 2009) is the core company of BIG, with total sales of 900,000 policies and about 6.4 billion kilometers of driving data accumulated for eight years after the commencement of its business.

Low-cost premiums based on telematics technology



Life saving based on proactive response



- 'Connected cars' equipped with on-board device
- Developed original product and service using GPS data and 3-axis accelerometer
- Low-cost insurance that even young people can buy



- Emergency service using on-board device data
- Life saving based on proactive response

Original product and service has been highly praised.
Going forward, we will consider using driving data to develop new services.

(6) Our initiatives (Japan) –“Tough Tsunagaru Telematics Automobile Insurance”

- An automobile insurance product developed jointly between AIOI and Toyota Motor Corporation, “Tough Tsunagaru Telematics Automobile Insurance”, reflects driving behavior such as sudden acceleration, sudden braking, and excess speed in premiums.

→ Japan’s first insurance product whose premiums reflect driving behavior (available from January 2018)



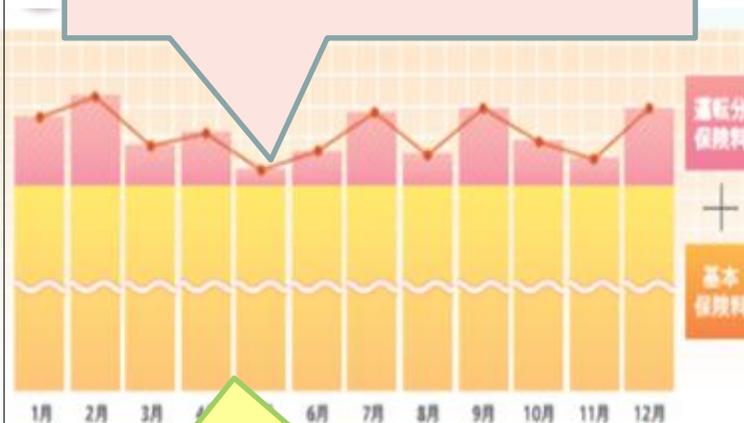
Enjoy safe driving

Save money by safe driving

Support safety of loved ones



Driving behavior-based premiums (variable)



Basic premiums (fixed)

- Safety confirmation call
- Provide information to family members
- 24/365 support



(7) Promoting telematics business

- Promote telematics business in our four key business regions: Japan, Europe, the US, and Asia

Europe

- Apply ITB's know-how to other nations

Maas
GLOBAL

insure
the
box

U.S.

- Expand telematics services in partnership with Toyota



TOYOTA INSURANCE
MANAGEMENT SOLUTIONS

Asia

- Provide carsharing/ridesharing companies with telematics services

Aioi Nissay Dowa Insurance Services Asia Pte. Ltd.
MS&AD INSURANCE GROUP

Grab

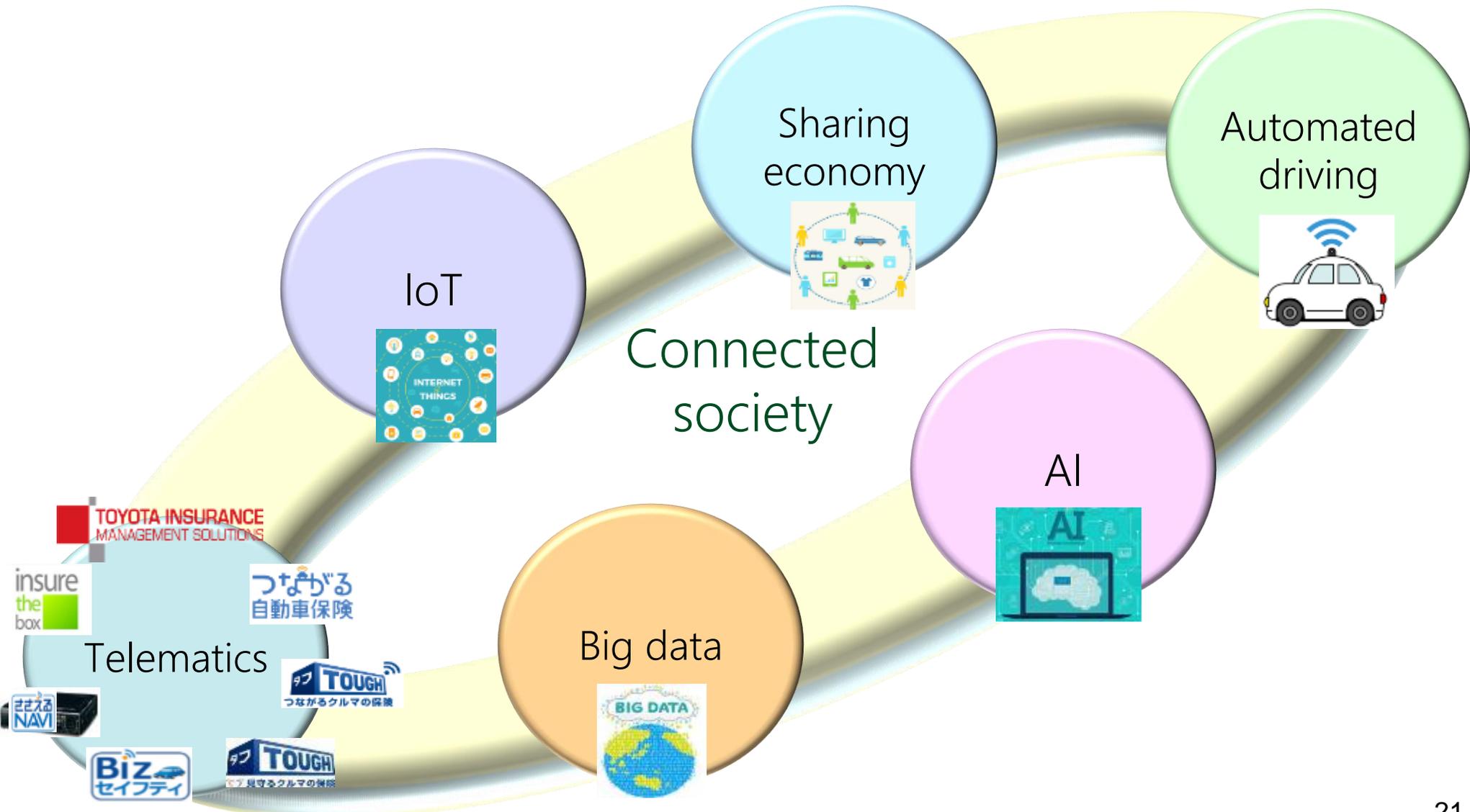
Japan

- Expand telematics insurance products and service offerings; develop new products in our mobility business

In an ever-changing mobility society, we are promoting our telematics and mobility businesses in partnership with the Toyota Group on a global scale.

(8) Expansion from telematics

- By now focusing on telematics, going forward we will be able to develop business in various markets.



Thank you

MS&AD

あいおいニッセイ同和損保