

IoT- Insurance of Things



Introduction

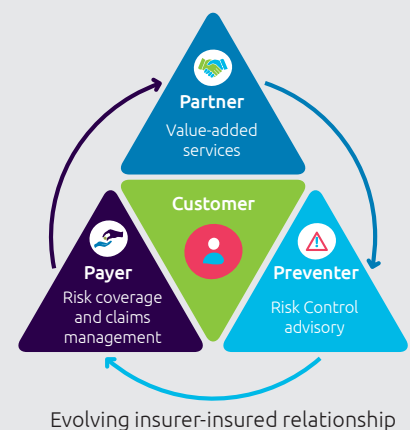
Alex recently bought a home insurance for his family house in Montpellier, France. The insurer advises Alex to install smart sensors and IoT devices to detect intrusions, monitor temperature changes, fire warnings, etc. The insurer uses this collected data to communicate preventive measures to Alex, while he benefits from several smart features like automatic cooling, smart windows, etc. Alex now gets alerted on his smart phone via an app when someone tries to intrude into his house, if there are unusual temperature variations or fire warnings. He can then open live video through the app to verify and can relay the information to the insurer who can intimate the police. Alex also has the option to directly alert the insurer when he is planning for a two-week family holiday in Greece this summer.

This is a prime example of how an organization can turn to IoT-based platforms to derive value and move into the next era of technology. Connected devices can help insurers offer new experience and services to its customers.

IoT in the Insurance Industry

The insurance industry has been going through a paradigm shift over the past couple of decades, adapting to a rapidly evolving technological landscape and changing customer preferences. The principal-agent relationship is being continually disrupted through routine changes in the roles of the stakeholders in the insurance ecosystem. With the technology playing field now firmly established, it has triggered insurers to realize data may be at the very heart of their business ambitions, not seldomly leading to becoming a self-declared 'data-driven' company. IoT sensors hold high importance when it comes to data collection at various stages of a policy life cycle, and insurers have to recognize to "thrive on good data and thrive on data for good"¹.

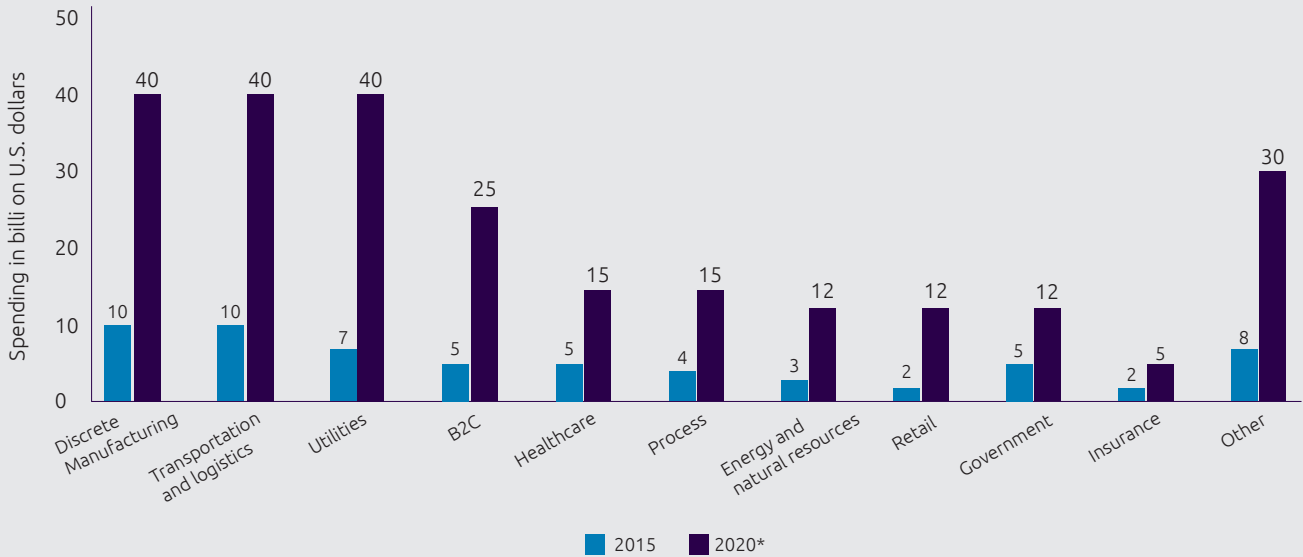
Although no longer a novel concept and abundant literature have been published on Internet of Things (IoT), it is worthwhile revisiting what IoT actually entails. IoT is essentially a concept of collecting, accessing and processing data through a network of devices connected over the internet. IoT, in some form of the other, touches people's lives and its potential to expand and penetrate a greater share of a person's life is imminent.²



1 <https://www.capgemini.com/technovision2020-technology-trends-in-business/>

2 <https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/>

Spending on Internet of Things worldwide by vertical in 2015 and 2020 (in billion U.S. dollars)



Source: <https://www.statista.com/statistics/666864/iot-spending-by-vertical-worldwide/>



The IoT market research estimates the number of connected devices to be in excess of 50 billion, an increase of 300% from 2010, when the number was approximately 12.5 billion.³ 30% of the automobile manufacturers are slated to involve telematics for generating policies and pricing strategies by 2020.

Underwriting and claims have been the two mainly benefitted functions in insurance through the application of IoT. However, the industry is heading towards the development of a digital ecosystem in which digital networking becomes a major component of the insurers’ strategic vision. Insurers can deliver new customer value through active partnerships for IoT knowhow and leveraging of cross-industry products and services within the ecosystem. Further revenue opportunities include data monetization such as through introduction of usage-based pricing. This paper talks about various levels of industry implementation of IoT in a subsequent section.

IoT has the power to not just transform an insurer’s top-line, but also the bottom line. Once permitted by the policy holder, insurers can leverage the data and alerts from IoT devices to deliver services with minimized touchpoints. Connected devices help insurers assume greater control over data, thereby mitigating fraud. IoT implementation will also help to improve efficiency of systems, improve protection mechanisms and reduce claims, leading to cost efficiency.

If one were to look closely at the insurance ecosystem from the perspectives of the market, the customers, and the insurers, several data points emerge that give a definitive picture of the status and maturity of IoT adoption in the insurance industry. The number of devices used per customer has increased significantly, denoting greater acceptability in the ecosystem.

³ <https://www.mckinsey.com/industries/financial-services/our-insights/digital-ecosystems-for-insurers-opportunities-through-the-internet-of-things>



In just the United States, 50 million drivers are projected to have tried usage-based, IoT-backed insurance by the end of 2020. Also, 50% of the homes in the US are projected to be connected with devices by 2025.⁵

The insurers too have been rapidly revamping their portfolio to offer more in terms of IoT-based insurance. A 2017 industry report showed that 20% of the insurance companies were either piloting, testing, or deploying an IoT initiative, which subsequently increased by 50% in the past three years.⁴

The propagation of IoT in insurance is driven by a combination of multiple technological enablers. Edge computing, in a big way, solves the major issue associated with data latency, which essentially includes a distributed computing model bringing data and analytics closer to the source location. Further, as Capgemini Research Institute (CRI) reports, 5G's fast and reliable data transmission capabilities can better deliver the sensing and remote-control abilities required by self-driven vehicles. The combination of connected device density and ultra-reliability will support the massive growth of IoT sensors. With the advent of Industry 4.0, the model of digital twins has also gained predominance. The finance and insurance industries are where the applications are widespread, with risk management being their raison d'être, or reason for being. Mapfre's Virtual replica technology is allowing insurers to explore a plethora of IoT-based insurance implementation through futuristic models connecting predictions to actual applications.

The benefits to customers are quite apparent. However, trust around access and control of data has always been a contention among the various stakeholders within the insurance data ecosystem. More discourse around data security and with regulatory frameworks intended to protect the interests of the customers, the trust factor has significantly improved. An Intel survey suggested that 80% of the respondents were ready to anonymously share health data to insurers in order to reduce premiums.

Insurance and IoT – use cases/ business model changes

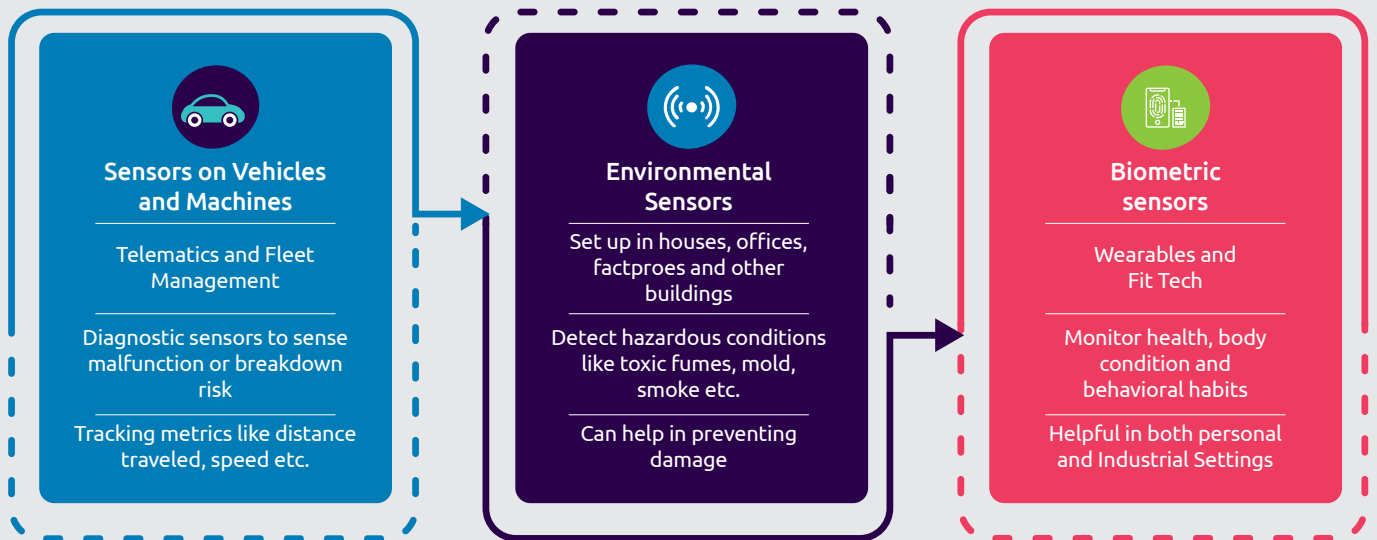
	Sales and Marketing	Customer Experience	Underwriting	Policy Servicing	Claims
Personal	Proactive and frequent customer interactions	Proactive loss prevention		Discount programs, up-selling and cross-selling,	Remote claim adjudication
Commercial	Highly personalized risk assessment and Premium	Fleet management, proactive loss prevention	Usage based insurance	Discount programs, remote claim adjudication	Automated FNOL
Health & Life		Assisted living		Discount programs	

4 https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2017/jun/Technology_Value_Driven_o6.pdf

5 <https://www.insurancexus.com/analytics/insurance-innovation-and-iot-part-1>

IoT-based insurance models allow insurers to establish trust through frequent, meaningful interactions and targeted communications with customers along various parts of the value chain. This can drastically bring down the enquiry call rate that any insurer receives on claim statuses, which in turn can bring down call center expenses and improve operational metrics.

In the insurance market, three different types of IoT devices are relevant and attractive to insurers: sensors on vehicles and machines, environmental sensors, and biometric sensors. The ecosystems defined by different IoT devices have parallels by measure of their basic dynamics, but on a granular level, they have key differences. Insurers therefore must develop a dedicated strategy for each. The degree of market maturity differs in each of the ecosystems, and they feature some clear distinctions in market dynamics, relevant players, and regulatory environment.



Connected Car



Progressive is using its usage-based-insurance (UBI) telematics programme to monitor how its car insurance customers drive.

Telematics is very integral to IoT innovation across all industries, including insurance. It acts as a guiding light for IoT development and existing adoption helps to explore value-added products and services. The industry will, on a larger scale, start to gauge consumer preference for sensors and the extent to which they can be used.

Using an OBD telematics dongle and machine learning, behavioral data about the consumer such as driving pattern, night usage, etc. can be collected and then leveraged for personalized premium calculations. Metromile is one of the first to have developed the first pay-per-mile car insurance policy using telematics.

With crash detection technology built into the Telematics applications, claim intake or FNOL can be automated to minimize loss. State Auto has enabled automated FNOL along with crash detection with the help of telematics.

Smart and Safe Housing



Liberty Mutual has partnered with Google's Nest to implement connected smoke alarms in the home, enabling customers to reduce the risk of a fire, and in turn reduce their home insurance premiums.

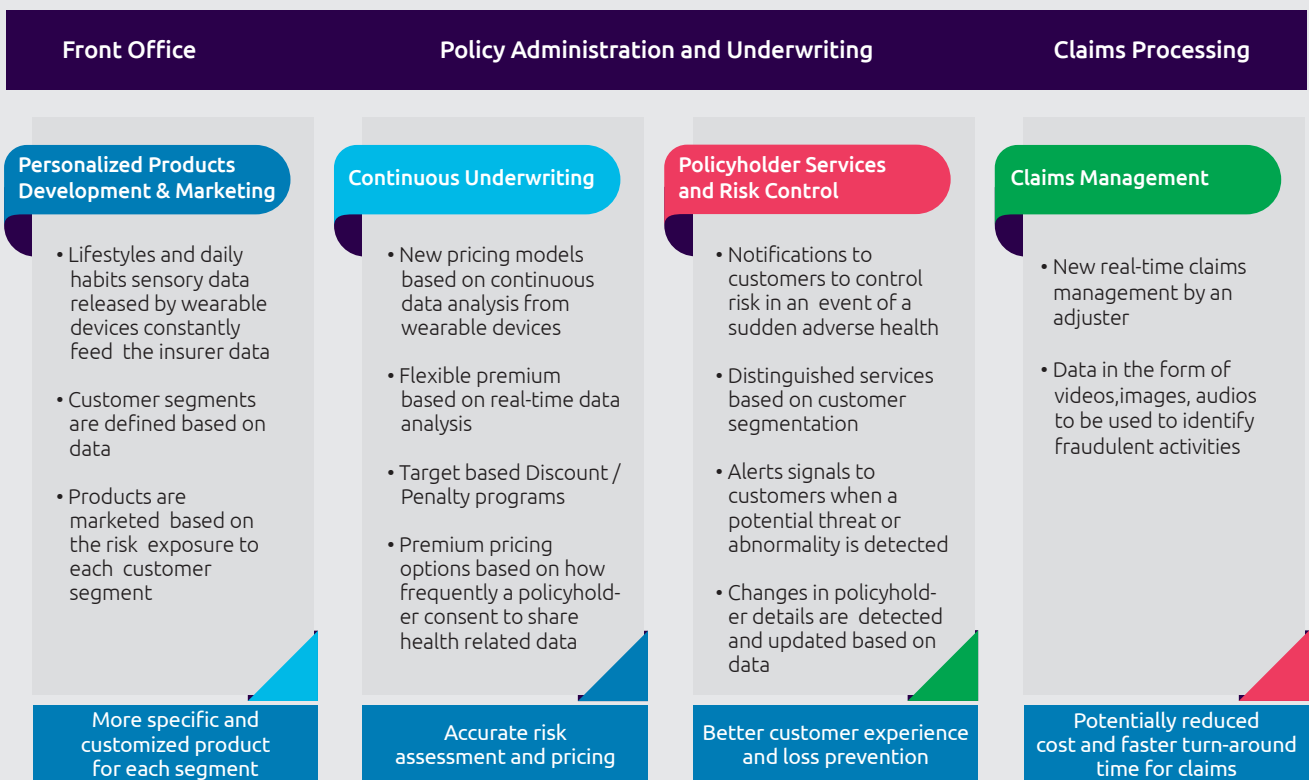
The home may be the next area to see IoT integration because consumers are using a variety of smart devices from their smoke alarms and air conditioners to door locks and automated home security systems.

Insurers around the world (for example, Allianz) have started selling integrated products via Google Nest or offering insurance discounts for people who equip their homes with smart-home devices. In addition, offering digital add-on services such as home security and convenience services has also been a growing trend. Insurers can upsell their products as well, e.g. extended warranty, travel insurance, home insurance for a recently moving family etc.

Connected Health/Wearables

Injecting IoT into the life insurance policies will allow insurers to measure policyholder behavior they have not been able to measure before. When IoT takes off in the daily lives of people, insurers can harness the data to monetize and leverage it in many ways.

Figure: Wearable Ecosystem Drives Insurance Value Chain



■ Summary of impact on each value chain segment ■ Benefits to Life Insurers



John Hancock has partnered with Vitality to distribute free Fitbits to customers, so that they could track their well-being. John Hancock incentivizes customers to stay fit – thus making them less at risk of filing a claim – by offering entertainment, shopping and travel rewards and discounts.



Verizon Connect has updated Navigation, its mobile app that works with the company's fleet management technology, with information on open truck stops and hours of operation to help the long-haul truck drivers who encounter rest stop closures.⁷

For example, connected health wearables can assist old-age members in their day-to-day activities. Reminders for taking medication and tracking of vitals will reduce the risk of health incidents. There are connected devices to monitor the physical movement and time on bed to provide the best care.

Connected fleet/ Connected workplaces

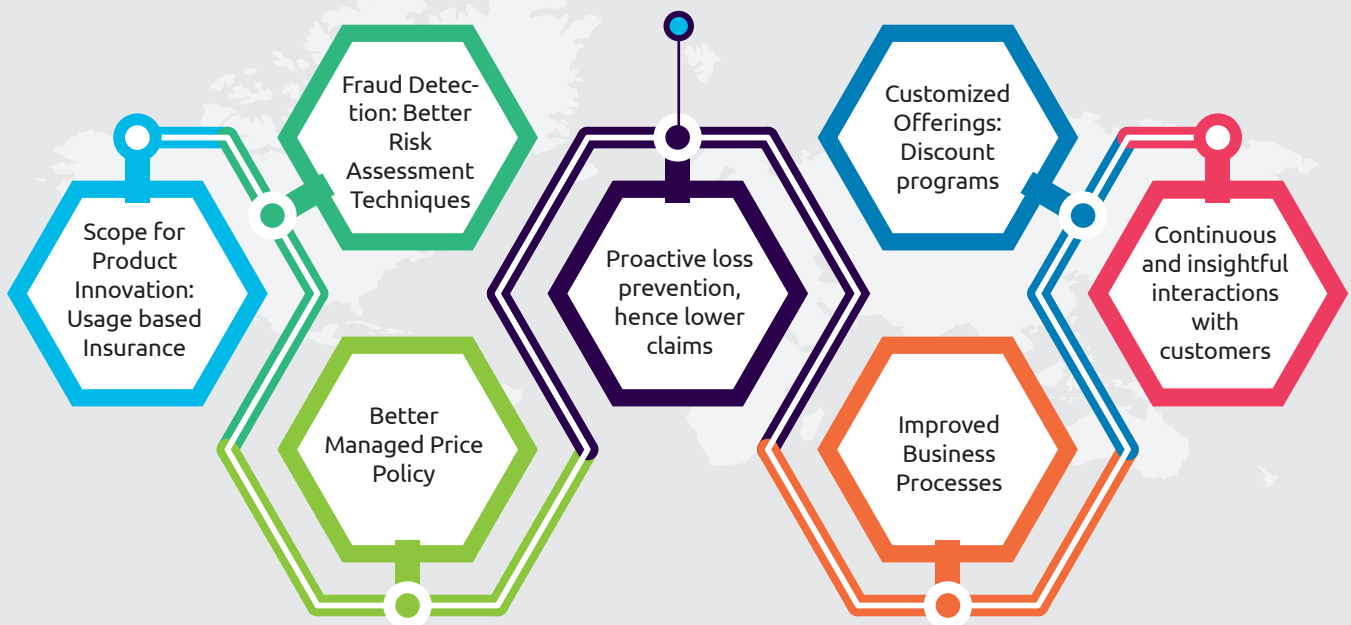
Commercial policies represent a significant opportunity as loss control/ risk engineering is improved through new sensors, such as infrared detection of heat anomalies in electrical equipment, HVAC monitoring, water usage analytics for crops, and even construction equipment that checks for irregular vibrations to alert before there is significant damage.

Commercial fleet management firms use telematics and IoT to not only track fuel usage, but also to prevent accidents from happening. This can be attributed as one of the reasons for claims severity falling down. Sensors in warehouses will act similarly to household ones, but with different risk parameters and levels.⁶

A core trend of IoT adoption in other industries has been the adoption of consumer electronics by employees. Their use under the Bring-Your-Own-Device (BYOD) policies has helped businesses become more comfortable with these devices and more trusting of their security and safety in a business setting.⁸

Potential benefits for insurers

How IoT can Help Insurers



6 <https://www.mckinsey.com/industries/financial-services/our-insights/digital-ecosystems-for-insurers-opportunities-through-the-internet-of-things>

7 <https://www.fleetequipmentmag.com/verizon-connect-updates-navigation-mobile-app/>

8 <https://internetofbusiness.com/10-examples-iot-insurance/>

From a policy servicing & underwriting point of view,

- Usage based insurance will give customers a product that can be tailored to their needs. For drivers, pay-how-you-drive products will act as incentives to drive safer.
- Discount programs, a different manifestation of UBI, also do the same and ensure that drivers are priced according to how they drive.
- Continuous and insightful interactions with customers can be managed with the help of data from the devices in insured's vehicles or properties. Cross-selling and upselling can open up new avenues for income. For example: When the device senses that the insured has moved houses, it can notify the insurer to sell property coverage.

Claims is also hugely benefitted from IoT usage in many ways:



In auto insurance, from a purely financial perspective, the impact of telematics on claims is well-documented:

- **10% reduction in total claims costs**
- **60% or greater reduction in time to settle claims**
- **20% reduction in claims frequency**
- **80% reduction in fraud**
- **30% reduction in lawsuits**
- **30% reduction in whiplash claims paid**

- Partnerships such as that of Panasonic Smart Home and Allianz Assist combine detection with action. When the Panasonic smart home system detects a water leak, Allianz Global Assistance service is contacted and service personnel are dispatched to quickly identify and address the source of the leak, minimizing damage and insurance payments. In the long term, the savings from quickly addressing the issue before significant damage occurs can be passed along to customers in the form of lower insurance premiums.⁹
- Security systems that detect someone approaching a home and alerts them that they are being watch, ADAS systems that prevent crashes and wearables that track your vitals, all try to prevent losses than mitigate them. IoT hence helps in proactive loss prevention and hence lower claims.
- Fraud detection is also easier with IoT devices in play. Consider the example of a Danish woman who had been receiving insurance payouts to cover her inability to work due to an injury. Her profile on a running app told a different story—she was actually much more active than she claimed and regularly participated in sporting events that would have been near impossible if she really was an injured as she claimed to be.¹⁰

For homeowners', one-third of claims are related to water damage. Thanks to water flow sensors, damages like is now easily monitored and prevented. Smart water flow monitors can detect leaks in a home's plumbing, alert the homeowner, and in many cases shut off water flow to affected pipes. One study by the ACE Group

⁹ <http://www.parksassociates.com/newsletter/article/iot-feb20177>

¹⁰ <https://www.forbes.com/sites/blakemorgan/2018/05/16/heres-how-iot-will-impact-the-insurance-claims-process/#797de43e366e>

predicts that more than 90% of water damage claims could be avoided through the use of automated leak detection and mitigation systems. Octo Telematics' partners have reported double-digit improvements in combined ratio with mature programs leveraging telematics to improve claims. Similarly, insurers such as Zurich, Ageas, and Co-operative insurance have reported using telematics data to reduce claims costs by 30-60%.

Fire-related claims are the most expensive homeowners' insurance claims, responsible for nearly one-quarter of total claims costs. Smart smoke and carbon monoxide detectors address two challenges with traditional alarms: off-premises notification and alarm status verification. BI Intelligence estimates a home equipped with a connected smoke detector that automatically alerts the fire department could potentially cut an insurance payout by an average of \$35,000 USD. Roost Telematics has reported that their sensors and automated reporting lead to 5-15% reduction in claims for their insurance partners.

Challenges to Integrating IoT in Insurance

01 Business

Reputational, Trust and Privacy Risks associated with the Technology

Investment in Infrastructure and Data **Cost 02**

03 Data

Cyber Risk Exposure
Data Misuse, Data Privacy

Connected Networks Implementation at Scale **Infrastructure 04**

Customer buy-in / establishing trust



37% of all customers are willing to share supplemental data and more than 55% are prepared to pay extra for risk-prevention services.¹¹

Meaningful customer engagement would require the insurer to collect and process data at each touch point, facilitated by IoT. Without establishing trust, Insurers would find it difficult to obtain personal data from customers in the future. A significant amount of customer data is being generated from the application of connected devices, starting from wearable devices to connected homes and telematics devices in smart vehicles. Customers are skeptical about the extent to which their personal data remains secured and how it is utilized by insurers.

However, customer confidence have improved over the past decade. As per the World Insurance Report 2019 published by Capgemini, customers say they are open to sharing additional data with insurers and would pay fees for personalized risk-control and prevention services.

Data Privacy and Security



According to the Capgemini's WIR 2019, approximately 83% of the consumers are under moderate-high exposure of cyber-attacks that can put personal data/information at risk; so are around 87% of the businesses.

IoT comes along with cyber-risks, in fact, much more than any other technology owing to the large number of external touch points that an IoT network will have. The more the number of connected devices, the higher is the end-point vulnerabilities that the network carries with it to cyber-attacks. IoT ecosystems would only work well if there is an infrastructure that allows huge data flow across entities over a network, which makes it susceptible to cyber-attacks.

Data privacy regulations around the globe are evolving to provide customers ownership of their data. Insurers need to be cognizant of the data privacy issues while deriving value out of personal data. With the introduction of laws such as the EU GDPR, the discussion on data privacy has taken on much importance. It is anticipated that approximately 82% of business customers are going to face higher cost of compliance due to frequent regulatory changes to reign in the effect of technology in the industry. In term of IoT-based insurance, insurers need to make their systems and policies in anticipation of future regulatory that would allow seamless transition from on policy to the other.¹²

Transformational Challenges

While solutions based on connected devices/ IoT may have long-term cost benefits associated, implementation at scale would require upfront technology investments. Most of the existing insurance companies are not ready to deal with the systemic changes that an IoT-based system would bring in. Transformation of legacy systems into modern ones would not only incur significant investment but would also require a paradigm shift in times of mindset. The insurers would need to develop new strategies and devise mechanisms to protect, maintain and utilize the vast









¹¹ <https://www.efma.com/study/detail/30818>

¹² <https://www.efma.com/study/detail/30818>

volume of data connected devices would generate. They need to strike the right balance within the IoT-based solutions and maintain alignment their foundational business models.

The change in mindset from the consumer's end is also crucial. With increasing adoption of technology and evolving behaviour among the section that avails insurance, IoT-based systems would see more penetration.

How can insurers get the most of IoT?

	Careful consideration of the IoT based business model that is critical to orchestration of an extended value proposition.		Model or create behavior patterns and risk groups, rating algorithms that are plugged into the product design and pricing process for underwriting
	Gauge and define customers' needs with the exact application area guiding prioritization of which use case of value chain process to tackle.		Couple sensors and touchpoints properly with insured objects and risks, with an appropriate platform for real-time insight generation
	Focus on meaningful customer to drive uptake of IoT devices. Establishing trust with proper consent verification is the first step towards that.		Devise an appropriate consortia strategy with a number of vendors and service providers like device manufacturers, utility service providers, telecom companies, and so on.
	Bring the data silos together and combining with already existing customer data. Ensure that systems are scalable and can work with Big Data.		Devise strategies to upsell and cross-sell add-on services, engaging their customer base, to remain competitive and add more revenue streams.

IoT has the potential to unlock new business models based on data-driven insights. IoT empowers businesses with data which reciprocates into customers through value-added and personalized services. Insurers need to embrace an ecosystem-based approach for innovation amid rapidly evolving technology landscape. Capgemini has a long legacy of innovation and always invest in our view point that innovation cannot be for innovation's sake, but must be applied to drive real business value. Each year, the Capgemini Research Institute strongly dedicates itself to detailed research across industries, tech and ecosystems.

Equipped with the biggest resource pool for IoT & smart factories, homegrown device-agnostic platform xIoT and deep expertise in insurance, we are best suited to be the a preferred partner for insurers in their IoT journey. Be it conceptualizing an IoT strategy for insurers, devising a road-map on how to get to the best possible end state or achieving all desirable efficiencies out of the technology, Capgemini can bring to the table its industry-best capabilities.

For more details, visit www.capgemini.com/insurance

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