Abstract
The Internet of Things is fast becoming a reality in the insurance space. An increasing number of insurance providers are in the process of developing well-defined IoT-based solutions in their core business product space. This includes usage-based insurance in the auto industry and discounted smart sensor devices. Large Property and Casualty (P&C) insurers have been watching the IoT technology space mature over a period of couple of years, and have been quick to capitalize on their learnings and analysis.
IoT is Altering the Insurance Space

The scope of IoT in insurance goes beyond just being connected through devices. An effective IoT solution includes capturing real-time and relevant data and making it available on the cloud to run advanced analytics and provide appropriate customer and other stakeholder dashboards. It is critical for insurers to leverage the colossal amounts of data available with them and develop the ability to drive improved outcomes for customers, brokers, and partners.

This thought paper reviews the journey of IoT in the insurance vertical and discusses what to expect from IoT in future. The paper also outlines the impact of various other technology trends upon insurance such as Blockchain, Artificial Intelligence, and Natural Language Processing.

Impacting P&C and L&A Segments

IoT has been able to mark its impact on P&C (Property & Casualty) market, but L&A (Life & Annuities) market still needs exploring various opportunities. In comparison, P&C insurers have deployed more IoT projects than L&A players. Since a connected ecosystem is one of the core IoT trends in the insurance space, it is interesting to note that approximately 34% of customers have indicated they would be inclined to smart homes and real estates.

Close to follow in terms of trends are the wearables with 30% customer interest. In terms of numbers, L&A has only 5% projects deployed, whereas in P&C percentage is 12%. The trends clearly indicate that growth of IoT-based solutions in both the domains is obvious. As IoT grows in adoption, leading insurers will find ways to leverage the data available from these technologies to improve operations and better engage customers.

BI Intelligence recently projected that by 2020, there will be over 34 billion connected IoT devices, and more than $6 trillion spent on IoT solutions in the next five years*. Given these projected numbers in IoT and wearables, insurers need to plan ahead and focus on the impact of these devices on consumer behavior and expectations.

Below are a couple of success stories in the P&C world where IoT has played a significant role in improving business:

1. Progressive Snapshot®

Progressive insurance group’s Snapshot® product is a flagship initiative that primarily deals with IoT and high volume of data with analytics to provide usage-based insurance to its customers. Its focus is to reward good driving, and thereby encourage customers to save in their insurance costs. Snapshot® is an OBD II based simple device that is pluggable into most modern cars. This device keeps a track on the driving habits such as usage of brakes, average speed, along with other relevant data like time of driving.

* BI Intelligence Report

* Internet of Business Report
https://internetofbusiness.com/iot-to-disrupt-insurance-industry/
2. Liberty Mutual – Google Nest
Liberty Mutual has collaborated with Google Nest to provide its customers the ability to prevent perils. Customers are offered the Nest protect device along with their insurance at no extra cost. This IoT device issues alerts to customers on critical parameters such as smoke, CO2 emission levels, and temperature variations. It also rewards the insureds for staying safe.

Challenges and Barriers for IoT in Insurance

With an increasing number of interconnected devices within the IoT ecosystem, there are a few apparent challenges that come hand-in-hand primarily in areas like security, standardization, and compliance. These barriers to a holistic IoT implementation are discussed below:

1. Security: The IoT ecosystem is susceptible to cyber-attacks as it involves multiple devices and multiple protocols. IoT-based solutions are effective with very large volumes of data flow between entities over networks, and many a times over public networks. Such solutions make an insurance company vulnerable to compromises. Large investments are required to secure IoT generated data, to avoid intrusions as well as misuse of such data for fraudulent activities.

A robust and end-to-end security policy cannot be an afterthought and the IoT roadmap should include a clear focus on identifying and addressing the possible security risks and threats as an important aspect. Insurance providers and their customers must understand the security dimension of such solutions to ensure appropriate measures are in place.

2. Data Volume Management: The core strength of a viable IoT solution is to provide and capture data in real-time, which is added to big data repositories of insurers. Such large datasets are the assets for insurance companies and the whole solution hinges upon how stakeholders utilize these large volumes for the benefit of all. With large data volumes, comes the challenge of managing these, which requires significant planning and appropriate enterprise strategy. It is also very important to include IoT real-time data with the historic data such as policy, client, and claims data.

Data ownership is another area of concern while developing an IoT data management strategy. It is always a challenge to understand if the data belongs to the insured or the insurer. Other concerns like privacy and data tampering issues also need absolute attention from the insurers while defining and establishing a long-term solution.

3. Standardization and Regulation: With growing number of IoT devices, interoperability is already a challenge. Several startups as well as large players are trying to capitalize on the IoT market by deploying and integrating devices. With lack of regulations and agreements in place, the IoT solutions are bound to fail. There have been quite a few initiatives by many players on this front, but the process maturity will take time.
4. Disruption to Existing Large Business Models: The insurance sector relies on the right balance between the volume of risk managed and the claims associated with the covered risks. To understand this better, insurers always seek to contain the volume of claims by preventive measures to have a good handle on the loss ratio. This leads to a direct impact on their written premium to losses ratio, improving their margins. IoT solutions give a great advantage in claims avoidance by providing relevant indications and alerts for most of the major critical perils. There is always a threshold to such business theory because if the claims continue on a downward trend, this will also bring down the premiums. Insurers need to ensure the IoT-based solutions provide the right balance and manage the alignment between solutions and core business models.

Integrating IoT with Other Technologies: Key Trends

Insurance industry has recognized the importance of IoT and the significant way it can alter the business. Industry estimates suggest that this acceptance will continue and lead to an increase in the implementations of IoT-based solutions. IoT solutions involve multiple technologies, such as analytics, cloud, and protocol management, to maximize benefits for stakeholders.

Some of the other trends where we see an immediate impact in the insurance industry are:

Natural Language Processing (NLP): Talking to devices is not something new for human beings. Smartphone digital assistants have been around for a while now. Amazon Echo has already pioneered in the home digital assistant space. Imagine a situation where an IoT device like Amazon Echo, captures the conversations of a senior citizen living alone. IoT devices can be extremely beneficial in emergencies for senior homes, and NLP capabilities to such sensors can help prevent any medical emergency by understanding, processing, and alerting appropriate agencies for help.

NLP and text processing is predicted to have a positive disruption in the insurance industry by providing abilities such as information retrieval from unstructured data, sentimental analysis to streamline the flow of information to customers, thereby improving customer relationships, and kiosk-based Chatbot.

Blockchain: Yet another emerging technology that shows great promise is Blockchain when it comes to providing solutions for some of the challenges that IoT solutions face. Roadblocks such as inorganic scaling of IoT devices (without identity or interoperability) and information and privacy concerns can leverage the fundamental principles of Blockchain technology for an appropriate resolution. We foresee Blockchain being considered as a heavyweight partner technology for IoT-based initiatives.

Insurance companies and their technology arms will need to understand and implement the appropriate solutions involving Blockchain. Blockchain comes with its own baggage of challenges, hence we recommend a thorough study of the problem scenario.

Artificial Intelligence: IoT generates high volumes of data, and such significant and relevant data is of no use if we do not have machine-learning capabilities introduced in our IoT-based solutions. As the devices are increasing, so will the data volume as well. This significant and invaluable data will help our systems understand what is working vs. what is not working. This data volume goes beyond human capabilities for analytics; hence, machine learning will be inevitable to maximize the return from IoT-based solutions.
How IoT can Shape the Insurance Industry

IoT-based solutions have seen tremendous development in all horizons of human life and the impact has been positive as well as negative. On the positive side, IoT provides real-time data, which is a useful source of information to both insurers and insureds and helps them in taking preventive action and reduces/eliminates losses. On the other hand, IoT presents both physical and financial risks with the devices connecting over the Internet. Some of the significant areas of IoT impact are listed below:

1. Need for cyber insurance policies will grow:
With the growth of IoT, the risk of data loss and resulting liabilities will increase. Cyber insurance policies provide coverage against data and liability losses and the costs involved due to data breaches, hence there will be improved focus on cyber insurance products, which increase the revenues from such policies.

2. List of excluded risks will increase in cyber policies:
With IoT permeating every sphere of human life, the risk of cyber-attacks on IoT devices will also increase. Providing coverage against all these risks will be a loss for insurance carriers, hence insurers will provide specific exclusion for cyber perils.

3. Minimize the insurance need:
IoT-based solutions will continue to alter the risk associated with customers making both insurance carriers and insureds aware of the risks before time. This will impact the global insurance market, as the chances of error will reduce that will likely shrink the insurance market, thereby minimizing the need for insurance.

4. Artificial Intelligence and containers will distribute IoT:
The year 2017 would see Internet of Things software distributed across cloud services, edge devices, and gateways. Further, machine-learning cloud services and Artificial Intelligence will be used to mine data from IoT devices.

5. Role of insurance carriers in IoT security will increase:
More and more inclination of consumers toward IoT-enabled devices leads to more security risk for them. Since IoT technology is evolving rapidly, it has become a big challenge for the insurance regulators to cope with it and design new products accordingly. Insurers are taking on the financial risk associated with the increase use of IoT; hence, they will address the IoT security via proper underwriting.

6. IoT will affect the mobile industry across dimensions:
Many upcoming solutions will raise the need for enhanced mobility and at the same time, we will see IoT solutions making mobile apps redundant. With increased connected devices, mobility solutions will enhance the user experience using digital assistants, smart watches et al.

7. IoT certification will suppress industry-specific certification:
In order to build in IoT into the DNA of their devices, vendors and manufacturers will be motivated to get IoT certifications despite having industry-specific certifications. Investments will be focused on minimal cost-based trainings and certifications along with maintaining high standards of these certifications. Along with it, all major industrial vendors will come together to jointly certify their IoT-enabled products with enterprise vendors**.

**Forrester & ICRM Report
The NIIT Technologies Thought Board:
Internet of Things in Insurance: Disrupting the Business Landscape

How is IoT making its mark on the insurance space?

- Captures real-time and relevant data
- Makes real-time data available on the cloud for analytics
- Provides appropriate stakeholder dashboards
- Monitors customer behavior
- Prevents and averts emergencies and accidents

What are the barriers to implementing IoT in insurance?

- Network security
- Data volume management
- Standardization and compliance
- Disrupting existing business models

How is IoT is integrating with other emerging technologies in the insurance space?

- Developing NLP and text processing capabilities
- Leveraging Blockchain to resolve challenges
- Deploying AI to maximize ROI from IoT solutions

How can IoT alter the insurance industry?

- Enhance need for cyber insurance
- Minimize need for insurance with more information
- Use AI to mine data from IoT devices
- Expand the role of insurance carriers in IoT security
- Increase need for IoT certifications
Recommendations for Insurers

To be able to effectively leverage the emerging technologies like IoT, insurers must:

- Research and understand customer needs and identify how IoT-based solutions can improve their business model. They should also understand organizational capabilities and whether they have the right solutions in place with the existing landscape for data management.

- Understand that IoT in isolation is not beneficial for long term; insurers must invest in solutions that are beneficial for all stakeholders. Invest on partner technologies, relevant to their business.

- Start looking beyond business-as-usual. Disruption in business has already become a norm, hence business, technology, and product research should be an ongoing process. Focus on impact of IoT innovations on insurance products, for instance, insuring driverless cars and drones.

- Enhance their business model and focus on how to help customers adopt IoT-based solutions. Without customer buy-in, IoT solutions will have no value.

- Be flexible to customization of products and the need to bring in more agility in product design as well. For many insurance products, IoT has minimized the need of large historic data and maturity since IoT has the ability to provide real-time, more relevant, and custom user-specific data to improve and customize underwriting. This has allowed smaller players to jump in to participate in this level field posing a threat to large, rigid players.

- Invest on appropriate Proof of Value and Proof of Concept initiatives for IoT solutions with their trusted partners before initiating any industry scale implementation or solution.

As an industry leader, NIIT Technologies has been participating in the growth of IoT-based solutions across industries. We have already worked with a large US-based insurer to come up with a complete connected solution suite. This solution involves end-to-end IoT-based package for the personal lines insurers, especially those dealing with home and dwelling insurance.

NIIT Technologies has in-depth experience with IoT-based devices including, but not limited to, Bosch XDK, Google Nest, Amazon Echo, VR devices, Pressure and Temperature measuring devices, as well as expertise in learning and research devices such as Raspberry pi, and Arduino. Our dedicated IoT lab and its experienced resources work closely with our data analytics experts to design comprehensive solutions for the insurance industry.

NIIT Technologies is also working on other relevant initiatives i.e. IoT solutions integrated with NLP, machine learning and non-natural disasters, artificial intelligence solutions et al.

About the Author

Sriram Natarajan is a Solution Architect with over 17 years of leadership experience spanning delivery, program management, technology solutions, and enterprise architecture in insurance. His vast domain and technical expertise has been instrumental in the successful delivery of various programs he has been associated with. Sriram has done Masters in Computer Application from Tamil Nadu University, in addition to a Bachelor’s degree in Mathematics from Delhi University.

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