



Whitepaper

AI-driven Transformation in the Insurance Industry

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Executive Summary

The Insurance industry is on the brink of complete digital transformation. Traditional business models are giving way to new paradigms like Connected Insurance, Usage-based Premiums, and Smart Underwriting. Insurance customers are seeking on-demand, personalized experiences. The types of risks being covered are also evolving, presenting fresh business opportunities for insurers to reimagine their business by building a digital-enabled core to deliver sustainable operational efficiencies.

Insurers are adopting a wide variety of digital technologies to meet these ever-changing demands, including Big Data and Analytics, Artificial Intelligence (AI), Automation, Blockchain, Cloud, and Internet of Things (IoT). These technologies will help insurers to reduce costs, optimize business processes, launch new innovative product offerings and improve customer experience.

By leveraging AI, insurers can engage with consumers in a faster and more convenient way, by offering features such as: virtual customer service representatives at contact centers, robo-advisors for consistent, rule-based advisory services, and virtual assistants for processes and related transactions. Insurers can also optimize products and pricing, predict customer needs and behavior, optimize marketing and sales strategies and optimize underwriting models to continuously predict and identify fraud. They can also develop new business models, launch innovative products, and customized solution offerings in a short span of time.

This white paper focuses on how AI and cognitive technologies are reshaping the Insurance industry and amplifying their digital transformation journey.

AI - The New Magic in Insurance

Be it a Virtual Insurance Advisor, Smart Underwriter, or Digital Claims Adjuster, all use AI and cognitive technologies to address needs such as: Digital Adoption, Customer Experience Management, Operational Efficiency, Underwriting Profitability, Claims Optimization, and much more. Insurance carriers are also combining various digital technologies complementary to AI and machine learning to embrace digital disruption.

The figure below depicts the current state and what lies ahead as regards to AI in Insurance.

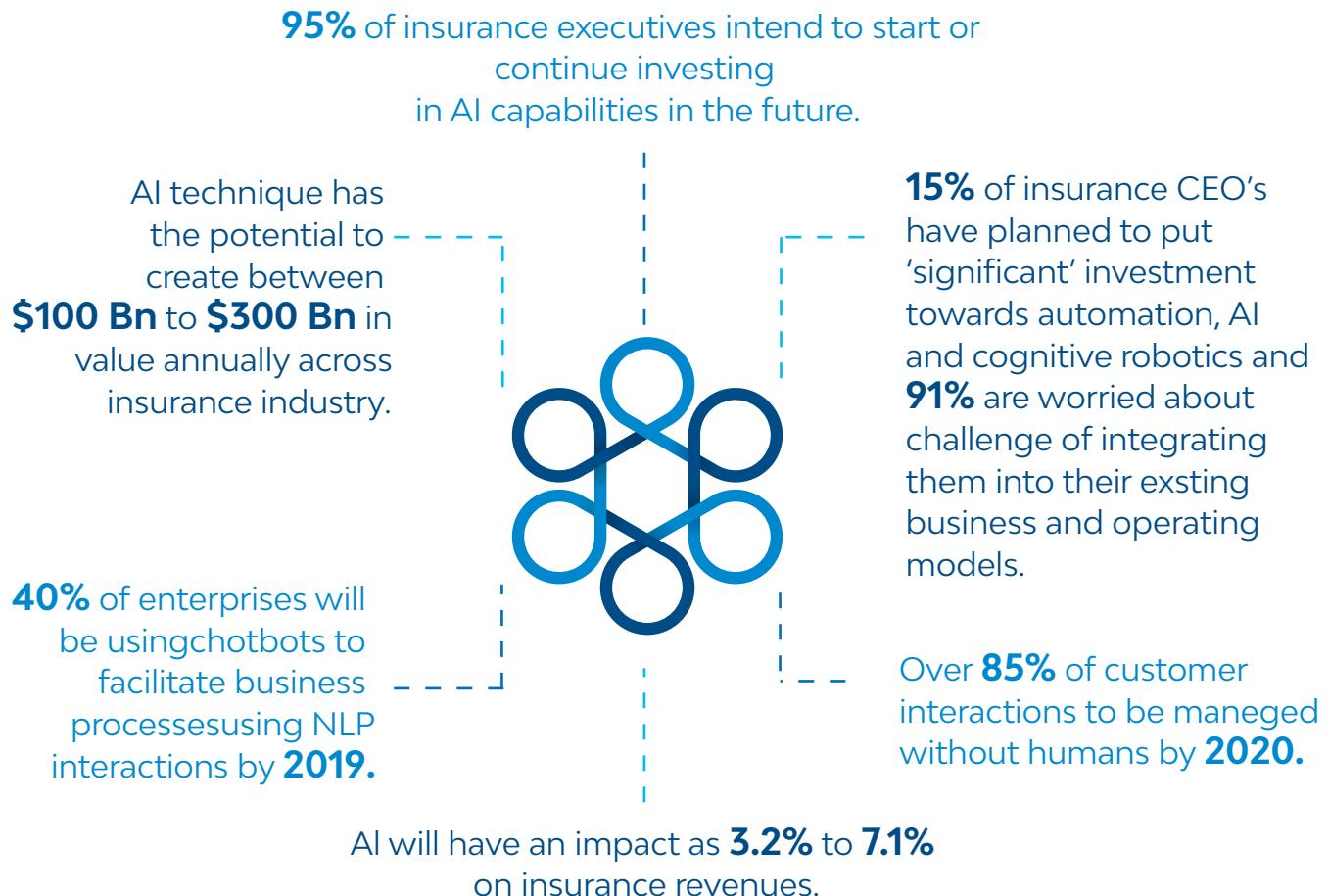


Figure 1: Key trends related to AI in Insurance

AI Trends Shaping Insurance

- **Explosion of Data from Connected Devices** - An increasing number of sensor devices will be connected by 2030 and will be used to collect and analyze data of Insurance customers. This will help insurers understand clients better, offer personalized Insurance products, and decide pricing of products.
- **Increased Use of Robotics** - Remotely controlled devices such as self-driving cars, autonomous drones, vehicles and farming equipment, and surgical robots will reshape Insurance products of the future by 2025. Insurers will need to re-evaluate the impact of these on risk assessment.
- **Open Source Data** - Open source protocols will emerge to ensure data can be shared and used across industries. For example, data of autonomous cars can be used by auto insurers to decide premiums and build risk profiles of insured customers.

• **Advances in Cognitive Technologies** - Rapid adoption in technologies like Natural Language Processing (NLP), Image Recognition, Voice Recognition, Virtual Agents, and Chatbots will lead to disruptive changes in the Insurance industry. Insurers will use these technologies to create innovative products, to streamline processes, lower costs, and to captivate customer experience.

The figure below illustrates few use cases of AI across the insurance value chain and across horizontal processes.

Key Use Cases of AI across the Insurance Value

	 Product Development	 Sales and Distribution	 Underwriting
Potential Use Cases	<ul style="list-style-type: none"> • Leverage real-time and usage-based data to develop customer-focused products. • Suggestion to customer on their required insurance plan and the sum insured. • Predict success of new products. 	<ul style="list-style-type: none"> • Electronic KYC and automated from filling. • Virtual agents for guided online buying processes. • Use NLP to address customer queries on policy components. 	<ul style="list-style-type: none"> • Real-time risk assessment for automated underwriting and direct policy purchase. • Machine learning to improve the traditional statistical models for claims forecasting.

	 Product Administration	 Claims Management
Potential Use Cases	<ul style="list-style-type: none"> • Biometric face and voice recognition and digital signatures to fill forms. • Auto reminder for policy updates triggered by life events. • Use of Chatbots and Virtual assistants to provide personalized services. 	<ul style="list-style-type: none"> • Claims assessment and loss estimation using mobile, drone etc. (Video and Image Analysis). • Algorithm to automate payout calculation for policyholders, thereby reducing their manual effort. • STP for low value and high volume claims. • Proactive FNOL and prevention using sensor data (IOT).

Some Use Cases of AI across Horizontal Processes

Customer Experience	Risk and Compliance
<ul style="list-style-type: none"> Customer Portals and mobile apps for self-service and personalized experience. Use of face identification and voiceprint to reduce time taken for customer verification. Chatbots and virtual assistants to provide quick resolution to standard customer inquiries. 	<ul style="list-style-type: none"> Analyze transactions to identify/predict/prevent fraudulent claims. Analyze social media and other channel data to identify non-complaint actions by advisors/agents. Automate risk analysis and reporting.

Figure 2: Use Cases of AI across Insurance Value Chain

The Rise of InsurTech

Startups are beginning to move in on the territory of Insurance giants, who themselves are beginning to change their service models.

Recent analyses of InsurTech financing deals over the past 18 months indicates that the Insurance industry has reached an inflection point. Instead of spreading their money on a large number of new InsurTechs just getting off the ground, many investors have started channelling more capital into proven entities.

According to a McKinsey report, the key business objectives and leading use cases of AI-based technology where InsurTechs are focusing, fall into these three categories:



- **Customer Experience:** Insurers are trying to provide personalized and instant services to customers using chatbots and mobile applications. They can also validate Insurance cases against business rules and use speech analytics solutions for sales and operational efficiency.
- **Process Improvement:** Key use cases include using mobile applications and web portals to answer customer queries and give policyholders a one-stop access to their documents.
- **Product Innovation:** Insurers are using IoT devices such as telematics, connected homes, and connected self, to develop more usage-based Insurance products for customers. Key use cases include leveraging data from connected vehicles and using AI-powered wearable devices and mobile applications to help customers with personalized advice.

Innovation Applied

 AI-based Insurance within Minutes	<p>New York based startup Lemonade is providing insurance on AI-based platform for low cost renter's insurance. It just takes about 9 seconds to get insured and about 3 minutes for claims to be paid using AI-based algorithms.</p>
 Intelligent Entity Extraction	<p>Silicon Valley based startup Captricity is using AI-powered intelligent automation solution that extracts and enhances data at 99.9% accuracy from any customer channel incl. handwritten documents. 13 of the top 20 US life insurers, normalized data from Captricity to deliver business insights.</p>
 On-demand Insurance	<p>Silicon Valley based startup Trov have developed the world's leading AI-based on-demand insurance platform where, claims are easily handled by chatbot with a few taps on phone and processes claims in minutes improving customer experience.</p>

 AI-driven Property Intelligence Solution	<p>Silicon Valley based startup Cape Analytics uses deep learning and geospatial imagery to provide instant property intelligence for buildings across the US. Anyone can plug-in their data feed of comprehensive property attributes via an API, and then use it to improve underwriting process by increasing quote speed and refining accuracy.</p>
 New way of Buying Insurance through Virtual Agents	<p>US based startup Insurify developed the first online car insurance shopping platform leveraging AI-related technologies to fuel rapid growth with the aim of transforming shopping experience and to help customers make the most confident decision about their coverage and choice of carrier.</p>
 Fraud Prevention	<p>Paris-based startup Shift Technology has developed an AI-powered solution using big data and machine learning algorithms to detect and identify fraudulent claims. Till date, the system has processed over 78 million insurance claims, and is said to have a 75% accuracy which is slated to improve over time and data volume.</p>

AI in Digital Insurance

1. Chatbot : Intelligent Virtual Assistants

Chatbots and voice bots are the new norms of the Insurance industry's frontiers. These virtual assistants mainly help reduce dependency on call centers, and are available 24/7 for customers to resolve basic queries like FAQs, claims status, non-premium amendments, and quick quotes.

Bots: Adding Conversational Capabilities to Insurance organizations

Virtual Underwriting Support	Agent Sales Assistant	Customer Advisor Bot	Claims Aduster Assistant
<ul style="list-style-type: none"> • Risk Alerts • Smart Configuration • Case Prioritization • Take Setup and Allocation 	<ul style="list-style-type: none"> • Proposal Status Enquiry • Endorsement Request • CLaims Status Enquiry • Policy Portfolio • Billing Enquiry 	<ul style="list-style-type: none"> • Product Inquiries • Claims Setup/inquiry • Product Advisory (FAQ) • Endorsement Requests • Policy Renewal Prompts • Follow ups 	<ul style="list-style-type: none"> • Field Planning • Task Setup and Allocation • Claim Data Retrieval • Claims Data Retrieval • Claims Status Inquiry

30% Reduction in call volumes; 3X Operational Efficiencies; Experience Transformation

Chatbot and Voice Assistants Use Cases:

Use case	<ul style="list-style-type: none">• AI assistants can help salespersons understand complex Insurance policy related questions and provide solutions for those queries.• They can propose personalized policies that would be desirable to policyholders thus assisting the underwriter. They can also propose personalized policies by using sentiment analysis to understand the intention of the customer and propose salaries where there is minimal risk for both the insurer and the insured.• Claims processing can also be automated by leveraging image processing, forecasting and predictive capabilities.
Early Adopters	<ul style="list-style-type: none">• AXA Insurance has launched an AI-driven personal wellness-coaching app 'Xtra,' which advises users on fitness and answers questions regarding health goals.• PNB Metlife has introduced the first AI-powered interactive medical chatbot solution on the Facebook Messenger platform. The chatbot informs users of cancer and heart disease risks and simplifies medical information.• ICICI Lombard General Insurance has introduced robotic assistant solutions using a chatbot called MyRA to underwrite two-wheeler Insurance as well as fire and burglary Insurance for SMEs, and offer them quotations in real time.

2. Cognitive Automation

Cognitive Automation refers to AI techniques applied to automating specific business processes. It imitates the way humans think and uses technologies such as NLP, image processing, pattern recognition, and contextual analyses to make more intuitive decisions.

Cognitive Robotic Process Automation (RPA) is one of the most prominent applications of cognitive technology emerging in the Insurance industry. With the integration of cognitive technologies, RPA is making its way to the front-office operations of Insurance organizations (both carriers and intermediaries). Cognitive RPA can help transform various Insurance business functions like Customer Engagement, Insurance Sales and Customer Service, Underwriting and Risk Management, Claims Management, Fraud Handling, Marketing and Proposition (Product) Management as well as Regulatory Reporting. To effectively reap benefits, Insurance organizations need to have a clear strategy and the right skills and partnerships in place.

Cognitive Automation Use Cases:

Use case	<ul style="list-style-type: none">• Operational efficiency is higher with the assistance of RPA, which can be either monitored by a human or can itself carry out the entire process without human intervention.• RPA can manage mundane tasks like registration and processing of claims for non-life Insurance policies, thus saving cost and time.• Regulatory compliance is tricky and prone to human errors. With defined compliance regulations, RPA can ensure complete compliance.
Early Adopters	<ul style="list-style-type: none">• Zurich Insurance is launching the pilot of an Insurance claims AI solution to improve injury claims efficiency through cognitive automation.• Lloyd's of London is enabling Cogito-powered cognitive automation to transform, automate and modernize its various business processes.• Generali is implementing Cogito to classify large volumes of unstructured information leveraging cognitive technology and accelerate registration and claims processing.

3. Predictive Analytics

Predictive Analytics uses data and models to make predictions about various outcomes or likelihoods, most often used by insurers to classify potential risks for incoming business or to gauge the likeliness that a given claim is fraudulent. Most predictive models are not an example of machine learning, but, rather, they are static formulas created through data mining techniques to determine key predictive variables. The ability to use machine learning with predictive analytics has implications that span underwriting, customer service, new business, and fraud detection among others.

Every time a predictive model is run, the outcome of the model can (and should) be stored and tracked. Over time, it's possible to see how the results of the predictive model line up with the actual experience (e.g. underwriting model scores can be compared with claims filed). Most insurers check these results and update their predictive models on an ongoing basis. Using a machine learning approach, these adjustments to models can be calculated and/or applied automatically by using the new information along with the original pool of data.

Predictive Analytics Use Cases:

Use case	<ul style="list-style-type: none">• Better knowledge of the market situation and GIS will help an underwriter draft policies that ensure that only the minimal claim amount be disbursed. It will also help in targeting appropriate prospects with policies better suited to their needs.• With the help of pricing analytics, insurers can set the right price for each customer which will ensure affordable premium payment for the insured and less disbursement of claim amount for the insurer.• In property and auto insurance, predictive models can be used to predict possible damage to property. This helps the insurer finalize the premium amount and also helps the insured avert any damage to his property or automobile.
Early Adopters	<ul style="list-style-type: none">• AIG, Hamilton Insurance, and Two Sigma Investments have partnered to create Attune, a data science-driven underwriting platform serving the small and mid-size commercial market.• The venture capital arm of CUNA Mutual Group has invested in Rippleshot, which uses machine learning and Big Data to identify potential payment card breaches at all types of merchants.• Baloise has partnered with Veezoo to develop the first conversational AI-solution that will analyze and visualize large data volumes in seconds and use results to facilitate fact-based, data-driven decision-making.

4. Natural Language Processing (NLP)

NLP refers to the ability of a program to treat human language as a rich data source. The goal of NLP is not simply phonetic, but semantic, as it seeks to understand and analyze spoken and written human language without human intervention. Recent examples of NLP are smart home automation tools from companies like Google, Amazon, and Apple. Within Insurance, NLP has the potential to be used at scale for call center staffing and customer service, which will ultimately yield substantial cost savings for insurers.

NLP Use Cases:

Use case	<ul style="list-style-type: none"> • NLP can assist underwriters in drafting policy in accordance with the policy seeker's social media profile with the help of text mining and social media analytics. • NLP assists in subrogation by making sure that the policyholder doesn't benefit by making money out of policy as well as from the third party. Data mining and text mining techniques help in automated extraction of subrogation indicators from reports that ensure no violation of the indemnity principle.
Early Adopters	<ul style="list-style-type: none"> • Allstate has developed a virtual assistant called 'ABLE' (the Allstate Business Insurance Expert). ABLE uses NLP to assist agents seeking information on their products and provides them with detailed guidance on selling ABI products. • Lockton is using data mining, machine learning, and NLP to access and analyze worker compensation claim sentiments. • Great Eastern in Singapore has launched GETGREAT, an AI-powered wellness platform to encourage customers to live healthier lifestyles through guidance on fitness programs, diet advice etc.

5. Computer Vision (Image and Video Analysis)

Compute or Machine vision is an application of deep learning (specifically, of "Convolutional Neural Networks") in the area of image/video pattern recognition. One of the most significant applications of this field applies to self-driving cars, which has tremendous implications for Insurance. Machine vision could be useful in claims inspection and adjustment and fraud prevention.

Compute Vision Use Cases:

Use case	<ul style="list-style-type: none"> • Frauds can be detected when uploaded documents lack authenticity or the request for insured amount is more than what is required in an attempt to make profit, thus bringing indemnity policy into question. • It also helps in policy underwriting by drafting a policy after analyzing the policyholders record. • Image/ video intelligence assists in claims inspection and validation by providing easy assessment and validation of damage to automobiles and property. Image processing can help in deciding the monetary expense for the insured to come back to his financial state before the loss. • Image analysis and pattern recognition can also help in the claim triage process, which in turn helps improve efficiency, save money, and reduce cost. This is more applicable in auto and property insurance.
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Early Adopters

- **Liberty Mutual Insurance** has developed an app to help drivers find safe route and locate parking. It also provides quick and real-time access to damage to a car after an accident using a smartphone camera with image/video analysis and a machine learning algorithm.
- **Fukoku Mutual Life Insurance Co.** has implemented IBM Watson to help analyze and interpret claim data including unstructured text, images, audio, and video to decide policy payouts.
- **ZhongAn Insurance** is applying AI to areas such as recognition of marathon runners. Images of the event are collected and checked by AI and ML to see whether there are “human faces” inside photo. Then, OCR is used to identify the athlete’s number, and facial recognition is applied to verify the athlete’s face.

6. Connected Insurance and AI – The Possibilities of IoT Data

The Internet of things (IoT) provides the Insurance industry with loads of data, enabling companies to more effectively determine rates and provide services that keep people and their assets safe. Combining Insurance and IoT is all about connecting the Insurance sector with clients and their risks. Using AI software, Insurance companies can track customer usage patterns, which will help them assess risks of specific individuals.

Connected Insurance Use Cases:

Use case

- Underwriters can draft policies that appeal to potential customers and improve targeting by salespersons.
- IoT helps prevent unfortunate events with the help of deep learning and predictive analysis, such as using devices to check speeding, track burglar and fire alarms, or using apps to track fitness levels.
- Usage Based Insurance (UBI) monitors various aspects of an automobile in order to decide on a premium and eliminate fraudulent claims. UBI ensures that the policyholder pays a premium as per his use of that automobile which also ensures road safety.

Early Adopters

- **Progressive Insurance** is leveraging machine learning algorithms for predictive analytics based on data collected by IoT devices from client drivers. Their mobile app, Snapshot, has collected 14 billion miles of driving data already. The device can track speed, frequency, turn motions, and other driving habits.
- **Munich Re** has taken a key step to create new business models in the area of industrial IoT and digitalization, to develop solutions offering not only technology but also risk management, data analysis and financial instruments.

Conclusion

Insurers are rethinking their business philosophy and developing a customer-centric value proposition, positioning themselves as protectors more than payers. They are looking to develop innovative, contextualized products to meet evolving customer needs, thus altering the Insurance distribution strategy to adapt these new offerings to client needs and the digital technology-led disruption in the market.

AI, Big Data and analytics, machine learning, RPA, IoT, etc. have significant potential to streamline Insurance operations and enhance customer experience. Insurers have started to capitalize on this potential of technology to address the increasing customer demands and rising expectations. AI alone has the potential to bring about significant cost savings, as well as speed-up the Insurance transaction process. It can easily enhance services like analyzing submissions, checking or verifying policy documents, developing new Insurance solutions and flagging potentially fraudulent claims.

The extensive use of AI-based virtual assistants helps enhance customer experience by creating an omni-channel experience to engage customers across platforms leading to immense improvements in the productivity and efficiency. Predictive analytics is helping insurers understand customers better and accordingly price a risk at optimum level. Using a customer's basic health profile, AI-based models can predict diseases, and insurers can use this information to drive targeted wellness interventions, encouraging healthy living through structured programs.

In the future, AI-powered analytics could help companies better understand their cyber risks, improve security and even defend against cyber-attacks. At the same time, AI could assist insurers in assessing and spotting accumulations of cyber exposures. There are many areas, such as reputation management, supply chain management and economic and climate risk scenarios, where machine learning could help better assess risk.

AI will also work alongside other technologies, most notably IoT and Blockchain, to increase the understanding of risk and enable insurers to offer new, faster and more customized services. For example, sensors embedded on shipping containers provide data on the location and condition of the cargo, which once analyzed can trigger Insurance cover or mitigation measures if the goods are damaged. Insights gained from data and AI-powered analytics could expand the boundaries of insurability, extending existing products, and helping in the creation of new risk transfer solutions in areas such as non-damage business interruption and reputational damage.

Over the three years, we have seen the tremendous progress and adoption of AI across the Insurance industry. We will call it the "beginning of the game" and wait to witness the paradigm changes in how the industry is transforming with AI. Stay tuned to enjoy the AI magic.

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Paresh is working with LTIMindtree as a Principal Insurance Consultant in Digital Consulting Practice, focusing on Claims and Compliance. He has over 15 years of experience in the field of Insurance Technology, Claims Transformation, IT Strategy Definition, Vendor Management, Program Execution and Governance, and creating Target Operating Model Development for CXOs over the years. Key interest area for Paresh is to analyse opportunities of best utilization of technology to improve business processes.



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