Artificial Intelligence on Property and Casualty Insurance

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Abstract — The property insurance and casualty insurance sector are large insurance sector that protects or covers the stuff you own (like Home, car and trucks). The provider that provides or covers huge amount of coverage to properties (like cars, trucks, motorcycles and property), other constructions, accidents, vandalism, on theft etc. Casualty insurance is that the policy has the liability coverage to protect yourself if you are the one who is legally responsible for an accident that creates injuries to another party or creates damage to the other party’s appurtenances. The property and casualty insurance are combined together into one insurance product under a single policy. With the help of innovative technology growth, Property and Casualty Insurance Carriers are steadily using leading-edge technologies like Artificial Intelligence and Machine learning, to avoid an intermediary between the insurer and the customer and directly reaching to the customers and make sure to deliver prompt and accurate services without any interruptions at an affordable cost. Among many examples, we can use one being an example is utilized of Artificial Intelligence and Machine learning in the Property and Casualty insurance sector, which is leading towards to have a much greater number of use cases substantial as prevention of fraudulent claims, making fast and accurate business decisions, predictable data analytics, improve customer satisfaction and much more. Mainly this paper talks about emerging technologies like AI, ML which is used and adopted in Property Insurance and Casualty Insurance domain. Artificial Intelligence provides many benefits to insurance carriers, so carriers can improve their process to support their customers. What is an AI: “AI is all about how the digitals and humans can collaborate; how digital can take over tasks they can do much better and faster than human, so human can focus on what only he can do.”

Keywords — Artificial Intelligence, AI & ML in P&C Insurance Sector, Machine Learning, ML & Artificial Intelligence in Insurance Domain, Technology Innovation in Insurance Sector.

I. INTRODUCTION

The Property and casualty insurance domain has recently adoption of Artificial Intelligence is in these carriers are due to changes from traditional Mainframe applications which are using in decades. In the earliest days, artificial intelligence (AI) was thought of as a dead-end technology and thought an invention that would never be adopted or used to its highest potential. These innovative technologies have brought a digital development among the all-insurance carriers. Today Artificial Intelligence technologies are rapidly reshaping the way business operates across industries. In ours, Artificial Intelligence in insurance is helping property and casualty insurers keep up with customer demands, operating the requirements of agents or customers and competitors. The insurance sectors are leveraging the new emerging technologies of Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), which helps to manage the customer experience in all insurance fraud. Artificial Intelligence can be utilized to do underwriting claims processing, insurance advice, direct Marketing, risk management and Fraud prevention. Insurance sectors advanced with the help of Artificial Intelligence by creating values, efficiently and wisely processing claims, reducing costs, giving best policy price and achieving higher customer satisfaction and faith.

II. BENEFITS OF AI

The below diagram shows the benefits of Artificial Intelligence in the property and casualty insurance sector. The benefits of implementing Artificial Intelligence in insurance sector seem clear to the stakeholders in this ecosystem. More than 50% of insurers feel AI can help in improving work force productivity. After deploying AI into Insurance sectors, the insurer reduced human errors due to the automation of AI. These errors are very high before AI that is due to few factors like changes in government regulations of information, which is used to analyze fraud claims. With Artificial Intelligence, insurance companies are saving lot of time, improving customer satisfaction and increasing profitability and reducing costs. Artificial Intelligence can also cut down tedious jobs and time-consuming processes into easy ones, those are claims management, customer services, underwriting and fraud detection.

A recent report from Big 4 firm that confirms the major issues from the insurance sectors are:

- Customer Engagements and Experience,
- Driving change through technology advancements,
- Improving quality of data analytics,
- Find talent to build underwriting,
- Cyber security,
- Commoditization, risk management etc.
III. SOME OF THE VIABLE USE CASES OF ARTIFICIAL INTELLIGENCE ON PROPERTY AND CASUALTY INSURANCE

I would like to mention here a few of the viable use cases of Artificial Intelligence on Property and Casualty insurance, which can be turned to favor for insurance sectors.

1. An Efficient Customer Support
2. Claim Fraud Detection and Prevention
3. Accelerated Claims Processing
4. Optimize Underwriting Process
5. Personalized Recommendations
6. Improve Policy Pricing

IV. AN EFFICIENT CUSTOMER SUPPORT

Many insurances are already in the early stages of enhancing and personalizing the customer experience. Exploiting social data to understand customer needs and understanding customers’ sentiments about products and processes. The further stage is predicting what customers need and what we can supply to them by inferring their behaviors or on feedback from what they do. These intermillions of customer behaviors are predicted by Machine learning and reality mining techniques. The most advanced stage is not only anticipating the needs and the behaviors of the user but also providing tailoring offer, that suits their need and personalized interactions. Ultimately, the insurers will reach the stage where agent-based modeling to understand, simulate and tailor the customer offers and interactions. Artificial Intelligence came up with a powerful digital process at every stage and aspect of the business by transforming the interactions of customer service, the reputation of the carriers, their loyalty, and the generation of revenue streams. With the help of Artificial Intelligence, transformation carriers enhance customer interaction by gathering data for speech recognition and response time messages. Customer experience has been enhanced with AI at nearly every point when it is applied correctly. Artificial Intelligence enables 24 × 7, always-on, multi-channel customer service by deploying virtual agents called Chatbot’s and personalized interactive videos. Here are a few things how Artificial Intelligence helps in delivering excellent customer services with faster response times i.e speeding up the response time of the customer support agents, AI helps to identify the customer needs and present the matching or right information to the agents. This was done by utilizing the chatbot’s very quickly and promptly in the backend to fulfill the requirements. Artificial Intelligence chatbot’s are deployed to address the common questions asked by the users, with this process insurance carriers reduce support tickets and deliver the best service to their customers. With the help of Artificial Intelligence, the carriers are gathering the patterns of the customers’ requirements and forecast later. The patterns are useful to offer good services to customers. Present technology evolution, customers are learning about online options or applications for buying and managing insurance policies. As per JD power study 2016, B Christian, B Goehring, and P Velichety; 32% of customers are getting quotes and buying straight from online through digital mediums without having any intermediary help for Property & Casualty insurance. In addition, 84% of all insurance carriers implementing AI-based Chatbot’s to engagements to make customer satisfaction a primary objective. Insurance
V. CLAIM FRAUD DETECTION AND PREVENTION

What is a fraud claim? How to find out when it occurs? Usually when the insurance carrier receives a huge amount of claims by, he/she, then that triggers a false claim. Thus, the carrier denies some benefits or coverage to which the user is entitled. In this case, Artificial Intelligence plays a very critical role in this sector to detect fraud dents. As a result, insurers can achieve an Efficient, high quality, and effective claims management system. There are a few ways in which Artificial Intelligence in insurance makes a huge difference in fraudulent claims detection and prevention. One of the ways to find big fraud schemes are by deploying artificial intelligence in the insurance sector by keeping keen cross reference and analysis among the internal and external data point. It is such a way that simplifies insurance fraud detection. Moreover, the other one is fraud patterns; with Artificial Intelligence it can easily, finds fraud patterns and that would become much more convenient in Fraud detection. Insurance Artificial Intelligence algorithms from Artificial Intelligence can analyze the vast amount of data very frequently to find common and very frequently used patterns and spot anomalies that do not fit in the patterns. From AI tool applications (Chatbot, Virtual Assistance) that offer complete 365 days of customer service that, bolster processes via automation. Nowadays everyone is aware of how emerging technologies are playing a vital role so, the insurance sector is initially small hesitation and discomfort that how AI will be useful to satisfy customer needs, preventing fraud claims, keep customers and agents happy but now the turnaround implementation is very minimal as they see many more evidence of the benefits and returns. The insurer taking advantage of AI is not only automation the tasks but also the quality of the work done by helping the intermediaries or customers make the right selection of products. A recent analysis made by the FBI on Insurance fraud, that the insurance fraud total cost (non-health insurance) is approximately to be more than $40 billion per year. This calculation gives on average each US family person's premium cost on insurance is increased from $400 to $700 per year. Every year, insurance carriers are receiving a huge number of claims from different customers, that are nearly billions of dollars on fraudulent claims, and fighting on these fraudulent claims is the biggest challenge that the insurer is facing. These kinds of issues lead insurance carriers to depend on innovative technologies like AI & ML, with this insurance carriers can utilize the advantage of predictive and data analytics. These technologies can help insurance sectors to reduce fraudulent claims. Artificial Intelligence can help property and casualty insurance sectors on finding frauds before automatic claim payments happen. With help of AI applications, insurance carriers can reduce fraudulent claims and increase fraud savings up to 5 to 6 times. AI has many features that enable insurers to detect fraud by utilizing Machine Learning techniques, pattern recognition, crash data, and data mining. Natural Language Processing can help insurance sectors to detect fraud by generating clustering, classification and forecasting that can be checked against the data, which was from internal audits.

VI. ACCELERATED CLAIMS PROCESSING

In this current Digital world, everyone expects a quick return, at the same time in the insurance sector customer expects on demand with real-time and efficient submission and quick turn-on processing of the claims by customers. The digital world expanded and now customers can submit their claims through their smartphones, web portals. Some places insurers are helping customers to submit the claims by using kiosk machines too. Along with this Artificial Intelligence now assisting customers by guiding them that how to submit the claims through the claims process without any help from insurer representatives. The Artificial Intelligence completely transformed by having bot’s and that can review the claim, verify the policy details and pass the application through fraud detection algorithm before sending the transaction (either wire or Ach) to the insurance company to approve and pay the claim settlements to the customers without any human interaction in between this process. All insurers can completely focus on the other sides where they can improve their services to the customers. There are many ways AI can streamline claim processing with AI-based chatbot’s. AI chatbot’s can improve the claim processes run by n number of employees, without touch insurance claim processes can remove huge amount of human intervention and quick report the claim and update the system as well at the same time it can communicate the customer all by itself. AI chatbot’s are integrated with different OCR technologies and capture very efficiently typed or written text or images from the scanned documents, which was submitted by the customer. Moreover, it can process the workflow to get concerned approval from different departments to process the submitted claims.

VII. OPTIMIZE UNDERWRITING PROCESS

In all types of insurance carriers, underwriting is an essential part, which is to determine the risk and exposure of potential customers. Underwriting involves in measuring risks, and exposure and that determines the premium that needs to be charged to insure that risk to their customers. After doing extensive research of evaluation and pricing risk on the customer risk profile then the calculations have been determined by the set of rules that the insurer has already set in their system.

With that said consequently manual underwriting is a time-consuming process and that could make some errors and that can lead to inefficient pricing to the customer. That is the reason Artificial Intelligence is a good fit and is required to avoid these kinds of errors and overcome the time-consuming process. Every insurance company has a set of guidelines, which their underwriters should typically follow to come to the conclusion that whether they should take the risk or not. There are so many factors that each insurance company would consider finding how much risk is there, they are the age of the vehicle, how many miles it drove, credit history, is their accidents, tickets, insurance coverage etc. These are the

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factors that insurance company underwriters check and based on these they will decide to accept or decline the risk and approve a quotation with limited exclusions on the taken policy. The underwriters have some deadlines to decide to take risks or not, and sometimes they may take longer time to decide due to a number of factors during the decision taken process. Artificial Intelligence has many tools that helps the underwriters and manage the load that they have then provides accurate results to take decision. There are a few key improvements where AI can improve underwriting. Always consumers expect instantaneous service in all digital points, Artificial Intelligence has that ability to minimize the underwriting workflows. AI application process enriched underwriting profitability. With help of AI and ML insurance underwriting can analyze the risk associated with customer profile and efficient application processing by data collection, data extraction and other repetitive tasks.

VIII. PERSONALIZED RECOMMENDATIONS

Every person has his own preferences and lifestyles, to keep customer satisfaction insurance carrier should think about what their requirement is and how can they fulfill the requirements as an insurance provider. Customers’ expectations are very high on their personalized policies, recommendations on their self-preferences and attributes, and loyalty programs. By giving personalized and preferred products to the customers, the insurance carriers can retain the existing customers and renew the existing policy. Insurers are starting to utilize AI-based tools that offer personalized insurance plans, to achieve this process Artificial Intelligence and Machine Learning models are trained on individual customer preferences to achieve this process.

![Fig. 3. Fraud Detection and prevent flow.](image1)

![Fig. 4 Insurance Underwriting flow.](image2)
With Artificial Intelligence, insurance can have chatbot’s with virtual assistants, providing applications with suggested advice on insurance, these suggestions ensure that the user gets suitable and personalized coverage and deliver with an excellent experience. The other tool is voice-based bot’s that can work with customers and find their preferences and promote the best offers. This process ensures that the end users are retained with them without moving out to their competitors. All insurance companies are enjoying with AI-based insurance solutions to go to market and to gain the extra mile to stand in the competitive market. At last, all insurers are wanted to spend low costs and gain more revenues. These can be achievable by adopting innovative technologies like Artificial Intelligence and Machine Learning.

IX. IMPROVE POLICY PRICING

In the property and casualty insurance market, every customer search for best policy with best price and best options. Every insurer must work on offering best offers to customers by providing best deals with low cost and with high options when they are buying policies. Policy pricing is deciding of rates or premiums by the insurer, to define the best price there are many factors that help in determining the cost of the insurance. Take an example of auto insurance, the insurance company checks how many miles drive per day (to either office or School), their location, when they got their license, age, gender, type of car they drive, vehicle history, any previous accidents are in the records, any ticket payments have made, etc., are contributed to set the price of the insurance policy. Gathering the above factors is a very tedious job for each insurer. With Artificial Intelligence, the average claims cost per customer in different segments can be estimated by the insurer. Can learn drive performance monitoring by analyzing behavioral data from the connected car systems and provide them with personalized rates and product lines. The insurance company delivers superior service levels to drivers by receiving automatic access to crash data and providing a rapid semi-automated response. There is a huge time reduction to build new pricing frameworks with the help of Artificial Intelligence based pricing models and the time-to-market is reduced from a long time to a very short time. The big data was incorporated with Artificial Intelligence in pricing enrich, models with help of the variables of weather data. Moreover, it also assesses the personal risk factor accurately through context and behavior. Moreover, it includes components like economic and political indicators. Artificial Intelligence introduced best pricing models and that delivered great benefits to the insurance carriers on their revenues.

X. CONCLUSION

Property and Casualty insurance sector is under heavy pressure post-pandemic. Insurance companies need to adopt emerging technologies like Artificial Intelligence, Machine Learning to come out from the stressors. The Artificial Intelligence use cases described in the above section hold strong potential for improving operational efficiency, containing costs, and enabling insurance companies to pivot to digital-first customer experience and technology-enhanced product lines. This paper describes how the property and casualty insurance sectors adopted the new emerging technologies like ML and AI tools, with this they built good relationships between the customers and insurance carriers, better pricing models, prevented fraud, improved Underwriting and good revenues.

REFERENCES


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