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Machine Learning in the Insurance Industry

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Abstract : The recent advancement in the technological era has driven the date to be a core value in the domain of the Insurance Industries. The data plays a vital role for the Insurance Industry. The traditional approach was tedious for the Insurance Industry to justify the policy for the customers of their claims because of this problems, emerging new technological tools like data mining, artificial intelligence and machine learning have paved the way for the customer to have a fair justification for his/her policy claim of Insurance efficiently within a span of time. Therefore now a days every Insurance company are using the machine learning algorithms to give full justification for the customers.

Key Words: Machine learning, Insurance

1. Introduction to Machine Learning Insurance Industry

In today's era, the latest agile advancement technology the data is playing a core value. In the domain of Insurance Industries the data plays a vital role to settle down the Insurance policy of the customer. In traditional way, the customer was suffering and delayed to claim his/her policies due to the number of reasons either because the manager was not having a complete/detailed idea about the claim of policies or it might be some other facts. Because of these reasons the customer will not get the policy claims at his need. Customer will be doing the policies so that it would be helpful at his bad time or at his uncertainty time. To avoid these thing now a days every company wants to utilize the latest technological tools for the Insurance Industries and these tools will be more efficiently and give the results within a span of time for individual customer.

Insurance Industry are adopting artificial intelligence to provide an optimized intelligent decision making and eliminate the issues which were there in the traditional approach that is at the process of claiming the policies to the customers. Machine learning has made an efficient and progressive ways to operate and eliminate issues related to the policy claims.

2. What is Machine Learning

Machine learning is a branch of artificial intelligence concerns with constructions and study of systems that can learn from data. It is the type of artificial intelligence that provides computers with the ability to learn without being explicitly programmed. Machine learning focuses on the development of computer programs that can teach themselves to grow and change when exposed to new data.

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The definition of machine learning according to Tom M Mitchell "A machine(computer program) is said to learn from experience E with respect to some class of tasks T and performance measure P, it its performance at tasks in T, as measured by P, improves with experience E [1].

The characteristics of Machine Learning are

i) The way the learning happens is critical.
ii) Applies to tasks that cannot be defined well except by examples.
iii) To find relationships and correlations that can be hidden in the data.
iv) To learn in proportion with experiences. Example, becoming a better player after playing many times in that game.
v) Results may vary vastly. If we apply different learning paths or different algorithms of machine learning.

The categories of machine learning are supervised learning, unsupervised learning, semi-supervised learning and reinforcement learning. In supervised learning, we are going to supervise the learning mechanism that is we are going to supply some guidelines, parameters and labeling regard the data. In supervised learning training patterns giving inputs and corresponding correct outputs are available. In unsupervised learning, learning happens automatically and the structure hidden in the data are recognized by the system. System must find interesting and/or significant patterns in the data without any feedback at to, what is right. In semi-supervised learning, it is a class of supervised learning tasks and technique that make use of unlabeled data for training. Typically, a small amount of labeled data with a large amount of unlabeled data. Reinforcement learning is about talking suitable action to maximize reward in a particular situation. It is employed by various software and machines to find the best possible behavior or path. It should take in a specific situation. Reinforcement learning differs from the supervised learning in a way that in supervised learning the training data has the answer key with it so the model is trained with the correct answer itself whereas in reinforcement learning, there is no answer but the reinforcement agent decides what to do to perform the given task. In the absence of training dataset, it is bound to learn from its experience.

Machine learning has become very important to know what all is driving more industries leads and how to best optimize the industries campaigns. Industry leaders believe that improving the precision and profitability of pricing is one of the integral areas where machine learning is revolutionizing the concept of a customer centric approach. As per a recent survey, in the last 2 years, small businesses have spent over $ 55 billion on just cloud-based services, wherein an average professional uses anywhere between 10-16 apps daily. If trends are to be believed, by the end of the year 2020, more than 80 percent of the small businesses operating today will be using.

Moreover , 84 percent of the Industry organizations operating today have already started implementing machine learning. Out of this 75 percent of the enterprises using machine learning are already experiencing customer satisfaction.

3.What is the need of Machine learning.

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Machine learning is an effective application of artificial intelligence also known as AI that makes any system efficient of learning and improving automatically from the experience itself without the assistance of the program. The application usually focuses on the development of different computer programs that can directly access data and use it to learn for themselves. The entire process of learning begins with the analyses of data which can include direct experiences or even any give instructions to properly study a pattern in data. This plays a vital part to make better and improved decisions in the future.

The key objective of machine learning is to let the computers automatically learn without the intervention of any human being and adjust the actions as per needs and requirements. Machine learning software was once thought to be a very technical and complicated application however it is now widely available and used by most business. Machine learning primarily heightens any organization's sheer ability to build all data-backed applications to enhance the overall customer experience.

The traditional Insurance industry has fully depend on what the data has given by the customer and then depending upon this data, Insurance industry will calculate the risk's and claim the policies to the customer. Now due to the profound transformation of technology, all the services have been digitalized. By using the tools of machine learning we can transform the traditional Insurance Industry to digital so that we can increase the operational efficiency within a minimum span of time, boosting the customer service at his figure tips and also we can detect the fraud of policy claims.

4.How we can deploy the machine learning in Insurance Industry

The following attributes can change the style of Insurance Industry by using the Machine Learning tools, that can make more comfortable to the customers of Insurance. They are i) Automation ii) Agile Algorithms iii) Optimized underwriting iv) Value added predictions v) User-Convenient Policies vi) Fraud Detection.

i) Automation:

The traditional Insurance Industry is having a specific rules and regulations and each claim has to process according to those constraints. These processes are done by the human and it becomes tedious to do these tasks and give the claims it might take more number of days. If we adopt these rules and regulation by using machine learning algorithms, we can process thousand of claims and responds to even more number of customers simultaneously.

Machine Learning also improves these processes automatically and move customer policy claims through the system from the initial report to the final report to analysis and give the acknowledge to the customer. In some claims, the worker of Insurance Industry has to dedicate more time for claiming the policies.

Some of Insurance Industries are already automated some process of the claims, benefiting from significant time saving [2] and increased quality of services to the customer.

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For example, Captricity (http://Captricity.com/) has developed algorithms that are able to extract handwritten or typed forms into a digital form with a smashing 99.9% accuracy, helping Insurance Industry to reduce cycle times. On February 2019, Captricity announced CaptricityREAD, the first AI –powered software that, according to company's claims, outperforms humans at reading handwriting.

Lemonade (https://www.lemonade.com/) is an Insurance company that uses AI to process claims more quickly and provide customers with fast payouts using various applications, such as *chatbot*. That is one of the fastest growing company in Insurance space- Lemonade raised dollar 780 million already, and is using the funding to expand into Europe [3] (with the Germany as their first market).

"The value proposition we've created resonates with young consumers in a universal way." Said Daniel Schreiber founder and CEO of Lemonade as quoted on TechCrunch.

ii) Agile Algorithm

The core value Insurance Industry is the rating of the policies. There's a famous saying in the Insurance world: "There are no bad risks, only bad pricing." That means companies are able to accommodate most risks as long as they find a good match in pricing.

However still many Insurance Industry depend on traditional way of evaluating risk of policy claims. For example, when calculating property risks, they use the historical data of a specific pin code. In this analysis, Machine Learning offers a variety of new agents [4] supporting them in rectifying/ classifying risks and calculating more accurate predictive price that eventually reduce loss ratios.

An example, is Zendrive (https://www.zendrive.com/), a mobile app that monitors the driving behavior of customers to potentially offer them significant discounts on car Insurance premium. Based on 60bn journey's data from 2018, Zendrive estimate that rate of smartphone use behind the wheel may be as hig as 60% [5].

iii) Optimized Underwriting

The Insurance Industry is embracing a customer-centric approach. Industries are looking to cater the individual need of policy claims and priced accordingly. They want to get rid of traditional policies of Insurance Industry that was based on the queries given by the customer and used to determine the risk profile.

They can now use of Machine Learning tools that helps to consolidate insights from large volume of highly varied data. Such as customer policy claims data, membership and provider data, benefits and medical records, nomination data and many others. These solutions can structure and process to offer an Insurance company insights leading to costs reduction, high quality of caring and fraud detection of policy claims.

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An example of such technology is Daisy Intelligence [6], which provides price suggestions for different customers based on their individual risk factors, such as age, location or even blood pressure. On April 2019, the company has beaten 12 other startups to won the Canadian Fintech 3.0 Summits Future of Retail Pitch Battle were establishing a new category, AI, empowered category management and delivering disruptive financial benefits to retailers and Insurance companies –said Gary Saarenvirta, Daisy's Founder and CEO.

iv) Value Added Predictions (VAP)

Value added predictions is a core metric that provides the main insight of the customer and the correlation between the customer with the Insurance for his future enhancement claim of the policy. Machine Learning tools help Insurance as well as customer predicting the likelihood of a particular customer behavior. For example, their maintenance of the policies or surrender.

v) User-Convenient Policies

Customer wants to take the policies according to his/her needs, preference and lifestyles. In traditional Insurance Industry, a professional insurance person has to tell each and every bit of information of each policies and then according to the convenient of the customer he was taking the polcies, but it was a tedious task to convince the customer to take the policies.

But due to the tools of the machine learning algorithms, depending upon the data available of the customer, the machine learning draw insights about individual preferences, behavior, attitudes, life style details and asset details. It recommends and suggest the policy that fits specific customers through sophisticated selection and matching mechanisms.

Machine Learning algorithms for Insurance Industry offers customers personalized services such as chatbots. For example ABIE help insurance make the right policy choice by using ChatBots [7]. Customers have nothing against that – in fact 74% of them are happy to interact with machines in that context [8].

vi) Fraud Detection.

Fraud is a serious concern that costs the US Insurance sector over dollar 40 billion [9] a year. If Insurance Industries found methods to mitigate fraud effectively they could positively impact their profit and loss and that's where machine learning algorithms can help.

Some of the company are already using and identifying claims that are more likely to be fraudulent than others and subject them to further investigation by employees.

For example, the Paris-based startup shift Technology has developed an AI-powered solution(https://www.shift-technology-com/) to better spot potential found among Insurance claims and provide fraud handlers with clear and actionable rationale for why the claim was scored with a high potential for fraud and best next steps for investigating the claim.

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The solution supposedly boasts a 75% accuracy rate (https://techcrunch.com/2016/), double the market standard. The accuracy rate refers to claims identified as potentially fraudulent that the handler elects to move forward. Machine Learning is on its way to causing a massive disruption across many different industries, and Insurance is no exception. Quarter 1 of 2018 saw dollar 728 million invested into Insurtech companies across 66 transactions [10]. Since Insurance Industries have always worked with data, it only makes sense that they ride the digital transformation wave and implement machine learning solutions that give them a more in-depth look into this data to uncover new insights. And these came in handy for a broad range of purposes, from fraud detection to development of rating algorithms that determine the best pricing strategies.

Due to the advancement tools in the machine learning, it is becoming more and more mature in all the domains in the sector digital transformation with efficient and intelligent decisions.

5.What is the power of Machine Learning.

Machine Learning is becoming an emerging tools for the development of applications because of its independent, self-learning, self-adapting and taking self decisions according to the kind of the process in our specific domains tasks. This is one of the important and powerful characteristics of Machine Learning.

Machine Learning is in the NEWS

- Google says [11]. It is " rethinking everything around machine learning".
- In slate, tech writer David Averbach argues [12] that machine learning reshapes how we live.
- In Harvard Business Review, Mike Yeomans write [13] that " every manager" should know about machine learning.

If you are an Insurance executive, these claims may seem like hype. Insurers invented [14] . Some of the most advanced statistical techniques more than a hundred years ago.

But consider how these insurers use machine learning today.

- Progressive Insurance uses [15] machine learning to predict claims from telematics and geospatial data.
- Zurich Insurance uses [16] machine learning to support marketing, fraud detection and claims management.
- Transamerica uses [17] machine learning to recommend products to customers Gary Reader, KPMG's Global Head of Insurance, writes [18]. For the Insurance sector, we see machine learning as a fundamental game-changer since most Insurance Industries today focus on three main objectives: improving compliance, improving cost structures and improving competitiveness.

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6.Future Enhancements

The Insurance industry is making strides in utilizing fast-developing technologies such as Artificial Intelligence, Machine Learning and cognitive automation to go after any kind of data-structured or unstructured. The insights gained are being leveraged to improve and streamline existing business processes. These computationally intensive projects are becoming more affordable thanks to developments in graphics processing units (GPU's), the rise of on-demand analytical cloud platforms, robust open source software languages and libraries and fall in computer hardware prices.

Let's examine some probable future scenarios: soon, a home-owner's roof will inform the insurer will automatically schedule a repair crew avoid a large claim. A combination of a virtual geo-fence and sensor-embedded collar will prevent the owner's pet from wandering into the work area and hurting itself thereby averting a potential claim for vet bills. Similarly, in life insurance, smart watches will notice variations in ECG during gym workouts and proactively advance the insured's routine physically.

The Internet of Things(IOT) also making an entry into the insurance sector, and the technology has a compelling value proposition to offer – sensors embedded in equipment can stream data that can be analyzed to improve processes, enhance customer service, and mitigate risk.

To facilitate a move to next-generation Insurance and capitalize an emerging advanced tools, the Insurance companies must switch to leveraging artificial intelligence, machine learning and cognitive technologies.

Due to the adaption of machine learning, it delivers optimized predictions than traditional analysis with better predictions. Insurance Industries can make smarter decisions so that it will be profitable to company as well as customer.

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