

## ARTIFICIAL INTELLIGENCE APPLICATIONS IN THE LIFE INSURANCE SECTOR: A STUDY OF SELECT LIFE INSURANCE COMPANIES IN INDIA

S. Lakhangaonkar<sup>1</sup>, D. Ubale<sup>2</sup>, S. Ubale<sup>3</sup>

<sup>1</sup>Faculty of Commerce & Management, Vishwakarma University, Pune, Maharashtra, India.

<sup>2</sup>MBA Dept., PES' Modern College of Engineering, Pune, Maharashtra, India.

<sup>3</sup>Matrix School of Management Studies, Pune, Maharashtra, India.

<sup>1</sup>supriya.lakhangaonkar@vupune.ac.in, <sup>1</sup>smlakhangaonkar@gmail.com,,

<sup>2</sup>deepali.choudaki@moderncoe.edu.in, <sup>3</sup>satish12091974@gmail.com

### ABSTRACT

*Indian Life insurance industry has witnessed a remarkable change in recent times. Insurance sector has included technology in various aspects of business - like consumer experience, underwriting, marketing and of course the constant competition. Digital interface, mobile and internet assistance and easy payment systems have transformed this sector in a considerable way. In recent times, Technology is being implemented in front as well as back-end insurance processes. This is possible mainly because of the use of Artificial Intelligence (AI) in various insurance operations like customer profiling, marketing, underwriting, claim processing, fraud detection etc.*

*This research is based on secondary data collected from various reliable sources like media reports, press releases and insurance company's websites etc. Several newspaper articles, reports, websites, research papers and expert comments have been reviewed to map the present state of use of AI in the insurance sector. The study offers an overview of AI technologies used in different insurance operations by the select six life insurance companies in India. The research focuses on AI enabled applications used in select insurance operations either customer-facing or employee-facing. The study also discusses how, where, and why AI applications are critical in the insurance operations.*

**Keywords:** Artificial Intelligence, Life Insurance Companies, Insurance Processes, Customer experience, Operational efficiencies.

### Introduction

Artificial intelligence (AI) is an extensive branch of computer science. AI powers computers and machines to imitate the problem-solving and decision-making talent of the human brain. AI focuses on developing the abilities of operation systems to solve issues complex skill set like learning, reasoning and self-correction. AI is applied in varied industries and services. Currently, it is applied in the field of healthcare, education, banking and financial services, automobiles and gaming to name a few. Artificial intelligence systems use several multifaceted algorithms that execute greater decision-making proficiencies with high communication speed.

Technological adaptations in the insurance sector were slow as compared to the other sectors. The main reason behind this is dependence of insurance industry on manual work. Insurance industry is adapting the AI efficiencies in day-to-day working to improve on performance speed and accuracy. Application of AI in insurance sector will bring

boon in the sector and help to make the processes more hassle free. Some of the areas in insurance sector, where artificial intelligence can be successfully applied are - distribution, underwriting, pricing, claims and product improvisation. AI applications are currently affecting the promotion, purchase and pricing of insurance product. The scope of AI in Indian insurance market is going beyond telematics and risk assessment.

Apart from insurance companies, the engineering and technology start-ups in India are slowly and steadily recognizing the importance of AI applications, opportunities and wide scope of operations in insurance sector. InsurTech companies in India are steadily approaching this comparatively new field of application and solving the critical insurance challenges. According to India Brand Equity Foundation Report (2021), currently, there are 110+ InsurTech start-ups operating in India.

### Literature Review

Eling, M., Nuessle, D. and Staubli, J. (2021)



studied the effect of AI on the insurance sector using Porter's value chain (1985) and Berliner's insurability criteria (1982). The study based on a data set of papers and industry studies. The results demonstrated that the cost efficiencies, new revenue recognition and better risk management in the field of insurance is possible with the help of AI. The study identified two major advantages of AI execution. The first one is - AI will help the insurance companies in correct estimate of loss probabilities. The second advantage is it can transform few risks from high frequency to low frequency. This study leads to new thought process among insurance companies and they started thinking to design adequate insurance products.

Seema Rawat, Aakankshu Rawat, Deepak Kumar, A. Sai Sabitha. (2021) the research work focuses on identifying the factors for claim filing in insurance. The data set was analysed using machine learning algorithms on performance metrics. The study showed that InsurTech can help to know and classify the customers more precisely. A study of customer demographics, claim pattern and claim analysis can assist significantly in insurance product improvisation and suitable premiums calculations. The policies can be altered on the basis of profit/loss ratio by recognizing the policy acceptance practice of insurance company.

Sushant K Singh and Muralidhar Chivukula. (2020) highlighted the role of machine learning and deep learning, in addressing the varied issues in insurance sector. The study mentioned that the data produced and the challenges faced by the insurance companies are multifaceted. It concluded that the AI application in the insurance industry is still in the elementary stages and there is a long way to go. Traditional statistical and machine learning methods may lack in establishing precise prediction models in nearing future due to increasing complexities involved. The study urged the new generation data scientists and engineers to work together to discover innovative ways of handling unique data of insurance industry and developing sustainable solutions. The study also mentioned about the expected proficiencies of data scientists. The study predicted that the

insurance industry innovations and upcoming technologies such as Drone, the Internet of Things (IoT), and Fitbit would bring additional challenges to AI professionals while working in the field of insurance.

Naman Kumar, Jayant Dev Srivastava and Harshit Bisht. (2019) The aim of the study was to get new sights into the operational problems and customer dissatisfaction in insurance. Few international insurance companies and InsureTechs companies were studied to develop the model to understand the relationship between AI & its uses in the sector. The study found the scope and market penetration of AI in current sector. This research showed that these techniques can help to increase customer satisfaction, reducing frauds, and reduce operational complexities thus increasing profits. Riikinen, M., Saarijärvi, H., Sarlin, P. and Lähteenmäki, I. (2018) has discussed the role of AI in improving value in insurance sector. The purpose of the study was to understand the role of insurance chatbots which support customers' and creates value. Three major points - AI, use of customer data in reverse manner, and service logic were briefly discussed. The results were further shown through cases that studies different ways of customer support leading to value creation.

### Research Objectives

1. To study the scope of AI technologies in life insurance sector.
2. To study AI applications of a select life insurance companies in India.

### Methodology

This research is based on secondary data collected from various reliable sources like media reports, press releases and insurance company's websites etc. Several newspaper articles, websites, research papers and expert comments have been reviewed to map the present state of use of AI applications in select companies of insurance in India. The selection of companies are based on the performance criteria. Top six insurance companies have been selected for review purpose.

### Analysis

Currently twenty four life insurance companies



are operating in India. LIC of India is public sector company rest all are from private sector. The researchers have selected top six insurance companies on the basis of media reports for this study.

### 1. Life Insurance Corporation of India (LIC)

It is one of the oldest insurance companies in India. LIC, being a government entity has always followed a traditional path of business making. The growing importance of technology in financial service sector and cut throat competition from private players has made LIC to shift to online connectivity and futuristic technology.

Being among the top service brands in India, LIC has a huge customer base of over 30 crores. The entire 30 crore policy records have been digitized by the year 2020. LIC has changed and upgraded its operations over a period of time. Now, LIC is set to improve its IT system in coming years applying blockchain and AI. During the lockdown it has started issuing electronic policies to its customers. According to Vipin Anand, Managing Director, LIC (2020) "LIC is committed to Aatmanirbhar Bharat agenda and for this we plan to deploy technology for better operations even from remote locations."

LIC has processed 6.5 Cr policies amounting to Rs 25,000 Cr online in the first quarter of 2020. It accounts to about 42% of insurance premium collected online between the period April-July 2020. Not only premium collection but the payment of claims and pension process has also been smoothened out with digitization. About 51 lakh claims were settled between April-July 2020 which was only 47 lakh during the same period previous year.

### 2. ICICI Prudential Life Insurance

It is the most recognized insurance companies in India in private sector on the basis of premium collected. For year 2019 the premium collected was more than 300 billion. It is well known for its process improvement efforts. Cutting-edge technology has become an integral part of company's business processes. ICICI has added layer of precision and convenience for its customers by introducing

digital technologies. It is pioneer in innovations like bots for auto servicing, facial recognition checks, Since long company is focusing on leveraging ecosystems, collaborating with internal stakeholders and partners for enhanced experience and productivity. In the year 2018, company has started focusing more on market leadership with the help of IT as an enabler for Business innovation.

The various stages of policy process like pre sales, onboarding and issuance, customer servicing and claims, marketing and lead generation and analytics are highly automated. Following are the little technological advancement applied by the company right from the pre sales to analytics stage-

- My Coach – AI Platform for video-based library creation for sales pitches.
- Robotic Enabled Issuance – Robotic processing for faster issuance of insurance policies.
- AI assisted Underwriting – Empowers underwriters with insights for speedy and comprehensive decision making.
- AI based Claim Processing – AI based pre claim assessment and claim processing with speed, efficiency and convenience has been implemented successfully.
- Bot Orchestration Layer – Universal bot with voice capability to cater to all touch points.
- Humanoid – AI based conversational tool positioned for reminder calling of renewal premium of insurance policies.
- Rank high on online searches – ML is used to rank the company higher when customers search.
- Selfie Quote – AI backed quote based on facial recognition.
- Google Big Query, Hadoop, Python – using best technology available to process the data.
- Data Lake Solution – Use of AI and ML to analyze structured and unstructured data.

### 3. SBI Life Insurance:

With 922 branches and offices, SBI Life operates throughout India. Digitisation is certainly helping SBI life to expand its reach. SBI Life has seen manifold rise in e-sourced



policies. SBI YONO, was a great success because life cover is provided in just three clicks. SBI Life also provides video based KYC in addition to Optical Character Recognition to read and recognize the KYC document's data and validate the same with proposal form data. Further to reduce on staff dependency, the company has used AI enables facilities for tracking cases, status updates etc.

#### 4. HDFC Life Insurance

It is a joint venture between HDFC and Abrdn, a global investment company. The company had insured over 20 million policies in both segments with highest margins in the business, with 25% in first half of 2019. HDFC Life's AI usage is divided into the following key areas:

- Text AI: Bots have enabled the company to automate processes to improve performance. Some of the bots are SPOK, Etty, Zoey and Neo, which extends service experience to customers 24X7. The company uses natural language processing to power the conversation engine.
- 'Etty' used to automate routine calls. 'Etty' supports more than 650 service queries. It has served 6.5 lakh users and has handled more than 35 lakh queries with a 94 per cent accuracy.
- Vision AI: These applications include - 'FaceSense', 'Bodmeter' and 'Age Tymer'. 'FaceSense' application, which is used for facial authentication of the customer, has processed over 40,000 cases year to date and processes almost 600 cases daily in the HDFC Life branches. It is used to mitigate risk of incorrect payouts at branches. Customers walking in for payouts are asked to take a simple picture then it is compared with the image at the policy inception, thus ensuring the same customer.
- Voice AI: These applications include - 'Ezra' (Google Assistant), 'Elsa' (Alexa) 'SVAR' and 'InstA'. 'Ezra' and 'Elsa' have seen over 1,000 inquiries so far. The voice bot 'SVAR' is available in 14 Indian languages. It reaches out to 4.5 lakh customers every month for payment collections. Approximately ₹3.5 crore of payment per month is attributed to this bot.

It has 14,500 active sales users. It is being used across all the branches and 17 call centres, addressing over 17 lakh queries.

- Machine learning: These applications include - Propensity, Risk and Customer Retention models. Cloud computing has helped company to increase scalability and enabled customisation. It currently has 25 cloud-native products with most of the applications migrated to the cloud platform. AI has aided the company in many areas such as underwriting engine, risk mitigation, sentiment analysis, hyper-personalisation of sales incentives.

#### 5. Max Life Insurance:

It is a joint venture between Max Financial Services and Mitsui Sumitomo Insurance Company. Its current claim settlement ratio is 98.74%. Max Life Insurance's AI usage can be divided into the following key areas:

- Machine Learning & NLP for Sales Team Support: The company is implementing machine learning models to help the sales team focus on promising leads with high probability of conversation into sales. The company has also built the NLP-based conversational virtual sales assistant which supports the sales agents throughout the sales journey - right from product suggestions by sales person to the product interrogation and query handling on the go over WhatsApp.
- Smart Algorithms and Machine Learning for Customer Segmentation: The company makes use of CRMs of bank-assurance partners and the industry databases to know more about the customers. This saves on onboarding time and lengthy documentation procedure. The company uses smart algorithms and machine learning for customer segmentation. It uses AI models for the right risk selection and pricing.
- AI to Support Banking Partners: The company has built the AI-based campaign engine, Suraksha, with banking partners to offer customised PASA proposals depending upon customer need, risk return trade off and recommending the most suitable product for the customers.



- **AI in Underwriting:** Shield & Fincheck, the predictive underwriting engine of Max Life Insurance assesses the likelihood of an early claim, policy lapse and risk of fraud upfront. It also intimates if any additional verification is required by an underwriter for any policies. This helps the company in fast policy issuance, identification of risky and fraudulent policies at the issuance stage rather than rejecting them at the claims stage. Deep learning-based face-matching algorithms is used at the application stage to verify customer's photographs with the proof of identity to further assess risk. The application can also accurately read KYC document scans, validate and digitise the details automatically.
- **AI in Policy Servicing:** The company uses a combination of machine learning and NLP-based techniques and has developed the AI-based automated IVR and email intent prediction engines to identify customer calls and email contents to provide quick solutions. The voice call data from renewals and customer servicing teams, is accessed by the speech engine – VOX. Linguistic speech models are used to infer the script and customer sentiment across these calls and thereby managing the unstructured data.

#### 6. Kotak Life Insurance:

It is founded in 2001 which caters 15 million customers and has 232 branches in India. Kotak life insurance's digital journey can be divided into key areas such as New Business Opportunities, Customer Experience and Distribution Ecosystem. Building a good support system for its employees is one more dimension of company's digitalization. Kotak Life Insurance claims that their, 98% of its data center workload is virtualized. Kotak Life Insurance uses AI in the following key areas:

- **Text AI:** Limited customer interaction is one of the challenges faced by insurance industry. Kotak has deployed an assistive bot that could help customers even if they don't remember their login Id and password. The bot is designed with artificial intelligence and machine learning

algorithms with an aim to solve customer's doubts and queries in a most efficient manner. Kotak chat bot has served as a solution to call center time bound limitations and served 53% more customers in a user friendly and adaptive way.

- **Voice AI:** KAYA is developed to enable the customer experience with instant solutions. It can handle multiple queries related to payment, policy statements, policy information and policy renewals.
- **Vision AI:** Vision AI system is started by the company to check the annuitant's liveliness. Automation of submission of certificate of existence using AI is done by uploading latest photograph through application and AI verifies whether the person is alive or not.

The company is working on AI based fraud analysis and has already working on open-source software and datafication of business interactions, private life and public life.

#### Discussion

The insurance sector in India is prospering at an enormous growth rate. With growing middle-class population, people recognizing importance of risk transfer and retirement planning, the expansion of insurance sector is enviable. The secondary data related to six select insurance companies clearly indicates that the insurance companies in India have recognized the increasing importance of technology implications in customer-facing as well as employee-facing operations.

The leading insurance companies in India are establishing and using the automated underwriting, taking support of machine and deep learning methods, experiences more insurance purchase with AI enable distribution network. Automation in claim processing with AI handling initial claims is leading to improved efficiency and high accuracy. Still there is a scope for enabling more complex AI and ML applications in insurance operations and thereby facilitating the customer and employee convenience.

#### Conclusion

AI is not new in India and we know the engineering and research professionals have



been experimenting with various AI enabled technologies for social revolution. AI enabling technologies in insurance sector are becoming more accessible and inexpensive for insurance companies plus there is an easy access to internet facilities to the end users, making it desirable to all the stakeholders. It is estimated

that AI will help Indian economy to add approximately \$1 trillion in next twenty years. AI adoption is still in its budding stages and it has got tremendous potential to grow in nearing future. There is huge scope for AI in insurance operations which can be explored with time.

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