

To Study the Technologies that are Used in Underwriting in 2022 Special Reference to Health Insurance

Dissertation Submitted to



THE IIHMR UNIVERSITY, JAIPUR

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

In

Pharmaceutical Management

by

Komal Bhauso Bhintade

0310

UNDER THE GUIDANCE OF

Dr. Saurabh Kumar Banerjee

Dean, Associate Professor, School of Pharmaceutical Management,

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DECLARATION

I hereby declare that the review work involved in this project was performed by me under the supervision of Dr. His Saurabh Kumar Banerjee of his IIHMR University Pharmaceutical Management Department in Jaipur. The scope and sources of information derived from existing literature are indicated in the main part of the project. The work is original and has not been submitted in its entirety as a degree or diploma from this university

Place: Jaipur

Komal Bhintade

CERTIFICATE

This is because (Komal Bhauso Bhintade) has partially fulfilled the requirements for conferring an MBA degree in Pharmaceutical Management at IIHMR University, Jaipur, on 1 March 2023 at (name of organization) for an internship till 31 May is proof that you have successfully completed , 2023

Place:
Date:

Preceptor/Head of the Organization
Name of the organization

CERTIFICATE

This is to certify that the dissertation titled TO STUDY THE TECHNOLOGIES THAT IMPROVE UNDERWRITING IN 2023 SPECIAL REFERENCE TO HEALTH INSURANCE is a record of the research work undertaken by **Komal Bhintade** in part fulfillmentment of the requirements for the award of the degree of MBA in Pharmaceutical Management from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide
IIHMR University, Jaipur

Date

School Dean
IIHMR University, Jaipur

Date



Acknowledgement

The satisfaction and exhilaration that comes with the successful completion of a job cannot be mentioned without mentioning the names of those who made it possible and whose constant guidance and encouragement lit up their efforts. I guess.

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Above all, I thank the almighty for his benevolence.

Thanking You,

Yours sincerely,

ABSTRACT

This study attempted to capture the current state of the health insurance industry in India. It thoroughly researches and explains the latest technology in the health insurance industry. Underwriting technology and its impact on insurance and underwriting operations will be discussed and explored. To understand the growth of the insurance business, we examine some features of future insurance coverage and underwriting processes.

This study examines how insurance is affected by digital technology and how insurance helps the economy become more digitalized. Our economy and culture are fundamentally changing as a result of technology and new data sources, and the insurance sector will follow suit. Some of the most important issues facing society are addressed in large part through insurance. Despite the economy's growing digitization and the popularity of personalizing more aspects of everyday life, the industry's best method of mitigating the financial impact of risk remains risk pooling through insurance.

Automation has caused insurers' responsibilities to go beyond loss indemnity and now also include providing advise to insureds on risk reduction, management, and prevention. In other words, thanks to modern technologies, insurance can move beyond risk mitigation to risk prediction and prevention. Underwriting, pricing, and other procedures could be made more effective by digital technologies. Digital innovations have, however, brought about fresh challenges.

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CHAPTER 1
INTRODUCTION

INTRODUCTION

Health insurance is a contract in which the insured receives medical coverage from the insurer in exchange for a premium payment. It covers, among other things, hospitalization, surgery, and day-care operations. Medical expenses are reimbursed, or cashless care is provided through health insurance policies.

For their own safety, all humans require insurance. When an earning member of the family died as a result of illness in the past, other members of the social circle would help the family recover financially. This donation aided the family's financial recovery. This generosity helped the family member get out of the economic crash. This benefaction was in the form of necessary things like food, clothing, and shelter. A commercial consideration develops stronger and stronger, nucleus family expansion becomes a regular practice, and those diving and sharing began to become individualized and took the form of you. This assumes that which was previously a commodity due to will and practice. Daily growth is being seen in the insurance concept. Anyone who is unable to contribute or who is unable to contribute at a level consistent with their earning potential is given assistance in lieu of the reciprocal help they would otherwise be entitled to. His help has been provided in proportion to his contributions as a loyal and obedient member of society, in proportion to his contributions as a loyal and obedient member of a specific society, and in relation to his contributions as a faithful and obedient member of society.

Everyone, afraid of something. One of their concerns is whether they will be able to satisfy an excess of fundamental necessities in a proportionate manner, such as food, clothing, and housing. Humans also care about their families, ensuring that they have adequate access to these essential necessities. So, to obtain these fundamental necessities, they will attempt to acquire assets such as vehicles, real estate, jewellery, and so on. At the same time, people are concerned that this shift will be destroyed by accident or natural weather.

As can be seen, health is a vital asset, and accidents, disease, disability, and the destruction of these valued assets are all unpredictable. Because the number of accidents and the incidence of lifestyle diseases is increasing every day, insurance plays a significant role in addressing this issue.

A human being's primary source of income is the reward he receives for his efforts. If their sources of income are suddenly cut off, the family must take the following steps.

1. How can a family alter their living expenses?
2. Wife will look for a job to assist the person.
3. Due to the economic downturn, children may be forced to work instead of attending school.

These are the probable eventualities that we as humans must encounter. The primary responsibility of an insurance underwriter was to assess risk. And an insurance underwriter assesses and assesses the risk in providing insurance to consumers and businesses, determining the insurance premium pricing. To access the risk of future events that would require the insurance business to compensate and cover individuals, underwriters employ various technology, data from actuaries, and prior film history.

UNDERWRITING

Underwriting is the main procedure to provide coverage to the company or the person to like protection future secure and financial risk

The time period underwriter comes from the exercise of getting every chance taker to signal their call below the whole quantity of chance they have been equipped to endure for a given premium.

Underwriting has the following jobs and responsibilities.

1. Examining facts on a possible client, such as age range, medical history, and business kind
2. There is an examination of possible clients using technology.
3. Choosing the appropriate insurance coverage for the possible client.
4. Calculation of premiums based on coverages
5. Finding novel ways to lower the risk of future claims.

Insurance and item usually specialized their expertise in one specific area of insurance such as properties, fire, marine, and health insurance. Underwriting in Health Insurance would analysis of formation related to an individual's health background such as age, medical family history, and preexisting disease conditions, with the help of Machine formation under ride wood than in put the data into the technology in order to access health-related associated with that individual and calculate how much premium need to be put in any person are having some preexisting disease conditions then the premium should be on a higher side. When calculating premiums, underwriters also consider risks of activity around the property that may cause injuries and result in an insurance claim, as well as personal information articles.

The insurance company estimates that I have a certain amount of risk each year, which can vary from individual to business via insurance transactions. The profitability of the insurance company was in some manner based on underwriting accuracy. Underwriting may also be defined as a person who assesses the risk of insuring a certain person or asset based on information about the premium that should be profitable to the insurance business. Underwriters employ technology and software to predict the likelihood and size of pay-outs over the policy's lifetime. The high-risk individual will pay a higher premium to gain protection from the pursuing

low-risk individual or asset. The primary function of underwriting is to build and maintain a successful book of business for insurance companies, and it plays a critical part in their success.

Underwriting process

- Following receipt of the item 2 completed documentation, the business will provide the following underwriting:

A request for an additional physical examination, a request for additional scientific background information, and, as a final step, an additional questionnaire are all examples of additional information the company may need to help with the underwriting decision.

The company may also provide an insured with a modern top-tier price policy without making a similar documentation request. Any additional requirements may be addressed to the capacity Insured by way of the company. The company may choose to underwrite the case with a higher premium rate policy based on the client's present health status, prior medical history, and line of work. The corporation will make a counteroffer in response to the suggested Insured. The business

- The company will provide the insured with a policy that contains a "free look" form once it has underwritten and accepted the case, whether at its standard rate or a lesser one. The insured must review and confirm the policy's accuracy before signing the "free look" form and returning it to the company. The company will terminate the application and return all premiums (if any) to the potential Insured if it does not receive the extra documents/requirements within a predetermined time frame.
- The application will be canceled and all premiums (if any) will be reimbursed to the proposed Insured if the proposed Insured rejects the company's counteroffer.
- The applicant will receive written notice and a refund if the company delays or rejects the application.

Underwriting Time Frames

The business will issue a policy for a typical rate case within 15 days of the document completion date.

The potential Insured will be contacted in writing within 30 days of the application's submission if the company needs any more paperwork or information.

If an insured purchases a policy with a "free look" form and decides it is accurate, the insured must sign the "free look" form and send it back to the insurer within 15 days of purchasing the policy.

History of Insurance

Insurance is a well-organized economic activity that has existed in several countries throughout history.

According to records, the first 12-month temporary insurance policy was issued in London on June 18, 1583, AD for the life of William Gibbons, and the policy was sourced from Richard Martin. This policy was created by 16 people for £ 3013s4d with an 8% premium for a total of £ 3836s8d. Within a year of taking out insurance, the insured died on May 25, 1584. The insurance company declined the claim, saying the person had been alive for over 12 lunar months (28 days). The claim was finally paid when the issue was brought to court, and the insured was sentenced in favor.

In 1705, a "friendly society" was established with varying death benefit payments, and in 1757, a fixed amount. With the invention of life tables, life insurance has become a little more scientific (mortality per 1000 people at all ages up to 100 years). The "Just Society," established in 1762, is based on scientific data.

The History of Insurance Underwriting.

Edward Lloyd, 32 years old, and his family arrived in London in 1680. He opened Lloyd's Coffee House on Tower Street in London with the goal of reaching a market of over 3,000 coffee shops. Cafes are becoming popular as a casual and handy venue to meet friends and coworkers, as well as to use free Wi-Fi for business. Cafes have been popular since the 17th century for gathering and exchanging news, as well as offering a place for intellectual discourse among seafarers, shipowners, and merchants. By 1691, Lloyds had established a reputation for providing up-to-date shipping information and announcing maritime auction prices. Bankers have begun collecting "premiums" in exchange for taking on the transportation risks associated with stated planned routes.

The modern insurance sector is said to have begun at Lloyds. Bankers etched names on the brick plaque beneath the ship, providing precise information about cargo, crew, destinations, and weather. The term "underwriting" was coined in this way.. Credit, insurance, and investing are all examples of risk. The insurance sector has evolved into a trillion-dollar industry after more than 300 years. Lloyds of London, as it is now known, is a market for insurance and reinsurance that is still very much alive today. However, when did the concept of insurance first emerge? Babylonians developed a method allowing merchants to pay an additional amount in addition to a loan to fund a voyage across the Mediterranean over 4,000 years ago. If the ship is stolen or lost at sea, this payment ensures that the loan will be cancelled. Prices varied based on the

weather at different periods of the year. Babylonians established what future generations consider risk-based pricing, the foundation of insurance, in a short period of time.

Indian Insurance in a global context

India is ranked 10th in the world in terms of life insurance. In 2019, India held 2.73 percent of the global life insurance market. Life insurance premiums in India climbed 9.63 percent year over year, while global demand for life insurance premiums increased 1.18 percent.

India is ranked 15th in the world for non-life insurance. In 2019, India had a 0.79 percent share of the global non-life insurance market. Non-life insurance premiums in India rose 7.98 percent year over year, while global non-life insurance premiums rose 3.35 percent.

In 2019, life insurance business accounted for 46.34 percent of total insurance premiums, while non-life insurance premiums accounted for 53.66 percent. However, India's life insurance sector accounts for 74.94 percent of the country's total insurance business, while non-life insurance accounts for 25.06 percent.

Insurance Penetration and Density

Insurance penetration and density are two indicators that are often used to assess a country's level of insurance development, among other things. Insurance density is determined as the ratio of premiums to the population, whereas insurance penetration is calculated as a proportion of premiums to GDP (premium per capita).

- In 2001, the rate of insurance utilization was 2.71 percent, and it has progressively increased to 3.76 percent in 2019. (Life 2.82 percent and non-life 0.94 percent). In the same year, insurance penetration rates in Malaysia, Thailand, and China were 4.72 percent, 4.99 percent, and 4.30 percent, respectively. In India, the insurance market share increased from 11.5 USD in 2001 to 78 USD in 2019. (Life 58 USD and Non-life 20 USD).

- Malaysia, Thailand, and China have comparable figures of \$536, \$389, and \$430 for the same time. In 2019, underwriting and underwriting for the life segment are 3.35 percent and \$379, respectively, and 3.88 percent and \$439 for the non-life sector.

Health insurance market 2023

The health insurance industry in India has undergone a significant transformation in recent years. The way consumers view this category and the necessity of health insurance has drastically changed.

The speed and trajectory of growth will continue as the health insurance sector has piqued consumer interest. The focus has steadily switched from health insurance to health insurance because of a major shift in consumer perception of the business.

Everyone is now more aware of life's uncertainties and susceptibility in the face of any health catastrophe thanks to the outbreak. Since Covid's founding, health insurance premiums have mostly driven the non-life insurance industry. Despite the protracted state of emergency, the healthcare industry expanded by 42% year-to-date in May 2023, compared to 9.9% since the fiscal year 2022's beginning in July. Even though the health insurance industry has grown quickly, the following significant patterns and shifts should be kept an eye on in the upcoming year:

The increasing expense of hospital visits is driving this shift, making consumers recognize the importance of health insurance. Consumers are also realizing that purchasing comprehensive coverage is a better option because it provides more comprehensive health care with broader coverage against disease, medical availability, and even cancer. As a result, many consumers have begun to view health insurance as an essential investment in providing healthy health coverage.

CHAPTER 2
BACKGROUND

Background.

In the modern world of investment alternative companies, making insurance investment judgments is usually tough. It required investors to be well-informed and sensitive when it came to the insurance industry. People with a lot of money, are confused about how to invest their hard-earned money effectively because so many insurance investments are presented in such a short period.

The procedure through which an organization or a person assumes the financial risk for a fee or at a present cost is referred to as underwriting. In most cases, this risk is assumed in the form of loans, insurance, or investments. The term underwriter is used in conjunction with the phrase underwriting, and it refers to the person or institution that signs their name beneath the whole amount of risk that they are prepared to assume in exchange for a certain amount of money or premium.

The mechanics have evolved throughout time, but the underwriting process remains important and is regarded as a crucial function in the financial industry. An underwriter's main responsibility is to examine the risk of the insurer's company before approving the insurance amount. Underwriting has proved to be useful in determining reasonable loan borrowing rates, determining suitable premiums, and generating a market for securities by appropriately pricing investment risk.

When a business files for an IPO, the underwriting process is used to assure that the firm will raise the necessary funds and that the underwriters will receive the agreed-upon premium or profit in return for their services. Investors gain from underwriting since it assists them in making educated investment selections.

The insurance industry, which previously had limited profit growth, now faces greater competition in terms of benefit duration and cost. Advanced analytics, natural language processing, digital twins, and other cutting-edge technology are being used by insurers to provide better customer service at reduced prices. Since 85% of consumer requests are for urgent insurance coverage, this tactic is chosen. How should insurers react? In order to accomplish this, insurers are reorganizing their underwriting divisions to handle higher risk rates and in less time. We outline four crucial technologies that could aid insurers in rethinking their approach to underwriting and explain why insurers are doing so.

CHAPTER 3

AIM AND OBJECTIVE

Aim- "To study about the importance of technology in insurance with special reference to insurance underwriting"

Objective-

1. To study about Insurance and health insurance.
2. To study about insurance underwriting.
3. To study about impact of technology on insurance and insurance underwriting
4. To study about advance technology available for insurance and insurance underwriting

CHAPTER 4
LITRETURE REVIEW

LITERATURE REVIEW

The fitness sector's proportion of India's countrywide price length stays one of the lowest within the world, with fitness care spending in most cases out of pocket. According to the situation, finances are being set apart to enlarge medical general insurance as a way of minimizing fitness-care inequities and reducing growing costs. The ethnographic case research should significantly decorate present fitness offerings and coverage studies with the aid of using presenting deeper expertise of the existence cycle and coverage application from the angle of each the coverages holder and the fitness care provider.

The current technology in the Dena health insurance business has been analyzed and described in detail how underwriting, preauthorization, and clean settlement are interdependent procedures that can be streamlined with the use of technology. The health insurance industry provides medical benefits that may be of financial assistance to ordinary people.

For the existing insurance business model, digital transformation is becoming increasingly important. It will serve as an ivories and challenge, with a focus on how artificial intelligence and cloud computing can be leveraged to revolutionize the insurance industry.

Good health is necessary for human growth and development in society. The cost of high healthcare is practically out of reach for the poor people of India. Display the inch According to the IRDA, low consumer awareness, and insufficient healthcare in procedures are the two biggest barriers to expanding healthcare insurance coverage in India. The Indian government implemented a major initiative to address the problem of healthcare in both rural and urban areas. Health insurance is more complicated since a severe problem comes from an adverse selection of moral hazards and unavailability of information gaps. At health insurance, policy creation, plane settlement, and assessment are all multiplayer tasks. The insurance industry benefits the country's economic development through utilizing technology. The healthcare market in India is growing rapidly, thanks to new insurance products and the entry of private enterprises into the industry. It plays an essential part in the country's insurance market growth.

LIMITATIONS OF THE TECHNOLOGIES

The digitalization of small coverage firms, that's tough for small coverage organizations to do on a worldwide platform, is one of the obstacles of the above technology withinside the coverage sector. Because technology is costly, the digitization of coverage organizations, mainly small coverage organizations, is hampered. The 2d limit is improving the quality of the analytical records, that's essential due to the fact the analytical records ought in order can also additionally get admission to it. This necessitates the enhancement of analytical records quality technology's ology' promises. The above technology has the capacity to carry innovation to the coverage industry, bearing in mind hassle-unfastened coverage provision. With using the above technology, the cover system has been simplified due to the fact the technology was powerful in disposing of the limitations withinside the whole coverage system. The term "insurtech" refers back to the era which has progressively altered the coverage system.

THE BENEFITS OF TECHNOLOGY FOR THE INSURANCE INDUSTRY, INSURANCE CUSTOMERS, INSURANCE COMPANIES, AND INSURANCE REGULATORS

The benefits that technology will bring to the insurance sector

The implementation of that new technology will assist the insurance industry because, in addition to the other processes involved, pre-authorization and claims management can be made simpler. Utilizing generating within the boundaries of the insurance quarter can also help to reduce fraud, abuse, and waste management. The main advantage of creating within the insurance industry is that the various individuals involved in the insurance process may work from anywhere.

The Implication of Technology for Customers of Insurance

With the aid of the technology, which may be stored inside the cloud and is simple to use, users may be able to access their profiles from anywhere. Customers have the option of enrolling in a plan that provides both life and health insurance. The generation will simplify the process of paying insurance premiums and getting the coverage amount.

The use of technology to the insurance industry's advantage

Businesses will benefit from technology development and adoption. Technology will enable businesses to provide people with risk management, and people in countries without health insurance will be able to access insurance and medical care

Technology's contribution to assisting insurance regulators

Technology helps the insurance regulation by making insurance and health coverage available to all houses in India. Insurance will become a household word once the technology is incorporated because India is a country where the majority of people do not have access to health insurance or coverage. The inclusion of multiple consumers in the health insurance programme to provide risk management protection may benefit the insurance regulator.

LATEST TECHNOLOGY USED IN THE HEALTH INSURANCE SECTOR

A digital platform called "**Digital Switch**" serves the requirements and desires of all clients in the health insurance market while reducing costs and raising satisfaction levels. Using digital switches to control operational processes and investigate global business has the following benefits: transparency, simplicity, consumer interaction, personalization, and ease. Sophisticated technology includes things like blockchain. In addition to streamlining claim procedures, machine learning (ML) automates the entire process of assessing digital content. Additionally, it helps insurers identify fraudulent activity and direct it using intelligent underwriting through the claim management process.

Blockchain is a Distributed Ledger Technology that uses computational power and cryptography to speed up transaction verification and store all transactions.

USAGE OF TECHNOLOGY IN UNDERWRITING

Health care coverage insurance Health insurance is the process through which a health insurance provider evaluates a patient's medical history to determine whether to offer coverage and what restrictions to include in the insurance record. The following are the several subcategories of underwriting methods.

Fully pooled

Insurance companies, usually health insurance companies, take all risks and charge premiums. Health insurance renewals are based on the number of consumers held by the health insurer, not the length of the plan, which is based on a pool model. The technology insurers typically use for underwriting is cloud-based solutions that provide underwriting and pricing solutions for health insurers.

prospectively graded in experience.

The underwriter accepts the risk and determines the premium rates for health insurance policies based on information such as historical claims and demographics. The majority of medical insurance paperwork is based on the author's own experiences. Despite the fact that there are many claims for these benefits, there are few. Medical insurance might utilise the programme to manage their claims and billings. Medical insurance paperwork and prices could increase as the system gains expertise.

Retention Accounting

In retention accounting or refund accounting, past claims are integrated with demographic, inflationary, and trend characteristics to estimate future claims and determine a premium. In more detail, if premiums are higher than costs, the surplus may be used to refund plans; however, if costs are higher than premiums, the loss may be made up for by raising premiums. Although

the insurance might be cancelled, the underwriter runs the risk of suffering a loss. The members of the retention accounting team have both individual and collective experiences.

Administrative services only

Billing for payment for services is handled by a third party and costs can be budgeted based on coverage. Additionally, a monthly service fee will be charged to the plan sponsor. Nevertheless, it has some advantages such as: B. Long-term disability and overseas hospitals are generally covered by insurance as benefits claims can be high. Administered Services Only (ASO) allows plan sponsors to save money on lower bills because medical benefits are often self-insured

Self-administered and Pooling limits:

The plan sponsor decides on all administrative duties, including all payments pertaining to claims, while taking on all risks. Only a few major insurance businesses may consider self-insuring long-term disability, even if claim variability may diminish as the group size grows. Pooling limits can lessen the risks connected to one-time medical claims and claims made outside of the country.

CHAPTER -5
RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

Research Methodology

Study type

The studies are based on secondary data. Who conduct the search, chose the relevant database, publication with the help of a literature review?

Study variable

- Insurance market in India
- Health Insurance market in India
- History of insurance and underwriting
- Approach of effective underwriting

Outcome variables

- Advanced technology used in health insurance and insurance underwriting
- Future of insurance and insurance underwriting.
- Effective use of technology in a risk assessment of Insurance.
- Creating awareness about new technology in the underwater
- Manual underwriting vs Technology underwriting

Methodology

Data collected from various sources and several websites.

1. Various search engines

Different search engine like PubMed, Google scholar, Web of science, research gate and various insurance services like IRDA, GIC.

2. Various publication

Several articles, journals, publication done by different publisher which is published.

3. Reviewed publication

After proper literature review of articles, journal and different publication help to build existing report on the " Importance of technology in insurance with reference to insurance underwriting "

Analysis and evaluation of publication

The data is connected from month of February and May 2023 from various publication was reviewed and based on different categories of publications they were selected most recent one from year 2014 to 2023 which provide a different perspective about the " Importance of technology in insurance with reference to insurance underwriting "

CHAPTER -6

RESULT

RESULT

Manual Underwriting

1. Customer Experience

- Manual underwriting provides the comfort of a personal touch, which can help you attract more clients. However, it is a lengthy procedure. Underwriting accuracy and speed aren't as trustworthy as they would be in an automated system.
- Customers avoid manual Underwriting because of extensive manual form fills, complex fine print, errors and omissions in Underwriting, long response times, higher premiums, lack of product customization, and predictive services. Even in the most efficient manual underwriting-based systems, preparing and transmitting commercial insurance quotations to clients can take up to 2-3 days.

2. Pricing and Risk Management

- Each application presents a new set of risk factors that are progressively harder to understand and exactly account for.
- Manual underwriting suffers from wasteful pricing, poor quality, and the possibility of procedural errors. The loss ratios of the top and bottom quintiles of performers differed by 23-28 percent. In developing risk profiles or calculating the amount of risk required for everyone, manual underwriting is prone to errors.

3. Underwriting Efficiency

- For the most high-value customers, the manual underwriting procedure takes weeks to receive a quote post-application, making it one of the most time and resource-intensive operations in the insurance client life cycle. Furthermore, the manual nature of the task has a negative impact on productivity.

4. Operational Costs

- Underwriting costs can range from \$50 to \$130 per hour, multiplied by headcount in some lines of business, and the underwriting process can take days to weeks.

Scaling up with manual underwriting also comes with a lot of fixed costs and greater operating costs. Insurance companies quickly resort to digitization to increase efficiency and save costs because hiring personnel is expensive.

5. Business Growth

- In comparison to algorithmically generated pricing judgments, manually generated insurance quotations are slow. When clients have to choose between the two, they'll go with the one that takes the least amount of time to process and is available 24*7
- The time-consuming and inconvenient process leads to customer churn, tarnishing the insurer's reputation in the market.

Automated Underwriting

1. Customer Experience

- AI-based underwriting technology enables insurers to deliver superior customer experiences during the sales process and build customer loyalty from the first touchpoint. Low-complexity steps are automated, allowing insurers to focus on more complex customer interactions. Insurers can then focus on developing long-term customer retention strategies based on customized customer care and profitable pricing models.
- Large insurers given the opportunity are already working to upskill their insurers to take on a more challenging role and adapt to the satisfying and labor-saving digital platform.

2. Pricing and Risk Management

- Artificial Intelligence is used in Automated Underwriting to evaluate an application against billions of data points. Using big data and accompanying algorithms, underwriters gain visibility into the most relevant risk indicators connected with customer profiles.
- An AI-powered underwriting solution helps underwriters quantify both unstructured and quantitative data points. In Underwriting, AI-driven automation provides total risk visibility into a case. As a result, it assists underwriters in recommending the best possible premiums and coverage.

3. Underwriting Efficiency

- AI-assisted When it comes to underwriting efficiency, underwriting is the clear victor. Underwriters can focus on complex activities and ultimate decision-making by utilising RPA and incorporating intelligence into the system for light and repetitive jobs.
- For example, An AI-powered underwriting system helps underwriters generate quotes for high-value customers in seconds on application deadlines, with no manual intervention required.

4. Operational Costs

- By accelerating the rise of automated underwriting, insurers and insurance firms can save considerable amounts of money on operating costs. It establishes a smooth workflow centered on Machine Learning models that can self-train and adapt to the system's patterns and nuances without incurring additional scaling costs.

5. Business Growth

- AI-based Underwriting improves profitability by supporting underwriters in achieving better loss ratios, a lower churn rate, more conversion-friendly quotations, and ultimately optimizing the underwriting function's total resource use.
- Companies can now achieve improved expenditure ratios and employee experience thanks to the underwriter's increasing role as a business creator and digital manager in an AI-first insurance organization.

The technology used in Underwriting-

1-Machine learning and advanced analytics

On structured data, advanced analytics

Insurers can choose the best portfolio strategy using advanced analytics techniques, which also enable quick and precise pricing. The best method for estimating risk is to interpret background information about prospective policyholders. Insurers can make use of statistics like the following to calculate the cost of health insurance:

- Applicant's age
- Smoking cigarettes
- Consumption of alcohol
- Dietary regimen
- Unhealthy fat ratio
- Medical examination report
- Workout regimen
- Threat to his or her working nature

- Medical records of the applicant (does he or she have any chronic illnesses)
- Medical records of the applicant's relatives

Every factor has a different relationship with the possibility that an insurance company will have to pay out. Insurance companies use AI/ML models to quickly and accurately calculate each coefficient. These models are effective in forecasting loss from historical data and have a large processing capacity..

Advanced analytics are a tool that insurers can use to implement portfolio strategies. A solid portfolio strategy is built on mean-variance analysis, and investors have long used advanced analytics models to optimise their portfolio strategies with robo-advisors. Similar technology have been employed by insurers to diversify their own holdings.

Behavioural analytics can help insurance companies perform efficient underwriting. Customers' clicks, location, click history, and other data are examined to determine how likely they are to commit fraud in the future. Insurance companies can reward their devoted policyholders rather than penalising all of their customers for fraud.

1. Natural Language Processing (NLP)

Advanced analytics and NLP both have advantages, but integrating text and speech data also allows insurers to raise prices.

NLP is an AI/ML method for understanding text and voice. The insurance industry has a lot of charts and texts that need to be evaluated. When we follow up on a health insurance case, for instance, the client fills out questionnaires and medical reports that all contain textual information. These documents may contain information that may be extracted, categorised, and searched for connections between claims and risk factors using NLP algorithms.

Optical Character Recognition (OCR) / Handwritten Character Recognition (HCR)

Insurance companies can read unstructured text documents using HCR/OCR to extract more data for advanced analytics and NLP.

One of the ways that businesses and people communicate is through documents. To understand their potential customers better, insurers must process documents. Two technologies help with this:

A method called optical character recognition (OCR) is used to decipher the meaning of printed documents.

Handwritten character recognition (HCR) allows insurance firms to decipher meaning from still-in-use handwritten documents.

Insurers can use OCR and HCR to automate data entry. According to Accenture, underwriters spend more than half of their time doing repetitive duties like data input. As a result, automating such operations can help insurers make better use of their workers.

I. Digital Twins

Digital twins are exact reproductions created by computers of any natural item, including people, places, or vehicles. They are used to execute simulations.

Insurance companies profit from simulations for two reasons:

They can evaluate whether their diversification tactics (portfolio management) are assuring their long-term viability. In the event that they don't, businesses can revisit their diversification tactics by focusing on fresh areas, covered populations, insurance objects, etc.

As was already mentioned, insurers benefit from past data. But in some circumstances, historical data are scarce. For instance, there hasn't been a large eruption of Mount Vesuvius in Italy since 1944. But this volcano wiped down the ancient Roman city of Pompeii. Such implausible but terrible calamities might be priced by insurance firms. Another example would be magnitudes of seven or greater.

2- Internet of things (IoT)

Insurers' increasing processing power was linked to their use of analytics technologies. However, computational power is meaningless without data. The Internet of Things (IoT) is a network of intelligent gadgets that communicate in their environment. Insurers can now conduct more accurate risk assessments thanks to IoT, which increases the amount of data that AI/ML models can analyze.

In addition to the factors the insurers have always taken into account, it is crucial to take into account any new ones that they may have added. Smartwatches, cell phones, intelligent factories, and other devices will be the primary data sources for health insurance, auto insurance, and business insurance.

IoT can inspire people to take more accountability. A person's tracking candriving behavior. Health insurance firms, likewise, have begun to compensate subscribers who take care of their health.

It's worth noting that the fast use of smart gadgets raises the potential of hacks. As a result, cybersecurity insurance may become the most significant type of insurance in the future.

3- Application Programming Interfaces (APIs)

The size and variety of insurers' databases are growing as a result of the Internet of Things. The computer power required for data interpretation is provided by AI/ML models. Systems for underwriting insurance can receive external data through software gateways called APIs.

Insurance businesses conduct technology-driven underwriting using their own hardware or cloud computing. Insurance companies can get data from external databases using APIs to satisfy their specific needs. By using APIs, insurance companies can reduce the cost of data transfer and storage. Remote data storage and retrieval are both possible using APIs. APIs help cloud users cut costs and increase overall corporate efficiency..

4- Blockchain

The Internet of Things has increased the amount and variety of insurers' databases. AI/ML models provide the computing power needed for data interpretation. Through software gateways known as APIs, systems for underwriting insurance can receive data from the outside world.

Insurance businesses conduct technology-driven underwriting using their own hardware or cloud computing. Insurance companies can get data from external databases using APIs to satisfy their specific needs. By using APIs, insurance companies can reduce the cost of data transfer and storage. Remote data storage and retrieval are both possible using APIs. APIs help cloud users lower cloud costs and increase overall corporate productivity

Underwriting in Reliance General Insurance-

- Sales persons receives a request on Call desk.
Call desk is an application where Client fills their Request form for Quote and their details and provide required documents.
- Salespersons generate a ticket for every proposal on Savion for underwrites to quote the premium with required terms.

Savion is an application from where underwriter can receive proposals details, documents required and proposal identification no. i.e., ticket no. After quoting a premium underwriter close ticket with outcomes on this application.

- Applications used by underwriter for quoting a premium-
 - 1. OTC calculator and IR pass- These softwares are used to quote OTC (over the counter products) and used to give quotes to fresh proposals with very small groups and for small Sum Insured.
 - 2. Qlik view- This application is used to analyze data for risk assessment.
 - 3. Excel- This application is used by underwriter for calculating the premium.

Traditional Advantages of Excel Based Underwriting

AMAZING VERSATILITY

Due to the ability to alter the formatting, add rows, columns, and sheets (as well as a number of other options), the user has complete control.

ASSET SPECIFIC ANALYSIS

Economical real estate transactions are not all the same. Many businesses have suffered significant losses because of their failure to recognize the impact of physical aspects on performance. Excel Underwriting lets an underwriter perform in-depth asset-specific analysis and provide the results in an easy-to-read and understandable style.

EMAILABLE

Simply email the recipient if you need to send the model to someone else. You don't need to go through a protracted process to grant them access to secure internal systems when all you want to do is find out whether they're interested in submitting a loan proposal. An Excel file can only be sent to the right person.

VERSIONABLE

There are numerous different structures that can be used to make a deal work. You can make branched clones in Excel to investigate all of the many possibilities.

SPEED

Excel is designed for speed, and a skilled user may breeze through it in no time.

OFFLINE USAGE

You may need to board a plane or wish to take your work with you on the train at times. When you have a robust, consistent, and secure internet connection, there is no reason to limit your work capacity. There is no such restriction in Excel.

Traditional Drawbacks of Excel Underwriting Based on Microsoft that no longer apply

PORTFOLIO LEVEL REPORTING

Classic Excel- Reporting at the portfolio stage with offline Excel spreadsheets is essentially impossible. Excel is great for loan analysis in-progress, but it is very difficult to roll up to a portfolio stage neatly and efficiently. Most often, this requires organisations to use several Excel spreadsheets before a centralised system. This results in double entry of everything. This is not only a waste of time, but it also leads to errors because records may be up to date in one area but not the other. With today's technology, this restriction is absurd.

Integrated Excel: This is no longer a problematic technique to integrate the multimillion-dollar grant from Rockport for Excel generation. Rockport has developed a generation that links its models to its core system, allowing users to view loans in local Excel and immediately store information (and vice versa, pull up-to-date data into the Excel model). This allows for the real-time storage and updating of all mortgage and portfolio details..

NO ABILITY TO RENDER INTO OTHER FORMATS

Classic Excel: This is no longer a problematic technique to integrate the multimillion-dollar grant from Rockport for Excel generation. Rockport has developed a generation that links its models to its core system, allowing users to view loans in local Excel and immediately store information (and vice versa, pull up-to-date data into the Excel model). This allows for the real-time storage and updating of all mortgage and portfolio details.

Integrated Excel: All system reports (such as Asset Summary Reports, Pipeline Reports, and so on) are kept in sync automatically since the data is kept current by connecting the Excel model with the system. Rockport has the option to export reports to Word, Excel, and PDF formats, allowing for quick generation and customization of these files to satisfy the needs of a particular client.

CONFUSING LOCAL FILES VERSUS DATABASE

Classic Excel: A modern company cannot afford to maintain hundreds or even thousands of offline Excel models that are misplaced or unavailable when needed. To enable the organisation, storage, and data syncing of all these files into a single system, a centralising mechanism is required.

L Integrated Excel: The Rockport user can store copies of the underwriting model and their own data in the system's document repository at any time during the underwriting process. A user can save all of the underwritings together in one location to keep track of them all.

LACK OF AUDIT TRAILS/CONTROL MECHANISMS

Traditional Excel: It makes sense and is essential for compliance to be able to audit the past of a piece of data. Who changed the interest rate when it was raised to 5%, and when? The speaker declares, "I swear it used to say 6%!" Excel is notorious for having a poor reputation in this area and offers little to no functionality.

Integrated Excel: With an integrated system, a thorough audit trail is kept and all data changes are recorded back into the system. Combining the two (Excel and System) gives you greater power than using Excel by itself.

NOT BEING ABLE TO CLEANLY MANAGE COMPLEX DEAL STRUCTURES

Classic Excel: Most excel models are developed by one or two individuals in an organization and gradually change over time. What about, however, a property that falls under a different property classification, a multi-property with six hotels, or an A/B1/B2/Mezz/Equity structure? Unless a firm has a different template for each possible combination of these (and maintains them), it is very difficult to organise transactions of multiple styles in an effective manner.

Integrated Excel: Using Rockport's unique underwriting method, the system produces each model to represent the credit characteristics of each deal. This means that every single formula (out of thousands) that goes into these kinds of complex models will be worked out for you by the incredibly intelligent system.

CHAPTER -6

DISCUSSION

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Discussion

Modern insurance in India

In 1912, the government began to regulate the insurance industry by establishing the "Insurance Act." In 1938, this Act was completely modified and approved as a New Act to regulate investment, expenditure, and management. The Controller's Office was founded. This Act was revised once again in 1950.

In 1955, India had 80 P.F. Societies registered as life insurance carriers and 170 insurance offices. The Life Insurance Corporation of India was nationalised by the Indian government in June 1956, and the LIC Act came into effect on January 1 of that same year. This was done as a result of rising industry-wide malpractice, high levels of illiteracy, and a lack of drive to enter or grow the profession.

Similarly, in 1972, general insurance (which deals with non-life industry, including as property insurance) was nationalised by merging 55 Indian and 52 non-Indian enterprises into four general insurance organisations.

The Indian government saw the need to liberalise the insurance market concurrently with the economy due to lesser insurance penetration relative to the population and size of India and other emerging countries. The government established the Malhotra committee in 1993 to investigate the viability of opening up the insurance sector to private companies. The group promoted the insurance sector's liberalism, privatisation, and globalisation (LPG). In 1999, the Insurance Regulatory and Development Authority was established under the IRDA Act.

Life and general insurance monopolies were broken after 44 and 27 years, respectively.

Insurance business liberalisation will surely help the Indian economy, government, industry, employees, consumers, and society in the following ways:

Gains for the Economy

- Quick investment
- Improve Life Quality (New Risk Coverage)
- Consumer-friendly products will emerge from the competition
- Large-scale fund mobilisation

- Major Projects Insurance and Reinsurance Facilities
- Domestic projects are covered

Advantages for government

- Funding for long-term infrastructure; Instruments for long-term debt markets; and More Opportunities for Employment and Compensation
- Reduction in the financial burden on rural, social, and underprivileged classes
- Contributions to Disaster Relief

Advantages for Industry

- transfer of technical know-how; new products and price points; and better national corporation opportunities
- Local companies will use technology and provide focused customer service. The benefits of a market-based economy will be greatest for consumers.

client support.

- A market-based economy will be most advantageous to consumers.

Benefits to Consumer

- Higher quality at lower prices
- More product options
- World-class customer service
- Increased Insurance Penetration

Benefits to Society

- Advantages for Industry
2. Medical
 3. Health
 4. Accident

The insurance sector is currently contending with rising pricing and service time competition despite historically having poor profit margins. Insurtech businesses use cutting-edge technology (such as digital twins, advanced analytics, and natural language processing) to provide clients

with better services for less money. Since 83% of customers desire to obtain insurance coverage more rapidly, they favour this strategy. How are insurance companies expected to stay current?

In order to compete, insurers are modernising their underwriting divisions to accurately price risk faster. We outline four crucial technologies that can assist insurers in reevaluating their underwriting strategy and explain why doing so is necessary.

Effective underwriting systems:

- Underwrite risk at a profit-maximizing price.
- Ensure appropriate diversification.
- Operate at customer-acceptable speeds.

Insurance companies utilise the underwriting process to determine how likely it is that a loss may impact people, companies, cars, or homes. Then, for damages that meet specific current requirements, insurers will sell an insurance policy (also known as an indemnity guarantee). In other words, by paying a set sum, policyholders lower their risks. In order to maximise profit, the underwriting procedure seeks to determine this sum as precisely as possible. On the other hand, effective underwriting involves more than just risk assessment. The other two crucial elements are the time needed to price the risk and a portfolio plan.

Future of insurance

The insurance industry will be significantly impacted by AI and related technologies in many aspects, including distribution, underwriting, pricing, and claims. Because policies are now priced, purchased, and bonded almost quickly, data and cutting-edge technology are already having an impact on distribution and underwriting. The whole insurance value chain will have undergone major changes by 2030, changing the insurance landscape.

Distribution

The application process for insurance is simpler and requires less interaction from both the customer and the insurer. Cycle times for purchasing a car, company, or life insurance policy will be reduced to minutes or even seconds with adequate data on individual habits and AI algorithms generating risk profiles. For instance, auto and house insurance carriers will continue to sharpen their capacity to quickly offer coverage to a wider spectrum of clients as telematics and domestic Internet of Things devices proliferate and pricing algorithms progress.

Even though the majority of simplified issue policies are only available to the healthiest candidates and are more expensive than a comparable fully underwritten policy, many life insurance firms are testing them out. As AI permeates life underwriting and carriers are able to identify risk in a much more granular and intelligent way, we will see a new generation of quick issue products for the mass market.

Payments from a customer's bank account are instantly approved via smart contracts powered by blockchain. Contract requirements and payment verification are also being simplified or eliminated, which lowers the cost of customer acquisition. Experts predict that there will be one trillion connected gadgets by 2025. AI-based cognitive models can now provide enough information to expedite the purchase of business insurance thanks to a mix of IoT, drones, and other publicly available data.

Usage-based insurance (UBI) refers to policies that are extremely flexible and tailored to the actions of particular clients. As product choices adapt to a person's behavioural habits, insurance moves away from a "buy and annual renewal" model and towards a continuous cycle. Additionally, customers can personalise products by dividing them into micro-coverage components (such as different coverage for a washer and dryer inside the home, flight delay insurance, and phone battery insurance), and then compare prices from different carriers in real-time for their customised baskets of insurance products. New items are being created to answer how living conditions and travel are changing.

The position of insurance salespeople has significantly changed by the year 2030. The number of active agents declines when active agents retire, and the development of the remaining active agents is heavily reliant on technology. Agents now educate consumers about products rather than facilitating processes. In addition to selling nearly any type of insurance, the future insurance agent will be able to provide value by helping clients manage their portfolios of policies for mobility, health, life, and personal property. Agents use AI-enabled bots to locate potential client transactions and intelligent personal assistants to make their tasks easier.

These technologies enable agents to handle a far larger client base while facilitating speedier and more meaningful customer encounters (a blend of in-person, virtual, and digital). Each interaction will be tailored to the precise current and future needs of each unique client.

Underwriting and pricing

By 2030, the majority of life, property, and liability insurance contracts for individuals and small Businesses won't need underwriting in the way it's now done. A combination of machine learning and deep learning models that are integrated into the technological stack enable the underwriting process, which is primarily automated and takes only a few seconds. These models are driven by a combination of internal data and a wide range of external data obtained via APIs and other data and analytics providers. Data is gathered from devices provided by mainline carriers, reinsurers, product manufacturers, and distributors via a number of data repositories and data streams. Insurers can use these data sources to make ex ante underwriting and pricing choices, enabling proactive outreach with a bindable quote for.

Regulators must examine AI-enabled, machine learning-based models in order to assess the traceability of a score, which necessitates a transparent approach (like the rating component derivations now used with regression-based coefficients). Regulators examine a range of model

inputs to decide whether underwriting is appropriate in order to evaluate whether data utilisation for marketing is appropriate. Suppliers set prices for online plans and create test procedures in order to ensure that the algorithm's results remain within acceptable parameters. Because public regulation prohibits access to some sensitive and predictive data (such health and genetic information), the risk of ant selection is elevated in some business industries.

Consumers primarily consider price, but carriers are advancing to stifle competition. the impact of artificial intelligence in 2030 on the cost of insurance. Customers and insurers can connect using sophisticated, exclusive technologies that offer customers unique experiences, features, and value. Special insurance solutions enable margin expansion and differentiation in industries where price competition is escalating and razor-thin margins are the norm. In governments that embrace change, pricing innovation happens swiftly. Consumers are influential Customers have influence over how their behaviours effect coverage, insuranceability, and pricing because pricing is supplied in real time and is based on consumption and a dynamic, data-rich risk assessment.

CHAPTER 8
CONCLUSION

CONCLUSION

Insurtech businesses seem to be creating business models that may better address policyholder insurability by using technology to speed up the contracting process and customising insurance to match their particular needs. Two other widespread shifts in economic activity that insurance can react to are the sharing economy and the sizeable millennial population. The inclusion of moral and environmental considerations in InsurTechs' business strategies is another distinctive feature. Several InsurTechs attempt to raise the transparency of contracting and claims management systems, including fraud detection, which may have an influence on the insurance sector. By giving better visibility into how premiums are spent.

Additionally, there seems to be a growing understanding that insurance quotation fine language is difficult to comprehend and does not give retail customers much information about the actual coverage of the policy. Websites are being created that make premium levels and insurance coverage information more understandable while also increasing peer pressure to reduce risk. An algorithm based on a few questions is typically used to perform the risk assessment; this algorithm may or may not use external data sources.

These innovations have the potential to provide financial security for a larger range of people, including those with lower incomes, and to give better, more individualised insurance coverage. The new distribution models also hold the promise of streamlining the insurance application process and providing insurance to underrepresented groups. InsurTech will have to adhere to insurance requirements as well as more extensive data protection and cyber security obligations if they want to grow their business, nevertheless.

The creation of innovation centres and regulatory sandboxes provides a nurturing environment for new technologies and breakthroughs, as well as the opportunity for a better understanding of their market impact. However, more clarity on the right level of regulation in such platforms, as well as how they progress to full regulation, is needed to strike a balance between the need for innovation and the requirement for proper policyholder protection.

While such laws are technology-neutral, further research is necessary to determine how they will actually affect InsurTech in terms of market conduct and internal controls. Internal controls that guarantee adherence to rules and laws, as well as treating customers and policyholders fairly, will be essential.

Big data and algorithms may have an impact, but it's unclear how regulators will see them. The complexity of the situation has implications for how regulators are set up as well as how the spirit of regulation is carried out. To the best of their ability, businesses should be required to

prove that they are using data responsibly and without bias. RegTech may help to make sure that this is done in the future

Impact of technology in underwriting

The following were the five areas of underwriting where technology had the greatest impact:

- Ability to handle larger amounts of business
- Speed to give quote
- Ability to access information
- Workflow simplicity
- Risk rating and pricing ability

REFERENCES

1. Accenture, 2017. The future of insurance distribution. New models for a digital customer. https://www.accenture.com/_acnmedia/pdf-38/accenture-reimagine-insurance-pov-final.pdf.
2. Akroush, M. and Mahadin, B., 2019. An intervariable approach to customer satisfaction and loyalty in the internet service market", *Internet Research*, 29 (4), 772-798.
3. Albrecher H., Filipović D., Koch-Medina P., Schmeiser H. e Loisel S., 2019. Insurance: models, digitalization and data science. Swiss Finance Institute. Research Paper Series, 19-26, June.
4. G., A. T. N. M. P. (n.d.). Health Insurance in India: What do we know and why is ethnographic research needed. *Anthropology & medicine*. Retrieved May 16, 2022, from <https://pubmed.ncbi.nlm.nih.gov/26828125/>
5. Bhatia, J. C., and Cleland, J. 2001. "Health-care Seeking and Expenditure by Young Indian Mothers in the Public and Private Sectors." *Health Policy and Planning* 16 (1): 55_61.
6. Ahuja, R., and De, I. 2004. "Health Insurance for the Poor: Need to Strengthen Healthcare Provision." *Economic & Political Weekly* 39 (41): 45014503.
7. Dang, A. D. (2021). Importance of Evidence-Based Health Insurance Reimbursement and Health Technology Assessment for achieving Universal Health Coverage and Improved Access to Health in India. *Value in Health Regional Issues*, 24, 24-30.
8. Nayak, B. B. (2019). Application of digital technologies in health insurance for social good of bottom of pyramid customers in India. *International Journal of Sociology and Social Policy*. Application of digital technologies in health insurance for social good of bottom of pyramid customers in India. *International Journal of Sociology and Social Policy*, 1-10.
9. Emerging Health Insurance in India – an overview. (n.d.). Retrieved May 16, 2022,

10. schemes on healthcare utilization and financial risk protection in India: a systematic review. PloS one, 12(2), , e0170996.
11. Waghade, S. S. (2018). A comprehensive study of healthcare fraud detection based on machine learning. International Journal of Applied Engineering Research, 13(6). A comprehensive study of healthcare fraud detection based on machine learning. International Journal of Applied Engineering Research, 13(6), 4175-4178.
12. Yadav, A. K. (2021). Artificial Intelligence in Healthcare. . Artificial Intelligence and Global Society: Impact and Practices
13. B rner, S. 2011. "Social Closure and Social Policy. The Debates on Social Opening Within Benefit Societies in the Advent of National Health Insurance." Journal of Comparative Research in Anthropology and Sociology 1 (2): 3553.
14. Reinhardt UE. 1993. The German Health System: Providing Equitable, Universal Access to Health Care and Controlling its Costs. July 29-31
15. Ranson MK. 1999 The Consequences of Health Insurance for the Informal Sector: Two Non Governmental, Non-Profit Schemes in Gujarat. London School of Hygiene and Tropical Medicine; Dept. of Public Health and Policy, Health Policy Unit. May 13, 1999.
16. IIMA 2000. Indian Institute of Management, Ahmedabad. Report on Conference on Health Insurance, March 18-19,2000 and three Technical Workshops on March 15-17,2000.
17. Dholakia R. Economic reforms: Implications for Health Insurance. Presentation at One day workshop on 'Health Insurance in India'. Indian Institute of Management, Ahmedabad. Oct. 30, 1999.
18. Insurance underwriting transformation using AI. Birlasoft. (n.d.). Retrieved May 16, 2022, from <https://www.birlasoft.com/articles/how-is-artificial-intelligence-transforming-commercial-insurance-underwriting>
19. Eckert, C., & Osterrieder, K. (2020, October 1). How digitalization affects insurance companies: Overview and use cases of digital technologies - zeitschrift f r die gesamte versicherungswissenschaft. SpringerLink. Retrieved May 16, 2022, from <https://link.springer.com/article/10.1007/s12297-020-00475-9>
20. Ketterer, H., Koopmans, J., M urers, R.: Building a digital technology foundation in insurance (2016).<https://www.bcg.com/de-de/publications/2016/building-a-digital-technology-foundation-ininsurance.aspx>. Accessed 26 Jan 2020
21. Russell, S., Norvig, P.: Artificial intelligence: amodern approach. Prentice Hall, Upper Saddle River (2016)

22. SCOR: The impact of artificial intelligence on the (re)insurance sector (2018).
https://www.scor.com/sites/default/files/focus_scor-artificial_intelligence. Accessed 29 Jan 2020
23. *How life insurance underwriting works*. Fidelity Life. (2022, March 10). Retrieved May 16, 2022, from <https://fidelitylife.com/learn-and-plan/insights/how-life-insurance-underwriting-works/>
24. Affirm. (n.d.). *The history of underwriting and its present problems*. Affirm. Retrieved May 16, 2022, from <https://www.affirm.com/business/blog/underwriting-basics>
25. Chester A., Hoffman N., Johansson S. and BraadOlesen P., 2018. Digital Insurance in 2018 - Commercial lines InsurTech: A pathway to digital,
<https://www.mckinsey.com/industries/financial-services/our-insights/html>