Application and Importance of Big Data in Insurance Industry

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Abstract: *One of the most potent buzzwords in the insurance sector today is big data. Insurance brokers can use it as a beneficial tool to analyses trends and patterns to inform policy, evaluate risk, and spot fraud. Although the majority of insurance companies already utilize big data to some extent, the applications of big data continue to expand and change annually. Any insurer's playbook should start with an understanding of big data and how it can be used to provide sophisticated customers with effective, intelligent insurance products.*

Keywords: Big Data

I. INTRODUCTION

According to McKinsey (2006), big data refers to data sets that are too large for traditional database systems to effectively collect, store, manage, and analyses. Big data, according to the IDC, is a new generation of technology and information architecture (IT) that, as long as costs are manageable, can extract value from large-scale and multi-category data through its quick collection, identification, and analysis. In a more limited meaning, "big data" refers to the quick capture, processing, and analysis of large, diverse, and important transaction data, interactive data, sensor data, etc. The amount of data involved is so great that it cannot be gathered, processed, or handled by current methods and technology in a reasonable amount of time. They need a new processing mode, the capacity to make decisions, the capacity for insight and discovery, and the capacity for process improvement. Big data is not just about having a "great quantity," but also about using it to handle data in a more "extensive," "deep," and "thorough" way. The ultimate aim of big data is to bring about both quantitative and qualitative changes. Its implementation will result in changes from quantitative to qualitative changes in predictive science, insurance concepts, and actuarial technology, accomplishing the shift from "why" to "what." The statistical properties of insurance are determined by the law of big numbers.

II. LITERATURE REVIEW

A review article is a sort of literature review. It is a research work that includes current information, major findings, and hypothetical and methodological contributions to a certain field. The data has been taken from different literature and various sources have been referred to, for this piece of work. The sources which referred to all provided well versed information about the subject.

1. "The Opportunity and Challenge for is Research": Agarwal R. and Dhār V.

We believe that some components of data science and business analytics have been around for a long time, but there are significant new questions and opportunities created by the availability of big data and major advancements in machine intelligence.2 While the notion that analytical techniques can be used to make sense of and derive insights from data is as old as the field of statistics, and dates back to the 18th century, one obvious difference today is the rapid pace at which economic and social transactions are moving online, allowing for the digital capture of big data. The ability to understand the structure and content of human discourse has considerably expanded the dimensionality of data sets available. As a result, the set of opportunities for inquiry has exploded exponentially with readily available large and complex data sets related to any type of phenomenon researchers want to study, ranging from deconstructing the human genome, to understanding the pathology of Alzheimer's disease across millions of patients, to observing consumer response to different marketing offers in large scale field experiments. And, easy (and relatively inexpensive) access to computational capacity and user-friendly analytical software have democratized the field of data science allowing many more scholars (and practitioners) to participate in the opportunities enabled by big data.

2. "A Review of Information Privacy Research in Information Systems":Belanger, F., and Crossler, R. E.,

Information privacy refers to the desire of individuals to control or have some influence over data about themselves. Advances in information technology have raised concerns about information privacy and its impacts, and have motivated Information Systems researchers to explore information privacy issues, including technical solutions to address these concerns. In this paper, we inform researchers about the current state of information privacy research in IS through a critical analysis of the IS literature that considers information privacy as a key construct. The review of the literature reveals that information privacy is a multilevel concept, but rarely studied as such. We also find that information privacy research has been heavily reliant on student based and USA-centric samples, which results in findings of limited generalizability. Information privacy research focuses on explaining and predicting theoretical contributions, with few studies in journal articles focusing on design and action contributions. We recommend that future research should consider different levels of analysis as well as multilevel effects of information privacy. We illustrate this with a multilevel framework for information privacy concerns. We call for research on information privacy to use a broader diversity of sampling populations, and for more design and action information privacy research to be published in journal articles that can result in IT artifacts for protection or control of information privacy.

2.1 Objectives

The primary goal of this study is to raise understanding of the fundamental uses of big data in the insurance industry. Because this technology can gather a vast quantity of information about various insurance policies, its applications are expanding daily. Big data is helpful to fully address the difficulties facing the insurance market today. It is the precise method of therapy that helps to lessen additional costs for the insurance firms.

2.2 Aims of the study

- RO1: To increase knowledge of big data and its uses;
- RO2: To discuss how different industries and sectors are using big data;
- RO3: To research the main advantages of big data for the insurance sector:
- RO4: Researching the various effects of big data on the insurance sector;
- Determine the specific uses of big data in the insurance sector, their constraints, and their scope.

2.3 The Critical Role Big Data Plays for Insurance Companies

The use of big data benefits insurance businesses greatly. First off, it expands the profit margin for insurance firms and boosts premium revenue. Big data technology offers a solid assurance for controlling real-time customer demand effectively, choosing high-quality clients, lowering loss ratios, and boosting revenues. Big data can help companies charge higher risk premiums for customers with higher risk levels and lower risk premiums for customers with lower risk levels, partially address information asymmetry, accurately classify customers according to their actual situations, encourage companies to retain high-quality customers as well as develop beneficial customer groups through customer behavior analysis, and increase the overall profitability of insurance companies. Second, big data increases the market share of insurance businesses. Big data makes it possible to promote things precisely. Through the analysis of user behavior, the products can be precisely given to clients who require them. Using big data technology, insurance companies can effectively look for customers from many different angles and in many different ways, identifying potential new clients, identifying potential needs of current clients, expanding their conventional sales channels, and offering solid guarantees for growing market share. Thirdly, the use of big data broadens the insurance sector's development space. Big data technology has eliminated the distinction between current insurable risk and uninsured risk, turning original uninsured risk into insurable risk and broadening the insurance industry's market. This has made it possible for various business organizations to share client resources. According to BCG study, cross-entity pooling of client resources can access 10% to 20% of the market's potential value, hence increasing the insurance sector's room for growth.

III. BIG DATA APPLICATIONS IN THE INSURANCE INDUSTRY

3.1 Development of New Insurance Products

New insurance products can be created thanks to big data. In the age of big data, some uninsurable risks brought on by actuarial realities can become insurable hazards. Big data can be used to create brand-new insurance solutions that cover things like protecting against freight losses, losing money on international transactions, and securing account cash. Reliance General insurance, as an illustration, bases its pricing on the analysis of enormous quantities of seller and buyer transaction data, the recording, storage, and transfer of which all rely on cutting-edge big data technologies. An innovation based on new insurable hazards is network account security insurance. With the rapid growth of the e-commerce sector, "choose to use the Internet or a mobile client to pay" has almost become the most popular method for every modern person. However, "online transactions" can also lead to problems with personal account security like network security flaws, account theft, swiping bank card fraud, and online banking account theft risk. Since 2013, Phoneme has offered guarantee and user capital transaction insurance for its third-party payment platform. For the majority of e-commerce platforms and user virtual accounts, Phoneme additionally creates fund security guarantees. Weather index insurance is another illustration. When an insurance company underwrites wind and precipitation in the production of wind power and hydropower, underwrites severe weather for the performance of large-scale outdoor events, underwrites the cherry blossom season, rainy days, and so forth for the travel of individual tourists, among other uses, weather insurance is used in agriculture, industry, business, and people's lives. When the meteorological parameters meet a predetermined criterion that corresponds to a level of loss within a specified range, this type of insurance can frequently be described as "exponential." With the aid of an Internet platform built on vast amounts of meteorological big data, Hogan Insurance Company develops tiny, frequent, and fragmented weather index insurance products and provides automated claim processing.

3.2 Enhances the Effectiveness and Quality of Insurance Services

Insurance firms may successfully improve service quality by analyzing the traits, routines, and preferences of their consumers using big data. As an important sales and service platform, the "PICC" app offers clients an insurance solution that combines insurance sales and services. PICC Property Insurance launches their mobile Internet marketing campaign for this "product + app" and improves the app. By fusing a variety of internal and external resources, constantly igniting the passion of current app users, and fostering buy transformation through "double interest attraction," the PICC plan consistently executes exclusive mobile promotion activities. PICC also promotes products in conjunction with the consumer environment, enhancing product awareness and purchase on mobile devices through scenario marketing, and encouraging a spike in visits. PICC develops important market optimization plans, puts into practice app download recommendations for significant application markets, gains external recognition and exposure for the "China People's Insurance customer" app, and ultimately boosts sales.

3.3 The Depth and Breadth of Insurance Product Innovation is Expanded

It is simple to innovate standard insurance products disregard the data obtained by the actions of Launching tailored products for each individual customer is challenging products. In addition, the information that insurance firmsare primarily internal, but rarely include external customer information. Data on behavior. Insurance companies can use big data to Identify user demands, save product development costs, and resolve the issue of very long product development cycle long to design items that meet consumer needs based on data about consumer behavior, more scientifically. This can be done to increase client interaction, in order to better meet the needs of the consumer, and to create unique, individualized items for consumers.

3.4 Achievement of Accurate Pricing

The historical loss data of sample types is the foundation of conventional actuarial science. Life table data, together with interest rates, premium rates, and other information, can be used by insurance firms to determine the cost of life insurance. Based on previous loss data, insurance companies can determine the cost of non-life insurance using loss models. As a result, a particular class or set of homogenous samples serves as the foundation for traditional actuarial pricing. Big data-based insurance products effectively alter the foundation of actuarial pricing. Big data technology can

enable the actuarial pricing of insurance products on an individual basis and give insurance providers access to a person's risk profile in order to calculate their personal insurance premium. A more precise and thorough life table may be created thanks to the advancement of big data technology, and loss risk probability and loss degree can also be calculated with greater accuracy.

3.5 Improves Risk Control

Risk has been improved thanks to the growth of big data. Authority over insurance firms. Insurance providers assemble thorough data regarding the insured, and further get precise client risk information. BigData technology can also increase the degree of risk control in while underwriting consumers, potential hazards, and aid in To reduce risk, identify potential hazards beforehand. From becoming dangers in the real world. The use of big data join the data gathered by insurance companies, banks, police departments, medical facilities, and other Research developments in the humanities, education, and social sciences establishment of databases by organizations to detect "high-risk "High-risk practitioners," "customers," "special lists," etc. then find and recognize high risk in real time, and enhance the speed at which information is transmitted. Health insurance faces a global issue with risk management.

3.6 Controls Potential Risks

By using big data technologies, insurance companies can improve customer behavior management by "monitoring" client behavior, lowering the likelihood of accidents for the insured, and lowering their own risk.

The interactive insurance programmer known as the "vitality plan" was introduced by Taking Life Insurance Company online and Gundog (a sports big data and service platform). Gundog urged the insured to record, upload, and share the information on each movement on the network as well as their personal movement experiences. Regular exercisers who are insured will also receive gift feedback and premium savings. Another illustration is Small Umbrella Insurance, an insurer that motivates clients to work out and lower their health risks. Customers of Small Umbrella Insurance join their public WeChat account "WeChat sports," pay the one yuan minimum daily insurance, and are then given a daily bonus that ranges from 0.2 to 1.6 yuan depending on how many steps they do each day.

IV. THE PROBLEMS THE INSURANCE INDUSTRY IS FACING

4.1 Insufficient Interactions

The format and homogeneity of insurance contracts, goods, and services are evident causes for the insufficient connection between the insurance industry and customers' restricted data sources. This limits customers' options and has an impact on how the insurance firm interacts with its clients. Insurance company pricing is based on the large-numbers principle and concentrates on group standardization, so it ignores the analysis and tracking of individual customers. Additionally, some insurance companies' official websites are overly professional, which makes them difficult for customers to understand and creates an information acquisition asymmetry, which lowers the bar for informational fraud.

4.2 Data Island

The data source is the cornerstone of big data applications.

The sharing and opening of data is one of the solutions to the problem of the data source. Otherwise, the big data industry will be fragmented, preventing the realization of many technologies and applications. Long-standing data islands in the insurance sector have their principal manifestations in the following areas. The integrity and promptness of information sharing are affected by the existence of data islands inside a single insurance firm, which are made up of various systems and departments with various conflicts of interest and worries. Due to the fact that insurance is founded on the concept of huge numbers, data islands exist within the insurance sector. While data exchange channels have not yet been fully established across organizations, doing so would substantially assist operations and management. In addition to the auto insurance platform, data islands exist between industries due to the lack of successful cross-industry data sharing in the insurance sector. Most businesses just examine and mine their already-existing business data, which has a significant impact on the analysis's breadth and impact. Government public data, on the other hand, mainly refers to the information generated by the government during the course of its administration, such as the information brought

forth by administrative licensing, court proceedings, and other activities. Industry public data, on the other hand, refers to the information produced by industry. Publicly available industry data primarily refers to the data sources that different insurance industry groups, alliance institutions, and other units disclose or distribute. Government agencies hold a lot of important data that is neither shared with the public nor accessible to private businesses. Many pieces of information and statistics are redundant or idle since the data between these departments is not open and portable.

4.3 Cross-Border Competition

Insurance businesses will encounter a growing amount of international competition as a component of the big data industry supply chain. Internet businesses or big data service platforms, for instance, may create an online insurance marketplace using their existing, developed platforms and sizable user bases. On the one hand, this increases their ability to retain users and master more user data; on the other hand, it prevents customers from directly contacting insurance firms and increases their reliance on them.

V. INSURANCE COMPANIES' BIG DATA STRATEGIES

Finding a big data application method that works for insurance businesses is one tactic. The following models can be used as examples by insurance companies. First off, big data may be used to reduce the gap between customers, analyses the personalized features of customers, manage and oversee business data analysis better, and create a new, more precise risk management model. The second tactic is to mine consumer demands to deliver additional, tailored, value-added services, which not only helps establish new business, but further enhances client loyalty, the customer experience, and the transformation of customer assets and resources. Finding a profit model that works for insurance firms is the third tactic. The majority of small- and medium-sized insurance companies are constrained by their technical prowess, clientele, and other elements. They can only rely on their own circumstances, which makes it challenging for them to build a robust big data platform quickly. It is not an option for insurance businesses to try to work with online e-commerce platforms, the Internet of Things, electronic maps, and other industries. The construction of a business collaboration mode, the use of various platforms and resources, and the promotion of the company's successful progressive transition from a product-driven mode to a data-driven mode are all examples of cooperation.

VI. CONCLUSION

The insurance industry can benefit from big data applications since they produce results that are comparable to those in other industries. Big data organizes and evaluates the data that is already available and gives the system high-quality information. Numerous companies and administrative departments are using big data, particularly to improve collaboration. Agents can now communicate pertinent client information to make plans for their risks. Big data may be able to accommodate an innovative development in the insurance industry. To handle current and upcoming difficulties, insurance agents can gather a vast amount of data. Big data helps businesses give customers high-quality service and improves the success rate of transactions. As a result, it aids in foreseeing and resolving problems facing insurance firms. This technology minimizes people. Big data will be used in the future to implement creative changes in the insurance sector.

REFERENCES

[1]. Belanger, F., and Crossler, R. E., Privacy in the Digital Age: A Review of Information Privacy Research in Information Systems, MIS Quarterly (35:4), 2011(10): 1017-1041.

[2]. Bircher, U., and Butler, M. Information Economics, 2007. Brown, M., Jappelli, T., and Pagano, M., Information sharing and credit: Firm-level evidence from transition countries, Journal of Financial Intermediation (18:2), 2009(4): 151-172.

[3]. Agarwal, R., and Dhar, V., Big Data, Data Science, and Analytics: The Opportunity and Challenge for IS Research, Information Systems Research (25:3), 2014(9): 443-448.

[4]. Agarwal, S., and Hauswald, R., Distance and Private Information in Lending, Review of Financial Studies (23:7), 2010(7):2757-2788

[5]. Davenport, T. H., Competing on analytics, Harvard Business Review (84:1), 2006(1):98-+.

[6]. Djankov, S., McLiesh, C., and Shleifer, A., Private credit in 129 countries, Journal of Financial Economics (84:2), 2007(5):299-329.

[7]. Hauswald, R., and Marquez, R., Competition and strategic information acquisition in credit markets, Review of Financial Studies (19:3), 2006(2):967-1000.