Title: Artificial Intelligence in Claims Processing - Revolutionizing the Insurance Industry

Introduction

The traditional claims process in the insurance industry strongly relied on manual procedures, resulting in time-consuming, error-prone, and expensive processes. The advent of Artificial Intelligence (AI) technology has presented new opportunities to revolutionize claims processing operations. This assignment aims to explore the impact of AI on claims processing and its potential to transform the insurance industry. Additionally, it will delve into the risks associated with AI in claims processing, with a specific focus on the UnitedHealth Group (UnitedHealth) case. Finally, proposed solutions and recommendations will be provided to mitigate risks and challenges in the field.

Traditional Claims Processing

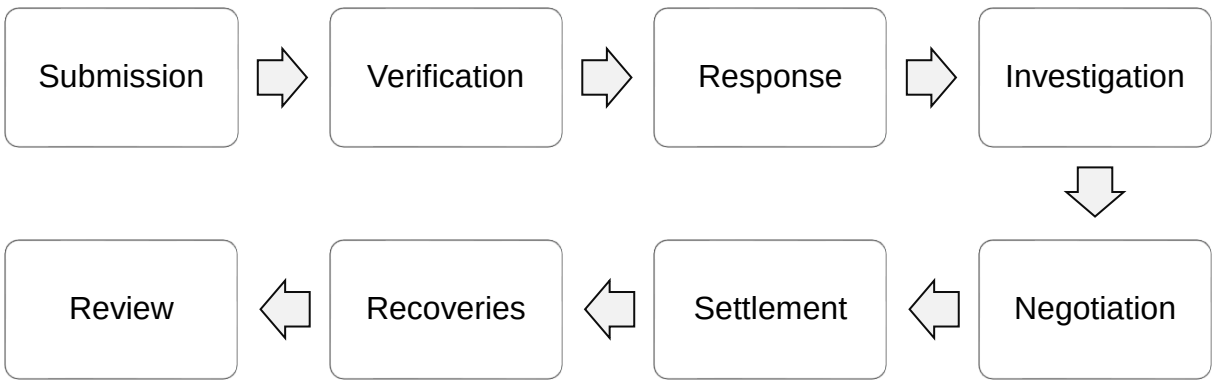
Claims processing is important operations in the insurance industry. Traditional insurance claims processing involves several sequential steps, beginning with claim submission, followed by verification, assessment, payment, and review. These processes are intricate and rely heavily on human effort to ensure accurate claim assessment and processing.

Initially, the claimant must submit a written claim form along with the original supporting documents to the insurance company, either in person or by mail. Upon receiving these documents, the claims department reviews them for necessary verification. In some cases, additional assessments such as medical evaluations or damage inspections may

be required. After a thorough verification and approval process, the payment is released to the claimant via cheque.

The claims handling procedures can differ in various classes of insurance. Below is a flowchart illustrating the general claims process (Greensweig, 2018):

Claims process flowchart



AI in Claims Processing

The manual handling of a substantial volume of documentation, data entry, evidence verification, reviews, fraud detection, and communication with claimants is inherent in the traditional claims process. This heavy reliance on manual tasks can frequently result in delays and errors during claim settlement, leading to increased administrative costs and potentially affecting customer expectations.

AI has the potential to transform claims processing in the insurance industry. According to the Life Insurance AI / Machine Learning (ML) Survey published by the National Association of Insurance Commissioners (NAIC) (DeFrain et al., 2023), it is evident that 52% of respondents are currently using, planning, or exploring the use of AI/ML in their

operations. The survey further reveals that AI/ML techniques employed in selected pricing and underwriting functions primarily focus on automation without human intervention in execution and augmentation for advising human decision-making processes.

AI is the field of computer science that seeks to build machines that can carry out complex tasks without human intervention (Brookshear & Brylow, 2018). It is a broad term refer to any technology and algorithms that enable machine to analyzing large volumes of data, identifying patterns, and making intelligent decisions based on predefined rules or ML models. ML and Natural Language Processing (NLP) are subfield of AI.

ML learn models from data to make better decision without being explicitly programmed. Three main ML approaches are supervised, unsupervised and reinforcement learning (Glaz et al., 2021; Mehta & Devarakonda, 2018). Supervised ML are trained using labeled data sets that have inputs and outputs, is widely used for tasks such as predictive analytics, fraud detection and automated processes. Mehta & Devarakonda (2018) stated that most of the current health care application of ML are based on traditional and supervised ML.

NLP involves intelligent analysis of extensive written text and focuses on comprehending and generating human language. Syntactic, semantic, and contextual analyses are utilized to uncover the meaning of statements in natural language, while information retrieval and information extraction pertain to the broader scope of entire document.

(Brookshear & Brylow, 2018). NLP is utilized in a wide range of tasks, such as text classification, sentiment analysis, chatbots and translation.

Gupta (2023) states that ‘AI and ML algorithms can facilitate and speed up the claims-handling process without human intervention’.

NLP is used in insurance claim process to generate structured data sets based on claims reports to process claims faster (Deloitte Digital, 2017). This allows automated document processing, analyzing and extracting relevant data without the need for manual data entry. AI can scan significant of medical records and predict which ones will need a manual assessment by a highly skilled reviewer (Optum, 2019). Additionally, NLP enables AI chatbots to understand and generate responses, facilitating their interaction with claimants.

The ability of ML to understand patterns and detect anomalies that fall outside of those patterns make it play a critical role in fraud detection. By analyzing historical data and claim details, these algorithms can detect suspicious behavior, such as unusual claim amounts, inconsistent information, or multiple claims from the same individual and duplicate claims that involve intentional adjustments to certain information.

Benefits of AI in Claims Processing

By leveraging AI in claims processing, manual tasks can be significantly reduced. This includes automating data entry, verification, and documentation, leading to streamlined

processes and improved efficiency. The elimination of manual data entry helps ensures accurate data input, reducing the likelihood of delays and improving the overall quality of claim settlements.

According to Deloitte Digital (2017), the annual fraud-related cost in the insurance industry amounts to approximately 10% of total claims expenditures. ML algorithms offer a proactive approach to identifying and investigating fraudulent activities. This verification process enhances the accuracy and legitimacy of claims, reducing the risk of fraudulent claims going undetected.

Prior authorization (PA) involves the claimant requesting pre-approval for the coverage of a treatment that will be claimed. According to an research conducted by McKinsey & Company, AI-enabled PA has the potential to automate 50-75% of manual tasks (AI-Haque et al., 2022).

Furthermore, the utilization of AI chatbots enables self-service options, allowing customers to quickly access information and obtain real-time updates on the progress of their claims. This improves customer satisfaction and retention.

A case study conducted by Deloitte Digital (2017) highlighted the tangible benefits of implementing AI in the insurance industry. Fukoku Mutual Life (Fukoku) deployed AI in 2017 to enhance the efficiency of its medical claims processing. As a result, Fukoku experienced a 30% increase in productivity, leading to improved accuracy in payouts and

annual savings of JPY 140 million. Fukoku also aimed to enhance customer satisfaction by reducing the time required for claim payouts.

AI use cases in UnitedHealth

UnitedHealth is indeed a well-known example of implementing AI in the insurance industry. UnitedHealth is a leading healthcare and insurance company consisting of two members: Optum and UnitedHealthcare. Optum focuses on delivering care aided by technology, while UnitedHealthcare offers a comprehensive range of health benefits (UnitedHealthGroup, 2024).

NaviHealth, a post-acute care management platform for health plans and providers, joined Optum in 2020. According to NaviHealth, their proprietary technology called nH Predict is an AI algorithm that serves as a guide to inform providers, families, and other caregivers about the type of assistance and care a patient may require both during their facility stay and after returning home (NaviHealth, 2024). The nH Predict algorithm has been the subject of a lawsuit that will be discussed later.

UnitedHealth also utilizes two other AI use cases: the Agent Virtual Assistant (AVA) and the OptumIQ Platform. AVA is a conversational AI that includes a chatbot that interacts with patients to streamline the collection and classification of patient information and provide customized solutions. (DeMello, 2023).

The OptumIQ Platform, on the other hand, is a centralized data platform that employs advanced data analysis, NLP, and ML to improve patient outcomes by enabling predictive health analytics.

Risks and Challenges

In 2023, a lawsuit was filed alleging that UnitedHealth illegally denied elderly patients the care they were entitled to under Medicare Advantage Plans. The lawsuit claims that UnitedHealth utilized an AI algorithm called nH Predict to evaluate claims for post-acute care and override the determinations made by the real live doctor regarding the medical necessity of the expenses (Napolitano, 2023).

According to Ars Technica (Mole, 2023), the nH Predict algorithm estimates post-acute care using a database of medical records from 6 million patients. It analyzes inputted data such as age, living situation, and physical functions to identify similar patients and generate estimates for medical needs, length of stay, and discharge dates. This supervised ML approach trains the algorithm on labeled data with input parameters and corresponding target values.

One of the main challenges in the claims process when using AI is how it handles complex scenarios that require further investigation. In such situations, AI may lack the necessary intelligence to individually assess each case and instead relies on labeled data to provide predicted outcomes. If biases are present in the training data, it can potentially lead to unfair treatment of certain groups.

In addition to possible wrong decisions and the fairness issue, the collection of data for ML has also become a noteworthy concern. As discussed in an article by Ars Technica (Mole, 2023), the nH Predict algorithm relies on a database of medical records from 6 million patients. This raises significant concerns regarding personal privacy and the associated risks related to data protection.

Mitigating Risks and Challenges

One of the claims in the lawsuit case is that UnitedHealth refused patients' requests to access the report generated by nH Predict without providing acceptable reasons when the denial was appealed. This has created a perception that the company heavily relies on AI-based claims denials and has raised suspicions that the AI algorithms are specifically trained for this purpose.

To address this issue and mitigate the risks associated with incorrect decisions, it is crucial to adopt transparent and explainable AI models. AI algorithms should be designed in a way that their decisions can be explained and understood. Additionally, careful attention should be given to sourcing and reviewing training data to minimize biases. Regular reviews of training data are important to prevent any inadvertent disparagement or harm to any group.

AI can make incorrect decisions, particularly in complex scenarios. Depending solely on AI algorithms can lead to erroneous claim rejections or approvals. To mitigate this risk, it

is important to strike a balance between technology and human oversight. In line with this, the American Medical Association (AMA) requests health insurers to require human examination of patient records before denying their beneficiaries care (American Medical Association, 2023).

AI learns from historical data but may encounter novel scenarios. While AI assists in analysis and recommendations, it should not override the judgment of human experts. To enhance trust in AI outcomes, a fair process based on clinical criteria is crucial, including reviews by unbiased healthcare professionals with relevant expertise.

Lastly, prevention is better than cure. To address potential risks proactively, implementing a comprehensive assessment tool for evaluating the potential impact of AI algorithms prior to their implementation would be beneficial. Scholars and advocates have proposed Algorithmic Impact Assessments (AIA) as a regulatory strategy to effectively address and mitigate algorithmic harms (Selbst, 2021).

The AIA is an assessment tool designed to evaluate the impacts associated with the deployment of automated decision systems. It is established based on two primary objectives: to require companies to assess and mitigate the social impacts prior to undertaking any development, and to create comprehensive records of decisions and testing that can support future policy development (Selbst, 2021). The AIA is influenced by established frameworks in data protection, privacy, and human rights policies. The assessment encompasses various aspects including system design, algorithms, decision

types, impacts, and data. These frameworks can provide valuable guidance for conducting assessments before implementing AI algorithms.

Conclusion

In conclusion, the integration of AI in claims processing holds great potential for revolutionizing the insurance industry. Traditional methods of claims processing are often time consuming and prone to errors, but AI offers numerous benefits such as streamlining the claims process, enhancing efficiency, and reducing errors. NLP can automate document processing and data extraction, while ML improve fraud detection and ensure the accuracy and legitimacy of claims. Additionally, AI-powered chatbots and self-service options provide real-time updates and enhance customer satisfaction.

However, the implementation of AI in claims processing also presents risks and challenges that need to be addressed. One such challenge is the management of biases in training data to avoid unfair treatment. Ensuring transparency and explainability of AI models is crucial for building trust among stakeholders. Human oversight remains essential to validate AI decisions and prevent errors. Additionally, implementation of AIA can proactively assess potential risks before deploying AI systems.

By utilizing AI in claims processing, there is a potential to reshape the insurance industry, improving service delivery to claimants and enhancing operational effectiveness.

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