



Pega AI for Adaptive/Predictive Model Development in Claims Processing: A Comprehensive Review

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Abstract This research paper examines the application of Pega Artificial Intelligence (AI) in the development of adaptive models for claims processing. Claims processing is a critical function in various industries, including insurance, healthcare, and finance, where efficiency, accuracy, and customer satisfaction are paramount. Pega AI offers advanced capabilities for building adaptive and predictive models that can dynamically adjust to changing data and business requirements, thereby improving the speed, accuracy, and cost-effectiveness of claims processing. Through a comprehensive review of existing literature, case studies, and practical examples, this paper explores the potential benefits, challenges, and best practices associated with using Pega AI for adaptive model development in claims processing. Additionally, it discusses future research directions and implications for practitioners seeking to implement AI-driven solutions in claims processing workflows.

Keywords Claims Processing, Pega AI, Adaptive Model, Claims Data Hub (CDH).

1. Introduction

➤ Claims Processing Overview

In the intricate web of industries like insurance, healthcare, and finance, claims processing plays a pivotal role, seamlessly bridging the gap between incidents and resolution. At its essence, claims processing embodies the mechanism through which individuals or entities seek reimbursement or assistance for covered losses, damages, or expenses. Its significance extends far beyond administrative functions, as it underpins the integrity of crucial sectors, ensuring prompt responses, fair evaluations, and swift resolutions.

While the specific procedures may vary depending on the type of insurance and the nature of the claim, the fundamental stages of claims processing typically include [1].

Claim Submission: The claims process is initiated when the policyholder files a claim to the insurance company. This step is the policyholder's first communication with the insurer regarding a loss, providing initial details about the incident. Digital technology simplifies this step, allowing policyholders to submit their claims through digital platforms such as mobile apps or online portals, enhancing accessibility and efficiency.

Claim Review: Upon receipt of the claims request, the claim handler meticulously reviews the policy to determine the coverage. This stage thoroughly examines the policy terms and conditions and the claim's specifics. The review process is significantly streamlined by automation, which detects crucial policy terms and cross-references the claimant's details with external databases, ensuring a comprehensive and accurate review.

Claim Verification: The insurer then proceeds to authenticate the claim by collecting additional data. This step may include damage assessments, incident photographs, witness statements, or relevant health documentation. The verification process is expedited by automation, which gathers data from various sources, enhancing the speed and precision of the process.

Claim Decision: The next step involves the insurer evaluating whether to approve or deny the claim based on the policy terms and the verified claim details. Automation aids this stage by applying pre-set guidelines to establish the pay out and coverage. However, a provision for human intervention is maintained for final checks to ensure fairness and accuracy, combining automation's efficiency with humans nuanced decision-making ability.

Payment Disbursement: Once the claim is approved, the insurer initiates the payment to the claimant. This step involves calculating the final settlement amount and arranging for its disbursement. The payment process is



enhanced by automation, which uses digital payment methods, ensuring swift transactions and clear records, thereby enhancing transparency and traceability.

Claim Data Analysis: After the completion of the claims process, the insurer can conduct an in-depth analysis of the claims data. Automation tools facilitate this analysis by providing structured data for easy examination and interpretation. The analysis offers valuable insights, enabling insurers to spot trends, detect potential fraudulent activities, and identify areas for process enhancement.



➤ Introduction to PEGA AI

In the fast-paced landscape of modern business, staying ahead requires more than just keeping up – it demands innovation, efficiency, and adaptability. This is where PEGA AI is revolutionizing traditional business processes with its advanced capabilities in artificial intelligence and automation. As a leader in intelligent automation software, PEGA AI empowers organizations to streamline operations, enhance customer experiences, and drive unprecedented levels of productivity and agility. PEGA's AI driven adaptive modeling helps to automate complex decision-making processes, enabling organizations to expedite claim approvals while minimizing errors and inconsistencies. Whether it's assessing the validity of a claim, identifying fraudulent claims, determining coverage eligibility, or calculating reimbursement amounts, PEGA's adaptive and predictive models can be leveraged to analyze relevant data points and provide real-time actionable insights, empowering claims processors to make informed decisions with confidence.

➤ Research Objective/Scope

- The primary objective of this research is to examine the effectiveness and impact of utilizing Pega AI for adaptive model development in claims processing.
- The research will specifically investigate the AI technologies employed by Pega for adaptive model development in claims processing. This includes machine learning algorithms, predictive analytics, natural language processing (NLP), and any other relevant AI capabilities utilized for data analysis and decision-making.
- The study will delve into the process of adaptive model development within Pega's framework, examining how AI-driven models are created, trained, and optimized for claims processing tasks. This includes understanding the methodology behind adaptive modeling feature selection, model training/validation, and ongoing model refinement.
- Overall, this research aims to provide a comprehensive understanding of how Pega AI can be leveraged for adaptive model development in claims processing, offering insights into its benefits, challenges, and practical implications for organizations seeking to enhance their claims processing capabilities

2. Key Challenges in Claims Processing

Human Error: Manual claims processing is susceptible to errors such as data entry mistakes, misinterpretation of information, and inconsistencies in decision-making. These errors can lead to inaccurate claim assessments, delayed processing times, and customer dissatisfaction.

High Processing Costs: Manual claims processing often requires a significant amount of labour-intensive work, including data entry, document verification, and manual decision-making processes. This can result in high operational costs due to the need for skilled personnel and time-consuming tasks.

Time-Consuming Processes: Manual claims processing workflows can be time-consuming, especially for complex claims that require extensive documentation and verification. Delays in processing can lead to longer waiting times for customers, impacting their satisfaction and trust in the organization.



Limited Scalability: Manual claims processing may struggle to scale efficiently to handle fluctuations in claim volumes or sudden increases in workload. This can result in backlogs, processing delays, and difficulties in maintaining service levels during peak periods.

Regulatory Compliance: Manual claims processing requires meticulous adherence to regulatory requirements and industry standards. Ensuring compliance with complex regulations can be challenging and may increase the risk of errors or inconsistencies in processing.

Data Security Risks: Manual claims processing involves handling sensitive personal and financial information, making it susceptible to security breaches and data privacy risks. Without robust security measures in place, organizations may face the threat of unauthorized access, data leaks, or identity theft.

Lack of Transparency: Manual claims processing workflows may lack transparency, making it difficult for stakeholders to track the status of their claims or understand the reasons behind claim decisions. This can lead to confusion, frustration, and distrust among customers and internal staff. [2]

3. PEGA's CDH-based claims adjudication solution

A solution can be built on PEGA's CDH (Claims Data Hub) platform, which serves as a centralized repository for storing and managing claims data. It includes an adjudication system designed to process and evaluate claims based on predefined criteria and rules. The solution is made configurable, allowing customization to suit the specific needs and workflows of different insurance carriers. It can be seamlessly integrated with existing claims processing workflows and systems, ensuring compatibility and interoperability. [3]

support for CDH adaptive models and external AI models:

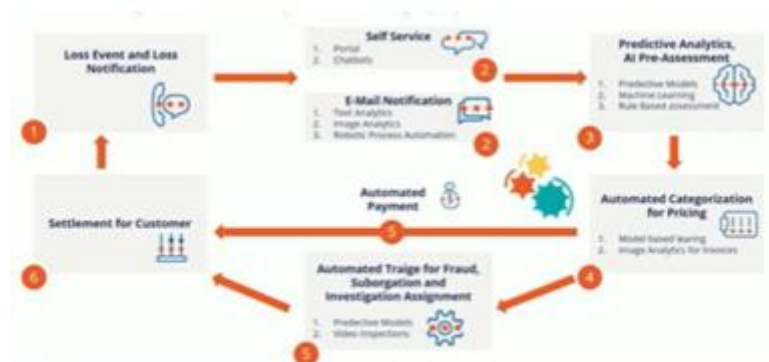
The solution supports the utilization of CDH adaptive models, which are trained using historical claims data to predict claim outcomes and assess risk. Additionally, it allows for the integration of external AI models, developed using languages like Python and imported as PMML (Predictive Model Markup Language) files. These models enhance the system's predictive capabilities and extend its functionality.

Benefits:

- Reduction in the need for manual investigations, leading to cost and time savings.
- Increased capacity for claim adjudicators, achieved through time-saving features and automation.
- Improved accuracy in decision-making, thereby reducing carrier liability and risk exposure.
- Expedited claim settlement processes, resulting in greater customer satisfaction, higher renewal rates, and increased referrals.
- Enhanced agent satisfaction, facilitated by simplified decision-making systems that aid in efficient claim handling.

Key Features of the Solution:

- **Adaptive Model:** Predefined predictors trained on sample claims data to facilitate predictive analysis and decision making.
- **Predictive Model:** Integration of external AI models via PMML, allowing for advanced predictive analytics within the solution.
- **Pega Application:** An intuitive user interface, resembling the Claim Adjuster Workbench, enabling claim adjusters to leverage the embedded models during the claims adjudication process.
- **Transparency and Explainability:** The solution provide transparency by presenting predictor performance through spider graphs, enhancing confidence in AI-driven recommendations and clarifying the rationale behind decisions.

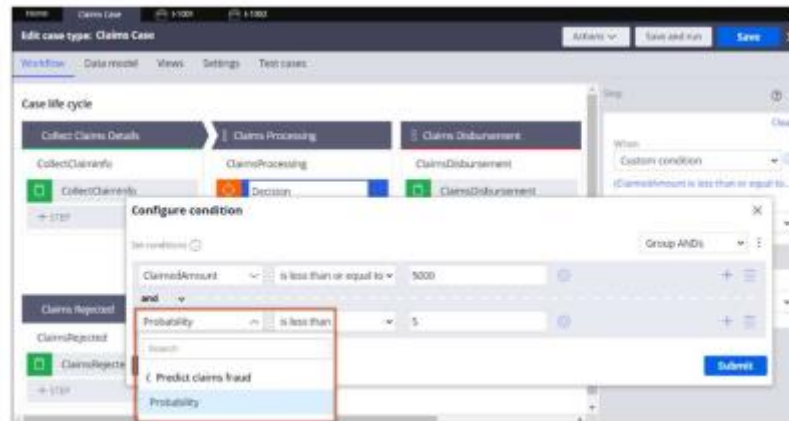


4. Example: PEGA AI Predictive Model for Fraud Detection

Pega Process AI is leveraged to predict the likelihood of fraudulent or erroneous claims, based on sophisticated predictive modeling techniques. This demonstration case illustrates the application of Process AI in two distinct scenarios: one involving a low-risk customer and another featuring a customer with an elevated probability of fraud [4]

a. Configure the Probability Condition

Configure a claims fraud probability condition to apply Pega Process AI capabilities to Case processing, so that claims are processed automatically or routed to a handler on the basis of fraud prediction.



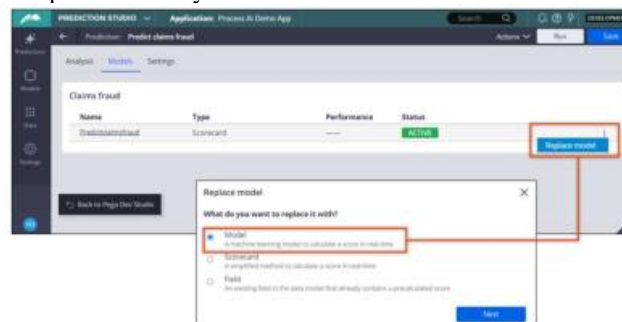
b. Adding the Prediction to the Case settings

Add the predictive model "PredictClaimsFraud" to the Prediction setting of the Claims Case. To inspect the model, open the prediction in the prediction studio and analyze the scorecard. Prediction studio will display the elements that were considered to derive at the prediction. The model can be built in PEGA or imported from already existing models outside of Pega built in H2O, Python or any other technology.

c. Importing a fraud risk Prediction

After implementing the application with a scorecard, the subsequent step involves substituting the scorecard with a Predictive Model developed by data scientists once it becomes available. This transition is facilitated by the data scientist role within Prediction Studio and does not impact the utilization of Prediction in the Case. However, an approval step is incorporated into the MLOps process.

The Predictive Models suitable for replacing scorecards include PMML, H2O.ai, or external models in AWS SageMaker or Google Vertex AI. In the given example task, an H2O.ai model, devised by the insurance company's data scientists, is imported to carry out the substitution



d. Testing the Model: High fraud-risk customer scenario

To test the model, create a Data Transform with sample Customer Details. Configure the Claims Processing flow to use the Data Transform to ore fil the customer details.

Configure the Customer Case Type to add a Decision step to predict the high risk and low risk customer and display the result on the screen or the Claims Approver.





e. Result:

Run the Customer Case Type flow with the pre filled customer details.

5. Conclusion

In conclusion, this research paper has explored the utilization of Pega AI for adaptive and predictive model development in claims processing, shedding light on its potential to revolutionize traditional approaches and enhance efficiency, accuracy, and customer satisfaction. Through an in-depth examination of Pega's AI-driven solutions, we have uncovered the transformative impact of adaptive modeling on streamlining claims processing workflows and improving decision-making processes.

final thoughts and reflections

As we look to the future of claims processing, the integration of AI technologies like Pega AI holds immense promise for driving innovation and efficiency in the insurance industry. By leveraging advanced algorithms, predictive analytics, and machine learning capabilities, organizations can unlock new opportunities to optimize operations, mitigate risks, and deliver superior customer experiences.

However, it is crucial to recognize that the adoption of AI in claims processing also presents unique challenges and considerations. Issues such as data privacy, algorithmic bias, and regulatory compliance must be carefully addressed to ensure ethical and responsible use of AI technologies. Moreover, ongoing research and innovation are essential to continually enhance the effectiveness and reliability of AI-driven solutions in the dynamic landscape of claims processing.



The potential impact of ai on the future of claims processing

Looking ahead, AI has the potential to reshape the future of claims processing in profound ways. From automating routine tasks and accelerating claims adjudication processes to providing predictive insights and personalized customer experiences, AI-powered solutions offer a pathway to greater efficiency, agility, and competitiveness for insurance organizations.

Furthermore, AI can enable proactive risk management and fraud detection, allowing insurers to detect and prevent fraudulent activities more effectively. This not only safeguards financial resources but also enhances trust and credibility among policyholders and stakeholders.

The importance of ongoing research and innovation

To fully realize the benefits of AI in claims processing, ongoing research and innovation are paramount. Continuous efforts to refine algorithms, improve data quality, and address emerging challenges will be essential to maximize the potential of AI-driven solutions and ensure their long-term viability and effectiveness.

Moreover, collaboration between industry stakeholders, researchers, and policymakers is crucial to foster a supportive ecosystem for AI innovation in claims processing. By sharing insights, best practices, and lessons learned, we can collectively drive progress and unlock new possibilities for enhancing the efficiency, fairness, and reliability of claims processing in the digital age.

References

- [1]. App Tech, "Common Challenges In Claim Management," [apptechllc.com](https://apptechllc.com/common-challenges-in-claimmanagement/), [Online]. Available: <https://apptechllc.com/common-challenges-in-claimmanagement/>. [Accessed April 2023].
- [2]. A. Veenendaal, "Claims Process Automation Explained," [blueprism.com](https://www.blueprism.com/guides/claims-processautomation/#:~:text=Most%20automated%20claims%20processing%20software,claims%20faster%20and%20more%20accurately..), [Online]. Available: <https://www.blueprism.com/guides/claims-processautomation/#:~:text=Most%20automated%20claims%20processing%20software,claims%20faster%20and%20more%20accurately..> [Accessed June 2023].
- [3]. Virtusa, "Intelligent Claims Adjudication," [pega.com](https://community.pega.com/marketplace/component/intelligent-claims-adjudication), [Online]. Available: <https://community.pega.com/marketplace/component/intelligent-claims-adjudication>.
- [4]. PegaSystems, "Predicting customer behavior using predictive models," [pdn.pega.com](https://academy.pega.com/topic/predictingcustomer-behavior-using-predictivemodels/v1/in/16766), [Online]. Available: <https://academy.pega.com/topic/predictingcustomer-behavior-using-predictivemodels/v1/in/16766>. [Accessed June 2023].

