CASE STUDY

SMARTER HEALTHCARE CLAIMS PROCESSING WITH MACHINE LEARNING

Medilink

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Smarter Healthcare Claims Processing with Machine Learning

INTRODUCTION

Most healthcare insurers employ allied health professionals for back office functions such as claim pre-authorization and adjudication. However, staffing is problematic as these professionals' first preference would be to work in a clinical setting, as these provide stepping-stones for overseas career opportunities. Not surprisingly, healthcare back office operations often struggle with high employee turnover, and the corresponding productivity loss, processing delays, and customer service issues.

CHALLENGE

Improve the turnaround time of claims processing to realize prompt-payment discounts.

SOLUTION

Auto-adjudicate claims with machine-learning algorithms

IMPACT

Significantly shortened turnaround time, big savings in processing cost and increase in realized discount

CHALLENGE

To improve the turnaround time of claims approval in order to realize bigger discounts offered by providers for on-time payment of claims.

The complexity of today's medical plans often require health insurers to employ medical allied professionals to process transactions, such as members' pre-authorization for elective procedures, or adjudication of claims. Unfortunately, healthcare back-office jobs are not the type that medical allied professionals dream of. Even with significant employer efforts to recruit and retain them, most medical allied professions would still prefer to work at hospitals and clinics. Many aspire to work overseas.

Our client's Operations Head confessed that high attrition rates were hurting their productivity and causing processing delays. Furthermore, post-audit revealed that millions of pesos are paid monthly for suspicious claims.

How can the problem on efficiency and quality be addressed at the same time?

SOLUTION

Auto-adjudicate claims with machine-learning algorithms

MediLink introduced Artificial Intelligence – supervised machine learning – to bridge the widening gap between the increasing number of claims and the need to process them quickly and correctly. Implementing the solution entailed having the machine learn from past data to determine whether to approve or refer a claim to a human processor for final adjudication. To learn, the machine detects patterns to determine thresholds for classifying or labeling future claims as "approve" or "refer". Thus, the machine is not explicitly programmed to follow pre-defined rules, but it is programmed to set its own rules based on patterns found in historical data.

Labels on three years' worth of historical data are deemed to be a valid training set since they were processed by qualified medical allied professionals, and were not flagged as fraudulent during post-audit. But to further assure the integrity of these data, very strict rules and statistical limits are applied to filter out the fraudulent claims and relabel them as "Decline" before they proceeding with machine learning.

Next, the following methodology was applied:

- Train the machine to detect pattern on unlabeled claims via ensemble, a type of classification algorithm
- Label the claims based on thresholds computed from patterns the machine has detected
- Evaluate the machine's labels against the true labels of claims
- Repeat steps 1 – 3 on different sets of historical data until evaluation score is optimal Adopt the final threshold for labeling future claims

IMPACT

Significantly shortened turnaround time, big savings in processing cost and increase in realized discount

To confirm the effectiveness of this solution, our client conducted parallel run of machine and medical allied processors. To ensure that no claims were unjustly denied, claims labeled as "refer" were directed to a human processor for verification. During a 3-month parallel implementation, claims labeled as "approve" were also assessed by a Quality Control team. The machine's performance continuously improved as more correct data were added to the training set.

An average of 50 – 60 % of daily claims volume were labeled by the machine learning model as "approve", with a 95% precision.

As a result, half of the daily claims volume could bypass human processing. Daily productivity has improved by over 50% and processing costs have decreased. Millions are saved monthly from preventing fraudulent claims from being paid. The medical allied professionals also find their jobs to be more enjoyable and fulfilling, since their focus has shifted towards improving the machine learning model and screening potential fraud rather than on repetitive tasks.