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## Board of Trustees Meeting of June, 2019 IT Report

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### WC Claims Handling Using Predictive Analytics

As technology evolves, the application of predictive analytics in insurance and **Workers' Compensation** claims handling in particular has proven to be an industry game changer. Predictive Analytics is a practice that analyzes historical facts in order to predict with a certain level of certainty either future events or outcomes. The Workers' Compensation line of coverage has a manageable scope of loss and less subjectivity than other lines of coverage, making it ideal for this sort of analytics. We have been working to leverage this technology and develop a data model that is consistent with our data. While the claims adjuster can never be replaced, utilizing predictive analytics to supplement decision-making reduces the margin of error and derives insight without bias.

Predictive analytics utilizes similar decision making concepts as humans do to make predictions, but instead creates these predictions without bias and utilizes historical data as the framework. These models can quickly go through hundreds of thousands of data elements and extract the relationships between dependent and independent variables while analyzing it objectively. Our model will leverage information from years of historical claims to provide a severity score that will predict the potential financial loss that may happen next in a particular claim. The model relates similar data points to the current claim and provides adjusters with insights on the potential severity of that claim. Instead of waiting until a claimant is already at a point of high risk, predictive analytics can help facilitate early and proactive intervention.

Our model will enable the adjuster to become aware of the potential severity of the claim from day one, and will continue to re-evaluate the score as the claim progresses. Any missed warning sign about the severity of an injury is a missed opportunity to intervene with the right care at the critical moment. The model aims to close the gap for the time it takes an adjuster to become aware of these warning signs

as any missed opportunity can add days, weeks, or months to the worker's recovery and time away from work which can increase the costs associated with a claim.

Through the course of development, we have found that utilizing a Boosted Decision Tree Regression has shown to yield the most accurate results. This methodology alongside a multiple-month long project to pre-process the data in such a way to achieve the best results has produced a model that can explain 90% of the variability of the response data. Below are some statistics regarding the accuracy of our model as it relates to predicting the potential severity scores of future claims.

#### ▲ Metrics

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|                              |          |
|------------------------------|----------|
| Mean Absolute Error          | 0.7023   |
| Root Mean Squared Error      | 0.952571 |
| Relative Absolute Error      | 0.282015 |
| Relative Squared Error       | 0.098734 |
| Coefficient of Determination | 0.901266 |

### **Reimbursement Request System**

A new system to process, archive, track, and manage reimbursement requests is currently being developed for employees to submit travel and education reimbursement requests. This new system will standardize expense request reporting and enable a seamless experience for staff. The system will have the capabilities of maintaining a designated workflow in which employees submit requests directly to their managers with the ability to attach all necessary supporting documentation directly to the request. Additionally, the system will allow managers to submit follow up correspondence to the requestor in the event any documentation is missing or additional documentation is required. Employees will have a dashboard area to showcase any pending reimbursement payouts as well as show a historical break-down of any prior reimbursements. Management will also have dashboard access to keep track on reimbursement requests and ensure there is no potential deviation from allocated budget dollars.

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