Supervised Learning Use Case: Wharton University Project

Describe a business or workplace-related decision problem and connect it to a prediction problem that can be addressed via supervised machine learning. In particular, state what the outcome variable is for the prediction problem you have identified.'

My organization struggles with bad debt and collection problems. In the healthcare industry, particularly in Specialty pharmacies, a bad debt event is significant revenue loss for organizations. There are several attributes of a patient order that result in becoming a bad debt. Because every order goes through a verification process before order is scheduled, a supervised learning model can be built that can be trained on a training set data of over millions of bad debt transactions and create a predictive model if an order is most likely to produce a bad debt.

Describe what kind of training data would be applicable to the prediction problem you identified in paragraph 1. In particular, describe some of the features or input variables of this training data.

Training data set for this would be all the bad debt transactions, payment or charges that have been sent to collection agencies. Some of the features of this data that would be applicable is patient age / date of birth, Rx, dosage, Insurance type, payer, cost of benefit, deductible, patients out of pocket, bill group, charge type etc. For an example, if patients cost of benefit is very high or if deductible is high and patient is > 67, there is a likelihood that payment may be defaulted. Such orders can be flagged for further review to work with the patient or designated caregiver to avoid becoming a bad debt at the end.

Describe the benefits of ML algorithms as an alternative or supplement to human decision-making. In addition, describe which of these benefits would be particularly important for the specific prediction problem you described in the prior two paragraphs.

For Specialty pharmacy or overall healthcare delivery, it's critical to provide patient care. For an individual scheduling an order in most cases based on referral from prescriber, it is not possible to identify if Account receivable team going to have problem with payment or charges. With Supervised learning, when a transaction or order is flagged for potential bad debt, every order can be fed thru the model after scheduling and account receivable team can start working with patients and providers to plan for payments. Model can be trained on high volume of training data that has been marked as bad debt by Account receivable team over period of time and then generate a predictive model. Training data will include good transactions to remove any bias on gender, ethnicity or a specific payer.