Medical claims rejection Prediction Using Classification Models

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Abstract

The latest healthcare industry is reported that one in every seven claims for health insurance in the United States is refused; the amount of money that hospitals and health care providers across the country lose due to denied claims is around $262 billion annually. This prevalent problem causes enormous problems with patients' cash flow and adds an unnecessary burden to their lives. Also, healthcare providers' profitability losing due to claim rejection because providers need to resubmit the claim again to the insurance company. This will take unnecessary time and effort. Furthermore, this process will take around 130$ per claim for each submission, this will financial burden for the healthcare providers.

Therefore, eliminating claim denials prior to submitting claims to insurers increases profitability, speeds up the revenue cycle Management(RCM) also known as healthcare finance, and enhances patients' well-being if not patients need to pay to the insurance company or patients need to wait until prior medical claims are sorted. This research makes use of the Cross-Industry Standard Process for Data Mining (CRISP-DM), which assists hospital and health care administrators in identifying claims that may be rejected. This framework makes use of five artificial intelligence algorithms, which are separated into white-box and glass-box categories, and utilizes cross-validation to tune input variables and determine which model is the most accurate. It is guided by five guiding principles. According to the findings, a model based on a black-box algorithm (Random Forest) achieves an Accuracy rate of 0.94, which is higher than that of any other model. The most important ramifications of this study are that it will assist providers in lowering their operational costs and improving the effectiveness of their insurance claim procedures and assisting patients in concentrating on their recoveries rather than dealing with appealing or resubmitting their insurance claims.