

**RETENTIA – EMPLOYEE RETENTION ENGINE WITH
TURNOVER PREDICTION FOR APPAREL INDUSTRY IN
SRI LANKA**

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Abstract

Due to global economic volatility and fierce rivalry in the garment industry, organizations are striving to find new ways to retain their employees in order to sustain in the industry. Retaining the existing workforce has been identified as more cost-effective than recruiting new workers resulting in employee turnover, a subject of paramount importance, in both industry as well as academic studies.

Despite being a globally recognized subject, the Sri Lankan garment industry is struggling to leverage cutting-edge technology to resolve the pertaining problem and strategically retain its human capital. Instead, they rely on their gut instinct that the “employee won’t leave”, and take serious measures to retain them, only when they announce their termination, which is a state that is too late to successfully address the problem. This situation is highly problematic in the garment sector as it is highly labor intensive thus the turnover of employees directly affects the business growth. Furthermore, the turnover of apparel personnel often come by surprise as they do not have a culture of providing letters of resignation, instead, obtain unnotified leaves and eventually turnover.

This dissertation focuses on utilizing data mining and machine learning techniques to implement a turnover prediction solution. Through the extensive literature review author analyzed current systems’ features, algorithms and limitations using a generic assessment criterion. Critical findings from the literature were then discussed with industry experts via questionnaires and interviews to identify how to develop a solution avoiding the identified limitations, that can be put into practical use in the local apparel context.

Using a real-life data set, author has incorporated techniques to optimally predict the turnover probability and the time till turnover of employees. Pre-processing tasks such as scaling, class imbalance handling was incorporated and hyper parameter tuning were also conducted for higher accuracy. Classification techniques identified through literature were used to predict the turnover and regression techniques were used to predict the time till turnover of employees. Extreme Gradient Boosting classifier displayed the the highest F1 score of 68.49% out of the classification techniques whereas Support Vector Regressor performed the best out of the regression techniques that were selected. Based on the created models, author has incorporated a functionality to recommend personalized retention mechanisms for each employee based on