

# “Venture Capital Investment Decision Making using Machine Learning Models”

Shuchita Jain

## ABSTRACT

The venture capital (VC) and Private equity (PE) industry is a flourishing industry filled with thriving opportunities to invest. Although, investment in such start-ups is circumscribed by the risk of failure or inadequate returns. Thus, for long investors have been working on tools and techniques to supplement their knowledge to make accurate decisions. In this direction, machine learning techniques have gained momentum over recent years. The aim of this study is to build an accurate Machine learning model to classify start-ups (SaaS and non-SaaS) based on their attributes and predict whether they will be successful or not. The research adopts a mixed methods approach incorporating both.

Supervised and unsupervised machine learning techniques are used to build a robust Models to investigate the relationship between the explanatory variables and outcome. The data is gathered from a real Private Equity investor. The model is built for 38 companies with 26 parameters. Data is gathered by Venture capitalist-Mr Vinay from his experience and provided for this research. Firstly, PCA analysis and LASSO Regression is implemented for dimension reduction companies and then they are clustered using K-means clustering. It is followed by fitting of various supervised Machine learning algorithms like SVM, Naïve Bayes, Multinomial Logit Regression, Linear Discriminant Analysis, Decision Tree and K-NN is fitted on data. Finally, all the models are evaluated using Accuracy measures, confusion matrix and classification report.

Results provided from K-means, Bernoulli NB and LDA are quite accurate. It can be concluded that machine learning can support venture investors in their decision-making processes to find opportunities and better assessing the risk of potential investments.

**Keywords:** Machine learning, Venture capital, Supervised, Unsupervised, Regression