

## **Developing Procurement Strategy by Applying Classification Algorithms for Effective Supplier Assessment**

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The manufacturing sector ranks one of the top spots in the 2018 Kansas economy and this projection is predicted to continue with 0.5% growth in 2019. Within the manufacturing sector, aerospace is ranked fourth in Kansas with over 30,000 workers. Almost 44% of Kansans work for small businesses (less than 50 employees) and this percentage is expected to increase with the effective assessment of the suppliers in the supply chain network of the business in Kansas. This research aims to provide a comprehensive and robust assessment process for suppliers. Therefore, we propose the use of supervised machine learning algorithms to classify various suppliers into four categories: excellent, good, satisfactory, and unsatisfactory. In this research, supervised learning (classification) algorithms are applied to a supplier assessment problem where a model is trained based on the previous historical data and then tested on the new unseen data set. This method will provide an efficient way for supplier assessment that is more effective in terms of accuracy and time when compared to the multi-criteria decision-making approach. Classification algorithms such as support vector machines (with linear, polynomial and radial basis kernels), logistic regression, k-nearest neighbors, and naïve Bayes methods are used to train the model and their performance is assessed against a test data. Finally, the performance measures from all the classification methods are used to assess the best supplier in any business in Kansas.