

Evaluating The Competencies of Incubation Firms by Using PCA and K-Means Clustering: A Case Study

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Abstract

In this research, a survey consisting of 112 questions, 96 technical and 16 general, was prepared to analyse the entrepreneurial ecosystem as a result of the literature research on entrepreneurship. All questions were directed to the entrepreneurial firm officials participating in the research from different regions in Türkiye, and a statistical database was created from the answers received. The survey consists of three sections: personal information of the entrepreneur, information about the entrepreneurial firm, and a technical analysis section where the entrepreneur firm is evaluated. Within the scope of the research, a survey was applied to 304 incubation firms. Related decision variables in the questionnaire are used to evaluate the performance of the entrepreneurial firms based on the clusters. Cluster analysis is applied to the research data to evaluate and group the entrepreneur firms. The general entrepreneur profile in the research is obtained with basic statistical analyses and descriptive statistics; incubation firms are grouped according to their performances in terms of the determined variables with Principal Component Analysis (PCA) and K-Means Cluster Analysis. The study aims to statistically evaluate the competency levels and performance of entrepreneurial firms by comparing them in different clusters. All performance results are evaluated and firms are analysed based on the entrepreneurial ecosystems. The study tries to analyse entrepreneurial firms by using K-means clustering with the PCA method. In the research, the competency evaluations of entrepreneurs are also interpreted depending on the performance clusters.

Keywords: entrepreneurship; innovation; performance analysis; statistical analysis; startups