Detecting mutual configurations of applied planning strategies and performances in small and medium sized businesses with kernel based machine learning methods

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Abstract

The aim of this paper is to investigate the impact of strategic planning on service small and medium size enterprises' (SMEs) performance. A machine learning methodology, based on an alternating diffusion process, is applied for organizing the SMEs into a network/graph, and generating management profiles. The method relies on ideas from non-linear dimensionality reduction, where a data-set is parameterized by a small number of intrinsic parameters. Recent advances in this field allow for the construction of a common intrinsic representation for two related dataset by using kernel multiplication. In this work, the method is applied to two related datasets that describe a business from two angles: strategic planning and performance. The goal is to reveal underlying hidden strategic patterns that influence SMEs’ performance.

The proposed methods are applied to a dataset containing planning and performance measures of 467 businesses. The obtained model yields an SME graph, where SMEs that share similar planning strategies and performances are located close to each other. Thus, the model generates typical strategic planning and performance profiles, describing distinct groups of SMEs. The study reveals two different planning strategies emphasizing different management approaches that lead to successful performance. Thus, in service SMEs there is more than one way to enhance performance via management strategy. Differentiating between various planning strategies was enabled by utilizing...
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