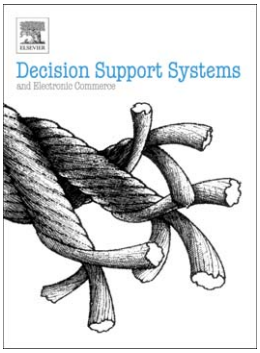

A Bayesian approach for incorporating expert opinions into decision support systems: A case study of online consumer-satisfaction detection

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A Bayesian approach for incorporating expert opinions into decision support systems: A case study of online consumer-satisfaction detection

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Abstract

Interest in the use of (big) company data and data-mining models to guide decisions exploded in recent years. In many domains there are human experts whose knowledge is essential in building, interpreting and applying these models. However, the impact of integrating expert opinions into the decision-making process has not been sufficiently investigated. This research gap deserves attention because the triangulation of information sources is critical for the success of analytical projects. This paper contributes to the decision-making literature by (a) detailing the natural advantages of the Bayesian framework for fusing multiple information sources into one decision support system (DSS), (b) confirming the necessity for adjusted methods in this data-explosion era, and (c) opening the path to future applications of Bayesian DSSs in other organizational research contexts. In concrete, we propose a Bayesian decision support framework that formally fuses subjective human expert opinions with more objective organizational information. We empirically test the proposed Bayesian fusion approach in the context of a customer-satisfaction prediction study and show how it improves the prediction performance of the human experts and a data-mining model ignoring expert information.

Keywords: knowledge fusion, expert system, domain knowledge, classification, Bayes, text mining, location commensurate power prior