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# Job satisfaction: An evaluation using a fuzzy approach

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**Abstract**

Complexity in organizations and their environments, and the rapid development of globalization has generated new interest in developing an understanding of how working individuals are satisfied with their jobs. Job satisfaction, which is a complicated multi-dimensional concept, has been a popular topic of research for many decades. The interest in this topic has been embraced by psychologists, management scholars, and more recently even economists. Unfortunately, in existing studies job satisfaction is investigated using only exact data not taking into account uncertainty and vagueness of obtained initial information. In this paper we suggest a fuzzy logic approach to the evaluation of job satisfaction taking into account that it is not always possible to deal with exact data or data with sharply defined boundaries. More specifically, we propose a fuzzy rule-based approach to evaluate the job satisfaction in an organization. The factors/facets of job satisfaction were collected through interviews. Due to the qualitative aspect of job satisfaction, we used linguistic choices in the questionnaires. The results are used to compose fuzzy rules as a model of the relationship between job satisfaction levels and the affecting factors/facets. A real-world job satisfaction evaluation problem is used to illustrate the suggested approach.


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*Keywords:* job satisfaction; fuzzy rule base; fuzzy IF…THEN model; interpolative reasoning.

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## 1. Introduction

Job satisfaction is probably one of the most widely discussed issues in organizational behavior, human resource management and organizational management (Giannikis et al., 2011; Markovits et al., 2014; Mohr et al., 2007). The interest in this topic has been embraced by psychologists, management scholars, and more recently even economists. This is due to the fact that most individuals spend a considerable part of their lives at work and a thorough understanding of job satisfaction is the key to improving the well-being of working individuals. It is therefore appropriate to say that managers, supervisors, human resource specialists, and employees, are all concerned with ways of improving job satisfaction.

Job satisfaction has been defined in a variety of ways. The definition provided by Locke (1976) is "a pleasurable or positive emotional state resulting from the appraisal of one's job experiences", is probably one of the most widely used definitions found in the job satisfaction literature. In general, however, it can be said that job satisfaction is an affective reaction to a job that results from the person's comparison of actual outcomes with those that are desired, anticipated, or deserved (Oshagbemi, 2000).

The application of fuzzy logic to the evaluation of job satisfaction in an organization was considered by Mahdavi et al. (2011). The authors attempted to use STRATA technique, fuzzy rules and a job satisfaction matrix in their evaluation of job satisfaction. However no concrete rule base, reasoning method, or computing procedures were used in the study. Rasmani et al. (2007) proposed the use of fuzzy sets to represent linguistic terms for a Likert-type scale and employed the technique using fuzzy conjoint method in the evaluation of job satisfaction. An application of fuzzy logic to job satisfaction problems were also considered by Gupta et al. (1998). The academic performance of students was evaluated and investigated using fuzzy IF…Then rules by Rasmani et al. (2006). Yuzainee et al. (2013) recommended the use of fuzzy sets to represent linguistic terms in Likert scale. In order to evaluate employers' satisfaction levels towards graduates' performance the fuzzy conjoint method was applied by Crocetta et al. (2007). The authors proposed a fuzzy approach to measure the degree of satisfaction felt by graduates in regards to the suitability of their university education for working purposes. In the study conducted by De Battisti et al. (2013) the fuzzy set theory was applied to define a measure of subject satisfaction relating to every social aspect (quality of life, job, a service, etc.). Souza-Poza et al. (2003) examined how individuals determine their job satisfaction based on changes in situational factors. A simulation model, using Fuzzy Set Theory and System Dynamics, was used.

Unfortunately, existing studies regarding job satisfaction is investigated only through the use of exact data and do not take into account the uncertainty and the vagueness of obtained the initial information (Aliev et al., 1993; Aliev et al., 2010). Indeed, job satisfaction and its affecting factors are of qualitative nature. As a result, a job satisfaction evaluation problem is characterized by perception-based information rather than measurement-based information. Such information often has a linguistic representation for which fuzzy logic-based formalization is more adequate. Also, the structure of the relationship between job satisfaction and its affecting factors (the number of which is high) is complex and not exactly known in order to utilize a classical precise formalization. In this respect, fuzzy IF-THEN rules can be a more adequate and computationally effective basis. Although numerous studies have utilized fuzzy logic, there are unfortunately no studies that describe in detail how to compute job satisfaction in the fuzzy environment. In this study we, for the first time, propose fuzzy IF…THEN rules model to compute job satisfaction in an organization taking into account its affecting factors. This fuzzy model provides an intuitive description of the relationship between linguistic values of job satisfaction index and its fuzzy valued effective factors.

The paper is structured as follows. Section 2 presents the necessary prerequisite material on operations over discrete fuzzy numbers. In Section 3 we outline the general framework of the evolution of the evaluation of job satisfaction using fuzzy IF…THEN rules and interpolation reasoning. In Section 4 we consider the application of the suggested approach to evaluating job satisfaction using real data. Section 5 concludes the study.

## 2. Preliminaries

Job satisfaction and many of its determinants are of moral, mental, and psychological nature. At the same time, they are characterized by imprecision of linguistic evaluation. In view of this the use of discrete fuzzy sets