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3 - Multi criteria methods used for assessing for companies' attractiveness

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Many researchers have studied about attractiveness of a company in business domain but survey after survey, reveals that there is always room for improvement. In this paper, human reasoning extraction is investigated to evaluate the attractiveness of each company resident in Belgium. The term attractiveness refers to the case that a company X pays attention only to customers preference to boosting employee satisfaction, help the company retain personnel and attract new employees. This leads to brand name improvement which allows the company to increase the sales of their products or services, remain competitive in the market and increase the employee productivity. These effects can be achieved if the company will focus and improve the factors that participants considered more important. Three Multi-Criteria Decision Making methods: Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), Analytical Hierarchy Process (AHP) and Weighted Sum Model (WSM) were deployed to identify and order the most important factors that influence the company competitiveness based in customer satisfaction. The challenging part of this study is the exploitation of "pure" knowledge from participants, the comparison of results and finally, the aggregation of all accomplished evaluations, without expert knowledge and consequently without weights and criteria. To accomplish this goal, we customized TOPSIS and AHP methods to deal with participants' consensus, without using common voting methods but methods based on MCDM. 14.585 questionnaires were gathered from people in Belgium and 349 companies, which were resident in Belgium, participated in this research. It is important to note that the respondents didnt have any information about the name of each company. The most significant factors were selected from respondents on the assumption that they wished to choose a company X to be employed in. The questionnaire was divided into two parts, Data Set 1 (DS1) and Data Set 2 (DS2). In DS1, participants gave their preference value only to five of the seventeen factors that consider more important. In DS2, participants had not any limitation for the factors' choice. Each participant had to split the amount of one thousand points to factors that they considered most important by giving more points to the most significant factor. Before ordering the factors, the first procedure was to clean the data in order to achieve the best results. As mentioned before, there is no knowledge about criteria, which are important to determine the ranking, especially in TOPSIS and AHP method. In this paper, each horizontal row of the decision matrix is allocated to one factor and each vertical column to one participants opinion. All participants had equal importance so no weights were required. The results have shown that rankings of seventeen factors (of thousands of participants opinions which were distributed in fifteen sectors), were similar in three methods. The five top factors that each company is interested to improve were at the top of the list. Since TOPSIS and AHP method was proved effective in our problem to rank properly the factors, we applied once again TOPSIS and AHP method to aggregate the people consensus in the final classification. In these cases, seventeen factors were used as an input (rows) in the decision matrix and fifteen sectors were inserted as columns and applied in DS1 and DS2. Fifteen rankings (one for each sector), that have been ordered with TOPSIS method, were aggregated into a final order, using TOPSIS method and other fifteen rankings that have been ordered with TOPSIS method, were aggregated into a single one, using AHP method. As noted in the final standings the top five factors or the most significant factors, are common in both different data sets. The purpose of the final ranking was to aggregate the common opinion (or else the consensus) and reflect the significant factors that need to improve when the company X cares about the attractiveness or wants to enhance the competitive advantage. The ranking of top 5 factors show that people prefer long term job security and competitive salary package more than offering of interesting jobs, financially sound and pleasant working environment. It also showed that people in Belgium prefer stability (long-term security) instead of jobs financially sound. However, this outcome is not surprising and it could be a direct result of the economic crisis.

4 - Inverse Multiple Criteria Sorting Problem

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