

Chapter 2

Improving Decision–Making in a Business Simulator Using TOPSIS Methodology for the Establishment of Reactive Stratagem

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ABSTRACT

This study combines Fuzzy Logic and multicriteria TOPSIS method for the selection, from three different alternatives, which machines of high productivity is more convenient to a construction company. The evaluation of each alternative is made through group decision making which identifies the most important criteria according to the requirements presented by the company. To assess the selected criteria in the TOPSIS method is weighted by a group of experts who, based on their experience and knowledge of this type of machinery, assess the relevance of these in the operation and functioning of the hydraulic excavator. Both qualitative and quantitative studies are used in this work, however the experts evaluate, through surveys based on Likert scale all the criteria in which they want to measure the perception. Data provided from the surveys is used for the construction and association of the groups of expert's opinion through the use of fuzzy sets to avoid ambiguity problems of the linguistic variables.

INTRODUCTION

The use of technology in business in a way helps a lot in making decisions, i.e. approaches to reality, figuring that we can have different scenarios, identifying the complexity of daily work that occurs in organizations within which can be found: industrial organizations, trade organizations for goods and services, public organizations, educational organizations, the nonprofit organizations. It is important and helpful to rely on a certain part in an organized and generally focused on the events that occur in

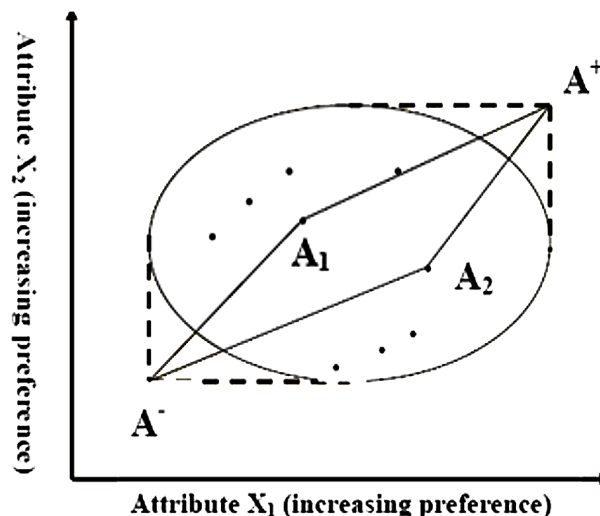
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business (Barnes, 1984). Thus the use of simulation as a system created to streamline decision-making and delineate the scenarios we can test and company information is certainly an advantage for employers who do business and turn all seeking profitability. A business simulator is a decisive intelligent tool, usually using Artificial Intelligence, which allows playback and feedback of a system. The simulators reproduce sensations and experiences that in reality may come to pass. A simulator is intended to play both physical sensations (speed, acceleration, perception of the environment) and the behavior of the machine equipment that is meant to simulate.

TOPSIS METHODOLOGY TO IMPROVE A BUSINESS SIMULATOR

Business Simulator is a learning tool and modeling which allows the entrepreneurial experience of creating and managing own business in an environment that does not risk money, a special situation which don't occurs in the real life. This will help you acquire the necessary experience to learn to distinguish the important from the unimportant when it comes to managing a business. Business Simulator can learn without risk –an important and transcendental factor in the real situations-, but empirically, it should not be done and what cannot be left to do. This is a systemic game in which the entrepreneur enters a simulator that behaves autonomously. Our actions affect others and those of others influence us. The entrepreneur must meet all the needs of your business: finance, marketing, sales, production, human resources, tax, competition, marketing positional and quality of services or products. An entrepreneur must learn to make decisions in a fog of uncertainty, should know to take advantage of the moments when all men doubt to gain competitive advantage. An entrepreneur must learn to calibrate each decision to understand the effect of short, medium and long term as in our Business simulator. See Figure 1. The chosen Alternative should have the shortest distance from the ideal solution and the farthest from the negative-ideal solution. It is very difficult to justify the selection of A_1 or A_2 . Each Attribute in the Decision Matrix takes either monotonically increasing or monotonically decreasing utility, a Set

Figure 1. Intelligent selection of stratagems using TOPSIS Methodology



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