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# Application of Combined SWOT and AHP: A Case Study for a Manufacturing Firm

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**Abstract**

Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis is a commonly used tool which examines strengths and weaknesses (internal factors) of a company or industry together with opportunities and threats (external factors) of the marketplace environment. SWOT analysis provides the basic outline in which to perform analysis of decision situations. In this study, the lack of determination of the importance ranking for the SWOT factors, we proposed to enhance SWOT analysis with multicriteria decision making technique called Analytic Hierarchy Process (AHP). AHP approach achieves pairwise comparisons among factors or criteria in order to prioritize them using the eigenvalue calculation. The aim of applying the combined method is to improve the quantitative side of strategic planning.



*Keywords: SWOT, AHP, Manufacturing*

## 1. Introduction

Good performance within a corporation is the result of correct interaction of business management with its internal and external environment. The descripton of internal strengths and weaknesses, as well as external opportunities and threats, takes place on the basis of a well-known technique called SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis [1]. SWOT analysis is a generally applying method for analyzing both environments in order to attain a systematic approach and support for a decisions. Moreover, SWOT includes no means of analytically determining the importance of the factors or of assessing the decision alternatives with respect to the factors [4].

In this study, a quantitative AHP based SWOT analysis has been proposed to determine priorities among SWOT factors systematically. The proposed method is obtained by performing pairwise comparisons between identified SWOT factors [12]. After that, comparison matrices analyzed by the

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eigenvalue method applied in the Analytic Hierarchy Process (AHP) for calculate priorities and assign the relative importance of each SWOT factor. This paper results show the usefulness of the SWOT-AHP technique in studying strategic decisions.

## 2. SWOT and AHP Model

### *2.1. SWOT Analysis*

SWOT analysis is a commonly used tool for analyzing external and internal environments simultaneously in order to acquire a systematic approach and support for a decision situation [3, 4, 5].

The internal and external factors most considerable for the company's future are referred to as strategic factors. In SWOT these factors are grouped into four parts called SWOT groups: strengths, weaknesses, opportunities, and threats. By applying SWOT in strategic decisions, the purpose is to select or constitute and implement a strategy resulting in a good fit between the internal and external factors [9]. Moreover, the chosen strategy has also to be in line with the current and future purposes of the decision makers [10]. SWOT analysis involves systematic thinking and comprehensive diagnosis of factors relating to a new product, technology, management, or planning. Figure 1 shows how SWOT analysis fits into an environment scan [29].

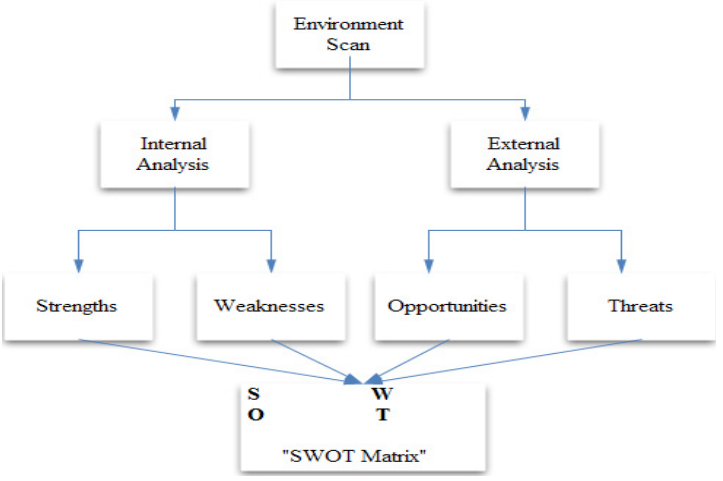


Fig. 1. SWOT analysis framework [29]

### *2.2. Analytic Hierarchy Process*

AHP is a multicriteria decision making technique that can help express the general decision operation by decomposing a complicated problem into a multilevel hierarchical structure of objective, criteria and alternatives [21]. AHP performs pairwise comparisons to derive relative importance of the variable in each level of the hierarchy and / or appraises the alternatives in the lowest level of the hierarchy in order to make the best decision among alternatives. AHP is a effective decision making method especially when subjectivity exists and it is very suitable to solve problems where the decision criteria can be organized in a hierarchical way into sub-criteria [22]

AHP is used to determine relative priorities on absolute scales from both discrete and continuous paired comparisons in multilevel hierarchic structures [23]. The prioritization mechanism is accomplished