



## A framework for strategy formulation based on clustering approach: A case study in a corporate organization



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### ABSTRACT

Recent corporate organizations are significantly more complicated than ever. They are more distributed and networked, as supply chains, virtual organizations and corporate arrangements. By increasing the complexity of the decision making in dynamic competitive environment, managers need relevant strategic plans for their firms. In this paper, a new framework for strategic formulation based on clustering approach has been proposed to cope with these intricacies. After exploring internal and external factors influencing the goals of the organizational departments, the goal–factor matrices are formed based on their correlations. A clustering approach is applied to integrate goal–factor matrices to fulfill incorporate interactions among departments. Strategies would be formulated for clusters instead of departments individually or as organization totally. In fact, management by objective (MBO) has been substituted by management by cluster (MBC). The capability and usefulness of the proposed framework are shown through a case study in National Iranian Oil Company Training Center. Results indicate that the proposed strategic formulation outperforms other approaches and is very promising not only for solving the organization's problem, but also is appropriate for utilizing in other corporate organizations.

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### 1. Introduction

The role and importance of strategy formulation in corporate organization is a keen subject of challenging area for both academics and practitioners. Due to frequent and significant environmental changes and enhancing complexities in organizational structures, strategy formulation has become more sophisticated in practice. Therefore, generating effective strategies are a critical issue for strategic managers. A corporate organization consists of multiple departments which act individually for achieving organizational goals through departmental goals. Departments may have different goals possibly with some conflict among them. Moreover, a great amount of internal and external factors as strength, weakness, opportunity and threat (SWOT) would be extracted from environmental survey. Consequently, strategy formulation for such organization is ever complicated than usual.

Many organizations utilize MBO approach with respect to the dynamic situation and rapid development. Although, they set goals for their departments in line of the organizational goals, the deviation from their departmental or organizational goals is most likely

to occur. So, in strategy formulation it is of importance to prevent the deviation issue. Accordingly, to overcome this and generating appropriate strategies, the process will be even more complicated and effort intensive. Hadighi and Mahdavi [1] utilized clustering algorithm for strategy formulation but there were several deficiencies namely, (1) the emphasis was on an organization with plenty of goals, and it does not satisfy the organizations incorporating several departments and possibly with some conflicting goals, (2) by utilizing Mahalanobis Taguchi Systems some factors were eliminated which may cause losing a set of variables improperly, (3) the interactions among factors of one department relating to other departments based on organization goals were not considered. But, in this paper first the clusters in an individual department would be configured and then expand to the whole organization, and (4) since the experts were from different sections of organization (not departments), there were plenty of factors and goals with diverging ideas, so there were significant conflicts among them and for overcoming this issue here, first we collected ideas from intra-department and then after promotion of generated clusters in departments, the clusters have been integrated till the consensus is achieved among experts. In fact the convergences of idea at this stage took place.

In this paper, for overcoming the problems stated above a framework based on clustering algorithm has been proposed for

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strategy formulation of corporate organization. By considering the complexities and obstacles and in accordance with correlations among factors and goals in each department the factor–goal matrices would be formed. Based on the matrices the relevant departmental clusters are generated. Having promoted the generated individual clusters, organizational clusters' integration will be performed. Then, we formulate the strategies based on the generated integrated organizational cluster. This framework assists to mobilize utilities from human to material resources in achieving organizational goals. The main contribution of this paper could be highlighted as follows:

1. Proposing a new framework for strategy formulation based on the clustering approach.
2. Presenting a new clustering method based on the correlation between departmental factors and goals.
3. Proposing a new MBC approach instead of MBO approach to prevent deviation of departmental goals from organizational goals.
4. Maximizing utilization of resources by integrating departmental goals as a set of organizational goals.
5. Considering the interaction among all factors and goals of the organizational departments, comprehensively.

The rest of the paper is organized as follows. Section 2 provides a review of the literature on strategic formulation and clustering techniques. Section 3 presents the proposed clustering method of the strategy formulation. In Section 4, the framework of the strategy formulation is described. Section 5 explores the implementation process of the proposed framework for strategy formulation in the Mahmoudabad Training Center as well as the corresponding experimental results. To evaluate the proposed method against contemporary approaches, Section 6 includes validation and comparison. Finally, Section 7 provides concluding remarks.

## 2. Literature review

Literature on strategy and organization theory emphasized, for a long time, on the environment of the firm as a major source for managers in charge to detect emerging factors and to respond on time [2–5]. SWOT analysis is an important supporting tool for decision-making, and is commonly used to systematically analyze organizations' internal and external environments. However, one

of its deficiencies is in the measurement and evaluation of prioritization of the factors and strategies [6].

The term “environmental scanning” became widely used to the search for information about emerging drivers “in a company environment, the knowledge of which would assist top management in its task of charting the company's future course of action” [7]. A large set of future-oriented techniques and methods have been developed and applied including strategy formulation [8–10], roadmaps [11–13] and scenarios [14,15] are by far the most popular ones [16].

The way organizations formulate strategy has become one of the most congested areas of debate in the strategic management field. In the conventional approach, strategy development is mainly the result of a systematic, rational process of deliberate planning by a top management team, which is then communicated to the organization for implementation. In large companies, this process typically occurs through formal strategic planning systems [17]. Strategy formulation is sometimes referred to as determining where you are now, where you plan to go, and finally how to get there. It consists of performing a situation analysis, self-evaluation and competitor analysis in both inside and outside the organization, while setting the objectives concurrent with the assessment. Many approaches and techniques can be used to analyze strategic cases in the process of strategic management [18], such as the traditional SWOT analysis [19], analytical SWOT method [20], resource-based view [21,22], and quantitative SWOT methods [23,24], fuzzy quantified SWOT [25], are used to support decision making in competitive environment in a given organization. The development of strategic management has been summarized in Table 1.

According to Table 1, authors refer to the factors influencing the organization, particularly in SWOT method, but they do not directly specify how, according to the long range goals, these factors would be refined and assessed. Accordingly, in the case of great amounts of factors and presence of homogeneity or conflict among them it would be very complicated in handling all these data. Here, for overcoming this issue we took advantages of clustering method being part of data mining subject. After emerging computer technology and cyber space, the science of data mining has been evolved and spread in different field of knowledge. Clustering is an attractive and important technique in data mining that is used in many applications. Clustering refers to grouping data objects so that objects within a cluster are similar to one another, while objects in different clusters are dissimilar [45].

**Table 1**  
Strategic management development.

Area	Authors	Contribution	Rationale	Method
Beginning of strategy in business	[26,27]	Mission and policy of business organizations in designing strategy	Strategy as a response to what the business is and what it should be	Quality of senior managers team
Definition of strategy	[28–31]	Corporate strategy, planning and growth	Strategy as a rule for making decisions	SWOT; experience curve; growth share matrix Value chain
Conceptualizing strategic management	[32–34]	Strategic management content and process	Evaluation and implementation of critical aspects of formulated strategy	
Industrial organization economics view of strategy	[35,36]	Competitive advantage development	Five forces analysis of industry attractiveness to develop competitive advantage through generic strategies	5 Forces model strategic choices
Resource-based view of strategy	[37–40]	Resources and capabilities development	Valuable, rare and costly to imitate resources without close substitutes can be sources of sustained competitive advantage	Core competence value system; game theory
Application of cluster analysis in strategic management				
New paradigm for strategic management	[41–44]	Learning, knowledge and innovation	Dynamic strategic model by which firms obtain valuable information, create knowledge and accumulate intangible capabilities in a process of learning	New integrated information technology systems

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