QUANTITATIVE STUDY OF CRITICAL SUCCESS FACTORS IN THE SUPPLY CHAIN OF THE TOP IRANIAN PHARMACEUTICAL DISTRIBUTION COMPANIES USING A HYBRID METHOD

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Abstract. Strategies, innovations, and well-planned activities will lead to competitive advantage and improvement in business performance of companies. In today's highly competitive global market, supply chain management plays a central role and it is recognized as a key factor for sustainable competitive advantage. This research aims to investigate the way of using supply chain management by drug distribution companies in Iran and its role in the success and competitiveness of companies. The method used in the research is a hybrid quantitative method. Data collection has been performed in depth interview with 30 experts from the top Iranian pharmaceutical distribution companies. Then, some categories have been extracted and the effects of underlying conditions and intermediate conditions on strategic factors of the development strategy have been determined; moreover, the research determines the consequences of strategic categories in the form of coded paradigm. Questionnaires were distributed among the top 16 pharmaceutical distribution companies and the extracted model from the qualitative section has been tested using partial least squares software. Finally, the model and the hypotheses have been confirmed.

Keywords: supply chain management, critical success factors, critical success factors in supply chain.

Introduction. The rapid and inevitable changes of the world today due to the global phenomenon and the rapid progress of science in the economic, social, political and industrial dimensions, especially, have brought about dramatic developments in the fields of information and communication in the last two decades. The speed and acceleration of these changes in various dimensions has led managers to improve the internal processes of organizations and companies in order to maintain the survival ability in a world that is more competitive every day. Organizations have been reviewing and revising their strategies in a variety of ways, and have found the cradle of survival in their customers' satisfaction. Therefore, competitive conditions, flexibility, and variety of products have been considered by manufacturing organizations. In this regard, one of the philosophies that have been considered is the supply chain management philosophy [1].

The customer's needs and interests can include price reductions, timely delivery, good quality, and so on. Supply chain management is an approach on which basis satisfaction of these needs is achieved not only through the final product delivery to the customer but also by other top suppliers. This sequence of suppliers in order to meet the needs of a customer is called the supply chain. Supply chain management integrates and coordinates all supply chain members. Planning can be done at all organizational and organizational levels. All these planning tasks can be categorized into four main supply chain processes for each partner, namely, procurement, production, distribution, and

References

sales. The process of "distribution" establishes the flow of materials an organization has with its suppliers and its customers [2]. The research emphasizes this section. Another important factor to be considered in this research is the analysis of critical success factors while these factors are used to identify the information needs of managers in a variety of industries. The critical success factors are the limited factors that play a critical role in the success of the organization, and if the organization wants to survive, it must provide them. In other words, each critical factor in the success of a field is one that should do its best to make the organization successful. These factors are essential requirements that must be met in advance as intermediate goals for achieving the main goal. Applying critical success factors and their accurate recognition can be the basis for determining the core competencies and supporting the competitive advantage of the organization [3].

The case of this study is drug distribution industry in Iran. Considering the importance of medicine in the healthcare system, its supply, distribution, maintenance, and proper use have a special place in the health care system. Hence, the activities of the drug delivery units, which includes drug stores and pharmacies, should be in accordance with scientific principles. Distribution of medicine is in fact one of the most important stages in the procurement and supply of medicines, which contribute to the safety of the community due to issues such as the usability of the drug, the timely and appropriate distribution and other related issues. Despite all the transparency in this industry, there are also a number of unfavorable behaviors in its distribution chain. While effective supply chain management with emphasis on the distribution sector can reduce costs to several effective points [4], few research has been done to measure and evaluate the competitive advantage achieved through supply chain management and to examine the critical success factors in each of the constituent parts of the chain. Supply chain management is not a static solution, but new techniques and improvements are increasing rapidly for supply chain management. Since research models and methodologies prove that critical success factors are valuable tools and approaches in supply chain management studies, the use of mathematical modeling techniques has been considered less and this area lacks these topics. Accordingly, this research tries to study such the depletion variables affecting the drug distribution chain. It will identify these variables and formulate how they affect the distribution chain performance and their correct operation. Therefore, the subject of this research is a new and innovative approach in the area of interest. The research questions asks about model of critical success factors in the supply chain of pharmaceutical distribution companies in Iran.

**Research Theoretical Foundations.** *Distribution and Procurement:* Management and delivery of products and services, including storage, warehousing, and air, land and water transportation [5]. *Supply chain:* It includes all related resources and activities required to create and deliver products and services to the customer [6]. *Supply chain management:* This includes supply and demand management, finding source of raw materials and components, production and assembly, distribution in all channels, and delivery to the customer [7].

**Critical success factors:** The critical success factors are a few things that need to go well in order to ensure the success of the manager or organization and, as a result, display the areas of management or company that need to be addressed continuously. The critical success factors include topics that are critical to the current operational activities of the organization and for its future success [8].

**Customer relationship management:** Management of technology, processes, information and individuals in order to maximize communication with each customer through the acquisition of a 360-degree customer view [9].

**Literature Review.** Table 1 reviews the work done in advance on the research subject.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Field / focus</th>
<th>Critical success factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothilal &amp; et al, [10]</td>
<td>Logistics (procurement) of a third party</td>
<td>Scope of services, industry focus, communication with a third party, investment in the information system, specialists in logistics (procurement) and integration in the supply chain.</td>
</tr>
<tr>
<td>Migdadi, [14]</td>
<td>Knowledge management capabilities and its results in small and medium enterprises.</td>
<td>Leadership and management support, culture, strategy and goals, assessment of organizational infrastructure, processes and activities, motivational propaganda, resources, education, and human resource management</td>
</tr>
<tr>
<td>Linder &amp; Wald, [15]</td>
<td>The critical factors of knowledge management in temporary</td>
<td>Culture and leadership (informal networks, error tolerance, project culture, management commitment), organization and process (knowledge management)</td>
</tr>
<tr>
<td>Farsijani &amp; Fallah Hosseini [16].</td>
<td>Identifying and prioritizing the effective factors of achieving supply chain management to the world class and providing appropriate solutions.</td>
<td>Management and leadership, foundations of business, employees, research and development, innovation, technology, sharing common objectives, flexibility, organizational performance evaluation, cost management, global customers, continuous quality improvement, global suppliers, creating and developing opportunities for alliance and collaboration, social responsibility.</td>
</tr>
<tr>
<td>Salami et al, [3]</td>
<td>Identification and evaluation of critical factors of science and technology parks in Iran from experts' point of view</td>
<td>The critical factors of the success of science and technology parks are twenty-eight factors in four groups including spatial factors, supportive factors, management factors, and cultural and social factors. Of the four groups, management factors are most important; among the identified factors, strategies, goals and specific programs, the mastery of managers in topics related to science and technology parks, the existing political atmosphere to support the park and its objectives, and the establishment of transparent and formal criteria for the acceptance, presence, evaluation and control of the activities of companies based in the park are most important.</td>
</tr>
</tbody>
</table>

**Research Method.** In this research, a questionnaire has been used to collect data. In this regard, a questionnaire has been developed based on codes derived from the analysis of the qualitative section and adaptation to previous research. Then, it was delivered to professors and people who have experience in the relevant industry. The questions have been examined in terms of clarity, relevance, and simplicity, and issues causing ambiguity have been corrected. Finally, a validated questionnaire with 134 items was distributed among the managers of the drug distribution chain. It should be noted that the questionnaire used in this research is a formative or constructive type, in which, the questions are not necessarily correlated, and each measures the variable from a specific angle [17]. In order to test the validity of developed structures, sampling is a simple and random random method. According to the Cochran formula, sampling was conducted among the experts of the leading pharmaceutical distribution companies that are effective to the critical success factors. According to the statistics obtained with the help of the formula, the sample size is 486. The demographic data were analyzed through the spss20 software, as well as the necessary pre-processing of the data before entering the main analysis stage. In the next step, Smart Partial Least Squares Regression (Smart PLS) software is used as a tool for analyzing structural equations to analyze the data of the questionnaire [17]. In this phase, the validity of questionnaires was investigated in the following ways:
- Face validity has been reviewed by the researcher himself, supervisors, advisers, and three sample members.
- Content validity is to ensure that all dimensions and components are present in the questionnaire, which can reflect the concept we are referring to; in this research, content validity was reviewed by supervisors and counselors as well as by two sample individuals in terms of relevancy based on the theoretical basis, the clarity, and simplicity of the items and usefulness.
- The construct validity (model) implies the degree to which the results obtained from the application of the questionnaire are consistent with the theory presented for study. This validity includes convergent and divergent validities.
- Convergent validity implies that each question converges with its own collection. That is, the indicators of measurement of each variable must be correlated.
- Divergent validity, meaning that the indices of each variable should differentiate or otherwise identify the indicators of the other variables, which are called differential or diagnostic validity. With the aid of three types of Nomological Validity (legal validity), a significance test of weights is performed to examine the convergent validity, and the test of suppression or inflation of variance for divergent validity (diagnostic) in this validity study [17].
- Reliability of the data is determined through evaluation of communality index [17].

**Results.** In order to test the extracted model from the qualitative stage, the data collected by the research questionnaire were examined and the results of the data analysis are presented by a multidimensional and systematic model of the critical success factors of the pharmaceutical distribution chain. At this stage, based on the extracted model, the following hypotheses have been extracted and examined by interviewing the experts (Table 2).

*Table. 2. Significance test of path coefficients (Significance hypotheses)*

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Hypotheses | Path Coefficient (β) | Significance of the coefficient (T-VALUE) | Result
---|---|---|---
H1: Causal factors influence on the development strategy of the pharmaceutical distribution chain management. | 0.761880 | 30.672667 | The hypothesis is confirmed with a probability of 99%.
H1a: Human resource development influences on causal factors. | 0.956744 | 170.023639 | The hypothesis is confirmed with a probability of 99%.
H1b: Organizational mechanisms influences on causal factors. | 0.881832 | 42.848489 | The hypothesis is confirmed with a probability of 99%.
H1b: Senior management support and commitment influence on causal factors. | 0.856790 | 33.099375 | The hypothesis is confirmed with a probability of 99%.
H2: The development of the drug distribution chain management strategy influences on the strategic factors. | 0.722252 | 25.998604 | The hypothesis is confirmed with a probability of 99%.
H2a: Establishing confidence among members of the drug distribution chain influences on the strategic factors. | 0.772579 | 26.844912 | The hypothesis is confirmed with a probability of 99%.
H2b: Managing customer demand (pharmacies) influences on the strategic factors. | 0.804832 | 26.359527 | The hypothesis is confirmed with a probability of 99%.
H2c: Sharing information between members of the drug distribution chain influences on the strategic factors. | 0.782001 | 27.885557 | The hypothesis is confirmed with a probability of 99%.
H2d: Effective partnership with members of the drug distribution chain influences on the strategic factors. | 0.923829 | 83.930929 | The hypothesis is confirmed with a probability of 99%.
H2e: Flexibility in the drug distribution chain influences on the strategic factors. | 0.755166 | 22.843811 | The hypothesis is confirmed with a probability of 99%.
H2f: Focus on pharmaceutical clients influences on the strategic factors. | 0.890314 | 48.420440 | The hypothesis is confirmed with a probability of 99%.
H3: Strategies for developing a drug distribution chain management strategy influences on the sustainable competitive advantage. | 0.890926 | 62.391823 | The hypothesis is confirmed with a probability of 99%.
H3a: Innovation in the drug distribution chain influences on the sustainable competitive advantage. | 0.805306 | 24.656225 | The hypothesis is confirmed with a probability of 99%.
H3b: Increasing quality of distributing pharmaceutical products influences on the sustainable competitive advantage. | 0.942326 | 93.143368 | The hypothesis is confirmed with a probability of 99%.
H3c: Increasing the efficiency of the drug distribution system influences on the sustainable competitive advantage. | 0.934373 | 103.032390 | The hypothesis is confirmed with a probability of 99%.

The test of the obtained model from the qualitative phase is investigated in the form of significance tests of hypotheses, R2 test Structural Model Quality Test, and Goodness of fit test in Table 3.

Table 3. Reliability and Validity of Variables

<table>
<thead>
<tr>
<th>Research variables</th>
<th>R2</th>
<th>Q² (CV-Redundancy)</th>
<th>CV-Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable competitive advantage</td>
<td>0.793750</td>
<td>0414769</td>
<td>0.527570</td>
</tr>
<tr>
<td>Managing customer demand(pharmacies)</td>
<td>0.647754</td>
<td>0.411576</td>
<td>0.646770</td>
</tr>
<tr>
<td>Flexibility in the drug distributions chain</td>
<td>0.570276</td>
<td>0.283365</td>
<td>0.479455</td>
</tr>
<tr>
<td>Human capital development</td>
<td>0.915359</td>
<td>0.457966</td>
<td>0.502746</td>
</tr>
<tr>
<td>Increasing quality of pharmaceuticals’ distribution</td>
<td>0.887978</td>
<td>0.559812</td>
<td>0.616185</td>
</tr>
<tr>
<td>Strategy Development Strategies in the Management of pharmaceutical distributions chain</td>
<td>0.521649</td>
<td>0.186828</td>
<td>0.385383</td>
</tr>
<tr>
<td>Establishing confidence among members of the drug</td>
<td>0.596879</td>
<td>0.283409</td>
<td>0.469757</td>
</tr>
</tbody>
</table>
Goodness of fit test represents the extent of model application in reality. The research model has gotten 0.577, which is strong enough.

**Discussion and Conclusion.** Strategies, innovations, and planned activities will lead to sustainable competitive advantage and, as a result, they improve business and brand performance. Just as companies are seeking a competitive advantage, they are also looking for new ideas and solutions. This research investigated the proposed competitive advantage and it revised the efforts of companies to achieve it. It focuses on one dimension of competitive advantage, namely, supply chain management to enhance business success. After analyzing the interview data based on Logic of Foundation Data Theory and formulating the primary framework for critical success factors, the research performed quantitative phase and confirmatory factor analysis to improve and determine the validity of the model; then, it the ultimate model presented as following (Figure 1).

![Ultimate Model](image)

**Figure 1. Ultimate model**

The results of the study show that the development of the pharmaceutical distribution chain strategy paves the way for a sustainable competitive advantage by influence on establishing confidence among members of the drug distribution chain, managing customer demand (pharmacies), sharing information with members of the drug distribution chain, effective partnership with members of the distribution chain, focusing on pharmaceutical clients, and flexibility in the drug distribution chain. Successful implementation of the core and sub-strategies of critical elements of supply chain success should be complementary policies to improve underlying conditions. Moreover, the required substrates, such as the development of infrastructure and applications of information technology should be regarded. Mediation conditions and "legal requirements" are special conditions for the emergence of consequences that should be considered. Finally, the consequences of strategy development plans for the drug distribution chain are innovation in the drug distribution chain, increasing the quality of distribution of pharmaceutical products, increasing the efficiency of the drug distribution system and, in general, the sustainable competitive advantage. Considering the central issue of
strategy development in the drug distribution chain, management needs to choose strategies that focus on customer needs, cost leadership, and quality to achieve sustainable competitive advantage and business success. In the area of distribution chain management, there are critical factors in the success of the distribution chain that support these strategies. These are the priorities that management needs to focus on. In this study, the critical success factors of the drug distribution chain have been identified and can be used as the first step for management to review and improve the company's strategies and the competitiveness of the drug distribution chain.

**Suggestions.** Researchers can better understand future research if the critical factors of the success of the distribution chain can be attributed to sustainable competitive advantage and business success. In addition, it is possible to conduct a comparison among different pharmaceutical distribution companies to uncover whether the critical success factors in different countries are similar or different. This information can help diverse drug companies to develop distribution chain strategies that will lead to sustainable competitive advantage and commercial success. Future studies can focus more on understanding the importance of the role of culture in terms of perceived value in the field of environmental issues and the development of technology infrastructure.

**References**