

RESEARCH ARTICLE

Open Access

Designing a Pattern the Innovative Brand in order to improve the Competitiveness of Iran's Petrochemical Industries Using Modeling ISM

Hamed Anvaripour¹, Farshid Namamian^{2*}, Fakhraddin Maroofi Naqhdehi³, Farhad Vafayi⁴

Abstract

The main purpose of this study is structural-interpretive modeling of industrial brand competitiveness in the petrochemical industry. This research is a qualitative-quantitative mixed exploratory research. The statistical population in the qualitative part of the research includes faculty members and experts in the field of industrial management, marketing and industrial brand, professor's familiar with the subject of research and managers and deputies with experience in petrochemical companies in the country using 16 snowball sampling method were chosen. In a small part, the statistical community includes personnel (managers, deputies and experts) of the marketing and sales department of petrochemical companies in the country. For sampling, due to the small size of the statistical population and the irreversibility of the questionnaires has been used the whole number and the whole population has been considered as a sample in a small part (N = 255). The research tool in the qualitative part of the interview is semi-structured and in the quantitative part the researcher has made a questionnaire. For data analysis in the qualitative part, fuzzy Delphi theme and technique analysis has been used and in the quantitative part, ISM technique has been used for data analysis. In the qualitative part of the research, a total of 14 variables were identified as factors affecting the competitiveness of the industrial brand.

Keywords: Competitiveness, Innovative brand, ISM, National Iranian Petrochemical Company

Introduction

Globalization of trade and economy and more dynamic competition have changed the role of customers in organizations. Today, organizations' view of customers is not just a consumer. Customers in today's organizations are accompanied and synchronized by the members of the organization in the production of goods and services, procedures and processes, development of knowledge and competitiveness. Therefore, effective and efficient management of customer relationship and creating and providing value to him is one of the most important topics of interest and attention of researchers and managers of organizations. (Alilou et al., 2021)

Competitiveness is one of the important issues that has been emphasized in recent years in the management and marketing literature and in this regard, different perspectives have been determined on the determinants of competitiveness. (fakhrehosseini and Isazadeh Roshan, 2020)

Just as a low-quality product in today's competitive world does not have the possibility of a long-term and stable presence in domestic and foreign markets, without creating strong brands, Iranian firms and companies will not be able to introduce their products and services and penetrate competitive markets. In addition, brands as a counter of products and services

¹ PhD Student, Department of Management, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran

^{2*} Assistant Professor, Department of Management, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran (Corresponding Author, Email: farshidnamamian@iauksh.ac.ir)

³ Associate Professor, Department of Management, Faculty of Management, University of Kurdistan, Kurdistan, Iran

⁴ Assistant Professor, Department of Business Management, Kurdistan University, Sanandaj, Iran

provided by a country, the ground for business prosperity, increase capital they provide foreign investment and increase exports (ziyae, 2015). The ability of businesses or countries to generate export earnings is often seen as a key indicator of competitiveness and the ability to create wealth and prosperity (soltaninjad, 2021).

The issue of customer loyalty to the brand has become an important issue in strategic marketing today and organizations seek to attract loyal customers, thus the appropriate strategic plans have become extremely important. The loyal customers are like the assets of the organization that play an important and decisive role in the survival of the organization. (Falihatgar et al., 2021)

Currently, branding has a special place in the world's leading companies, to the extent that in some of these companies, brand management has replaced market development management. This is while the necessity of creating and developing the brand in Iranian economic enterprises has not been considered before and these enterprises do not have any share of 1100 billion dollars' worth of world famous brands (behboodi et al., 2022). Meanwhile, the category of branding in the petrochemical industry has different conditions. Given the increasing number of competitors domestically and internationally and offering new products to customers in different ways, having a brand in the petrochemical industry can lead to a competitive advantage. On the other hand, Iran's economy is in a situation where, on the one hand, it is under intense international pressure for trade liberalization, and on the other hand, for sustainable development, it is necessary to significantly develop non-oil exports and increase its share in total exports. Petrochemicals and its products can play a key role in the way (Liberali et al., 2013). Despite the large resources, capacities and talents, it seems that petrochemical companies, through proper support, guidance and management, can achieve an acceptable degree of competitiveness in global markets and the source of significant effects in improving the situation. Become Iran's

economy. Undoubtedly, having a brand and branding is very important in this industry. Because in the field of competition, units are successful whose names are known to the consumer and create trust in his mind and heart. Therefore, considering the importance of branding in today's competitive economy, the main purpose of this article is to design an industry brand competitiveness model using ISM modeling to increase competitiveness and stay competitive.

Definitions of Research Terms

Competitiveness: Competitiveness means the ability to force the customer to choose the company's offers against the offers of competitors (Safari and Ebrahimi, 2012).

Intensity of competition: The strategic management literature shows that managers formulate the strategies of the organization after considering the environmental trends.

Therefore, the key point is: How managers perceive and interpret competitive forces. Market conditions shape the nature and intensity of competition and affect industry dynamics.

Intensity of competition refers to a situation where there is a (high) number of competitors in the market and the lack of growth opportunities is very intense competition (Yoon et al, 2015).

Brand: A name, phrase, design, symbol or any other feature that characterizes a particular service or seller of a product that distinguishes it from other similar products and services (Schmitt, 2013).

Branding: Branding refers to the extent to which a company recognizes the importance of the brand as a valuable asset and focuses its strategy and marketing activities on developing strong branding capabilities. This concept was first defined by Urde (1994, 1999), and reflects the vital importance that senior management must place on branding. Branding in this sense is a way of thinking and a kind of organizational culture that ensures that the brand will play a dominant role in the company's strategy (Baumgarth, 2010).

The creation of informative content is one of the dimensions of brand marketing efforts in social networks. This aspect of marketing efforts, could significantly affect the three aspects of brand equity. These aspects include brand image, brand associations and brand quality. . (Kafilaleh et al., 2021)

Companies offer products and services that lead to unique experiences - these unique experiences play a prominent and important role in the development of a brand. Consumers and their habits cause the formation of tendencies that leads to branding that branding is an integral part of the choice that advertising helps to control and capture value. If we do not advertise, our branding products will get in the minds of consumers, but this branding will be different from what we are looking for. Consumers and their habits cause the formation of tendencies that leads to branding that branding is an integral part of the choice that advertising helps to control and capture value. If we do not advertise, our branding products will get in the minds of consumers, but this branding will be different from what we are looking for. Advertising has the greatest impact on the customer experience, Also, the mediating effect of customer experience management variable in the relationship between advertising and brand perception was greater than the direct effect of advertising on brand perception. (Kiyomarsi et al., 2021)

Internal branding: When organizational culture reinforces the creation of strong brands as a fundamental strategic goal, all members of the organization must work together to achieve this goal and institutionalize the importance of the brand. Therefore, companies must train and educate all their workforce at every level and in every area of the job they are working on, so that they become familiar with and support the brand identity and meaning. And fully understand its implications (Kim, & Hyum, 2010). Following an internal marketing approach, the goal of this process is for employees not to limit their relationship with the brand to a business exchange for monetization, but to develop

symbolic relationships with the brand and thus become "brand ambassadors" (Khamitov Et al., 2019).

From the aspect of newness and innovation: Considering that so far no research has been done in Iran to investigate the competitiveness of industrial brand in the petrochemical industry, and also there is no comprehensive research in the world to study the application and provide a structural-interpretive and comprehensive model for The competitiveness of the industrial brand has not been discussed, as a result of the current research, the percentage of filling the gap in the society in this field. In this research, according to the strategic plan of the country's petrochemical industry, one of its problems is the lack of competitiveness of Iranian brands at the international level; Studying, investigating and filling the research gap in this field has also been done.

The spatial scope of the research this research was conducted in the petrochemical industry and among 13 petrochemicals in the country, also the current research was conducted in the period of May 2017 to February 2018.

The main purpose of this study is to design an industrial brand competition model using ISM modeling of Iran's petrochemical industry and in this regard help to increase the level of knowledge and studies related to the industrial brand in order to enhance asset value and increase profitability by relying on competitiveness. In Iran's petrochemical industry, the study and study of the effect of variables affecting the competitiveness of the brand in the Iranian petrochemical industry and the prioritization and classification of factors affecting the competitiveness of the industrial brand in the Iranian petrochemical industry has been proposed .In order to help petrochemical industry managers to increase competitiveness by explaining the interpretive structural model and to help petrochemical industry managers as well as branding products and facilitating their relationship with the market through branding of Iran Petrochemical Company products.

Research Methodology

The present study is a combined qualitative-quantitative research with a structural-interpretive modeling approach. In terms of purpose, this research is also considered as applied research. In the qualitative section, the statistical population is experts (faculty members and experts in the field of industrial management, marketing and industrial brand, professors familiar with the subject of research and managers and deputies with a history of petrochemical companies). Since experts in the field of industrial branding are not clearly identifiable have been used targeted sampling and snowball sampling methods. The focus is on people who are more aware of the research topic. In addition to this method, the interviewees are then asked to introduce other experts who are experts in this field, which refers to snowball sampling in qualitative research. In this method, after identifying or selecting the first expert and expert, it was used to identify and select the second sampling unit. In the same way, other units of the sample are identified and selected. At the beginning, criteria for purposeful selection of experts were considered. Based on these criteria, a list of these experts was prepared to make the necessary arrangements for scheduling and conducting the interview. Expert criteria for entering the interview included the following:

- 1- Managers and deputies of marketing and sales department of Iranian petrochemical companies

- 2- Faculty members who had a long history in teaching related courses such as, industrial marketing, brand, etc.

- 3- Faculty members who have a history of research in the field of industrial brand, variables related to competitiveness, brand and branding, and this field was one of their research interests.

The statistical population of this research in the quantitative part includes the personnel (managers, deputies and experts) of the marketing and sales department of the country's petrochemical companies, whose number is 255

according to the statistics published by these companies. The sampling method in the qualitative part of the research is snowball sampling. The number of samples in the qualitative stage is according to the theoretical saturation level. In other words, the researcher has continued the interviews to the extent that more interviews did not lead to newer data and no more knowledge was obtained about identifying the characteristics of the industrial brand and also developing its model. Therefore, if more interviews do not lead to more data and the previous data is repeated, the researcher will stop the interviews. In the quantitative part of the research, according to the population size ($N = 255$), 175 people were selected to select the sample size using Morgan table. Sampling method in the quantitative part of the research is stratified sampling. In the qualitative stage, after in-depth review of the theoretical literature of the research, protocols and interview questions were designed to collect information. Therefore, the method of data collection in the qualitative stage of this research is interview. The data collection tool in the quantitative phase is library studies and questionnaires. Through library studies, secondary data are obtained, which are reviewed by the researcher before starting the research. The sources of this data are: Data in past documents, official and unofficial statistics, books, English and Persian articles, dissertations and websites. To evaluate the validity in the qualitative part has been used triangulation or three-way analysis of data sources and peer review. To evaluate the reliability in the qualitative part has been used the definition of terms and external and internal status. Content validity has been used to check the validity in the quantitative part and Cronbach's alpha coefficient has been used to check the reliability in the quantitative part. All coefficients have been higher than 0.70 and it is a sign of confirmation of the reliability of the quantitative part tool.

Interpretive Structural Modeling

Interpretive Structural Modeling (ISM) is a way to design a pattern of complex and multiple relationships between variables of a phenomenon. This method is a kind of structural analysis based on an interpretive paradigm. The purpose of this method is to identify the relationships between the underlying variables of a multifaceted and complex phenomenon and is suitable for management and social science studies. Designing an interpretive structural model (ISM) is a way to examine the effect of each variable on other variables; this design is a comprehensive approach to measuring communication and this design is used to develop the model framework to make the overall objectives of the research possible.

Determination of the Variables

Interpretive structural modeling begins with a list of variables that are relevant to the problem or subject. These variables are obtained from the study of the subject literature, interviews with experts or through a questionnaire (Akroun & Nagy, 2018).

Obtaining a structural self-interaction matrix

This matrix is a matrix with the dimensions of the variables that are listed in the first row and column of those variables, respectively. Then the two-by-two relationships of the variables are determined by symbols (Akroun & Nagy, 2018). The structural self-interaction matrix is formed based on the discussions and opinions of a group of experts (Brown et al., 2007). To determine the type of relationships, it has been suggested that it be used by experts based on various management techniques, including brainstorming and nominal grouping techniques, etc. (Etikan et al., 2016). The following symbols can be used to determine the type of relationship:

Table 1.

Conceptual relations in the formation of structural self- interaction matrix (Hennig-Thurau et al, 2010)

symbol	concept of symbol
V	i leads to j. (Row leading to column)
A	J leads to i. (Column leads to row)
X	There is a two-way relationship i and j
O	There is no valid relationship.

Obtain the achievement matrix

By converting the SSIM matrix relationship symbols to the numbers zero and one, the matrix can be accessed. These rules have been stated (Jetish Takar et al., 2007).

Table 2.

How to turn conceptual relations into numbers (Jetish Takar et al., 2007).

Conceptual symbol	J to i	i to j
V	0	1
A	1	0
X	1	1
O	0	0

Obtaining the achievement matrix

At this stage, the state of coexistence between factors should also be considered; If i leads to j and j leads to k, then i must lead to k Huang et al. Used mathematical rules to create consistency in such a way that the achievement matrix is power $(K + 1)$ of course, the matrix empowerment operation must be in accordance with the Boolean rule (Jetish Takar et al., 2007).

Determining the level of variables and forming a conical matrix

To determine the level and priority of variables, the achievement set and the set of prerequisites for each variable are determined. The access set of each variable includes the variables that can be reached through this variable and the prerequisite set includes the variables through which this variable can be reached. Then, the subscriptions of the access set and the prerequisites of all factors are determined, and if the access set is equal to the

subscription set of that factor (factors), it is considered as a high level. To obtain other levels, the previous levels must be separated from the matrix and the process repeated. After re-determining the levels, the received matrix is arranged in order of levels, and the new matrix is called a conical matrix (Jetish Takar et al., 2007).

Drawing the Chart

First, we sort the criteria according to the level according to the priority obtained from top to bottom. Using the matrix obtained from the received matrix sorted by surfaces, the structural model is drawn by nodes and lines. If there is a relation from *i* to *j*, it is indicated by an arrow from *i* to *j* (Jetish Takar et al., 2007).

MICMAC Analysis

The purpose of this analysis is to identify and analyze the influence and dependence of variables. In this analysis, the variables are divided into four categories according to the power of guidance and dependence: 1- Autonomous variables: which have weak leadership and dependence. These variables are relatively unconnected to the system and have little or no communication with the system. 2- Dependent variables: which have low conductivity, but are highly dependent. 3- Communication variables: which have high conductivity and high dependence. These variables are unstable, because any change in them can affect the system, and ultimately system feedback can change these variables again. 4- Independent changes: which have strong leadership, but weak dependence (Ravi et al. 2005).

Research Findings

In the qualitative part of the research, semi-structured interviews have been used to extract the factors affecting the competitiveness of the industrial brand in the petrochemical industry. In these interviews, in addition to university professors and managers with a background in Ilam Petrochemical Company, doctoral students

familiar with the subject of the researcher were also present. The final results obtained from the analysis of the interviews are reported in Table 1.

Step 1: Identify the variables related to the problem

In the qualitative part of the research, 14 factors were finally identified as variables affecting the competitiveness of the industrial brand in the petrochemical industry, which is shown in the table.

Table 3.

Factors Affecting on Industrial Brand Competitiveness in Petrochemical Industries (Source: Researcher Findings)

	Extracted variables
Industrial brand competitiveness in petrochemical industries	Brand differentiation
	Exploratory marketing
	customer relation management
	Commercialization of innovation
	Brand management system
	Innovative marketing
	Strategic entrepreneurship
	Strategic pricing
	Technological opportunism
	Strategic knowledge management
	Inclusive quality
	Brand strength
	Strategic intelligence
	Brand attractiveness

Step 2: Formation of structural self-interaction matrix

The structural self-interaction matrix consists of dimensions and indicators and their comparison using four states of conceptual relations.

Step 3 and 4: Creating the initial and final access matrix

In order to achieve the initial availability matrix, the symbols mentioned in Table 2 must be converted to zero and one symbols. After the initial access matrix is obtained, the final access matrix is formed by entering the transferability in the variables. In this way can be done the next step of implementing the ISM methodology.

The results of using multiple relationships between variables are shown in Table 3, and the influence of each variable and the degree of dependence of each variable are also shown.

Table 4.

Accessibility matrix (Source: Researcher Findings)

Factors	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Influence
1. Brand differentiation	1*	1	0	0	1*	1*	1*	1	1	1	1*	1	1	1	12
2. Exploratory marketing	0	0	0	0	0	1	1*	0	1	0	0	0	1	0	4
3. Customer relationship management	0	0	0	0	0	1*	1	0	1	0	0	1	1	0	5
4. Commercialization of innovation	0	0	0	0	0	1	1	0	1*	0	1	0	1	0	5
5. Brand management system	1*	1	0	0	1	1*	1	1	1	1	1	1	1	1	12
6. Innovative marketing	0	0	0	0	0	1	1	0	1	0	0	0	1	0	4
7. Strategic entrepreneurship	0	0	0	0	0	1	1	1	1	0	1	1	1*	0	7
8. Strategic pricing	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
9. Technological opportunism	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
10-Strategic knowledge management	0	0	0	0	1	1*	1	1	1	0	1	1	1	0	8
11-Inclusive quality	1	1	1	1	1	1	1	1	1	1	1	1	1	0	13
12. Brand strength	0	1*	1	0	1	1	1*	1	1	1	1*	1*	1*	1*	12
13. Strategic intelligence	1	1	0	0	1	1*	1	1	1	1	1	1	1	1	12
14. Brand attractiveness	1	1	0	0	1	1	1	1	1	1	1	1	1	1	12
power of dependence	5	6	2	1	7	14	14	8	12	6	9	9	12	5	

Step 5: Determining the level of variables

In this step, the final received matrix is classified into different levels. To determine the level of variables (factors) in the final model, three sets of output, input and common were formed for each of them. The output set of a variable consists of the components of the system from which the component originates. To determine the output set of each component, the corresponding line must be checked. The number 1s in this row indicate the directional lines that come out of it. The input set of a

variable consists of the components of the system to which the component leads, to determine the input set of each component, the corresponding column must be checked. The 1s of this column indicate the directional lines that enter that component. After determining the input and output sets, the subscription of these sets is determined for each of the variables. In this way, a common set for each variable is obtained. To determine the rank of factors, those factors whose output is equal to their subscription set are placed at level one.

Table 5

Final accessibility matrix (corresponding to level 1) (Source: Researcher findings)

Factors	Inputs	Outputs	Common	Level
1. Brand differentiation	1-5-12-13-14	1-2-3-4-5-6-7-8-9-10-13-14	1-5-13-14	
2. Exploratory marketing	1-2-3-4-5-6-7-10-11-12-13-14	2-6-8-9	2-6	
3. Customer relationship management	1-3-5-7-10-11-12-13-14	2-3-6-8-9-	3	
4. Commercialization of innovation	1-4-5-7-10-11-12-13-14	2-4-6-8-9-	4	
5. Brand management system	1-5-11-12-13-14	1-2-3-4-5-6-7-8-9-10-13-14	1-5-13-14	
6. Innovative marketing	1-2-3-4-5-6-7-10-11-12-13-14	2-6-8-9	2-6	
7. Strategic entrepreneurship	1-5-7-10-11-12-13-14	2-3-4-6-7-8-9	7	
8. Strategic pricing	1-2-3-4-5-6-7-8-9-10-11-12-13-14	8-9	8-9	First
9. Technological opportunism	1-2-3-4-5-6-7-8-9-10-11-12-13-14	8-9	8-9	First
10-Strategic knowledge management	1-5-10-11-12-13-14	2-3-4-6-7-8-9-10	10	
11-Inclusive quality	11	2-3-4-5-6-7-8-9-10-11-12-13-14	11	
12. Brand strength	11-12	1-2-3-4-5-6-7-8-9-10-12-13	12	
13. Strategic intelligence	1-5-11-12-13-14	1-2-3-4-5-6-7-8-9-10-13-14	1-5-13-14	
14. Brand attractiveness	1-5-11-13-14	1-2-3-4-5-6-7-8-9-10-13-14	1-5-13-14	

After setting the technological opportunism and strategic pricing variables as level 1 to determine the other levels, the table is re-leveled

by eliminating the technological opportunism and strategic pricing criteria, the results of which are shown in the table.

Table 6.

Final accessibility matrix (related to level 2) (Source: Researcher findings)

Factors	Inputs	Outputs	Common	Level
1. Brand differentiation	1-5-12-13-14	1-2-3-4-5-6-10-13-14	1-5-13-14	
2. Exploratory marketing	1-2-3-4-5-6-7-10-11-12-13-14	2-6-	2-6	Second
3. Customer relationship management	1-3-5-7-10-11-12-13-14	2-3-6	3	
4. Commercialization of innovation	1-4-5-7-10-11-12-13-14	2-4-6	4	
5. Brand management system	1-5-11-12-13-14	1-2-3-4-5-6-7-10-13-14	1-5-13-14	
6. Innovative marketing	1-2-3-4-5-6-7-10-11-12-13-14	2-6-	2-6	Second
7. Strategic entrepreneurship	1-5-7-10-11-12-13-14	2-3-4-6-7-	7	

Factors	Inputs	Outputs	Common	Level
10-Strategic knowledge management	1-5-10-11-12-13-14	2-3-4-6-7-10	10	
11-Inclusive quality	11	2-3-4-5-6-7-10-11-12-13-14	11	
12. Brand strength	11-12	1-2-3-4-5-6-7-10-12-13	12	
13. Strategic intelligence	1-5-11-12-13-14	1-2-3-4-5-6-7-10-13-14	1-5-13-14	
14. Brand attractiveness	1-5-11-13-14	1-2-3-4-5-6-7-10-13-14	1-5-13-14	

After placing exploratory marketing and innovative marketing at the second level to determine other levels of the table, by removing

these two factors, it is re-leveled, the results of which are reported in the below table.

Table 7.

Final Accessibility Matrix Table (for Level 3) (Source: Researcher Findings)

Factors	Inputs	Outputs	Common	Level
1. Brand differentiation	1-5-12-13-14	1-3-4-5-10-13-14	1-5-13-14	
3. Customer relationship management	1-3-5-7-10-11-12-13-14	3	3	Third
4. Commercialization of innovation	1-4-5-7-10-11-12-13-14	4	4	Third
5. Brand management system	1-5-11-12-13-14	1-3-4-5-7-10-13-14	1-5-13-14	
7. Strategic entrepreneurship	1-5-7-10-11-12-13-14	3-4-7	7	
10-Strategic knowledge management	1-5-10-11-12-13-14	3-4-7-10	10	
11-Inclusive quality	11	3-4-5-7-10-11-12-13-14	11	
12. Brand strength	11-12	1-3-4-5-7-10-12-13	12	
13. Strategic intelligence	1-5-11-12-13-14	1-3-4-5-7-10-13-14	1-5-13-14	
14. Brand attractiveness	1-5-11-13-14	1-3-4-5-7-10-13-14	1-5-13-14	

After placing the commercialization of innovation and customer relationship management at the third level to determine the

other levels of the table, by removing these two factors, it is re-leveled, the results of which are reported in the table below.

Table 8.

Final Accessibility Matrix Table (for Level 4) (Source: Researcher Findings)

Factors	Inputs	Outputs	Common	Level
1. Brand differentiation	1-5-12-13-14	1-5-10-13-14	1-5-13-14	
5. Brand management system	1-5-11-12-13-14	1-5-7-10-13-14	1-5-13-14	
7. Strategic entrepreneurship	1-5-7-10-11-12-13-14	7	7	Fourth
10-Strategic knowledge management	1-5-10-11-12-13-14	7-10	10	
11-Inclusive quality	11	5-7-10-11-12-13-14	11	
12. Brand strength	11-12	1-5-7-10-12-13	12	

Factors	Inputs	Outputs	Common	Level
13. Strategic intelligence	1-5-11-12-13-14	1-5-7-10-13-14	1-5-13-14	
14. Brand attractiveness	1-5-11-13-14	1-5-7-10-13-14	1-5-13-14	

After placing strategic entrepreneurship at the fourth level to determine the other levels of the table, by removing this factor, it is re-leveled,

the results of which are reported in the table below.

Table 9.

Final Accessibility Matrix Table (corresponding to Level 5) (Source: Researcher Findings)

Factors	Inputs	Outputs	Common	Level
1. Brand differentiation	1-5-12-13-14	1-5-10-13-14	1-5-13-14	
5. Brand management system	1-5-11-12-13-14	1-5-10-13-14	1-5-13-14	
10-Strategic knowledge management	1-5-10-11-12-13-14	10	10	Fifth
11-Inclusive quality	11	5-10-11-12-13-14	11	
12. Brand strength	11-12	1-5-10-12-13	12	
13. Strategic intelligence	1-5-11-12-13-14	1-5-10-13-14	1-5-13-14	
14. Brand attractiveness	1-5-11-13-14	1-5-10-13-14	1-5-13-14	

After placing the strategic knowledge management in the fifth level to determine the other levels of the table, by removing this factor,

it is re-leveled, the results of which are reported in the table below.

Table 10

Final Accessibility Matrix Table (for Level 6) (Source: Researcher Findings)

Factors	Inputs	Outputs	Common	Level
1. Brand differentiation	1-5-12-13-14	1-5-13-14	1-5-13-14	Sixth
5. Brand management system	1-5-11-12-13-14	1-5-13-14	1-5-13-14	Sixth
11-Inclusive quality	11	5-11-12-13-14	11	
12. Brand strength	11-12	1-5-12-13	12	
13. Strategic intelligence	1-5-11-12-13-14	1-5-13-14	1-5-13-14	Sixth
14. Brand attractiveness	1-5-11-13-14	1-5-13-14	1-5-13-14	Sixth

After placing the brand differentiation, the brand management system, strategic intelligence and brand attractiveness in the sixth

level to determine the other levels of the table, by removing these 4 factors, it is re-leveled, the results of which are reported in the table below.

Table 11

Final Accessibility Matrix Table (for Level 7) (Source: Researcher Findings)

Factors	Inputs	Outputs	Common	Level
11-Inclusive quality	11	11-12	11	
12. Brand strength	11-12	12	12	Seventh

After placing the brand performance at the seventh level to determine the other levels of the table, by removing this factor, it is re-leveled,

the results of which are reported in the table below.

Table 12.

Final Access Matrix Table (corresponding to Level 8) (Source: Researcher Findings)

Factors	Inputs	Outputs	Common	Level
11-Inclusive quality	11	11	11	Eighth

Step 6: Formation of an interpretive structural model

After determining the levels of each factor and also considering the final availability matrix, the initial interpretive structural model is drawn. The final model is shown in Figure 4-6. The final model obtained formed of eight levels.

Factors at the top of the hierarchy are less important.

Formation of structural-interpretive model
 After determining the levels of each factor and also considering the final availability matrix, the initial interpretive structural model is drawn. The final model is shown in Figure 1. The final model obtained formed of three levels.

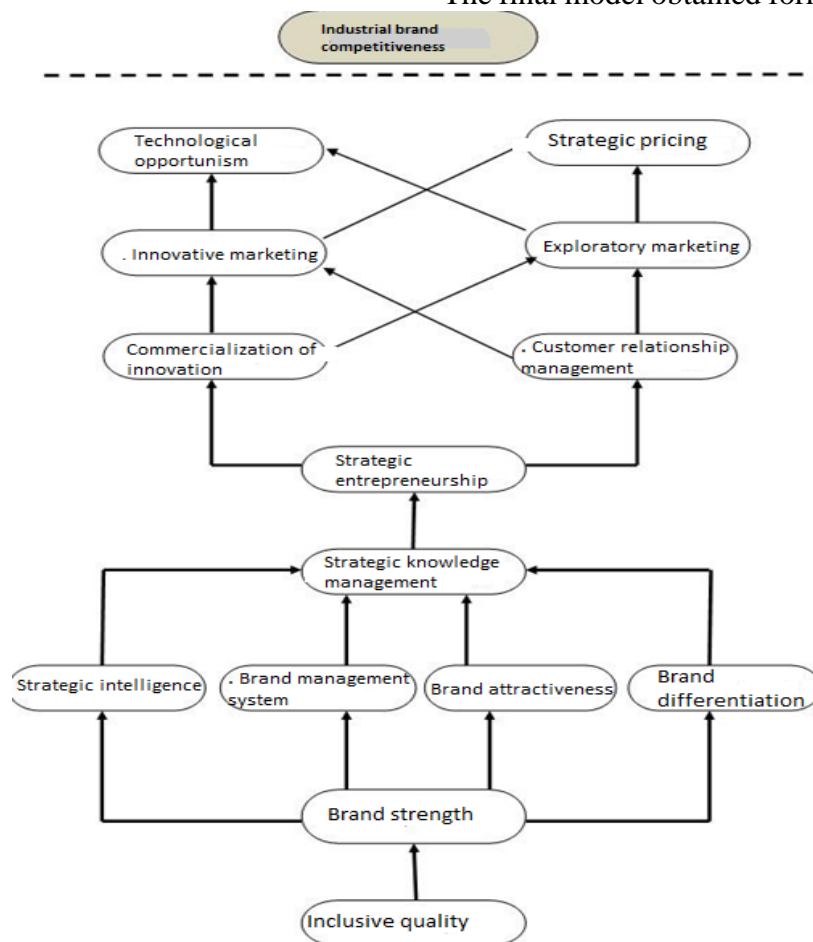


Figure 1. Structural-interpretive model of industrial brand competitiveness

After drawing the structural-interpretive model of industrial brand competitiveness by

using structural-interpretive modeling and availability matrix, the table of permeability-

dependency matrix is created and the variables are classified into 4 categories.

1- Autonomous variables: This category includes variables that have weak and moderate guidance and dependence. These variables are relatively unconnected to the system and have little or no communication with it.

2- Dependent variables: These types of variables have low conductivity but relatively high dependence. These variables are usually outcome or goal variables.

3- Linked variables: The third category are variables that have high conductivity and high

dependence. These variables are non-static, because any change in them can affect the system, and ultimately system feedback can change these variables again.

4- Infiltration variables: Variables that have high conductivity but low dependence.

The results of Mick Mac analysis showed that the ten elements of banking brand competitiveness in terms of permeability and dependency are divided into four categories of infiltrators, linkage, dependent and autonomous, which are reported below.

Table 13.

Summarizing the results of the quantitative section

	11		
	12	14-1	5-13
influence			10
			7
			4-3
			6-2
			9-8
			Dependence

The quantitative part of the research has been done in the form of three types of analysis. In this section have been used three methods of t-test, confirmatory factor analysis and structural model of identified factors. First, a one-sample t-test was used to evaluate the status of the identified factors in the statistical population. Then, using confirmatory factor analysis, the identified variables and their construct validity as well as their fit were confirmed. In this section were confirmed all the identified elements in the qualitative part of the research. In this section, it was found that all 14 main variables identified (which were presented as 14 variables affecting the competitiveness of the industrial brand) have a positive and significant

effect on the competitiveness of the industrial brand. 14 identified variables were classified into 8 levels.

Discussion and Conclusion

In this study, a total of 14 variables were identified for industrial brand competitiveness, which are: Technological opportunism, brand strength, brand differentiation, total quality, innovation commercialization, strategic entrepreneurship, exploratory marketing, innovative marketing, brand attractiveness, strategic knowledge management, customer relationship management, brand management system, strategic intelligence and strategic pricing.

Nowadays, the brand as an important organizational resource can act as a strategic point. By aligning organizational and environmental capabilities, the brand can lead to business development. Brand competitiveness is one of the important issues that has been emphasized in the management and marketing literature in recent years and this emphasis is due to the impact of competitiveness on the growth of national productivity and as a result the economic growth and development of countries and increasing welfare and living standards. Today's world and the need for economic development for a country like Iran, requires a study of competitiveness, especially in the field of industries that have a special role and place in the economy, including the petrochemical industry.

Competitiveness is currently a central issue in the world and it is mentioned as a means to achieve the desired economic growth and sustainable development. Competitiveness is one of the most important concerns of business and activity in today's dynamic and competitive environment. Today, the main asset of many companies is the brand of that company. Many academics and researchers today have stated that creating strong brands is one of the key factors in achieving a competitive advantage and ensuring the long-term survival of companies. The intensity of competition in the petrochemical industry has caused these companies to try to create a kind of brand differentiation in gaining a competitive advantage over their competitors. Brand differentiation has a competitive advantage for companies. According to Acker (2003), if one brand is not different from the others, customers have no basis or justification for choosing that particular brand over others. The aim of this study was to identify and categorize the factors affecting the competitiveness of the industrial brand in the petrochemical industry with a structural-interpretive modeling approach. After performing the steps of the structural-interpretive method, it was identified that 14

main factors that affect the competitiveness of the industrial brand

These 14 factors are: Technological Opportunity, Brand Strength, Brand Differentiation, Innovation Commercialization, Strategic Entrepreneurship, Exploratory Marketing, Innovative Marketing, Brand Attractiveness, Strategic Knowledge Management, Customer Relationship Management, Brand Management System, Strategic Intelligence and Strategic Pricing. They were categorized into eight levels: the first level (technological opportunism and strategic pricing), the second level (innovative marketing and exploratory marketing), the third level (innovation commercialization and customer relationship management), and the fourth level (strategic entrepreneurship) and in the fifth level (strategic knowledge management) and in the sixth level (strategic intelligence, brand management system, brand attractiveness and brand differentiation) and in the seventh level (brand strength) and in the eighth level (overall quality)

According to the obtained results, the following suggestions are provided for the managers of petrochemical companies to improve the competitiveness of their brand:

- ✓ Improving the quality of products to strengthen the market performance of the brand in order to attract and retain customers.
- ✓ Increasing brand equity through various means such as increasing perceived quality and also creating a strong structure in order to achieve brand value in the market.
- ✓ Creating a strong and long-term relationship with customers by providing quality products and reasonable prices.
- ✓ Apply new techniques and methods (such as new advertising) to improve the delivery of new and quality products to customers.
- ✓ Due to the high level of competition in the petrochemical industry, managers are advised to carefully monitor the behavior and activities of competitors to operate in these markets and use appropriate advertising, promotion and

pricing methods compared to their competitors.

- ✓ Offers
- ✓ The need to pay attention to the issue of brand and its competitiveness on the part of managers because brand competitiveness is an essential factor for petrochemical companies. The characteristic of this strategy is that it wins with the focus on service, seldom takes advantage of the brand's new marketing initiatives and measures, never or rarely advertises, and it is also very rare that a price war breaks out. They influence the consumers by manipulating the values of the products, visualizing and creating a favorable feeling, etc.
- ✓ Obviously, brand competitiveness is a power that many factors are involved in creating and shaping. In competitive markets, the key to the success of any company is the continuous development and promotion of brand competitiveness with the help of various resources and integrated capacities, and it is necessary for petrochemical companies to structure their brand competitiveness in such a way as to maintain this advantage. To lead, organize, compile and create competition.
- ✓ Raising the quality of products to strengthen the market performance of the brand in order to attract and retain customers.
- ✓ Increasing the power of brand stability in the target market through planning for customer loyalty and creating a favorable image among customers in the target market.
- ✓ In addition, it is very important that petrochemical companies, by developing appropriate processes, complement the information obtained from identifying and responding to customer needs (brand market performance) with information obtained from identifying and responding to technology (technology opportunism). . This is because the complementarity of these variables will be effective on strategic decisions related to the adoption of new technologies in business.

Research limitations and obstacles

- Due to the fact that the method of collecting

information was through semi-structured interviews with experts, due to the spread of the Covid-19 disease, the researcher has faced many limitations.

- Due to the spread of petrochemical companies across the country, the researcher has encountered many problems in collecting data.
- Due to the fierce discussion of the competitiveness of petrochemical companies at the country level and information monopoly, there is a lack of trust in providing data to the researcher. The lack of information transparency in the discussion of sales and exports - the negative perception and view of some people towards scientific research; time and budget limitations;
- Suggestions for future research
- It is suggested to conduct a research titled "Identifying the antecedents and consequences of industrial brand competitiveness".
- In this research, we used the structural-interpretive method, it is suggested to use the foundation data method.
- Examining this model in other statistical societies with regard to cultural differences, in order to generalize the findings of this research to other parts of the world and especially to other emerging economies that have great cultural and economic differences with Iran, more studies should be done.

References

- Akrout, H., & Nagy, G. (2018). Trust and commitment within a virtual brand community: The mediating role of brand relationship quality. *Information & Management*. <https://doi.org/10.1016/j.im.2018.04.009>
- Alilou, P., Saeednia, H., Badi Zadeh, A. (2021). Studying the Effective Factors in Brand Value Creation from the Perspective of Customers, Organizations and Stakeholders (Case study: Iranian Textile Industry). *Journal of System Management*, 7(4), 23-47. <https://doi.org/10.30495/jsm.2021.1943070.1548>
- Baumgarth, C. (2010), "'Living the brand": brand

- orientation in the business-to-business sector", *European Journal of Marketing*, Vol. 44 No. 5, pp. 653-671. <https://doi.org/10.1108/03090561011032315>
- Behboodi, O., ghafourian shagerdi, A., Mohammadi Kushki, A. (2022). The Impact of Brand Community Identities and Incentives on Brand Loyalty through Online Brand Interactions (Case Study: Pandora Brand Instagram Users). *Quarterly Journal of Brand Management*, 8(4). <https://doi.org/10.22051/BMR.2021.36527.2166>
- Brown, J., Broderick, A. J., & Lee, N. (2007). Word of mouth communication within online communities: Conceptualizing the online social network. *Journal of Interactive Marketing*, 21(3), 2–20. <https://doi.org/10.1002/dir.20082>
- Colabi, A., Yadollahi Farsi, J., Azizi, M. (2021). Identifying and Prioritizing Key Success Factors of Business Model. *Public Management Researches*, 14(54), 61-84. doi: 10.22111/jmr.2021.37610.5392. <https://doi.org/10.22111/JMR.2021.37610.5392>
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Fakhrehosseini, S., Isazadeh Roshan, Y. (2020). Assessing the Effective Factors on Improving Competitiveness in the Iran's Tourist Industry Using the Hybrid MCDM Approach. *Journal of Tourism Planning and Development*, 8(31), 219-232. <https://doi.org/10.22080/jtpd.2020.15500.2971>
- Falahatgar, S., Chamanzamin, M., Taleghani, M. (2021). The Effect of Competitive Advantage Strategies on Customer Loyalty: Mediated role of Brand Identification and Brand Awareness (Case study: Persian Insurance customers). *Journal of System Management*, 7(4), 229-252. <https://doi.org/10.30495/jsm.2021.1943132.1550>
- Hennig-Thurau, T., Malhotra, E. C., Friege, C., Gensler, S., Lobschat, L., Rangaswamy, A., & Skiera, B. (2010). The impact of new media on customer relationships. *Journal of Service Research*, 13(3), 311– 330. <https://doi.org/10.1177/1094670510375460>
- Jitesh Thakkar, S.G. Deshmukh, A.D. Gupta and Ravi Shankar (2007) "Development of a balanced scorecard an integrated approach of Interpretive Structural Modeling (ISM) and Analytic Network Process (ANP)". *International Journal of Productivity and Performance Management*. 56 (1). 25-59. <https://doi.org/10.1108/17410400710717073>
- Kafilaleh, Y., Bodaghi Khajeh Noubar, H., Motemani, A., Peyvasteh, A. (2021). Validation of the Pattern of Brand Marketing Efforts on Social Media with Customers in the Dermato-Cosmetic Industry. *Journal of System Management*, 7(3), 311-331. <https://doi.org/10.30495/jsm.2021.1942981.1544>
- Khamitov, M., Wang, X. & Thomson, M. (2019). How well do consumer- brand relationships drive customer brand loyalty? Generalizations from a meta-analysis of brand relationship elasticities. *Journal of Consumer Research*, 36(3): 330–309. <https://doi.org/10.1093/JCR/UCZ006>
- Kim, J. & Hyum, Y., (2010). A model to investigate the influence of marketing -mix efforts and corporate image on brand equity in the IT software sector. *Industrial marketing management*, 40(3), 424 -438
- Kiyomarsi, E., Saeednia, H., Alipour Darvishi, Z. (2021). The Effect of Advertising on Expectations and Perception of the Brand with Emphasis on the Mediating Role of Customer Experience Management in the Insurance Industry. *Journal of System Management*, 7(4), 183-204. <https://doi.org/10.30495/jsm.2021.1943472.1562>
- Liberali, G., Urban, G.L. & Hauser, J.R. (2013). Competitive information, trust, brand consideration and sales: Two field experiments, *International Journal of Research in Marketing*, 30(2), 101-113. <https://doi.org/10.1016/j.ijresmar.2012.07.002>
- Safari, S., ebrahimi, A. (2012). Measuring competitiveness of Iranian banks. *Iranian Journal of Trade Studies*, 16(64), 187-222. <https://dori.net/dor/20.1001.1.17350794.1391.1664.7.0>
- Schmitt, B. (2013). The consumer psychology of customer- brand relationships: extending the relationship model. *Journal of Consumer Psychology*. 23(2): 249-252. <https://doi.org/10.1016/j.jcps.2013.01.003>

- soltaninjad, M., Fathi Hafashjani, K., hashemzadeh, G., alirezaee, A. (2021). The Presentation of a Pattern for Service Design and Development Process with a Competitiveness Approach in Iran Banking Industry. *BI Management Studies*, 9(36), 71-113.
<https://doi.org/10.22054/ims.2021.55911.1832>
- Yoon, J., Yong Lee, H. & Dinwoodie, J. (2015). Competitiveness of container terminal operating companies in South Korea and the industry–university–government network, *Transportation Research Part A*, 80, 1-14.
<https://doi.org/10.1016/j.tra.2015.07.009>
- Ziyae, B. (2015). The Investigation of Relationship between Brand Trust and Brand Citizenship Behavior with Emphasizing on the Mediating Role of Brand Commitment in the Area of Entrepreneurship. *Public Management Researches*, 8(29), 27-42.
<https://doi.org/10.22111/jmr.2015.2304>