

Enhancing Strategic Positioning Through Marketing Engineering in Tourism Sector in Najaf City-Iraq

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Abstract--- *This research aims to identify the role of marketing engineering as an independent variable through its dimensions (marketing data and information, marketing insight, decisions and implementation) in enhancing strategic position as a dependent variable by its dimensions (customer co-production, customer contact and service customization). After reviewing the literature and conceptual framework, two main hypotheses were assumed to test the correlation and regression relationships between the study variables. An empirical study approach was utilised. This study was applied in the tourism organizations in Najaf city in Iraq. The study population consist of (233) managers in the hotels and tourism companies, the questionnaire was designed for collecting the data, and was distributed to (178) directors, and only (163) of them returned it. Besides that, 46 questionnaires were excluded due to missing data. Hence, (117) questionnaires remained and used in the statistical analysis using the statistical program (SPSS.V.20). The results showed a positive relationship and effect between the variables and their dimensions. Based on the results, a number of suggestions were given for the necessity for the tourism companies to practice the dimensions of marketing engineering in order to enhance their strategic positioning, and achieve sustainable competitive advantage. The contribution by this study can be realized that this study was conducted in the tourism companies in the city of Najaf which is considered as one of the most cities across the Iraq embracing tourists and visitors from the Middle East each year. In addition, no research has been found that examined the role of marketing engineering in enhancing strategic positioning.*

Keywords--- *Marketing Engineering, Marketing Information, Strategic Positioning, Tourism Organizations.*

I. INTRODUCTION

Nowadays, the majority of Iraqi tourism organizations are facing more challenges and difficulties due to the fact that their business in external environment is characterized by continuous mobility in their factors. To overcome and cope, most of hospitality companies are trying to focus on doing their business appropriately in order to stay longest in the competition environment. In response, managers must be responsible for analyzing competitors' strategic positions and comparing them with the strategic positioning of their companies. This is to reduce the gap between their organizations and other competitors and achieve strategic success through focusing on the customers, and emphasizing on their participation in the production after contacting them. Besides to provide services that meets their essential needs and wants. On the other hand, companies cannot reach to achieve these goals without their adoption of marketing engineering orientation, which is recognized as a modern marketing method. This enables them

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strengthening their strategic positioning in a way that leads to accomplish their marketing and strategic goals, based on investigating and using marketing data and information, insight of marketers, marketing decisions and implementation methods and plans properly. Therefore, the research problem of this study is formulated as a question which includes, 'Do the tourism companies in Najaf city/Iraq apply the dimension of marketing engineering effectively? And if yes, do they lead to enhance their strategic positioning?'

The scientific importance of this paper can be determined through seeking to study new variables which have not previously been examined together in the Iraqi business environment. It also attempts to enable the tourism organizations to improve their marketing and strategic situation, ambition to stay as long as possible in the business market, and review their competitive state to be able to reach the best condition by applying marketing engineering and strategic positioning.

Further, to the research problem and importance, there are two primary aims of this study. Firstly, to investigate the conceptual bases of the marketing engineering and strategic positioning, secondly, to examine the role of marketing engineering in strategic positioning

Therefore, this paper is organized as following: The first section discusses the theoretical framework and hypothesis development. The second section explains the methodology of the research. The next section presents the empirical aspect which covers the analyzing of the correlation coefficient and linear regression relationships between the study variables and the discussion of the results. Finally, the conclusion and suggestion is displayed.

II. THEORETICAL BACKGROUND

A. Marketing Engineering

1) The Concept of Marketing Engineering

Over the last twenty years, there has been a growing debate about the concept of marketing engineering. In the business world, accelerated developments have provided a set of tools which can enrich decision-making to support marketing management via marketing engineering, this is considered as an integrated approach to solve marketing problems through harnessing all the data and knowledge marketing in order to facilitate marketing decision-taking. According to Griffin and Hauser (1992) the marketing engineering examines all the marketing data which are collected from different levels of communication between occupations, teams, groups, suppliers, sales men, and so forth. This is vital to enhance harmony and communication concerning to perceive the needs and preferences that must be addressed and covered through the review and design of innovative products that meet these needs. While, Midgley (2002) believes that marketing engineering plays a vital role in the better using of the available marketing knowledge, as well as educating managers on how they think and make their marketing decisions based on accurate marketing principles as a key objective to achieve goals. In the new global business, marketing engineering has become a central method for supporting organizations using high-precision computers, big data, supply and demand preference for market analysis, and capture the essence of marketing problems in order to solve them scientifically (Lilien and Rangaswamy 2004). It motivates companies to design their products that meet customer expectations and improve engineering design supported by available marketing capabilities to achieve marketing objectives (Michalek,

Feinberg, and Papalambros 2005). Survey such as conducted by Michalek et al. (2011) has shown that marketing engineering highlights the significance of designing and developing of production lines that require into the balance between the technical tradeoffs, market, and the accessible marketing methods in order to improve the product characteristics without any problems that affect the subsequent marketing processes and practices. On the other side, previous research has established that marketing engineering is perceived as a marketing decision support system that supports firms in collecting, storing, processing and disseminating marketing information and knowledge, considering the prominence of different information systems that meet the decision maker's need for information that leads to an accurate marketing decision with the consideration of the solution of marketing difficulties that limit the ability of organizations and their managers to stay in the external market for the longest time (Ying and Peters 2011). However, this study claims that marketing engineering is a process based on the review and reconsideration of the nature, scope and practices of marketing management to enable marketers creating a rapid change in the markets facing a strong competition rely on the marketing information that reveal for them the opportunities and threats which should be taken as an attention as marketing the products of the organization in foreign markets.

2) *The Dimensions of Marketing Engineering*

Once the reviewing of academic studies and researches has been considered, it is noted that there is no agreement by researchers on the dimensions of the marketing engineering, and the reasons behind this belongs to the rarity of the studies in this field. In this case, in order to measure the process of marketing engineering in the tourism organizations in Najaf Governorate, this study is agreed with the model of (Lilien et al. 2002) based on its realizing as a comprehensive model and more convenient for our study environment, which divide the variable of marketing engineering into four basic dimensions including (marketing data and information, marketing insight, marketing decisions and Implementation), which they will be explained in detail below:

3) *Marketing Data and Information*

it indicates to how the organization can improve or maintain its current competitive position through providing marketing data that highlights more on the development of business activities, customer behavior, the causes that lead to increase competition intensity and the appearance of problems which are experienced by marketers due to the fluctuating of market conditions and changing in customer needs and wants as a consequence of excitements that are presented by competitors (Ying and Peters 2011).

4) *Marketing Insight*

it reflects the future situation that the organization is trying to reach via the benefits which aspires to achieve through the utilizing a set of practices and processes enabling it to increase the demand for its products with the specific time horizons by investigating the optimum benefit of the exploration of marketing opportunities in order to exploit them properly (Lilien et al. 2002)

5) *Marketing Decisions*

it is perceived as the ability of decision makers in organizations to make realistic marketing decisions that help addressing matters related to the organization's ability to identify issues associated with purpose, feasibility and benefits that can be obtained before proceeding in adopting of ambitious marketing practices, methods and processes

that drive to achieve marketing objectives (Midgley 2002).

a) *Implementation*

It means the ability of the organization to translate marketing data, information, insight and decisions into action mechanisms and implementation, making the marketers gaining the ability to maintain their competitive advantage and access to customers who are expected to deal with them within the time horizons that allow organizations staying in the competition environment for the longest possible time.

B. *Strategic Positioning*

1) *The concept of Strategic Positioning*

In recent years, a considerable literature has grown up around the theme of strategic positioning due to the growing of competitive environmental concerns, in response, many organizations that compete in the business environment have faced unpredictable competitive situations and the reasons behind that might be related to their uncertainties and changing in the customers' needs and wants which affect their strategic positioning in the short term. This makes them reviewing their strategies and focusing on how to develop and gain a well position in the marketing environment. Many experts have mentioned about the subject of strategic positioning. Skaggs and Youndt (2004) found that the improvement of the strategic positioning by the companies is based on their available options which may affect the level of uncertainty caused by the continuous change in customer needs. While, Gago and Antolín (2004) suggested that strategic positioning reflects the extent to which the corporate is constantly adapted with the external environment in order to reach to an entrepreneurial position and gain an outstanding reputation within the business sector. In a competitive marketplace, positioning also reveals how customers recognize the products/services or organization's performance on specific given attributes relative to that of the competitors (Camgöz Akdag and Zineldin 2011). Despite the fact that gaining the strategic positioning is vital for all the companies, it also allows managers to identify the position of competitors, and attempts to discriminate their organization beside real quality dimensions in order to be the most preferred company for a certain given market segment (Baines et al. 2005). Therefore, understanding strategic positioning handles marketing myopia that may be suffered by managers as a result of using internal or external programs based on the incorrect decisions (María García-Pérez et al. 2014).

According to an article by Mahat and Goedegebuure (2016), strategic positioning encourages managers to achieve further development to improve their strategic positioning through re-shaping the organization's strategy consistent with the ability to achieve strategic objectives set by top management after addressing the key issues which are formed the strength of the organization to adopt strategic choices in order to acquire the benefits from its available resources and intellectual capital more efficiently and effectively. In addition, the better strategic positioning occurs when the organization can adapt its core competencies and capabilities with the market alterations (Gray, Boehlje, and Akridge 2004). Hence, it can be said that the strategic positioning of the organization can be enhanced by achieving optimal operational excellence, cost leadership, improving of innovative processes, building the relationships with the customer as well as delivering the products that meshes with the requirements of the customers in the market. This study describes the strategic positioning as the ability of the organization to utilize and exploit its rare resources,

capabilities, advanced technology to achieve a better position that enable it leading the business sector which it operates on and achieving a sustainable competitive advantage.

2) *The Dimension of Strategic Positioning*

For the purpose of determining and measuring the strategic positioning in the tourism organizations in the city of Najaf, the current study depends on the model of (Skaggs and Youndt 2004). In their framework, (Skaggs and Youndt) identifies three basic dimensions of strategic positioning consists of (Customer co-production, Customer contact and Service customization).

a) *Customer co-production*

it refers to the organization's ability to motivate customers participating in production as well as reducing the effort, time and cost which entails once listening directly to their views for the purpose of reviewing the nature and quality of services provided to them and reducing the non-consumption by the customer of the services provided by the organization (Skaggs and Youndt 2004).

b) *Customer contact*

it means to which extent the organization is able to build continuous relationships with the clients for the purpose of increasing communication with them, limiting production errors and developing bilateral interaction between the service provider and customers, hence identifying their personal needs and asking certain questions that ensure the service provider reaching to the information and knowledge owned by the buyers in order to be used in production processes (Bearden et al. 1999).

c) *Service customization*

it is seen as a way to customize services to a specific customer, which requires from the company recognizing customers with similar needs in order to produce and provide services that meet their needs and wants. Indeed, this leads organization facing high levels of demand volatility. This increases the level of uncertainty during the delivering the service which affects the human capital considerations. In addition, the higher levels of service customization requires from the marketing staff department ascertaining the needs of different customers to determine production and marketing procedures to discover these needs within a specific time (Skaggs and Youndt 2004).

Based on the aforementioned literature, this study envisages that there is a correlation and regression relationship between marketing engineering and its dimensions and strategic positioning in the tourism companies in Najaf city in Iraq. Therefore, the following has been hypothesised:

H1: There is a statistically significant correlation relationship between marketing engineering and strategic positioning.

H1a: There is a statistically significant correlation relationship between marketing data and information and strategic positioning

H1b: There is a statistically significant correlation relationship between marketing insight and strategic positioning

H1c: There is a statistically significant correlation relationship between marketing decisions and strategic positioning

H1d: There is a statistically significant correlation relationship between implementation and strategic positioning

H2: There is a statistically significant impact of marketing engineering in strategic positioning.

H2a: There is a statistically significant impact of marketing data and information in strategic positioning

H2b: There is a statistically significant impact of marketing insight in strategic positioning

H2c: There is a statistically significant impact of marketing decisions in strategic positioning

H2d: There is a statistically significant impact of implementation in strategic positioning

III. METHODOLOGY

Measures and Method

In this study, the 5-points Likert scale (1= strongly disagree to 5= strongly agree), which is realized as one of the most widely used methods for investigating research in administrative and social sciences, was used to rate respondents' perception for each item. Marketing engineering was measured using four items which adopted by Lilien et al. (2002) The scale measuring strategic positioning was developed by Skaggs and Youndt (2004).

Descriptive methodology was used to describe the characteristics of phenomenon and to access the information and real results as well as to find realistic and logical solutions to the study questions through data collection, tabulation, analysis and interpretation.

Validity and Reliability

The questionnaire form was initially prepared by the researchers based on the theoretical references related to the field of marketing engineering and strategic positioning. The original form was developed in English and translated into Arabic by a professional translator. To test instrument clarity, question wording and apparent validity, the questionnaire form has been scrutinized by four academic expertise and specialists in the field of marketing and strategic management.

Consequently, a number of statements have been adjusted as suggested by them. Statistical analysis was performed using SPSS software (version 20). The reliability of the form was calculated using Cronbach's alpha, as it was (0.92) for the marketing engineering dimensions, (0.81) for the strategic positioning dimensions, and the total value was (0.88) as shown in the Table 1. This indicates that the statements of the questionnaire have a high level of reliability.

Table 1: Cronbach's alpha

variables	Cronbach's alpha	N. of Items
marketing engineering	0.92	16
strategic positioning	0.81	12
total	0.88	28

Sample and Data Collection

The tourism sector has been selected as a research field for the current study due to its fundamental role in attracting tourists and developing the economic situation of the Iraq generally and Najaf city in particular. The population of the current study consists of (233) directors of hotels and tourism organizations in the city of Najaf / Iraq. The random sampling was used to select the sample. The sample of this research includes (117) managers. The data were collected using questionnaire which is realized as the most popular scientific research tools compared to others. In total, (178) questionnaires were directly distributed by the researchers to the managers in these organizations with permissions, (163) forms were returned, once checking the returned questionnaire, (46) forms were excluded because of missing value. By the end of the survey period, data had been collected from 117 individuals. The response rate was (%50).

Ethical Consideration

In this paper, a number of guidelines were applied in order to be ethical, such as giving participants a free choice to take a part of the questionnaire, honesty about the purpose of the research, anonymity and confidentiality, honest in term of analysing the data and results. In addition, an ethical form has been filled by the researchers in our department before doing this survey.

Model Specification

In the light of the study problem, objectives and hypotheses, the proposed model of this study has been configured which represents the correlation and regression relationships between the marketing engineering and its dimensions as an independent variable, and the strategic positioning as a dependent variable, as shown in the Figure 1.

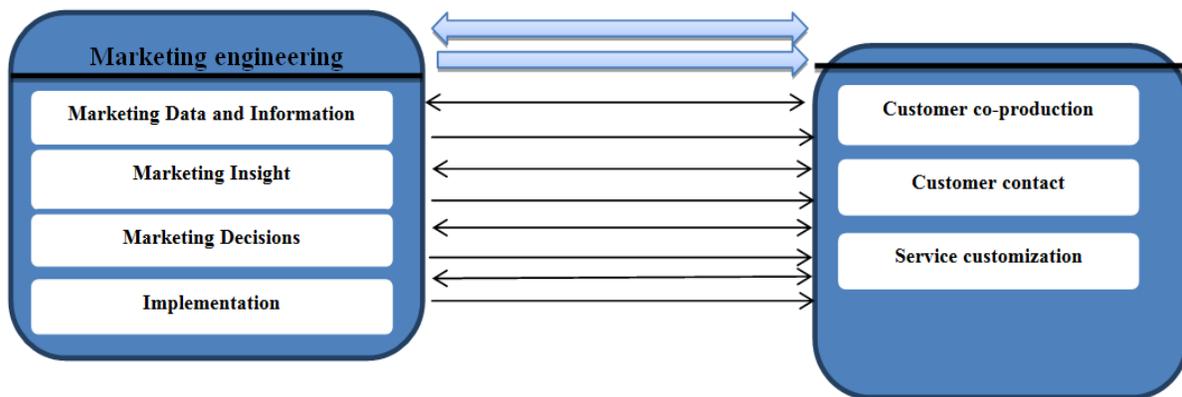


Fig. 1: The proposed framework

IV. EMPIRICAL RESULTS

Testing the First Hypothesis

Simple Pearson correlation was employed to test the first hypothesis which proposes a correlation relationship between marketing engineering (X) and strategic positioning (Y). As can be seen from the Table 2, it is noticed that

there is a strong and positive correlation ($r=0.817$) between the marketing engineering and strategic positioning in the level of significant (0.000) which is less than (0.05). Accordingly, H1 was accepted. In addition, results from the Table 2 reveal that there is a significant and positive correlation relationship between each of marketing engineering dimensions including (marketing data and Information, marketing insight, marketing decisions and Implementation) and strategic positioning with the value ($r = 0.661, 0.596, 0.782, 0.755$) respectively. Thus, (H1a, H1b, H1c and H1d) were confirmed.

Table 2: Value of the correlation between variables

No	Dimensions	Strategic positioning	Sig.
1	Marketing Data and Information	0.661**	0.000
2	Marketing Insight	0.596**	0.000
3	Marketing Decisions	0.782**	0.000
4	Implementation	0.755**	0.000
	Marketing engineering	0.817**	0.000

Notes: All correlations are significant at the 0.05 level** (2-tailed). N=117

Testing The Second Hypothesis

Multiple regression methods was used to identify the significance of marketing engineering and its sub-dimensions in enhancing strategic positioning, as well as to test the Second hypothesis and its branches. Table 3 exhibits that marketing engineering has a positive impact on the strategic positioning ($\beta = 0.817, p < 0.05$). This is also supported by t-test, the value of (t) calculated (15.169) is higher than the value of (t) tabulated (1.96) on the level of (0.05). In the light of the regression equation, the constant ($a = 0.559$) indicates that the value of strategic positioning, based on the views of the research sample and when the value of marketing engineering is zero, equal to (0.559). Accordingly, H2 is accepted. Additionally, results from Table 3 prove that there is a statistically significant impact of all the dimensions of marketing engineering in strategic positioning ($\beta_1=.661, \beta_2=.596, \beta_3=.782, \beta_4=.755$) and ($p < .05$) respectively. The value of t calculated of all the dimensions marketing data and Information (9.457), marketing insight (7.960), marketing decisions (13.467) and Implementation (12.357) are significant and greater than the value of t distributed (1.96). Thus, H2a, H2b, H2c and H2d were accepted. Besides, it can be noticed that those effects are also supported by the calculated value of F (290.099) which is higher than its distributed value (1.35) with a significance of (0.000) which is less than (0.05), consequently, this means that the research model is accepted.

Table 3: Regression Results

No	Model	B	Beta	t	Sig.	F	Sig.
1	Constant	0.559				290.099	0.000
2	Marketing Data and Information	0.560	0.661	9.457	0.000		
3	Marketing Insight	0.555	0.596	7.960	0.000		
4	Marketing Decisions	0.763	0.782	13.467	0.000		
5	Implementation	0.678	0.755	12.357	0.000		
	Marketing engineering	0.870	0.817	15.169	0.000		

N=11 Based on the results in this part, the final status of the study hypotheses can be shown as in Table 4.

Table 4: Results of the study hypotheses

Hypotheses		Results
H1	There is a statistically significant correlation between marketing engineering and strategic positioning.	Confirmed
H1a	There is a statistically significant correlation between marketing data and information and strategic positioning	Confirmed
H1b	There is a statistically significant correlation between marketing insight and strategic positioning	Confirmed
H1c	There is a statistically significant correlation between marketing decisions and strategic positioning	Confirmed
H1d	There is a statistically significant correlation between implementation and strategic positioning	Confirmed
H2	There is a statistically significant impact of marketing engineering in strategic positioning.	Confirmed
H2a	There is a statistically significant impact of marketing data and information in strategic positioning	Confirmed
H2b	There is a statistically significant impact of marketing insight in strategic positioning	Confirmed
H2c	There is a statistically significant impact of marketing decisions in strategic positioning	Confirmed
H2d	There is a statistically significant impact of implementation in strategic positioning	Confirmed

Taken together, these results explain that the significance of marketing engineering is related to the attention of the administration of tourism companies to the practices of all dimensions, which in turn lead to enhancing the strategic positioning and achieving competitive advantage.

V. CONCLUSIONS AND SUGGESTION

The current study has investigated the role of marketing engineering in enhancing strategic positioning in the tourism companies in Najaf city. The empirical results demonstrated that there is a correlation and regression relationship between the study variables. This research found that the tourism organizations in Najaf city focused on the importance of obtaining data and marketing information from their certified sources in order to utilize them in reviewing and monitoring market conditions, and continuous change in the customers' needs. Another important finding was that tourism organizations in Najaf city intensively depended on the marketing data and information for the sake of starting building a future marketing insight in their implementation, that leads to achieve their objectives in the short, middle and long term, taking into consideration the importance of this information in reviewing of the marketing knowledge which should be used in emerging the current marketing processes and practices. In addition, the empirical evidence of the current study indicates that the tourism companies emphasize on the importance of transforming the marketing insights based on accurate data and information into the work mechanisms and scientific marketing plans that leads them to build effective communication with customers, enhance competitive positions, achieving the best strategic positioning and avoiding the marketing problems and dilemmas that occur quickly. Moreover, the importance of using rare resources, capabilities, core competence with expertise, know-how and skills have been considered in implementing marketing plans, delivering service customization and avoiding all that leads to the emergence of marketing disturbances during their execution with high accuracy. The results further support the idea of (Midgley 2002), and are consistent with the findings of Ying and Peters (2011) which showed that marketing engineering supports firms in collecting, storing, processing and disseminating marketing information and data, that

leads to an accurate marketing decision with the consideration of the solution of marketing difficulties and rising the ability of organizations to stay in the external market effectively. Finally, there was a good attention from the tourism companies and hotels to build continuous relationships and communication with the tourists, listening to their ideas and information by doing surveys, hence delivering a quality service to them as well as satisfying them.

The results of this research have suggested some future recommendation for the investigated companies. Firstly, it is possible, therefore, that the tourism companies should use and depend more on the accurate marketing data and information that leading them to making accurate marketing decisions. In addition, it can thus be suggested that tourism companies should adopt with a range of innovative marketing scenarios in order to be close with the tourists, increase their market share and achieve sustainable competitive advantage. Finally, our findings suggest that the tourism organizations should focus more and more on the selection and recruitments and then hiring people with marketing background and high communication skills in order to be able to communicate effectively with tourists, hence enhancing strategic positioning in the marketing environment.

Further studies, which take these variables into account, will need to be undertaken in different sectors such as banking, education and industry sectors.

REFERENCES

- [1] Baines, Tim, Gwyn Kay, Sola Adesola, and Martin Higson. 2005. 'Strategic positioning: an integrated decision process for manufacturers', *International Journal of Operations & Production Management*, 25: 180-201.
- [2] Bearden, William O, Manoj K Malhotra, Kelly H %J Psychology Uscátegui, and Marketing. 1999. 'Customer contact and the evaluation of service experiences: propositions and implications for the design of services', *Journal of Psychology & Marketing*, 15: 793-809.
- [3] Camgöz Akdag, Hatice, and Mosad Zineldin. 2011. 'Strategic positioning and quality determinants in banking service', *The TQM Journal*, 23: 446-57.
- [4] Gago, Roberto Fernandez, and Mariano Nieto Antolín. 2004. 'Environmental management and strategic positioning of Spanish manufacturing industries', *Journal of Business Strategy Environment*, 13: 33-42.
- [5] Gray, Allan, Michael Boehlje, and Jay Akridge. 2004. "Strategic Positioning in Agribusiness: Analysis and Options." In, 4-13.
- [6] Griffin, Abbie, and John R. Hauser. 1992. 'Patterns of Communication among Marketing, Engineering and Manufacturing-A Comparison Between Two New Product Teams', *Management Science*, 38: 307-458.
- [7] Lilien, Gary L, and Arvind Rangaswamy. 2004. *Marketing engineering: computer-assisted marketing analysis and planning* (DecisionPro).
- [8] Lilien, Gary L, Arvind Rangaswamy, Gerrit H van Bruggen, and Berend %J Journal of Business Research Wierenga. 2002. 'Bridging the marketing theory–practice gap with marketing engineering', *Journal of Business Research*, 55: 111-21.
- [9] Mahat, Marian, and Leo Goedegebuure. 2016. 'Strategic positioning in higher education: Reshaping perspectives.' in, *Theory and Method in Higher Education Research* (Emerald Group Publishing Limited).
- [10] María García-Pérez, Ana, Vanessa Yanes-Estévez, Juan Ramón Oreja-Rodríguez, and Enrique González-Dávila. 2014. 'Strategic positioning and strategic types of small firms', *Journal of Small Business and Enterprise Development*, 21: 431-49.
- [11] Michalek, Jeremy J, Peter Ebbes, Feray Adigüzel, Fred M Feinberg, and Panos Y %J International Journal of Research in Marketing Papalambros. 2011. 'Enhancing marketing with engineering: Optimal product line design for heterogeneous markets', *International Journal of Research in Marketing*, 28: 1-12.
- [12] Michalek, Jeremy J, Fred M Feinberg, and Panos Y %J Journal of Product Innovation Management Papalambros. 2005. 'Linking marketing and engineering product design decisions via analytical target cascading', *Journal of Product Innovation Management*, 22: 42-62.

- [13] Midgley, David %J Marketing theory. 2002. 'What to codify: marketing science or marketing engineering?', *marketing theory*, 2: 363-68.
- [14] Skaggs, Bruce C, and Mark %J Strategic Management Journal Youndt. 2004. 'Strategic positioning, human capital, and performance in service organizations: A customer interaction approach', *Strategic Management Journal*, 25: 85-99.
- [15] Ying, Li, and Mike %J Systems Engineering Procedia Peters. 2011. 'Setting up The Tourism Engineering Marketing Information System of China', *Systems Engineering Procedia*, 1: 301-08.