

A Study of the Effect of Technology & Marketing Strategies on Innovative Performance from the Standpoint of the Organizational Project Management (Case study: Home appliances manufacturing companies in Esfahan Province)

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DOI: 10.6007/IJARBSS/v3-i11/329 URL: <http://dx.doi.org/10.6007/IJARBSS/v3-i11/329>

Abstract

In the present-day dynamic world, where the globalization process and the quick advances in technology have brought enormous changes into the marketplace, innovation is an important and critical factor for the organizations in order to create value and sustainable competitive advantage in today's complex and changing environment; and more innovative organizations will be more successful in dealing with changing environments and in creating and developing novel capabilities which allow them to achieve a higher performance. This research, in terms of its purpose, is an applied and practical one; and in terms of nature and descriptive method is a survey. The statistical population include 84 managers (senior, marketing, technical and R&D) of the home appliances manufacturing companies in Esfahan Province. Since the population is limited no sampling is necessary. Thus, the whole population is studied. The data collection tool is research-made questionnaire the validity of which was obtained using the standpoints of specialists and scholars in management and the reliability was obtained with a Cronbach's alpha coefficient of 85%. The collected data were analyzed using SPSS and AMOS software programs through statistical tests at descriptive (frequency, percentage, accumulated percentage, average and standard deviation) and inferential (t-test, regression modeling, variance analysis, non-parametric Kolmogorov and Smirnov test, and Freedman non-parametric test) levels. According to the results obtained, all hypotheses were supported. Therefore, technology and

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marketing strategies have significant effect on innovative performance from the standpoint of the organizational project management.

Keywords:

Organizational project management, Innovative performance, Marketing strategy, Technology strategy, Market turbulence

1. Introduction

The intense competition between organizations in the global market leads that the innovation is considered as a critical characteristic for organizations. Sustainable innovation helps the organizations to maintain their competitive position in the market. In today's ever-changing environment, organizations should attend innovative performance for creating sustainable competitive advantage (Ahmadi and Alahyari, 2003). A company's ability for creating creativity and innovation in order to develop and maintain competitive advantage is very important (Calanton et al., 2002). The companies need exploring the alternatives for improving innovation and their performance in order to respond the competitive pressures. Achieving success in the innovation depends on the cooperation between marketing and technology departments. On the other hand, the strategic direction is critical in perceiving innovation of products and performance (Spanjhol et al., 2011). The organizations have to encourage innovation in their structure and also consider the environmental factors because of the growth and development of technology in the external environment and surrounding world. Technology is one of the key factors in strategic decision making. Generally, technology strategy is one of the most important functional strategies in every organization and should support the strategic goals of the organization. Marketing strategies are the most important strategies that can be used for creating sustainable competitive advantage. Marketing plays two main roles in terms of sustainability of competitive strategies. These include maintaining customers and creating core competencies. The results of different studies indicated that project management is the main option that the companies can combine their marketing and technology strategies for improving innovative performance. With regard to the literature review and importance of innovative performance, the present study was aimed to examine the effects of marketing and technology strategies on the innovative performance of Isfahan Appliance Companies based on the organizational project management perspective.

2. Literature review

2-1. Organizational project management and innovative performance

The knowledge of project management refers to the techniques and skills that ensure the customers' satisfaction through producing unique products and applying them successfully (National organization of teenagers, 2004). The first definition of organizational project management has been presented in 1998. Based on this definition, organizational project management is the organization's ability to develop the projects' successful plans continuously and predictably for doing organizational strategies and improving organizational effectiveness (Schiller, 1998). This definition is completed during time in comparison to a more dynamic point. Abroy et al. (2007) pointed out that organizational project management is a new

managerial area that is done for achieving organizational goals in order to maximize value through projects. Organizational project management is improving from different aspects and can be shown in forms of unsustainable networks. These active and variable networks refer to a competitive advantage that should be done autonomously from project-based structure (Hobbos and Aubry, 2011). Also innovation is known as any organizations survive prerequisite. A company has to explore the new and improved products continuously for satisfying the customers' needs. On the other hand, innovation depends on the variation in products, processes, and activities. Innovation can be defined as creating new products and entering them to new or existing markets that can be achieved through following methods: 1: a new technology, 2: a new application as a new product, service, or process, 3: new market or new market segment, 4: a new structural diagram or a new management approach (Mike, 2010). The innovative performance can be measured through innovation technical aspect and introducing new products to the market (Hagedoorn and Clodt, 2003). The organizational performance can be shown through both efficiency and effectiveness concepts. The first refers to the return on investment and profitability and the second can be measured through customer value, sale, and customer share (Sandvik and Sandvik, 2003). On the other hand, it is should be noted that organizational performance is a complex result that can be influenced by several factors (Salamo et al., 2008). Innovation consists of four dimensions. These include steps (from creation to confirmation), analysis (industry, organization, and innovation), type (administrative, technology, product, and process), and degree (incremental and fundamental) (Camison-Zornoza et al., 2004). Sikvet et al. (2012) used the innovative performance as a mediating variable in the relationship between organizational processes and total performance for measuring innovative performance that is achieved through innovative efforts. They found that there is a significant positive relationship between these variables. Tomas and Molali (2008) pointed out that project management based on the innovative performance influences producing new products and improving existing ones and also it is difficult to evaluate it because its return on investment is zero.

With regard to the literature review that has been presented in this section, the following hypothesis can be developed.

1. Organizational project management influences innovative performance significantly.

2-2. Marketing and technology strategies and innovative performance

Although the concept of strategy has been considered as an important concept during 1980s, but nowadays different definitions and interpretations are presented for this concept. The following definition is the most famous definition of strategy.

Strategy is the fundamental model of the existing and planned goals, exploiting and allocating resources and the organization's interactions with competitors, markets, and other environmental factors (Waker, 2004). Sirovastav et al. (2001) pointed out that the companies need assuring sufficient marketing and technology resources for improving success and innovation. The outcomes of strategic marketing can be observed in the products development that satisfies the customers' needs that are more differentiated from competitive suggestions.

On the other hand, technology strategy reinforces the direction toward innovative products and better use of the organizational resources (Paladino, 2007). Krishnian et al. (2009) found that there is a significant positive relationship between marketing strategies and innovative performance. They pointed out that the synergy between marketing and research and development is the only factor that explains the excellence performance. Riter and Gimonden (2004) indicated that technology strategy reinforces the network. This can improve the market-orientation, performance, and technology competencies that have a positive effect on the innovative performance. Sikvet et al. (2012) pointed out that market-oriented strategic creativities influence innovative performance significantly. The following hypotheses have been developed based on the literature review.

2. Marketing strategy influences innovative performance significantly.
3. Technology strategy influences innovative performance significantly.

2-3. Technology and marketing strategy and organizational project management

The use of project management principles have been increased in industry and in public and commercial jobs. The reason is that it is proved that project management can solve the strategies' problems and help their implementation. Only having marketing and technology resources cannot assure the best use of them. Gingington and Zorob (1997) pointed out that marketing and technology resources should be combined for creating new abilities that result in more values for organization and its customers. Mormen and Slotorger (1999) found that there is an interaction between marketing and technology resources. Tis (1980) presented different types of the relationship between technology and marketing in new product development. Implementation of strategy through project management is considered as a resource of competitive advantage for many years. Project portfolio management is an aspect of the organizational project management that can be defined as the simultaneous management of several projects (Meshkendal, 2010). Coordination of project and strategy refers to the dynamic capability of project portfolio management. Also organizational project management can act as an integrative mechanism. Organizational project management is a system of structures, processes, instruments, and techniques for projects that has a close relationship with its stakeholders. It seems that organizational project management is a new organizational mechanism that facilitates the employees' interaction with different expertise. This issue results in this fact that organizational project management should has the sufficient potentials for managing the created knowledge of projects. Knowledge management capabilities are one of the main effective factors on the organizational effectiveness (Anderson, 2009). Organizational project management helps the organizations in their innovative efforts so much that they can improve their innovative approach. The forth and fifth hypotheses of this study can be developed based on the above-mentioned literature review.

4. Marketing strategy influences organizational project management significantly.
5. Technology strategy influences organizational project management significantly.

2-4. Market Turbulence

The market turbulence refers to change in the market prices and product development and technology (Buganza et al., 2009). Unstable economic conditions, change in the customers' needs, and continuous change in technology results in more market turbulence. In today's ever-changing world, the customers need new and innovative products, better access to products, more products differentiation, better quality, and better prices. Ecology has a critical role in the market turbulence. Market turbulence influences the rapid and unpredictable variations of market in both internal and external environment of an organization. It also influences performance of economy. Market turbulence can be operationalized through three dimensions. These include change in the market, competition, and technology. On the other hand, it can be divided into two dimensions inducing change in market and technology (Calanton et al., 2010). Boganza et al. (2009) pointed out that market turbulence can increase inflexibility. A shock environment is perceived as a motivator for organizations to increase their innovation. The results of a meta-analysis that has been used by Kalanton et al. pointed out that there is a significant relationship between technology shock and innovation, but is cannot support the market turbulence fully. Sikvet et al. (2012) indicated that the innovation with internal changes (innovation in technology), it can be said that there is a significant relationship between market turbulence and innovation. On the other hand, if there is an external innovation (innovation in product), it is expected that there is a significant positive relationship between market turbulence and innovation. The higher levels of shock refers that the relationship between innovations as a tendency is more powerful than technology innovations and new products success (Drog et al., 2008). Therefore, the sixth and seventh hypotheses of this study can be developed based on the literature review that has been indicated in this section.

- 6. Market turbulence influences innovative performance significantly.
- 7. Market turbulence influences organizational project management significantly.

3. Conceptual model of study

The conceptual model of this study has been presented in figure 1. The research hypotheses have been indicated in the relationships between research variables.

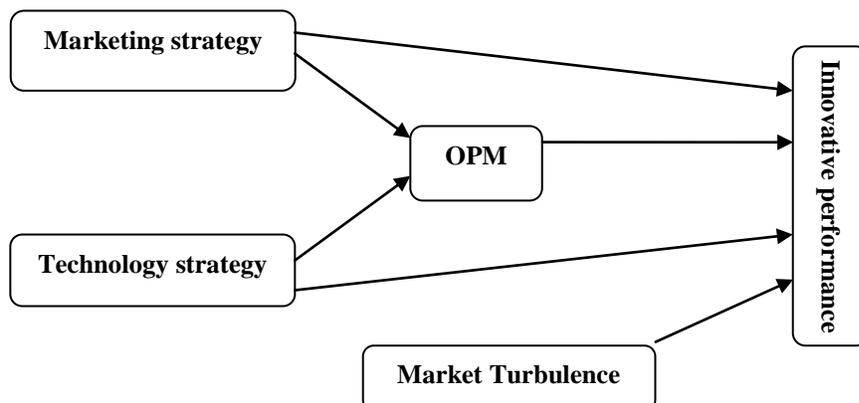


Figure 1.

Model Overview

4. Research Methodology

4-1. Research method

This study is a descriptive research from purpose view. The reason is that the authors only describe the existing conditions (Kafeznia, 2008). This study is also a practical research. The practical study is used for finding solution for research questions. Also this study is a correlation research. The correlation studies are determined to examine the relationship between research variables. Also the purpose of such studies is to evaluate the correlation between variables that have relationship with another variable (Khaki, 2010). There are several types of descriptive studies that the survey has been used in this study. Indeed, the surveys are determined to predict and analyze the relationship between variables. In summary, it can be said that this study is a survey-correlation research. Also it should be remembered that this study has a case study approach.

4-2. Statistical population and sample

The statistical population of this study includes all of the technical, marketing, research and development, and senior managers of Isfahan Appliance companies. This population consists of 84 members. This is why that census method has been used rather than sampling.

4-3. Data-collection method

The authors use questionnaire for collecting the data in field study and also review method in the library studies. In order to examine and confirm validity of the questionnaire, face validity has been used. Also Cronbachs' Alpha coefficient has been employed for examining and confirming reliability of the questionnaire. The questionnaire has been developed based on Likert five-point scale.

5. Reliability and validity of questionnaire

5-1. Validity of the questionnaire

Validity refers to this fact that the measurement instrument can measure the main variable and characteristic (Khaki, 2008). Assuring trust of the questionnaire is a technical thing, but validity is more than a technique (Homan, 1994). There are three types of validity including face, content, and construct validity. Face validity is a primary measure and is less important than content validity. On the other hand, it should be remembered that validity refers to the degree in which the instrument can measure a concept precisely (Khaki, 2008). In face validity, the researcher seeks to examine that whether instrument measures the main concept of research or not. This is why that face validity has been employed in this study and then the authors seek to ensure that whether the questionnaire is developed based on the literature review.

5-2. Reliability of the questionnaire

Reliability of a questionnaire refers to its trust, predictability, and precise. The authors of this study used internal consistency for measuring reliability of data. Cronbachs' Alpha Coefficient is the most important measure of internal consistency that refers to the degree in which the questions of the questionnaire measure the variable or characteristic (Zohori, 2008). It is should be noted that Cronbachs' Alpha Coefficient cannot show the errors that are created through external factors such as difference in the test positions and differences in the respondents' responses during time and only examines the internal measures. This coefficient has been calculated through SPSS. This coefficient has been calculated based on 30 primary responses. This coefficient was 0.85 for 30 questionnaires and was 0.90 for 70 questionnaires.

Table 1:pre test Cronbach's Alpha

Cronbach's Alpha	N of Items
.852	34

Because the minimum acceptable level of reliability is 0.70, it can be said that the questionnaire of this study has desirable reliability. Also this coefficient was calculated individually for each of research variables. These findings have been indicated in table 2.

Table 2: scale, frequency of the questions, Cronbachs' Alpha coefficient, and resources of the questions

Variables	Scale type	Number of questions	Cronbachs' Alpha coefficient	Resources
Innovative performance	Likert five-point	5	0.73	[Calanton et al., 2010]
OPM	Likert five-point	13	0.80	[Calanton et al., 2010]
Market Turbulence	Likert five-point	5	0.78	[Krishnan et al., 2009]
Technology strategy	Likert five-point	4	0.72	[Krishnan et al., 2009]
Marketing strategy	Likert five-point	7	0.81	[Sicott et al., 2012]

6.Data analysis

In order to analyze the research data, disruptive and inferential statistical have been used. In order to examine the demographic characteristics of the respondents, five questions have been used. The results of the descriptive test indicated that 94% of the respondents were male and 6% of them were female. These results indicated that most of the respondents were male in Isfahan Appliance companies. Also the results of this section revealed that about 50% of the respondents had more than 50 years old. Also the results revealed that 54% of the respondents had M.Sc.. 41% of them had job experience of 6-10 years. These results have been indicated in table 3.

Table 3: the respondents' demographic characteristics

percent	Distribution	Variables	percent	Distribution	Variables
31.4	Less than M.Sc.	Educational levels	94.3	Male	Sex
54.3	M.Sc.		5.7	Female	
14.3	M.A.				
21.4	Less than 5 years	Job experiences	38.6	Less than 30 years	Age
41.4	6-10 years		38.6	30-39 years	
10	11-15 years		8.6	40-49 years	
10	16-20 years		14.2	More than 50 years	

Also inferential statistics have been used for testing the research hypotheses. In order to this, confirmatory factor analysis, path analysis, and structural equation modeling have been used. For this purpose, the SPSS and Amos have been used.

Table 4: the goodness of fit indexes for structural equation modeling

main model	index	kind of fit index
15	NPAR	
0	DF	
---	P (More than 0.05)	
0	CMIN (Chi Square)	unconditional
000	AGFI (More than 0.9)	
1	GFI (More than 0.9)	

---	(More than 0.9)TLI	Comparative
1	(More than 0.9) NFI	
1	CFI (More than 0.9)	
0	PNFI (More than 0. 5)	Thrifty
0	PCFI(More than 0.05)	
0.000	RMSEA (Less than0.08)	
---	CMIN/DF(Less than 5)	

7. Structural model

It is necessary to attend the relationship between talent variables in the structural models. In such models, the existing relationship between talent variables that are derived based on the theory can be explained through collected data from sample members. In the structural equation models, the hypotheses can be tested through path analysis. The RMSEA is less than 0.08 that us acceptable. Therefore, it can be said that the predicted parameters are reliable in the model and so the hypotheses test can be done. In order to use Amos, it is should be remembered thaty refers to theeffects of external variables on the internal variables and the β refers to the effects of internal variables on each other. In order to examine significance of β and γ , it is necessary to examine t-value of every path.

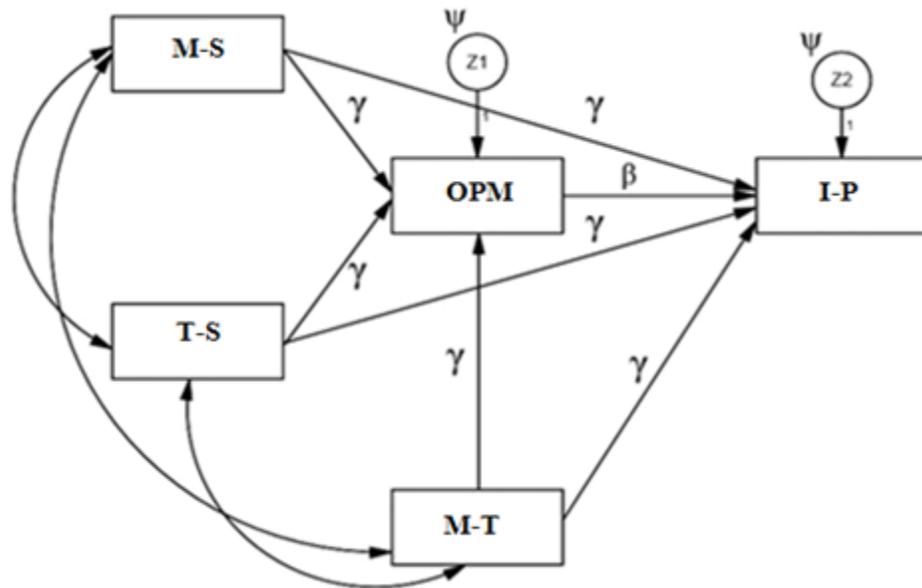


Figure 2: the effects of internal and external variables

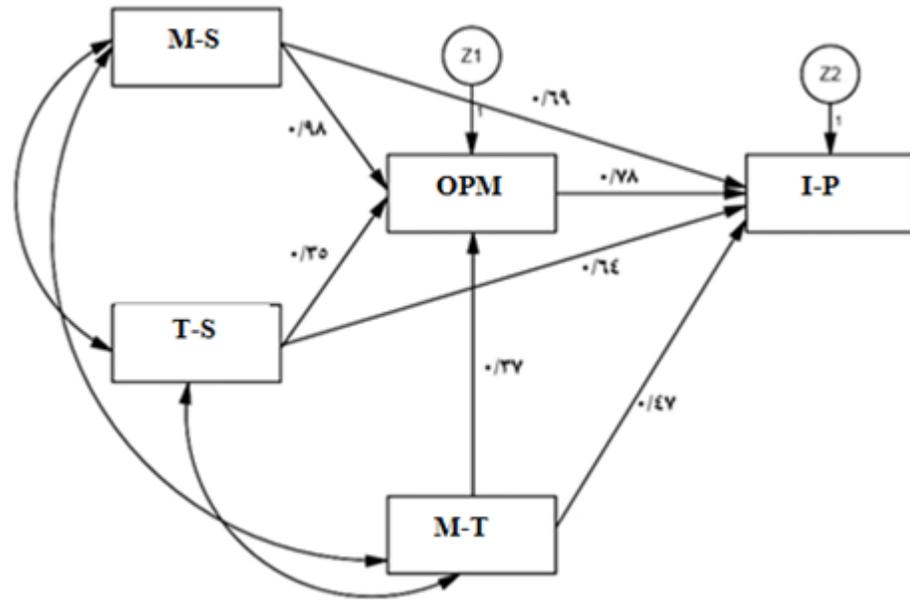


Figure 3: the model of study (path analysis model)

The coefficient of path can be examined through P-value. If the value is less than 0.05, the coefficients are acceptable and vice versa. Therefore, it can be said that all of the research hypotheses are confirmed. The results of examining direct and indirect effects of independent variables on dependent variable have been indicated in table 5.

Table 5: The results of hypothesis test

	Secondary hypotheses	Standard coefficient	Standard error	Critical ratio	p-value	Result
OPM ← M_S	H1	0.975	0.070	11.208	***	Is confirmed
OPM ← T_S	H2	0.350	0.094	2.767	0.006	Is confirmed
I-P ← M_S	H3	0.688	0.209	5.855	***	Is confirmed
I-P ← T_S	H4	0.643	0.201	5.672	***	Is confirmed
I-P ← M-T	H5	0.468	0.160	2.886	0.004	Is confirmed
OPM ← M_T	H6	0.369	0.096	3.071	0.002	Is confirmed
I-P ← OPM	H7	0.777	0.227	6.069	0.027	Is confirmed

*** P is less than 0.001

Table 6: total, direct, and indirect effects

Dependent variable	Independent Variable	Direct effect	Indirect effect	Total effect
Innovative performance	Marketing strategy	0.69	0.98*0.78	1.45
	Technology strategy	0.64	0.35*0.78	0.91
	Market Turbulence	0.47	0.37*0.78	0.76
	OPM	0.78	—	0.78
OPM	Marketing strategy	0.98	—	0.98
	Technology strategy	0.35	—	0.35
	Market Turbulence	0.37	—	0.37

8. Discussion and conclusion

The results of this study revealed that organizational project management influences innovative performance significantly (β : 0.78). With regard to the cooperation that should be obtained between organizations and rapid variations across the world, project management is an integrative mechanism that can encourage the organizations toward innovation and performance improvement. Also the results revealed that marketing strategy influences organizational project management significantly (γ : 0.98). The results of structural equation modeling revealed that technology strategy influences organizational project management (γ : 0.35). Also marketing strategy influences innovative performance significantly (γ : 0.69). These findings are supported by Crishnan et al. (2009). The results of this study revealed that technology strategy influences innovative performance (γ : 0.64). These results are supported by Riter and Gimonden (2004) and Crishnan et al. (2009). The results of this study in terms of the effects of marketing and technology strategy on the innovation in performance revealed that the organizational managers can influence organizational performance through developing and implementing good strategies in this area. Also the results revealed that technology and marketing strategies influence innovative performance, but a part of this effect can be created through organizational project management. Therefore, it seems that organizational project management is a desirable instrument for making strategies more tangible. Market turbulence influences innovative performance significantly (γ : 0.47). These findings are supported by Calanton et al. (2010) and Rick Disk et al. (2011). Also market turbulence influences organizational project management significantly (γ : 0.37).

9. Limitations of study and future studies suggestions

Eachs study has several limitations that some of them exist in beginning of study. Also every comprehensive study has several limitations and difficulties that these prevent from generalizing its results to other cases. Recognizing these limitations paves the grounds for interpreting its results and promoting quality level of the future studies. There are several limitations in this study that some of these have been presented in the following sections. The difficulties that the managers facing in communicating managers, managers' sensitivity toward

questionnaire, and inappropriate organizational culture are the main limitations of this study. Undoubtedly, the main limitation of every study is that the authors cannot generalize the results of the study to other cases. Such a limitation exists in this study and the authors cannot generalize its results and findings to other cases. Also this study has been done in an especial area of Iran in the city of Isfahan and thereby its results cannot be generalized to other cities of Iran. Another limitation of this study is that there are other factors that influence innovative performance beside the factors that have been considered in this study. Therefore, it is suggested that the future authors identify and examine these factors. Also this study has been done from organizational project management perspective, it is suggested that the future authors use other perspectives. If the future authors can examine different dimensions of innovative performance individually, its results will be attractive.

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