

A Survey of the Role of New Product Development Performance in Brand Equity Creation (Case Study: Mapna Industrial Group)

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Key words: Brand equity, NPD performance, Mapna industrial group, significant, competitive power

Abstract: Brand equity is a tool to measure competitive power of brands and this field is measured mostly by academics and researchers. Based on the increase of competition, new product should be presented. The main purpose of this study is the evaluation of the role of new product development performance on brand equity. In this study, brand equity is based on Aaker model (1991) as awareness, association, perceived quality and brand loyalty. To evaluate NPD performance variables and brand equity, a questionnaire is used. The validity of questionnaire is supported via content validity and its reliability via Cronbach's alpha. The study population is marketing and product research and development experts of some companies of Mapna industrial group in Tehran province. The sample size is 80. To evaluate the relationship between variables, regression test is used. The results of study showed that there was a positive and significant relationship between NPD performance and brand equity and dimensions of brand equity. Also, the condition of brand equity indices and NPD performance is evaluated using mean test of a population and is evaluated as average.

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INTRODUCTION

Local studies: Shahrokh *et al.*^[1] performed a study as effective factors on brand equity of insurance companies from the view of customers. The success of an organization only depends upon the clear goals of an organization. For most service organizations, profit is an important goal and can be a combination of short term financial results (increase of resources or cash flow) and increase of brand equity. Some factors as perceived quality, brand loyalty, awareness, association are dimensions of brand equity. Aaker^[2] is one of the famous scholars presenting effective factors on brand equity in

the form of a model. The results of study show that perceived quality, brand loyalty and associations are effective directly on brand equity of insurance companies and awareness is not effective directly on brand equity. Amari and Zendedel^[3] carried out a study as the evaluation of the mediating effect of brand image on formation of brand equity. The main purpose of this study is evaluation of the mediating effect of brand image between personality and attitude to brand with brand equity. This study is applied, inductive, causal and its aim hypothesis test and its time horizon is single section. For data collection, a standard questionnaire is used. To evaluate the causal relationship between brand equity,

structural equations modelling and confirmatory factor analysis are used. The results show that brand image is the most effective factor on creation of brand equity in chocolate industry. In addition, based on the collected data, the mediating effect of brand image is supported on formation of brand equity. Rahiminia and Fatemi^[4] performed a study as evaluation of the mediating role of brand equity based on customer on the effect of successful relationship with customer and brand image in five star hotels of Mashhad. This study aimed to evaluate the mediating role of brand equity on the effect of successful relationship between customer and brand image. The present study is applied in terms of purpose and is descriptive-survey in terms of data collection. The results of study showed that successful relationship with customer had positive and significant effect on brand equity and brand image. The positive effect of brand equity on brand image was supported. In this study the indirect effect of successful relationship with customer on brand image was more than its direct effect and mediating role of brand equity was supported as showed the effectiveness of this variable in improvement of the successful relationship between customer and brand image. This means that in hoteling, to improve brand image, the effective role of brand equity and its enhancement should be considered. Ardakani *et al.*^[5] performed a study as the evaluation and ranking effective factors on NPD (the study of the view of SMEs managers in food and drinking industries of Fars province). This study is quantitative in which by extensive review of relevant literature and structured interview with SMEs managers of target companies, the questionnaire is formulated and it is used for data collection. The results of study showed that vital five factors on NPD were technological, supportive, marketing, internal organizational and commercialization factors. Also, the ranking results of effective factors on NPD success showed that encouraging producing applied ideas and product attraction of market were the most important components. Hosseini *et al.*^[6] performed a study as brand equity of services and purchase behavior of customers. The present study attempted to find a relationship between brand equity of services and its components in purchase behavior of consumers in Ansar bank. This study presented a complete model of formation of good dimensional behaviors and effective factors on brand equity of services and purchase behavior were considered and then by selection of good variables of each group, their relationship and consumers purchase behavior in Ansar bank were examined. The results of study supported the relations of model. One of the important results was the effect of marketing mix on word of mouth

and its effect on customers purchase but this variable had no relationship with internal perceptions. The role of internal reaction and perceptions on loyalty and long-term purchase of consumers was of great importance. Internal reaction was based only on internal perceptions of customer and had no direct effect on brand equity of services. Taleifar and Hataminasab^[7] performed a study as evaluation of the challenges of NPD in SMEs (case study; selected food and drinking industries of Fars province). In this study, the challenges of NPD were regarding these companies. To do this, a survey study was performed regarding the opinion of manages and experts of SMEs of selected food industries of Fars province and applied strategies were raised. In the study, after the review of literature, the effective challenges were identified and based on the opinion of managers, the significance of results and their importance were determined. The results showed that from the view of managers, regarding the effective challenges on NPD, there was a significant gap between the existing condition and ideal condition. Some challenges as false estimation of market, inadequate consideration of research and development, lack of good distribution channels, lack of advertising on NPD were the important challenges. Ardakani *et al.*^[8] performed a study as the analysis of the effective factors on NPD success in SMEs (selected food and drinking industries of Fars province). This was a quantitative study in which with relevant literature and structured interview with target company managers, a questionnaire was designed for data collection. The results showed that five factors were effective on the successful development of new product of these companies. Based on the gap between existing and ideal condition, the challenging factors were identified and strategies were presented. Hosseini *et al.*^[6] performed a study as design of agility model in NPD using path analysis in automotive industries of Iran. In this study, it was attempted to use explanatory analysis of factors and extract the main success factors in agility of production and NPD and then by path analysis, the relationship between variables and the effect of them and their effect on agility were shown. In Iran, automotive industries, the changes in market needs and technological changes were higher. To explain the effective factors on agility in a model from the view of managers of NPD projects were used. The identification and application of effective factors on agility of NPD process can solve the problems of managers of manufacturing units to increase response of new products to unpredicted environmental changes. Radfar *et al.*^[9] carried out a study as the necessity of considering NPD and the role of innovation, R and D and technology. This study introduced NPD, strategies, models and its process and considered the goals and

reasons of importance of NPD. Also, then the role of innovation, R and D, technology and management in NPD was considered the important factors in success or failure of NPD were referred.

Literature review: Lin and Huang^[10] in a study “The impact of customer participation on NPD performance; the mediating role of inter-organization relationship” examined the role of customers participation in NPD performance from two dimensions of information and coordination-based participation. To evaluate NPD performance, the effectiveness, efficiency and innovation in product were used. This study was quantitative. The data were collected using a questionnaire. By statistical tests of RMSEA, GFI, NFI, the data were analyzed. The results of study showed that customer’s participation and inter-organization relationship had significant and positive effect on NPD performance. Hsu and Fang^[11] performed a study “Intellectual capital and new product development performance; the mediating role of organizational learning capability” examined the relationship between these three variables via. interview and field study as questionnaire. For data analysis, PLS method was used. The results of study showed that human capital and relational capital increased NPD performance by organizational learning capability. The results showed that although structural capital increased organizational learning capacity, it reduced NPD in samples. Karbonel, etc. in a study “Customers engagement in NPD” stated that customers’ participation had positive and significant effect on NPD performance. Fang, etc. in a study “The impact of customer’s participation on creating value of NPD” stated that customers participation was effective with the increase of effectiveness of NPD process by the increase of information sharing and collaboration of customers-suppliers and increase of investment on customers and special suppliers on creating new products value.

Study purposes

Main purpose: The evaluation of the role of NPD performance in brand equity creation of industrial group of Mapna.

Sub-purposes:

- Evaluation of the effect of NPD performance of industrial group of Mapna
- Evaluation of the condition of brand equity creation of Mapna industrial group

Conceptual model: Conceptual model shows in Fig. 1.

Hypothesis of study

Main hypothesis: NPD performance has positive and significant effect on brand equity creation of Mapna industrial group.

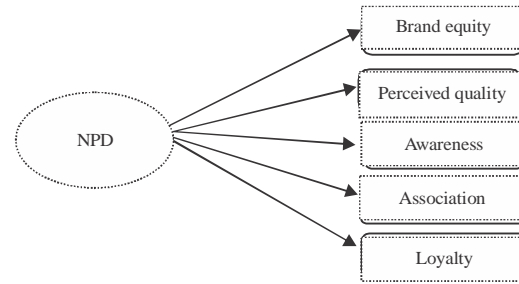


Fig. 1: Conceptual model according to Lin and Huang^[10] and Aaker^[2] model

Sub-hypothesis: NPD performance has positive and significant effect on perceived quality of Mapna industrial group. NPD performance has positive and significant effect on brand loyalty of Mapna industrial group.

MATERIALS AND METHODS

The present study method is descriptive-survey and causal based on nature. Descriptive research refers to the phenomena as occurred naturally. Thus, a descriptive research includes the set of techniques to determine a model with describing the phenomena as occurred naturally. In descriptive researches, the researcher attempts to know how something is occurred. In other words, this study evaluates the existing condition. A survey research is a descriptive-explanatory design based on selection of a random sample indicating the people in population and their response is to questionnaire, survey and other methods dealing with the existing condition including attitudes, beliefs, behaviors and extraction of information about life style and the items differentiating people. This is a survey study as we consider what they know what they think and what they do. Causal research deals with the relationship between variables. In correlation study, the relationship between two groups of data is emphasized. This is the data about a variable in two populations or two situations or the data is about two or some variables in a population. In these studies, the researcher attempts to know the relationship between two groups of information and if there is such relationship, how much and what type? A correlation study doesn't reflect a causal relationship and it describes the existence of a relationship. This study is correlation as it examines the relationship between two variables and if there is such relationship how much and what type?. As it was said, the present study is applied in terms of purpose and survey in terms of method and correlation in terms of type of relationship.

Data analysis measures: In this study, descriptive and inferential statistics are used. Descriptive statistics

Table 1: Regression of the relationship between NPD and brand equity

| t-value | Durbin-Watson | Significance level | f-values | Coefficient of determination | Correlation coefficient | Depended variable | Independent variable |
|---------|---------------|--------------------|----------|------------------------------|-------------------------|-------------------|----------------------|
| 11.22 | 1.98 | 0.0001 | 125.95 | 0.60 | 0.78 | Brand equity | NPD performance |

Table 2: Regression of the relationship between NPD and brand perceived quality

| t-value | Durbin-Watson | Significance level | f-values | Coefficient of determination | Correlation coefficient | Depended variable | Independent variable |
|---------|---------------|--------------------|----------|------------------------------|-------------------------|-------------------|----------------------|
| 10.77 | 2.09 | 0.0001 | 116.11 | 0.58 | 0.76 | Perceived quality | NPD performance |

Table 3: Regression of the relationship between NPD and brand loyalty

| t-value | Durbin-Watson | Significance level | f-values | Coefficient of determination | Correlation coefficient | Depended variable | Independent variable |
|---------|---------------|--------------------|----------|------------------------------|-------------------------|-------------------|----------------------|
| 9.20 | 1.85 | 0.0001 | 84.80 | 0.51 | 0.71 | Brand loyalty | NPD performance |

presents a summary of measures of samples and inferential statistics allows us to judge about the total population based on the results and achieve a general conclusion. To evaluate the condition of study variables, the mean test is sued. Finally, to fit model and relations between variables, AMOS Software and RMSEA, GFI, CR tests are used. This study applies the combination of SPSS, AMOS Software.

Hypothesis test: NPD performance has positive and significant effect on brand equity of Mapna industrial group.

- H_0 : there is a significant relationship between NPD performance and brand equity
- H_1 : there is no significant relationship between NPD performance and brand equity

NPD performance has positive and significant effect on brand equity of Mapna industrial group ($p < 0.0001$, $f = 125.95$). Thus, main hypothesis is supported. NPD performance with correlation coefficient 0.78 can predict brand equity positively and significantly. Also, R^2 (coefficient of determination) shows that 60% of dispersion of brand equity are explained by the independent variable. Durbin-Watson values have no much difference with value 2. The values close to 2 show the non-auto correlation of residuals showing one other assumptions of regression (Table 1).

NPD performance has positive and significant effect on perceived quality of Mapna industrial group:

- H_0 : there is a significant relationship between NPD performance and perceived quality
- H_1 : there is no significant relationship between NPD performance and perceived quality

NPD performance has positive and significant effect on brand perceived quality of Mapna industrial group ($p < 0.0001$, $f = 116.11$). Thus, hypothesis is supported. NPD performance with correlation coefficient 0.76 can

predict brand equity in perceived quality positively and significantly. Also, R^2 (coefficient of determination) shows that 58% of dispersion of brand equity in perceived quality are explained by the independent variable. Durbin-Watson values have no much difference with value 2. The values close to 2 show the non-auto correlation of residuals showing one other assumptions of regression (Table 2).

NPD performance has positive and significant effect on brand loaylty of Mapna industrial group:

- H_0 : There is a significant relationship between NPD performance and brand loyalty
- H_1 : There is no significant relationship between NPD performance and brand loyalty

NPD performance has positive and significant effect on brand loyalty of Mapna industrial group ($p < 0.0001$, $f = 84.80$). Thus, hypothesis is supported. NPD performance with correlation coefficient 0.71 can predict brand equity in brand loyalty positively and significantly. Also, R^2 (coefficient of determination) shows that 51% of dispersion of brand equity in brand loyalty are explained by the independent variable. Durbin-Watson values have no much difference with value 2. The values close to 2 show the non-auto correlation of residuals showing one other assumptions of regression (Table 3).

RESULTS AND DISCUSSION

Descriptive statistics results: Based on the results of gender of participants, we can say men are 76.2%, women 23.8%. The gender evaluation is to avoid bidirectional responses and to examine women opinions. Regarding education, frequency of BA is 46.4%, MA 53.6% of samples. The education is examined to use people with different degrees. In evaluation of age group, the subjects aged 30 years are 26.2%, aged 31-50 years about 73.8%. The age is evaluated in this study to evaluate the opinion of all age groups. In terms of experience, the subjects with

the experience of 6-10 years show the highest frequency with 40.5% and subjects with above 16 years have the lowest frequency of about 3.6%. Work experience is used to evaluate the experienced experts. Inferential statistics results (explain the findings of main and sub-hypothesis) are following.

Hypothesis results: NPD performance has positive and significant effect on brand equity of Mapna industrial group. NPD performance has positive and significant effect on brand equity of Mapna industrial group ($p < 0.0001$, $f = 125.95$). Thus, main hypothesis is supported. NPD performance with correlation coefficient 0.78 can predict brand equity positively and significantly. Also, R^2 (coefficient of determination) shows that 60% of dispersion of brand equity are explained by the independent variable. Durbin-Watson values have no much difference with value 2. Durbin-Watson value shows no correlation between the errors of variables. First hypothesis regarding the significance of relationship between two variables is supported.

Hypothesis results: NPD performance has positive and significant effect on brand perceived quality of Mapna industrial group. NPD performance has positive and significant effect on brand perceived quality of Mapna industrial group ($p < 0.0001$, $f = 116.11$). Thus, hypothesis is supported. NPD performance with correlation coefficient 0.76 can predict brand equity in perceived quality positively and significantly. Also, R^2 (coefficient of determination) shows that 58% of dispersion of brand equity in perceived quality are explained by the independent variable. Durbin-Watson values have no much difference with value 2 and show no correlation between errors. Thus, third sub-hypothesis is supported.

Hypothesis results: NPD performance has positive and significant effect on brand loyalty of Mapna industrial group. NPD performance has positive and significant effect on brand loyalty of Mapna industrial group ($p < 0.0001$, $f = 84.80$). Thus, hypothesis is supported. NPD performance with correlation coefficient 0.71 can predict brand equity in brand loyalty positively and significantly. Also, R^2 (coefficient of determination) shows that 51% of dispersion of brand equity in brand loyalty are explained by the independent variable. Durbin-Watson values have no much difference with value 2 and show no correlation between errors. Thus, fourth sub-hypothesis is supported.

CONCLUSION

The result of examination of NPD performance states that total respondents regarding NPD performance of Mapna industrial group is 3.37 and is higher than mean

value (score 3) and this difference is significant statistically ($p < 0.0001$, $t = 5.32$). Thus, the response to the question is evaluated positive. In other words, according to the respondents, NPD performance of Mapna industrial group is above average. Also The result of examination of brand equity states that respondents regarding brand equity condition of Mapna industrial group is 3.65 and is higher than mean value (score 3) and this difference is significant statistically ($p < 0.0001$, $t = 12.68$). Thus, the response to the question is evaluated positive. In other words, according to the respondents, brand equity of Mapna industrial group is above average.

LIMITATIONS

- Dispersed distribution of study sample and no suitable access to the participants to distribute questionnaire
- Numerous questions to be completed
- No familiarity of study population with the study purposes
- No study to compare the variables of study with the other studies

RECOMMENDATION

The results of study showed that NPD performance had significant effect on brand equity. It is recommended that Mapna Company improves its brand equity and increase efficiency and effectiveness to implement the followings.

New products should be presented to the market rapidly. By new ideas, new products can enter the market rapidly. Using flexible services can be a good solution. To develop new products and services, it is attempted to manage the costs of products and these costs should be considered as they are lower and economical compared to the competitors.

Financial performance of NPD should be reviewed continuously. It is required to evaluate profitability and revenue of implementation of new ideas and review also the strengths and weaknesses of products with costs assessment. The products of company should be presented with high quality based on the customers needs. It is required to monitor the opinion of customers about the products and present high quality products for customers.

It should be attempted to actualize the creative ideas of employees and we can be innovative in this way. Using recommendations of new ideas of employees to management can be effective. This study is a comparison between different organizations and this can lead to present good points in evaluation of study variables in new population. Using structural equations analysis in this study can be used in implementation and fit of conceptual model and support of total fit of model.

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