

New Marketing Mix Element for Marketing of Medical Devices

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Abstract

The research focuses on the views of the actors involved, who are employed in laboratories, hospitals and health centers. The research problem is based on verifying the correlations between the elements of the 4P marketing mix, after-sales activities and their influence on the preparation of tender documentation in the marketing of medical devices to social welfare institutions. The research question related to the research problem reads as follows: Do after-sales activities have at least as statistically significant influence on the preparation of the public procurement tender documentation when marketing medical devices to social welfare institutions as the elements of the marketing mix (product, price, promotion, distribution)? We created a marketing mix model for the marketing of medical devices through public procurement, which companies will be able to use in this type of marketing.

Keywords: Public procurement, Medical devices, After-sales activities, Social welfare institutions, Marketing mix

INTRODUCTION

The marketing mix with the basic elements, as so far stated by many authors, applies to the marketing of the products that do not need to be marketed through public procurement. Different authors have already studied the marketing mix, but nobody has expanded it with the after-sales activity variable, where after-sales activities only begin after signing the contract. The results and findings of the research serve as a guidance to many companies in which they market more complex products of a higher price range, characterized by high quality. Representative companies that market these products exclusively to social welfare institutions can market them only through public procurement defined by the Public Procurement Act. The article presents the importance of each variable, in the eyes of the buyer in the marketing of products through public procurement. The conducted research also serves as a model that enables more successful sales for the companies offering medical devices, and thus a better competitive position on the market.

The concept of a marketing mix based on the selected four elements (4P: product, price, market communication or promotion and marketing channel or distribution) is the most well-known and most criticized concept of marketing. Some authors say that this is an excessive simplification of Borden's (1954, summarized by Harker and Egan, 2006) list of variables and that the latter was not meant as a basic definition or method in the marketing theory, but as a set of guidelines to be taken into account by an organization in an integrated marketing program.

The concept of the marketing mix initially contained 12 variables: product, price, brand, purchasing and sales channels, personal sales, advertising, promotion, packaging, display, servicing, physical handling, fact finding and analysis (Borden, 1964, pp 7-12, Rafiq and Ahmed, 1995, pp. 4-15). A few years later, McCarthy (1964 according to Vukasović, 2020) presented the renewed concept of the marketing mix, the so-called 4P concept. It was developed after the Second World War in the United States (USA). The need for the change was due to demand that significantly exceeded the supply. The USA was a large market with relatively homogeneous consumers, a high level of consumer confidence, poorly developed marketing channels and dominant producers (Harker and Egan, 2006, pp. 215-242). In such circumstances, the concept of 4P worked perfectly, and it was at this very time that it began to be referred to as the basis of modern marketing. More and more criticism of the 4P concept became evident after 1980, because the concept itself was too simplified and the market reality was completely different. The supplier has an active role in the market, whereas the consumer only has a passive role. Criticism and the subsequent development of new views on marketing began in Europe (Harker and Egan, 2006, pp. 215-242). The basic concept of the marketing mix had been too simple, especially when implementing marketing activities between businesses (B2B – Business to Business) and in the field of services; this was consequently followed by the development of the concept of a marketing mix by adding different P's. We list some of the key changes to the marketing mix: Mindak and Fine (1981) added public relations, Kotler (1986) politics, Judd (1987) people, Christopher et al. (1991) people, processes and consumer services. Some authors also added elements that were outside of the P's, for example, Harker and Egan, 2006, who added market research as the fifth P, Doyle (2006) proposes an extension of 4P with 2S, i.e. services and staff, Benett (1997) proposes the concept of 5V (Value, Variety, Volume, Virtue, Viability) and Beckwith (2001) proposes four keys to modern marketing (Price, Brand, Package and Packaging, Relationship). These authors only expanded the existing marketing mix, while some revolutionarily proposed major changes (Vukasović, 2020; Kotler and Armstrong, 2018).

When reviewing the published research in accessible databases, we did not find any similar research that would connect the product, price, personal sales as a marketing and communication channel (distribution), and after-sales activities into a whole of influential factors in the marketing of medical devices to social welfare institutions through public procurement. Various authors and experts in this area deal with these factors only individually as some kind of impact on a particular phenomenon; thus, we can note that the conceptual design of this research is new.

We focus on one particular element, namely after-sales activities, which are supposed to be key in the purchasing behavior of consumers, who can in this case study purchase medical devices exclusively through public procurement, as required by the Public Procurement Act. Such marketing is different from the marketing where it is not necessary to market products through public procurement, in particular it differs in the part that follows the signing of the framework agreement or contract. The marketing mix with the basic elements, as many authors have so far pointed out, applies to the marketing of products that do not need to be marketed through public procurement. Many authors studied the

marketing mix, but no one has ever expanded it with the variable of the after-sales activities. After the signing of the cooperation agreement between the supplier and the contracting authority, the obligation of the supplier to the customer is not terminated, instead by signing the mutual agreement, this obligation only starts in the aftermath of after-sales activities (monitoring and maintenance of contacts, preparation of seminars, informing about novelties).

METHODOLOGY, DATA COLLECTION AND SAMPLE

The target population of our research is employed in laboratories in health centers (61 institutions) and hospitals (31 institutions) in Slovenia and totals 92 observed units. Altogether we received 217 completed questionnaires, while 9 questionnaires were excluded from the survey because they were not entirely filled out or were incomplete. We have obtained a sample ($N = 208$) of 208 respondents employed in these institutions. We used non-probability and purposive sampling. We used a quantitative research method. The primary data was collected by means of a structured questionnaire. The data were collected using the postal surveying technique. We contacted the heads of laboratories via telephone and asked them to assist in the submission of surveys to their colleagues. We subsequently sent surveys to them by post. Upon completion, the respondents returned the completed surveys to the address provided in the accompanying survey letter. The questionnaire was designed based on the purpose and objectives of the research and the basic assertions. The principle of the selection of items that were included in the questionnaire was based on the theoretical perspectives found in literature, OBE (Overall Brand Equity) measuring instrument (Yoo and Donthu 2001, pp. 14) and the measuring instrument developed by Vukasović (2010, pp. 147-149), Vukasović (2012). These measuring instruments were adapted for our own research case. We analyzed the data by the corresponding uni-, bi- and multivariate data processing methods in the SPSS statistical package.

RESULTS AND DISCUSSION

The reliability of the research is justified by the verification of the measuring instrument. The purpose of the verification of the measuring instrument is to assess the reliability and validity of the criteria by which the studied latent variables are measured (Šuster Erjavec and Južnik Rotar, 2012). The reliability of the measuring instrument was tested using the Cronbach Alpha test (Table 1).

Table 1: Analysis of the reliability of the measuring instrument

Cronbach Alpha Coefficient	Number of items
0.895	48

Source: Author's own source

We checked whether the presented indicators were a quality measuring instrument for the mentioned latent variables. For the Cronbach Alpha reliability coefficient, we used the criterion given by Ferligoj, Leskošek and Kogovšek (1995, pp. 157). The reliability of the measurement was labelled as exemplary if the coefficient $\alpha \geq 0.80$. If the coefficient at the interval was $0.70 \leq \alpha < 0.80$, the reliability was labelled very good, and moderate if it was at an interval of $0.60 \leq \alpha < 0.70$. If the Alpha coefficient was less than 0.60, it was barely acceptable. The results of the research, shown in Table 1, indicate that the measuring instrument is very reliable, since Cronbach Alpha is greater than 0.8.

As part of the survey data analysis, we first checked what impact after-sales activities have on the preparation of the public procurement tender documentation in the marketing of medical devices to social welfare institutions compared with the elements of the marketing mix (product, price, marketing communication and promotion, marketing channel or distribution).

Table 2: Pearson's correlation coefficient between the elements of the marketing mix and the “After-Sales Activities” variable

		After-sales activities
Product	Pearson's correlation coefficient	.463**
	Statistical significance (Sig.) (two-tailed)	.000
	N	208
Price	Pearson's correlation coefficient	.304**
	Statistical significance (Sig.) (two-tailed)	.000
	N	208
Distribution	Pearson's correlation coefficient	.740**
	Statistical significance (Sig.) (two-tailed)	.000
	N	208
Promotion	Pearson's correlation coefficient	.701**
	Statistical significance (Sig.) (two-tailed)	.000
	N	208
**. Correlation is significant at the 0.01 level (two-tailed)		
*. Correlation is significant at the 0.05 level (two-tailed)		

Source: Author's own source

As can be seen from Table 2, all the studied elements of the marketing mix are with regard to the “After-Sales Activities” in positive correlation with each other. The strongest correlation is noted between

“Distribution” and “After-Sales Activities” ($r = 0.740$), and “Promotion” and “after-sales activities” ($r = 0.701$), indicating a strong positive correlation. “Product” ($r = 0.463$) and “Price” ($r = 0.304$) have a moderate positive correlation with “After-Sales Activities”. The strength of correlation is interpreted in accordance with the following criteria: $0 < |r| < 0.3$, indicating a weak correlation / no correlation, $0.3 \leq |r| < 0.7$, indicating a moderate correlation, and $|r| > 0.7$, indicating a strong correlation (Hanushek and Jackson, 2013).

In the continuation of the study, we checked whether good product characteristics statistically significantly influence the preparation of public procurement tender documentation when marketing medical devices to social welfare institutions. According to the results of the statistical analyses, we note that only some product characteristics statistically significantly influence the preparation of public procurement tender documentation when marketing medical devices to social welfare institutions.

We were interested in whether personal sales as a marketing and communication channel statistically significantly influence the preparation of public procurement tender documentation when marketing medical devices to social welfare institutions. Based on the results of the correlation analysis, we can conclude that the “Personal Sales” and “Public Procurement” variables are in a weak mutual correlation ($r = 0.92$).

It is evident that only the independent variable “The brand justifies a high price” has a statistically significant influence on the dependent variable of “Public Procurement”, as the value of the test at the studied assertion is $\text{Sig.} = 0.04$ and is less than $\text{Sig.} \leq 0,05$. Since we were also interested in the correlation between the variable “Public Procurement (preparation of tender documentation)” and the marketing mix element of “Price”, we used the Pearson coefficient of correlation to check mutual correlations. The variable of “Public Procurement (preparation of tender documentation)” and the marketing mix element of “Price” are in a positive correlation with each other. Results show a weak correlation between them ($r = 0.203$).

With the analysis, we evaluated the conceptually set structural model of correlations between the marketing mix elements of “Product”, “Price”, “Market Communication (promotion)”, Market Channel (distribution)”, and the “After-Sales Activity” variable with respect to the “Public Procurement (preparation of tender documentation)” variable for the marketing of medical devices to social welfare institutions through public procurement. Based on the results of the research, the research question, which reads: “Do the studied variables *in mutual correlation and together influence the preparation of tender documentation for public procurement* when marketing medical devices” can be answered with the statistical analysis which found that all the studied variables are in a mutual positive correlation, and that the “Personal Sales” variable, which combines the marketing mix elements of “Market Communication (promotion)” and “Market Channel (distribution)” is equally important in the marketing of medical devices to social welfare institutions through public procurement as the “After-Sales Activities” variable. However, despite the strong positive correlation of almost all the studied variables, based on the analysis of the variance we found that the marketing mix elements of “Product” and “Price” are not statistically significant ($\text{Sig.} \geq 0.05$).

This can be justified by the fact that medical devices are sold to social welfare institutions only through public procurement contracts, by which the Public Procurement Act - PPA-3) (2015, Article 84) imposes on public institutes the criteria for awarding a public procurement contract. In its first paragraph, the Act states that the contracting authority must award the public contract on the basis of the most

economically advantageous tender. In addition, the Public Procurement Act - PPA-3 (2015, Article 64) permits prior market verification. Thus, the contracting authority may, before the commencement of the public procurement procedure, carry out market verification and professional dialogues with the bidders, and ask for advice that they will be able to use in the preparation of the documentation relating to the award of the public contract. Based on this, we can conclude that the marketing mix element of “Product” is not statistically significant for the “Public Procurement (preparation of tender documentation)” variable. Based on the interpretation of research results, we created a marketing mix for the marketing of medical devices through public procurement, which companies will be able to use in this type of marketing (Figure 1).

Figure 1: The marketing mix elements for the marketing of medical devices through public procurement



Source: Author’s own source

The marketing mix elements for the marketing of medical devices includes price, product, after-sales activities and personal sales, in which marketing communication (promotion) and market channel (distribution) are combined. Companies will be able to use the mentioned marketing mix as an aid in the marketing of more complex products, although it is important to use it properly.

CONCLUSION

The research focuses on the views of the involved actors who are in our case employed in laboratories, hospitals and health centers. The studied variables were in this type of marketing shown as mutually dependent variables that affect the preparation of tender documentation in the marketing of medical devices (devices for blood sampling) to social welfare institutions, where sales are made through public procurement. By conducting statistical analyses, we found that all the studied variables are in a positive correlation with each other and that the “Personal Sales” variable, which combines the marketing mix elements of “Market Communication (promotion)” and “Market Channel (distribution)”, is equally important in the marketing of medical devices to social welfare institutions through public procurement as the “After-Sales Activities” variable. Using the statistical analysis, we proved that the proposed additional element of the marketing mix, "After-sales activities", is very important in this type of marketing and equivalent to the marketing mix elements of marketing communication (promotion) and marketing channel (distribution) in this type of marketing and that personal sales is that form of a marketing channel and marketing communication that combines both elements into one and is most effective in the marketing of medical devices to social welfare institutions through public procurement.

The research results presented in the paper can be a trigger for further research. The newly designed model can be used in practice. In the study, we limited ourselves to studying the correlations of the selected elements of the product marketing mix. We selected a simplified concept of 4P. In the future, it would be useful to include other elements of the product marketing mix, which are mentioned by authors in the different concepts of the marketing mix. In this way, we would explore the correlations between the expanded marketing mix and other studied variables and find out if there are generally valid rules of correlations in the marketing of products through public procurement, as defined by the Public Procurement Act.

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