

## INCREASING COMPETITIVENESS OF AN INDUSTRIAL ENTERPRISE BASED ON MARKET SEGMENTATION

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### Abstract

In this article, theoretic approach to analyzing competitiveness of an enterprise in an industrial market is regarded. Market segmentation is outlined as the key factor of increasing competitiveness of a firm in the market economy environment. Characteristic features and development trends of the polyvinyl chloride profiles market, as well as industry monopolization level are determined. The article deals with the impact of a customer-centric marketing policy on the competitiveness of an industrial enterprise based on segmenting clients and conducting customized marketing programs. Analysis of theoretical approaches and methods of industrial market segmentation is conducted. The segmentation of the polyvinylchloride profiles market is done by the hierarchical cluster analysis method with the help of the Statistical Package for the Social Science (SPSS) software. The following features are taken into consideration as market segmentation criteria: geographical location; scale of a customer; features of technologies used by a customer; customer activity; delivery volumes; peculiarities of interaction with end-users, urgency, the size of an order. Key factors helping to succeed in the market are identified. Competitiveness polygons of an enterprise are formed based on key competitive advantages before and after implementing customer-centric program.

**Key words:** competitiveness, segmentation, cluster analysis

**JEL Code:** M31, C38, C81

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### Introduction

Long-standing global economic crisis causes serious problems for Russian industrial enterprises. The demand on products has been decreasing, the investment volume has been going down which is resulted in toughening rivalry and enhancing price competition. Under these conditions increasing the effectiveness of management is becoming the key success factor of organization that should be based on the in-depth analysis of marketing information,

customer segmentation, clarifying their needs and wants and, as a consequence, developing customer-centric marketing strategy. Being aware of the individual characteristics of every client and his or her needs allows to optimize the costs on sales and marketing and to get the maximum feedback from implementing efficient communications and interactions with customers.

The main research task is to estimate the impact of a customer-centric marketing policy on the competitiveness of an industrial enterprise in the polyvinylchloride profiles market based on segmenting clients and conducting customized marketing programs.

## **1 Theoretic approaches to estimating competitiveness of an enterprise in the industrial market**

A lot of research has been done analyzing competitiveness of an enterprise. These studies contain different definitions of the term ‘competitiveness’. In order to manage competitiveness of an enterprise the objective tools for its estimation are needed. Historically, the term competitiveness has been primarily used to draw attention to the cost position of firms or countries. Several authors regard competitiveness from the point of view of the opportunities for national industry and corporate development. Porter put forward a theory of estimating competitive advantages based on five forces that have a major impact on the competitiveness of an organisation (Porter, 1990). Oral (1993) suggested to use the industrial model of competitiveness which allows to estimate the competitiveness of manufacturing on the industry level.

Huggins and Izushi concern the identification of the sources of high levels of productivity and long-run productivity growth achieved by a nation’s successful competing firms in particular industries or industry segments (Huggins & Izushi, 2015). Lambin (Lambin, 1996) defines competitive advantage as a combination of organisational characteristics creating certain advantages compared to their competitors. Aiginger and Vogel (2015) think that the competitiveness is more than just an accounting result, which compares costs and revenues at a point in time. A broader interpretation of the term evaluates the sources of competitiveness of firms as well as their future prospects. This involves examining the markets on which firms compete, processes that lead to a favorable cost or productivity position and the opportunities to sustain it (Aiginger & Vogel, 2015).

In Russian practice the most widely spread methods for estimating competitiveness are index and rating models based on comparative analysis of a combination of enterprise

characteristics. The first step in the models of that kind is formulating competitiveness indicators (Zadeh, 1965) with further determining integral rating of companies. These methods include calculating the integral competitiveness level, as well as the graphic method implying the use of competitiveness polygon. The advantage of these methods is the fact that they allow to separate chosen characteristics, the sequence of their estimation and calculate criterion with the help of which it is possible to make a conclusion about the competitiveness level. Identifying the real state of an enterprise is crucial for businesses in terms of increasing their competitiveness. Zhang, Tan, Shen and Wu (2011) developed an idea of elaborating competitiveness indicators taking into account the environmental features, as well as local market peculiarities. Therefore, it could be concluded that competitiveness is a characteristic that combines various factors, structure, processes and abilities. Thus, a system of indicators considering market features and enterprise uniqueness should be used for its estimation.

## **2 Analysis of industrial markets segmentation methods**

The process of segmenting customers in industrial markets has a number of distinctive features. The companies in industrial markets tend to choose partners based on mutual interest to co-operation. Industrial markets segmentation requires integrative approach taking into consideration the industry features as well as technological characteristics of an enterprise and the process of making a purchasing decision. As market segmentation plays a key role in developing business strategies, companies' top management require conducting segmentation research regarding it as an essential tool in strategic planning (Neal, 2002).

If customers in the industrial market are non-homogeneous, the authors recommend to use multi-dimensional statistical methods. Cluster analysis is recognized as the most widely spread statistical method applied for segmenting the market. The researchers ground the validation of choosing a statistical method for segmentation on the characteristics of variables sampling, along with the unique features of obtaining and visualizing the results. Schaffer and Green suggest to apply the cluster k-means analysis as the segmentation method. This method gives a chance to choose variables for clustering more thoroughly and correctly and obtain more accurate results while analyzing a wider selection (Schaffer & Green, 1998). Das also describes the advantages of this type of clustering emphasizing on the possibility to clearly divide observations among the number of clusters selected in advance and consider even the minimal difference between the observations (Das, 2013).

According to Hepsen and Vatansever, more objective result of segmentation could be reached by hierarchic cluster analysis, where the user does not need to provide exact parameters of clustering, e.g. the number of clusters in advance. To add, the opportunity of visualising the results of the conducted analysis occurs (Hepsen & Vatansever, 2011). Punj and Stewart (1983) suggest selecting the method of cluster analysis under which the united clusters will become the most useful for a particular research problem.

Considering the complexity of an industrial market, the authors recommend the integral use of various methods of hierarchic cluster analysis while conducting market segmentation in order to diminish the uncertainties and to outline the unique features of customers. Hierarchic methods of clustering allow to research the structure of links and differences between objects in detail and to choose the optimal number of clusters. The results of clustering will eventually provide an opportunity to develop individual marketing programmes for each segment aimed at strengthening motivation of customers to increase the frequency of purchases.

### **3 Analysis of company's competitiveness**

Polyvinyl chloride is plastic of white color, the thermoplastic polymer of vinyl chloride abbreviated internationally as PVC. There are about 70 manufacturers and suppliers of the PVC profile operating in Russia, whereas half of them are subsidiaries of foreign companies. The main part of manufacturing facilities is located in the European part of Russia (including the Urals) – it accounts for 93.7 %. According to our calculations, the Herfindahl–Hirschman Index equals 1223, which indicates that the market is moderately concentrated. Under this level of concentration manufacturers largely depend on each other and companies' decisions on production volumes and product prices are determined by the activities of the competitors. Producers are also highly interdependent in using marketing tools and so on.

The main objective of the author's research is to estimate the influence of customer-centric marketing approach to the competitiveness of an industrial enterprise based on customer segmentation and implementing customized marketing programmes. Information for the research was taken from internal documents of 'Adeplast' Ltd., the manufacturer of a wide range of profile moldings made of polyvinyl chloride. Company's market share in the Ural region is estimated at 15%. Due to the competition and the declining market 'Adeplast', Ltd. is facing a decrease in demand on its products. The management is trying to find ways to keep market share and use new opportunities.

Let's estimate the competitiveness of 'Adeplast', Ltd. by using the method of 'enterprise competitiveness polygon'. The analysis of the competition was conducted according to indicators showing the activities of five key competitors – PVC profile manufacturers in the Ural Federal District, as well as the 'Adeplast', Ltd. Commerce & Sales department heads of companies purchasing PVC profiles for producing windows from the given producers, including 'Adeplast', Ltd. acted as the experts. The following requirements for experts were applied: experience of work in the window market less than 3 years; job title connected with sales or windows market research; knowledge of the features of windows market; being aware of key market players and their unique characteristics. 7 experts took part in the survey. On the first step of estimation experts were suggested criteria for estimating competitiveness, from which by group discussion a set of criteria crucial for the success of an enterprise involved in producing or selling window profiles was worked out (the number of criteria was limited to ten). As a result, 9 key success factors (KSF) presented in Table 1 were chosen. Then every factor was given its weight by the experts based on their importance for success in the market so that the sum of all KSF equals 1.0. The weight of a criterion reflects its importance in the plastic profiles market: in other words, the higher the weight is, the more important and significant the criterion is.

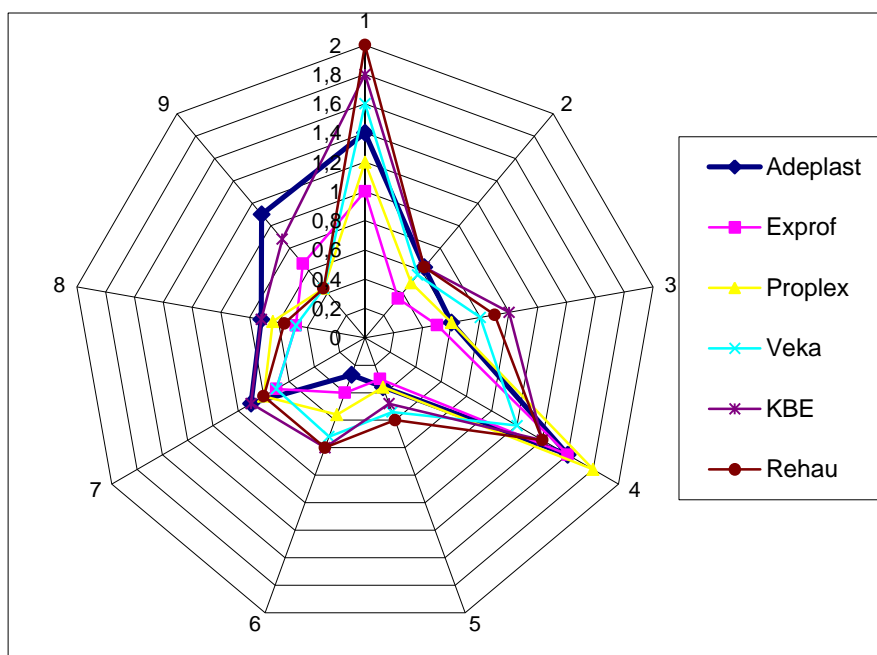
**Tab. 1: Key success factors in the PVC profiles market**

No.	Key Success Factor (KSF)	KSW weight
1	Quality of products and services	0.20
2	Qualifications of personnel	0.07
3	Range of products	0.10
4	Prices level	0.20
5	Experience in the market	0.06
6	Level of advertising activity and support of the client	0.08
7	Technical support of the client	0.10
8	Relationship with the client	0,08
9	Warehouse in the region	0.11
TOTAL		1

Source: done by authors

On the next step the key success factors for each profile manufacturer were estimated by experts using the 10-point scale. The scale has the following grading: 10 – best position, 1 – worst position. Using the expert estimates a polygon of competitiveness was created (Figure 1). The axes of the polygon conform to the chosen KSF (Table 1).

**Fig. 1: Estimation of the competitiveness of the PVC profiles by the competitiveness polygon method**



Source: done by authors

Therefore, the analysis of competitiveness allows to conclude that increasing advertising activities, extending the range of products and lowering prices are the priority areas for increasing the competitive potential of ‘Adeplast’, Ltd. At the same time high quality of products should be sustained and the customer-centric marketing strategy should be developed.

#### 4 PVC profiles market segmentation with the use of the hierarchic cluster analysis method

For the research we decided to use the advantages of hierarchic cluster analysis for segmenting the PVC profiles market with the help of the Statistical Package for the Social Science (SPSS) software 20.0. Classification of PVC profiles customers based on consumer preferences was conducted for the following product lines: profile system of the 3rd series, profile system of the 4th series, profile system of the 7th series, door profile systems, window sills, thickeners, reinforced plastic. The selection included 150 companies working with ‘Adeplast’, Ltd. for more than three years.

The following characteristics were chosen as segmentation criteria: geographical location; scale of a customer; features of technologies used by a customer; speed of consumption; delivery volumes; peculiarities of interaction with customers, urgency and the size of an order.

Hierarchic analysis methods were applied through intergroup linking and the squared Euclidean distance in order to measure the distance between centers. Hierarchic analysis helped to study the structure of differences between objects in detail and select the optimal number of clusters. The formation of clusters was done by merger. Basic clusters were increased by uniting objects to the point when the united cluster containing all data is formed. Intergroup merger was chosen as the way of uniting. SPSS calculates the least average distance between the pairs of groups and unite two closest groups. Clusters are created step by step uniting objects with the shortest distance between each other. As a result of this analysis the table of agglomeration steps and a tree-like dendrogram were done. Based on the analysis of increasing the ratio of distance between clusters a decision was made to form three clusters which are fully-featured from the point of view of the number of companies they contain – 87, 33 and 29 companies relatively. In order to link customer preferences with the characteristics such as geographical location, company size, technological features, speed of consumption, peculiarities of interaction with customers, urgency and the size of an order the contingency tables were created.

As a result of the analysis three target customer segments were outlined: the segments of narrow, selective and wide demand. The target segments were described and for each of them customized marketing programmes were elaborate (Table 2).

**Tab. 2: Developing customized marketing programmes for target segments**

Characteristics of segments	Customized marketing programmes
<p><b>Narrow demand</b> Share of enterprises – 58%. Share of profit – 37.6% Represented by consumers in 13 regions, the majority of which is based in Ekaterinburg (33.3%), Sverdlovsk Region (13.1%), Omsk (12.1%) and Moscow (10%). Only certain types of products are bought, especially 1-2 assortment groups. 56% of consumers of this segment buy products every month with 22% buying once a year. The length of interaction with the company varies from 3 to 5 years.</p>	<p>Constantly maintaining stock in the warehouse: profile of the 3<sup>rd</sup> series, window stool. High percentage of one-time purchases requires individual work with every customer on extending the range of orders and increasing the frequency of sales. There should be the guarantee of having the product in stock and fast delivery. The system of personal relations with decision-making employees is to be developed. Flexible price policy is needed for big and regular orders for those product groups.</p>
<p><b>Selective demand</b> Share of enterprises – 22%. Share of profit – 36% The segment includes consumers representing 9 regions, the majority of which are companies from Ekaterinburg (50%). Another 8.8 % are represented by Chelyabinsk and Sverdlovsk region respectively. Close location of a warehouse with wide range of products is also vital. Customers prefer the profile of the 3<sup>rd</sup> series, T-shaped profile for doors and mouldings. 68% of customers buy products monthly, whereas 17% do it quarterly. The length of interaction with the company varies from 4 to 7 years.</p>	<p>Constantly maintaining stock in the warehouse: profile of the 3<sup>rd</sup> series, T-shaped profile for doors and mouldings. Regular informing consumers about the product range presented in the warehouse. Advertising activities should be increased in Chelyabinsk and Sverdlovsk regions. Personalized offers for companies buying the products monthly should be designed. Clients should be informed about the possibilities of technical support.</p>
<p><b>Wide demand</b></p>	<p>Constantly maintaining stock in the warehouse of all</p>

Share of enterprises – 20%. Share of profit – 26.4 %  
 The segment included customers representing 6 regions, companies from Ekaterinburg (52.9) and Perm (23.5%).  
 Customers prefer various assortment groups and order from 4 to 7 types of products.  
 At the same time only 21% of clients order all the tree types of profile at once, whereas another 79% tend to order 2 types of profile. It is the only segment consuming reinforced profile. 72% of consumers buy products monthly and 13% once two months.  
 The length of interaction with the company varies from 3 to 8 years.

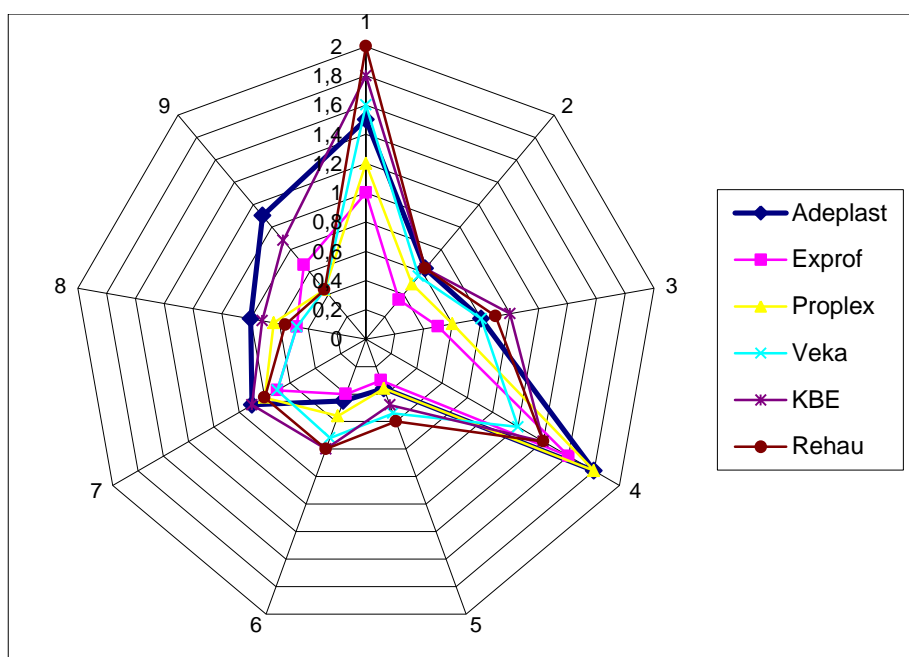
the products in required volumes: profile of the 3<sup>rd</sup>, 4<sup>th</sup> and 7<sup>th</sup> series, door profile systems, window sills, thickeners, reinforced profile and mouldings.  
 Studying potential demand and elaborating offers on extending the range of products is needed. The loyalty program should be developed. Promotional program should be developed and implemented in the Perm Krai.

Source: done by authors

Also the role of technical support of clients in each segment should be underlined. It is done by providing software, tools, and technical documentation, additional opportunities such as lamination and producing arched elements, as well as visiting production facilities by the technical specialists. Re-distribution of personal sales managers from individual work with particular clients to working with the target segment will allow reducing costs on personnel and increasing the efficiency of their interactions with clients.

The first stage of implementing customer-centric marketing programme in ‘Adeplast’, Ltd. resulted in creating one more polygon of competitiveness (Figure 2) based on the key success factors chosen before (Table 1).

**Fig. 2: Estimation of the competitiveness of the PVC profiles after implementing the customer-centric marketing programme**



Source: done by authors



Analyzing the graph it could be concluded that implementing a customer-centric marketing programme allowed the 'Adeplast'. Ltd. company to increase its competitiveness level in the Russian PVC market by improving the following key success factors: range of products, level of prices, interaction with customers, as well as advertising activity and support of the clients.

## Conclusion

The results of the research obviously showed the positive influence of customer-centric marketing strategy on the competitiveness of an industrial enterprise based on customer segmentation and implementing customized marketing programmes. The verification was based on a case study of industrial enterprise 'Adeplast' Ltd. and qualitative assessment of the experts. Applying recommendations on measures that could be undertaken will allow the PVC manufacturer to increase its market share in the Ural Federal District. The results of the study provide an opportunity to work with loyal and new customers more efficiently. Introducing client databases including company location, size of a customer, technological features, consumption levels, volumes of delivery, length of relationship with a customer, as well as terms and volumes of orders allow identifying target segments according to their interest from the producer with the help of statistical methods for further developing marketing programmes on increasing companies' competitiveness.

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