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## THE FEATURES OF CLUSTER ANALYSIS FOR MARKET SEGMENTATION

### ОСОБЛИВОСТІ ЗАСТОСУВАННЯ КЛАСТЕРНОГО АНАЛІЗУ ДЛЯ СЕГМЕНТАЦІЇ РИНКУ

**Summary.** Were considered the problems and peculiarities of application of cluster analysis in the segmentation of the market, namely in marketing research. Outlined the main advantages and disadvantages of cluster analysis, as well as the intended use of this type of analysis of the market environment.

**Key words:** cluster, cluster analysis, segmentation, marketing research, market.

**Setting of the problem.** In our time, the creation of goods is no longer such an unprecedented and unique event, as it was before. Even just a half-century ago, the creation of something new revolutionized and brought inventors profits. Now the main thing is not to create, but the ability and effective promotion of the new product. There are cases when products, which, in fact, were not unique or supernova became market leaders for many years, thanks to competent marketing strategy.

**Analysis of recent research and publications.** Problems of application of cluster analysis for market segmentation engaged: R. Tryon [2], S. Molodetska [4], M. Porter [5], P. Rudnev [6].

**Determination of the unsolved general problem.** However, today the problem of the correct use of cluster analysis is not determined for market research.

**The aim** of this publication is to systematize destinations using cluster analysis for conducting market research, as well as to designate the main problematic issues, a marketing expert may face, when using this method.

**Statement of the base material.** World experience of developed countries proves both efficiency and inevitable pattern of occurrence of different types of clusters. In the last ten years, the formation of clusters has become an important part of the state policy in the field of regional development in many countries. Abroad clusters are one of the effective tools for the development of small and medium-sized enterprises. The questions of cluster formation cause the growing interest of economists and government agencies in different countries. The rapid development of technology, logistics, means of transport has led to the fact that the transmission of information, financial flows have become almost instantaneous, and the transportation of goods – cheaper and faster. In this regard, the most important factors in achieving and maintaining superiority over its competitors are not only innovation and education, but also the relationships between the companies that provide the conditions for the establishment of network structures – clusters.

When developing a new product one needs to know clearly on what kind of consumer audience it is aimed at. You need to know everything about your average statistical customer from the age and sex, to the personal hobbies. These details make it

possible to develop a product down to the smallest detail and have an effective advertising campaign.

One of the main directions of marketing activity is segmentation of the market, allowing the company to accumulate funds in the specific direction of the business. The market consists of buyers, and buyers are different from each other in a variety of settings. And any of these variables can be used as a basis for market segmentation.

Segmentation of the market – is the division of the market into distinct groups of buyers, each of which may require separate goods and/or marketing systems. The purpose of segmentation is to identify one or more target groups of consumers. The entire range of marketing activities will be aimed at these groups – from product development and branding to selecting the modality and media marketing communications [1].

In all kinds of marketing activities analysis of customer segments is used and has an impact on the results of the promotion of products to customers.

The basis of segmentation is to divide the users into meaningful groups, which are called “segments”. There are a lot of approaches to classification of objects. Among the existing methods clustering takes its rightful place as a set of methods and technologies for separating of homogeneous groups of objects, and interpreting the results. As a result of applying the classification procedures “clusters” or groups of similar objects are created. The feasibility of using cluster analysis to segmentation problems is due to the fact that its computational procedures allow us to classify consumer groups.

Cluster analysis is a mathematical procedure that allows grouping the objects into certain classes or clusters based on similarity of quantitative values of several characteristics peculiar to each object of any set.

As cluster we mean the definition provided by BG Mirkin in [3, p. 4], according to which it is a subset of objects characterized by a subset of the variables that stand out from the others by the presence of a certain homogeneity of its elements

Cluster analysis is used increasingly in market research. Cluster analysis is used by university experts, practitioners and marketers, solving primarily, the problem of categories. This may be about products, customers, employees – with proper use, cluster analysis can be applied to a very wide range of objects [2].

Use of cluster analysis in the decision segmentation problem is reduced to solving the following tasks:

- classification of consumers;
- creation the hypotheses about the existence of the study population homogeneous groups of consumers;
- testing the hypotheses about the presence of homogeneous groups in the study population of consumers.

An important feature of clustering techniques is that the groups or clusters, are determined during the analysis, not before, and the researcher may not have a priori information about the population distribution [3].

It is important to note the following feature of using of cluster analysis in segmentation. The cluster approach is intended to highlight the group from the original set of objects. However, the resulting division may not reflect the analyst's hypothesis of the existence of "real" segment structure. Therefore, while utilizing cluster analysis, the analyst has to conduct numerous experiments to combine his idea of the actual structure of the market with concrete results computed.

Thus, the problem of cluster analysis is to divide the set of the objects at a relatively small number of homogeneous segments so that each object owned by one and only one cluster and the objects of a cluster are similar, while the objects belonging to different clusters were heterogeneous.

Marketers have used cluster analysis for these components (Figure 1):

1) segmentation. In this case, the cluster analysis is used to identify stable groups (consumers, markets, organizations), each of which combines the objects themselves with similar characteristics. Realizing this analysis, the researchers tend to make the following mistake: the characteristics on which the clustering is carried out, are selected on the basis of "affordable, easier, cheaper". Such an approach challenges the appropriateness of all further analysis, as the inclusion of even one or two insignificant characteristics can lead to inadequate partition into clusters.

2) analysis of consumer behavior. Using cluster analysis apparatus for constructing homogeneous groups of consumers in order to obtain the most complete picture of how the customer behaves in each segment.

3) positioning. Cluster analysis is also used to determine which niche should be used to position the product. This type of analysis allows us to construct a map based on which it will be possible to determine the level of competition in the various segments and the characteristics that must have the goods to get to the target segment. This allows you to identify new markets, for which you can develop and promote your solutions.

4) choice test markets. Many researchers use cluster analysis to identify which markets (services, products) can be combined into a single group on relevant characteristics. Having set forward the hypothesis of the existence of certain laws

(buyers of luxury goods with an increase in prices increases the demand) it is necessary to propose a new, not used in the analysis, market in which it must be tested before being put into practice. Also, this analysis can be used to search for a new ocean strategy.

5) reduction of the number of observations. In order to accurately account for all indicators in the same group in the classification process, it is necessary to apply multivariate classification techniques to which the cluster analysis [4].

The most important part of the formulation of the clustering problem – it is a choice of variables on which the clustering is performed. The inclusion of even one or two outsiders (not related to the grouping) variables may distort the clustering results. The goal is to select a set of variables able to describe the similarity between objects in terms of the features that are relevant to the issue of marketing research [5].

There are certain advantages of cluster analysis. Cluster analysis allows to conduct the classification of any objects, which are characterized by a number of features.

Firstly, the production of clusters can be interpreted, that is, to describe which groups actually exist.

Secondly, the individual clusters may be cast out. This is useful in those cases when the dataset contained certain mistakes, as a result of which the values of parameters in individual objects may vary. When using cluster analysis such objects fall into a separate cluster.

Thirdly, only those clusters that have the interesting characteristics can be selected for further analysis [7, p. 98; 8, p. 47].

Like any other method, cluster analysis has certain drawbacks and limitations. In particular, the composition and number of clusters depends on the selected partition criteria. With the reduction of the original data set to a more compact form certain distortions can arise and individual features of individual objects can be lost by being replaced by characteristics of generalized values cluster parameters.

Unlike most other methods of multivariate analysis, cluster analysis in parallel developed in several disciplines (psychology, biology, economics), so most of the methods, have 2 or more titles, which greatly complicates the understanding of researchers, especially if we are talking about different branches of knowledge [9, p. 52].

Another problem is related to the abundance of options when choosing a metric and clustering method, as well as in finding consistency between them. Differences in the reasons for using some metric are very small, in addition, not always an option metric uniquely identifies allowable clustering method. In such a situation, selecting a particular combination of "metric method" should be based on "recommendations" that have to be gathered from various sources, as well as "common sense". Understanding of common sense comes only after understanding in detail the subtleties of a particular method and metrics.

We draw your attention to the fact that the very concept of "cluster" is ambiguously defined. We don't need the unambiguous definition – in each case the "cluster" is different. As a rule, the following guidelines should be followed: internal homogeneity and external isolation.

**Conclusions and prospects for further research.** After the study, we can conclude that at this stage of market research cluster analysis is an integral part of them. This can be considered as an important tool for implementation, analysis and prospects of development of an enterprise. In the future, you can improve the use of cluster analysis as a mandatory factor for research.

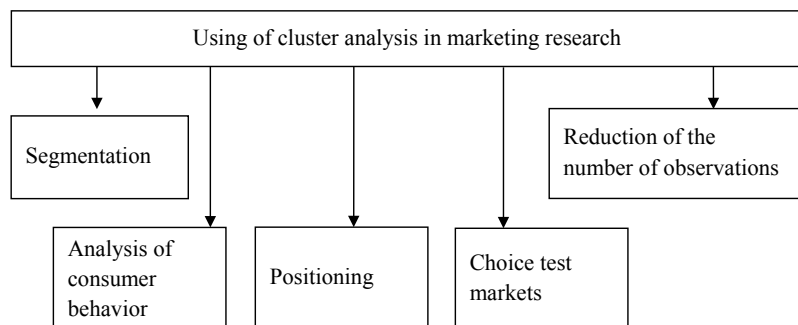


Fig. 1. Using of cluster analysis in marketing research

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**Анотація.** Розглянуто проблеми та особливості застосування кластерного аналізу в сегментації ринку, зокрема, в маркетингових дослідженнях. Визначено основні переваги та недоліки кластерного аналізу, а також цілі використання цього аналізу ринкового середовища.

**Ключові слова:** кластер, кластерний аналіз, сегментація, маркетингові дослідження, ринок.

**Аннотация.** Рассмотрены проблемы и особенности применения кластерного анализа в сегментации рынка, прежде всего, в маркетинговых исследованиях. Определены основные преимущества и недостатки кластерного анализа, а также цели использования данного вида анализа рыночной среды.

**Ключевые слова:** кластер, кластерный анализ, сегментация, маркетинговые исследования, рынок.