SHORT NOTES

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MODELING OF THE SURVEY FORM USING THE COUNTERS IN QUESTIONNAIRE

A. V. Keller[1]***,*** keller.alev@susu.ru***,***
E. M. Kanyshko[1]***,*** kanyshkoem@susu.ru***,***
Ye. P. Dyatlova[1]***,*** diatlovaep@susu.ru***.***
[1] South Ural State University, Chelyabinsk, Russian Federation***.***

We consider the approaches to develop a survey form for market research using the counters in questionnaire, which are necessary to determine whether a potential respondent is a carrier of information in accordance with the purpose of marketing research or not. In the survey form, the counters in questionnaire are used to reflect the structure of potential respondents. The article gives examples of the counters in questionnaire in the survey forms and the results of their use. For known possibilities of counters in questionnaire, it is important to determine the principles to model working documents of marketing research and develop analytical procedures. The paper pays great attention to these principles. We present the advantages of the use of the counters in questionnaire, the effectiveness of analytical procedures in proving the representativeness of marketing research and determining the quantitative parameters of the market segments. In conclusion, we give the development prospects of the application of the proposed modeling principles with the use of the counters in questionnaire.

Keywords: marketing research, quantitative methods, counters in questionnaire, modeling of survey forms, representativeness.

Introduction

In marketing research, where the method of information gathering is a survey, special attention is paid to reducing the share of potential respondents who refuse to participate in the survey [1], as well as questionnaires, which are unsuitable for analysis. The reasons are the following two types of errors. Technical errors can arise in making answers to important questions, because analytical logic of the research is based on these answers. System errors are given by a fuzzy definition of the research object, a poor development of the questionnaire (or poor organization of the survey), an ignored question or an unacceptable answer [2]. Usually, such system errors in the development of questionnaires arise in the following cases. First, the researcher (or customer) desires to cover a wide range of questions by the research. Second, a quantitative evaluation of groups of potential buyers who are not carriers of information for a specific field research is inaccurate. Finally, a content of the preamble and the first question in the questionnaire is poor [3]. We present the use of the counter in questionnaire, that is one of the possible approaches to solve the problems mentioned above. At the same time, the proposed tool for marketing research allows to consider questions of survey form modeling in order to improve the effectiveness of research results and algorithms for statistical processing of the obtained data. In addition to methodological aspects, the article considers specific examples, provides analytical results of specific marketing research, discusses the prospects of the use of questionnaires in mixed methods for information gathering [4].

1. Counters in Questionnaire

Let A be a set of potential respondents, i.e. people invited to participate in the survey. Consider the simplest structure of the set A (Fig. 1). However, for various reasons, not all potential respondents will become real respondents. Let C be an object of research, that is a set of information carriers. Note that the answers of respondents from the set C are significant for the particular marketing research. In order to select the set C, we can always select the following sets in the set A.

1. A set D such that $D \cap C = \emptyset$.
2. A set B such that $B \cap C \neq \emptyset$ and $B \cap D \neq \emptyset$, for example, the set of potential respondents who did not agree to participate in the survey.

Depending on each specific case, the set $A \setminus (B \cup C \cup D)$ can be either empty or non-empty.

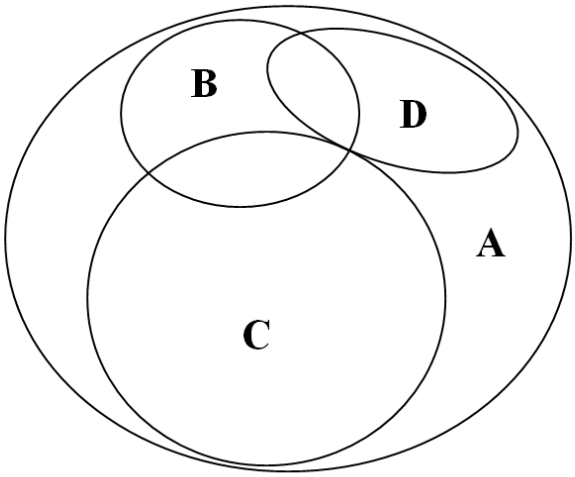

Fig. 1. A structure of the set of potential respondents

A set of respondents participating in the survey is the set $C \setminus B$. Note that the modeling of the set of potential respondents is important to develop the sample and working documents for marketing research, and, first of all, the survey forms.

At the same time, it may be necessary to estimate the share of the sets C and D, or their relations. The set which includes the given respondent can be determine by asking several questions. Namely, if we ask two or three questions and find out that the respondent does not belong to the set C, then the participation of this respondent in the survey do not make sense. Therefore, we do not ask him others qustions and remove his questionnaire from the set of questionnaires, which answers are used for key conclusions. Of course, we can increase the number of questionnaires, and use the empirical method to determine the sample size in order to get the required number of completed questionnaires. But in this case, there is the image problem. Indeed, in the survey form preamble, where a respondent is asked to participate in the questionnaire, the name of the customer's company is called. The respondent agrees, and after a few first filter questions, the survey is suddenly finished. Taking into account the usual formulation of survey preamble, it is

easy to see that such "unpleasant surprise" as suddenly finished survey, i.e. non-positive perception of the situation, the respondent associates with the name of the customer's company.

In order to avoid such a situation, we propose to use the counters in questionnaire, that is a graphical representation of the marks on the number of potential respondents participated in the survey. In one questionnaire, it is reasonable to use no more than two counters, and each of them should be on different sides of the main text or questions at the beginning of the form (for example, see Fig. 2).

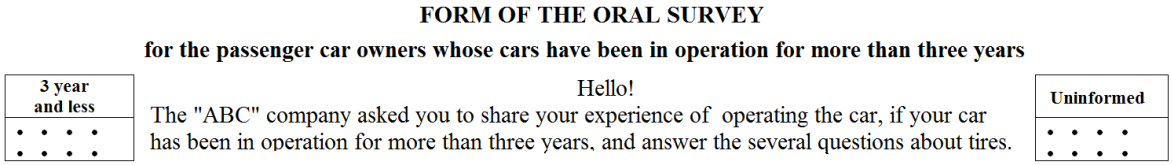

Fig. 2. An example of arrangement of the counters in questionnaire

Consider an example. We investigate the preferences of car owners regarding the brand of tires. The customer of the marketing research is intersted in the opinion of the owners of cars that have been in operation for more than 3 years. These owners of cars form the set C. But, in addition, there are such potential respondents as owners of new (and first for them) cars (the set D) and car owners who practically do not know the necessary information (the set B). For example, the set B can includes the car owners who have never made (and probably are not going to make) such decisions, relying entirely on the opinion of specialists or relatives, which always solve questions related to the cars.

In order to work with the counters in questionnaire, we use a standard graphical tool. Namely, a group of four points allows to draw 6 segments and 4 arcs, that is 10 lines (Fig. 3).

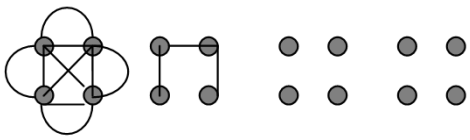

Fig. 3. Graphic representation of a counter in questionnaire

Therefore, each element of the set of potential respondents is represented by a segment (or an arc) connecting two points. As a result, we can mark large quantity of units on a rather small area of the questionnaire sheet. For example, the number 13 is marked in Fig. 3.

We stop filling of the counter in questionnaire, when the respondent of the target group (the set C) is met.

2. Modelling of Survey Forms

The use of counters in questionnaire significantly changes the standard algorithms to develop a sample and survey forms [2]. First, a preamble now is used not only to motivate

and inform, but also to filter the potential respondents. Namely, the preamble formulation helps the potential respondents to give meaningful, explanatory answers in order to ensure the effectiveness of the counters in questionnaire. Secondly, in order to make a decision about the possibility to use the counters in questionnaire, we should construct the final form of the preamble at the first steps of the algorithm, and not at the final steps. Let us formulate the basic steps to model the survey form.

Step 1. Model the structure of the set of potential respondents.

Step 2. Determine the research object and its place in the structure of the set of potential respondents.

Step 3. Determine the aim of the counters in questionnaire. Choose one or two parameters for representation in the counters in questionnaire.

Step 4. Form the preamble of the survey form, which satisfies the following conditions.

1) There is a message of greetings to a subset of potential respondents who are the information carriers.

2) Each respondent of the set of the information carriers feels the value of his participation in the survey.

3) There are the purpose of the survey and information about the organizers.

4) The preamble is brief, clear and polite.

Step 5. Make a final decision on the use of the counters in questionnaire.

Step 6. Determine the type of information needed to find out from the information carriers.

Step 7. Determine the content of the questions.

Step 8. Determine the form of the answer to each question.

Step 9. Determine the sequence of questions. The first question should be connected with the preamble, be simple and confirms the importance of the respondent's participation in the survey.

Step 10. Formulate each question.

Step 11. Determine the physical characteristics of the survey form. Here, in addition to standard tools, a space for the counters in questionnaire should be allocated on the sheet.

Step 12. Test the survey form and review the previous steps if necessary.

Consider an example shown in Fig. 2. In the preamble, a respondent is asked to share the experience of operating the car. Therefore, the potential respondent feels like an expert, that is a positive tone of the conversation is formed. In addition, the preamble indicates that the survey about tires is addressed to the car owners whose cars have been in operation for more than three years. Usually, if the potential respondent refuses to participate in the survey, then he friendly answers that either his car is new, or he does not know anything about tires, or simply he does not want to take part in the survey. In our example, a counter of owners of new cars is formed on the left part of the questionnaire, and a counter of owners who do not have relevant information is formed on the right side.

3. Statistical Processing of the Results Obtained by the Use of the Counters in Questionnaire

The counters in questionnaire allow to expand the possibilities of statistical processing of the marketing research results. In this section, we consider only the following two

mandatory algorithms:

1) to confirm the structure of the total population and representativeness of the sample;

2) to make the share indicators of marketing effectiveness more exact.

Let W_J and w_J be fractions of subsets in the set of potential respondents of the total and sample populations, respectively; N and n be volumes of the total and sample population, respectively. Usually, the open statistical information does not provide the information on the volume of the total population N and on all fractions of the subsets W_J. Therefore, the obtained sample error can be not adequate. If the counters in questionnaire are used, then we suggest to take the following value δ as "an error" of the measurement of the potential respondent set structure:

$$\delta = \left| \frac{W_D}{W_C} - \frac{w_{D\setminus B}}{w_{C\setminus B}} \right|.$$

In our example, the statistical data shows that the number of passenger cars in Chelyabinsk is 212420 in the year of marketing research. Various open sources show that the share of cars not older than 3 years is 20.8%. Therefore, the volume of the total population N is 162236. In addition,

$$\frac{W_D}{W_C} = 0,25313.$$

As a result of the use of the counters in questionnaire, we found that the number of information carriers that participated in the survey is 406, the number of car owners that refused to participate in the survey for various reasons is 87, the number of owners of new cars is 104. Therefore,

$$\frac{w_{D\setminus B}}{w_{C\setminus B}} = 0,25616,$$

and $\delta = 0,00303$. The results indirectly confirm data from the used open sources. Therefore, we can use the answers to the question "How many years is the car used?" and annual data on the new car buying in the city to forecast demand and identify its small cycles.

We make the indicators of marketing efficiency more precise based on the answers of information carriers taking into account data of the counters in questionnaire. For example, one of the questionnaire questions was "Do you plan to buy tires in the near future (it does not matter, summer tire or not)?". The number of respondents answered positively is 184, that is 45.32%. Without taking into account the data of the counters in questionnaire, we can assume that the demand for the tires among passenger car owners increases above the average in the near future. However, taking into account the content of the question, the number 184 should be include in 406, but not in 406 + 104, i.e. 510. Here we do not take into account a set of potential respondents who refused to take part in the survey, because we assume that this set contains elements of both a set of information carriers and a set of new car owners. Therefore, we forecast that 36.08% of car owners plan to buy tires in the near future, which corresponds to the average level of demand for tires. In addition, this result indirectly confirms the statistics of the number of operated cars by year. Therefore, we can form the forecast characteristics of the demand for tires taking into account the preferences of brands and cost.

We give only two examples of the use of the counters in questionnaire. However, the statistical analysis of the data obtained by the real marketing research using the counters in questionnaire shows the high efficiency and value of the proposed approach. Namely, our approach allows to obtain meaningful additional information and easily interpret the obtained results.

Conclusion

We give the basic principles to use the counters in questionnaire in the survey form, steps to model the form, variants for statistical processing of the marketing research results. Of course, the counters in questionnaire can be used for sociological, pedagogical and psychological research.

The counters in questionnaire allow to expand the researcher's possibilities to develop working documents for marketing research. For example, the mixed forms of questionnaires can be used and the goals of marketing research can be implemented in greater depth. Along with the key principles to develop questionnaires, the use of the proposed tool solves some ethical and analytical problems of marketing research.

Note that the counters in questionnaire can be used not only for an oral survey, but also for such information gathering as observation. That is, the research is assumed to be standardized and hidden. For example, the counters in questionnaire can be used in observation to analyze the behavior of buyers of certain brand products in the sales area, shopping racks or storefronts.

At the same time, note that the counter in questionnaire is not very suitable for online surveys, and in this case the proposed tool should be seriously reworked.

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Alevtina V. Keller, DSc (Math), Associate Professor, Department of Mathematical and Computer Modeling, South Ural State University (Chelyabinsk, Russian Federation), keller.alev@susu.ru.

Elena M. Kanyshko, Undergraduate, Department of Mathematical and Computer Modeling, South Ural State University (Chelyabinsk, Russian Federation), kanyshkoem@susu.ru.

Yevgenia P. Dyatlova, Undergraduate, Department of Mathematical and Computer Modeling, South Ural State University (Chelyabinsk, Russian Federation), diatlovaep@susu.ru.

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МОДЕЛИРОВАНИЕ ФОРМЫ ОПРОСА С ИСПОЛЬЗОВАНИЕМ АНКЕТНЫХ СЧЕТЧИКОВ

А.В. Келлер, Е.М. Канышко, Е.П. Дятлова

В статье обсуждаются подходы проектирования формы опроса при проведения маркетинговых исследований с использованием анкетных счетчиков. Необходимость такого проектирования возникает в том случае, когда уже при обращении к потенциальному респонденту необходимо определить, является ли он носителем информации в соответствии с целью маркетингового исследования. Анкетные счетчики вводятся в форму опроса для отражения структуры потенциальных рецензентов. В статье приводятся примеры анкетных счетчиков в формах опроса и результаты их использования. Вместе с тем важно, зная о возможностях применения анкетных счетчиков, определить принципы моделирования рабочих документов маркетингового исследования и разработки аналитических процедур. Этим аспектам в статье уделено большое внимание. Представлены преимущества использования анкетных счетчиков, эффективность аналитических процедур при доказательстве репрезентативности маркетингового исследования и определении количественных параметров сегментов рынка покупателей. В заключении представлены перспективы развития использования предложенных принципов моделирования с использованием анкетных счетчиков.

Ключевые слова: маркетинговые исследования, количественные методы, анкетные счетчики, моделирование форм опроса, репрезентативность.

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Келлер Алевтина Викторовна, доктор физико-математических наук, доцент, кафедра математического и компьютерного моделирования, Южно-Уральский государственный университет (г. Челябинск, Российская Федерация), kellerav@susu.ru.

Канышко Елена Михайловна, магистрант, кафедра математического и компьютерного моделирования, Южно-Уральский государственный университет (г. Челябинск, Российская Федерация), kanyshkoem@susu.ru.

Дятлова Евгения Петровна, магистрант, кафедра математического и компьютерного моделирования, Южно-Уральский государственный университет (г. Челябинск, Российская Федерация), diatlovaep@susu.ru.

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