POLSKA AKADEMIA NAUK

Instytut Badań Systemowych

ROZWÓJ I ZASTOSOWANIA METOD ILOŚCIOWYCH I TECHNIK INFORMATYCZNYCH WSPOMAGAJĄCYCH PROCESY DECYZYJNE

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Książka zawiera wybór artykułów poświęconych omówieniu aktualnego stanu badań w kraju w zakresie rozwoju i zastosowań metod, modeli, technik i systemów informatycznych w procesach podejmowania decyzji. Kilka artykułów przedstawia rezultaty projektów badawczych finansowanych przez Ministerstwo Nauki i Szkolnictwa Wyższego i realizowanych przez polskie instytucje badawcze.

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STUDYING DEMEANORS
AND PREFERENCES WITH THE USE OF THE INTERNET

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Abstract: *Researches with the use of the Internet have become a promising method of collecting data. Ever more research agencies and enterprises conduct research this way. The modern research market has been enriched with group interviews conducted with the use of the Internet, Internet questionnaires and Internet pages' tests. The speed, precision and low costs of the Internet are more frequently used in order to understand consumers' needs and the demeanors and preferences regarding shopping. The purpose of this article is to present the possibilities of using the Internet in examining the demeanors and preferences of consumers.*

Keywords: Marketing research, measurement scales.

1.   Introduction

The Internet is becoming an ever more broadly used tool for acquiring information in the process of marketing research. It's interactive nature enables receiving information from the studied rapidly and an interaction between the researcher and the studied. It provides the possibility of receiving a greater amount of information about a greater number of buyers and, what is more, it does not cost much in comparison with traditional researches.

Marketing researches are presently an essential link of the Marketing Information System of a company (in short SIM). The modern Marketing Information System, especially in a large company, can not function without computer techniques due to an enormous amount of data, which must be collected and processed every day. Marketing researches are tolls of collecting and analyzing information that are significant in making marketing decisions. They also provide their contribution in the evolution of marketing itself, as thanks to them, the development and verification of consumer's actions theory is possible, they contribute to the development of marketing terminology and they also enable, through a model approach, constructing and verifying marketing theories.

Most of the conducted marketing researches regard the demeanors and preferences of consumers. Companies usually want to know the opinions of buyers in

relation with their market offers, their opinions about the image of the product's brand, company, perhaps intentions of purchases, preferences regarding the brands of products, etc.

Agencies, organizations, institutes, companies, centers and foundations established in Poland and involved in marketing, social and public opinion research are associated in two organizations: OFBOR - The Organizations of Opinion and Market Research Companies (http://www.ofbor.pl) and PTBRiO - Polish Association of Market and Opinion Professionals (http://www.ptbrio.pl). They abide by standards of researches determined by ESOMAR - The World Association of Research Professionals (http://www.esomar.org) and by WAPOR - World Association for Public Opinion Research (http://www.unl.edu/WAPOR). On the web pages of the individual research facilities one can find information about the scope of research, types of research and about the research methods and techniques.

2.   Methods and techniques of studying demeanors and preferences

In the most consumers' marketing researches the object of the measurement are the demeanors of buyers of various goods. Among the ideas of demeanors popularized in the social psychology and sociology one may cite the following, in which demeanor is described as: "a positive or negative relation to a certain object, idea or situation, as well as the readiness to react in a certain, predetermined way to these (or related with them) objects, ideas or situations" (according to E.R. Hilgard, 1972 page 834)[1], or as a structure comprising of cognitive elements, emotional relations and tendencies towards specific behaviors towards a given object" (that is what demeanor is defined by Krech, Rosenberg): Sagan (2004). Demeanors are shaped as the result of a reaction of an individual with the environment. Psychologists discern three basic elements of demeanors: beliefs (related with the given subject), emotions (which are shown in preferences and likes) and behaviors (e.g. before making a purchase, during it is being made and after it has been made).

Due to the complexity of such an idea of a demeanor and the difficulties in implementing it, in the practice of marketing research in examining the demeanors one usually uses a narrowed idea of a demeanor, in which it is a "degree of feeling's intensity, which an individual shows towards the given object"[2]. Thus any research of demeanors in marketing are down to evaluating the emotional feelings of buyers, their evaluating judgments and opinions, regarding various objects.

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[1] (quoted for Kaczmarczyk, 2003).

[2] Such a definition is suggested by Thurstone and Fishbein in their works - based on: Sagan (2004)

The most often used methods and techniques of researching demeanors are:

- Open or closed questions about demeanors, regarding knowledge and beliefs about products, emotional states and judgments, as well as the willingness to buy (included in the questionnaire of the survey or interview);

- Psycho-physiological techniques, which are based on using devices, that register physiological reactions of the man, created as the result of his internal feelings (with the use of an electrooculogram with an encephalogram - for registering the movement of eye-balls and the measurements of brainwaves, techitoskop, pupil meter, psycho galvanometer, etc.);

- Projection techniques, which are based on the effect of projection, i.e. spontaneous and unaware expressing subject qualities by the studied person; they are groups of researches (associations, supplements, games, plays) in which the matter and they way of presenting allow making various interpretations by the studied person;

- Matter analysis, based on systematic, formal, statistical analysis utterances of the respondents, included in various types of reports (consumers' journals, journals, shopping reports);

- Demeanors scales and models - are the most frequently used tools in marketing researches (demeanors scales and models are broached in the later part of this compilation)

Preferences are the subjectively felt evaluations, which direct the consumer when making a certain choice. They are based on preferring some variants to other possible. In effect we may imagine, that as the result of evaluating of choices by the consumer, preferences' scales are created, which put the goods in order according to the rank of their importance.

In researching preferences the following methods and techniques are used:

- The method of products' scheduling, thanks to which an ordinal scale of preferences in created (as the result of putting the objects in order by respondents from the least preferred to the most preferred);

- The method of triads, in which it is assumed, that while analyzing the similarities between objects (brands), the consumer makes the brand, he thinks of as the best, as the datum point, so the most preferred, and he compares all the other objects to this point. Based on similarity evaluations, preferences' scales are created;

- Thurstone's comparisons method, thanks to which an interval preferences' scale is created, based on comparisons of every brand with each other (comparing in pairs is used, the results of which are collated in a table, where at the intersections of verses with columns the proportion of answers of brand preferring from the column over the one from the verse is entered - then the results are standardized and the values in columns are added, and the averages are calculated; the lowest average from the columns is the datum point in the scale);

- The method of valorization of the utility qualities, which is based on attaching double rank scales: one for qualities, and the other for their values (the ranks of qualities are determined e.g. of products based on consumers evaluations, then the values for each of the qualities are taken into account and they are also attached to a rank based on consumer's evaluations; then the qualities' scale is multiplied by the scale of values of these qualities and the so called advantages are created; the advantages are added for each quality).

3. Scales for measuring demeanors and preferences

When designing marketing researches, one needs to think how to make the measurement, in order to get proper information on the studied qualities. One needs to think which measurement scales should be used, and how they should be constructed.

Scales for measuring demeanors - enable finding the causes of a certain behavior and they possess diagnostic meanings.

The following measurement scales are used for measuring demeanors and preferences:

- **The scale of ranks.** The purpose of rank scales is getting an ordinal rank series of the studied objects (products' brands, advertisements, shops, people, combinations of products' qualities, companies, etc.). The rank of scales is based on the fact, that a respondent, while giving his answers in the questionnaire, is at the same time to put the categories in order (product's qualities) according to the provided criteria (e.g. in a sequence the respondent attaches the greatest importance to the given quality - from the less important to the most important for the respondent qualities).

- **Thurstone's scale.** A measurement according to this scale is based on the fact, that a respondent makes a series of choices: selecting one of two possibilities according to the given criteria (e.g. taste criteria). He makes a series of evaluations (comparisons), usually in pairs (e.g. product A tastes better than product B, etc.). The number of evaluations is equal to the number of comparisons.

- **The scale of totalized evaluations.** There are two variants of this scale: comparative and rank. Using the comparative scale of totalized evaluations is based on conducting a series of comparisons (e.g. in pairs): the respondent is to attach numerical evaluations the listed qualities or objects from each of the series, according to own preferences so that they would produce the required evaluation. On the other hand using the rank scale of totalized evaluations is based on attaching ranks - numerical evaluations to the specified individual qualities, and the sum of ranks is determined (e.g. 100).

- **Position scale** is the simplest variant of composite demeanors' scales. This scale is comprised of a nominal scale, for which the individual evaluated positions

have identical ordinal scales attached. While filling the questionnaire's positions, in which a position scale has been used, the respondent makes an evaluation of each position of the nominal scale, determining the qualities of the given object with the use of an ordinal scale attached to each position of the nominal scale, according to his preferences.

- **Semantic scale** (other names are also used: the method of semantic profiles, polarization profiles' method, semantic differential). The semantic scale is a set of several ordinal scales, usually bipolar (limited from both sides with a pair of antonyms) and often seven-degree, independent from each other. The respondent is to select one category in each scale according to his preferences.

- **Stapel's scale** is a variation of the position scale. It is comprised of a nominal scale, the positions of which have attached multi-grade monopolar scales (e.g. from -5 to +5). With the use of the Stapel's scale it is possible to make a measurement of both the direction and the intensity of demeanors.

- **Likert's scale.** It is a nominal scale, which is comprised of many positions, which usually are short sentences characterizing specified demeanors towards a given object - intensity scales are attached to those positions, being multi-grade ordinal bipolar scales. Each position of the Likert's scale is a scale of it's own, so the Likert's scale is a set of ordinal scales.

- **Multidimensional scaling (MDS).** The purpose of multidimensional analysis it to transform the data collected from measurements, regarding preferences and demeanors, into a complex image in a multidimensional space - represented graphically, usually in two or three dimensions. An example of such a multidimensional scale may be the method of comparing objects with many qualities in pairs, and the quantitative data can be transformed into a graphical multidimensional configuration of preferences and similarities. Multidimensional scaling is used in comparing products.

- **Multifactor measurement** is based on a measurement of respondents' preferences towards several interconnected factors (qualities) of one product. The respondent is presented with a full qualities' profile or comparisons of all the qualities in pairs are used. Multifactor measurement is especially useful in testing new products in the market.

4.   Demeanors' and preferences' models

The most popular consumer's demeanor model is Fishbein's model, which stems from the mainstream of cognitive theories. It is based on an assumption, that demeanors are shaped based on beliefs constructed by consumers. Demeanors are learned through a process of interpretations and a cognitive integration of information about the demeanor's object. The process of cognitive integration of information is selective, it is done in the so called long-term memory of an individual; through

this process convictions are formed - "solidified convictions" are an important cognitive element of a demeanor.

Fishbein expressed his model in the form of a mathematical formula:

$$A_0 = \sum_{i=1}^{n} b_i e_i$$

where:

A_0 – demeanor towards a product,

b_i – grade of belief about the existence of a certain quality in the product,

e_i – evaluation of the given quality,

n – the amount of possessed "solidified convictions"

Demeanor measure proposed by Fishbein in this model is relative and allows only to compare different products or other objects between each other due to subjective demeanors of the studied people in relation to these objects, as the relation of demeanors with the actual consumers' behaviors is not always unequivocal (e.g. positive demeanors do not necessarily need to be reflected in purchases, i.e. the consumer, despite a positive demeanor towards the given product, may buy other products, and not this one).

In order to identify the relations between the cognitive and affective aspects of a demeanor and the actual, observed behaviors, Fishbein and Ajzen proposed a different extended model, called the model of rational action. According to them, behaviors' intensions are created under the influence of various factors (which need to be identified by the researcher), which in an immediate way direct the action itself. And people choose those actions, that they prize the most and which are also popular among others. So, aside from demeanors towards such objects as: products, brands, advertisements, etc. the researcher must additionally include demeanors towards behaviors, behaviors' intentions, and also current social or cultural standards and individual's motivation to abiding by them.

An extended to Fishbein and Ajzen model is presented by the following formula:

$$B \approx BI = w_1(A_B) + w_2(SN)$$

where:

B – current consumer's behavior, which in approximation equals BI ,

BI – intention of an individual to behave in a certain way,

A_B – consumer's demeanor towards the contemplated behavior.

$$A_B = \sum_{i=1}^{n} b_i e_i$$

where:

b_i – grade of belief about the consequences of given behaviors,

e_i – evaluation of these consequences by an individual,

n – he number of beliefs regarding behaviors and taken into account.

SN – objective standards regarding an individual's behavior (concession of other significant people),

$$SN = \sum_{j=1}^{m} NB_j MC_j$$

where:

NB_j – onsumer's beliefs about the existence of a behavior standard (i.e. that other significant individuals believe, that he should or should not behave in a certain way),

MC_j – motivation for behaving according to a standard (i.e. subjugate to opinions of significant people),

m – the number of people taken into account,

w_1, w_2 – mportance defining the strength of affecting A_B and SN are the behavior's intention.

According to this model demeanor of an individual towards given behaviors is shaped by the dominating beliefs about the consequences of these behaviors (b_i) and an evaluation of these consequences (e_i). Nevertheless, subjective standards are specified by the beliefs of an individual regarding the reactions of others for it's intentional behavior (NB_j) and motivation of a customer to subjugate to their standards of behavior (MC_j).

Dominating beliefs regarding the implementation of individual purchases, as well as any subjective standards specified by the dominating consumers' groups, may be determined in the process of marketing researches.

Preferences' models are closely related to demeanors models. They allow to explain the shaping of preferences and choices of brands in the market. One may discriminate the following models from among the known models:

- compensational (expected value, perfect brand), in which the low level of evaluation is compensated by the high level of a different quality,
- non-compensational (conjunctive, disjunctive, lexicographic), in which the high level of evaluation of one quality does not compensate the low level of a different quality.

The model of expected value is expressed by the formula (it is basically an interpretation of Fishbein's demeanor model):

$$A_{ik} = \sum_{j=1}^{m} W_{jk} B_{ijk}$$

where:

A_{ik} – score evaluation of the brand i by the consumer k,

W_{jk} – the importance of the quality j for the consumer k,

B_{ijk} – score evaluation of the quality j in a brand and by the consumer k,

m – the number of evaluated qualities for the brand.

The most preferred is the brand, for which the expected value of the relative importance of the quality and the evaluation of implementation of this quality in the given brand is the highest.

A model of a perfect brand is similar to the model of the expected value, and it discriminates with the fact, that beside the actual products there is a set of evaluations called the "perfect brand".

The model of a perfect brand is expressed by the following formula:

$$C_{ik} = \sum_{j=1}^{m} W_{jk} \left| B_{ijk} - I_{jk} \right|$$

where:

C_{ik} – dissatisfaction with the brand and felt by the consumer k,

I_{jk} – the level of quality j in a perfect brand evaluated by the customer k.

The most preferred is the brand causing the least dissatisfaction.

In the conjunctive model the consumer sets the minimum level for individual qualities of the product and chooses only those brands, in which all these qualities got scores higher than the required minimum. If even one quality is lower from the expected level, the product is rejected.

In the disjunctive model the consumer sets the minimum levels for the subjectively most important qualities of the product and chooses the brand meeting one of the criteria, not taking the evaluations of other qualities into account, and which are less relevant to him.

The lexicographic model assumes, that all the qualities are taken into account in a hierarchical configuration. The consumers makes an evaluation first in relation to the most important quality, and then, if several brands have similar qualities, he takes the next qualities from the set into account, until only one brand remains.

5. Direct methods of collecting data with the use of the Internet

The scope of possibilities of using the Internet for conducting various kinds of marketing researches is broad, as it covers practically all the areas of marketing researches, where the classical research techniques are used: testing the new products, examining packages, examining the image, pretests of advertisements, brands of existing products, studying the planned and implemented changes in marketing actions, studying the prices, examining satisfaction and loyalty of customers, studying demeanors and preferences, studying WWW pages, etc..

The possibility of implementing researches on trials formed with the use of the Internet is currently still limited to several segments, such as: computer-engineers, employees of the sector related with computer technologies, pupils, students. It is the reason of the weak penetration of the Internet in Poland.

Regardless of whether the sources of information are traditional, or the ones using the Internet, the division of marketing tasks by reason of the way of collecting information is the same, and they are divided into:

- passive studies, acquiring information, which are included in various publications or collected in some collections,
- primal studies (direct methods of acquiring data), acquiring information specially from the point of view of the specific research's needs and directly from people, who are the source of these information (Sznajder, 2004).

A great problem in conducting researches is the fact, that only a small portion of the specified or encouraged people is willing to be the subject of a research. M. Bosnjaka and T. L. Tuten, as the result of Internet researches conducted on a trial of almost 1500 people, have made attempts to classify respondents' behaviors during giving their answers in survey researches through WWW based on the number of questions seen by every participant of the research and number of questions, that were answered to. As the result of this research they showed the following types of behaviors and they determined the percentage of those segments in the examined group: "answering completely" - 25,3%, "not answering at all" - 10,2%, "answering and terminating the research" - 4,3%, "watching" (watching, but not answering any questions) - 6,9%, "watching and terminating the research" - 13,3%, "skipping" (people, who after having seen the questions answered some of them) - 36%, "skipping and terminating the research" - 4% (Mącik, 2005 page 121).

In the case of researches implemented in the Internet one may discern two general techniques of selecting a trial. The first is the so called "self-recruiting", in which the Internet user, informed about the research (e.g. through a banner or a pop-up window), decides for himself to participate in the research. The second method is based on the pre-selection of respondents. In this case the person conducting the research, with the use of various choice criteria, decides directly, who to encourage to participate in the research.

The most popular method of measuring in the Internet is an Internet questionnaire, based on acquiring answers for the questions included in questionnaires (distributed by e-mails or with the use of WWW technologies - in web pages or with the use of so called pop-up windows, small windows, that appear after entering a page). Aside from surveying one can also conduct many other types of studies. A certain variation of sample surveys are panel studies. They are continuous or periodical studies, based on a permanent group of respondents chosen from the database of the person conducting research (a group of people, who agreed to participate in researches regularly). It is possible to conduct qualitative study in the form of extended interviews and focus groups with the use of this medium, in which a moderator, moderator's assistant, the customer of the research and respondents participate. The moderator moderates a discussion in a group of several people regarding the analyzed issue. Usually specialized software is needed for this, in order to design and conduct the research in real-time properly with the participation of many people simultaneously. The way to implement this research may also be a so called chat, a simultaneous discussion of Internet users in the Internet itself. This way even more frequently discussions of Internet users with politicians, actors, scientists are conducted. During such a research the following are used: vocabulary associations' tests, unfinished sentences, creating stories, collages and sorting pictures, comics, creating perception maps, brands' rankings.

Internet can also be used to conduct psychological researches, with the use of which the researcher wants to know the opinions of the researched people. Such a research is based on arranging various situations and constructing the questions in such a way, that the person subjected to the research could express opinions involuntarily during doing the tasks, that can not be associated with the actual subject of the research.

6.   Conclusions

The market created by the new economy has changed the rules of marketing researches. The need of faster access to better data has become a standard. At the current rate of changes in the market environment, in short time one may lose the position, if one does not control himself and does not react to the changes in the market. As information today are popularized very rapidly nowadays, one needs to react quickly to ever more incentives.

It has been foreseen, that the participation of marketing researches conducted with the use of the Internet will be constantly growing and that mail, phone surveys will more often be replaced with electronic questionnaires (Mazurek-Łopacińska, 2005, page 215). Currently the low penetration of the Internet in Poland is a great limitation for such types of researches.

Using the Internet as the new medium of communication in marketing researches is a giant challenge for research companies or for companies conducting

research activities on their own, due to the possibility of reaching a very large number of people, in a short time and at low costs. One can not wait for the results of researches for months, when the pressure of competition is always very strong.

Nevertheless, the potential of the Internet as a tool used for understanding the market still has not been fully used. But perhaps soon the times, in which marketing managers will be starting their Internet browsers, in order to see the daily reports regarding the satisfaction of customers, to observe the position of the brand, and also the effectiveness of their marketing programs, will come.

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Monografia zawiera wybór artykułów dotyczących informatyzacji procesów zarządzania, prezentując aktualny stan rozwoju informatyki stosowanej w Polsce i na świecie. Zamieszczone artykuły opisują metody, modele, techniki i systemy informatyczne stosowane do wspomagania procesów podejmowania decyzji, a także omawiają zastosowania narzędzi informatycznych w różnych sektorach gospodarki. Kilka prac przedstawia wyniki projektów badawczych Ministerstwa Nauki i Szkolnictwa Wyższego, dotyczących rozwoju metod informatycznych i ich zastosowań.