

EXAMINING THE COMPONENTS OF DELPHI METHOD IN ORDER TO IMPLEMENT ITS LONG-TERM PROGNOSIS IN THE FIELD OF NATIONAL SECURITY. THEORETICAL AND RESEARCH STUDIES.

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ABSTRACT: THE JUSTIFICATION OF DELPHI METHOD IS NOT A SINGLE ACT BUT CONTINUOUS PROCESS WHOSE DEVELOPMENT IS IS REFLECTED IN A SERIES OF REPORTS. THEY ARE PART OF RESEARCH MEMORANDUM OF RAND CORPORATION BY 1948 UNTIL 1973 AND REPRESENT WORKING DOCUMENTS RELATED TO DELPHI METHOD. AT FIRST THEY WERE DESIGNED FOR THE NEEDS OF THE CORPORATION AND ONLY FOR THE PERIOD OF SEVERAL YEARS EXCEEDED ITS LIMITS. DELPHI METHODCONTAINS THE CHARACTERISTICS OF SCIENTIFIC STRICTLY REGULATED PROCESS, WHICH APPLIES TO A SPECIFIC TECHNOLOGY - EACH PROCESS HAS ITS COMPONENTS. THESE COMPONENTS ARE: 1.CHOOSING A TOPIC 2. TIME TO CONDUCT 3. A RESEARCH GROUP 4. AN EXPERT GROUP 6. NUMBER OF ROUNDS 7. COMMUNICATION; 8. ANALYSIS OF RESULTS 9. AUDIT OF THE PROCESS; 10. PILOT STUDY.

KEY WORDS: LONG-TERM FORECASTING, FUTUROLOGY, GOVERNED SCIENTIFIC PROCESS, SCIENTIFIC AND TECHNICAL PROGRESS, MEMORANDUM REPORTS, CHOICE OF SUBJECT STANDARDS FOR CHOOSING A TOPIC, TIME TO CONDUCT, COMMUNICATION BETWEEN EXPERTS, ELECTRONIC COMMUNICATION, ADMINISTRATION DELPHI PROCESS, A RESEARCH GROUP, EXPERT GROUP, QUALIFICATION OF EXPERTS, QUESTIONNAIRES, ITERATIONS, NUMBER OF ROUNDS, ANALYSIS OF RESULTS, AUDIT PROCESS, A PILOT STUDY

THE U.S. RAND Corporation is creator of the the method for long-term forecasting - Delphi method first intended for the needs of the corporation and only for a period of several years outside its borders.

ITS start Delphi method was from the Second World War - in 1944, when General H. Arnold ordered the creation of a report linked to future technological capabilities that can be used by the military. The method is described in 1964 in "Report on the study of long-term planning" Corporation. Objects of study, according to this report: scientific controversies, population growth, automation, space exploration, the emergence and prevention of wars, future weapons systems and others. For the last time the list of predictable processes using the Delphi method has been significantly enlarged, but undoubtedly the most use it has in the field of scientific and technical progress.

THE main task that started the development of the method is to answer the question: "How much can be known about the future?" When they published treir report on the long-term forecasting it became RAND - bestseller that contains forecasts for technological breakthroughs in 2000 and beyond. Contributions were also by above 82 experts participated in the Delphi.

THE justification of Delphi method is not a single act but a continuous process whose development is reflected in a series of reports. They are part of a research memorandum of RAND Corporation from 1948 to 1973 and represent working documents related to the Delphi method. During the development of the method they are designed for a range of scientists and researchers. It is clear that the Delphi method contains characteristics established strictly regulated scientific process that applies to a specific technology.

EACH process expresses consistent actions or events, changes, that outline specific development or achieving a defined objective. And each process has, its constituent parts - components.

THE components of the Delphi method are: selection, setting of time for performing, forming of a research group, a group of experts, development of questionnaires, determining the number of rounds, choice of way of communication, analysis of results, conducting a pilot study and audit of the process.

1. SELECT A THEME

ACCORDING to **R. Judd, R. Taylor and J. Jacobs**, the choice of topics for study by the Delphi is the most important step in the whole process because it directly relates to the quality of the generated results [19], [36], [18].

BECAUSE Delphi technique focuses on the extraction of expertise for a short period of time, the choice of topics in general depends on the disciplinary areas of competence required by the experts on specific issues.

WITH respect to certain standards for the selection of topics for Delphi, in fact there are no accurate criteria mentioned in the literature. **K. Oh** argues that the selection of appropriate topics for Delphi, is usually based on the judgment of the principal researcher [26].

THE choice of topic should be approached with extreme caution and need to be comply with the following:

1. Therefore appropriate is to avoid general, broad themes in the development that enables experts to meet surface only "touching" to the problem, without being able to meet full and complete. The more specific it is a topic, as it allows for a thorough and complete opinions.

2. The topic should be related to the actual problems of the science, the technological development or the social practice. In this sense, through her may enable experts to develop a problem or make long-term forecasting associated with its development.

3. It is necessary the respect for the line between desire and intention of the researchers and their real strength and abilities to provide adequate expert team, to develop the theme and giving expert opinion. Very often it is permitted to start work on a difficult and a large volume of a topic that takes a long time and it faces insurmountable difficulties, which eventually has a negative impact on the results themselves.

4. With the choice of topic is necessary to determine baseline information from factual data, materials or existing statistics containing the necessary indicators to assist the research group. There is also a literature research in the selected direction, which has attracted initial attention and interest of the research group to orient it in a better formulation of the selected topic.

5. It is essential when choosing a topic, to answer the question how long it is possible to separate it in order to develop it.

2. TIME FOR PERFORMING

CONDUCTING the Delphi method can take different times. In most cases it is quite lengthy. **A. Delbecq, A. Van de Ven and D. Gustafson, B. Ludwig and F. Ulschak** recommend at least 45 days for the administration of Delphi [9] [39] [24].

WITH regard to the time between iterations **A. Delbecq, A. Van de Ven and D. Gustafson** advised two weeks to be able to respond calmly to the questions [9].

B. LUDWIG believed that "blemish of Delphi method is that the process can be slowed down considerably, as it is possible a few days or weeks pass between the rounds." [23, pp. 54]

THE research group determines the number of iterations and time required, in relation to the volume of research and also, considering the number of participants - the more they are, the longer it takes to process their opinions and there - for formulating questionnaires . Depending on whether they are using computer programs or using traditional paper-based, time may be reduced or increased. [1]

3. RESEARCH GROUP

THE research group, which plays the role of coordinator, analyzes the data and wrote the questionnaires. It plays a very important role in the whole process, as they have to be careful not to reflect their views and preconceptions on issues and this may distort the results. If there are disagreements between the answers they need to be investigated, but not forgotten. Otherwise the answers to the dissidents will fall and this will lead to a false consensus. [1]

ACCORDING to **W. Trochim** in front of the research group is also the primary responsibility for ensuring ethical behavior within the research. This includes the protection of human subjects participating safety and welfare, drawing on relevant protocols and adherence to the institutional and governmental regulations. It is responsible for providing an informed consent obtained from each participant and proper maintenance of records of the study. It is responsible for compliance with financial and administrative policies and conflict prevention at the realization of Delphi. [37]

ALL members of the research team must have appropriate education, training and qualifications to undertake the project implementation. They must have the ability to perform well under stress task and easy to acquire new skills in new situations.

OF great importance are the qualities of the leader of the research team:

- ✓ manages and coordinates overall conduct of the Delphi procedures act as the primary point of contact between the research group and the expert group;
- ✓ has the qualities of an organized person with excellent coordination and management skills, research experience and dedication to science, to be flexible, patient, good social skills, good communicator, both physically and mentally stable;
- ✓ should be involved in determining targets, responsibilities and tasks of the research team.

IN the research group and the coordinator enters Data Coordinator /Analyst/. He is responsible for the overall management of the survey data, which are derived from the opinions of experts and into a specific database for the development of the questionnaires. One of his main duties is proper and timely implementation of the expert answers in the

electronic database and the electronic form of communication between experts and research groups.

4. EXPERT GROUP

THE experts may be homogeneous or heterogeneous group. Their profile can be defined by age, nationality, knowledge, qualification, profession or professional position, etc. Of particular importance are their expertise, which affects the quality of the results [16]. **T. Gordon** wrote that "The key to a successful Delphi study lies in the selection of participants. Because the results of the Delphi depends on the knowledge and cooperation of experts is essential to include persons who could offer valuable insights." [15, p.7]

THE respondents of the questionnaire experts, should be knowledgeable in the field, but in the literature there are suggestions that high level expertise is not required. The minimum number of participants to ensure good performance of the group is to some extent depending on the project expertise.

EXPERIMENTS of **K. Brockhoff** show that under ideal circumstances, and small groups composed of four expert can perform well [3].

BUT how can the experts be identified a priori? - Referring Dalkey, **T.Gordon** answers this question: "Can be use different rating systems, for example [15, p.13]:

1. *Are you an expert in this field, you work every day?*
2. *Do you work in this area from time to time?*
3. *Was knowledge of this area received through casual professional reading?*
4. *Do you feel yourself informed citizen?*
5. *Are you uninformed about this area? "*

He offers a a sample questionnaire for the selection of experts in the Delphi study [15, p. 13-14]:

„1. *Which one of the terms best describes your profession?*

scientific worker _____

politician _____

physicist _____

others _____

businessman _____

cleric _____

servant _____

engineer _____

actor _____

producer _____

teacher _____

publisher _____

shopkeeper _____

2. *If you are a scientist, what is your research area? (Parallel issues for engineers, businessmen, teachers, etc.)*

Elementary particle physics, genetics, biomedicine and others.

Organic Chemistry, Nuclear Physics, Astronomy

Materials Science, Psychology, Economics,

Social Sciences, Political Science, Agricultural Science.

3. *Do you consider yourself:*

Erudite

Specialist

4. *Are you interested in (or have experience): Technological forecasting political developments, ideas and more. Importance of policies relating to the analysis of the issues Issues of world politics. "*

IF the number of respondents is large, the process of gathering information in referred matrix should be automated. The program will have access to a database of characteristics of respondents as their choice will be done automatically.

IN Delphi, one of the first things facing researchers is the sample size of experts. There is a wide range for its size and it is always carefully appointed from the researcher with the topic being studied. **B. Ludwig** writes that "the greater part in the Delphi were used between 15 and 20 respondents." [23, pp. 2]

THERE is no consensus among researchers at Delphi regarding the number of experts involved in the process. **A. Delbecq, A. Van de Ven and D. Gustafson** believe that 10-15 people are enough [8]. **B. R. Witkin and J.W. Altschuld**, believe that the recommended amount of the expert group should generally be less than 50 people, but is likely to be employed more people [42].

H. JONES and B.C. Twiss, said the principal investigator of the Delphi study, need to identify and select the most appropriate persons through a process of nomination [18].

B. LUDWIG also states that "the appointment of well-known and respected persons as members of the target group of experts is recommended". [23]

ACCORDING to **M. Adler and E. Ziglio** there are four requirements for experts to conduct Delphi expertise [2]:

1. knowledge and experience to analyze issues;
2. capacity and willingness to participate;
3. have enough time to participate;
4. have communication skills.

BECAUSE seeking the expert opinion is necessary in advance sampling of experts on whether they have the necessary knowledge and willingness to answer the research questions set [11]. In the absence of full scientific knowledge, decision makers must rely on their own intuition.

A. DELBECQ, A. Van de Ven and D. Gustafson explicitly identify three groups of people who are well qualified and able to participate in Delphi. According to them, these are [9]:

"(1) best management decision makers who will use the results of the Delphi study, (2) professional staff along with their team, (3) meeting the Delphi questionnaire that can provide solutions.

T. GORDON notes that in the realization of Delphi "... the first problem is how to select potential participants. Knowledgeable individuals are usually identified by the literature, which are published on the subject of the study, recommendations from institutions ... "[15, pp. 8] In his opinion the final approach suffers the most serious criticism because in the recommendations of institutions has the potential to propose people belonging to cliques, but not so good specialists. One feature that helps to ensure that the necessary skills are in place to form a matrix that lists the necessary skills [10, pp. 8-9].

IN summary, about the experts participants can say the following:

- ✓ The expert in conducting the Delphi method is a participant in the team that has a lot of experience, expertise, proven practical skills in a defined professional field, which is the purpose of discussing and contributing to the achievement of the team goal;
- ✓ Specific behavior of the expert is that he is always confident in what he say and what he does, is very knowledgeable about news and facts in whose problem / and discuss / ; convincing and suggests real confidence;
- ✓ The expert input to the target is that it provides the team with unique expertise and skills in problem discussions;
- ✓ Weaknesses of the expert are its straightforwardness and intransigence of the statements of his position, which often makes it difficult for the team.

BEYOND those criteria, **B. Ludwig** specifically addresses the motivation of experts and the research group as a key to successful implementation of Delphi, which ensures a high degree of accuracy [23].

IN addition cited authors a number of other researchers of the Delphi method have achieved scientific developments related to the formation and work of the expert group, such as **B. Brown and S. Cochram, P. Ashton, F. Boulder and G. Wright, L. Christian, D. Gustafson, R. Shockley, G. Uolstar, M. McKee, P. Priest, M. Dzhinzlar, N. Black, A. Klee** and others. [1]

5. QUESTIONNAIRES

THE start of iterations in Delphi begins with the development of the first questionnaire for the first round. It takes great care and attention to this because if respondents do not understand the issues, they can formulate the wrong answers and / or be disappointed [9]. **R. Schmidt** believes that sometimes even the purpose of the first round Delphi is to formulate these questions well [32]. Initially these are usually wide open-ended questions so that they are clear in the research network [2].

ACCORDING to **G. Skalmoski** and **F. Hartman**, alternative questions can be more focused and structured to lead participants to a particular purpose, all the time in the next rounds. With a broad research questions presented to the network in the first round is likely to receive a wider range of responses than if it represented a narrow set of issues. But will they be presented to experts focused broad issues is a decision that should be taken at an early stage of the design of the Delphi procedure [35, pp. 10].

IN Delphi there is a continuum representing the degree of focus openness of the questionnaire. For example, the initial questions are generally wide open-ended questions, so as to obtain open, wide responses from research network [2], [9], [23].

THE alternative is that the questions are more focused and structured to lead participants in Delphi to the target set by the duration of the procedure relate to items on the next rounds. With a broad research network responses in the initial round is more likely in the next rounds to get a wider range of responses than if narrower set of questions focuses the collective intelligence of the participants around one or more possible answers [1]. **M. Adler and E. Ziglio** added that if the experts failed to deal with issues that may lead to inappropriate application of Delphi and discredit the creative efforts [2].

PRESUMABLY responding of the questionnaire should be well informed in the field, but in the scientific literature on the Delphi method is mentioned otherwise - **G. Welty**, who takes the view that it is not necessary high level of expertise of the participants. [loc. 2]

EXPERTS are encouraged, by answering questionnaires to draw from their experiences, and to use any historical data, studies, or other resources available to assist in response to questions.

FIRST questionnaire is usually composed of one or two questions. They are intended to be open-ended. Experts give their opinion and return the questionnaire to the research group. It shall review the responses and use this information to develop more specific questions which will be used in the second questionnaire.

THE second questionnaire has two main parts: first, results and responses from the first questionnaire are presented in an orderly format /example in the form of a list or table/. Second, include new questions formulated by the research group. Depending on the number of rounds, the procedure as for the second questionnaire multiplies.

6. NUMBER OF ROUNDS

THE number of the rounds is also variable and depends on the purpose of the study. Their number varies from two to ten, but the most common is limited to two or three rounds. **P. Gootschalk** however, identify Delphi studies with a circle [16].

A. DELBECQ and D. Gustafson indicate that two or three iterations in Delphi are enough for most studies [9]. If the estimates in the group are heterogeneous, then it can be held more rounds. But, if their number is increasing, it is often a decline in the desire and effort required by participants [1].

THE research group determines the number of rounds even with the setting of the Delphi and plan them in the documentation of the study.

7. COMMUNICATION

IN the scientific literature there are described different ways of reacting to the experts with the investigator. Originally Delphi studies were made of paper and pen by answering the questionnaires have been returned by mail to the researcher [22], [35]. But with the advent of e-mail, Delphi began to be carried out with the help of personal computers in a network as pen and paper carrier gradually lose their application. New technologies allow researchers to put Delphi on-line questionnaire, where respondents enter and reflect their answers. These responses are in a digital format and then more easily can be processed. Some researchers use online surveys to collect data from the experts. Switchover process communication in Delphi from paper to electronic media are described by **K. Cabaniss, J. Richards, V. Schmidt** [4], [28], [34].

EMAIL offers many advantages for both sides - researchers and experts. Perhaps the most significant contribution of e-mail for Delphi is a fast connection and hence maintain high enthusiasm among participants. Another benefit of e-mail in the fact that the data is transmitted in digital format ready which eliminates the tedious task of processing and interpretation. Through an electronic network is possible the Delphi study to be completed in a circle [1].

8. INTERPRETATION OF THE RESULTS

IN the Delphi method, the data analysis and reporting of results are directly related to the used questions. Therefore, researchers must apply appropriate analysis techniques. Presentation of the results of the Delphi are discussed in detail in a significant number of different monographs related [7], [8], [9], [33].

SOME researchers include an analysis of the results [1], sorted according to the areas of agreement and disagreement, and others, eg. **S. Kincaid and A. Watson** used purely qualitative analysis [21], [40]. Purely quantitative methods have been used by **Friend J., A. Silverman**, [13], [35] and others.

MOST of them - **J. Friend, A. Prestamo, J. Rosenbaum** - starting with qualitative methods, followed by quantitative analysis of the next round, by means of questionnaires Likert [13], [27], [30]. Most of them - **Friend J., A. Prestamo J. Rosenbaum** - start with qualitative methods, followed by a quantitative analysis of the next round, using a Likert questionnaire [13], [28], [31].

SKULMOSKI G. and F. Hartman believe that qualitative research is an explanatory /interpretative/ in the sense that the researcher is interested in how to interpret the social world and experience as a researcher is flexible and sensitive to the social context. [35, pp. 9-10]

R. SCHMIDT and others., Identified as difficulty to collate the results coming from the large number of experts or that are in a different location [33].

ACCELERATED evolution of computers and their applications increasingly eases the process of analyzing the results and making decisions as part of Delphi. Computer models make more efficient use of data collected through traditional techniques and methods generate highly realistic predictions and results of future events. Most scientists associated with the development, implementation and analysis of the Delphi method recommended after the results achieved to undertake further study to improve and verify the results already obtained, but with a sample set of experts other geographical locations or completely different team of experts [1].

MANY researchers indicate the difficulties aggregation, because of the larger sample size, their limited views, or their geographic location. Therefore it is recommended further study to test their results. To achieve this goal should be expanded set of questions and administered among experts from other geographical locations. It is possible to make a completely different study to compare the results. Verification of research would provide richer opportunities for the researchers.

WHILE some scholars and practitioners include in Delphi the publication of the results the majority do not. The results of the Delphi contain key data that are in the toolbox of futurologists, so they need to be published.

PRESENTATION of the results of the Delphi are discussed in more detail in various monographs as the creators of Delphi and its other researchers [1].

9. PILOT STUDY

THE pilot study is sometimes performed to sampling questionnaire or all procedural issues related with the conduct of Delphi. This is especially important for inexperienced researchers who can put too ambitious tasks related to the scope of their research or underestimating the time required for realization at all stages associated with the method.

ACCORDING to **P. Prescott and K. Soeken** often pilot studies are undertaken for many reasons [26]:

1. identification of problem;
2. conceptualization of the study;
3. formation /structure/ of the study;
4. development of the first questionnaire;
5. refinement of the research tools
6. developing and testing techniques for data analysis.

THE pilot study can also help to establish the relevance of the research question to the relevant field of study. Usually are selected and different methods of research /qualitative and quantitative/ after considering the pros and cons of each selected the most promising of them, which have the greatest potential to answer research. And qualitative and quantitative methods can be used in the process of Delphi.

G. SKULMOSKI and F. Hartmann considers that the pilot Delphi is particularly important for inexperienced researchers may be too ambitious in the scope of their research or underestimate the time the research will take [35].

A. FINK and J. Kosecoff are focusing on the fact that the pilot study is needed in terms of how quality will be the searched expertise. As seeking expert opinion, targeted sample is needed when people are not elected to represent the population, and represent their personal expertise and ability to respond to research questions. [11]

10. AUDIT OF THE PROCESS

MANY researchers of Delphi - **M. Adler and E. Ziglio, A. Delbecq** and others., **N. Linstone and M. Turoff** express the opinion that the permanent controls at Delphi process are crucial to improve the reliability of the results [2], [9], [22].

ACCORDING **J. Creswell, F. Fowler, M. Sadleowski** this is related to compliance with methodological rigor, which is also crucial in Delphi [6], [12], [31].

THE rigor is improved when the researchers implement "audit trail" to solve all major theoretical, methodological and analytical issues from beginning to end, says **M. Sadleowski** [31]. In this sense, **B. Rodgers and K. Cowles** write that audit trails help to justify the reliability of research [29].

G. SKULMOSKI and F. Hartman advised the researcher to regularly use a journal that is intended for registration of audit information. Thus, "the methodological rigor can contribute to a successful Delphi." [35, p.10] The logical rigor contributed to an extremely high level of success Delphi.

THROUGH such composite process Delphi Method O. Helmar its creators T. Gordon and N. Dolki Rishar aim the unpredictable events and changing values /both practical life and of scientific progress/ not to be represent the discretion of the random posts and unclear predictions and to study systematically their conditions so that they become available to a strictly methodical treatment. According to them, the method is designed to build hypotheses planning in major areas of the economy, technology, science and the whole political and social reality.

THE FOREGOING CONTENT OF THE PASTED RESEARCH PROBLEM ALLOWS TO BE MADE
THE FOLLOWING
GENERALIZATIONS AND CONCLUSIONS:

1. PURPOSE of the Delphi Method: (a) it is associated with the futurology - the science of predicting the future, (b) it is most appropriate for problems that require evaluation, quality responses rather than accurate quantitative results, (c) it is intended to build hypotheses on planning large areas of the economy, technology, science and the whole political and social reality.

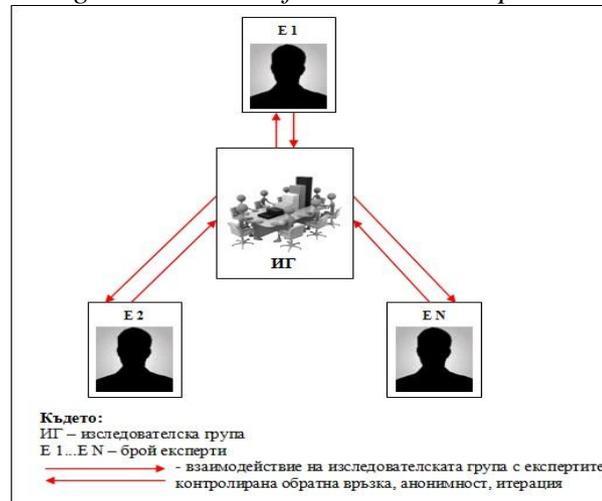
2. CENTRAL figure in the process is the **informed expert** with its resources, basic knowledge and cultivated a sense of meaning and transfer of general in specific cases can best perform the application of quasi-laws necessary for motivated predictions in a given area, creating prototyping technology management issues of new projects to develop products, etc.

3. THE principal difference between the Delphi method and the other expert methods of the type face to face. (a) Instead of using the traditional approach to reaching consensus through open discussion, this technique completely eliminates the committee's work, thereby reducing the influence of some psychological factors such as specious persuasion, reluctance to express opinions publicly and disadvantages with group dynamics as manipulation or coercion is minimized. (b) The group interaction in Delphi is anonymous in the sense that the comments and forecasts do not identify their author and are presented to the group in such a way as to suppress such identification.

THE difference between the Delphi method and the other expert methods of the type face to face is visually presented in the following figures. (*Figure № 1 u Figure № 2*) They clearly show the controlled connection between experts from the research group at Delphi Method and keeping anonymity (*Figure № 1*) and operation and communication experts in all other methods face to face - they can communicate with experts in addition to the research group and each other. In their work they remain known to each other and can exchange thoughts, formulating their expertise (*Figure № 2*). The uniqueness of the Delphi method consists precisely in terms of anonymity, controlled feedback, which occurs in reaching a consensus on a particular research question.

Figure № 1:

Authorial model representing the controlled feedback with experts in the Delphi method



Legend:

RG – research group

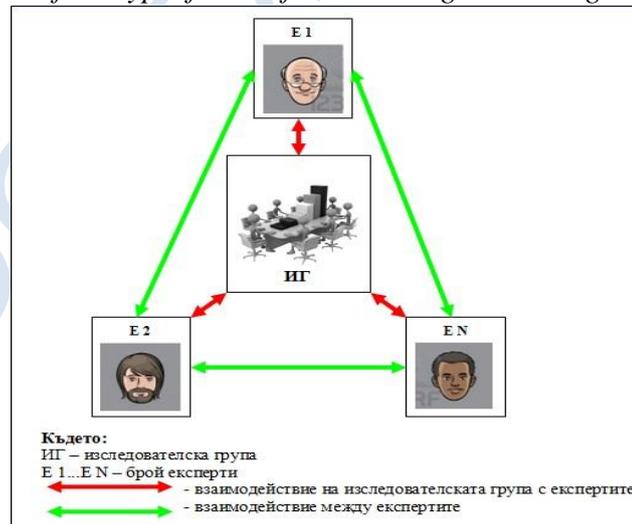
E 1...E N – number of experts

→ interaction between the research group with the experts

← controlled feedback, anonymity, iteration

Figure № 2:

Authorial model representing the uncontrolled communication between experts in the methods of the type face to face involving research group



Legend:

RG – research group

E 1...E N – number of experts

→ interaction between the research group with the experts

↔ interaction between the experts

4. THE strengths of the Delphi method are:

- ✓ Anonymity of assessments. The principle of anonymity removes the negative psychological impact posed by stifling influence of authority or direct imposition of their own ideas. This method avoids meeting between experts and their ability to influence psychologically. Thus, each expert is not influenced by evaluations that formulate the others.
- ✓ Controlled feedback. It allows experts to take account of certain circumstances and opinions, which until then had not complied.
- ✓ The participation of highly qualified professionals as experts ensure scientific merit and reliability of the forecasts.
- ✓ Easy and quickly gets the best of the knowledge and experience of the most qualified experts.
- ✓ Impartially and objectively examine issues that require evaluation.
- ✓ Removes some very disturbing of group dynamics in other methods that arise when making decisions such as the impact of particularly charismatic or powerful actors who are able to dictate opinions.
- ✓ Allows the participants more successfully revise their opinions hidden behind anonymity.
- ✓ Advantage of Delphi is consensus in a field of uncertainty in the absence of empirical evidence of a process or phenomenon.
- ✓ The method is a quick and relatively cheap efficient way to combine the knowledge and skills of a group of experts who may be participants from several parts of the globe together to solve a problem or to predict the future.

5. THE weaknesses of Delphi are:

- ✓ Low level of reliability of the expert decisions;
- ✓ Conditioning results related to uncertainties in the questionnaire used for data collection in each round;
- ✓ Difficulties associated with assessing the degree of expertise included in the forecast.
- ✓ The duration of the procedure is undefined because of the possibility of a more sessions;
- ✓ Defenselessness of the experts to research / analytical group that has too much power;
- ✓ The majority opinion is not always the most appropriate, creative solutions to the minority, sometimes most effective are rejected;
- ✓ The analysis requires a lot of time, the minimum of each range is at least one day;
- ✓ In an effort to fall in most constantly growing conformism of experts;
- ✓ Opportunities for manipulation by the research group.

6. IMPROVING the Delphi Method. More efficient use of the expert in the context of Delphi can be achieved by further methodological studies in several areas:

- ✓ Improvements to systematic selection of experts;
- ✓ Experimenting with different schemes for respondents to give self-assessment of competence;
- ✓ The methods to achieve reliability of estimates can be improved by appropriate formulas for achieving consensus on the basis of appropriate self-ratings;
- ✓ Experiment with different methods of acquiring information to learn more about the form and content of the feedback;

7. ONE of the most preferred Foresight is Delphi method because:

- ✓ It focuses on identifying technological breakthroughs and innovation;

- ✓ through it outlines the prospects of innovative development, related to the progress of science and technology, possible technological horizons that can be achieved and the likely effects on the economy and society.

8. **DETAILED** and consistent tracking the evolution of the Delphi Method to institutional global applicable method shows that it is a very **flexible technique suitable for studies** where there is incomplete knowledge of the various phenomena in the social world. In this context, it gives a lot of great opportunities for different areas of knowledge that focus on problem solving and implementation of short and / or long-term forecasts. Especially suitable for project development as a tool in research.

9. **THE** conducted Delphi studies are not identical. There are **varieties of methods ranging from qualitative to quantitative or mixed type**. But they have in common are: design considerations, a decision defining the structure of the expert group, following certain methodological orientation, a number of rounds of running, maintaining anonymity of the experts structured interaction between experts and researchers.

10. **DELPHI** method is applied in different situations and for a wide range of complex problems for which there is often no other appropriate means of analysis, because it is an advantage over other expert methods:

- ✓ the iterative approach allows the experts to reconsider their decisions in the light of feedback;
- ✓ the process gives participants more time to consider their ideas before you commit to them, leading to better quality of response;
- ✓ the anonymity allows experts to express their opinions freely without showing institutional loyalty or peer pressure from the group - thus is deleted the potential impact of the individual;
- ✓ the excess "noise" - unnecessary questions and judgments that may occur during the debate can be controlled from the research /analytical group.
- ✓ Meanwhile, Delphi can be **extremely sensitive to**:
- ✓ the level of expertise of the experts involved in the two main groups of processes - analytical and expert;
- ✓ clarity of the questions formulated in the basic questionnaire - for the first round and "daughter questionnaires" for the next iteration;
- ✓ the way in that takes into account the reasons for the large differences in the reported values for determining the consensus.
- ✓ To **improve the effectiveness** of Delphi method is necessary to consider the following:
- ✓ it should not be regarded as a basic research tool and as a means of support, such as for the necessary studies with established and reliable research methods;
- ✓ research questions and questionnaires themselves need to be pilot tested to avoid any ambiguity or contradiction in them.

13. **THE** theoretical study done in connection with this work showed that the application of Delphi method has the **potential for misuse**. However, it is still a valuable tool for all researchers of society as a whole and individual areas of social development and futurologists.

14. **THE** results of Delphi method can be **very valuable to any social organization**. It can provide professionals in organizations to stimulate innovation. These results can be used as an educational tool for senior managers who are trying to predict the future of their organizations, through long-term forecasting and planning in order to survive in an increasingly competitive global environment.

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