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SEARCH Project Delphi

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## **SEARCH Project Delphi**

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### **Abstract**

This paper describes a plan to implement the Delphi method to obtain consensus of expert opinions on policy statements derived from research evidence. The evidence is based on a three-year large-scale European Union (EU) research project (“SEARCH”). The SEARCH project focuses on trade, migration, innovation and institutional issues on relationships between the European Union (EU) and its neighbouring countries (NCs). The main objective of the use of Delphi in this context is to obtain as many high-quality responses and opinions as possible on policy implications of SEARCH project results. The SEARCH Project Delphi aims to inform policy formulation at the EU level, specifically European Neighbourhood Policy (ENP).

### **1. Introduction**

The SEARCH project addresses interrelationships on trade, migration, innovation and institutions between the EU and its Neighbouring Countries. SEARCH is a large project with a consortium of over 30 EU and NC partners addressing different aspects of cross-border interactions and EU-NC cohesion. A key outcome of the project is providing usable information and policy recommendations to guide European Neighbourhood Policy (ENP). Work Package 6 of the project – “Policy Issues and Research Implications: Towards Integrated ERN Policies”<sup>1</sup> focuses on analysing and informing policy to contribute to evidence-based policy-making on the topic of EU and Neighbouring Country relations. The process by which policy recommendations will be drawn is through involvement of the SEARCH Advisory Board in a Delphi process. The SEARCH Advisory Board and associated

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<sup>1</sup> Please see SEARCH Project Quality Plan (Seventh Framework Programme THEME “EU regions and their interaction with the neighbourhood regions”, Project full title: “Sharing Knowledge Assets: InteRregionally Cohesive Neighbourhoods”, Workpackage 6, p. 32-36.

advisory institutions have been selected to provide expert advice on the applicability, desirability and importance of policy implications derived from SEARCH research results.

The Delphi method is a widely used tool for structured opinion collection for policy decision analysis and formulation (Adler and Ziglio, 1996; Gupta and Clarke, 1996). Delphi aims to obtain consensus on informative, accurate and reliable policy statements that can be used as inputs for policy formulation and implementation (Dalkey and Helmer, 1963). Delphi has been applied for the purpose of opinion collection in a variety of policy contexts, in particular on the topic of forecasting social, economic and technological conditions and events and policy planning at local, national and international levels (Adler and Ziglio, 1996; Gupta and Clarke, 1996), making it suitable for application in the SEARCH project.

This paper presents a summary of the uses of Delphi with the objective of defining a suitable Delphi method for the SEARCH project. This paper is a basis for discussion open to changes that the Advisory Board members may wish to suggest.

The remainder of this paper is structured as follows. Section 2 offers a review on the Delphi method. Section 3 presents a suggestion for the SEARCH Project Delphi, focusing on main steps and timing. Section 4 provides a summary and open questions.

## **2. Delphi: Procedures and methods**

Dalkey and Helmer (1963) define the main purpose of the Delphi method as:

“To obtain the most reliable consensus of opinion of a group of experts ... by a series of intensive questionnaires interspersed with controlled opinion feedback” (Dalkey and Helmer, 1963 quoted in Gupta and Clarke, 1996:186).

Delphi's first uses were in policy planning in the US following WWII (Dalkey, 1969; Linstone and Turoff, 1975). Delphi's early uses were for collecting opinions on strategy and policy planning of international concern (Gupta and Clarke, 1996). The need for international application of decision-making tools spurred on the creation and improvement of Delphi as a process that could overcome large geographical distances and ensure anonymity, key reasons why Delphi remains practical for international policy even today.

Over time Delphi applications to policy planning have increased and it has attained its own niche in policy practice. Gupta and Clarke (1996) found that 90% of technological forecasts

are based on it. Delphi has been applied to diverse areas such as national and local policies for healthcare, education, and tourism (Schneider, 1972; Landeta, 2006). In Schneider's (1972) application Delphi was used in an exploration of a planning problem in Seattle the focus of which was on understanding people's opinions on a range of options for town planning. Landeta (2006) describes the use of the Delphi method for an assessment of expenditure of tourists in Catalonia. A further example, from Crawford et al. (2004), is the use of Delphi for consensual inputs into formulation of medical guidelines.

In the 1990s and 2000s the use of Delphi with online tools became more popular (Hilbert et al., 2009; Steinert, 2009; Gordon and Pease, 2011). Computers have made it easier to collect and analyse data. Users can provide inputs into questionnaire surveys and take part on digital templates with little inconvenience. Data analysis is quicker and more sophisticated. It is likely that computer techniques will improve Delphi data collection and analysis further. For example, in 2011, a real-time (RT) Delphi was developed which uses online tools making it possible for group members to participate in any phase of the decision process at any time (Gordon and Pease, 2011).

Despite its widespread application to diverse policy contexts, and that computers have made it somewhat easier to collect data, other important challenges still remain. Determining consensus and shifts in opinion are still the most subjective and underdeveloped aspects of Delphi (Crisp et al., 1997 in Rayens and Hahn, 2000:310). Dalkey (1969:75) states: "every iteration should lead to more convergence". In practice however, determining shifts in opinion and degree of consensus unfortunately remain highly complex and tacit. A key problem is that there is considerable variability in the literature on threshold levels of consensus and degrees of opinion shifts. Rayens and Hahn (2000) draw attention to these important aspects:

- *Measuring consensus*: studies use different threshold levels on a percentage scale, for example, McKenna (1989) find their threshold level for consensus to be 51%, whereas Aelxandrow et al. (1996) use a 67% threshold level. A number of studies use the inter-quartile deviation (Rayens and Hahn, 2000).
- *Measuring shifts in opinion*: most studies use qualitative methods, or quantitative measures such as Chi-squared test for statistical significance, or the McNemar test (for example, Hahn et al., 1999; Rayens and Hahn, 2000).

Delphi methodology has been translated in a variety of ways depending on the policy context and the purpose of enquiry. In the main, it is organised around the key stages of: (1) issue

definition and expert selection, (2) questionnaire formulation, (3) several rounds of short questionnaires sent out to experts each containing feedback from the previous round, which gradually lead to solutions which are comprehensive and consensual (Schneider, 1972; Van de Ven and Delbecq, 1974; Rowe et al., 1991). The following sections describe the main stages in the ‘ideal’ Delphi process and its pros and cons.

### ***Expert selection***

The selection of experts is guided by the main issues to be evaluated in the surveys. Issues are normally defined at the stage of proposal or project formulation. A good choice of experts is essential for ensuring valid and applicable findings. However, deciding upon what defines an expert, and determining differences between experts and lay-people can be a difficult task. A further point is that the reliability of expert judgments over those made by lay-people may be unclear Gupta and Clarke (1996).

A key advantage of Delphi is that many people can be questioned, which is good because ‘n heads are better than one’ (Dalkey, 1969). Similar to other methods of group decision-making (for example, the Nominal Group Process, or NGT, see for example Van de Ven and Delbecq, 1971), a large pool of experts is considered to affect the validity of results positively (Dalkey, 1969). However, over time this assumption has been disputed as results analysing the superiority of group judgment over the judgment of the ‘best’ individual in the group are inconclusive (Rowe et al., 1991).

Delphi ensures anonymity in expert selection and questioning. Experts can respond to policy statements in private, avoiding social pressures and without worrying about status or losing face in front of a group (Rowe et al., 1991). This method also reduces ‘process loss’, or dominance of particular individuals that may occur in group discussions (Dalkey, 1969; Van de Ven and Delbecq, 1974). Every participant’s opinion is given equal importance (Schneider, 1972).

A disadvantage of Delphi is that even after experts have been selected; it may be difficult to ensure commitment to the process (Rowe et al., 1991). If the Delphi process is well-designed it can be motivating for participants, if badly designed motivation can be low (Gupta and Clarke, 1996). Unless properly informed, respondents have little idea of how their responses

are being applied, and therefore may have a low sense of accomplishment and the impression that they are being used (Gupta and Clarke, 1996; Landeta, 2006).

On the one hand, Delphi allows for the provision of more information by respondents than interactive methods of opinion collection, as well as having more time to consider before reaching a decision. On the other hand, the nature of Delphi's several rounds of questioning mean that experts may be required to answer the same question more than once, with a long period of time between the two stages, while not being sure why they have to do so, and perhaps long after their interest in the subject has lapsed (Landeta, 2006).

### ***Formulation of policy statements***

In parallel or in the second phase of the process, the information to be evaluated by the expert panel is formulated into short and precise policy statements that are put together in a questionnaire. One of the biggest challenges of Delphi is formulating clear, precise and compact policy statements (Linstone and Turoff, 1975; Scapolo and Miles, 2006). Scapolo and Miles (2006) suggest a formulation of statements under a limit of 30 words.

Each statement has one type of evaluation criteria such as applicability, importance, desirability and feasibility (Linstone and Turoff, 1975; Adler and Ziglio, 1996; Rayens and Hahn, 2000). Statements are normally evaluated on a four-point Likert scale. For example, applicability is judged on a scale of certainly applicable, applicable, inapplicable, and certainly inapplicable. As Delphi questions are designed to elicit agreement as well as disagreement, the scale categories do not normally allow neutral answers (Rayens and Hahn, 2000). Following each statement respondents are asked to provide information on why they have taken that position. To ensure comprehension and clarity statements need to be pretested before they are included in the first questionnaire (Linstone and Turoff, 1975; Nelson, 1978).

### ***First round of questioning and analysis***

Following the formulation of the policy statements, the first round of the questionnaire survey is carried out. This can be done using postal questionnaires sent out to respondents, via telephone survey, or through an online survey, which is increasingly popular (Linstone and Turoff, 1975). Once replies on each policy statement are received back, the first round of

analysis can be performed. Analysis focuses on the range of responses to each policy statement, the degree of consensus, and a qualitative analysis based on written explanations from respondents justifying their response.

Each policy statement can be evaluated using simple statistical summaries (normally medians, lower and upper quartiles) to determine the inter-quartile range of responses. The threshold level chosen by the researcher determines the degree of consensus and dissension. It can be based on previous Delphi studies (for example, the 67% threshold level used in Alexandrow et al., 1996), or determined by the researcher.

The results in the first round determine the initial expert positions on the issues (Linstone and Turoff, 1975). They show which statements are the ones experts agree upon, disagree upon, and which statements can be discarded (Linstone and Turoff, 1975). The statements where disagreements occurred are used as a basis for follow-up questions to further investigate reasons for disagreement, and increase the likelihood of consensus in the second round (Linstone and Turoff, 1975/2002; Rowe et al., 1991).

Linstone and Turoff (1975) describe two aspects of opinion analysis:

- *Exploring and obtaining the reasons for disagreements.* What underlying assumptions, views, or facts are being used by the individuals to support their respective positions?
- *Evaluating the underlying reasons.* How does the group view the separate arguments used to defend various positions and how do they compare to one another on a relative basis?

If certain statements are below the threshold level of consensus, then these are re-stated in the second round together with the statistic summary of the responses to that statement. This type of iteration informs respondents of the group results using a simple statistical summary and provision of clarification. The purpose of the steps of asking for clarification, providing clarification, providing information on results on previous rounds, is to see whether given this entire information consensus can be reached on the policy statements that were disagreed upon (Adler and Ziglio, 1996; Linstone and Turoff, 1975/2002). This allows experts to change their opinions by having their concerns addressed and being provided with statistical information instead of only consensual judgment (Rowe et al., 1991).

### ***Second round of questioning and analysis***

The second round of the survey contains statistical feedback on the previous round, clarification of respondents' concerns or queries, and the set of policy statements that were disagreed upon for further questioning. The analysis of the second round involves the same steps as in the first round (the range of responses to each policy statement, the degree of consensus, and qualitative analysis) plus one additional step: the shift of opinion (Linstone and Turoff, 1975; Rowe et al., 1991). To determine the shift of opinion, the researcher must decide whether to use qualitative methods, or quantitative measures such as Chi-squared, to determine the degree of the shift, its significance and whether now consensus or dissension can be claimed.

In the second and later rounds, experts can change their estimates on the basis of group feedback. If the experts' assessments fall in the upper or lower quartile (deviate strongly from the median) they are asked why their judgment is valid compared to the majority judgment (all judgments remain anonymous) and this feedback is included in the next round. The process continues until general agreement on policy statements occurs, or until the researcher decides to stop. The majority of Delphis are completed in two or three rounds (Rowe et al., 1991).

Evaluations of the Delphi technique suggest that over rounds opinions do converge, even though at the beginning they may have been divergent (convergence however does not mean responses are valid) (Rowe et al., 1991). The reiteration of responses and their feedback to respondents has been criticised by authors as being manipulative of people's opinions (Nelson, 1978). If used in this way, it can serve vested interests, as feedback may have a lobbying effect on respondents' future responses (Nelson, 1978). Delphi designers must therefore take into account not to force consensus, and to include the indicator of disagreement in the final response (Rowe et al., 1991:237). On a more general note, Delphi results must be, as in any research, triangulated with other research results where possible and used as one of a variety of inputs into policy decision analysis.

### ***Final steps and closure***

The survey process ends when the degree of consensus deemed reasonable by the researchers is achieved. This is normally when responses are relatively stable (also a decision which has

to be made by the researchers). The assessment of each policy statement is presented by the median of the final round, with the degree of disagreement indicated by the inter-quartile range. The results can be used to summarise the policy statements where agreement has been reached, and display statements of no agreement. Policy statements the experts did not agree upon can be used in an open face-to-face discussion between experts (Crawford et al., 2004). Scapolo and Miles (2006) state that while Delphi is useful in informing the policy decision process, its systematic feeding into and use in policy making is less clear. This is finally up to policy-makers and others who have expert knowledge on policy formulation and implementation processes, where researcher knowledge normally ends. As such, Delphi results may be considered the first step from research evidence to policy inputs, but not a recipe for policy-making.

### **3. SEARCH Project Delphi: Procedures and timing**

The following sections describe the first suggestion for the SEARCH Project Delphi. The SEARCH project has a panel of experts and supporting institutions who will be asked to participate in the SEARCH Project Delphi survey. As previously stated, the SEARCH project will provide research results and policy implications from which policy statements will be derived. The main policy topics are EU-NC interactions on trade, migration, innovation and institutions. A central aim of the SEARCH project is to inform EU policy decision-making on the ENP area based on policy recommendations derived from project findings.

#### ***Experts***

SEARCH experts have been selected during the project proposal phase. The SEARCH expert panel is an experienced and professionally diverse group of high-profile experts from government, international organisations, European Commission (EC), and academia. The experts are internationally diverse, from Austria, Ukraine, Russia, Romania, Jordan, Hungary, Israel, and the EC. The international locations of the experts mean that a structured communication method requiring physical proximity is unfeasible. Thus, the Delphi method was chosen as a process by which experts may provide their opinions on SEARCH policy implications.

### *Formulation of policy statements*

In January 2013<sup>2</sup>, each of the four SEARCH project work packages focusing on the analysis of empirical data on trade, migration, innovation and institutions within the EU-NC area will produce initial reports, report summaries, policy notes and policy briefs based on research results. The policy briefs and policy notes are produced based on pre-specified templates. The templates help in the translation and focusing of SEARCH project research results into policy implications that are explicit and precise, and clearly linkable to the acquired research evidence within the project. The following questions are examples of issues that need to be addressed by the work package leaders formulating policy briefs and policy notes:

- *Which kinds of policies are the results important for?*
- *What are the novel, expected and controversial findings that affect current policy?*
- *Which countries do the policy recommendations apply for?*

In November 2013<sup>3</sup> the SEARCH policy recommendations guide based on project results that have been obtained up to that date, will be produced.

In the period December 2013 to February 2014<sup>4</sup>, the cumulative inputs of project reports, policy notes and policy briefs will be the main basis for the formulation of policy statements. Each policy statement is linked to a reference to the source (i.e. report, report summary, policy brief or policy note) so that experts can consult the individual documents from which the policy statements are derived. For example, a policy statement linked to results of work package 3 may be:

- *“EU migration regulation has hindered growth of industries in the EU. How completely does this finding agree with your understanding of EU migration regulation effects?”*

➤ *Answer: Strongly agree/Agree/Disagree/Strongly disagree*

If considered necessary by the researchers, the policy statements will be pre-tested for clarity on colleagues or project members not part of the expert panel.

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<sup>2</sup> SEARCH Project month 18.

<sup>3</sup> SEARCH Project month 29.

<sup>4</sup> SEARCH Project months 29 to 31.

### ***First round of questioning and analysis***

The SEARCH Project Delphi survey is planned for February to April 2014<sup>5</sup>. Depending on the preference of the experts, the first round of questioning will be carried out using a telephone survey or an online questionnaire.

The responses of the first round will be analysed for agreement, general tendency and most extreme answers. Any disagreements will be used as inputs into the formulation of policy statements for the second Delphi round. Such as for example:

- *“In the first round of the survey, 80% agreed with the findings on EU migration regulation effects. If you did not agree, please state why. “*

### ***Second round of questioning and analysis***

The results of the second round will be analysed for consensus and shifts in opinion. This process will continue until sufficient agreement amongst the advisory board members is reached (decided by the researchers), and no extreme responses and views are unexplained or unjustified.

### ***Final steps and closure***

The SEARCH Project Delphi results will be directly incorporated into the final draft of Deliverable 6.5. In May 2014<sup>6</sup> the final report of the SEARCH project will be delivered, containing the SEARCH Project Delphi results, and synthesis of EU/ENP Policy recommendations.

## **4. Summary and open questions**

This paper has reviewed the literature on Delphi procedures and proposed a preliminary Delphi method for the SEARCH Project. The Delphi method is a structured opinion collection process whose main aim is to obtain consensus on policy statements. Policy statements are

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<sup>5</sup> SEARCH Project months 31 to 33.

<sup>6</sup> SEARCH Project month 34.

accumulated in the form of a questionnaire, which is sent out to experts for evaluation. The results are then analysed for degrees of consensus and dissension. If disagreement on policy statements exists, these statements are then re-stated in the second round of the survey, including feedback on the previous round. Feedback also contains any points of clarification that the respondents may require. The second round is aimed at obtaining consensus on the remaining policy statements. If the feedback did not lead to convergence of opinions in the second round, then a third round may be carried out, although this is at the discretion of the researcher to decide (if a third round is likely to lead to more consensus).

Despite the apparently straightforward steps in the Delphi process, some methodological questions remain open as to its application to the SEARCH policy formulation context. The first concerns the mode of questioning. Should experts be questioned using an online or telephone survey? The second concerns the threshold levels that will be used to determine consensus. What level should that be? A further question regards pretesting of the questionnaire statements. Should they be pretested? Help in addressing these questions and advice on how to improve and tailor the method to the SEARCH context is highly welcomed, in particular from the SEARCH Advisory Board and SEARCH project members.

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