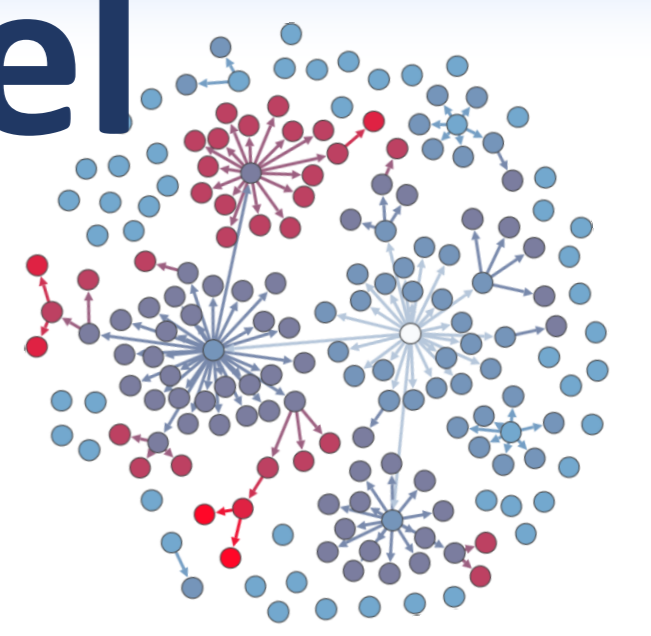




International On-line Expert Access Panel for Open Science Development

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INTRODUCTION

The global **population of researchers**, data scientists, and analysts from academia and private sector is **hard to reach** for quick and cost-effective survey needs. At the same time, quantified **opinions of such experts are a valuable help** for decision-making, public policies, and meta analyses of (open) science development.

In the forthcoming age of the Open Science there is a strong need for tools and methods that would allow for quick and easy **access to members of the scientific community** for research purposes. This also should be a **system solution**, that can be easily **scalable** across countries and **cost-efficiently** maintained for a long period of time. Such solution should be also open to **research proposals** coming both from inside and outside of the research community.

Our **concept of on-line expert access panel** meets those needs and exceeds most of the limitations.

GOAL

The goal of the proposed project is to provide systematically new declarative data about **obstacles and opportunities in the development of Open Science**. We can achieve it by creating an **international** on-line expert access panel with scientists as panel members. ISO defines access panels as „a sample database of potential respondents who declare that they will **cooperate with future [on-line] data collection if selected**” (ISO 2009). The main role of such panel is to provide samples for surveys conducted mainly by *Computer Aided Web Interviewing* (CAWI) research technique. An access panel can also provide samples for different types of research projects of both quantitative and qualitative character (ex. real time on-line Delphi method).

Participation in such panel will be **voluntary and easily scalable** across disciplines, languages and countries. The on-line access panel will allow to conduct on-line studies (longitudinal, tracking omnibus, ad-hoc) **quickly and cost-efficiently** while costs of data collection with traditional survey modes continue to rise and cooperation rates decline. This tool will be particularly useful for providing investigating changes in experts' opinions on different topics **over time**, considering **country-specific differences**.

Research studies, benefiting from access panel, will have **purely scientific and noncommercial** character. They will be focusing on science development, in particular topics such as **Open Science, Open Research Data, Open Access, Open Software**. We can also study scientists themselves, their working conditions, research grants use, career progress within the academia and beyond.

In the long-term, proposed project aims to **support evidence-based policy making** on national and multi-national level by providing instant feedback and verifying hypothesis concerning development of open science **from the perspective of researchers themselves**.

METHODS

To create International On-line Expert Access Panel we will use knowledge coming from experience with CAWI technique and non-probabilistic on-line access panels **used extensively** for years in market research. Recent trends indicate a **large-scale diffusion** of this data collection mode recognized as one of the **most important** market research survey tools (Bethlehem & Biffignandi, 2012). Also a **number of scientific projects in social sciences** would not have been possible without variety of access panels e.g. the Dutch MESS project (Das, 2012) or WageIndicator (Fikret Öz, 2012).

Our expert panel will comply with **recognized standards** directly related to on-line access panels (ESOMAR 2006, ISO 2009).

The panelists' recruitment will be based on **on-line self-recruitment** and variations of **snowball sampling** as well as Respondent Driven Sampling (RDS). National and international **scientific institutions and associations** of scientist are expected to play an important role as proxies in the recruitment. The on-line recruitment will use double opt-in technique and panelists will be able to leave panel according to simplified opt-out procedure.

Filled out individual profile forms by the recruited panelists will allow in the future for **precise quota sampling** and survey invitation targeting. Updating of profile information by the panelists will also be possible. We will not collect any sensitive personal data in the profiles and all survey results will always be fully anonymized.

To ensure **high quality of the panel surveys** we will establish a research panel program committee. If the committee accept a submitted research proposal, we will prepare script and conduct the survey **free of charge** or with minimal charge that will cover the necessary costs. After scripting the on-line questionnaire we will send the invitation to the survey by email only to panelists that fulfill profile criteria.

By combining questionnaires, a number of separate but overlapping surveys will be replaced by few, thus **panelists won't be overloaded** with many questionnaires. Data become available for analysis much more quickly than with the traditional and more conventional methods of data collection. This greatly increases the efficiency of scientific research and better suits the dynamics of population and its problems.

The data will be gathered through advanced open-source on-line survey software which we will connect with R statistical language, and panel web portal. Thus it will allow to collect declarative data from scientists around the world in a matter of few days and **disseminate raw data** to the whole research community almost as quickly. In repeated studies we can also automatically report the changes of indicators via **interactive web application**.



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DISCUSSION

The challenging aspect of the project will be a necessity to ensure **the most possible representativeness** of samples drawn from the access panel. Bias in online access panel surveys is primarily caused by limited Internet coverage and self-selection in the recruitment phase of new panel members. These lead to undefined uncertainty about inference of population parameters. Although the self-selection bias also occurs in commercial non-probabilistic on-line access panels, it did not prevent them to be successfully used for market research.

The main problem about on-line survey methods is that not all members of the population in interest can be participant of the panel due to **limited coverage of Internet access** or digital competencies. It **will not be the case** in the proposed project. We can safely assure that vast majority of scientists that we want to reach, have access to the Internet and necessary skills to take part in on-line research surveys. So **coverage error is negligible** and **self-selection bias can be counteracted** with monitoring of recruitment process, quota sampling and weighting.

We will try to reduce the bias through **different weighting adjustment techniques** (poststratification, generalized regression estimation, raking ratio estimation, calibration). To compute adjustments weights, we will be able to **use auxiliary variables** that will be measured in the surveys or panelists' profiles. We will use results from reference surveys if available.

As possible solution for correcting self-selection bias and user non-response we can also use **response propensity**, understood as the conditional probability that a person responds to the survey request, given the available background characteristics. The response propensities can be used for estimation of the target variables directly by using the response propensities as weights (propensity weighting) or indirectly by forming strata of elements having approximately the same response propensities (propensity stratification). In any case, the available auxiliary variables need to be capable of explaining the response behavior of panelists (Bethlehem & Biffignandi, 2012).

The second major problem is how to **motivate experts** to engage in such projects. Our project will not be based on financial rewards but **mainly on intrinsic motivators** drawing from willingness to help science development. With topics of the future panel studies closely related to panelists work, we expect interest in research results will be additional motivation to engage more panelists. Such willingness to participate may be not enough to achieve an effective recruitment rate, but as history shows such **noncommercial access panels have proved to be successful** even for market research purposes (Leiner, 2012).

There will be also two main critical points in the project connected closely to the recruitment process. In order to achieve the aims of the project, the number of panelists must achieve a **critical mass** that will allow to use of quota-random samples in appropriate sizes for specific research problems. With the recruitment process there is also a problem of homogeneity of panelists, but this problem could be monitored and controlled during the recruitment with the use of social networks analysis and RDS estimates (Tyldum & Johnston, 2014).

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