

## On the use of questionnaires as a reliable tool to gather data

This note is integral to research that was carried out during the period June 2022 – March 2023, on the state of the art of models of implementation of telecommunications networks in the metro area. A preprint documenting the research is available [1].

### 1. Criticism

Reviewer anonymous\_2, a reputable network engineer who consented to participate in the study, but wishes to remain anonymous, opined that “[q]uestionnaires are collections of problems that are poorly defined, answered by someone who doesn’t understand them, and even if they did, they don’t really know what their company is doing and is going to be doing going forward” [2]. In point form, the objections are:

1. questionnaires are poorly defined;
2. respondents answer regardless of whether they understand the questions or not, and
3. respondents are unaware of the status quo in operations and their organizations’ plans for development of operations.

### 2. Defence

The implications of the criticism are severe for researchers at least partially dependent on this research tool; it was necessary to understand the **validity** of these objections. If valid, then it would prove necessary to **safeguard** against them.

#### 2.1 On the validity of the objections

A highly experienced, well-known analyst ([Sterling Perrin](#)<sup>1</sup>) in the field of telecommunications, who regularly employs questionnaires, was contacted to understand the general **validity** of these objections [3]. The analyst’s response is cited first, then paraphrased.

*“I think a well-developed survey mitigates most of what he stated. We spend a lot of time/effort in crafting the questions so that they are not ambiguous and are well-defined (e.g., including specific definitions). The database(s) is important because we solicit responses from people who are directly involved working in the survey topic and have an understanding of their company’s plans in the topic area. He is describing a very poor survey. I’ve described the ideal survey – the reality is probably somewhere in between.*

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<sup>1</sup> <https://www.linkedin.com/in/sterling-perrin-2492b5/>

*We individually scrutinize each response to remove suspicious and uninformed responses and push the aggregate as close to the ideal scenario as possible. Again, not perfect, but in aggregate I have found survey results a reliable indicator of major market trends and shifts. The more granular we cut the data, the more likely to obtain results influenced by a bad response in the numbers. We aim for 80-100 responses for this reason, and rarely analyze a cut less than 40 (and if so, with a disclaimer that the size is small).*

*A couple of other observations: 1. consumers don't really plan but businesses do. It's reasonable to ask business employees about their plans for their business, because they spend a lot of time planning for the future. Plans change, but a survey will capture plans at a moment in time. 2. Businesses (and consumers) understand their pain points. This data is very reliable. 3. Businesses also tend to understand the trends influencing their business, so surveys are good indicators here. 4. Surveys (in my experience) have been least accurate in identifying timing. They know what they want, but it takes longer than expected almost always. I rely on timing data least of all."*

This can be condensed into the following five recommendations for a researcher designing a quantitative survey of the population of CSPs.

1. Major market trends and shifts are reliably predicted by quantitative survey; narrower interests are less reliably predicted.
2. Write unambiguous questions, using definitions where necessary.
3. Ask people whom you know are qualified to respond; here, this instantiates to:
  - a. ask people who are involved in network operations, and
  - b. ask people who understand their organization's plans in network operations.
4. Individually scrutinize responses for evident inconsistencies, and eliminate such responses from the set of responses.
5. A sample of 80 – 100 responses has been found to provide statistics that match the population's (CSPs) parameters well.

## 2.2 On safeguarding

Since the validity of the objections was established, it proved necessary to safeguard against them. Safeguarding was tackled as follows:

- **Pre-survey**

- through support in writing the questions, before dissemination of the questionnaire:
    - the questions were reviewed by Seacom's head of engineering ([Mark Tinka](#)<sup>2</sup>) [4], and
    - demographic questions were suggested by an analyst experienced in writing questionnaires [5];
  - through use of names of standards that uniquely identify technology, where necessary (e.g., rather than write "GPON" to refer to this access technology, "GPON (ITU-T G.984.1)" was used);
  - through use of graphics from standards documents where specific points in the metro area were invoked;
  - technical questions did not mandate an answer; only questions that addressed demographics were mandatory. Indeed, as the results show, most of the answer sets (one set per question) carry less responses than the number of respondents.
- **Post-survey**
    - through scrutiny of individual responses [6];
    - through review using the means of a qualitative survey<sup>3</sup>.

- [1] E.-V. Depasquale, M. Tinka, S. Zammit, and F. Davoli, 'A survey of trends and motivations regarding Communication Service Providers' metro area network implementations'. arXiv, Sep. 22, 2023. doi: 10.48550/arXiv.2309.11969.
- [2] E.-V. Depasquale, 'Review of SGA + NOG Data', Nov. 22, 2022. [Online]. Available: [https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/dc3a3d2b-e188-4ca3-bd37-a15b34921802/file\\_downloaded](https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/dc3a3d2b-e188-4ca3-bd37-a15b34921802/file_downloaded)
- [3] S. Perrin, 'Validity on the use of questionnaires as a research tool', Feb. 17, 2023. [Online]. Available: [https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/2e10f90e-38d4-47fe-9a2f-2fceb9bf5a1/file\\_downloaded](https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/2e10f90e-38d4-47fe-9a2f-2fceb9bf5a1/file_downloaded)
- [4] M. Tinka, 'Would you help me craft a short questionnaire?', Jun. 18, 2022. [Online]. Available: [https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/fc5adfbe-39a5-4f58-83ed-e4514fd94d14/file\\_downloaded](https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/fc5adfbe-39a5-4f58-83ed-e4514fd94d14/file_downloaded)
- [5] S. Perrin, 'Expressing an interest in collaboration', Jun. 07, 2022. [Online]. Available: [https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/5878186b-234d-41ab-b69a-01a78ded7417/file\\_downloaded](https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/5878186b-234d-41ab-b69a-01a78ded7417/file_downloaded)
- [6] E.-V. Depasquale, 'Respondents that present some inconsistency', Sep. 20, 2022. [Online]. Available: [https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/d0317e21-2a22-480a-9299-5b166d3bab2a/file\\_downloaded](https://data.mendeley.com/public-files/datasets/k72dntnfgv/files/d0317e21-2a22-480a-9299-5b166d3bab2a/file_downloaded)

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<sup>3</sup> The scope of a qualitative survey may extend beyond assessment of objective clarity of the questions.