## Background paper to
## THE RESPONSE PROCESS IN LARGE BUSINESSES

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**Organization: Statistics Netherlands**

### 1. Introduction: Redesign of the Quarterly Survey of Finances of Enterprises

In close collaboration with the Dutch Central Bank (DCB), Statistics Netherlands (SN) has redesigned the Quarterly Survey of Finances of Enterprises: SN conducts the Quarterly and Annual Survey of Finances of Enterprises, asking about Balance of Payment and Profit and Loss Account data; DCB conducts a monthly survey asking about details on financial transactions (movements), which are input for the balance of payment. These surveys are used together in the Balance of Payments at the enterprise level and National Accounts. In theory, the SN and DCB surveys should generate approximately the same results at the Balance of Payments level. In practice, however, large differences in results are perceived between these surveys. In order to permanently eliminate the differences, enhance quality and reduce response burden, both institutes concluded that these surveys should be combined into one new quarterly survey, from which the data can be used by both institutes. Instead of post-field editing it was decided to opt for the input harmonisation. The target population consists of the 360 largest non-financial enterprises in the Netherlands.

In 2014, a new set of required data had been developed (the conceptual data model). This data model is very complex and requests for a lot of detailed information. As a consequence, the response process within businesses could be quite complicated and burdensome, even though the goal of this redesign was to reduce response burden. Our expectations are that the data quality will improve, and response burden will decrease after one/two years, as a result of learning to work with the questionnaire and a fully implemented response process. At first however, we expect response burden to increase: businesses need to invest in setting up the internal response process.

As input for the new quarterly questionnaire a feasibility study was conducted, studying the internal response process in these businesses, in order to tailor the questionnaire to the response process. This study resulted in a number of design requirements. This paper discusses the questionnaire design process, including the background of the combined data model, the feasibility study, the business response processes, as well as the resulting questionnaire design. In the presentation, I will discuss the consequences of the response process for pre-testing business survey questionnaires.

### 2. Conceptual data model

As a consequence of this decision, in 2014 the requirements in the Balance of Payments 6 (BMP6) and the System of National Accounts 2008 (SNA 2008) have been translated into a conceptual data model. A project group of financial experts from SN and DCB jointly developed this model.

This conceptual data model requests for a lot of detailed information to be provided on a quarterly basis. It is presented as a matrix of line items and columns as is shown in figure 1, defining the information in detail. It was anticipated that this new model would be a risk for the data collection, resulting in item non-response and measurement/unit errors (Haraldsen, 2013; Snijkers 2016). The risks included: are the data available on a quarterly basis, are the data easy to retrieve, and does this reduce response burden? In early 2015 it was decided that a risk assessment was needed: a feasibility study and an independent accounting expert review were carried out. As for the planning, the targeted deadline to field the new survey was set to the first quarter of 2017; it turns out that this will be early 2019.

### 3. Feasibility study: research questions

Instead of moving directly from the conceptual data model to the development of a data collection instrument, the feasibility of the data model was investigated (as described by Willimack, 2013; Snijkers & Willimack, 2011; Snijkers and Arentsen, 2015). This study was aimed at getting more insights in the response process within these large enterprises. The main research questions were: (1) Are the data available? And, (2) how much work is involved in collecting the data? In business surveys, these questions address the following issues:

1. What (data): What data do we get? Are the concepts clear and do they match or differ with accounting definitions?
2. Who (units): What entities in the enterprise are involved in the response process? Do we get the data about the correct units?
3. Where (people and sources): what business staffs is involved in the response process and where can the requested information be retrieved?
4. When (time): When is the requested information available?
5. How (questionnaire): What would be the best way to collect the required information?

**Figure 1. Conceptual data model and Risk assessment (color-codes)**



### 4. Feasibility Study and Accounting Expert Review

As for the feasibility study five large non-financial enterprise groups were visited on site and asked about the information in the data model. A topic list for a 2-hour discussion on the data model was prepared on the basis of the research questions. These businesses have been visited in April/May 2015.

Since the model under investigation is very large, the topic list was carefully time boxed to ensure adequate information was collected to proceed with the development of the data model and the data

collection instrument. More specifically, the line items in the model were tackled one by one, whereas the required details corresponding to these line items were dealt with on a higher level. This approach does allow for some subjectivity when coding the results. It was not possible to do a detailed record check on availability and retrieval; this would take too much time.

At the same time, an accounting expert review (Willimack, 2013) was carried out by Pricewaterhouse-Coopers (PWC), with the same focus: to answer the five main questions mentioned above. The PWC study (PWC, 2015) consisted of a desk research, the accounting export review part, as well as on site visits to four enterprises. This study was carried out independently of the SN/DNB feasibility study: during the execution phase, no information was shared between the researchers to avoid bias in outcomes.

Both studies resulted in the same conclusion: combining the SN and DCB surveys into one new survey seems logical for both organizations, but offers no benefits to the enterprises. Consequently they don't perceive the new data requirements as a reduction in response burden. As a result, the goals of improving data quality and reducing response burden may not be achieved.

The findings were presented as a short management summary and a color-coded data model (see figure 1). The coding is based upon the ease of retrieving the required information and the sources that would need to be used. For *each variable* in the data model the color-coded sheet indicates if:
- the information is easily and readily available (at group accounts level): coded green;
- the information is available at a central location, but not in the group accounts (treasury level), which requires more effort: coded yellow;
- the information is available, but decentralized (general ledger level), which requires considerable effort to acquire: coded orange;
- the information is not available: coded red;
- in the meantime, some information was dropped from the data model: this is shown in brown.

The color-coded Excel sheet presents management and researchers with a clear overview of potential risks in the data collection and processing stages: the more steps and the more sources are involved in the response process, and the deeper within the business information has to be retrieved, the higher the risks of survey errors like measurement errors and item non-response.

### 5. Questionnaire design requirements

Following from these studies it was decided to develop an electronic questionnaire. Also a number of questionnaire design requirements were identified: 1. Content issues, 2. User interface & usability issues, and 3. Recommendations regarding the communication strategy:

1. Content issues:
   - A clear definition of the structure of the questionnaire, identifying each and every data entry box.
   - Clear-cut definitions of terminology: there is a difference between statistical and accounting definitions. Also the observational unit should be clear and clearly defined (consolidation cluster).
2. User interface & usability issues:
   - To be accessible and completed from various locations and by various respondents: online application.
   - Both top-down and bottom-up completion should be possible.
   - Data entry not only manually but also by uploading/importing data files; as well as data export options.
   - Indicate where the data come from (to facilitate the internal response process)
   - Provide a clear overview of the questionnaire: use an index to provide overview of the content, for navigation, and progress control.
   - Have a print option of the questionnaire should be available, including an overview of the data asked.
   - Include consistency checks and validation rules
   - The questionnaire should be available in Dutch and in English.
   - Working with matrixes is not a problem.
3. Communication
   - Communicate the new questionnaire in one year in advance so that businesses can prepare the internal process. In follow-up to this result it was decided to include a pilot year (2018).

## 6. Questionnaire design (www.cbs.nl/balanceofpayments)

Early 2016 a project team started with the design of the questionnaire. Again this included two aspects: the operationalization of the content and the user interface. As for the content, the conceptual data model was translated into an overview of the entire questionnaire content using Excel (see figure 2a).This was done in such a way that: 1. each individual data item is represented by a data entry box (meaning that if a box was missing here, the variable would not be in the final data file), and 2. each tab represents a screen (thus serving as input for the user interface). This Excel sheet can be seen as a questionnaire schedule. Developing this schedule was a considerable effort and took quite some time. Specifying the questionnaire content in detail turned out to be a cyclical process: it required going back and forth to the conceptual data model, as the model needed additional specifications.

An initial visualisation of the user interface was designed in Powerpoint, as is shown in figure 2b. In mid-2016, a draft version of this design was presented to a small number of businesses (those who had participated in the feasibility study) as a first check to see if this user interface would work in practice. Especially we were interested in how people would navigate, finding their way, using the index. This seemed to work quite well, which gave confidence to proceed. In 2017 a pre-testing study was done with a more fully developed user interface, mainly focussing at usability issues (Giesen and Vis-Visschers, 2017). Again the results indicated that the user interface worked well.

Even though the data model is quite complex, the structure of the questionnaire is quite simple. The questionnaire is structured around the Balance of payment: assets and liabilities (which was the original SN Survey of Finances of Enterprises). For some items more detailed information is requested: a matrix of financial mutations/movements (reconciliations); these items come from the monthly DCB survey.

As a result, a list of usability issues and functionalities was prepared. Each issue was rated according the MoSCoW principles: Must, Should, Could, Would. This was necessary as it was decided that the questionnaire would be developed by an external software developer. The final design of the questionnaire is presented in two instruction video clips for respondents explaining 1. how the questionnaire works, and 2. how to import data: **www.cbs.nl/balanceofpayments**.

**Figure 2a. Translation of conceptual data model into an Excel questionnaire schedule**
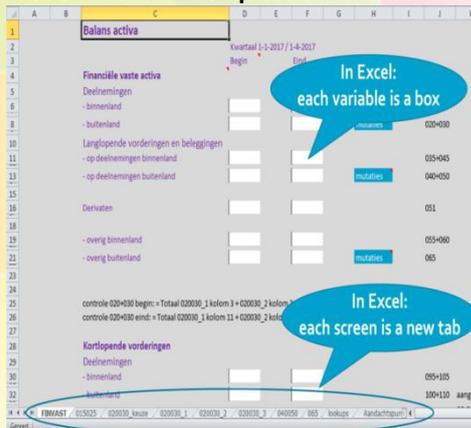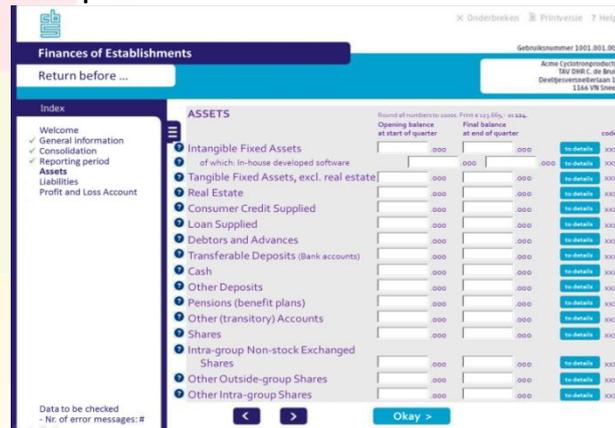


**Figure 2b. Visualisation of the user interface using Powerpoint**



## 7. Business response process

Another important result of the feasibility study, not yet discussed, is that the internal business response process depends on the structure of the business administration. Figure 3 gives an overview of the processes that were identified. For businesses with a centralised accounting this process was straight forward. For complex structures, the retrieval process can be very complex, involving one or more respondents/data providers and data sources at various locations.

In addition to the feasibility study and the 2017 pre-test study, in mid-2018 another small number of businesses was visited for a final check studying if the final questionnaire would work in practice. This time the focus was on how businesses could prepare themselves for working with the questionnaire (there was not time anymore for large changes). The results yet again indicated that accountants could easily work with the questionnaire itself, the problem however was the data retrieval process: the business response process does not only involve the completion of the questionnaire itself, but organisational issues and getting prepared are equally if not more important (Willimack and Nicholls, 2010; Bavdaz, 2006, 2010).

Based on these visits, a three-step preparation plan was developed and communicated to the businesses, in order to help them to get ready prior to 2019:
1. Identify the requested information for the consolidation cluster for the previous SN and DCB surveys, and identify everyone who was involved in the reporting processes to SN and DCB.
2. Get together and discuss how the various reporting processes can be integrated into one process, based on the new questionnaire. This should result in new procedures. And identify what should be done to get the new procedures working (changes in the administration and IT system, responsibilities, etc.).
3. Implement the new procedures.

Businesses can get familiar with the new questionnaire since December 2017. They are invited to complete and submit test data for checking by SN by September 2018.

These findings have consequences for a fundamental methodological question: How to pre-test business survey questionnaires? This is discussed in detail by Willimack (2013) and Bavdaz et al (2016a, 2016b). Simple cognitive in-depth interviews may not be sufficient, as this method mainly focusses on step 1 in the Tourangeau survey response model (Tourangeau et al., 2000): comprehension. My hypothesis is that for complex reporting processes getting a good understanding of step 2, the retrieval process, is of more importance. Consequently, starting a pre-test study when a draft of the questionnaire is ready would come too late for tailoring the questionnaire to the response process. In my presentation, I will discuss the complex response process and its consequences for pre-testing in more detail.

**Statement to be discussed:** The common questionnaire development process taken from social surveys:
> **conceptualisation – questionnaire development – pre-testing – adapting the questionnaire,**
should be adapted for business surveys and should start earlier (see also Snijkers and Willimack, 2011):
> **conceptualisation –** *study the business context* **– questionnaire development – pre-testing – adapting the questionnaire.**
In business surveys it is especially important to take the business context into account, i.e. tailor to the business context (Snijkers et al., 2013), both for the questionnaire and the communication strategy.

**Figure 3. Complexity of the response process in large businesses**
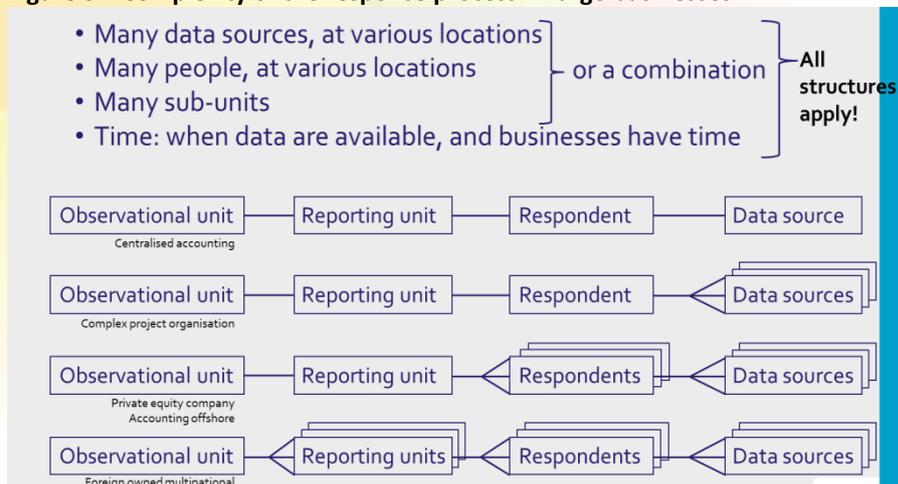
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