

Harmonizing Business-Based Surveys Based on Statistics Indonesia’s Business-Based Survey Business Process Reengineering (BPR)

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Abstract

Increasing demand for Statistics Indonesia (BPS) to produce a wider variety of high-quality statistics compels BPS to conduct transformation. The ultimate purpose of the transformation is to better the quality of statistics by improving the efficiency of the statistical business process from the silo into a more integrated approach. The improvement is expected to reduce respondent burden, mainly in business-based surveys, which has become a serious concern in many statistical offices. As a guideline of the transformation, there are 8 key principles set: (1) National Accounts and Macro Statistics are the primary beneficiaries for statistical integration; (2) Each survey serves multiple purposes; (3) Preference for registration and administrative data over surveys; (4) Integrated survey operations; (5) Integrated Business Registers; (6) Re-centralise IT away from subject matter areas; (7) Use paperless data collection; (8) Use continuous surveying.

By referring to the key principles and Generic Statistical Business Process Model (GSBPM), BPS has developed its business-based survey Business Process Re-engineering (BPR) design document. Using it as a guideline, BPS conducted a pilot study in 2019 to analyze the integration of business-based surveys to reduce respondent burden and ameliorate response rate. The analysis was mainly based on similarities in terms of questions and sampling units. After analyzing and comparing questionnaires and sampling units between surveys in BPS, it was found that several sets of surveys have relatively high similarities. However, as the first step of survey integration, it was decided to conduct a pilot test of the monthly Large-Medium Industry Survey and Producer Price Survey integration. Some challenges of the integration were related to the differences between the two surveys in terms of the sampling methodology, time reference, and classification code. With coordination between the Methodology Unit, Transformation Division, and related subject matters, the pilot test was undertaken in Banten Province with 300 samples of large-medium industries for the period of October-December 2019. The sample size was calculated based on a response rate estimation of 79.34% and a 6% error margin.

This paper will focus on the process of integrating the surveys, taking into consideration the aforementioned differences; the use of Statistical Business Register as sampling frame; multimode data collection of the integrated survey which accommodated paper-based data collection and self enumeration through CAWI (Computer-assisted Web Interviewing); also data processing and analysis. Furthermore, this paper will also discuss the evaluation of the pilot test to improve the implementation of survey integration in the future.

Keywords: Survey integration; statistical transformation; Business Register; code standardization

1. Introduction

Generally, the current business processes of a survey in BPS consist of planning, preparation, data collection, data processing, and data dissemination. Although the steps seem to be regular, the problem of overlapping data collection between Subject Matter Areas (SMAs) occurs as each of them arranges its surveys individually. The problem leads to a high burden on respondents causing reluctance on them to participate in BPS surveys. This has become a critical concern—mainly in business-based surveys—as the low response rate would induce low quality of statistics. Based on the problem, BPS has composed eight key principles of transformation so that BPS can move from the silo into a more integrated approach.

The main transformation principle to address the high respondent burden in business-based surveys is to integrate survey operations by utilizing Statistical Business Registers (SBR) as the sampling frame, standardizing classification code between SMAs, and optimizing the use of IT infrastructure to facilitate

respondents on participating in surveys. As the first step, the BPS Transformation Division together with the Methodology Unit and related SMAs initiated a pilot study of survey integration in 2019. The objectives of the study were to measure the effectiveness of the Computer-Assisted Web Interviewing (CAWI) method in increasing response rate, to test the readiness of SBR as a sampling frame, and to assess whether the usual statistical outputs can be fulfilled by the survey integration.

2. Methodology

2.1. Identifying The Surveys and Locus of the Pilot Study

To identify which surveys to integrate, all business-based surveys existed in BPS were listed. The surveys were then grouped based on their sampling unit and period of data collection. The next activity was to compare questionnaires of each survey within the same group. It was found that the monthly Large-Medium Industry Survey (IBS) and Producer Price Survey (SHP) have the most similarities. Both surveys question types of commodities produced, their quantities, the price per unit, and the number of workers.

Despite the similarities, differences between IBS and SHP in terms of the sampling methodology, time reference, and classification code had to be taken into consideration before integrating the surveys. As an example, IBS uses probability sampling with a cut-off-point method to ensure the representativeness of the samples in estimating the industrial index at both the national and provincial levels. On the other hand, SHP uses purposive sampling to ensure the prices of the basket commodity are obtained to calculate the producer price index. To mitigate the difference, the Methodology Unit designed a sampling frame to fulfill those objectives. In terms of time reference, IBS collects data of commodities produced in the previous month; whereas SHP asks prices of commodities produced in the current month. For the integrated survey, it was decided that the time reference was previous month data.

Regarding the locus, Banten Province was chosen based on several criteria: the significant output share of its manufacturing industry nationally and the relatively high IBS sample size in the province to fulfill the basket commodity of SHP which contains 145 commodities. Besides those technical criteria, Banten is relatively small compared to other provinces with significant numbers of the manufacturing industry in Java so that coordination between BPS offices in the province was expected to be well-managed.

2.2. Utilizing SBR as The Sampling Frame

In BPS, SBR development has been initiated since 2013 by integrating Economic Census 2006 (large-medium businesses only) with SMAs' establishment directories. Since then until the preparation of the pilot study, SBR database had been updated from various sources, namely, local administrative data uploaded and matched by BPS Provincial Offices, data profiling (both from the internet and ground checks), Economic Census 2016 (formal plus other large-medium businesses), and SMA Directories (agriculture). SBR database content is illustrated in Figure 1.

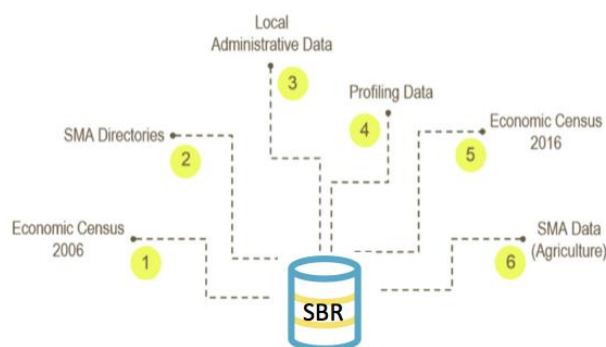


Figure 1. SBR Database Content by 2019

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Because the large-medium business list in SBR had not been updated after the Economic Census 2016, the SBR database was then updated with new large-medium industry data maintained by the Subdirector of Large-Medium Industry Statistics. Indeed, in this transition phase of the SBR usage in BPS from the silo business directories maintained by each SMA, the mechanism to update the SBR database has not been well-established. Moreover, SBR identification numbers had not been used across SMAs yet. Hence, dirty works had to be done first to match large-medium industry data between SMA's directories and SBR database. However, despite the difficulties, the matching process was advantageous as it improved the content of SBR variables, including outputs, commodities, and email addresses of large-medium industries that later were used for sending the link of e-survey.

After updating the large-medium industry business list in SBR, the subsequent activity performed was cleaning the list. The main work in this step was making sure that there was no duplication in the list. Another important effort was checking the content of the list. Some businesses turned out to be outside of Banten Province. Therefore, the number of businesses in the large-medium industry business list lessened.

Simultaneously with this frame preparation stage, the sampling mechanism and the required variables for sampling identifications were conducted. Here, it was discovered that outputs, activities, and commodities information were required in the frame. However, the fact that there was an unstandardized commodity code used across BPS, and particularly in the two SMAs, another effort must be done. Based on the recommendation that was given by Sub Directorate for Development of Statistical Standardization and Classification to apply Indonesia Commodity Classification (KBKI), a coding activity based on the available product information was performed in the SBR for the target frame by the aforementioned parties involved (see subsection 2.3.).

As the final frame preparation step, completing the businesses' contact information was carried out. This information was essential for sending information related to the use of CAWI. Ultimately, the large-medium business list containing 1691 units was transformed into a CSV file and sent out for sampling.

2.3. Standardizing Classification Code

Variation of classification code used by SMAs has become an issue in BPS because it complicates comparability between similar entities or statistics. This also happens to the IBS and SHP as they used different codes to categorize their commodities. In classifying commodities, the IBS uses Indonesia Industrial Classification (KBLI—which is a classification for industries, not for commodities), while the SHP has its classification code. To assure that the commodities are comparable between the two surveys, it is important to standardize the classification of commodities. In this study, the commodities were standardized using the KBKI composed by the Methodology Unit, deriving from the Central Product Classification (CPC).

2.4. Sampling

Using SBR as the sampling frame and taking into consideration the number of large-medium businesses and the basket commodity of SHP in the province, 300 samples of large-medium businesses were selected using a probability sampling technique. The sample size was calculated based on a response rate estimation of 79.34% and a 6% error margin. The data collection period was October–December 2019 where time reference for each of the periods was previous month data.

2.5. Designing The Questionnaire

Combined and improved from monthly IBS and SHP questions, the questionnaire of the integrated survey consisted of four sections. The first section required respondents to complete their establishments' identity: name, address, and whether the establishments produce commodities for export. The question was to assess which commodities were exported and their per-unit prices (in the next section) to calculate the international-trade price index. The second section was the main section

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as it covered questions about types of commodities produced, their quality, quantity, and value of production, per-unit domestic price, per-unit export price, the reason for price change (if exist), and the number of workers. Quality of commodity had to be written in detail to ensure that price changes occur not because changes in commodities being compared. The third section was feedback questions to examine respondents' preference towards paper-based or electronic surveys and the clarity of each question. This section was asked only once to each respondent in the first month of the enumeration period. The last section was provided for respondents or enumerators to put notes, if necessary.

2.6. Composing New Business Processes

Unlike IBS and SHP which are conducted only through PAPI (paper-and-pencil interviewing), this integrated survey provided two modes of data collection, namely, PAPI and CAWI (computer-assisted web interviewing), as one of the study objectives was to assess the effectiveness of CAWI method in increasing response rate in business-based surveys. The business process for the IBS-HP was based on the design document of BPR for the business-based surveys. In general, the integrated survey business process can be grouped based on the actors conducting the process.

BPS HQ

- Designing questionnaires both PAPI and CAWI
- Preparing SBR and selecting samples
- Building tools/application for CAWI and data processing
- Conducting analysis and evaluation of the pilot study

BPS Banten Province

- Blasting email containing a link of the e-survey to all samples whose email addresses already listed in the sample list and monitoring the status of the emails
- Informing BPS Regencies about no-email-address establishments or establishments whose status of the emails were bounced-back

BPS Regencies

- Visiting no-email-address and bounced-back-status establishments to explain about the survey and ask for a preferable method (PAPI or CAWI) for the establishment to be surveyed. If they chose CAWI, they were asked to submit their email addresses
- Collecting data from establishments choosing PAPI method
- Conducting data entry from PAPI questionnaires

Respondents

- Filling out the e-survey independently

3. Result

The SBR

Some problems related to incompleteness and not up-to-date information within the sample list occurred mainly at the beginning of the data collection period. Those problems were incorrect email addresses and out-of-date operational statuses of establishments where some operationally-closed establishments were still selected as samples of the survey.

Response Rate

In September, 114 establishments (38%) participated in the survey where only 38 establishments (13%) chose the CAWI method. The response rates in October and November were decreasing, respectively, to 36% and 29%. From the 114 participating respondents, the number of respondents with “clean” status (commodities, quality, quantity and value of production, and price of

each commodity were filled completely) were even slower which was only 20% (61 establishments) and declined to only 17% in November. These results can be seen in Table 1.

Table 1. The Response Rate of IBS-HP Pilot Integration Survey

Month	Data Entry			Clean Data Entry		
	Number of Establishments	Number of Commodity	Response rate (%)	Number of Establishments	Number of Commodity	Response rate (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
September	114	263	38.00	61	126	20.33
October	108	252	36.00	61	125	20.33
November	87	200	29.00	51	103	17.00

Commodities

The number of commodities reported by the 114 participating establishments in September was 263 commodities and only 126 commodities were considered to have “clean” status. In November, the number of commodities with “clean” status decreased to only 103 commodities. This was unfortunate because the producer price index can be calculated only from commodities with “clean” status.

Respondents' Feedback

Concerning the difficulties in answering questions, 81% of the respondents did not experience any problems during the questionnaire completion. Conversely, 19% of the respondents stated it was difficult to answer questions about commodities, price, and production quantity as the data was closely related to market competition. In terms of question clarity, 97% of the respondents considered the questionnaire clear while the other 3% stated that more information had to be provided for questions about prices. Regarding the method preference for the next survey, the percentage of respondents choosing PAPI was 51% or only slightly higher than the percentage of respondents choosing CAWI.

4. Discussion, Conclusion, and Recommendations

Issues

- The number of establishments participating in the survey was still very low. Several reasons causing this problem could be: the lack of socialization about the survey and establishments might think that participating in BPS surveys was not beneficial. Another reason stated by some establishments was that BPS enumerators did not look neat and did not communicate well.
- According to the SMAs, the main reason for the decreasing response rate in October and November was because establishments are likely to provide the data quarterly as they usually do in IBS and SHP. Although the data is collected monthly, most establishments prefer to provide the monthly data at the end of each quarter.
- Regarding sufficiency to fulfill SHP basket commodities consisting of 145 commodities, the survey could only fulfill 43 commodities. According to the Producer Price subject matter, data from the pilot test can only be used for calculating a simulated index, not the actual index due to its insufficiency in fulfilling the basket commodity.

Recommendations

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- SBR in the future should be updated regularly so that it can reflect the current conditions about business existence, contact person, and anything related.
- In terms of data comparability, the use of standard classifications across SMAs has to be encouraged in BPS.
- To increase the response rate, socialization from BPS top management is important to gain trust and respect from business owners. Moreover, monitoring and respondent follow-up mechanisms have to be improved. It is also essential to provide regular feedback to respondents in the form of published statistics so that they know the use of their data and can improve their business using the provided statistical outputs.
- BPS should optimize the first phase of the GSBPM, the Specify Needs phase, to address the problem of high respondent burden. By strengthening the user needs also gathering and prioritizing statistical activities, overlapping surveys and/or survey questions could be avoided. Thus, the number of surveys and/or survey questions that have to be participated by respondents would be significantly reduced.
- Further, to reduce the respondent burdens, some surveys and their variables also need to be periodically assessed to assure that the data collected are needed by the data users.
- SBR identification numbers need to be used across BPS so that updating from survey feedback can be performed easier. SBR identification numbers are also vital to reduce respondent burden since it will enable the use of survey rotation and overlap control in the future.
- To promote the effectiveness of electronic surveys, user-oriented systems providing various modes of data collection have to be developed. The e-surveys have to be easy to use and informative so that respondents would not feel burdened while answering the questions. Besides, the e-surveys should be able to overcome the issue of unstable internet connection existing in several locations in Indonesia.
- Enumerators as the front liner should be equipped not only with technical skills about the surveys being conducted but also with soft skills, such as communication skills to increase respondent's impression about the enumerator and the survey itself.
- The survey design process is crucial to be done before the frame preparation and sampling selection. This can make the frame preparation process more efficient.
- BPS SBR needs to be updated so that it will cover the standardized stratification variables that are used in surveys. For this, some discussions with National Accounts and SMAs are required.

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