

## CHAPTER 11 - PRIMARY DATA COLLECTION: REGULAR INDUSTRY SURVEYS

### 11.1 Introduction

Following the successful pilot and first full-scale surveys described in Chapter 9, a number of historic time series were constructed from the limited available secondary data to calibrate the primary data from such surveys of the South African consulting engineering industry. Chapter 10 described the development of these secondary data time series. This chapter details the evolution of the regular industry survey process, the execution of a further 8 surveys, and its role in primary data collection for the SMIS.

Survey forms were iteratively modified and improved throughout the study period, i.e. each survey used a modified and improved version of the questionnaire from the previous survey. Modifications were planned in such a way that continuity of key indicator monitoring and user familiarity could be maintained while addressing shortcomings that became apparent during the previous survey period.

Data obtained from surveys will not be reported in detail in this chapter, as that will be covered in Chapter 12.

#### 11.1.1 Establishing survey intervals

The survey period for the first full-scale survey was 12 months (1 July 1996 to 30 June 1997). One of the recommendations made at the conclusion of the first full-scale survey (chapter 9) was that the survey period should be shortened to improve the accuracy of tracking indicators and to speed up the acquisition of

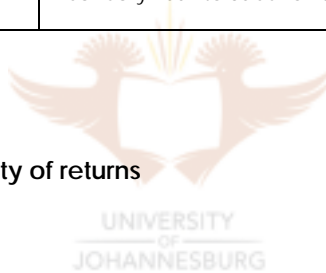
primary data points. Suitable survey intervals had to be determined with consideration for the following factors:

- Surveys conducted at suitably short intervals will allow timeous detection of variations from the established trends for any of the indicators being monitored.
- Shorter survey intervals imply more topical, relevant and useful MIS reports.
- Frequent surveys will provide more primary data points and therefore more accurate and useful data for forecasting purposes.
- Shorter survey intervals imply additional costs that have to be managed within the constraints of a limited budget
- Frequent surveys may result in survey fatigue among the consulting engineering fraternity with the consequences of low response rates and poor and non-representative data.

It was decided to select a 6-month survey period for the first of the regular surveys, with an understanding that the effect of the shorter survey intervals would be closely monitored and the necessary corrective action taken when required. A six-month survey period proved to be achievable and a good balance was struck between the advantages and disadvantages of increasing the frequency of surveys. The resultant survey periods are shown in Table 11.1.

**TABLE 11.1**  
**Survey periods**

Survey designation	Survey period dates	Survey period
Pilot survey	1 July 1995 to 30 June 1996	12 months
First full-scale survey	1 July 1996 to 30 June 1997	12 months
Survey 2	1 July 1997 to 31 December 1997	6 months
Survey 3	1 January 1998 to 30 June 1998	6 months
Survey 4	1 July 1998 to 31 December 1998	6 months
Survey 5	1 January 1999 to 30 June 1999	6 months
Survey 6	1 July 1999 to 31 December 1999	6 months
Survey 7	1 January 2000 to 30 June 2000	6 months
Survey 8	1 July 2000 to 31 December 2000	6 months
Survey 9	1 January 2001 to 30 June 2001	6 months



### 11.1.2 Statistical representivity of returns

The data obtained from the pilot survey and the first full-scale survey of SAACE member firms was shown in Chapter 9 to be statistically representative as data for the South African consulting engineering industry. Survey forms for each of the subsequent surveys were sent to all SAACE member firms and the statistical representivity level of responses were monitored in terms of the number of returns received, the firm size distribution of respondents and the geographic distribution of respondents. The number of SAACE member firms varied throughout the study period, but at no time were less than 370 survey forms dispatched. During each survey the processing of returns only commenced once an appropriate level of representivity of responses (in terms of number of returns, firm size distribution of respondents and geographic distribution of respondents) was achieved. In some instances this meant that data capturing

and processing as well as reporting had to be delayed while interventions, such as e-mail reminders and requests to the defaulting sections of the target population, were carried out to improve representivity of responses to acceptable levels.

The benefits of the SMIS to individual firms and to the industry as a whole were communicated to member firms throughout the study period in order to maintain both interest in the study and acceptable survey response rates. This communication took place through e-mails to all nominated principals at firms, electronic newsletters to all principals of SAACE member firms, special messages on the SAACE website and talks presented at regional branch meetings of the SAACE. Table 11.2 shows that the number of returns processed for each survey remained at a fairly constant level over a 6-year study period.

**TABLE 11.2**

**Number of respondents per survey**

<b>Designation of survey</b>	<b>Number of respondents (number of participating firms)</b>
Pilot survey	104
First full-scale survey	141
Survey 2	146
Survey 3	129
Survey 4	117
Survey 5	116
Survey 6	150
Survey 7	135
Survey 8	121
Survey 9	150

## 11.2 Evolution of survey forms

The basic format of the questionnaire was developed after the pilot survey and changes to the format was kept to a minimum in order to build user-familiarity with the respondents. Survey questions did however evolve throughout the study period, in keeping with the exploratory nature of the study. The following sections will highlight the main amendments to the survey forms over time as well as the reasons for such amendments.

### 11.2.1 Survey 2: period 1 July 1997 to 31 December 1997

The survey questionnaire for this period is enclosed as Annexure 2.3. It should be noted that the survey period was shortened from 12 to 6 months in keeping with recommendation made in Chapter 9. This survey was conducted prior to the development of the historic time series (Chapter 10), which was only completed during March 1998.

The General Questions, Economic Cycle Indicators and Product Cycle Indicators sections in the previous questionnaire (sections 9.3.1, 9.3.2 and 9.3.3) were used without any amendments.

The section on Human Resources in the previous questionnaire (section 9.3.4) was expanded slightly by amending the qualitative question on recruitment problems to differentiate between engineers and technicians from a previously disadvantaged background and other engineers and technicians. This was specifically amended to improve understanding of the reported shortage of suitable technical staff in the PDI category.

In the section on Capacity Utilisation (section 9.3.5) a third qualitative question was added. This was aimed at assessing future perceptions regarding technical staff capacity utilisation in the six months following the survey period. This amendment was added to start building a forecasting capability regarding future business conditions in the South African consulting engineering industry, as reflected in perceived future technical staff capacity utilisation.

The section on Business Conditions (section 9.3.6) was deleted from this questionnaire as the results of the previous survey showed that the responses on the Capacity Utilisation and Economic Indicators sections provided the same information. The section on Leverage Ratios (section 9.3.7) was also deleted from this questionnaire, as these two qualitative questions were only included in the previous questionnaire as a once-of exercise to establish characteristic workflow ratios for the consulting engineering industry.

At the time of this survey the consulting engineering industry was increasingly reporting problems with slow payment of invoices by their public sector clients. A new section on Non-payment of Accounts by Clients was therefore added to the questionnaire. The quantitative questions in this section were intended to provide detailed information in order to determine:

- the **extent** (financial implications) of the problem and
- the **location** (level of government and geographic location) of the problem.

This intention was for the SAACE to use this information when approaching government on behalf of the industry in order to:

- explain the serious implications of slow payment for the industry and

- assist in identifying problem areas where slow payment may be as a result of insufficient administrative capacity or inexperienced staff.

### **11.2.2 Survey 3: period 1 January 1998 to 30 June 1998**

The survey questionnaire for this period is enclosed as Annexure 2.4. This survey was conducted after the development of the historic time series (Chapter 9), which became available during March 1998.

The General Questions, Economic Cycle Indicators, Product Cycle Indicators, Human Resources and Capacity Utilisation sections in the previous questionnaire, as described in sections 9.3.1, 9.3.2, 9.3.3, 9.3.4 and 11.2.1, were used without any amendments.

The section on Non-payment of Accounts by Clients was introduced in the survey number 2 questionnaire, but was omitted from this questionnaire in favour of a separate in-depth e-mail survey on this issue. The special survey was carried out by the SAACE in August 1998 and was outside the scope of this study. The data obtained from the special SAACE survey was however incorporated into this study and the section on Non-payment of Accounts was again included in the next survey (number 4).

### **11.2.3 Survey 4: period 1 July 1998 to 31 December 1998**

The survey questionnaire for this period is enclosed as Annexure 2.5. Several amendments to the survey 3 questionnaire were introduced in this survey questionnaire to reflect changes in the external business environment of South

African consulting engineers. These amendments are discussed in the following paragraphs.

- In the General Questions section the questions on employment were expanded to provide more information on targeted employment categories (i.e. race, sex and disability) in order to monitor the response of the consulting engineering industry to Employment Equity and Targeted Procurement legislation. The question on engineering discipline or competency categories was expanded to allow for the identification and tracking of new disciplines. In the question on the geographic spread of fee income the section on international income was split between African countries (other than the RSA) and other countries outside Africa. This was introduced for improved tracking of South African consulting engineers' international market penetration. The question on income contribution by client type was expanded to allow for the identification and tracking of new client types.
- The sections on Economic Cycle indicators and Product Cycle indicators were used unchanged from the survey 3 questionnaire, except for minor grammatical changes to the questions to eliminate specific misinterpretations reported during survey 3.
- Two new qualitative questions were added to the section on Human Resources. These questions were also included to monitor the response of the consulting engineering industry on Employment Equity and Targeted Procurement legislation and covered:



- o the percentage of total turnover represented by business with affirmable business enterprises (i.e. payments to ABE's) and
  - o the intended percentage of new employees to be employed from the PDI category.
- The section on Capacity Utilisation was left unchanged.
- The section on non-payment of accounts by clients was again included in the questionnaire with the following amendments:
  - o the wording was improved,
  - o payments by private sector clients were now also tracked and
  - o the identification of individual defaulting clients was made optional to accommodate the wish expressed by several respondents in the previous survey not to identify defaulting clients.

#### **11.2.4 Survey 5: period 1 January 1999 to 30 June 1999**

The survey questionnaire for this period is enclosed as Annexure 2.6. This form included the following minor amendments to the survey 4 questionnaire:

- In the General Questions section the two questions on employment category breakdowns were changed from a percentage basis to a number basis. This was done both to eliminate apparent

misinterpretation of the questions by some respondents and in the interest of improved accuracy of survey results. The question on the value of business conducted with ABE's was moved from where it was in the Human Resources section of the previous questionnaire to the more appropriate General Questions section in this questionnaire.

- The sections on Economic Cycle indicators and Product Cycle indicators were left unchanged.
- In the Human Resources section respondents were given a third choice option (static as against decrease and increase) for answering the qualitative question on employment numbers in various categories. This was done due to the responses in the previous survey where several respondents indicated that employment would neither decrease nor increase. The question on the value of business conducted with ABE's was moved from the Human Resources section in the previous questionnaire to the General Questions section in this questionnaire.
- The section on Capacity Utilisation from the previous questionnaire was used unchanged.
- In the Non-Payment section the wording of the "period outstanding" response headings was amended to avoid a recurrence of the misinterpretations that occurred in the previous survey. The idea of providing for the optional identification of individual defaulting clients was abandoned in this questionnaire, as it did not result in any meaningful data in the previous survey, i.e. individual defaulting clients will not be identified.

### 11.2.5 Survey 6: period 1 July to 31 December 1999

The survey questionnaire for this period is enclosed as Annexure 2.7. This form included the following amendments to the previous questionnaire:

- In the General Questions section the wording of the question on business with ABE's was amended in line with the latest targeted procurement terminology by referring to projects jointly undertaken with Affirmable Professional Service Providers (APSP's). The previous two questions on employment categories were combined into a single expanded question, which required extensive breakdowns into race, gender and disability categories to monitor employment equity trends and compliance within the industry.

The question on the percentage of total income derived per type of work or discipline was expanded as a result of new disciplines identified in the previous survey in that categories for Facilities/ maintenance management, Information systems/ technology and Management consulting were added. The category multidisciplinary/ multi-professional was deleted as the previous survey revealed that this category was largely unused as firms split this type of work and reported it under the other work categories.

Two further questions were added to the General Questions section to quantify and track the new trend towards Public Private Partnerships (PPP's) for the creation, operation and maintenance of infrastructure. The questions were aimed at determining:

- o The value of PPP-related work executed by the consulting engineers and
  - o the roles in which consultants participated in PPP's (e.g. advising the public sector, advising the private sector or participating as equity partner).
- In the section on Economic Cycle Indicators two new questions were added:
  - o Respondents were asked to indicate what they expected the rate or tempo of consulting engineering activity to be for both the next 6 months and the six months thereafter, i.e. extending this from the previous 6-month forecast to both a 6-month and a 12-month forecast.
  - o Respondents were asked to indicate whether they regarded profit margins achieved during the survey period as unsatisfactory, satisfactory, good or exceptional in order to assess profitability expectations within the industry.
- The section on Product Cycle indicators was left unchanged.
- In the section on Human Resources the question on the intended percentage of new employees to be employed from the PDI category was deleted as sufficient information had been obtained in the previous two surveys.

- The section on Capacity Utilisation was used unchanged from the previous questionnaire.
- In the Non-Payment of Accounts section the wording of the “period outstanding” response headings was expanded further in the interest of greater clarity and better data. The question was furthermore expanded to also make provision for separate monitoring of payments by parastatals.

#### **11.2.6 Survey 7: period 1 January 2000 to 30 June 2000**

The survey questionnaire for this period is enclosed as Annexure 2.8. This form included the following amendments to the previous questionnaire:

- The General Questions section was left unchanged from that contained in the previous questionnaire, except for the two questions on Public Private Partnerships. Few respondents replied to those questions in the previous survey and it was not clear whether respondents did not understand the question or whether participation by consulting engineers in PPP's was still in its infancy. In the reworded questions the wording “joint ventures with your traditional clients in either the public or the private sectors” was used instead of PPP's to test industry response.
- The sections on Economic Indicators, Product Cycle Indicators, Human Resources, Capacity Utilisation and Non-payment were left unchanged.

### **11.2.7 Survey 8: period 1 July 2000 to 31 December 2000**

The previous survey questionnaire was used unchanged for this survey, except for the following minor amendment. The question on the percentage of turnover represented by joint projects with APSP's in the General Questions section of the questionnaire was amended to refer to the percentage of turnover outsourced to enterprises or individuals outside the boundaries of the organisation. This was done to measure the extent to which consulting engineers were following the outsourcing trend in their businesses. The complete survey questionnaire is enclosed as Annexure 2.9.

### **11.2.8 Survey 9: period 1 January 2001 to 30 June 2001**

The previous survey questionnaire was used without any amendments for this survey. This survey questionnaire is enclosed as Annexure 2.10.



## **11.3 Evolution of reporting format**

The format of the reports for three surveys will be discussed to illustrate how reporting evolved throughout the study period. These three reports were chosen from the ten reports produced during the study period, as they were considered most suitable for illustrating the evolutionary nature of the reporting. Detailed data will be discussed in Chapter 12 and not in this section.

### **11.3.1 Report for the pilot survey: period 1 July 1995 to 30 June 1996**

The first report, which reported on the results of the pilot survey, was very basic and consisted of a single double-sided A4 sheet issued to all SAACE member firms. Although simple, the report already provided some previously unavailable information on the South African consulting engineering industry. The report was generally well received and the resultant increased interest was reflected in the fact that the response rates for the next survey improved by 32,55% from 43% to 57% as measured by the number of staff employed by responding firms (Table 9.6).

The report consisted of the following sections:

- Confidence levels in the industry
- Fee income by province and by client
- Preliminary income forecast
- Data on bursaries awarded

A copy of the report is enclosed as Annexure 3.1.

### **11.3.2 Report for survey 3: period 1 January 1998 to 30 June 1998**

This was the fourth report produced during the study period and the first to be produced after the development of the historic time series (Chapter 10). The report, which was much more substantial (7 pages) than the first report discussed in 11.3.1, was distributed electronically to all SAACE member firms and was titled "State of the Consulting Engineering Industry". The report consisted of the following sections:

- **General Economic Background:** The economist gave an economic overview that focused on the construction industry.
- **Statistics:** This section presented the data on employment, salaries, fee income and cost escalation from the four surveys conducted to date in tabular form. It furthermore showed inflation-adjusted changes in the employment, salaries, fee income and confidence indicators as well as the industry's capacity utilisation during the survey period.
- **Regional employment distribution:** This section reported on regional employment statistics. It also reported on regional employment market trends by comparing changes in regional employment figures over a ten-year period, utilising data from the relevant historic data series.
- **Salient features of the market:** This section reported on changes in the following market characteristics since the previous survey:
  - Proportional split of income by type of work / discipline
  - Geographical split of income or provincial market share
  - Contribution to total income by client type (Central, provincial and local government, parastatals and private sector)
- **Tempo of activity, competition, profitability and capacity utilisation:** This section reported on changes in market conditions experienced in the consulting engineering market over the survey period and commented on the future expectations of members regarding market conditions.



- **Prospects for 1999/ 2000:** This section reported on the consulting engineering confidence index based on respondents' confidence about current and future trends in the industry.
- **Phases of the product cycle:** The survey data on the phases of the product cycle is used in this section to report on trends in the flow of work into and the output of the consulting engineering industry.
- **Fee income:** Fee income trends and forecasts were discussed in this section.
- **Cost escalation:** This section included a discussion on cost escalation trends in both the consulting engineering and greater construction industries.
- **Manpower and training issues:** This section reported on staff composition, recruitment trends, training expenditure, shortage of PDI candidates leading to recruitment problems etc.
- **Presentation slides:** A number of PowerPoint™ presentation slides were produced with this report and were made available on the SAACE website as an experiment. The intention was that SAACE member firms could use the slides for presentation purposes both inside their organisations and to clients. The slides were welcomed by the consulting engineering firms and were even utilised by the technical press for inclusion in industry articles. As a result of this positive reaction, more extensive slides were produced with all subsequent survey reports and these were published on the SAACE website.

A copy of the report is enclosed as Annexure 3.2 and of the presentation slides as Annexure 3.3.

### 11.3.3 Report for survey 9: period 1 January 2001 to 30 June 2001

This, the tenth report produced during the study period, was much more voluminous (19 pages) than the fourth report discussed in 11.3.2 (7 pages). It did however retain the same format and the additional volume consisted mostly of statistical tables. The report (in MS Word™ format) as well as a useful PowerPoint™ presentation of accompanying graphs were placed on the SAACE website to be publicly accessible. An e-mail message was furthermore sent to all SAACE member firms and to key media representatives to alert them to the presence of both the report titled “State of the Consulting Engineering Industry” and the accompanying presentation graphs on the website. A separate executive summary of the report was furthermore produced for general distribution and as a hand-out.

The report consisted of the same sections as those in the fourth report described in Section 11.3.2, with the following additions and omissions:

- **Regional employment distribution:** The section was omitted from this report as the data did not represent any meaningful change from what was published in previous reports. The emphasis was therefore changed to analysing regional contributions to total fee income.
- **Salient features of the market:** This section was expanded by:

- o Providing both more data and
  - o an analysis of client types for different firm sizes.
  
- **Impact of affirmative procurement on the industry:** This new section was added to improve the understanding of the impact that the application of government's targeted procurement policy has on the industry. A sub-section on the industry's participation in Public-Private partnerships was also included under this main heading.
  
- **Human Resources section:** This section was expanded substantially to provide extensive data on employment in the consulting engineering industry by category. The detailed employment data was included as separate statistical tables at the end of the report.
  
- **Fee income outstanding:** This new section provided details of trends regarding slow payments to consulting engineers by client type.
  
- **Presentation slides:** As a result of the popularity of the PowerPoint™ presentation slides produced with the fourth report an extensive set of slides was produced with this report.
  
- **Executive summary:** A separate executive summary of the report was produced for general distribution.

A copy of the report is enclosed as Annexure 3.4, of the presentation slides as Annexure 3.5, and of the executive summary as Annexure 3.6.

#### 11.4 Conclusion and recommendations

A standardised questionnaire was developed to ensure respondent familiarity with the format and continuity of key indicator tracking. The questionnaire format does however make provision for ongoing improvements and amendments to take account of changes in the external business environment.

A standardised reporting format was developed and used from the fourth survey onwards with only minor additions and omissions to address changes in the external business environment. Examples of such changes for which the surveys and reports were amended are the impact on the industry of the increased application of targeted procurement policies or the impact on the industry of the application of employment equity legislation. This standardised reporting format can be retained in future as the backbone of the SMIS for the South African consulting engineering industry.



The standardised reporting format was developed for use by various industry-stakeholders, for example:

- Consulting engineers who could use the more detailed data for benchmarking and strategic management purposes in their firms.
- Contractors and material suppliers who could interpret the provincial market and client type distribution of consulting engineers and the analysis of the phases of the product cycle to forecast trends in their markets.

- The media who could use sections of a report and the accompanying presentation slides in various media releases and industry articles.
- Industry lobbyists who could use the reports and presentation slides for informing clients or lobbying government on various issues.

The ability was furthermore developed to produce customised individual firm reports on request to firms who had participated on an ongoing basis in the surveys. An example would for instance be a report that benchmarks a particular firm of a certain size (by either staff employed or turnover) against all other similar sized firms. Benchmarking reports can similarly be produced against all firms working in similar disciplines, similar geographic areas or for similar client types. This capacity to produce such individualised firm reports needs to be marketed more widely in future.

The next chapter will show how primary and secondary data were combined to produce useful SMIS data and reports and will present illustrative processed and summarised data from this study.