STATISTICS DENMARK

REVIEW OF EFFICIENCY, QUALITY AND THE ORGANISATION OF STATISTICAL PRODUCTION

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Executive Summary

My terms of reference were to:

- Evaluate and recommend improvements to Statistics Denmark, leading to efficiencies and/or improved quality within an unchanged budget constraint.
- Assess the organisation of statistical production in an international perspective, taking account the needs and opportunities that arise from the EU context.

In order to address the Terms of Reference, I visited Copenhagen from 19-27 June 2014.

Efficiency

I believe Statistics Denmark is an efficient organisation as previous benchmarking studies have shown. Nevertheless, there are opportunities for improved efficiencies. The most promising areas that I identified are:

1. Social Statistics – (a) Functionally specialise the BUILD function for the systems (including the data collection instruments) for outsourced household surveys and develop real strengths in software like BLAISE (or replacement software). This functionally specialised area should be located in the Interviewer Services Division. (b) Functionally specialise the sample selection function in the Research and Methods Division. (c) Renegotiate the contract with the private sector provider of LFS interviews to make greater use of web surveying and a focus on a smaller representative sample rather than an absolute response rate of 65%. (d) Review the panel structure used for the LFS. (e) Consider functional specialisation of the acquisition and processing functions for administrative data.
2. Business Statistics – (a) Introduce further functional specialisation of business survey activity by moving responsibility for input processing to the Business Surveys Division. This will also facilitate the greater use of more cost effective macro editing. (b) Change the approach to the processing of VAT data to improve the quality so it can be used more extensively replacing some of the existing surveying of businesses for short term statistics.
3. Economic Statistics – (a) Take a corporate approach to the redevelopment of the ageing production systems used by Departments. Capture any resource savings that are possible by performing existing functions more effectively. (b) Examine whether efficiencies are possible through a redesigned National Accounts processing system.
4. Registers – Establish Memoranda of Understanding with supporting Service Level Agreements for data obtained from Registers.
5. Information Technology – Change the organisational arrangements for those IT staff working on the development and support of IT applications systems.

Quality

Statistics Denmark provides a high quality statistical service. Nevertheless, there are opportunities for improved efficiency which I have identified in the Report. I think the most important are (1) to set up arrangements to undertake independent reviews of product quality supported by a standard methodology, (2) strengthen the methodology capability especially in the area of non-sampling

errors, and (3) continue with the profiling of large enterprises to improve the accuracy of national accounts and other statistics.

Statistical Production Systems

Statistics Denmark has taken important steps towards the introduction of modern statistical production systems especially in the area of management of meta data and the adoption of GSBPM. I suggest that Statistics Denmark develop a formal enterprise architecture and appoint a Chief Information Officer who should be part of the Executive as Information Technology is so important to the operations of Statistics Denmark.

The focus should remain on the use of standard generalised software rather than developing large scale generalised systems. The functionally specialised areas may identify opportunities for some generalised systems and these should be considered on the basis of a business case.

There should be a deliberate move away from locally developed and maintained systems.

Analysis, User Engagement and Human Resource Management

There was interest in the experience of the Australian Bureau of Statistics (ABS) in these areas. The Report provides some details of the ABS approach.

Table of Contents **Page**

Annexes

1. Introduction and Terms of Reference

The Terms of Reference are attached. My main tasks are to:

- Evaluate and recommend improvements to Statistics Denmark, leading to efficiencies and/or improved quality within an unchanged budget constraint.
- Assess the organisation of statistical production in an international perspective, taking account the needs and opportunities that arise from the EU context.

The work is taking place in parallel with a Consultancy firm (Deloittes) undertaking related studies. In this report I refer to them as the 'Consultants'. My report is to be finalised by the end of October. This version should be regarded as an advanced draft. I will continue to work on some aspects as indicated in the relevant Sections below.

The main audience for the Final report is internal, especially the Executive of Statistics Denmark. It may also be used by the Consultants to assist their investigations. The report has been written largely for these audiences but mindful that it may be distributed outside Statistics Denmark.

The main focus of the Report is on improved efficiency. In many cases, efficiency improvement will require investment up front to develop the systems and infrastructure to enable the efficiency improvements. This will require resources to be found, with the appropriate skills, to undertake the development work. It will also require savings to be identified in future years and activated consistent with the business case. A loan through the Ministry Of Finance might be a possibility for larger projects but this is a decision for Statistics Denmark. Otherwise, investments will have to be funded from internal savings which should be the primary strategy.

As outlined by the Director-General, the main requirement for efficiency savings is to fund new work. He particularly mentioned improved user engagement and an increased focus on analysis as specific requirements. Both of these topics are discussed in this Report. However, as indicated in the previous paragraph, some of the efficiency savings should be devoted to investment activities.

As specified in the Terms of Reference, the report will also address 'improved quality' and 'statistical production' systems.

2. My Credentials

My main credential for this review is that I was Australian Statistician (equivalent to Director-General) for the Australian Bureau of Statistics (ABS). Prior to that time I held a number of senior positions in both the ABS and Statistics New Zealand, including Deputy positions. These positions covered most fields of official statistics and support services like methodology, IT and corporate services. On two occasions, I have worked in the United Nations Statistics Division on a short-term contract basis. I have also undertaken consulting work in Statistical Offices in a number countries including Statistics Sweden.

3. Modus Operandi for Review

I have read a lot of documents supplied by Statistics Denmark many of which were made available prior to my visit. These provided a good overview of the activities of Statistics Denmark and how it operates.

I was also able to visit Copenhagen from 19-27 June where I held a number of discussions especially with the Statistical Divisions. The staff of Statistics Denmark were very helpful and co-operative and these discussions were extremely useful for achieving my Terms of Reference.

I was also able to bring the experience of some other National Statistical Offices to the table, namely Australia, New Zealand, Sweden and United Kingdom. This is particularly relevant to the term of reference on statistical production systems where all four Offices have moved to a more functionally centralised approach based on a business process model. Their experiences (good and bad) will be relevant to Statistics Denmark.

At the time of writing this Report, I have already had some discussions with the ABS and have made contact with my colleagues in New Zealand and Sweden. I have also made extensive use of a special issue of the Journal of Official Statistics (2013) on statistical production systems. I was a contributor to this issue.

It is also important that I work closely with the Consultants and that, as far as possible, our conclusions and recommendations are consistent especially with those areas where our work has overlapped. We are coming from different perspectives and knowledge and are using different methodologies. Being realistic, there may be some areas where we disagree. In those cases (hopefully small) I will try to explain the reasons for my different view.

I met with the Consultants several times whilst in Copenhagen. We agreed to continue to collaborate now that I have returned to Australia but, at this time, there has been no further interaction.

We also discussed our respective areas of focus. The main overlap will be with the statistical activities of Statistics Denmark. However, I will be making comments in areas such as user engagement, analysis and human resource management that may also overlap with the areas being examined by the Consultants.

4. Comparison of Statistics Denmark with other Statistical Organisations

I was provided a copy of the Report of the benchmarking study with Statistics Finland undertaken in 2010. The overwhelming message is that Statistics Denmark is efficient compared with Statistics Finland. In virtually every area of activity, Statistics Denmark seemed to use fewer human resources than Statistics Finland. This may be because there has been greater pressure to improve efficiency. Statistics Denmark has also taken greater leadership in standardising it processes and the IT environment. Some of the key messages are shown at Annex 1.

This benchmarking study looked right across both organisations. As I understand it, the comparison of individual statistical products did not succeed. Expectations have to be realistic. Whilst I was at the ABS we undertook some benchmarking studies and they were very insightful. For example, we undertook a benchmarking comparison with the UK Office of National Statistics (ONS) on the CPI. The cost structures were very different. The ABS was spending a lot less effort on data collection and a lot more on data quality than the ONS. The benchmarking study then focussed on understanding the reasons for these differences and whether they were justified. Consequently both organisations made some changes to their collections with impacts on efficiency and accuracy. I would suggest that the experts of SD and SF from individual collections would consider benchmarking whenever they meet. I believe the focus should be on the cost structure, rather than total costs, if most is to be gained from these studies. Both quality and efficiency considerations should be in scope and it should be kept in mind that the statistical objectives being sought by both organisations may differ somewhat.

I have also been provided with the Report of the benchmarking study with Statistics New Zealand undertaken in 2003. There have been many changes in both organisations since then. The focus was on Dissemination. At that time, Statistics Denmark had about 25% less staff than Statistics New Zealand in total and also in the Dissemination area. The population of Denmark is about 15% higher than New Zealand. I have worked in Statistics New Zealand and I know the organisation well and it is a relatively efficient organisations. This comparison also speaks well for the efficiency of Statistics Denmark.

I had ambitions of doing some benchmarking comparisons with Statistics New Zealand and approached them. They were very co-operative and provided me with some preliminary data. The comparison with Statistics Finland showed how difficult it can be to make reliable comparisons at the product level. It proved even more problematic with Statistics New Zealand because the organisational structure is so different. I have reduced my ambitions and focused on where there appear to be really big differences. The only area where Statistics New Zealand used less staff than Statistics Denmark was in the National Accounts where they used 13 staff compared with 28.7 staff in Statistics Denmark. I know Statistics New Zealand publishes a less extensive range of national accounts but there may be other reasons which are worth exploring such as the systems to support National Accounts.

My most extensive experience is with the ABS. It is a much larger organisation than Statistics Denmark and the Australian population is much larger. For this reason I have not made direct comparisons. However, I have tried to provide insights from my ABS experience where I thought they were useful.

5. Review of Possible Improvements in Efficiency

(a) Overview

Previous studies have shown that Statistics Denmark is a relatively efficient organisation. This is also my assessment from what I have read and observed. In fact, the number of staff devoted to some activities is surprisingly small when compared with other statistical offices. Nevertheless, there are still some opportunities for efficiency improvements.

Many of the suggestions below relate to greater standardisation of processes and the opportunities that provides for methodological development with broad impacts on efficiency and quality. You can think of standardisation in terms of the following spectrum. For reference purposes below, I refer to this as the 'standardisation spectrum' although this is my term.

1. Standardisation with functional specialisation
2. Use of standard (corporate) systems but without functional specialisation
3. Local systems using standard software tools
4. Local systems using non-standard software tools

Moving up the spectrum will generally increase corporate efficiency but it may be at the expense of local efficiency especially in the short term when you consider transition costs. There will also be additional investment costs involved in (1) and (2). There are trade-offs and judgements that will need to be made as to whether to move up the spectrum according to the specific circumstances. Short term considerations should not receive undue weight although it is important that transition issues be considered. However, statistical activities should not be allowed to remain in (4). Although Statistics Denmark has activities at each stage of the transition spectrum, there is not much in (4) I believe. This is a strong positive for Statistics Denmark as it is not the case in many national statistical offices.

In this Report I have included some specific suggestions on where moves up the spectrum should be considered. I have also included some examples of where a move up the spectrum would not be sensible because the local inefficiencies would be too great.

I have not tried to quantify my suggestions for efficiency improvements. This is probably best left to the Consultants who will be able to analyse these proposals in more detail than was possible for me.

(b) General

Would a different organisational design improve efficiency? I have looked at this for the Business Statistics Department and support the 2006 organisational redesign but will be making some suggestions on how to go further on standardisation and/or functional specialisation but without changing the basic organisational design. Also, I do not believe it is necessary to change the basic organisation design for the Economic Statistics Department but there are some suggestions on standardisation and functional specialisation mostly to do with the Household Budget Survey. Within the Social Statistics Department there seem to be some opportunities to reduce the future costs of the Labour Force Survey with some changes in methodology. I discuss this in Sub-section 5(c). Also there are some suggestions on standardisation and functional specialisation especially to do with administrative data. This may require the creation of a new specialised unit to perform these

functions. With the User Services Department I will be making some recommendations to how the IT personnel are organised and managed.

A question Statistics Denmark should ask itself is if some of the lower priority 'non-compulsory' work that is not user funded be deleted from the work program to provide scope for new work? The Consultants are specifically looking at this question so this issue is best left to them.

Another question is whether the grants received for user funded work are sufficient. Quite often Statistics Denmark deliberately undercharges because there is a benefit to Statistics Denmark (eg it publishes the output and it is a collection it would have liked to have conducted if it had the funding). However, should a harder line be taken especially as Statistics Denmark cannot afford a continuously increasing subsidy for this type of work? A deliberate decision should be made on the extent of the subsidy for each collection. Wherever possible, all direct costs should be included in the grant provided by the user to support this survey work. (Note this comment does not apply to the client funded work undertaken by the Sales and Marketing Department where activities appear to be fully funded.)

This needs to be considered together with the fact that Statistics Denmark is only partly being funded for EU mandated work and cannot count on all future EU mandated tasks being matched with increased funding by the Danish Government. In essence, Statistics Denmark will be subsidising this work. Furthermore, Statistics Denmark is also required to meet an annual 2% productivity dividend. This combined impact of the 'subsidies' and 'productivity dividend' is that Statistics Denmark budget situation is unsustainable as it implies greater improvements in productivity than is possible over the longer term and the statistical program will either have to be reduced and/or quality allowed to deteriorate (eg by reducing sample systems). I note the following important comment in the Statistics Denmark reply to the Eurostat questionnaire.

"Statistics Denmark is experiencing significantly larger problems in obtaining financing of new EU obligations than 5 years ago. From 2005 until 2010, there was an informal understanding in the responsible ministries on the necessity of financing new EU obligations via the general appropriation. The present absence of a mechanism adjusting financial resources, concurrently with increasing EU statistical demands is a major challenge."

As I note below, the tight budget situation is such that investment in new IT systems has been restricted and this increases the risk of a major system breakdown. This also limits the opportunity for productivity improvement through the application of new technology.

I have been advised that some statistical outputs are of poor quality and may not be fit for purpose. Logic says they should either be discontinued or effort put into upgrading the quality so it is fit for purpose. I shall not be addressing this point explicitly although the Consultants may as part of their work program review.

An important question to address is whether IT can be managed more effectively? The Consultants will also be examining this so I have restricted the scope of my work to IT applications staff and the way they are organised. The number as a proportion of total staff seems relatively large compared with other organisations with whom I have worked especially given Statistics Denmark is generally a very efficient organisation. You might argue that this is the reason why Statistics Denmark is

efficient. This may have been the case in the past but, at present, too many of the IT applications staff are working on support type activities rather than new systems. I have concluded that the way they are organised and used is not efficient and I will address this in more detail in Section 8.

Software licenses can be expensive especially if there is not an implemented policy of limiting the software available to perform particular functions. For example, I have come across organisations that use SAS, SPSS and STATA even though there is a lot of commonality in their functions. In addition to the additional software license costs there are additional training costs from having the three software packages.

About 10 years ago, the Australian Bureau of Statistics participated in a Gartner benchmarking study of 50 organisations of similar size and complexity. Its software costs were the lowest by some margin. The main reason was that it had fully standardised the software that was able to be used in the organisation largely eliminating redundancy.

Standard IT software seems to be used extensively In Statistics Denmark but some packages such as SAS are expensive. R is an alternative. It is freeware so there are no license costs but there are still costs associated with support, training and the transition of course. It is not a straightforward decision but many National Statistical Offices are starting to move to R. The transition could take several years with R and SAS being used in parallel. Nevertheless, the transition costs should be the main consideration in a business case considering a move away from SAS. I am not suggesting this be done but it is something that might be considered.

(c) Social Statistics

This Department works 'in boxes or stovepipes' to a much greater extent than the Business Statistics Department. As a consequence, there is considerably less functional specialisation. A particular focus of my study was whether there was more scope for systems standardisation, including both standardisation of processes and functional specialisation? The possibilities are discussed below.

Sample Surveys

My main focus was on data collected by sample surveys. I have considered collectively the household survey run by this Department (Labour Force Survey (LFS)) and the Economic Statistics Department (Household Budget Survey (HBS)) together with the surveys run by the Sales and Marketing Department (the Living Conditions Survey (SILC)) and the large number of user funded surveys, currently about 30). There is little collaboration between these areas at present, certainly nothing formal.

I have used the GSBPM as a framework to consider the possibility of further functional specialisation for sample surveys of households. Here is my summary of the situation.

DESIGN – This is partly functionally specialised at present especially with the use of the staff from Research and Methods Division to assist with the sample design. There is not much else in the way of opportunities to deploy functional specialisation in an effective way. One possible exception, and definitely worth investigating, may be the extent to which the sampling function should be specialised. From an efficiency point of view, the savings are likely to be relatively small but it is an area of expertise that fits naturally with Research and Methods Division and would avoid the retraining of staff in the Statistical Division as things change. The main benefits may be through quality improvements. Where conducted by non-experts, there are risks that the sampling is done wrongly or inefficiently, resulting in inefficient samples or too much time being spent on the sampling process.

BUILD – This is not functionally specialised at present but there are opportunities around the building of the data collection instrument and the production system (see below)

COLLECT – This is not functionally specialised unlike the equivalent function in business surveys. However, there are probably limited opportunities given private sector companies are used to collect data for LFS and HBS. SILC is already collected by the Interviewer Division within the Sales and Marketing Department as are the User Surveys so there is specialisation within this Department.

PROCESS – This is not functionally specialised but much of the input processing is integrated with the data collection. Therefore, not much in the way of distinct resources is used for input processing.

ANALYSE – There is some functional specialisation in that the Research and Methods Division are responsible for the estimation methodology (using calibration techniques). The seasonal adjustment function should also be functionally specialised. It is not as present so there are no strict rules about which methods to use. As a consequence there are inconsistencies in the way seasonal adjustment is applied through Statistics Denmark. The other functions are not functionally specialised and I do not see any advantage in doing so.

DISSEMINATION, ARCHIVE AND EVALUATION – Most of the Dissemination activities are functionally specialised. There are not many other opportunities.

With respect to functional specialisation, it is suggested that the household survey activities associated with BUILD be functionally specialised and located with the Interviewer Services Division of the Sales and Marketing Department. BLAISE is the current software tool that is used across all the surveys. It is used widely in the official statistical world. If another tool is chosen, it makes it even more important to centralise this expertise in order to reduce costs. However, given the widespread use of BLAISE, it should be checked whether there are plans to extend its functionality so that it better serves web surveys. My understanding is that BLAISE version 5 will provide much better support for web surveys. It should be released in the not too distant future. If my proposals were accepted, it would be equivalent to Level 1 in the "standardisation spectrum".

As outlined above I also propose that sample selection (part of DESIGN) be functionally specialised within the Research and Methods Division.

I have not suggested further functional specialisation with the COLLECT set of functions as the two main surveys (Labour Force Survey and Household Income and Budget Survey) have been contracted out to private providers.

In a rather unusual arrangement for National Statistical Offices, the interviewing for the quarterly Labour Force Survey and annual Household Budget Survey have been outsourced to private firms. This appears to have been an effective arrangement for Statistics Denmark. The costs were reduced initially compared with internal provision and have remained stable over time. It has been at a time when the increasing costs of interviewing have been a major headache for many National Statistical Offices. However, there are opportunities for further reducing the costs of both surveys as discussed below.

With respect to the LFS, it may only be possible to actually reduce the costs at the time that the contract is next negotiated. However, there is a lot of lead up investigation and analysis work that is necessary and this work could be commenced. My specific suggestions are as follows.

(i) Make much greater use of web surveys – Some persons complete a web survey now when that is their preference. However, the proportion is considerably lower than with the surveys conducted by Statistics Denmark where a much more aggressive approach is taken to convince selected persons to complete the survey using the web version. Over 50% of respondents complete the survey this way. The costs are much lower than for telephone interviews and there are arguments that the data quality is better although this is yet to be proven.

(ii) Focus more on obtaining a representative sample than a pre-specified response rate of 65% for the whole population. This may enable a reduction in the overall sample size with corresponding cost savings. Much of the non-response follow-up effort may be focussed on persons well-represented in the sample rather than those that are underrepresented. It can be shown that, if this happens, the non-response bias increases even though the non-response rate has reduced. The weighting system does not adjust for this because the implicit assumption is that the respondents in a strata or post-strata (where the weights are used) represent the whole population. A better

indicator than the raw response rate should be used – an indicator that reflects the representativeness of the sample. Several other indicators are available that can be estimated in real time. The R indicator, developed by Statistics Netherlands, is probably best known. But there are others. If we call this indicator RI, the target for the contactor can be expressed in the form of "a response rate greater than x% but with RI greater than y". The September 2014 issue of the Journal of the IAOS contains a number of articles that discuss representativeness indicators. This is in the Section of the Journal that was edited by me.

(iii) I do not think the panel structure of being in for two surveys, out for two surveys, and in for another two surveys (2 (2) 2 in shorthand) is efficient. In Australia, we keep households in the sample for 8 consecutive monthly surveys. It used to be 8 quarters before the survey became monthly. Compared with the Danish system, this will (1) reduce costs, (2) improve the accuracy of quarter to quarter estimates, but (3) worsen the accuracy of year to year estimates. It would be worth putting some effort into investigating the relative merits of different panel options. I think the short term movements are more important to analysts than the annual movements in which case a panel structure like Australia may be more suitable. Also, if it was possible to include persons in the survey for more than four surveys, it would reduce costs. Other countries tend to keep Labour Force respondents in the survey for 6-8 quarters.

My comments on the Household Budget Survey are under the Economic Statistics heading.

Administrative Data

The majority of Social Statistics are derived from administrative registers. For example, according to the figures provided to me, there are 15.0 staff years allocated to Population, 13.1 to Education, 10.3 to Earnings and absences, and 15.5 to Welfare. These statistics would be mainly based on administrative data. It is a total of 53.9 staff years so it is quite sizeable. It begs the question of how efficient are the processes associated with extracting this administrative data, processing the data and compiling statistical outputs from it. I did not consider data compiled from administrative systems in as much depth as with surveys whilst in Denmark but was a little surprised about the lack of formality in the arrangements for accessing administrative data. I was told that the administrative agencies were respectful but sometimes they forget about statistical needs. It seems an unnecessary risk to continue to rely on informal arrangements particularly as staff change in the administrative agency and Statistics Denmark. I would recommend a more formal agreement (but not legally binding) that outlines the arrangements and the appropriate service level standards. This is discussed in more detail in Sub-section 5(f).

With respect to efficiency, the use of administrative data will generally be of lower cost compared with collecting the data by survey especially when you also take account of the reduced reporting burden on the target population. This still begs the question of whether the statistical processes themselves could be made more efficient. The main possibilities are considered below. They are mainly concerned with greater functional specialisation and standardisation of the processes used in deriving statistics from administrative data.

One important difference, when compared with sample surveys, is that data custodians of administrative data are responsible for the management of their systems. This can impact on

Statistics Denmark because changes made to the systems that collect and store the administrative data can impact negatively on their ability to extract and use the data for statistical purposes. Although Statistics Denmark does not have direct control it should still have influence. In particular, efforts made by Statistics Denmark to ensure the data is acquired in a format that is acceptable to their systems can be greatly reduced by encouraging and helping the data custodians to use standard data items and/or apply standard classifications and coding. It may be a good investment to develop the software systems to perform these functions in collaboration with the data custodian. I did not investigate the extent to which these type of steps were undertaken. Understanding the impact on quality and cost when setting up the systems for processing administrative data is also a very important step in any acquisition of administrative data.

As with survey data, I have used the GSBPM as a framework to consider the possibility of further functional specialisation for statistics derived from administrative data. Here is my summary of the situation.

DESIGN – There is no functional specialisation at present but there may be some opportunities around the activities mentioned in the previous paragraphs. Efficient data extraction depends on specialist technical knowledge that you would not expect to have in all Statistical Divisions. There would be advantages in having a common approach to extraction of administrative data including the use of a consistent systems approach. (I understand standardised software is used for data acquisition.) Whilst the relevant Statistics Division should have the main responsibility for managing the relationship with the administrative authority they need to be supported by technical specialists for extracting administrative data and these may be located in a specialised unit.

BUILD – This is not functionally specialised at present but there may be opportunities around the building of the data extraction systems as discussed above.

COLLECT – This is not functionally specialised at present but there may be opportunities as discussed under the DESIGN heading.

PROCESS – This is not functionally specialised. Home grown SAS programs are generally used. However, there may be opportunities using a functionally specialised group. Administrative data sets tend to be very large and accessed on a regular basis. Some of the functions are quite different to those that apply to surveys such as comparisons or linkages with previous versions of the data set. Some of these functions may be quite specialised and requiring technical skills. There may also be opportunities to take advantage of the rapidly developing methods for editing and processing large data sets, and associated imputation or data substitution activities. If this function was to be specialised it should only be up to the clean micro data stage. Subsequent processes should be the responsibility of the Statistics Division.

ANALYSE – These activities are not functionally specialised and I do not see any advantage in doing so. The subject matter knowledge is most important for this function.

DISSEMINATION, ARCHIVE AND EVALUATION – Most of the Dissemination activities are already functionally specialised. There are not many other opportunities.

The above implies the establishment of a small group of specialised people to assist with the acquisition and processing of administrative data. Given it is serving several Divisions, it could be

located in the support group for the Department for their day to day management although technically the staff would probably be part of the IT applications group.

The research and development work associated with macro-editing should be part of the Research and Methods Division.

Summary

Where systems standardisation is not possible or desirable, it is still prudent to standardise on software (ie Level 3 on the 'standardisation spectrum'). This can lead to surprisingly large savings due to reductions in software license fees, training costs, lower reskilling costs when staff move Divisions, etc. Statistics Denmark already has such a policy but I was advised of some non-compliance with the policy although I am not sure of the extent to which non-compliance happens. It might be worth checking where there is non-compliance with the policy and, if so, take steps to remove it.

In summary, I think the main opportunities for efficiencies are (1) greater functional specialisation, with standardisation of processes and supporting systems, for both household surveys and administrative data (ie Level 1 on the 'standardisation spectrum'); (2) greater use of web surveys; (3) more of a focus on representative samples especially with the LFS; and (4) the design of the Labour Force Survey.

(d) Business Statistics

Business Register

The Business Register appears to be a very efficient operation. Certainly the resources used are low compared with other National Statistical Offices especially given volume of work undertaken although it has the advantage of excellent administrative data sources. The Division has its own ideas on how to make some improvements to efficiency and quality. Whilst these should be pursued as resources permit, as they will lead to improvements, none are likely to lead to very significant efficiency improvements. Furthermore, the Register needs to create resource capacity to implement new work associated with profiling of large enterprises to be consistent with EU standards.

The main challenge for the Business Register Division will be to successfully and efficiently implement the procedures for profiling of large businesses. Although, this is an EU requirement it should lead to improved quality of statistics using the Business Register as a frame. In particular, the industry dissections of business statistics will be more accurate. This will be of benefit to the national accounts in particular.

Business Surveys

The main opportunities for efficiencies in this Department appear to be in the further standardisation of business survey activities. The changes made since 2006, especially the creation of the Business Surveys Division, have been very important for improving the efficiency of business surveys and probably their quality. I believe the strategy was right and should be continued to be implemented. However, I do make a suggestion for further functional specialisation in the following paragraphs. That is, there are still opportunities to move further up the 'standardisation spectrum'.

Some collections are not yet using the centralised Business Surveys Division. The Unit has been in operation for some years now and has developed maturity. A definite plan for moving the remaining collections should be developed including those surveys from other Departments such as the Survey of Earnings (ie moving to Level 1 on the 'standardisation spectrum'). There may be some collections such as the Producer Price Index where it is not sensible to move data collection and input data processing to the Business Surveys Division because the samples are quite small and specialist price index knowledge is needed for data editing and imputation activities. However, that should be an exception based on a deliberate decision made by the Executive.

I held discussions with some of the staff responsible for the surveys that had moved to the new functionally specialised arrangements. They confirmed that any initial problems with the transition were soon overcome, including some complex collections like INTRASTAT. This was consistent with our experience in Australia when we made a similar shift to functionally specialised units for business statistics.

Opportunities for Further Functional Specialisation

The organisational design introduced in 2006 should have facilitated the move to standardised systems. The development of the portal for electronic reporting of business data is a good example. This development would have been far more difficult if the responsibility for business data collection had not been concentrated in a single Division. I looked at whether there is more scope for systems

standardisation including standardisation of processes (ie Level 1 on the 'standardisation spectrum'). This has already happened with many of the functions undertaken by the Business Surveys Division and I have made a suggestion below for further standardisation in respect of input editing. Again, I have used the GSBPM as a framework for making these comments.

It would also be easier to implement selective editing (or macro-editing) with a more functionally specialised arrangement. There are some collections (eg manufacturing) when edit failures are quite high and resources might be saved by reducing the amount of editing.

As discussed under Social Statistics, where systems standardisation is not possible or desirable, it is still prudent to standardise on software (ie Level 3 on the 'standardisation spectrum').

In terms of the GSBPM, the following summarises the current situation.

DESIGN – This is partly functionally specialised at present especially with the use of the staff from Research and Methods Division to assist with the sample design. Like for household surveys, an area worth investigating may be the extent to which the sampling function should be specialised. From an efficiency point of view, the savings are likely to be relatively small but it is an area of expertise that fits naturally with Research and Methods Division and would avoid the retraining of staff in the Statistical Division as things change. As with social statistics, the main benefits may be through quality improvements. Where conducted by non-experts, there are risks that the sampling is done wrongly or inefficiently, resulting in inefficient samples or too much time being spent on the sampling process. Otherwise, there is not much else in the way of opportunities to further deploy functional specialisation in an effective way.

BUILD - This is functionally specialised for data collection activities (eg the portal for the electronic submission of business surveys) and there are further opportunities around the building of the production systems for input editing (see below).

COLLECT – This is already functionally specialised but, as noted above, there are some further collections which could move to this environment.

PROCESS – This is not functionally specialised at present but there are opportunities around input editing.

ANALYSE – There is some functional specialisation in that the Research and Methods Division are responsible for the estimation methodology. As mentioned under Social Statistics, the seasonal adjustment process should be functionally specialised. The other functions are not functionally specialised and I do not see any advantage in doing so.

DISSEMINATION, ARCHIVE AND EVALUATION - Most of the Dissemination activities are already functionally specialised. There are not many other opportunities.

With respect to Business Statistics, there are probably enough idiosyncrasies at the estimation stage to require individual estimation systems for particular statistical outputs. However, it may be possible to develop standard tools for certain functions (ie Level 2 on the 'standardisation spectrum'). This has been done in other statistical offices for functions such as imputation and weighting. Otherwise, they should be based on a restricted number of standard software products

(ie Level 3 on the 'standardisation spectrum'). I believe this is the case at present with systems being largely based on Oracle, SAS and Excel. It might be worth checking if there are exceptions that are not really justified.

One change I would like to suggest is to move input editing to the Business Surveys Division. Output editing responsibility should remain with the various Statistics Divisions. The reason for having a functionally specialised arrangement for input editing is that it will lead to greater standardisation and more cost-effective editing. Input editing can be undertaken by (a) record by record editing (referred to as 'sheep dipping' in Australia) or (b) a macro-editing approach (or selective editing) which focuses on those records which are likely to have most impact on final estimates. Some macro-editing is undertaken in Statistics Denmark but it could be used more extensively. Some of the existing surveys have a high proportion of records failing edits at present. This suggests either over-editing or a problem with the questionnaire design.

Selective editing does require special skills and software systems to apply this approach and this will happen most effectively if the function was transferred to the centralised Business Surveys Division. There would still need to be close collaboration with the statistical Divisions in setting up the macro-edits.

Such an approach would be more effective with the establishment of an input data warehouse based on the Business Register which would enable consistency checks across surveys and with data on the Business Register. For the largest businesses, it needs a consistent approach to the definition of the units used in the various surveys which would be consistent with the objective of the profiling work currently taking place. The savings from the reduced editing in the statistical Divisions should more than offset the additional costs in the Business Surveys Division.

This approach to input editing was adopted by the Australian Bureau of Statistics despite a lot of resistance from statistical areas. There were some teething problems, especially in complex collections like Foreign Investment, but these were soon overcome and the decision proved to be correct.

With respect to the design of selective editing schemes, the expertise of the Research and Methods Division should be utilised.

Increased Use of VAT Data

A different approach to the collection and processing of VAT data should be considered. Should the data collection/processing be undertaken by the Business Register Division or an area closely aligned to it such as the Business Surveys Division? With the inclusion of the VAT data, the Business Register could in effect provide the framework for an input data warehouse. The advantages are that (a) there could be greater standardisation of the input processing functions, (b) the availability of both the BR data and other data would provide more powerful validity checks (and information for imputation) and greater consistency across data sources, and (c) provide the critical mass to enable an effective macro-editing strategy to be adapted. This could be applied to all the administrative data sets relating to businesses but especially the VAT data where there is little input editing at present. With big data sets like the VAT data, effective methods of macro-editing and data

imputation have been developed. They are somewhat sophisticated and it probably requires specialist expertise to apply these effectively.

I would not be able to assess how difficult it would be to extend the existing Business Register system to incorporate this additional data content and functionality.

From the discussions I had there appears to be some scope to make more use of VAT data for short term statistics? One possibility may be to make use of VAT data to replace sample surveys for short term statistics as there is currently duplication. The VAT based data would provide a different statistical series to those currently based on surveys because the definitions are different but that you would expect that the trends would be consistent and therefore the impact on the movements in the Production indexes might be negligible after a transition period. Businesses often ask why Statistics Denmark does not use VAT data rather than sending them a survey form. The reason appears to be concerns about quality of VAT data but they might be assisted by my suggestions in the previous paragraph. As I understand it the main difficulties with VAT data are incomplete coverage of small businesses, which are not required to report monthly, under-reporting, and data not being available at the time it is required by Statistics Denmark. (There are also special problems with the construction industry which I will not discuss here.) There is a need to make adjustments to allow for these deficiencies. The models that are being used need improvement because the estimates are subject to relatively large revisions when more data becomes available. This suggestion should be seen in the context that 88% of sales are reported monthly and not long after the end of the month so should not need to be estimated. The main problem area appears to be those businesses that report quarterly (11% of sales) with a reporting period of up to 2 months after the reference period. However, it should be possible to develop good models to estimate this relatively small part of the economy.

Statistics Sweden has been conducting some promising investigation into the use of VAT data in their production indexes. A particular advantage is that they may be able to get away from the assumption that the ratio of intermediate consumption to final output is constant. It might be worth contacting Statistics Sweden to discuss this possible development with them.

Furthermore, in recent years Statistics Netherlands have started using VAT data for business statistics in lieu of data collection from businesses. It would also be worthwhile talking to them about their experiences.

(e) Economic Statistics

IT Systems

I have looked at the scope for standardisation of processes and systems within this Department. The nature of the work in the Divisions of this Department is so different from one Division to the next that, with the exceptions discussed below, there is little scope for functional specialisation. Of course, the comments made above about efficiencies through the standardisation of IT software tools also apply to this Department.

The IT systems used by the National Accounts, Government Finance, Prices and Foreign Trade are quite old. I was advised that there were no resources available to develop new systems even though there is now a relatively urgent need as discussed in the next paragraph. I think the unavailability of IT resources is partly a result of the way that IT applications resources are organised. Their widespread distribution makes it more difficult to create the critical mass of IT resources needed to replace or redevelop these systems.

Clearly these systems were developed well. They remain useable even though many are now 10-15 years old. However, I heard complaints about their lack of flexibility. This makes it more difficult to undertake certain tasks resulting in a loss of efficiency. For example, it was difficult to satisfy requests for special tabulations for Government Finance Statistics. There is also a risk to quality as old systems are more likely to have a critical error particularly if they are relying on software that is no longer supported. Maintenance costs will also be high. Corporate decisions need to be made on the upgrade of these systems and their priority. It is unlikely that all can be redeveloped at the same time.

Consumer Price Index

A significant part of the price data collection for the Consumer Price Index has been outsourced to a private sector provider. This is rather unusual for a National Statistical Office. However, it appears to have improved efficiency and has certainly stabilised costs. I was not able to compare with previous costs so I am reliant on the feedback from the Prices Division in making this assessment. They also confirmed that these arrangements did not appear to result in deterioration in quality including the procedures for managing discontinuities (eg for clothing items) from one period to the next which are so crucial to maintaining estimates of movement in the CPI.

My impression is that Statistics Sweden makes greater use of scanner data than Statistics Denmark. Rather than being a budget saving measure, I think this is largely to increase the effective size of the sample for certain commodity groups and also improve the accuracy of prices by taking account of discounts, etc. However, it would save some data collection costs if the scanner data can be used for some items. This would be worth investigating especially as it is relatively easy to tap into the Swedish experience.

The Prices Division is responsible for the data collection and processing of the Household Budget Survey (HBS) as they are the key user of the data. The survey is mostly conducted using face to face interviewing using the services of a private sector provider but the survey instrument is provided by Statistics Denmark. As appropriate, BLAISE is used as the main software tool as is the case for other household surveys conducted by Statistics Denmark. In my comments on the Social Statistics

Department I suggested the BUILD functions (using BLAISE) be functionally specialised within the Interviewer Services Division. This should also apply to the same functions for the HBS rather than the Division trying to maintain the necessary expertise in BLAISE which a substantially different activity, requiring different expertise, to most of their functions. As at present, the CPI Division could retain responsibility for the other functions associated with the HBS.

Seasonal Adjustment

This is more of a quality issue than an efficiency issue but, as mentioned earlier, the seasonal adjustment process should be functionally specialised. It can be applied by the statistical areas but the determination of the most appropriate method should be the responsibility of the methodological specialists in collaboration with the statistical areas.

(f) Registers

Relationship with Data Providers

The relationship with the administrative data providers is critical to Statistics Denmark. Administrative data is the source for the majority of their statistics and the frameworks from which the samples for surveys are collected. The relationships with data providers have been good and this has enabled Statistics Denmark to produce their statistics at a much lower cost, and in more detail, when compared with direct data collection. Importantly, it has significantly reduced the burden on businesses and households for completing statistical forms. Although the relationships with data providers are sound, I was advised of incidents of changes in administrative systems which impacted on Statistics Denmark but were implemented without consultation. Also, I was advised that Statistics Denmark requirements are often given lower priority than some of the functions of the administrative agency. This can impact on efficiency and/or quality because of discontinuities in the series.

The following quote from a Statistics Finland paper is pertinent.

"*In spite of the existence of a legal framework, statistical agencies still rely on the goodwill and co-operation of the keepers of administrative data. It is, therefore, necessary to participate actively in policy development. Statistics Finland is member of the Finnish Register Board Committee, which prepares strategy level definitions for a register policy in Finland. The directors of Statistics Finland and each register authority also meet at regular intervals. Statistical production based on administrative data also requires firm and committed collaboration among the relevant authorities. The use of administrative sources can be improved by working closely with the authorities."*

My impression was that the relationship with the Danish statistical authorities is not as close as in Finland. In Australia, we instituted Memoranda of Understanding supported by service level agreements (SLAs) and annual meetings at the Chief Executive level with the main administrative agencies where there data was used for statistical purposes. The SLAs provided a common understanding of what is expected through the arrangements. The annual meeting highlighted the importance of the arrangements to the staff of both agencies. I am sure the institution of similar arrangements will contribute to the cost-effectiveness of the arrangements with administrative data.

Even though this has been previously considered and rejected, I would suggest the use of a Memorandum of Understanding (MoU) supported by Service Level Agreements (SLAs) signed at the Chief Executive level. Their effectiveness should be reviewed on an annual basis, possibly at the Chief Executive level. I believe this has the benefit of (a) providing a more reliable service, (b) demonstrating the importance of the arrangements to the staff of both organisations, and (c) ensuring there is some certainty in the agreements through the changes in staff in Statistics Denmark and the administrative agency.

Efficiency in the Processing of Administrative Data

There may be some efficiencies in the way administrative data are extracted and processed through the use of functional specialisation supported by standardisation of processes and systems. These are discussed in Sub-section 5(c) for Social Statistics and to a lesser extent in Sub-section 5(d) for Business Statistics.

(g) Dissemination

My assessment is that the dissemination functions in Statistics Denmark are efficient and there is little scope at present for further efficiencies. I also believe that Statistics Denmark is largely state of the art with respect to the dissemination of official statistics but new opportunities may emerge in the future as technology develops. It is important to maintain close relationships with the other more advanced statistical offices so that developments in this area can be monitored and utilised, where appropriate, in Statistics Denmark.

(h) Administrative Services

Back office services are being examined by the Consultants. They have more expertise than me in this area so I have excluded these functions from the scope of my study. However, I did note that accommodation seemed rather generous compared with other Offices I have visited. If the opportunity arises, it might be worth considering the space requirements of Statistics Denmark in order to reduce rent costs.

(i) Information Technology

There is considerable scope for improved efficiency in the use of IT resources especially IT applications staff. My focus has been on the IT staff involved in developing and supporting applications where I think different organisational arrangements would lead to more efficient and effective outcomes. I have outlined the ABS arrangements in Section 8 and I think Statistics Denmark should move in a similar direction.

In the benchmarking study with Statistics Finland, Statistics Denmark showed up well on virtually every comparison. IT applications work was one of the exceptions.

I have not looked at the 'back office' IT services. These are best left to the Consultants who more expertise than me with these functions.

6. Review of Possible Improvements in Quality

(a) Background

I have not taken a highly structured approach to looking at Quality because the main focus of my interviews for this Review was on efficiency but during the course of discussions and examination of documents there have been some aspects of quality that I have observed. These are listed below but should not be interpreted as a complete list of the major quality concerns at Statistics Denmark.

They should also be interpreted in the context that Statistics Denmark puts considerable effort into managing the quality of its processes including the final estimation stage where extensive effort goes into checking outputs. Nevertheless, some improvements seem desirable.

I will look at quality for selected product groups from the broader perspective using the ESS framework (Relevance; Accuracy and Reliability; Timeliness and Punctuality; Coherence and Comparability; Accessibility and Clarity). However, the focus is on Accuracy and Reliability.

Suggested improvements in quality management are discussed more fully below. In addition to some general comments, I have looked at opportunities for improving quality separately for household surveys, business surveys, the population register, the business register, foreign trade, national accounts, and the consumer price index.

(b) Product versus Process Quality

The focus in Statistics Denmark has been on process rather than product quality except for the last stage of estimation. My impression is that process quality works well so future improvements should focus on evaluation of product quality. Having said that, I recognise the considerable work that has gone into preparing quality declarations for individual products. Statistics Denmark has been at the leading edge of European work on this.

(c) Methodology for Quality Evaluation

It is important to develop a standard approach that suits the needs of Statistics Denmark. For example, I have been involved in developing an approach in Statistics Sweden known as ASPIRE. Likewise, in the ABS and Statistics Canada, a standard approach has been developed around a corporately agreed quality assurance framework.

The Research and Methods Division has started work on developing an approach to product quality for Statistics Denmark which they presented at a European Quality Conference in Vienna in June. The focus here was on a 'Reporting for Quality Management System (Quality Declaration)'. This is important work that should be continued but it does not address the issue of Quality Assessment or Audits (also important for compliance with the ISO standard).

I suggest that Statistics Denmark adapt the ASPIRE system to suit their particular circumstances. Collaboration with Statistics Sweden would be relatively straight forward. It does not need to be precisely the same as the Swedish version of ASPIRE. For example, it could be simplified in some ways. Also, it may be decided to use internal reviewers rather than external reviewers.

The ASPIRE system is documented in the September 2014 issue of the Journal of Official Statistics. The underlying model identifies three core elements on quality when looking at the Accuracy and Reliability Dimension. They would be different for the other Quality Dimensions.

- *Error sources*: These will vary somewhat according to the statistical product. For example, the error sources for surveys will differ somewhat between surveys, statistics based on administrative collections, and compilations such as the national accounts. For surveys, the key error sources will be framework errors, measurement errors, nonresponse errors, sampling errors, data processing errors and modelling/estimation errors.
- *Risk Assessment*: This is an assessment of the risk of the error before any mitigation action is undertaken. For example, the intrinsic risk of nonresponse error is high in household surveys but it is mitigated to a large extent by the weighting system that is used so the residual risk is much lower.
- *Quality Criteria*: Five criteria are used. They are all important in their own way. They are Knowledge of Quality, Communication with Users and Data Providers, Expertise, Compliance with Standards and Best Practice, and Planning/Mitigation Action.

The following key steps are undertaken in the quality evaluation.

- Pre-interview activities which involve reading the relevant documentation, especially the quality declaration, and self-evaluation against a standard template.
- An interview with the key staff, including support staff, for the statistical product.
- A preliminary assessment by the evaluators.
- Feedback by the product areas and further discussions if required.
- Final assessment and rating by error source and quality criteria.
- Identification of the highest priority areas for improvement.

If Statistics Denmark are interested in looking more closely at this I can provide further information and assist if required.

(d) Resourcing of Quality Assurance. How the Unit should work?

It is recognised that there is a need to strengthen quality assurance work in Statistics Denmark. This includes a need for systematic quality reviews. Statistics Denmark has devoted little centralised resource to quality assurance work – less than one person. This is changing with the impending appointment of a full time Quality Assurance manager and other possible recruitments. This is a positive move but one thing to discuss is the extent to which support staff should be used as distinct from contracting external experts with the required expertise for the specific assignment. For example, it is very difficult to build a quality assurance team that would have the expertise to cover collections as diverse as the national accounts and population statistics. There are some alternatives. For example, it might be possible to organise peer reviews using staff from other National Statistical Offices. This could perhaps be done on quid pro quo basis to save on costs. Even though different experts might be used for product quality reviews, it is still important to use a common methodology.

External experts could also be used from time to time, but the costs will be higher, so this approach should focus on those areas where external expertise will be of most benefit.

Another approach is to use internal persons to do the quality reviews but they should come from a completely different area to the product being reviewed to ensure a reasonable degree of independence. They would still need to have the required expertise and work in accordance with agreed guidelines. This is the approach that is used by Statistics Canada.

A mixed approach to the use of experts is also possible of course and this indeed may be the best approach. I think it would the wrong strategy to try to build up a Quality Assurance unit that would be large enough to cover all the functions of the organisation. It would be more efficient to have a smaller group supplemented by the use of experts as discussed above.

It is difficult for internal reviewers, even when from a different area of the organisation, to always be objective in critical and sensitive situations. Statistics Sweden's internal evaluators tended to report no concerns regarding product quality and few areas needing improvement which is quite different to the situation when external reviewers were used. The use of external reviewers would address any suspicion of partiality of reviewers and would enhance the credibility of the evaluation process.

(e) Strengthening Methodology

The Research and Methods Division is quite small compared with other National Statistical Offices but seems to cover the most important tasks adequately except for quality assurance. There are attempts to upgrade the work around product quality as discussed above but another area where the Methodology Divisions should develop more expertise is non-sampling errors. In my comments below on product groups some of the errors that are potentially greatest concern are non-sampling errors and Statistics Denmark should have the expertise to analyse these and develop strategies to mitigate their impact. I was advised that non-response and coverage errors are measured but these are reported as simple ratios rather than any detailed evaluation of the bias and variance impacts.

(f) Household Surveys and Population Register based Statistics

The main potential sources of error that might impact on *Accuracy and Reliability* for household surveys are framework errors, measurement errors, non-response errors, sampling errors, processing errors and estimation errors. There are two of these sources that I would like to focus on for household surveys – (a) Measurement Errors (including interviewer bias) and (b) Non-response error.

With respect to measurement error, unlike business surveys there is no specialised area in the design of questionnaire instruments for the 'outsourced' household surveys that I am aware of. This is a specialised function and poor questionnaire design can lead to measurement errors although one exists for the interview surveys conducted within Statistics Denmark. My recommendation is to functionally specialise those functions and associate them with my proposed functional group responsible for the design of household survey instruments. This would help reduce any measurement errors in household surveys. The Research and Methods Division should work closely with this functional group to help measure the extent of measurement errors from time to time especially interviewer bias which is often found to be important in household surveys.

Interviewer bias can result if interviewers are inclined to interpret questions in particular ways. This can happen in both face to face and telephone interviews. Another possible cause of interviewer bias is interviewers completing the form themselves rather than contacting households. This is less likely in a centralised telephone interviewing arrangements where monitoring is much easier. These problems do not exist with web surveys which is one of their attractions.

The non-response rate is quite high in Danish surveys although hopefully this can be reduced in the future by not allowing people moving houses to opt out of household surveys (the so called research protection). High non-response rates can lead to a potentially high non-response bias. In Statistics Denmark this is mitigated to a large extent by the use of benchmark data to calibrate the estimates although I was not aware of any studies of the residual non-response bias. However, there is the possibility of changing the approach to focus more on obtaining a representative sample than a designated response rate per se (eg 65% for the Labour Force Survey). This has the potential to improve accuracy and/or reduce cost.

The accuracy of register-based statistics depends on the accuracy of the register and its contents. Statistics Denmark is confident about the accuracy of their registers. I have worked with Statistics Sweden on an audit of their Population Register and they have some accuracy concerns with (a) immigrants not registering, (b) persons working internationally not removing themselves from the Population. These problems may not exist to the same extent in Statistics Denmark but they should be assessed from time to time.

With respect to *Relevance*, users want new and/or more detailed and timely statistics. This is not surprising – it would be the same for virtually all statistical offices. Through its Interviewer Services Division, Statistics Denmark does have a flexible facility that enables it to enhance its relevance although it is on a user-funded basis. My only thought is that many National Statistical Offices use supplementary questions on its main household surveys (eg LFS) to provide a relatively efficient way of obtaining additional information. However, care would have to be taken that the objectives of the main survey are not distorted by the inclusion of supplementary questions.

With respect to *Timeliness and Punctuality*, see 6(n) below.

With respect to *Coherence and Comparability*, I note Statistics Denmark's objective that statistics are common across domains. There are also policies in place for when there are discontinuities in series for one reason or another (eg change in methods). A lot of the tools for coherence are in place – population register that underpins household surveys and register based statistics, common classifications and standards, and a meta data system that supports their use. The initiative to produce statistics on a common topic (eg unemployment) based on different data sources, and to explain differences, will further improve cohesion. No doubt more could be done but I have no specific suggestions except to have an explicit policy on managing discontinuities in statistical series (other than documentation).

With respect to *Accessibility and Clarity*, Statistics Denmark's practices are world class with respect to the availability of data through the web site, access to meta data including quality declarations, availability of customised analysis, and access to micro data for research purposes. I have no specific suggestions but support the proposal to improve the information available through small scale technology where pdfs (the main format for delivering data) can be difficult to read.

With respect to *Relevance* of population statistics based on registers, the increasing power of technology may enable more sophisticated statistical analyses be undertaking by combining registers and also combining over time. For example, this may enable more sophisticated longitudinal analysis to be undertaken. With respect to the other User Dimensions (*Timeliness and Punctuality, Accessibility and Clarity, Coherence and Consistency*) I have no additional comments to those made above.

(g) Business Surveys and Business Register based Statistics

The main potential sources of error that might impact on Accuracy and Reliability are framework errors, measurement errors, non-response errors, sampling errors, processing errors and estimation errors. Some of the potentially most important Business Survey error sources are (a) errors associated with the Business Register (framework errors), (b) measurement errors through poor questionnaire design, (c) non-response error, and (d) processing errors (eg edit/impute). Each of these is discussed in turn below.

As an overarching comment, in Statistics Denmark, these errors do not seem to be of great concern. This is one of the benefits of using the functionally specialised approach in business surveys.

In other countries, some of the most common errors arising from the utilisation of a Business Register are missing units, duplicated units, inactive units (where the errors can arise due to the non-response imputation) and incorrect NACE coding. The discussions with the Business Register and others in Statistics Denmark did not suggest any major problems from these sources. In large part, it is because of the procedures used to update the Business Register. Also, information is available to distinguish inactive from active units. However, it may be worth some analysis from time to time to provide some reassurance.

Imprecise NACE coding may be an issue if the largest multi-industry businesses are not broken up into Kind of Activity Units. This is discussed in (i) below.

There is a specialist questionnaire design unit so that should help to minimise measurement errors due to poor questionnaire design. As with household surveys, the Methodology and Research Division may help to measure these from time to time.

Non-response rates are very low by world standards for business surveys. This reduces the risk for non-response bias but there are still risks from the imputation process. The most common way of imputing for non-response is to use the stratum weight (population/respondent). In effect, this assumes the non-respondent is the average of the respondents for the stratum. With low non-response rates and strata based on industry and size, this is generally a safe procedure unless the non-respondents tend to be inactive. It is important to distinguish active from inactive units in the imputation process.

The edit/ imputation process can also be a source of error. However, it should be possible to reduce the risk of errors from this source by moving editing to a functionally specialised area where it is possible to develop real skills in these functions. This includes the development of macro-editing techniques and the standardisation of procedures for adjusting for non-response and edit failures.

With respect to *Relevance,* Statistics Denmark does have the capability to run additional surveys if required. The limitation is the funding available to conduct the collections. There may also be the possibility of making greater use of administrative data to satisfy some statistical requirements.

With respect to *Timeliness and Punctuality*, see 6(n) below.

With respect to *Coherence and Comparability*, I note Statistics Denmark's objective that statistics are common across domains. There are also policies in place for when there are discontinuities in series for one reason or another (eg change in methods and the back casting of the national accounts). A lot of the tools for coherence are in place – a business register that underpins business surveys and register based statistics, the use of a frozen frame for the different surveys based on the register, common classifications and standards, and a meta data system that supports their use. I note also that there is complete consistency between the national accounts, government finance statistics and balance of payments. Under household surveys I made a suggestion to have an explicit policy on managing discontinuities in statistical series (other than documentation). This should also apply to business surveys. My other suggestion repeats what I said earlier about the importance of establishing a Large Enterprise Unit to manage the data collection of the largest business. This must surely lead to improved cohesion across the surveys to which they contribute.

With respect to *Accessibility and Clarity*, as I mentioned earlier, Statistics Denmark's practices are world class. I have no specific suggestions but support the proposal to change the format of the information so that it is more readable when using small scale technology where pdfs can be difficult to read. This is arguably more important for business statistics where users are looking to access the statistics soon after release time.

With respect to *Relevance* of register based business statistics, the increasing power of technology may enable more sophisticated statistical analyses be undertaken by combining registers and also longitudinal analysis combining over time. This may be useful for studying the life cycle of small businesses. It might be possible to supplement survey data sets to provide a richer data set for data analysis purposes. With respect to the other User Dimensions (*Timeliness and Punctuality, Accessibility and Clarity, Coherence and Consistency*) I have no additional comments.

(h) Population Registers

The main potential sources of error for Population Registers are over-coverage, under-coverage, duplication, missing data and content error.

The main potential source is over-coverage is Danes or foreigners (resident in Denmark) moving outside Denmark, perhaps temporarily, and not de-registering. This is most likely to be a problem for young adults. My impression is that this is not a significant issue for Denmark.

The main potential source of under-coverage is immigrants. Again, my impression is that this was not a problem in Denmark.

Likewise, duplication, missing data and content error do not seem to be major problems for the Population Registers. There is some missing data on the register where imputation is used to provide data for these units. The accuracy of the imputations should be evaluated from time to time.

(i) Business Register

The Business Register is a high quality operation. The use of frozen frameworks is important for improving coherence across collections. This is good practice but used by surprising few statistical Offices. The use of the Data Archive to support macro editing is also important.

The main potential sources of error for Business Registers are over-coverage, under-coverage, duplication, missing data and content error. My main comments are about one form of Content Error (NACE coding).

The accuracy of NACE coding is always a risk for the Business Register. If units are assigned the wrong NACE code, especially large businesses, the accuracy of industry statistics can be affected. Evaluation studies suggest that the quality of NACE coding in Statistics Denmark is relatively good. My main concern is with the largest businesses.

Statistics Denmark is currently using legal units as the sample unit rather than the preferred enterprise unit, broken up into Kind of Activity Units where these are significant. However, I believe the greatest improvement to the accuracy and usefulness of the Business Register, especially with the accuracy of industry statistics, is through the management and profiling of large businesses. Work on this has recently recommenced in Statistics Denmark. One important lesson is to keep the number of profiled units to a manageable size. Only the largest and most complex businesses should be profiled. As a rough guide, the Australia economy is 4 times that of Denmark. About 180 businesses are profiled in Australia. This suggests about 45 businesses in Denmark.

For over 20 years, the ABS has had a Large Business Unit (LBU). The size has varied over the years but it is now about 25 persons but this also covers those less complex units which are profiled using the tax information alone (ie no interviews with firms). There are several core functions. The most important is to create a profile (a list of KAUs) for the largest and most complex businesses. There is a degree of pragmatism in creating the KAUs. The ideal is to have industry purity but this is not achievable in practice and would create undue reporting load on businesses. To the extent possible, KAUs are formed based on the legal units for which businesses can provide annual and hopefully sub-annual data. There will be some situations where this is not possible but the (theoretical) KAU is still significant in terms of its industry contribution. In these cases, there will be discussions with the business on what information is available to enable the contribution of the KAU to be estimated. This may be based on partial indicators such as sales and employment.

In addition to the profiling, and keeping it up to date, the LBU is responsible for managing the relationship with the business. This includes the reporting arrangements and how the ABS can assist these large complex businesses to reduce their reporting load. Electronic reporting is being increasingly used to reduce reporting load.

In Denmark, the relationship with the other stakeholders in maintaining the Register generally works well but I believe there is a need for a Service Level Agreement as discussed in Section 5(f). The main problems are when there are changes to the tax administration system and there is lack of

consultation. This has happened in the past. It is a potential cause for discontinuities in business statistics if not managed correctly.

Missing Data is potentially an issue particularly if it is prevalent among the largest businesses. Imputation is used to provide data for those units where there is missing data. The accuracy of the imputations and their potential influence should be evaluated from time to time.

(j) Foreign Trade

The main potential sources of error that might impact on Accuracy and Reliability of Foreign Trade Statistics are framework errors, measurement errors, non-response errors, sampling errors, processing errors and estimation errors. Assuming the sample sizes are adequate, those errors most likely to be of concern are (a) measurement errors and (b) estimation errors especially the modelling to estimate those exports and imports not covered by the surveys.

I was not aware of any particular problems with these error sources but there should be some evaluation from time to time as the questionnaires for INTRASTAT are quite complex. For example, comparisons of import statistics to Denmark from another Scandinavian country, as published by Statistics Denmark, could be compared with the export statistics to Denmark, as published by the other country. The differences can often provide useful insights. This would be a continuation of studies already undertaken from time to time.

The smallest businesses are not surveyed for foreign trade statistics as is sensible. Their contribution is estimated often using ratios based on past data. These ratios may not remain constant over time and the reliability of the estimates based on these ratios should be assessed from time to time to see whether the ratios or models need to be updated.

(k) National Accounts

The main potential sources of error that might impact on the national accounts are input data source errors, modelling errors when deriving national accounts data from that data which is available, processing errors, errors in the estimation of deflators, and balancing errors.

The national accounts should know which surveys are the most problematic. However, it may be the cohesion across the surveys which may be the greatest concern. I was advised that the results from different surveys cannot always be integrated for a variety of reasons. This can also cause quality problems for the National Accounts leading to discrepancies between the different approaches to estimating GDP. Whilst the discrepancies can be eliminated during the balancing process, this process itself can distort estimates.

What are the main steps that can be taken towards effective integration of economic statistics especially for the benefit of the national accounts. The use of frozen frames is a very important step although I am not clear whether the use of these frames is universal. Also, a consistent approach to sampling and the inevitable problems that occur with Business Registers (deaths, NACE changes, errors in benchmark variables, etc) will support cohesion. This is more likely to happen if the Research and Methods Division are universally responsible for these functions. Another important initiative is the planned profiling of the largest, most complex multi-industry businesses (see Section

6(i). A more accurate industry dissection of production statistics will also support the cohesion of the national accounts.

(l) Consumer Price Index

Perhaps the most difficult quality problems to manage with the Consumer Price Index are (1) measuring price change where there are changes in quality, and (2) taking account of discounts, online specials, etc. Also, the sample size for the Danish CPI is quite small. For certain commodity groups, scanner data is becoming increasingly prevalent and may also be able to assist with the aforementioned problem. I suggest the Swedish experience be assessed for application in Denmark. Likewise they have adapted their methods for pricing on-line purchases and their work in this area may also provide some useful insights.

(m) Role of Analysis

Analysis, if done well can play an important role in improving accuracy. It forces the statistical staff to confront the data by making comparisons with other time periods, related variables and/or external data sources. It also ensures that the reasons for unusual statistics or unusual movements in statistics are better understood. Explanations for unusual statistics can be an important 'value add' to the user community and help ensure statistics are more reliably interpreted. In Section 10, I have discussed the potential strengthening of the Analysis function in more detail**.** It is important for all statistical staff to achieve a certain level of analysis capability.

(n) Timeliness and Punctuality

Statistics Denmark does have a good record on punctuality. 97% of releases are punctual and this has been improving over the years. There is a strong understanding of the importance of punctuality and a culture to support this.

However, I thought the timeliness standards were not strong enough. In saying this I recognise that many products are released well inside the standard and that Statistics Denmark does meet the IMF Standards for those products that are part of the Special Data Dissemination standard. The current standards for Statistics Denmark are:

- Monthly within 62 days
- Quarterly within 92 days
- Annual within one year.

Looking at some other Offices I would suggest that the monthly standard should be more like 45 days (or even lower) and the standard for quarterly surveys should be more like 75 days.

7. Review of Statistical Production Systems

The Terms of Reference asked me to assess the organisation of statistical production in an international perspective, taking account the needs and opportunities that arise from the EU context.

The approach I have taken is to (1) describe the general trend in the development of statistical production systems, (2) describe the perceived benefits, (3) analyse how the actual benefits in efficiency and quality are obtained, (4) discuss the extent to which they might be achievable in Statistics Denmark given the starting point is quite different to most of the other countries redeveloping statistical production systems, and (5) make suggestions on next steps Statistics Denmark might undertake with the development of statistical production systems.

General Trends in the Development of Production Systems

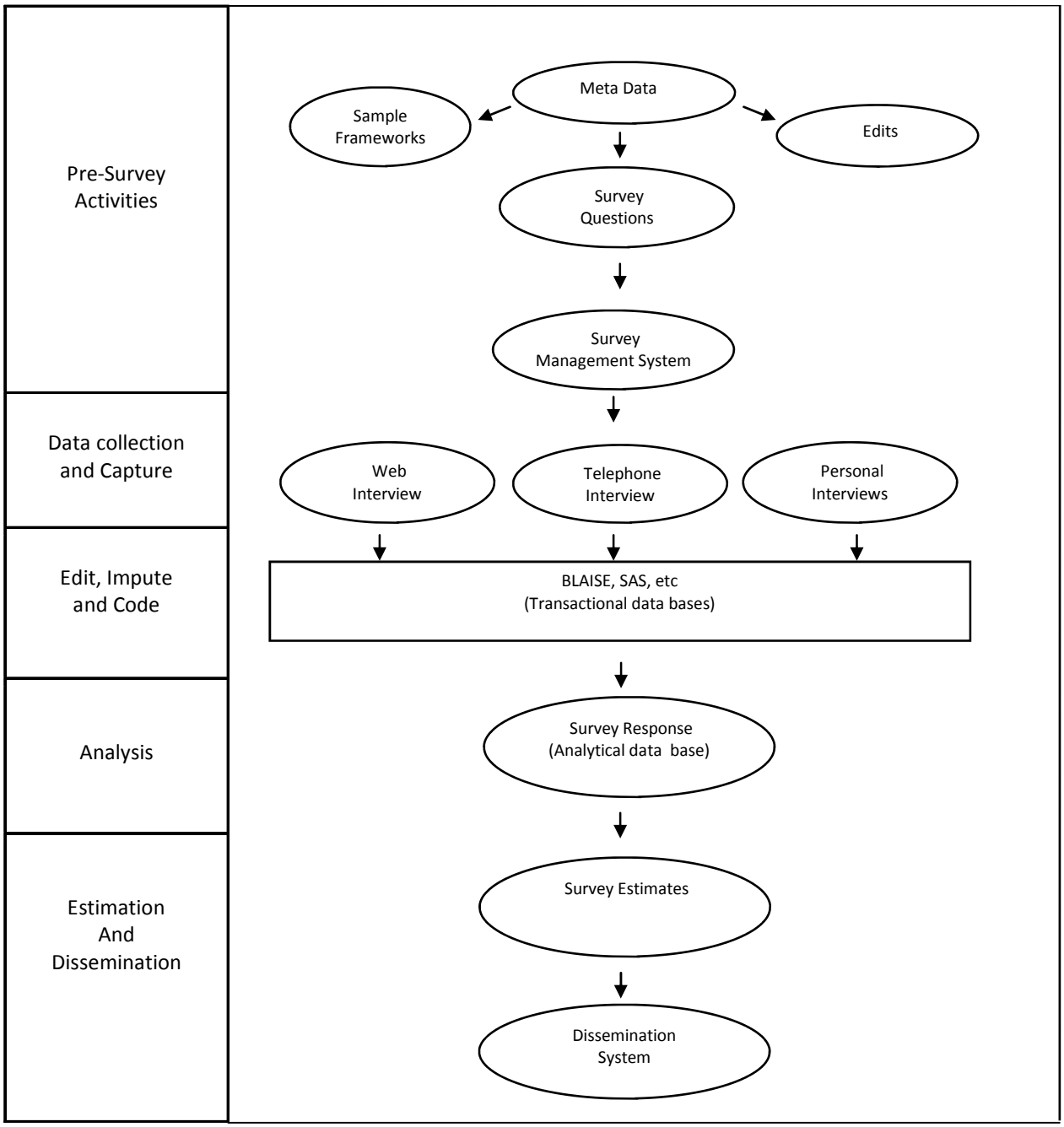
The March 2013 issue of the *Journal of Official Statistics* was devoted to statistical production systems. Whilst not complete in its coverage, it provides a good overview of current work. The development of the recently introduced statistical production systems at the National Agriculture Statistical Service (NASS) in United States is one example worth looking at as I think it is relatively simple in concept but still takes advantage of new technologies. Although much of the efficiency improvement being sought in NASS is through consolidation of the regional data collection and processing activities which is not relevant to Statistics Denmark, there are other aspects that are relevant to Statistics Denmark.

The main trend in statistical production systems are:

(a) To integrate data, especially meta data, from design of a data collection through to dissemination.
(b) To enable this through an input data warehouse whose basic structure stays the same but the content is modified as the data collection proceeds through the various processing stages.
(c) To support it by standardised meta data that is specified from the start of the process and used from design through dissemination – some meta data can be at the enterprise (ie Statistics Denmark) level (eg classifications, standard questions) whereas others may be survey/collection specific (e survey specific questions).
(d) To ensure that all participants are working off the same centralised data base.
(e) Flexible data storage to enable the use of a mixture of OLTP (on-line transactional processing) and OLAP (on-line analytical processing) databases depending on the stage of processing in order to improve efficiency.
(f) To use the new technology capabilities to establish multi-year data bases to assist editing, analysis, etc.
(g) To use standardised software across collections (eg Blaise, SAS) in order to reduce software support costs, license fees and staff training. This is often referred to as a 'toolbox'.
(h) The use of virtualisation software (thin clients) to reduce the software that needs to be held on the user's PC/laptop.
(i) To design production systems from a business perspective rather than an IT perspective. Tools like Business Process Analysis are often used.

(j) A trend towards the use of 'agile applications software' to reduce the costs of systems development.
(k) To acquire or develop generalised applications where appropriate.
(l) To use output data warehouses to support dissemination in a consistent way although the power and speed of processing systems increasingly means input data warehouses suitably structured, can be used to produce statistical outputs on an 'as required' basis.
(m) The use of a project management methodology, agreed corporately, to help ensure projects meet their goals within budget timelines.

This is largely consistent with the directions Statistics Denmark has taken in recent years. The basic design of the new processing systems is shown in the Figure below which is based on the National Agriculture Statistical Service article in the Journal of Official Statistics issue mentioned above.



The ABS introduced new generalised production systems in 2006 that provided separately for (a) business surveys and (b) household surveys. These systems are built around the concept of micro data warehouses and have generally been regarded as successful although now reaching the stage where significant revisions are desirable because of the availability of much more effective software tools.

Perceived Benefits

There are four key reasons for redeveloping production systems – efficiency, quality, improved timeliness, and providing the flexibility to enable better data products for dissemination. Furthermore, some systems have become so old they may be difficult to maintain increasing the risks of a production failure. These potential benefits need to be offset against the costs of developing new or significantly amended system and this is an important but difficult challenge for management.

The costs (and risks) can be significant and there is a litany of IT systems developments with budget and time over-runs. It is important to keep up with developments but there is no need to be at the leading edge. Such an approach will help reduce costs and risks. Utilisation of approaches used by other statistical offices (GSBPM, GSIM) maximises the possibility of leverage off the work of other Offices.

It is also important to note that the benefits are often only obtained through some re-engineering of the production processes and these costs need to be considered together with transition costs. Wherever possible, I would suggest an 'incremental' rather than a 'breakthrough' approach. This has influenced my comments below.

How are the benefits obtained?

Some benefits will be obtained by applying a consistent enterprise architecture and promoting standardisation. For maximum benefits to be obtained (eg efficiency improvement, better timeliness), there will generally also need to be some re-engineering of the production processes. A new IT system will generally not achieve this alone. There need to be changes in the way work is done. The extent of re-engineering can vary considerably. In some cases it may simply be modification of the way work is done within a Division. In other cases it might involve a major organisational restructuring.

Statistics Denmark has already undertaken some restructuring of their business statistics. This has had the benefits obtained from economies of scale and more consistent approach across business collections, supporting greater cohesion. The economies of scale can fall in several areas. As well as economies in production areas, they may also be possible in reducing the costs of process design, application of statistical methods, IT applications development and support, and training.

In Statistics Denmark, the benefits from economies of scale could be extended to other areas where I have suggested some restructuring take place by increasing functional specialisation of some activities. There has been a large part of the reasoning behind my recommendations for the Social Statistics and Business Statistics Department.

The benefits from the redesign of the systems in the Economic Statistics Department will mainly be about the reduction of risks although there would be some efficiency savings and increases in flexibility especially around satisfying special requests for information. National Accounts may be an exception. As I noted in Section 3, the costs of National Accounts in Statistics New Zealand are much lower than those in Statistics Denmark. They have a relatively new system for the National Accounts in New Zealand. It is possible that some of the lower costs might be due to a better production system. I have not analysed this but it might be worth doing so.

Are they (the benefits) achievable in Statistics Denmark?

Yes, there are opportunities for more benefits. However, I would recommend an 'incremental' rather than a 'breakthrough' approach especially given that Statistics Denmark has already started down the journey of modern production systems. However, even this does require some restructuring to support the additional functional specialisation that I have recommended above. This is really a pre-requisite and, if this is not done, there are few benefits in terms of efficiency from investing in statistical production systems.

The following Statistics Netherlands statement is relevant and is largely true for many other statistical offices.

"A decade ago statistical departments had their own IT solutions which were usually maintained locally".

Even though Statistics Netherlands has moved to a modern centralised statistical production system, it still needs to do with a large legacy of IT systems requiring increased maintenance costs. It will require some years to wind this down.

Statistics Denmark has made major steps towards the standardisation of software and deserves to be applauded for this. However, my impression is that there is still a legacy of IT solutions which have been developed and maintained locally. These need to be phased out.

Next Steps

A more centralised approach to the management of IT is desired even though Statistics Denmark is well down this path.

Consistent with this, there would be some advantages in documenting a formal enterprise architecture. Quoting from the Statistics Netherlands paper in the special issue of the Journal of Official Statistics;

"Briefly, an enterprise architecture can be seen as general blueprint of how to create an organisation's processes and IT infrastructure. It can serve as a guideline for the redesign projects that are carried out to bring the changes as well as the management of change. The GSBPM is an international reference for describing statistical production processes used by NSIs at a high level. However, this model only covers part of an enterprise architecture as it mainly focuses on statistical processes."

I would not develop an Enterprise Architecture in too much detail. The main objective is to have documentation of the approach to IT environment that Statistics Denmark wants to sustain. Some important elements are already documented such as the standard software that can be used within Statistics Denmark. (Note: If desired, I can provide a hard copy of the enterprise architecture diagrams the ABS used a few years back.)

For major development and redevelopment projects, project teams should be operating under project management principles based on a consistent methodology used throughout Statistics Denmark.

There should be a designated Chief Information Officer. I may be wrong but I was under the impression that there wasn't such a role in Statistics Denmark. Ideally this person should be part of the Executive at least for those discussions around IT and information systems.

My suggestion is that Statistics Denmark should take further steps towards the modernisation of their production systems but with a focus on the use of generalised software (eg BLAISE) rather than developing generalised applications. The use of GSBPM is important as that maximises the potential use of software developed elsewhere.

There should be a deliberate move away from locally developed and maintained systems with the establishment of a redevelopment program. Also, the functionally specialised areas may see opportunities for generalised systems for the functions they are responsible for. These could be considered on a business case basis.

One 'local' system worth examining is the National Accounts for the reasons outlined above. Statistics Sweden is considering the use of the Statistics Finland system for producing National Accounts and that may be a possibility for Statistics Denmark as well.

8. Information Technology

In organising the IT staff working on the development and support of applications, the ABS choose an approach that balanced (a) the desirability of IT applications staff working closely with the statistical staff, (b) the IT Applications staff being recognised as a distinct group working according to agreed standards with the guidance of strong technical leadership, (c) the personal development needs of these IT staff including rotation (lateral mobility) possibilities, and (d) IT applications priorities being determined corporately rather than Division by Division. I believe Statistics Denmark should use an approach along the lines of that used by the ABS.

The key features of the ABS approach are as follows. I have used Statistics Denmark organisational descriptions to make it easier to understand.

(a) All IT applications staff belong to one Division, an IT Applications Division.
(b) Nearly all these staff are physically located with a Statistical Division for day to day work purposes but it is not done in a way where one or two staff only are working on applications as this limits the cross-fertilisation of ideas.
(c) Their work program is decided annually collectively by the Department heads together the Director of the IT Applications Division. The allocations are meant to reflect corporate priorities. The Director-General will intervene if consensus cannot be obtained. In reality, there are not large shifts in numbers assigned to Departments from one year to the next. There is generally a greater shift within Departments to support approved IT Development projects.
(d) There is continual pressure from the most senior to reduce the resources on IT Applications Support in order to free up staff for development projects. This means that some less important support and maintenance work is put on hold.
(e) Once the work program is agreed the Department heads are free to move resources within a year to reflect the needs of the day.
(f) The Director of IT Applications Division is responsible for the personal development of staff including the institution of training programs that are needed including training on the standards which they should use.
(g) They are also responsible for the rotation of staff from one Division to another to give them the opportunity to personally develop through different work experiences. This is done in consultation with the Department heads and their senior staff.

Another issue I have identified is lack of documentation particularly when systems are developed by non-IT professionals using user driven software such as Excel and SAS. This can cause significant difficulties with the maintenance of these systems. It is a common problem across most statistical offices.

9. User Engagement

The Director-General has expressed a special interest in improving the engagement between Statistics Denmark and its most important users. The Australian Bureau of Statistics (ABS) had an independent review of its performance in 2005 whilst I was Chief Executive and one of the main recommendations was to improve user engagement. They thought it was haphazard, unco-ordinated, duplicated at times and with little feedback. Users were strongly supportive of the ABS but were frustrated by the lack of feedback especially about the reasons for not being able to satisfy their requests. If there was a good reason, there would be much more understanding although they did feel the ABS interpreted their confidentiality provisions too conservatively. If there was no feedback they tended to think that the expression of their views was a waste of time.

In the following, I have outlined what the ABS did to improve user engagement. In light of this, and the particular circumstances of Statistics Denmark, I have made some recommendations as to what Statistics Denmark could do to improve user engagement at the end of this Section.

An important aspect of User Engagement is the use of Committees. From what I have read Statistics Denmark has the following Committees.

1. Professional committees for labour market statistics, population statistics, economic statistics, food statistics, welfare statistics and the knowledge society.
2. Working groups for specific statistics.
3. A Research Committee, a committee for data reports by businesses, and a co-ordination committee for European statistics.

Some have worked effectively, others not so effectively.

This list is very similar to those that exist at the ABS except for the last listed. I will not comment on the type of committees that should be formed but I do make suggestions based on how the ABS made the equivalent Committees more effective.

There were a number of initiatives made to ensure that the Committees were made more effective. Some are for special purposes and disbanded when the job is done. My main focus in these comments is on ongoing Committees.

- They need to meet regularly. This may be as often as quarterly or as infrequent as annually. It is important that the following meeting and its timing is discussed.
- There should be a formal agenda, based on consultation with users, and that there be discussion papers and/or presentations associated with each item. Users should be also be asked to make contributions.
- The participants should be reasonably senior in their organisations. They should be participants not just observers.
- Some Committees are reasonably broad in their scope – macroeconomic statistics, labour and environment. Other more specific relating to a single subject matter. As an aside, both the ABS and Statistics New Zealand tried to establish social statistics committees but without success – there were not enough sophisticated users with a broad knowledge in social statistics. They tend to be specialised in particular fields such as health statistics.

- For those committees that relate to a single subject matter, it was very important to underpin the discussions at those meetings with an Information Development Plan (IDP). The IDPs covered relevant statistics produced both by the ABS and other data providers. They described (1) the existing statistics that are available for all the data providers, (2) the relevant statistical standards and classifications, (3) the major shortcomings and gaps in these statistics, (4) any plans to upgrade these statistics, and (5) priorities for further upgrades. These are updated after meetings if changes are agreed.

It is important to recognise the different types of users and to treat them differently – key clients, other regular users, specialist users such as the media, libraries and the education sector, and ad hoc users. The aforementioned committees are an important way of interacting with key users in particular. They also have the benefit of having users interact with each other and this can help build consensus. They are not the only way of interacting with key clients. A direct relationship is also important. In some cases staff outposted by the ABS to other agencies (with a 50:50 funding arrangement) can be important. Furthermore, they were provided access to training on relevant ABS courses with the objective of enabling them better understand ABS statistics and the methods behind them.

Deliberate strategies were developed for addressing the other three segments. For example, the media were regarded as particularly important as they were the main means of communicating official statistics to the general public. They also had a big impact on public image.

The ABS was often invited to participate in committees run by other organisations where statistical expertise was regarded as important. Likewise, they sought representation on Committees from time to time where they felt they could make a contribution. For example, I was on the Board of the Australian Institute of Health and Welfare which produced a lot of statistical data from administrative data sets especially from those held by State Governments; I was a member of a Committee which was responsible for producing a formal report to Parliament on the state of the environment; and I was involved in a Committee charged with looking at developing an electronic reporting system for business to meet their regulatory requirements (tax, customs, official statistics). Other examples of ABS involvement were the joint economic forecasting committee which produced the official economic forecasts used by Government and a committee charged with developing a set of performance indicators for Indigenous well-being so that Governments could measure the effectiveness of their initiatives in this area.

With respect to Statistics Denmark, I suggest that firstly it develop a set of 'rules of operation' that committees should follow to ensure they are effective. These could be based on the rules that were developed for the ABS. Their effectiveness should be evaluated from time to time by someone who is not associated with the Committees. Second, I would suggest Statistics Denmark should seek to get involved in a small number of important Governmental committees where the inclusion of statistical expertise can make a valuable contribution. The Statistics Denmark representatives should be relatively senior and be persons who are prepared to intervene in discussions when they can make a useful contribution. If these are successful, the word spreads and Statistics Denmark is likely to be invited to more Committees.

10. Analysis

This is another area in which the Director-General has expressed an interest. He has suggested that Statistics Denmark should have a greater involvement in analytical work than at present. At the ABS, the newly appointed Australian Statistician in the late 1980s had a similar objective. He had a strong economics background and had transferred to the ABS from being the head of the Department of Finance and a very serious user of ABS statistics in that and previous positions. His leadership stimulated much greater ABS involvement in analysis but further strengthening of this function has remained one of the core strategies in the ABS Corporate Plan long after his departure.

This required cultural change, upgrading of organisational capability as well as some upgrading of skills of the staff involved in the production of statistical outputs. There also had to be a clear policy on the type of analysis the ABS should be involved in. I will discuss each of these in turn.

Another relevant topic is the support for external analysts, particularly those who require access to micro data.

Cultural Change

It was not all that difficult to convince the senior staff of the importance of increasing the amount of analysis work. The key questions were 'what' and 'how'. He addressed these questions to a large extent by strong personal leadership and involvement in selected publications. For example, he led the work on a Fiscal Incidence Study. This was a unique publication that looked at the distribution of household income after adjusting for tax and government benefits (cash and non-cash). The household budget survey was the key underlying data source but a range of other data sources were used. ABS web site contains this publication (catalogue 6537.0) and subsequent editions. This had a significant impact on policy when the extent of 'middle class welfare' was realised. Previously analysis had focussed on the extent of government cash benefits. He also personally led the introduction of other 'analytical' publications such as Australian Social Trends and Australian Economic Indicators which contained quite a number of analytical articles as well as bringing together data from a range of different data sources.

He also led the introduction of multi-factor productivity measurement utilising the national accounts framework. This has become an annual and much sought after data series. I understand Australia was one of the first countries to develop multi-factor productivity measures.

The other area where there was considerable effort put into upgrading analysis was the commentary and other material included with publications. Again, the Australian Statistician led by example by personally clearing the commentary on selected publications until there was a clear understanding of what was good commentary. We were in the situation where the commentary was "statistic x increased by 3.6% since the last quarter" without any explanatory information to "statistic x increased by 3.6% since the last quarter; over half the increase was due to the 12% increase in industry y" with some explanation as to why there might be a large increase in industry y. There was also a significant increase in the use of graphs to assist with the interpretation of statistics.

Organisational wide training into statistical interpretation, statistical writing and graphics was introduced to reinforce the message about the importance of analysis even in regular publications.

About this time the ABS started releasing trend estimates for many of their time series as well as seasonally adjusted estimates. This was done to help with the interpretation of time series. Users (especially the media) were placing too much emphasis on the movement of a statistical series for the most recent period especially when the statistical series is subject to error including sampling error. There was also a lot of emphasis on statistics such as "change from the same period last year" which has a phase shift and can be a very misleading estimate of current trends. The production of reliable trend series required reasonably sophisticated knowledge of time series analysis.

An important by-product of this work was that it forced the statistical staff to look more closely at their outputs and this often led to changes that improved the quality of the statistics.

About the same time, there was a deliberate effort to try to involve ABS staff, with appropriate analytical skills and statistical knowledge, into government inquiries. For example, ABS National Accounts are observers in the Government's Economic Forecasting Group but they are frequently asked questions about the underlying data series. As another example, a senior ABS staff member participated in an Inquiry into Indigenous Well-being (leading to sensible recommendations for improvements in statistics).

Upgrading Organisational Capability

An Analytical Services Division was created in the mid 1990s to provide a centre of expertise and critical mass that could support other ABS statistical areas in their analytical work as well as produce some products of their own. The current focus of the Analytical Services Division is time series analysis (including seasonal adjustment); the construction and interpretation of socio-economic indexes; the construction of small domain estimates; the development of data integration (or data linking) methods; the development of data confidentialisation methodology; and general modelling and analysis of data from statistical and administrative collections. The program also provides a statistical consultancy service to other government agencies.

In its earlier days there was a lot more emphasis on price index work including the development of price indexes for a number of service industries. They also produced the first issue of *Measures of Australia's Progress* which set a global precedent for the involvement of National Statistical Offices in this type of product.

Other important areas of analysis work included improved productivity measures including the introduction of industry level multifactor productivity measures. It also included estimates of output for industries such as education and health where the public sector is dominant. This work led to revised estimates of output being included in the national accounts. It was most important for the health sector where productivity improvement was quite high.

The research outputs of this work are disseminated via a series of *Research Papers* (ABS cat. no. 1351.0). These papers may contain analytical work in preliminary stages, in order to stimulate discussion and feedback. Time series products and analyses appear in many ABS publications on a regular basis.

This Division has made a major contribution to the work of the ABS. It has succeeded because there was a strong working relationship between the Statistical Divisions and Analytical Services Division. They saw it as a valuable supporting service rather than a threat to its current work. Following a visit

to the ABS in 2005, the then Director-General of Statistics Sweden (Svante Oberg) tried to institute in Statistics Sweden. It did not work in Sweden and was abandoned. During my recent work in Statistics Sweden I explored the reasons why it didn't work. I believe the main reason was that the Statistical Divisions were threatened by these staff and felt that expert analytical staff should be on their strength rather than in some central group.

In Section 10.1, I described the analytical work taken by the Statistical Divisions in association with their publications. Although this worked quite well, the analytical work did not go to the next step. For example, we wanted more emphasis on subject matter based publications, utilising multiple data sources, rather than collection based publications. This was not happening to the extent desired and the Statistical Divisions argued that they were too busy with collection based activities to do this type work. In the mid 2000s we embarked on a major re-engineering project known as the Business Statistics Innovation Program (BSIP). BSIP resulted in considerable savings in resource usage some of which was devoted to the work described in this paragraph and other analytical or standards work on a specific subject matter. The organisational units for this work were quite separate to those responsible for data collection activity. Their subject matter responsibility tended to be quite broad (eg labour statistics, environment statistics, industry statistics). Divisions such as the National Accounts could also be regarded as being of this ilk.

Upgrading Skills of Statistical Staff

In addition to the creating a critical mass of highly skilled specialised analysis staff, it was recognised that there was a need to upgrade the analysis skills of all statistical staff. There were three main forms of training introduced.

- Training aimed at improving the statistical analysis in the commentary contained in publications.
- Training in what were good and bad graphs (based on the work of Tufte) and the introduction of standards for graphs.
- Basic training in Time series analysis, especially in seasonal adjustment.

In more recent years a more sophisticated training program in analysis for statistical staff has been developed. It is known as TAPAS (Thinking Analytically, Problem-solving and Story-telling). This is an internal ABS course. For external clients, a course known as Turning Data into Information (TDII) was developed. TAPAS aims to enhance the capabilities of statistical staff by equipping them with a toolkit of strategies and techniques for effectively analysing data and linking the story back to the question posed. The focus of TAPAS is to equip staff to determine 'what is the story to tell' by thinking analytically (or critically) about the information contained in the datasets to be published. TAPAS is designed to complement a Statistical Writing Training Program which has as its objective effective report and article writing, or 'how to tell the story'. More details on TAPAS can be provided if required.

Policy on Analysis

In establishing a policy an important consideration is what users want. There are several different types of users. The two most important users for the development of the policy were:

(a) more sophisticated users, especially the Central Bank and government policy agencies

(b) media who play an important role in disseminating information about official statistics.

Group (a) were clear on several points. They did not want the ABS commentary to make judgements on whether policy had been effective or not. The commentary should assist policy analysis but stop short of being analysis of policy. They did not want duplication of analysis work already undertaken by other organisations and wanted it to focus on areas where the ABS had a comparative advantage. This included information on changes on methodology, information gathered during data collection and explanations for unusual or unexpected movements. One recent example was the March quarter 2014 national accounts where the increase from the previous quarter was greater than expected. A large part of the explanation was that the monsoonal weather that can affect oil production was much milder than normal so the impact on production was less than usual. They also quantified the impact. The ABS was applauded for this because it meant that users interpreted this growth figure in a more sensible way and with less pressure on monetary policy than might otherwise been the case.

Group (a) also supported the production of publications that bring data together, including relevant non-ABS data, in a coherent way. They thought the ABS had a comparative advantage in knowledge of statistical frameworks, statistical standards and methods all of which are important for these type of publications. For example a publication on labour statistics requires an understanding of the strengths and weaknesses of the different employment series (Population Census, Labour Force Survey, employer surveys, tax based series) as well as any differences in statistical concepts, standards and methods. The same applies to publications about specific population groups (eg migrants) where data is obtained from a range of different sources.

They also supported the ABS producing 'analytical publications' such as the fiscal incidence study and productivity measurement mentioned earlier where the ABS had a comparative advantage in access to the data (especially micro data) or the required statistical conceptual knowledge.

The main interest of Group (b) is to provide information in a way that it makes it easier for them to tell a good, interesting about accurate story. The statistical commentary is very important for this and the media are one of the main audiences being considered when preparing the commentary in statistical publications or media releases based on the commentary.

Consequently, the main elements of the ABS policy on analysis were:

> (a) *Overarching*: Any analysis should be consistent with ABS values on integrity and policy independence. It should inform policy analysis, not assess policy effectiveness. It should either result in (a) new statistical outputs where the ABS has a comparative advantage, b) assist readers with their interpretation of statistical outputs, or (c) lead to the application of improved statistical methods.
> (b) *Analytical publications*: These are to be encouraged where there is a strong user need, support from a key agency, no duplication of existing publications, peer review processes in place, and the ABS has a comparative advantage in the production of such publications.
> (c) *Multiple data source publications*: These are to be encouraged as an important part of National Statistical Service endeavours. It needs the support of all the important data source areas. A peer review process should be in place.

(d) *Commentary*: All publications should contain commentary. The main aim is to help users to interpret the statistics more accurately. As well as descriptive material, graphics should be used. Any knowledge on the reasons for unusual or unexpected movements should be included in the commentary. The major sub-annual time series should be seasonally adjusted and trend estimates should be published.

(e) *Participation*: The staff of the ABS have specialist skills and knowledge that would be valuable in many government inquiries. ABS staff should be made available for these purposes although the nature of the participation will vary from inquiry to inquiry.

Support for External Analysis

A criticism of the ABS was the very limited access to micro data and the cost of that access. During my time as Australian Statistician I took steps to redress that criticism but working within the constraints of the statistics legislation. The main steps were as follows.

1. Increase the availability of micro data files. It was expected that a micro data file would be released from every household survey.

2. One of the concerns of researchers working within universities of the cost of accessing micro data files. A special arrangement was negotiated with Universities Australia which is the representative organisation for Australian Universities. Each University agreed to pay an annual fee and then their research staff had free access to the ABS micro data files. Not surprisingly, this greatly increased the use of micro data files.

3. Remote data access facilities were made available. This option allowed access to some micro data files where public access files could not be released because of confidentiality concerns. Rather researchers submitted analysis jobs using SAS, SPSS or STATA against the micro data bases held by the ABS. Sample data bases were available for experimentation.

4. A special remote access product was developed to allow researchers to run their own tables against the Census data base. The confidentilisation process was automated using the same algorithm applied by the ABS to its own Census tables.

5. Data Laboratory arrangements were established similar to those in place in Statistics Denmark at the time. As this was somewhat expensive it tended to only be used for the most important clients.

6. A small number of joint projects with other government agencies were conducted. One requirement was that there would be an ABS published output (or jointly published output) resulting from this work. Then it was legally possible to engage the persons from the other agencies so that they could access the micro data like ABS staff but with the same confidentiality restrictions that applied to ABS data.

7. A Population Census data base that facilitated longitudinal links across Censuses as well as links with other data bases (eg register of deaths) was established. Among other things, it enabled much more accurate estimates of Indigenous mortality. Because there is no population registration in Australia, and concerns about privacy, statistical data matching techniques were used.

The latter opens up the possibility of a range of new and innovative analytical products. There are

special confidentiality issues and the Analytical Services Division has been researching data confidentialisation methods, especially when applied to integrated micro data files, which would allow researchers outside the ABS to construct analytical outputs of their own choice.

Suggestions for Statistics Denmark

From my rather brief period of time in Statistics Denmark, I would think the following initiatives would be worth considering in order to increase the analytical focus of Statistics Denmark.

(a) Establish a group of specialised analytical staff possibly within the Research and Methods Division. Explore possible analytical projects in collaboration with the Statistical Divisions. Establish an agreed work program to be endorsed by the Executive. Collaborate with academic researchers who have specialist knowledge in these areas.
(b) If it doesn't already exist, establish a training program like the TAPAS program conducted by the ABS. The ABS will almost be willing to assist with the provision of training resources. One of their former trainers is now based in London.
(c) Identify two or three government inquiries where Statistics Denmark could add real value and take steps to have them involved in these inquiries.

11. Human Resource Management

The Consultants expressed interest in some aspects of human resource management in the ABS. These included initiatives to enhance lateral mobility across the organisation, recruitment practices, the development and use of a competency framework for performance review and skills enhancement.

Lateral Mobility

Lateral mobility is strongly encouraged in the ABS especially for those staff who have most potential for senior positions. Lower level staff are not expected to stay in the same area for more than 3 years; for more senior staff it would be 5 years. It is rare for someone to be successively promoted to different levels within the same Division. This creates a certain level of expectation and most of the younger, brighter staff take their own initiative to seek a move after a period of time in their current position.

This is supported by advertising vacancies 'at level' for the more senior levels. That is, a vacancy for a specific position is not advertised. Rather, every six months a vacancy at that level is advertised without being specific about the positions that are vacant. If there are n vacancies, the top n candidates are chosen after a selection process. Then, a panel looks at who should undertake a lateral transfer. The vacancies can then be filled by a lateral transfer (creating a new vacancy) or one of the successful applicants. The order of merit from the selection process can be used for some months if new vacancies arise.

Recruitment Practices

Recruitment was mostly internal even though advertised externally. There was a strong emphasis on graduate recruitment. The situation has improved somewhat in recent years and, at a guess, I would say that about one third of positions are now filled by external applicants. The main reason has been the advertising the vacancies 'at level' mentioned in the previous paragraph. When specific positions were advertised those with the specialist knowledge has a distinct advantage as there was a tendency to choose a candidate who was the best candidate now rather than in one or two years time.

Development and Use of a Competency Framework

The ABS has developed a Competency Framework to:

- Help guide the formal and informal training programs offered by the ABS;
- Provide guidance to ABS staff on the skill expected of them to undertake different positions.

Annex 2 is titled 'Capability Diagram' and is self-explanatory I think. The numbers/letters on the left hand side refer to position levels with the more senior levels being at the top. Not surprisingly, you will find capabilities around 'statistical leadership' being more important at the most senior levels. The diagram also recognises that some capabilities are picked up through formal learning whereas others are through experiential learning.

The next step is to compile a list of capabilities or skills required within the organisation. Annex 3 entitled 'ABS Capability Framework' attempts to do this. It provides a full list disaggregated by Role. The actual capabilities will vary by the position held and the level. There are some generic capabilities that are not listed eg statistical leadership, communication.

The Competency (or Capability) Framework has been in place for some time and has greatly assisted in achieving the two objectives mentioned at the beginning of this Section. It would be possible to obtain more details if they are of interest.

12. Summary of Recommendations on Efficiency

In this Section I have included those Recommendations associated with Efficiency. The final Report will include recommendations on the other areas covered by my Report.

In terms of Efficiency, the following are my main recommendations.

Social Statistics – (a) Functionally specialise the BUILD function for the systems (including the data collection instruments) for outsourced household surveys and develop real strengths in software like BLAISE (or replacement software). This functionally specialised area should be located in the Interviewer Services Division. (b) Functionally specialise the sample selection function in the Research and Methods Division. (c) Renegotiate the contract with the private sector provider of LFS interviews to make greater use of web surveying and a focus on a smaller representative sample rather than an absolute response rate of 65%. (d) Review the panel structure used for the LFS. (e) Consider functionally specialisation of the acquisition and processing functions for administrative data.

Business Statistics – (a) Introduce further functional specialisation of business survey activity by moving responsibility for input processing to the Business Surveys Division. This will also facilitate the greater use of more cost effective macro editing. (b) Change the approach to the processing of VAT data to improve the quality so it can be used more extensively replacing some of the existing surveying of businesses for short term statistics.

Economic Statistics – (a) Take a corporate approach to the redevelopment of the ageing production systems used by Departments. Capture any resource savings that are possible by performing existing functions more effectively. (b) Examine whether efficiencies are possible through a redesigned National Accounts processing system.

Registers – Establish Memoranda of Understanding with supporting Service Level Agreements for data obtained from Registers.

Information Technology – Change the organisational arrangements for those IT staff working on the development and support of IT applications systems.

17 October 2014

Annex 1: Comparisons with Statistics Finland

Annex 2: Capability Diagram

Annex 3: ABS Capability Framework

ANNEX 1 – COMPARISONS WITH STATISTICS FINLAND

The basic goal of the benchmark study was to try to answer the question: how it is possible that Statistics Denmark (SD) uses so much less resources than Statistics Finland (SF)? The key conclusions are as follows. These are the conclusions at the time the report was written in December 2010 and some things will have changed since then.

- The pressure to cut down resources has been prevalent and visible at SD much longer than at SF.

- Both organisations are heavy users of administrative data collected by other authorities and this reduces the cost of data collection compared with other organisations. SD is comparatively lower cost than SF possibly because of more efficient extraction and management of data bases used to derive statistics.

- Some basic data and data management systems are standardised in Denmark, whereas in Finland no standardisation existed. More generally, SD has taken a more disciplined approach and standardised its IT tools, methods, and platforms for a far longer time than SF has. The outcome is more standardised, streamlined, and functional way of working, particularly in the dissemination of statistical results. It has also been assisted by the functional specialisation of many business survey activities.

- SF spends far more resources to collect data from households and individuals than SD. The lower costs at SD are because they have taken a market oriented approach to the data collection and used private sector providers to several collections including the partly the Survey. Interviewing activity at SD is seen much more as a market-oriented activity than at SF and this pressure also applies to the interviewing activity undertaken within SD.

- The organisation structure of SD is more concise than at SF, even after the number of the staff is taken into account. Specifically there are fewer layers of management at SD compared with SF and the responsibilities are more clearly delineated ie less reliance on matrix management arrangements.

- On the other hand, SD seems to spend more on IT applications staff. SF applications staff are centralised to a much greater extent. The Statistical Departments do not have their own IT staff.

This document was created 2004

Job Specific Capabilities

Division	Role	Capabilities
ESG/PSG/MD	**Stakeholder Engagement** This capability relates to Identifying Information Needs, understanding the broad context in which information is required, for example - ● the drivers and policies of key users ● what information is required ● how the information will be used by users,and ● generally assessing the information need within the current statistical program and framework.	● Awareness of current and emerging policy issues and debates and their potential statistical impacts. ● Ability to identify information needs ahead of user demand ● Define client needs in a conceptual terms for statistical measurements, particularly when the demand is new. ● Awareness and understanding of all important ABS national and international statistics, frameworks and standards. ● Understand research and policy aims of key users and how these may be met by statistical collections ● Ability to explain to external clients legislative requirements and how this limits the collection and release of certain types of data ● Ability to forge close links with external clients, understand and guide what data is needed, how it will be used, how this may be best satisfied and agree on priorities. ● Maintain a network of business partners and data providers. ● Ability to influence non-ABS statistical activities with view to expanding and enhancing the national statistical service.
	Planning Statistical Planning relates to assessing the information need and how this need can be addressed and how decisions made at different parts of the process flow through. For example ● survey versus other data sources or combination ● census versus sample ● methodological parameters ● sample size ● accuracy requirements ● collection methods ● frames ● dissemination strategies ● field processes ● data entry (coding) ● budgeting	● Knowledge (and use) of national and international statistical frameworks and standards ● Understanding of questionnaire design principles and testing techniques ● Understanding of sampling procedures and the impact these have on statistics produced ● Ability to define collection content, technical specifications (topics, data items, definitions) and define methodological parameters (eg sample sizes)in consultation with users taking provider load issues into consideration ● Understanding of ABS statistical publishing/dissemination directions and objectives ● Ability to develop effective dissemination strategies ● Understand link between quality, cost and timeliness to ensure surveys are well managed, cost effective and meet requirements ● Understand the context in which data collection is based. ● Capacity to identify most appropriate data collection vehicles, including the use of administrative data sources ● Application of Project Management principles to the statistical cycle. ● Ability to develop estimation and statistical

		error specifications
	Methodoology This relates to using information and decisions made during tatistical Planning to finalise the collection design. For example: ● the collection type, frequency & mode; ● frame developemnt; ● sample design, methodology and size; ● estimation methodology	● Ability to develop estimation and statistical error specifications ● Ability to implement sound methodological procedures into ABS surveys ● Ability to develop cost effective arrangements for obtaining data which minimises provider load ● Understanding of non-sample error. ● Understanding of impact of data collection methods on data collection instruments
	Collection Development This is the link between the methodology area and the implementation of specifications eg sample, collection, forms	● Understanding of questionnaire/forms design principles and testing techniques ● Ability to undertake appropriate testing strategies and communicate test results effectively ● Understanding of impact of data collection methods on data collection instruments ● Ability to implement sample and frame specifications within collection methodology. ● Awareness of previous related survey. ● Understanding of sampling procedures and this impact these have on statistics produced
	Data Collection Includes collecting the information from providers as well as accessing administrative data sources. This is the process of bringing the data into the ABS.	● Ability to communicate effectively with providers, includes interviewing, follow-up procedures etc ● Ability to negotiate appropriate agreement with providers. ● Ability to: i. assess quality of data; ii. use of that data appropriately, and iii. facilitate their delivery to internal users ● Understanding of quality issues relevant to the use of data from administrative systems ● Ability to use, develop and provide appropriate data capture and provide management systems ● Understanding of sampling procedures and this impact these have on statistics produced
	Processing From the input data source - getting the data into a more useable form and checking for errors etc. Includes ● estimation ● editing ● imputation ● sample and frame maintenance procedures	● Effectively use (and develop)processing mechanisms ● Use (and develop) processes for using relevant corporate data storage, processing and dissemination facilities ● Understanding of sampling procedures and this impact these have on statistics produced ● Ability to use editing, imputation and weighting systems ● Ability to develop appropriate editing and imputation strategies ● Undertake effective estimation processes ● Ability to develop and implement appropriate quality assurance processes
	Dissemination How do you communicate	● Ability to advise what data are fit for use and what data are inappropriate

	statistics? Turning the data into information, includes ● tables, graphs and publications ● coherence - framework in which data is collected ● application of time series ● application of prices Adhering to ABS policies and practices associated with dissemination of statistical products (includes publications, data cubes, CURFs etc)	● Ability to lucidly express statistical ideas and concepts in writing. ● Understand information design and presentation principles and practices ● Understand the dissemination capabilities of the ABS and the impact on output generation ● Ability develop and implement quality assurance processes (eg clearance documentation) ● Ability to create appropriate standard outputs (eg tables, graphs and data analysis) and products (eg publications, web releases, data cubes, CURFs). Also includes analytical techniques such as time series and prices
	Decision Support Evaluate the collection and outputs. Has it met the information need?	● Ability to evaluate and improve current systems, processes and procedures to increase efficiency and/or quality of data produced ● Ability to be able to providemeasures and explain aspects of the quality of the data ● Understand and explain the date to clients including its limitations and quality issues. ● Ability to understand the external environment and monitor the impacts they have on ABS and external statistics
	Managing quality and processes Relates to managing those processes which impact throughout every stage of the statistical cycle and ensure the collection meets its objectives. This includes: ● project management ● data management ● application of the data quality framework	● Knowledge of the interactions between data structures and technology to get the most out of efficient data processes ● Ability to evaluate and improve current systems, processes and procedures to increase effiency and/or quality of data produced Knowledge of corporate facilities to create and maintain metadata ● Ability to apply good corporate practice in effective use of relevant corporate data storage, processing and dissemination facilities ● Ability develop and update corporate data storage, processing and dissemination facilities
	Statistical Research Involves formulating a research question and researching the issues to develop a solution.	● Ability to conduct systematic investigation of a particular topic, including defining topic and objective of research ● Ability to investigate and find alternate sources of information ● Ability to evaluate methodologies / techniques/ topics and assess applicability for the ABS ● Ability to critically analyse information and identify what is important and assess applicability for the ABS ● Ability to apply statistical frameworks in statistical research and analysis. ● Ability to develop new methodologies / techniques or enhance existing ones
	Statistical Standards and Infrastructure Maintaining and developing statistical frameworks and	● Ability to develop appropriate techniques for presentation of statistical data ● Knowledge of national and international statistical frameworks and standards

	infrastructure, includes - • standards • geography • statistical systems such as genest etc • business register etc	• Ability to develop statistical frameworks and standards • Ability to develop and apply conceptual frameworks • Understanding of questionnaire/forms design principles and testing strategies and impact on statistics produced • Understanding the impact the data collection method has on statistics produced and the link with standards
	Specialist - Sampling This involves assessing the methodological parameters and designing (and allocating) a sample. Also includes other non-sampling considerations such as frames, editing and imputation	• Ability to design and allocate appropriate sample design based on methodological parameters • Ability to provide methodological advice and advise of aspects of the collection design. • Ability to research statistical techniques and apply to ABS environment
	Specialist - Questionnaire Designer Developing appropriate collection instruments based on data item specifications.	• Ability to develop appropriate data collection instruments to minimise provider load and ensure concepts are readily understood and are cost effective • Ability to provide methodological advice and advise of aspects of the collection design. • Sound understanding of the cause and effects of non-sample error • Ability to translate data content specifications into appropriate collection instrument
	Specialist - Technical Analysis Advanced analytical techniques, which require application of theory and ability to take design information and create a solution - • modelling • time series • demographic techniques	• Understand, discriminate, select and implement methodological tools appropriate to the data • Understanding of appropriate methodological technique and limitations of the techniques • Ability to apply technique and interpret results • Understanding of the context in which the data was collected
	Specialist - Methodological /Review Audit A methodological capability which involves assessing a part of the statistical process (including analysis etc) and be able to make judgements about appropriateness of techniques etc.	• Ability to inspect and assess methodologies used and make recommendations for improvements etc as appropriate • Ability to determine and ensure application of best available methodology given standards and resources constraints • Ability to understand and document method used • Conversant with current methodologies including their validity, limitations and usefulness
	Specialist - Accounts Preparation of National and International Accounts.	• Understanding the system of National /International Accounts • Understanding of sampling procedures and this impact these have on statistics produced
	Specialist - Prices Production of prices products such as CPI and PPI, includes understanding and	• Knowledge of prices theory and ability to apply to input data series

	applying prices theory.	
TSD	**Generic TSD roles .** Although, TSD is reposnsible for the delivery of a wide range of services, all TSD staff members are expected to aspire to this set of capabilties.	• Applying appropriate tools and techniques in designing solutions • Research skills to maintain knowledge of broader industry directions • Implementing timely solutions • Technical knowledge and adaptability • Innovation • Problem management • Keeping up to date with current developments • Knowing the industry • Anticipating industry developments • Discover and researches new technologies • Ability to provide strategic technological leadership and guidance • Ability to delivers outcomes
	Project Manager - The TSD Project Manager is responsible for the formation and organisation of key TSD projects. Issues such as stakeholder liaison, the management of resources and risk and the ulitmate delivery of project output within time and budget limitations are part of the Project Managers responsibilities.	• Demonstrated ability to manage projects in a technical environment • Knowledge of client business and their business processes • Broader than normally expected knowledge of ABS Project Management Framework, as specified in the Core Capabilities. • Broader than normally expected knowledge of and skills in use of ABS Projects Database. • Knowledge of relevant IT environment(s) and associated application development tools (see list below). • Knowledge of Service Oriented Architecture and Service Oriented Development • Knowledge of business analysis, OO Analysis and Design, Modelling techniques • Knowledge of ABS enterprise architecture and architectural directions • Knowledge of ABS strategic directions • Knowledge of industry and vendor directions • Other project management capabilities as defined in Core Capabilities.
	Technical Expert - A Technical Expert develops and retains deep expertise in one or more IT domains applicable to ABS and is the authoritative contact for strategic directions and tactical decisions relating to those domains. A Technical Expert is usually inquisitive, questioning, innovative and have an experimental attribute for the application of technology related to likely ABS directions.	• Communicates and champions ideas in the use of appropriate technologies • Maintains high level awareness of industry trends and demonstrates ability to align and implement to meet ABS business requirements • Advises TSD Management on future technology options • Contributes to industry directions or Standards bodies and peer groups • Ability to learn and apply technologies in ABS context in shorter timeframes than normally expected of TSD staff • Filters and summarises ICT Technologies • Displays expertise to the evaluation of hardware and software products • Shares technical and operational knowledge • Ensures security, resilience and performance standards are met • Provides identification of resolution to complex technical analysis

		• Demonstrates high level expertise in one or more technical fields • Complex technical problem analysis, identification or resolution • Sources and applies specific IT solutions to meet ABS needs • Demonstrates strong contextual abilities • Ability to articulate and encourage the adoption of specific technology • Be able to develop a deep knowledge of new technologies and maintain pace with industry developments • Be able to provide independent judgement and advice
	Account Manager - TSD Account Managers act as a contact person for assigned ABS clients. They liaise with client areas to determine requirements and offer initial technological advice and provide guidance to ABS clients regarding technological issues.	• Operates from a sound Information, Communication and Technology (ICT) base • Advises clients of TSD services and products • Facilitates business outcomes congruent with both TSD and client requirements • Effectively translates ICT terminology to clients • Influences and negotiates effectively between TSD and client areas • Demonstrates strategic technological leadership and guidance • Knowledge of ABS current technological capability • Knowledge of ABS strategic technological direction • Knowledge and appreciation of client business priorities and demands • Knowledge of TAB Cost Recovery
	Help Desk Analyst - The Help Desk Analyst is the first point of contact for technical faults and problems. They must have a good knowledge of the IT Environment and the ability to prioritise incidents.	• Displays excellent phone manner (communication skills) beyond those listed in core capabilities. Qualities required include patience, tact, courtesy and excellent listening skills • Displays resilience to difficult situations • Ability to recognise patterns in calls and uses documented solutions to resolve common incidents • Willingness to take responsibility for incidents and the provision of feedback to clients • Ability to triage and assess priorities of incidents • Serve as an effective single point of contact for error reports and service requests (incident management) • Provide an accessible professional, consistent and efficient service to callers • Records and monitors progress of incidents • Applies analytical skills and judgement triage and filter incidents, and assign or escalate to support teams where required • Produces management reports and identifies trends. • Commits to operating in a rostered environment. • Good knowledge of ABS IT environment and business systems • Ability to identify and access solution

		resources ● Awareness of new and emerging ABS technologies and business tools ● Familiarity with the commonly used service management tools and how they interact to support the ABS Enterprise Architecture.
	Infrastructure Designer	● Displays extensive knowledge and experience of ABS technologies and how they meet business needs, ● Applies knowledge of and contributes to the Enterprise Architecture, including the Infrastructure Ecosystem and Service Management Architectures. ● Ability to identify and promote technology opportunities for the ABS, ● Understanding of the operational and strategic objectives of the business, ● Shows leadership in using good practice in the areas of design and implementing infrastructure. ● Demonstrates process improvement skills ● Displays creativity and innovation ● Applies risk assessment (Technical, financial, operational, business) ● Ability to lead and drive virtual teams ● Actively networks with industry and peers to identify opportunities ● Ability to transform vision into results ● Leads and contributes to change ● Communicate and promote ideas ● Provides fit for purpose infrastructure designs ● Identifies infrastructure technologies to address business needs. ● Delivers quality, adaptable and manageable designs and solutions ● Assesses suitability of architectural options and opportunities for the evolution of a design over time ● Rearchitect legacy systems ● Assesses impact of infrastructure design upon ABS business ● Analyses and designs service resumption strategies ● In-depth knowledge of IT technology, industry & trends ● Strong understanding of infrastructure architecture and technologies ● Design principles ● Data modelling, application design ● ABS business models and strategies Carrying out at different levels is characterised by the; ● depth and breadth of knowledge and experience, ● level of independence in carrying out the work, ● size of project, impact of the change, ● initiative, innovation and leadership, ● quality and significance of ideas.
	Infrastructure Administrator	● Demonstrates initiative and sound judgement ● Displays ownership for resolution of problems

		and issues ● Assesses the impact of technical and operational change upon the stability of infrastructure and business systems. ● Develops proficient operational technical documentation ● Effectively administers process management ● Innovation ● Expertise in the delivery and operation of technical infrastructure ● Analysis and resolution of complex operational problems, including out of hours ● Liaison with peers, management, clients and vendors ● Application of expertise to the evaluation of hardware and software products ● Sharing of technical and operational knowledge ● Ensure security, resilience and performance standards are met ● Ability to provide advice on architecture ● Contribute to the development of operational standards and procedures ● Complex technical problem resolution ● Implementation and maintenance of systems that meet business requirements ● Broad technical knowledge in areas of responsibility ● ABS Enterprise Architecture ● Technology trends and directions ● TSD governance arrangements ● Understanding of impact and contribution to other areas, both within TSD and in the rest of the organisation
	Application Programmer . ● Details and clarifies business analysis ● Designs system solution ● Coordinates translation of analysis into build ● Negotiates changes to architecture ● Provides guidance to programmers ● Translates business requirements into specifications for process and/or system change ● Applies technology to solve specific business problems ● Assists in the defining of standards and guidelines ● Focuses on and encourage reuse ● Has strong client negotiation/communication skills ● Encourages client buy in	● Applying architecture decisions. ● Balance broad strategic view with detailed pressing operational demands. ● Programming skills. ● Separation of layers. ● Applying appropriate tools and techniques in designing solutions. (Generic TSD capability) ● Research skills to allow maintaining knowledge of broader industry directions. (Generic TSD capability) ● Influence corporate architectural directions. ● Communicating technical design ● Problem solving/decision making ● Integration decisions ● Specialist technical knowledge in solution space ● Knowing who to call (knowledge of skill within TSD) ● Understanding/knowledge of client subject matter. ● Implement timely solutions (Generic TSD capability) ● Project management skills - particularly budgeting and estimating etc. ● Sound technical knowledge of relevant IT environment(s) (see list in (Subject: TSD IT Environments (list from WR) - DRAFT;

		Database: TSD Portal; Author: Chi Nguyen; Created: 17/01/2005; Doc Ref: CNGN-68PV7E)) and associated application development tools ● Understanding of client business and their business processes ● Testing and performance tuning techniques ● Tool(s): Testing eg. TestPartner ● Industry standards eg. XML, web services, and ABS Standards and Guidelines (Subject: ADE - Standards and Guidelines - to be developed
	Analyst Programmer ● Detailing and clarifying business analysis . ● Designing system solution. ● Coordinating translation of analysis into build. ● Negotiate changes to architecture. ● Provide guidance to programmers. ● Translate business requirements into specifications for process and/or system change. ● Apply technology to solve specific business problems. ● Assist in the defining of standards and guidelines. ● Focus on and encourage reuse. ● Strong client negotiation/communication skills ● Encourage client buy in.	**Knowledge:** ● Sound technical knowledge of relevant IT environment(s) and associated application development tools (see list in (Subject: TSD IT Environments (list from WR) - DRAFT; Database: TSD Portal; Author: Chi Nguyen; Created: 17/01/2005; Doc Ref: CNGN-68PV7E)) ● Good underdstanding of client business and their business processes ● Service Oriented Architecture and service oriented development ● Requirements Capture, Business analysis, OO Analysis and Design techniques ● Modelling including UML ● Testing and performance tuning techniques ● Tool(s): Modelling eg. Holocentric Modeller, BPM tool(s) eg. BPM Mapper, BPM Process Assistant, Process Library, Testing eg. TestPartner ● Industry standards eg. XML, web services, and ABS Standards and Guidelines (Subject: ADE - Standards and Guidelines - to be developed) **Capabilities and Skills :** ● Applying architecture decisions. ● Balance broad strategic view with detailed pressing operational demands. ● Programming skills. ● Separation of layers. ● Applying appropriate tools and techniques in designing solutions. **(Generic TSD capability)** ● Research skills to allow maintaining knowledge of broader industry directions. **(Generic TSD capability)** ● Influence corporate architectural directions. ● Communicating technical design ● Problem solving/decision making ● Integration decisions ● Specialist technical knowledge in solution space ● Knowing who to call (knowledge of skill within TSD) ● Understanding/knowledge of client subject matter. ● Implement timely solutions **(Generic TSD capability)**

		• Project management skills - particularly budgeting and estimating etc.
	System Architect Designer • lead role in a major area of Enterprise, Infrastructure, Application & Information Architecture • leadership of technologists • participate IT strategic work • Work closely with wide range of ABS business and IT staff to provide advice on application of ABS's architecture models. provide advice on the application of ABS architectural models to IT and business staff • developing a deep understanding of how frameworks can be provided which deliver technology to meet the business needs of the agency • contribute to the enterprice, infrastructure, application and information architectures • contribute to other architectures and project level design work.	**Knowledge:** • Sound technical knowledge of relevant IT environment(s) and associated application development tools (see list below). Sound knowledge of client business and their business processes • Service Oriented Architecture and Service Oriented Development • OO Analysis and Design techniques • Modelling including UML • Tool(s): Modelling eg. Holocentric Modeller • Sound knowledge of ABS enterprise architecture and architectural directions • Sound knowledge of ABS strategic directions • Sound knowledge of industry and vendor directions **Capabilities and Skills :** • Technical knowledge and adaptability **(Generic TSD capability)** • Communication at an appropriate level • Project and process management • Interpersonal skills • Business understanding • Innovation **(Generic TSD capability)** • Problem management **(Generic TSD capability)** • Enterprise architecture
	Infrastructure Manager **Capabilities and Skills :** 1. Manage a technical infrastructure team 2. Provide a reliable, scalable, secure and cost effective infrastructure which meets business needs 3. Contribute to infrastructure design 4. Deliver a service to the organisation 5. Awareness of industry trends and being able to align and implement to ABS business requirements 6. Provide advice to TSD management on options for future technology infrastructure 7. Devise a forward work programme	**Knowledge:** • IT Technology & trends • Management of IT • Commonwealth procurement procedures • Financial management • TSD planning processes • ABS Enterprise Architecture • ABS business • Management of a technical team **Capabilities and Skills :** • Problem Management • Ability to translate business needs into technical solutions • Client and vendor relationships/negotiations • Financial Management of technical infrastructure • Maintaining awareness in industry trends • Managing and faciltating infrastructure change • Broad technical knowledge of infrastructure services • People management/ leadership • Risk management • Mentoring

		• Ability to influence
IMCD	**Librarian:** To provide a range of library products and services in Central Office and State Office Libraries to meet the information needs of ABS staff, LEP libraries and staff and external clients.	• Cataloguing and technical services • Information needs analysis • Reference and research • Training delivery and evaluation • Policy writing • Advocacy
	Researcher: Carry out research of relevance to the ABS in relevant fields and bring relevant information into the organisation.	• Expert knowledge in related areas. • The ability to define a problem; to distinguish the wood from the trees. • Problem solving and analytical skills. • Investigative skills. • Persistency. • Creativity. • Credibility. • An inquiring mind; an enthusiasm for finding out things. • The capacity to learn. • The ability to draw connections between seemingly unrelated facts. • The ability to take a broad perspective. • The ability to see new ways of doing things. • The ability to grasp new ideas and concepts. • The ability to deal with complexity. • The ability to formulate generalised ideas or concepts by extracting common qualities from specific examples. • The ability to explain issues. • The ability to bring in relevant information to the ABS.
	Client supplying : • Understand client requirements and provide information or assistance (both for public good and commercial activities), to meet client needs in accordance with ABS client servicing policies and practices. • Represent the ABS in a professional manner.	• Skills to understand client requirements and to interpret statistical needs • Knowledge of the sales process, and the ability to close a sale • An ability to convert major opportunities into sales.
	Client Managing : • Develop and maintain relationships within client organisations and the ABS. • Understand clients' business objectives and operating environment • Listen, understand and interpret clients' requirements. • Provide timely, quality and ongoing solutions to	• Skills to understand the business environment of clients • Skills to recognise business policies/objectives of clients and to interpret statistical needs • Ability to identify appropriate stakeholders in client organisations • Negotiation and relationship building skills of a high order • Understanding of the clients' work and objectives (eg through meetings, prior work with them, or outpostings to their areas, and knowledge through ongoing relationship

	meet identified clients' needs, utilising CSSS and appropriate ABS subject matter areas. ● Provide feedback from clients to marketing, sales and SMAs on market intelligence, products and services, unmet demand, etc. Continually assess ABS capability to meet demand and include assessments in feedback. ● Represent the ABS in a professional manner at client sites, conferences, and seminars	
	Marketing Services : ● Provide strategic market analysis and advice to the ABS. ● Develop and manage / implement product/service marketing plans. ● Develop, produce and manage distributution of product/service promotional mediums ● Apply new product development policy, principles and process. ● Integrate and coordinate product development, marketing and selling people and processes. ● Manage ABS commercial strategies and operations. ● Develop ABS revenue projections and manage revenue and client service costs performance. ● Manage resellers of ABS products and services.	● Ability to apply marketing concepts to ABS products and services ● Ability to develop and write marketing plans ● Ability to design, develop, write and produce promotional materials including newletters ● Ability to conduct analysis and market research ● Ability to conduct/carry out/ evaluate promotional campaigns ● Ability to write marketing material effectively on the Web
	Information Consultant ● Understand client requirements and provide information or assistance (both for public good and commercial activities), to meet client needs in accordance with ABS client servicing policies and practices. ● Provide a consultancy service to clients	● Understanding of the clients' work and objectives ● Understanding of statistical analysis techniques ● Knowledge of sources for non-ABS data or where to go to find information/who to ask ● Knowledge of ABS products and services. ● Knowledge of collection/statistical methodologies ● Knowledge of ABS classifications ● Knowledge of ABS systems and software ● Knowledge of the sales process

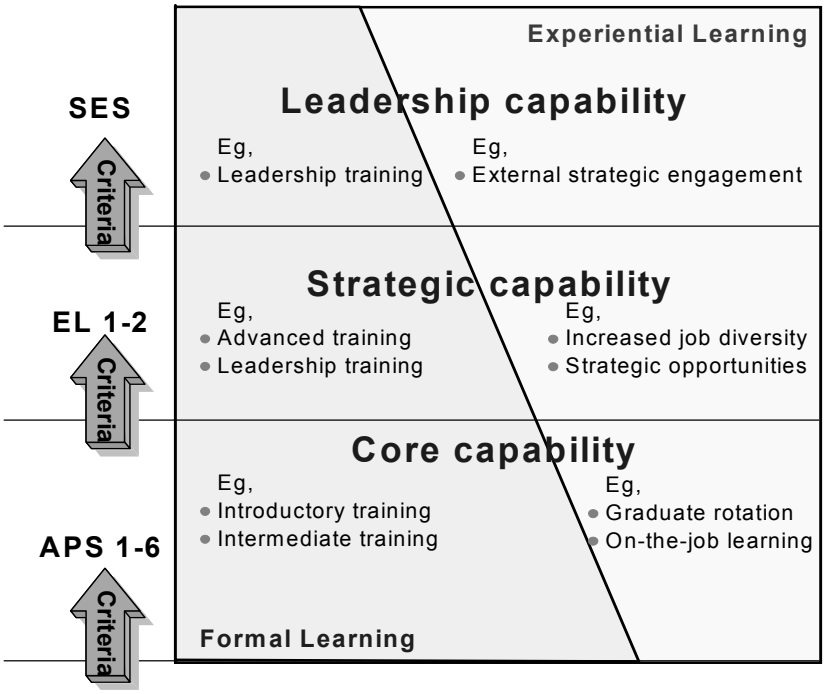
	requiring data extraction, interpretation and analysis. ● Ensure that clients are provided with information solutions that meet their needs. ● Represent the ABS in a professional manner.	
	Bookshop/Front Counter/Reception ● First point of public contact with ABS office environment. Greet visitors, service simple enquiries and sell ABS products and services. ● Represent the ABS in a professional manner. ● Understand client requirements and provide information or assistance (both for public good and commercial activities), to meet client needs in accordance with ABS client servicing policies and practices. ● Act as agent for the Collector of Public Monies.	● Customer service skills - eg personal ie counter service techniques, telephone techniques, sales/marketing techniques, (sales cycle, closing a sale), active listening, questioning techniques, negotiating skills ● Ability to understand client requirements and to interpret statistical needs ● Data extraction, presentation, delivery skills ● Ability to communicate in an effective and pleasant manner ● Ability to identify customer needs and translate these to ABS service capability or leads for referral to information consultants ● Appropriate technology skills
	Strategic Marketing Planner	● ability to apply marketing and PR techniques to ABS products and services (basic concepts APS4-5, advanced marketing and PR techniques APS6-EL1) ● understand how clients use ABS data and make recommendations on potential markets and appropriate marketing techniques ● ability to prepare and implement strategic marketing plans for key ABS products and services (APS4-5 = draft, APS6-EL1 = to final standard) ● ability to monitor and evaluate marketing effectiveness (all levels), and adjust planned marketing activities to take account of intelligence and new information (APS6, EL1) ● high level of understanding and ability to apply client service policies (APS6, EL1) ● ability to design, develop, write and produce promotional materials including those for use on web ● writing skills that are higher than equivalent levels in rest of ABS, including writing for web
	Market Researcher	● Ability to define problem and seek appropriate market research solution. ● understanding of market research processes as they apply to ABS business ● ability to conduct market research using qualitative and quantitative methods, including

		online methods (APS6, EL1); for APS4-5 lesser standard required ● ability to manage outsourced market research projects (APS6, EL1); lesser standard required for APS4-5 ● ability to turn ABS administrative information and market intelligence on clients, products and competitors into emerging trends and recommendations for exec (draft for APS4,5; final standard for APS6, EL1)
	Graphic Designer	● Manage Graphic Design Studio within time and budgetary constraints (APS6). ● Manage multiple graphic design and print jobs, both in-house and outsourced, using established job tracking systems to log and monitor all design and print work. (APS5-6) ● Advanced ability to create high quality artwork and designs using design-specific software (APS6); lesser ability for APS5. ● High level knowledge of printing and pre-press processes. ● Excellent networks with others in the graphic design and print industries, and an understanding of their relative strengths and weaknesses as service providers to the ABS. ● Ability to research and investigate new technologies in graphic design and printing, and keep up-to-date on design styles, presentation and software. (APS5-6) ● Ability to make recommendations on acquisition of new software and hardware to ensure efficient operation of Graphic Design Studio. (APS5-6)
	Geography Section ● sets, maintains and promotes geographic, mapping and Geographic Information System (GIS) standards for the ABS; ● provides geographic, mapping and geographical information system support services for the Census of Population and Housing; and ● implements appropriate geographical information system and geocoding technology for the collection, production and dissemination of statistics.	● Technical ability to develop and maintain geographical information systems ● Understanding of spatial concepts and geographical classifications, in particular geography associated with the census.
CSD	Knowledge - Bringing HR to the business	Knowledge of: 1. HR related policies and processes o Continually builds knowledge and expertise o Understands current HR approaches, tools and technology

		o Actively stays up to date with organisational guidelines and processes 1. Organisational dynamics o Understands the culture of the organisation and its impact on HR policies and processes o Has an appreciation of corporate governance and strategically uses this information o Understands the interplay between organisational structure and culture o Understands the points of influence in the organisation 1. Development and reward systems. o Is alert to and understands where organisations stand in the market o Knows what makes the organisation an employer of choice o Has a detailed knowledge of current HRD thinking and applications to maximise the potential of staff o Understands the behavioural triggers that affect or improve performance
	Credibility - Assumes an influential seat at the table	1. Is influential and persuades others (Core Capability - People and Communication) o Makes a positive impression and engenders confidence o Influences attitudes and opinions and gains agreement to plans and ideas o Negotiates and resolves conflict o Effectively communicates across audiences 1. Acts as a strong role model (Core Capability - ABS Environment) o Acts with integrity, has high ethical standards and upholds Values o Models high standards of behaviour through own actions o Inspires trust by treating all individuals fairly o Makes fair decisions and stands by agreements made o Is resilient and shows courage 1. Is analytically agile (Core Capability - Thinking) o Demonstrates strong analytical skills in diagnosing issues and trends o Anticipates problems and initiates effective responses o Assesses and prioritises issues o Thinks laterally o Thinks quickly on one's feet
	Alignment - Connecting HR with the ABS business.	1. Scans and reads the business (Core Capability - The Business of Statistics) o Takes responsibility for learning about, and being alert to, changes in the business o Maintains business knowledge through frequent interaction with people in the workplace o Reads and translates the organisation's business to others 1. Integrates HR initiatives with business plans (Core Capability - Achieves Results) o Identifies and sets HR priorities within the context of business plans

		o Presents strong business cases for HR initiatives o Blends both a strategic and operational focus in providing advice and delivering results 1. Contributes to and supports corporate strategy (Core Capability) o Translates Government and organisational expectations of performance and direction into business context o Works to support and shape long term organisational goals o Works with line areas to promote and facilitate the integration of people issues into the business plan
	Innovation - Brings ideas to the ABS business	(Core Capability - Achieving Results) 1. Prepares people for change o Proactively explains and supports change initiatives o Demonstrates a clear sense of one's own role as an enabler of change o Builds a shared enthusiasm and purpose for change o Supports individuals to manage change 1. Seeks out and acts on opportunities o Continually looks for ways to enhance and create methods to achieve business outcomes o Seeks, evaluates and integrates better practices within the organisation o Champions innovative ideas and projects 1. Is flexible and explores opportunities o Critically evaluates and explores alternatives to the way things are done o Helps others to find creative ways around obstacles o Is open to new ideas o Seeks and encourages ideas from others
	Relationships - Partnering with the business	(Core Capability - People and Communication) 1. Creates and maintains partnerships o Establishes and maintains good relationships across the organisation o Collaborates with clients to formulate and implement HR initiatives o Fosters open and frank discussion of issues with others 1. Focuses on the needs of others o Understands and focuses on the needs of people and the organisation o Accommodates and adapts to different circumstances and audiences o Demonstrates an interest in, and understanding of, the views of others 1. Coaches and develops others o Enables others to make the best use of their talents o Empowers others to take initiative and solve problems o Guides the Executive and line managers in actively managing people issues
	Performance - Achieving	(Core Capability - Achieving Results)

	high quality business results	1. Applies business acumen to HR decisions o Approaches HR issues from a strategic business perspective o Understands the implications of business plans o Understands financial and budgetary implications o Understands and uses business analysis and evaluation tools o Demonstrates effective project and contract management skills 1. Drives for results and manages risk o Anticipates situations, assesses the probable impact, weighs options and plans accordingly o Is energetic and takes personal responsibility to deliver on agreed outcomes o Accesses best resources to get the job done o Maintains high performance even when under pressure o Is prepared to stand one's ground in the best interests of the organisation 1. Evaluates outcomes o Continually monitors HR initiatives to maintain consistency with business outcomes o Evaluates outcomes, considers business implications and integrates results into the performance improvement cycle o Assesses the added value of implemented HR initiative


Experiential Learning
SES
Leadership capability
Eg,
Leadership training
Eg,
External strategic engagement
Criteria
Strategic capability
EL 1-2
Eg,
Advanced training
Leadership training
Eg,
Increased job diversity
Strategic opportunities
Criteria
Core capability
Eg,
Introductory training
Intermediate training
Eg,
Graduate rotation
On-the-job learning
APS 1-6
Criteria
Formal Learning